

A 000 2582

IFB NO. DACW29-98-B-0112



US Army Corps
of Engineers
New Orleans District

Lake Pontchartrain, LA and Vicinity
Hurricane Protection, High Level Plan

**Fronting Protection at Pump Station #6
Orleans Parish - Jefferson Parish
17th Street Outfall Canal (Metairie Relief)**

Orleans and Jefferson Parishes, Louisiana

Competitive 8(a)

Note: A bid guarantee in the amount of 20% of the bid price IS REQUIRED!

**Construction Solicitation
and Specifications**

03 Sep 1998

**PHONE INQUIRIES
REGARDING THIS SOLICITATION SHOULD
BE MADE TO THE FOLLOWING:**

**AREA CODE 504
COLLECT CALLS NOT ACCEPTED**

**INFORMATION
MRS. SHEILA ENCLADE
862-1514**

**PLANS AND SPECIFICATIONS
MS. KATRINA PELREAN
862-2880**



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P O BOX 60267
NEW ORLEANS, LOUISIANA, 70160-0267

REPLY TO
ATTENTION OF

SOLICITATION NO. DACW29-98-B-0108

03 September 1998

FOR: COMPETITIVE 8(a), LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY, HURRICANE PROTECTION, HIGH LEVEL PLAN, ORLEANS AND JEFFERSON PARISH, FRONTING PROTECTION AT PUMP STATION #6, ORLEANS PARISH - JEFFERSON PARISH, 17TH STREET OUTFALL CANAL (METAIRIE RELIEF)

TO OPEN: 06 OCTOBER 1998, 2:00 P.M., LOCAL TIME AT PLACE OF BID OPENING

- I. NOTE THE AFFIRMATIVE ACTION PROGRAM REQUIREMENT OF THE EQUAL OPPORTUNITY CLAUSE WHICH MAY APPLY TO THE CONTRACT RESULTING FROM THIS SOLICITATION.
- II. NOTE THE CERTIFICATION OF NONSEGREGATED FACILITIES IN THIS SOLICITATION. **Bidders, offerors and applicants are cautioned to note the "Certification of Non-segregated Facilities" in the solicitation. Failure of a bidder or offeror to agree to the certification will render his bid or offer non-responsive to the terms of solicitations involving awards of contracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause.**

BIDS MUST PROVIDE FULL, ACCURATE AND COMPLETE INFORMATION AS REQUIRED BY THIS SOLICITATION AND ITS ATTACHMENTS. THE PENALTY FOR MAKING FALSE STATEMENTS IN BIDS IS PRESCRIBED IN 18 U.S.C. 1001. (FAR 52.214-4 APR 1984)

DESCRIPTION AND MAGNITUDE OF WORK: THE WORK CONSISTS OF CONSTRUCTING A CONTINUOUS LINE OF FLOOD PROTECTION ACROSS THE PUMPING STATION. THIS PROTECTION WILL INCORPORATE THE USE OF REINFORCED CONCRETE CAPPED STEEL SHEET PILE I-WALL; PILE FOUNDED REINFORCED CONCRETE T-WALL; PILE FOUNDED GATED REINFORCED CONCRETE MONOLITHS; CONCRETE CANAL LINING; ALUMINUM BULKHEADS AND SLUICE GATES WITH ELECTRIC OPERATORS; SITEWORK WILL INCLUDE MODIFICATIONS TO EXISTING UTILITIES; DEWATERING; COFFERDAM CONSTRUCTION; CLEARING AND GRUBBING; EXCAVATION(BRACED AND CONVENTIONAL); EMBANKMENT BACKFILLS; FERTILIZING, AND SEEDING; AND OTHER INCIDENTAL WORK THERETO. PUMP STA. NO. 6 IS AN OPERATING FACILITY WHICH MUST REMAIN IN OPERATION THROUGHTOUT CONSTRUCTION; THEREFORE, THE CONSTRUCTION AREA IS SUBJECT TO FLOODING.

CAUTION TO BIDDERS: In delivery of hand-carried bids, bidders are cautioned to allow sufficient time for delays which may be encountered as a result of frequent trains which are subject to block all access roads to place of bid opening for various lengths of time. Such delays DO NOT permit acceptance or consideration of late bids.

NOTE: ALL WORK UNDER THESE SPECIFICATIONS WILL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF EM 385-1-1 "CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUEL", DATED SEPTEMBER 1996.

NOTE: A BID GUARANTEE IN THE AMOUNT OF 20% OF THE BID PRICE IS REQUIRED!

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SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO. DACW29-98-B-0112	2. TYPE OF SOLICITATION <input checked="" type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	3. DATE ISSUED 09/03/98	PAGE OF PAGE

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

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO. ED0000-8219-0007	6. PROJECT NO. DACW29-98-B-0112
7. ISSUED BY US ARMY ENGR DIST NEW ORLEANS PO BOX 60267 NEW ORLEANS LA 70160-0267	CODE ISSUE1	8. ADDRESS OFFER TO OFFER1 US ARMY ENGR DIST NEW ORLEANS ATTN CELMN-CT PO BOX 60267 NEW ORLEANS LA 70160-0267
9. FOR INFORMATION CALL:	A. NAME Sheila W. Enclade SC1	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) (504) 862-1514

SOLICITATION

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

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

11. The Contractor shall begin performance within 10 calendar days and complete it within 700 calendar days after receiving award, notice to proceed. This performance period is mandatory, negotiable. (See _____.)

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	12B. CALENDAR DAYS 3
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13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 10/06/98 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee is, is not required.

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

D. Offers providing less than 30 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)

CAGE CODE

CODE FACILITY CODE

15. TELEPHONE NO. (Include area code)

16. REMITTANCE ADDRESS (Include only if different than Item 14)

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

AMOUNTS ▶

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

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

AMENDMENT NO.	DATE

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	20B. SIGNATURE	20C. OFFER DATE
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AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA
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24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)	ITEM 26	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <input type="checkbox"/> 10 U.S.C. 2304(c) () <input type="checkbox"/> 41 U.S.C. 253(c) ()
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26. ADMINISTERED BY CODE

**NEW ORLEANS AREA OFFICE
U. S. ARMY CORPS OF ENGINEERS
P O BOX 60267
NEW ORLEANS LA 70160-0267**

27. PAYMENT WILL BE MADE BY

**USAED NEW ORLEANS
C/O USACE FINANCE CENTER
7800 THIRD AVENUE
MILLINGTON TN 38054-5005**

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

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

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

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

SOLICITATION NO. DACW29-98-B-0112

SECTION 00010 - BIDDING SCHEDULE

Lake Pontchartrain, LA and Vicinity, Hurricane Protection, High Level Plan,
Fronting Protection at Pump Station #6, Orleans Parish - Jefferson Parish,
17th Street Outfall Canal (Metarie Relief)

Item	DESCRIPTION	Estimated Quantity	Unit	Unit Price	Estimated Amount
0001	Mobilization and Demobilization	Lump Sum	LS		
0002	Clearing and Grubbing	Lump Sum	LS		
0003	Cofferdam Excavation (East Monolith)	Lump Sum	LS		
0004	Cofferdam Excavation (West Monolith)	Lump Sum	LS		
0005	Channel Excavation	Lump Sum	LS		
0006	Embankment	Lump Sum	LS		
0007	Fertilizing and Seeding	Lump Sum	LS		
0008	Armor Stone (Rip-Rap)				
0008AA	First 1583 Tons	1583	Tons		
0008AB	All Over 1583 Tons	1583	Tons		
0009	Piling, Steel Sheet, Type PZ-22	6100	SF		
0010	Piling, Steel Sheet, Type CZ-114	480	SF		
0011	Piling, Steel Sheet, Type PSA-23	285	SF		
0012	Construction Dewatering	Lump Sum	LS		
0013	Cofferdam (East Monolith)	Lump Sum	LS		
0014	Cofferdam (West Monolith)	Lump Sum	LS		
0015	Furnish Steel H-Piles (HP 14 x 73)	10804	LF		
0016	Driving Steel H-Piles (HP 14 x 73)	10804	LF		
0017	Reinforced Concrete	Lump Sum	LS		

SECTION 00010 - BIDDING SCHEDULE

Lake Pontchartrain, LA and Vicinity, Hurricane Protection, High Level Plan,
 Fronting Protection at Pump Station #6, Orleans Parish - Jefferson Parish,
 17th Street Outfall Canal (Metarie Relief)

Item	DESCRIPTION	Estimated Quantity	Unit	Unit Price	Estimated Amount
0018	Sluice Gates	Lump Sum	LS		
0019	Aluminum Bulkheads	Lump Sum			
0020	Utility Modifications	Lump Sum			
0021	Miscellaneous Metalwork	Lump Sum			
0022	Furnish and Drive Test Piles	Lump Sum			
0023	Compression Test				
0023AA	First Compression Test	1	EA		
0023AB	All Over One Compression Test	1	EA		
0024	Tension Test				
0024AA	First Tension Test	1	EA		
0024AB	All Over One Tension Test	1	EA		
0025	Electrical Work	Lump Sum	LS		
0026	Diving Services	Lump Sum	LS		
0027	Railroad Insurance	Lump Sum	LS		
0028	Selective Demolition	Lump Sum	LS		
0029	Asphaltic Concrete Pavement Restoration				
0029AA	First 150 SY	150	SY		
0029AB	All Over 150 SY	600	SY		
TOTAL:				\$	_____

Award will be made as a whole to one bidder.

SECTION 00010 - BIDDING SCHEDULE

Lake Pontchartrain, LA and Vicinity, Hurricane Protection, High Level Plan,
 Fronting Protection at Pump Station #6, Orleans Parish - Jefferson Parish,
 17th Street Outfall Canal (Metarie Relief)

Item	DESCRIPTION	Estimated Quantity	Unit	Unit Price	Estimated Amount
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NOTE 1: Bidders shall furnish unit prices for all items listed on schedule of bid items which require unit prices. If the bidder fails to insert a unit price in the appropriate blank for required items but does furnish an extended total or an estimated amount for such items, the Government will deem his unit price to be the quotient obtained by dividing the extended estimated amount for that line item by the quantity. The quantities shown in Items 008, 0023, 0024, and 0029 are for evaluation purposes only. IF THE BIDDER OMITTS BOTH THE UNIT PRICE AND THE EXTENDED ESTIMATED AMOUNT FOR ANY REQUIRED ITEM, HIS BID WILL BE DECLARED NON-RESPONSIVE.

NOTE 2: In recognition of the funding shortfalls that may occur in Fiscal Year 1999, the CONTINUING CONTRACTS (ALTERNATE) clause in Section 00800, has been used in this solicitation. This alternate clause is more restrictive with respect to funds availability and the liability of the United States in the event additional funding is not provided. Bidders are directed to read this clause before submitting a bid.

NOTE 3: EXPEDITING THE NOTICE TO PROCEED (NTP): The NTP for this contract will be expedited. The successful bidder is advised that performance and payment bonds shall be submitted within three (3) days after Notice of Award. The NTP will be issued immediately after verification of acceptable performance and payment bonds. Within seven (7) days after issuance of the NTP, the Contracting Officer or his authorized representative will meet with the Contractor to discuss the submittal process. Physical work cannot start until the Accident Prevention Program, Contractor Quality Control Plan, and other submittals which may be required, have been submitted and approved and all preliminary meetings called for under the contract, have been conducted.

EVALUATION OF SUBDIVIDED ITEMS. (EFARS 52.212-5000 - MAR 95). Item Nos. 008, 0023, 0024, and 0029 are subdivided into two or more estimated quantities and are to be separately priced. The Government will evaluate each of these items on the basis of total price of its sub-items.

VARIATIONS IN ESTIMATED QUANTITIES - SUBDIVIDED ITEMS. (EFARS 52.212-5001 - MAR 95). The Variations in Estimated Quantities Subdivided Items clause is applicable only in Item Nos. 008, 0023, 0024, and 0029.

a. Variations from the estimated quantity in the actual work performed under any second or subsequent sub-item or elimination of all work under such a second or subsequent sub-item will not be the basis for an adjustment in contract unit price.

b. Where the actual quantity of work performed for Item Nos. 008, 0023, 0024, or 0029 is less than 85% of the quantity of the first sub-item listed under such items, the Contractor will be paid at the contract unit price for that sub-item for the actual quantity of work performed and, in addition, an equitable adjustment in contract price shall be made in accordance with the clause FAR 52.211-18, Variation in Estimated Quantity – Apr 84.

c. If the quantity of work performed under Item Nos. 008, 0023, 0024, or 0029 exceeds 115% or is less than 85% of the total estimated quantity of the sub-items under that item, and/or if the quantity of work performed under the second sub-item or any subsequent sub-item under Item No. NONE exceeds 115% or is less than 85% of the estimated quantity of any such sub-item, and if such variation causes an increase or a decrease in the time required for performance of this contract, the contract completion time will be adjusted in accordance with the clause FAR 52.211-18, Variation in Estimated Quantity.

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SECTION 00100
INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS

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SECTION 00100
INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS

1 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 these addresses:

<http://www.arnet.gov/far>
<http://farsite.hill.af.mil>
<http://www.dtic.mil/dfars>

(End of provision)

2 252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (DEC 1991)

(a) The Offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter CAGE before the number.

(b) If the Offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Services Center (DLSC). The Contracting Officer will--

- (1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;
 - (2) Complete section A and forward the form to DLSC; and
 - (3) Notify the Contractor of its assigned CAGE code.
- (c) Do not delay submission of the offer pending receipt of a CAGE code.

(End of provision)

3 52.211-2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) (JUN 1997)

Single copies of specifications cited in this solicitation may be obtained by submitting a written request to the supply point listed below. The request must contain the title of the specification, its number, date, applicable amendment(s), and the solicitation or contract number. A

telephone order entry system is available with the use of a touch tone telephone. A Customer Number is required to use this system and may be obtained by written request to the address listed below or by telephone (215-697-2179). In case of urgency, telegraphic requests are acceptable. Voluntary standards, which are not available to Offerors and Contractors from Government sources, may be obtained from the organization responsible for their preparation, maintenance, or publication.

Standardization Document

Order Desk, Building 4, Section D

700 Robbins Avenue

Philadelphia, PA 19111-5094

Facsimile No.....215-697-2978

(End of provision)

4 52.214-1 SOLICITATION DEFINITIONS--SEALED BIDDING (JUL 1987)

"Government" means United States Government.

"Offer" means "bid" in sealed bidding.

"Solicitation" means an invitation for bids in sealed bidding.

(End of provision)

5 52.214-3 AMENDMENTS TO INVITATIONS FOR BIDS (DEC 1989)

a. If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

b Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, (3) by letter or telegram, or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids.

(End of provision)

6 52.214-4 FALSE STATEMENTS IN BIDS (APR 1984)

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false

statements in bids is prescribed in 18 U.S.C. 1001.

(End of provision)

(R 2-201(b)(xiii))

(R 1-2.201(a)(11))

7 52.214-5 SUBMISSION OF BIDS (MAR 1997)

(a) Bids and bid modifications shall be submitted in sealed envelopes or packages (unless submitted by electronic means) (1) addressed to the office specified in the solicitation, and (2) showing the time and date specified for receipt, the solicitation number, and the name and address of the bidder.

(b) Bidders using commercial carrier services shall ensure that the bid is addressed and marked on the outermost envelope or wrapper as prescribed in subparagraphs (a) (1) and (2) of this provision when delivered to the office specified in the solicitation.

(c) Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice.

(d) Facsimile bids, modifications, or withdrawals, will not be considered unless authorized by the solicitation.

(e) Bids submitted by electronic commerce shall be considered only if the electronic commerce method was specifically stipulated or permitted by the solicitation.

(End of provision)

8 52.214-6 EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984)

Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

(End of provision)

(R SF 33A, Para 3, 1978 JAN)

(a) Any bid received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made and it--

(1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of bids (e.g., a bid submitted in response to a solicitation requiring receipt of bids by the 20th of the month must have been mailed by the 15th);

(2) Was sent by mail (or telegram or facsimile, if authorized) or hand-carried (including delivery by a commercial carrier) if it is determined by the Government that the late receipt was due primarily to Government mishandling after receipt at the Government installation;

(3) Was sent by U.S. Postal Service Express Mail Next Day Service-Post Office To Addressee, not later than 5:00 P.M. at the place of mailing two working days prior to the date specified for receipt of bids. The term "working days" excludes weekends and U.S. Federal holidays; or

(4) Was transmitted through an electronic commerce method authorized by the solicitation and was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of bids.

(b) Any modification or withdrawal of a bid is subject to the same conditions as in paragraph (a) of this provision.

(c) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent either by registered or certified mail is the U.S. or Canadian Postal Service postmark both on the envelope or wrapper and on the original receipt from the U.S. or Canadian Postal Service. Both postmarks must show a legible date or the bid, modification, or withdrawal shall be processed as if mailed late.

"Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, bidders should request the postal clerk to place a legible hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(d) The only acceptable evidence to establish the time of receipt at the Government installation is the time/date stamp of that installation on the bid wrapper or other documentary evidence of receipt maintained by the

installation.

(e) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent by U.S. Postal Service Express Mail Next Day Service-Post Office to Addressee is the date entered by the post office receiving clerk on the "Express Mail Next Day Service-Post Office to Addressee" label and the postmark on the envelope or wrapper and on the original receipt from the U.S. Postal Service. "Postmark" has the same meaning as defined in paragraph (c) of this provision, excluding postmarks of the Canadian Postal Service. Therefore, bidders should request the postal clerk to place a legible hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(f) Notwithstanding paragraph (a) of this provision, a late modification of an otherwise successful bid that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

(g) Bids may be withdrawn by written notice or telegram (including mailgram) received at any time before the exact time set for receipt of bids. If the solicitation authorizes facsimile bids, bids may be withdrawn via facsimile received at any time before the exact time set for receipt of bids, subject to the conditions specified in the provision entitled "Facsimile Bids." A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.

(h) If an emergency or unanticipated event interrupts normal Government processes so as to cause postponement of the scheduled bid opening, and urgent Government requirements preclude amendment of the solicitation or other notice of an extension of the opening date, the time specified for receipt of bids will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(End of provision)

10 52.214-18 PREPARATION OF BIDS--CONSTRUCTION (APR 1984)

(a) Bids must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a bid must initial each erasure or change appearing on any bid form.

(b) The bid form may require bidders to submit bid prices for one or more items on various bases, including--

1. Lump sum bidding;
2. Alternate prices;
3. Units of construction; or
4. Any combination of subparagraphs (1) through (3) above.

c. If the solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

d. Alternate bids will not be considered unless this solicitation authorizes their submission.

(End of provision)

(R SF 22, Para 5, 1978 FEB)

11 52.214-19 CONTRACT AWARD--SEALED BIDDING--CONSTRUCTION (AUG 1996)

a. The Government will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the Government, considering only price and the price-related factors specified elsewhere in the solicitation.

b. The Government may reject any or all bids, and waive informalities or minor irregularities in bids received.

c. The Government may accept any item or combination of items, unless doing so is precluded by a restrictive limitation in the solicitation or the bid.

d. The Government may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items or subline items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Government even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

(End of provision)

12 52.214-5000 ARITHMETIC DISCREPANCIES (MAR 1995)--EFARS

a) For the purpose of initial evaluations of bids, the following will be utilized in the resolving arithmetic discrepancies found on the face of bidding schedule as submitted by the bidder:

- (1) Obviously misplaced decimal points will be corrected;
- (2) Discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected;
- (4) 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 his 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.

(End of statement)

13 52.219-6 NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE (JUL 1996)

a Definition.

"Small business concern," as used in this clause, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation.

b. General. 1) Offers are solicited only from small business concerns. Offers received from concerns that are not small business concerns shall be considered nonresponsive and will be rejected.

2 Any award resulting from this solicitation will be made to a small business concern.

c Agreement. A small business concern submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States. The term "United States" includes its territories and possessions, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia. If this procurement is processed under simplified acquisition procedures and the total amount of this contract does not exceed \$25,000, a small business concern may furnish the product of any domestic firm. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

(a) Definitions. "Domestic end product," "qualifying country," "qualifying country end product," and "nonqualifying country end product" have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) Evaluation. Offers will be evaluated by giving preference to domestic end products and qualifying country end products over nonqualifying country end products.

(c) Certifications. (1) The Offeror certifies that--

(i) Each end product, except those listed in paragraphs (c)(2) or (3) of this clause, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The Offeror certifies that the following end products are qualifying country end products:

QUALIFYING COUNTRY END PRODUCTS

Line item No.	Country of origin

List only qualifying country end products.)

(3) The Offeror certifies that the following end products are nonqualifying country end products:

NONQUALIFYING COUNTRY END PRODUCTS

Line item No.	Country of origin (If known)

(End of provision)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) The amount of the bid guarantee shall be 20% percent of the bid price or \$3,000,000.00, whichever is less.

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 3 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

End of provision)

a Definitions. As used in this clause--

Contract price means the award price of the contract or, for requirements contracts, the price payable for the estimated quantity; or for indefinite-delivery type contracts, the price payable for the specified minimum quantity.

(b) Unless the resulting contract price is \$100,000 or less, the successful offeror shall be required to furnish performance and payment bonds to the Contracting Officer as follows:

(1) Performance Bonds (Standard Form 25):

SECTION 00100
INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS

1 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 these addresses:

<http://www.arnet.gov/far>
<http://farsite.hill.af.mil>
<http://www.dtic.mil/dfars>

(End of provision)

2 252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (DEC 1991)

(a) The Offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter CAGE before the number.

(b) If the Offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Services Center (DLSC). The Contracting Officer will--

- (1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;
 - (2) Complete section A and forward the form to DLSC; and
 - (3) Notify the Contractor of its assigned CAGE code.
- (c) Do not delay submission of the offer pending receipt of a CAGE code.

(End of provision)

3 52.211-2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) (JUN 1997)

Single copies of specifications cited in this solicitation may be obtained by submitting a written request to the supply point listed below. The request must contain the title of the specification, its number, date, applicable amendment(s), and the solicitation or contract number. A

(i) The penal amount of performance bonds shall be 100 percent of the original contract price.

(ii) The Government may require additional performance bond protection when the contract price is increased. The increase in protection shall generally equal 100 percent of the increase in contract price.

(iii) The Government may secure additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(2) Payment Bonds (Standard Form 25-A):

(i) The penal amount of payment bonds shall equal--

(A) 50 percent of the contract price if the contract price is not more than \$1 million;

(B) 40 percent of the contract price if the contract price is more than \$1 million but not more than \$5 million; or

(C) \$2.5 million if the contract price is more than \$5 million.

(ii) If the original contract price is \$5 million or less, the Government may require additional protection if the contract price is increased. The penal amount of the total protection shall meet the requirement of subparagraph (b)(2)(i) of this clause.

(iii) The Government may secure additional protection by directing the Contractor to increase the penal sum of the existing bond or to obtain an additional bond.

c. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

d. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register, or may be obtained from the U.S. Department of Treasury, Financial Management Service, Surety Bond Branch, 401 14th Street, NW., 2nd Floor, West Wing, Washington, DC 20227.

(End of clause)

17 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

Mrs. Diane K. Pecoul
Chief, Construction Service Branch
U. S. Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

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)

18 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

(End of clause)

19 52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

a The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigation and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) Site visits may be arranged during normal duty hours by contacting:
Name: Mr. Chester Ashley New Orleans Area Engineer Address: U. S. Army
Corps of Engineers P. O. Box 60267 New Orleans, LA 70160-0267 Telephone:
504. 862-1200

(End of provision)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

(End of clause)

21 ^^REQUIRED CENTRAL CONTRACTOR REGISTRATION (MAR. 1998) FAR 52.204-7004

(a) Definitions. As used in this clause --

(1) Central Contractor Registration (CCR) database means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) Data Universal Numbering System (DUNS) number means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) Data Universal Numbering System +4 (DUNS+4) number means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) Registered in the CCR database means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b) (1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at <http://ccr.edi.disa.mil>.

(End of clause)

END OF SECTION 00100

NOTICE TO CONTRACTOR

This solicitation contains two sets of goals for minority participation in construction crafts on this contract. They are the New Orleans Hometown Plan and the New Orleans Standard Metropolitan Statistical Area (SMSA).

Contractor will determine the goals applicable to him by the following:

Hometown Plan applies only to those contractors who are signatory to the Hometown Plan and utilizing crafts signatory to the plan.

New Orleans Standard Metropolitan Statistical Area (SMSA) applies to all contractors in the New Orleans SMSA area not signatory to the Hometown Plan, or utilizing crafts not signatory to the plan.

Federal Register/Vol. 45, No. 194/Friday, October 3, 1980

SOLICITATION PROVISION
NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY

The Bidder's attention is called to the "EQUAL OPPORTUNITY" and "LOCAL AFFIRMATIVE ACTION PLAN" clauses of the contract.

The acceptable ranges of minority manpower utilization, expressed in percentage terms, are as follows:

<u>Timetables</u>	<u>Goals for Minority Participation for Each Trade</u>	<u>Goals for Female Participation in Each Trade</u>
Indefinitely	20% - 23%	6.9%

The Bidder shall, within 5 days after a request therefor by the Contracting Officer of his duly authorized representative, submit the following information.

(a) A list of the construction trades he intends to use, either directly or through subcontractors at any tier, in the performance of work covered by this solicitation;

(b) A list of the labor organizations with which he has collective bargaining agreements and which are signatories to the Hometown Plan with respect to trades for which specific commitments to goals of minority manpower utilization are set forth in the Hometown Plan;

(c) A list of the labor organizations with which he has collective bargaining agreements and which are not signatories to the Hometown Plan or which are signatories thereto but with respect to trades for which no specific commitments to goals of minority manpower utilization are set forth in the Hometown Plan, and

(d) A list of all current construction work or contracts to which he is a party in any capacity in the covered area.

As used in this NOTICE and the contract to result from this solicitation:

- (a) "Hometown Plan" or "Plan" means the NEW ORLEANS Plan, consisting of "An Agreement for Implementation of Employment of Minorities in the New Orleans Building Construction Industry."

- (b) "The covered area" means Orleans, Jefferson, St. Bernard, St. Tammany, St. Charles, St. John, Lafourche, Plaquemines, Washington, Terrebonne, Tangipahoa*, Livingston** and St. James*** Parishes, Louisiana.
- (c) "Director, OFCC" means the Director, Office of Federal Contract Compliance, United States Department of Labor, or any person to whom he delegates authority; and
- (d) "Minority" means Negro, Spanish-surnamed American, Oriental, and American Indian, and includes both men and women.

* Area covered is east of the Illinois Central Railroad.

** Area covered is southeast of the line from a point of the Livingston & Tangipahoa Parish line adjacent from New Orleans and Baton Rouge.

*** Area covered is southeast of a line drawn from the town of Gramercy to the point of intersection of St. James, Lafourche and Assumption Parishes.

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL
EMPLOYMENT OPPORTUNITY (APRIL 1984)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for Minority Participation for Each Trade		Goals for Female Participation for Each Trade
SMSA Counties MS	19.2%	6.9%
SMSA Counties LA	31.0%	6.9%
Non-SMSA Counties	27.7%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Program office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract. Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Director, Office of Federal Contract Compliance Programs, within 10 working days following award of a construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notifications shall list the -

(1) Name, address, and telephone number of the subcontractor;

(i) Employer identification number of the subcontractor;

(2) Estimated dollar amount of the subcontract;

(3) Estimated starting and completion dates of the subcontract;

and

(4) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is (FAR 52.222-23) Economic Area 113, New Orleans, LA as follows:

Standard Metropolitan Statistical Area

(SMSA) Counties:

0920 Biloxi - Gulfport, MS - - - - - 19.2%
MS Hancock; MS Harrison; MS Stone

5560 New Orleans, LA - - - - - 31.0%
LA Jefferson; LA Orleans; LA St. Bernard; LA St. Tammany

Non-Standard Metropolitan Statistical Area

(Non-SMSA) Counties - - - - - 27.7%

LA Assumption; LA Lafourche; LA Plaquemines; LA St. Charles;
LA St. James; LA St. John the Baptist; LA Tangipahoa;
LA Terrebonne; LA Washington; MS Forrest; MS Lamar; MS Marion;
MS Pearl River; MS Perry; MS Pike; MS Walthall

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SECTION 00600
REPRESENTATIONS & CERTIFICATIONS

1 52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

a The offeror certifies that--

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory--

1 Is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or

2 (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above _____

(insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of provision)

CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN
FEDERAL TRANSACTIONS (APR 1991)

a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989--

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

3 He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

(End of provision)

a Definitions.

"Common parent," as used in this solicitation provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Corporate status," as used in this solicitation provision, means a designation as to whether the offeror is a corporate entity, an unincorporated entity (e.g., sole proprietorship or partnership), or a corporation providing medical and health care services.

"Taxpayer Identification Number (TIN)," as used in this solicitation provision, means the number required by the IRS to be used by the offeror in reporting income tax and other returns.

b) All offerors are required to submit the information required in paragraphs (c) through (e) of this solicitation provision in order to comply with reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M and implementing regulations issued by the Internal Revenue Service (IRS). If the resulting contract is subject to the reporting requirements described in FAR 4.903, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

c) Taxpayer Identification Number (TIN).

TIN: _____.

TIN has been applied for.

TIN is not required because:

Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the U.S. and does not have an office or place of business or a fiscal paying agent in the U.S.;

Offeror is an agency or instrumentality of a foreign government;

Offeror is an agency or instrumentality of a Federal, state, or local government;

Other. State basis. _____

(d) Corporate Status.

Corporation providing medical and health care services, or engaged in the billing and collecting of payments for such services;

Other corporate entity;

Not a corporate entity;

Sole proprietorship

Partnership

/_/ Hospital or extended care facility described in 26 CFR 501(c)(3) that is exempt from taxation under 26 CFR 501(a).

e Common Parent.

/_/ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

/_/ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

4 52.204-5 WOMEN-OWNED BUSINESS (OCT 1995)

(a) Representation. The offeror represents that it [] is, [] is not a women-owned business concern.

(b) Definition. "Women-owned business concern," as used in this provision, means a concern which is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(End of provision)

5 52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (MAR 1996)

(a) (1) The Offeror certifies, to the best of its knowledge and belief, that--

(i) The Offeror and/or any of its Principals--

(A) Are / / are not / / presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have / / have not / /, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery,

falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

C. Are / / are not / / presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a) (1)(B) of this provision.

(1) The Offeror has / / has not / /, within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, UNITED STATES CODE.

b. The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

c. A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

d. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

6 252.209-7000 ACQUISITION FROM SUBCONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (NOV 1995)

(a) The Contractor shall not deny consideration for a subcontract award under this contract to a potential subcontractor subject to on-site inspection under the INF Treaty, or a similar treaty, solely or in part because of the actual or potential presence of Soviet inspectors at the subcontractor's facility, unless the decision is approved by the Contracting Officer.

(b) The Contractor shall incorporate this clause, including this paragraph (b), in all solicitations and contracts exceeding the simplified acquisition threshold in Part 13 of the Federal Acquisition Regulation, except those for commercial items.

(End of clause)

7 252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

a Definitions.

As used in this provision--

1 "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

2 "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(1)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

3 "Significant interest" means--

1) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(1) Holding a management position in the firm, such as a director or officer;

iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

b. Prohibition on award. In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary or, in the case of a subsidiary, the firm that owns the subsidiary, unless a waiver is granted by the Secretary of Defense.

c. Disclosure.

If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclose such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include--

1. Identification of each government holding a significant interest; and
2. A description of the significant interest held by each government.

(End of provision)

8 52.214-2 TYPE OF BUSINESS ORGANIZATION--SEALED BIDDING (JUL 1987)

The bidder, by checking the applicable box, represents that--

a. It operates as a corporation incorporated under the laws of the State of _____, an individual, a partnership, a nonprofit organization, or a joint venture; or

b. If the bidder is a foreign entity, it operates as an individual, a partnership, a nonprofit organization, a joint venture, or a corporation, registered for business in _____.

(country)

(End of provision)

9 52.214-26 AUDIT AND RECORDS--SEALED BIDDING (OCT 1997)

(Reference 14.201-7(a))

10 52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (FEB 1998)

a: (1) The standard industrial classification (SIC) code for this acquisition is 1629

(2) The small business size standard is \$17.0 Million

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it [] is, [] is not a small business concern.

(2) (Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it [] is, [] is not a small disadvantaged business concern.

(3) (Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it [] is, [] is not a women-owned small business concern.

c) Definitions. "Joint venture," for purposes of a small disadvantaged business SDB set-aside or price evaluation preference (as prescribed at 13 CFR 124.321), is a concern that is owned and controlled by one or more socially and economically disadvantaged individuals entering into a joint venture agreement with one or more business concerns and is considered to be affiliated for size purposes with such other concern(s). The combined annual receipts or employees of the concerns entering into the joint venture must meet the applicable size standard corresponding to the SIC code designated for the contract. The majority of the venture's earnings must accrue directly to the socially and economically disadvantaged individuals in the SDB concern(s) in the joint venture. The percentage of the ownership involvement in a joint venture by disadvantaged individuals must be at least 51 percent.

"Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

"Small disadvantaged business concern," as used in this provision, means a small business concern that (1) is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals, and (2) has its management and daily business

controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more of these entities, which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirements of 13 CFR Part 124.

"Women-owned small business concern," as used in this provision, means a small business concern--

(1) Which is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice. (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small or small disadvantaged business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

- i Be punished by imposition of fine, imprisonment, or both;
- ii Be subject to administrative remedies, including suspension and debarment; and
- iii Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

11 52.219-19 SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (JAN 1997)

(a) Definition.

"Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the standard industrial classification code assigned to a contracting opportunity.

b) (Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation.)

The Offeror [] is, [] is not an emerging small business.

(c) (Complete only if the Offeror is a small business or an emerging small business, indicating its size range.)

Offeror's number of employees for the past 12 months (check this column if size standard stated in solicitation is expressed in terms of number of employees) or Offeror's average annual gross revenue for the last 3 fiscal years (check this column if size standard stated in solicitation is expressed in terms of annual receipts). (Check one of the following.)

No. of Employees	Avg. Annual Gross Revenues
___ 50 or fewer	___ \$1 million or less
___ 51-100	___ \$1,000,001-\$2 million
___ 101-250	___ \$2,000,001-\$3.5 million
___ 251-500	___ \$3,500,001-\$5 million
___ 501-750	___ \$5,000,001-\$10 million
___ 751-1,000	___ \$10,000,001-\$17 million
___ Over 1,000	___ Over \$17 million

(End of provision)

12 252.219-7000 SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION (DoD CONTRACTS) (JUN 1997)

(a) Definition. "Small disadvantaged business concern," as used in this provision, means a small business concern, owned and controlled by individuals who are both socially and economically disadvantaged, as defined by the Small Business Administration at 13 CFR Part 124, the majority of earnings of which directly accrue to such individuals. This term also means a small business concern owned and controlled by an economically disadvantaged Indian tribe or Native Hawaiian organization which meets the requirements of 13 CFR 124.112 or 13 CFR 124.113, respectively. In general, 13 CFR Part 124 describes a small disadvantaged business concern as a small business concern--

- (1) Which is at least 51 percent unconditionally owned by one or more socially and economically disadvantaged individuals; or
- (2) In the case of any publicly owned business, at least 51 percent of the voting stock is unconditionally owned by one or more socially and economically disadvantaged individuals; and
- (3) Whose management and daily business operations are controlled by one or more such individuals.

b. Representations. Check the category in which your ownership falls--

Subcontinent Asian (Asian-Indian) American (U.S. citizen with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal)

Asian-Pacific American (U.S. citizen with origins from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, the Federated States of Micronesia, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru)

Black American (U.S. citizen)

Hispanic American (U.S. citizen with origins from South America, Central America, Mexico, Cuba, the Dominican Republic, Puerto Rico, Spain, or Portugal)

Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians, including Indian tribes or Native Hawaiian organizations)

Individual/concern, other than one of the preceding, currently certified for participation in the Minority Small Business and Capital Ownership Development Program under Section 8(a) of the Small Business Act

Other

For Complete the following--

1 The offeror is is not a small disadvantaged business concern.

2 The Small Business Administration (SBA) has has not made a determination concerning the offeror's status as a small disadvantaged business concern. If the SBA has made a determination, the date of the determination was _____ and the offeror--

Was found by SBA to be socially and economically disadvantaged and no circumstances have changed to vary that determination.

Was found by SBA not to be socially and economically disadvantaged but circumstances which caused the determination have changed.

(d) Penalties and Remedies. Anyone who misrepresents the status of a concern as a small disadvantaged business for the purpose of securing a

contract or subcontract shall--

- 1) Be punished by imposition of a fine, imprisonment, or both;
- 2) Be subject to administrative remedies, including suspension and debarment; and
- 3) Be ineligible for participation in programs conducted under authority of the Small Business Act.

(End of provision)

13 52.222-21 CERTIFICATION OF NONSEGREGATED FACILITIES (APR 1984)

a) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.

b By the submission of this offer, the offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The offeror agrees that a breach of this certification is a violation of the Equal Opportunity clause in the contract.

c The offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods it will--

- 1 Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;
- 2 Retain the certifications in the files; and
- 3 Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES.

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to the Equal Opportunity clause. The certification may

be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

(End of provision)

(R 7-2003.14(b)(1)(A) 1970 AUG)

(R 1-12.803-10(d))

14 52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (APR 1984)

The offeror represents that--

a. It /_/ has, /_/ has not, participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

(b) It /_/ has, /_/ has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

(R 7-2003.14(b)(1)(B) 1973 APR)

15 52.223 1 CLEAN AIR AND WATER CERTIFICATION (APR 1984)

The Offeror certifies that--

a. Any facility to be used in the performance of this proposed contract is /_/ is not /_/ listed on the Environmental Protection Agency (EPA) List of Violating Facilities;

(b) The Offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the EPA, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and

(c) The Offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

(End of provision)

(AV 7-2003.71 1977 JUN)

(AV 1-1.2302-1)

16 52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 1996)

a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

b) By signing this offer, the offeror certifies that----

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

/___/ (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023.c);

/___/ (ii) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

/___/ (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

/___/ (iv) The facility does not fall within Standard Industrial Classification Code (SIC) designations 20 through 39 as set forth in Section 19.102 of the Federal Acquisition Regulation; or

/___/ (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(End of provision)

(a) Definitions. "Caribbean Basin country end product," "designated country end product," "domestic end product," "NAFTA country end product," "nondesignated country end product," "qualifying country end product," and "U.S. made end product" have the meanings given in the Buy American Act--Trade Agreements--Balance of Payments Program clause of this solicitation.

(b) Evaluation. Offers will be evaluated in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement. Offers of foreign end products that are not U.S. made, qualifying country, designated country, Caribbean Basin country, or NAFTA country end products will not be considered for award, unless the Contracting Officer determines that there are no offers of such end products; or the offers of such end products are insufficient to fulfill the requirements; or a national interest exception to the Trade Agreements Act is granted.

(c) Certifications.

(1) The Offeror certifies that--

- (i) Each end product, except the end products listed in paragraph c 2) of this provision, is a domestic end product; and
- ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

2 The Offeror must identify all end products that are not domestic end products.

(i) The Offeror certifies that the following supplies qualify as "U.S. made end products" but do not meet the definition of "domestic end product":

(insert line item number)

(ii) The Offeror certifies that the following supplies are qualifying country end products:

(insert line item number)

(insert country of origin)

(iii) The Offeror certifies that the following supplies qualify as designated country end products:

(insert line item number)

(insert country of origin)

(iv) The Offeror certifies that the following supplies qualify as Caribbean Basin country end products:

(insert line item number)

(insert country of origin)

(v) The Offeror certifies that the following supplies qualify as NAFTA country end products:

(insert line item number)

(insert country of origin)

(vi) The following supplies are other nondesignated country end products.

(insert line item number)

(insert country of origin)

(End of provision)

18 252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)

(a) Definitions.

As used in this clause--

(1) "Foreign person" means any person other than a United States person as defined in section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec 2415).

(2) "United States person" is defined in section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign concern), and any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern which is controlled in fact by such domestic concern, as determined under regulations of the President.

(b) Certification.

By submitting this offer, the Offeror, if a foreign person, company or entity, certifies that it--

- 1 Does not comply with the Secondary Arab Boycott of Israel; and
- 2 Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. Sec 2407(a) prohibits a United States person from taking.

(End of clause)

19 252.225-7035 BUY AMERICAN ACT--NORTH AMERICAN FREE TRADE AGREEMENT
IMPLEMENTATION ACT--BALANCE OF PAYMENTS PROGRAM CERTIFICATE
(MAR 1998)

a. Definitions. "Domestic end product," "foreign end product," "NAFTA country end product," and "qualifying country end product" have the meanings given in the Buy American Act--North American Free Trade Agreement Implementation Act--Balance of Payments Program clause of this solicitation.

b. Evaluation. Offers will be evaluated in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement. For line items subject to the North American Free Trade Agreement Implementation Act, offers of qualifying country end products or NAFTA country end products will be evaluated without regard to the restrictions of the Buy American Act or the Balance of Payments Program.

c. Certifications. (1) The offeror certifies that--

1. Each end product, except the end products listed in paragraph (c. (2) of this provision, is a domestic end product; and

11. Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

2. The Offeror must identify all end products that are not domestic end products.

(i) The Offeror certifies that the following supplies are qualifying country (except Canada) end products:

insert line item number insert country of origin

(ii) The Offeror certifies that the following supplies qualify as NAFTA country end products:

insert line item number insert country of origin

(iii) The following supplies are other foreign end products:

insert line item number insert country of origin

(End of provision)

20 252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

a. The Offeror shall indicate by checking the appropriate blank in paragraph b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

b. Representation. The Offeror represents that it--

_____ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

_____ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

c. Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of provision)

21 NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(a) CONCERNS (JAN 1997) FAR 52.219-18 MOU Alternate A (JUN 1998)

(a) Offers are solicited only from small business concerns expressly certified by the Small Business Administration (SBA) for participation in the SBA's 8(a) Program and which meet the following criteria at the time of submission of offer --

(1) SIC code 1629 is specifically included in the Offeror's approved business plan;

(2) The Offeror is in conformance with the 8(a) support limitation set forth in its approved business plan; and

(3) The Offeror is in conformance with the Business Activity Targets set forth in its approved business plan or any remedial action directed by the SBA.

(b) By submission of its offer, the Offeror represents that it meets all of the criteria set forth in paragraph (a) of this clause.

(c) Any award resulting from this solicitation will be made directly by the Contracting Officer to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

(d) (1) Agreement. A small business concern submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States. The term "United States" includes its territories and possessions, the Commonwealth of Puerto Rico, the trust territory of the Pacific Islands, and the District of Columbia. If this procurement is processed under simplified acquisition procedures and the total amount of this contract does not exceed \$25,000, a small business concern may furnish the product of any domestic firm. This subparagraph does not apply in connection with construction or service contracts.

(2) The _____ [insert name of SBA's contractor] will notify the U. S. Army, Corps of Engineers, New Orleans District, Contracting Officer in writing immediately upon entering an agreement (either oral or written) to transfer all or part of its stock or other ownership interest to any other party.

(End of provision)

END OF SECTION 00600

In the event you do not have a cage code, please complete Section B of DD Form 2051 and submit this form with your bid.

REQUEST FOR ASSIGNMENT OF A COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE <i>(See Instructions on Reverse)</i>		Form Approved OMB No. 0704-0225 Expires May 31, 1990	
SECTION A - TO BE COMPLETED BY INITIATOR			
1. REQUESTING GOVERNMENT AGENCY / ACTIVITY			
a. NAME		b. ADDRESS (Street, City, State and Zip Code)	
2. TYPE CODE REQUESTED (X one)		3. EXCEPTION CODES	
a. TYPE A		a. CAO	
b. TYPE F		b. ADP	
4. INITIATOR			
a. TYPED NAME (Last, First, Middle Initial)		b. OFFICE SYMBOL	c. SIGNATURE
			d. TELEPHONE NO.
SECTION B - TO BE COMPLETED BY FIRM TO BE CODED			
1. FIRM			
a. NAME (Include Branch of, Division of, etc.)		b. ADDRESS (Street, City, State and Zip Code)	
c. CAGE CODE (If previously assigned)			
2. IF FIRM PREVIOUSLY OPERATED UNDER OTHER NAME(S) OR OTHER ADDRESS(ES) SPECIFY THE PREVIOUS NAME(S) AND/OR ADDRESS(ES) (Use separate sheet of paper, if necessary)		3. PARENT COMPANY AND AFFILIATED FIRMS (X one, and complete as applicable)	
		a. NONE	
		b. CURRENTLY AFFILIATED WITH OTHER FIRMS (List name(s) and address(es) of such firms on a separate sheet of paper)	
		c. PREVIOUSLY AFFILIATED WITH OTHER FIRMS (List name(s) and address(es) of such firms on a separate sheet of paper)	
4. PRIMARY BUSINESS CATEGORY (X one)		5. DISADVANTAGED SMALL BUSINESS STATUS (X one)	
a. MANUFACTURER		a. APPROVED BY SMALL BUSINESS ADMINISTRATION (SBA) FOR SECTION 8(a) PROGRAM	
b. DEALER/DISTRIBUTOR		b. OTHER DISADVANTAGED SMALL BUSINESS FIRM	
c. CONSTRUCTION FIRM		c. NOT DISADVANTAGED SMALL BUSINESS FIRM	
d. SERVICE COMPANY			
e. SALES OFFICE			
f. OTHER (Specify)			
		6. NUMBER OF EMPLOYEES	
		7. WOMAN OWNED BUSINESS (X one)	
		a. YES	
		b. NO	
		8. STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE(S)	
		a. PRIMARY	
		b. OTHER (Specify)	
10. FIRM OFFICIAL			
a. TYPED NAME (Last, First, Middle Initial)		b. DATE SIGNED (YYMMDD)	c. SIGNATURE
			d. TELEPHONE NO.

In the event you do not have a cage code, please complete Section B of DD Form 1 and submit this form with your bid.

INSTRUCTIONS FOR COMPLETING DD FORM 2051

GENERAL NOTE FOR PERSONNEL PREPARING OR PROCESSING THIS REPORT

Coding must be as indicated in the instructions. In cases where specific coding instructions are provided, reference must be made to the Department of Defense Manual for Standard Data Elements, DoD 5000.12-M. Noncompliance with either the coding instructions contained herein or those published in referenced manual will make the organization which fails to comply responsible for required concessions in data base communication.

SPECIFIC INSTRUCTIONS

SECTION A - TO BE COMPLETED BY THE INITIATING GOVERNMENT ACTIVITY	SECTION B - (Continued)
Item 1: Self-explanatory.	Item 4: Self-explanatory.
Item 2: Mark the type of code being requested. a. Type A - Manufacturers Code which is used in the Federal Catalog System to identify a certain facility at a specific location which is a possible source for the manufacture and/or design control of items cataloged by the Federal Government; or, b. Type F - Non-manufacturers Code which is required for identifying an organization/function in MILSCAP. These are assigned to contractors which are non-manufacturers or are manufacturers not qualifying for a Type A Code.	Item 5: A disadvantaged business firm is defined as a firm that is 51%, or more, owned, controlled, and operated by a person(s) who is socially and economically disadvantaged. "Controlled" is defined as exercising the power to make policy decisions. "Operated" is defined as actively involved in the day-to-day management of the firm.
Item 3: If applicable, enter the exception DoD Activity Address Code for the Servicing Contract Administration Office (CAO) or ADP point.	Item 6: Enter the number of employees. This number should include the employees of all affiliates.
Item 4: Self-explanatory.	Item 7: A woman-owned business is defined as a firm that is 51%, or more, owned, controlled, and operated by a woman or women. "Controlled" and "Operated" are as defined in Item 5.
SECTION B - TO BE COMPLETED BY THE FIRM TO WHICH THE CODE WILL BE ASSIGNED	Item 8: The SIC Code is a Government Index used to identify business activity and indicates the function (manufacturer, wholesaler, retailer, or service) and the line of business in which the company is engaged. If multiple SIC Codes, indicate the primary first, next important, etc.
Items 1a and 1b: Self-explanatory.	Items 9 and 10: Self-explanatory.
Item 1c: If a CAGE Code (Type A or Type F) was previously assigned, enter it in this block.	NOTE: When any future changes are made to the coded facility; i.e., name change, location change, business sold or operations discontinued, etc., written notification stating the appropriate change should be sent to: <div style="text-align: right;"> Commander Defense Logistics Services Center ATTN: DLSC-FBA Federal Center 74 North Washington Battle Creek, MI 49017-3084 </div>
Item 2: Self-explanatory.	
Item 3: If a block other than "None" is marked, identify the Parent company by a (P) beside the firm name.	

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1 52 252 2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses 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. Also, the full text of a clause may be accessed electronically at these addresses:

<http://www.arnet.gov/far>
<http://farsite.hill.af.mil>
<http://www.dtic.mil/dfars>

(End of clause)

2 52.202-1 I DEFINITIONS (OCT 1995)--ALTERNATE I (APR 1984)
(Reference 2.201)

3 52.203 3 GRATUITIES (APR 1984)
(Reference 3.202)

4 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)
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5 52.203-6 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)
(Reference 3.503-2)

6 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)
(Reference 3.502-3)

7 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER
ACTIVITY (JAN 1997)
(Reference 3.104-9(a))

8 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
(Reference 3.104-9(b))

9 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN
1997)
(Reference 3.808(b))

10 252.203-7001 SPECIAL PROHIBITION ON EMPLOYMENT (JUN 1997)
(Reference 03.570-5)

11 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991)
(Reference 03.7002)

12 52.204-4 PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER (JUN 1996)
(Reference 4.304)

13 252.205-7000 PROVISION OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS (DEC 1991)
(Reference 05.470-2)

14 52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS
DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)
(Reference 9.409(b))

15 252.209-7002 DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT (SEP 1994)
(Reference 09.104-70(b))

16 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)
(Reference 11.703(c))

17 252.211-7000 ACQUISITION STREAMLINING (DEC 1991)
(Reference 11.002-70)

18 52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA--MODIFICATIONS--
SEALED BIDDING (OCT 1997)
(Reference 14.201-7(b))

19 52.214-28 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS--SEALED BIDDING
(OCT 1997)
(Reference 14.201-7(c))

20 52.219-8 UTILIZATION OF SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL
BUSINESS CONCERNS (JUN 1997)
(Reference 19.708(a))

21 52.219-9 I SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING
PLAN (AUG 1996)--ALTERNATE I (OCT 1995)
(Reference 19.708(b)(1))

22 52.219-14 LIMITATIONS ON SUBCONTRACTING (DEC 1996)
(Reference 19.508(e))

23 52.219-16 LIQUIDATED DAMAGES--SUBCONTRACTING PLAN (OCT 1995)
(Reference 19.708(b)(2))

24 52.219-17 SECTION 8(a) AWARD (DEC 1996)

a. By execution of a contract, the Small Business Administration (SBA) agrees to the following:

1. To furnish the supplies or services set forth in the contract according to the specifications and the terms and conditions by subcontracting with the Offeror who has been determined an eligible concern pursuant to the provisions of section 8(a) of the Small Business Act, as amended (15 U.S.C. 637(a)).

2. Except for novation agreements and advance payments, delegates to the Corps of Engineers the responsibility for administering the contract with complete authority to take any action on behalf of the Government under the terms and conditions of the contract; provided, however that the contracting agency shall give advance notice to the SBA before it issues a final notice terminating the right of the subcontractor to proceed with further performance, either in whole or in part, under the contract.

(3) That payments to be made under the contract will be made directly to the subcontractor by the contracting activity.

(4) To notify the Corps of Engineers Contracting Officer immediately upon

notification by the subcontractor that the owner or owners upon whom 8(a) eligibility was based plan to relinquish ownership or control of the concern.

(5) That the subcontractor awarded a subcontract hereunder shall have the right of appeal from decisions of the cognizant Contracting Officer under the "Disputes" clause of the subcontract.

(b) The offeror/subcontractor agrees and acknowledges that it will, for and on behalf of the SBA, fulfill and perform all of the requirements of the contract.

(c) The offeror/subcontractor agrees that it will not subcontract the performance of any of the requirements of this subcontract to any lower tier subcontractor without the prior written approval of the SBA and the cognizant Contracting Officer of the Corps of Engineers

(End of clause)

25 52.219-18 NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(A) CONCERNS (JAN 1997)

a Offers are solicited only from small business concerns expressly certified by the Small Business Administration (SBA) for participation in the SBA's 8(a) Program and which meet the following criteria at the time of submission of offer--

1 SIC code 1629 is specifically included in the Offeror's approved business plan;

2 The Offeror is in conformance with the 8(a) support limitation set forth in its approved business plan; and

3 The Offeror is in conformance with the Business Activity Targets set forth in its approved business plan or any remedial action directed by the SBA.

b) By submission of its offer, the Offeror represents that it meets all of the criteria set forth in paragraph (a) of this clause.

(c) Any award resulting from this solicitation will be made to the Small Business Administration, which will subcontract performance to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

d) (1) Agreement. A small business concern submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States. The term "United States" includes its territories and possessions, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia. If this procurement is processed under

simplified acquisition procedures and the total amount of this contract does not exceed \$25,000, a small business concern may furnish the product of any domestic firm. This subparagraph does not apply in connection with construction or service contracts.

2) The _____ will notify the _____ Contracting Officer in writing immediately upon entering an agreement (either oral or written) to transfer all or part of its stock or other ownership interest to any other party.

(End of clause)

26	252.219-7003	SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DoD CONTRACTS) (APR 1996) (Reference 19.708)
27	52.222-3	CONVICT LABOR (AUG 1996) (Reference 22.202)
28	52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT--OVERTIME COMPENSATION (JUL 1995) (Reference 22.305)
29	52.222-6	DAVIS-BACON ACT (FEB 1995) (Reference 22.407(a) (1))
30	52.222-7	WITHHOLDING OF FUNDS (FEB 1988) (Reference 22.407(a) (2))
31	52.222-8	PAYROLLS AND BASIC RECORDS (FEB 1988) (Reference 22.407(a) (3))
32	52.222-9	APPRENTICES AND TRAINEES (FEB 1988) (Reference 22.407(a) (4))
33	52.222-10	COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988) (Reference 22.407(a) (5))
34	52.222-11	SUBCONTRACTS (LABOR STANDARDS) (FEB 1988) (Reference 22.407(a) (6))
35	52.222-12	CONTRACT TERMINATION--DEBARMENT (FEB 1988) (Reference 22.407(a) (7))
36	52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988) (Reference 22.407(a) (8))
37	52.222-14	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988) (Reference 22.407(a) (9))
38	52.222-15	CERTIFICATION OF ELIGIBILITY (FEB 1988) (Reference 22.407(a) (1))
39	52.222-26	EQUAL OPPORTUNITY (APR 1984) (Reference 22.810(e))

40 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (APR 1984)
(Reference 22.810(f))

41 52.222-35 AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM
ERA (APR 1998)
(Reference 22.1308)

42 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)
(Reference 22.1408(a))

43 52.222-37 EMPLOYMENT REPORTS ON DISABLED VETERANS AND VETERANS OF THE
VIETNAM ERA (APR 1998)
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44 52.223-2 CLEAN AIR AND WATER (APR 1984)
(Reference 23.105(b))

45 52.223-6 DRUG-FREE WORKPLACE (JAN 1997)
(Reference 23.505(b))

46 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 1996)
(Reference 23.907(b))

47 252.223-7004 DRUG-FREE WORK FORCE (SEP 1988)
(Reference 23.570-4)

48 52.225-11 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (OCT 1996)
(Reference 25.702)

49 52.225-15 BUY AMERICAN ACT--CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS ACT AND
NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)
(Reference 25.207(d))

50 52.225-15 I BUY AMERICAN ACT--CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS ACT AND
NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)--ALTERNATE I (MAY 1997)
(Reference 25.207(d)(2))

51 252.225-7001 BUY AMERICAN ACT AND BALANCE OF PAYMENTS PROGRAM (MAR 1998)
(Reference 25.109(d))

52 252.225-7007 I BUY AMERICAN ACT--TRADE AGREEMENTS--BALANCE OF PAYMENTS
PROGRAM (MAR 1998)--ALTERNATE I (MAR 1998)
(Reference 25.408(a)(i))

53 252.225-7012 PREFERENCE FOR CERTAIN DOMESTIC COMMODITIES (SEP 1997)
(Reference 25.7002-3(a))

54 252.225-7036 BUY AMERICAN ACT--NORTH AMERICAN FREE TRADE AGREEMENT
IMPLEMENTATION ACT--BALANCE OF PAYMENTS PROGRAM (MAR 1998)
(Reference 25.408(a)(v))

55 252.225-7037 DUTY-FREE ENTRY--ELIGIBLE END PRODUCTS (MAR 1998)
(Reference 25.605-70)

56 52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES
(SEP 1996)
(Reference 26.104)

57 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)
(Reference 27.201-2(a))

58 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
(AUG 1996)
(Reference 27.202-2)

59 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)
(Reference 27.203-5)

60 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)
(Reference 27.7107-1(c))

61 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)
(Reference 28.106-4(a))

62 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997)
(Reference 28.310)

63 52.228-11 PLEDGES OF ASSETS (FEB 1992)
(Reference 28.203-6)

64 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)
(Reference 28.106-4(b))

65 52.228-14 IRREVOCABLE LETTER OF CREDIT (OCT 1997)
(Reference 28.204-4)

66 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (JAN 1991)
(Reference 29.401-3)

67 52.229-5 TAXES--CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO (APR
1984)
(Reference 29.401-5)

68 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)
(Reference 31.100-70)

69 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY 1997)
(Reference 32.111(a)(5))

70 52.232-17 INTEREST (JUN 1996)
(Reference 32.617(a)&())

71 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)
(Reference 32.806(a)(1))

72 52.232-27 PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS (JUN 1997)
(Reference 32.908(b))

73 52.232-33 MANDATORY INFORMATION FOR ELECTRONIC FUNDS TRANSFER PAYMENT (AUG 1996)
(Reference 32.1103(a)&)

74 252.232-7006 RESERVED
(Reference 32.111-70)

75 52.233-1 DISPUTES (OCT 1995)
(Reference 33.215)

76 52.233-3 PROTEST AFTER AWARD (AUG 1996)
(Reference 33.106(b))

77	52.236-2	DIFFERING SITE CONDITIONS (APR 1984) (Reference 36.502)
78	52.236-3	SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984) (Reference 36.503)
79	52.236-5	MATERIAL AND WORKMANSHIP (APR 1984) (Reference 36.505)
80	52.236-6	SUPERINTENDENCE BY THE CONTRACTOR (APR 1984) (Reference 36.506)
81	52.236-7	PERMITS AND RESPONSIBILITIES (NOV 1991) (Reference 36.507)
82	52.236-8	OTHER CONTRACTS (APR 1984) (Reference 36.508)
83	52.236-9	PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984) (Reference 36.509)
84	52.236-10	OPERATIONS AND STORAGE AREAS (APR 1984) (Reference 36.510)
85	52.236-11	USE AND POSSESSION PRIOR TO COMPLETION (APR 1984) (Reference 36.511)
86	52.236-12	CLEANING UP (APR 1984) (Reference 36.512)
87	52.236-13	ACCIDENT PREVENTION (NOV 1991) (Reference 36.513(a))
88	52.236-15	SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984) (Reference 36.515)
89	52.236-21	SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997) (Reference 36.521)
90	252.236-7000	MODIFICATION PROPOSALS--PRICE BREAKDOWN (DEC 1991) (Reference 36.570(a))
91	52.239-1	PRIVACY OR SECURITY SAFEGUARDS (AUG 1996)

a) The Contractor shall not publish or disclose in any manner, without the Contracting Officer's written consent, the details of any safeguards either designed or developed by the Contractor under this contract or otherwise provided by the Government.

(b) To the extent required to carry out a program of inspection to safeguard against threats and hazards to the security, integrity, and confidentiality of Government data, the Contractor shall afford the Government access to the Contractor's facilities, installations, technical capabilities, operations, documentation, records, and databases.

(c) If new or unanticipated threats or hazards are discovered by either

the Government or the Contractor, or if existing safeguards have ceased to function, the discoverer shall immediately bring the situation to the attention of the other party.

(End of clause)

92	52.242-14	SUSPENSION OF WORK (APR 1984) (Reference 42.1305(a))
93	52.243-4	CHANGES (AUG 1987) (Reference 43.205(d))
94	252.243-7001	PRICING OF CONTRACT MODIFICATIONS (DEC 1991) (Reference 43.205-71)
95	52.244-1	SUBCONTRACTS (FIXED-PRICE CONTRACTS) (OCT 1997) (Reference 44.204)
96	52.245-2	GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) (Reference 45.106(b)(1))
97	52.245-4	GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984) (Reference 45.106(d))
98	52.246-12	INSPECTION OF CONSTRUCTION (AUG 1996) (Reference 46.312)
99	52.247-64 II	PREFERENCE FOR PRIVATELY OWNED U.S.-FLAG COMMERCIAL VESSELS (JUN 1997)-- ALTERNATE II (APR 1984) (Reference 47.507(c))
100	252.247-7024	NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (NOV 1995) (Reference 47.573(c))
101	52.248-3 I	VALUE ENGINEERING--CONSTRUCTION (MAR 1989)--ALTERNATE I (APR 1984) (Reference 48.202)
102	52.249-2 I	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SEP 1996)-- ALTERNATE I (SEP 1996) (Reference 49.502(b)(1))
103	52.249-10	DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984) (Reference 49.504(c)(1))
104	52.249-5000	BASIS FOR SETTLEMENT OF PROPOSALS

Actual costs will be used to determine equipment costs for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a terminations settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

1 Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting

records to determine total actual equipment costs.

(2) If equipment costs have been allocated to a contract using predetermined rates , those charges will be adjusted to actual costs.

(3) Recorded job costs adjusted for unallowable expenses will be used to determine equipment operating expenses.

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate.

(End of Statement)

105 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

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

(b) The use in this solicitation or contract of any _____ (48 CFR _____) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

(NM)

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Memorandum of Understanding dated May 6, 1998, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA is not a party to this contract. SBA does retain responsibility for 8(a) certification, for 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA district office is:

U. S. Small Business Administration
One Canal Place, Suite 2250
New Orleans, LA 70130

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract. The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assign contract administration functions to a contract administration office.

(c) The Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 19 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L.100-656, transfer of ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

(End of clause)
(NM)

END OF SECTION 00700

INDEX

SECTION 00800 - SPECIAL CONTRACT REQUIREMENTS

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SECTION 00800 - SPECIAL CONTRACT REQUIREMENTS

1. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (FAR 52.211-10 - 1984 APR). The Contractor shall be required to (a) commence work under this contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 700 calendar days after the date of receipt by him of notice to proceed. The time stated for completion shall include final cleanup of the premises.

2. LIQUIDATED DAMAGES - CONSTRUCTION. (FAR 52.211-12 - 1984 APR).

a. If the Contractor fails to complete the work within the time specified in the contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of \$1,675.00 for each day of delay.

b. If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

c. If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

3. CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS. (DFARS 252.236-7001 - 1991 DEC).

a. The Government—

(1) Will provide the Contractor, without charge, five sets (unless otherwise specified) of large-scale contract drawings and specifications except publications incorporated into the technical specifications by reference;

(2) Will furnish additional sets on request, for the cost of reproduction; and

(3) May, at its option, furnish the Contractor one set of reproducible, or half-size drawings, in lieu of the drawings in paragraph a.(1) of this clause.

b. The Contractor shall—

(1) Check all drawings furnished immediately upon receipt;

- (2) Compare all drawings and verify the figures before laying out the work;
- (3) Promptly notify the Contracting Officer of any discrepancies; and
- (4) Be responsible for any errors which might have been avoided by complying with this paragraph b.

c. Large scale drawings shall, in general, govern small scale drawings. Figures marked on drawings shall, in general, be followed in preference to scale measurements.

d. Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work, but shall be performed as if fully and correctly set forth and described in the drawings and specifications.

e. The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

<u>Title</u>	<u>File No.</u>	and	<u>Drawing No.</u>
Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection, High Level Plan, Fronting Protection for Pump Station # 6, Orleans Parish-Jefferson Parish 17 th Street Outfall Canal, (Metairie Relief) Orleans and Jefferson Parishes, Louisiana	H-4-44654		1-1, 2-1 thru 2-7, 3-1 thru 3-10, 4-1 thru 4-3, 5-1 thru 5-7 6-1 thru 6-18 7-1 thru 7-10 8-1 thru 8-7, and 9-1 thru 9-10

4. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE. (EFARS 52.231-5000–MAR 95).

a. This statement shall become operative only for negotiated contracts where cost or pricing data is requested, and for modifications to sealed bid or negotiated contracts where cost or pricing data is requested. This clause does not apply to terminations. See 52.231-5000, Basis For Settlement of Proposals, and FAR Part 49.

b. Allowable cost for construction and marine plant and equipment in sound workable condition, owned or controlled and furnished by a Contractor or Subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series

equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense Schedule," Region III. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retrospective pricing, the schedule in effect at the time the work was performed shall apply.

c. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d) (ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase and sale-leaseback arrangements will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

d. When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the Contracting Officer shall request the Contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

NOTE 1: Costs for repairs or overhauling are not allowed.

NOTE 2: A copy of the manual can be obtained from the Government Printing Office (GPO) by calling (202) 512-1645. The cost will be \$9.50. (Stock number: Volume 3, # S/N-008-022-00256-1.)

5. PHYSICAL DATA (FAR 52.236-4 - 1984 APR). Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and borings. Field notes, graphic boring logs, field and laboratory test results, and other data on which this information is based are available at U.S. Army Engineer District, New Orleans, Corps of Engineers, Attn: CEMVN-ED, Foot of Prytania Street, P.O. Box 60267, New Orleans, Louisiana 70160-0267, and access thereto may be had upon request.

b. Weather Conditions. Data on weather conditions may be obtained from the National Weather Service.

c. Transportation.

(1) Access Roads and Staging Area. Access to the site for the purpose of transporting construction personnel and equipment is available via the I-10 at the Metairie Road exit and west along Metairie Road to Orpheum Street and North on Orpheum Street to Pumping Station No. 6. Once at Pumping Station No. 6, equipment can be staged from the west bank of the canal just north of the station and south of the railroad tracks, where the NOS&WB owns a large fenced lot. Additionally, pile driving rigs and larger equipment can access the site from Carrollton Street to Pink Street northwest of the station. At the end of Pink Street, the previously mentioned staging area has entrance gates that can be used for access. Power lines in this area may restrict access to some large equipment. The Contractor shall be required to verify which access is suitable for the type of equipment he requires to perform the work.

(2) Also, just east of the station from Metairie Road, the Contractor can access the east part of the station from Maryland Avenue. However, low power lines in this area restrict the transport of large construction equipment.

(3) The staging area shall be maintained in good condition throughout the contract period and restored to pre-construction conditions upon completion of the contract. All repairs shall be done by using materials matching to the existing surfacing.

(4) The pre-construction and post-construction condition of the staging area, adjacent structures, pumping station building, and public roads shall be required and be verified/ documented by the use of Contractor furnished surveys and/or photos/videos at the Contractor's expense. All surveys, photos and/or videos shall be conducted by the Contractor in the presence of representatives from NOS&WB, EJLD & OLD and the Contracting Officer. Original copies of all surveys, photos and/or videos shall be furnished to the Contracting Officer prior to acceptance of work.

(5) Measurement and Payment.

(a) No separate measurement or payment will be made for pre-construction and post-construction surveys, cleaning roadways and relocating of power lines. Pavement restoration of construction access roads and staging areas will be measured by the square yard of asphaltic concrete pavement restored to pre-construction condition.

(b) Payment for restoring roads and paved staging area to pre-construction condition shall be included in the applicable contract unit price per square yard for "Asphaltic Concrete Pavement Restoration". Price shall include all plant, equipment, labor and materials to complete the pavement restoration in accordance with the plan details.

Payment for preconstruction and post-construction surveys, cleaning roadways and relocating of power lines will be included in the contract lump sum price for "MOBILIZATION AND DEMOBILIZATION".

d. Hydrographs shown on the drawings do not constitute a prediction.

6. LAYOUT OF WORK. (FAR 52.236-17-APR 1984). The Contractor shall lay out its work from Government-established base lines and benchmarks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

NOTE: In lieu of the "baselines and benchmarks" mentioned in the above paragraph entitled "LAYOUT OF WORK", the Contractor shall layout and monitor his work from the benchmarks and reference points shown on the drawings.

7. PAYMENT FOR MOBILIZATION AND DEMOBILIZATION (DFARS 252.236-7004 - 1991 DEC.).

a. The Government will pay all costs for the mobilization and demobilization of all of the Contractor's plant and equipment at the contract lump sum price for this item.

(1) Sixty percent (60%) of the lump sum price upon completion of the Contractor's mobilization at the work site.

(2) The remaining forty percent (40%) upon completion of demobilization.

b. The Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid if the Contracting Officer believes that the percentages in paragraphs a(1) and (2) of this clause do not bear a reasonable relation to the cost of the work in this contract.

(1) Failure to justify such price to the satisfaction of the Contracting Officer will result in payment, as determined by the Contracting Officer, of—

(a) Actual mobilization costs at the completion of mobilization;

(b) Actual demobilization costs at the completion of demobilization;
and

(c) The remainder of this item in the final payment under this contract.

(2) The Contracting Officer's determination of the actual costs in paragraph b(1) of this clause is not subject to appeal.

8. PERFORMANCE OF WORK BY CONTRACTOR (FAR 52.236-1 -1984 APR). The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty percent (20%) of the total amount of the work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract, if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

9. CONTINUING CONTRACTS (ALTERNATE) (MAR 1995) EFARS 52.2325002.

(a) Funds are not available at the inception of this contract to cover the entire contract price. The sum of \$1,176,000.00 has been reserved for this contract and is available for payment to the contractor during the current fiscal year. It is expected that Congress will make appropriations for future fiscal years from which additional funds, together with funds provided by one or more nonfederal project sponsors will be reserved for this contract. The liability of the United States for payments beyond the funds reserved for this contract is contingent on the reservation of additional funds.

(b) Failure to make payments in excess of the amount currently reserved, or that may be reserved from time to time, shall not be considered a breach of this contract, and shall not entitle the contractor to a price adjustment under the terms of this contract except as specifically provided in paragraphs (e) and (h) below.

(c) The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The contracting officer will promptly notify the contractor of any additional funds reserved for the contract by issuing an administrative modification to the contract.

(d) If earnings will be such that funds reserved for the contract will be exhausted before the end of any fiscal year, the contractor shall give written notice to the contracting officer of the estimated date of exhaustion and the amount of additional funds which will be needed to meet payments due or to become due under this contract during that fiscal year. This notice shall be given not less than 45 nor more than 60 days prior to the estimated date of exhaustion.

(e) No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract. If and when sufficient additional funds are reserved, the contractor shall be entitled to simple interest on any payment that the contracting officer determines was actually earned under the terms of this contract and would have been made except for exhaustion of funds. Interest shall be computed from the time such payment would otherwise have been made until actually or constructively made, and shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 9241, 85 STAT 97, as in effect on the first day of the delay in such payment.

(f) Any suspension, delay, or interruption of work arising from exhaustion or anticipated exhaustion of funds shall not constitute a breach of this contract and shall not entitle the contractor to any price adjustment under a "Suspension of Work" or similar clause or in any other manner under this contract.

(g) An equitable adjustment in performance time shall be made for any increase in the time required for performance of any part of the work arising from exhaustion of funds or the reasonable anticipation of exhaustion of funds.

(h) If, upon the expiration of sixty (60) days after the beginning of the fiscal year following an exhaustion of funds, the Government has failed to reserve sufficient additional funds to cover payments otherwise due, the contractor, by written notice delivered to the contracting officer at any time before such additional funds are reserved, may elect to treat his right to proceed with the work as having been terminated. Such a termination shall be at no cost to the Government, except that, to the extent that additional funds to make payment therefore are reallocated to this contract, it may be treated as a termination for the convenience of the Government.

(i) If at any time it becomes apparent that the funds reserved for any fiscal year are in excess of the funds required to meet all payments due or to become due the contractor because of work performed and to be performed under this contract during the fiscal year, the Government reserves the right, after notice to the contractor, to reduce said reservation by the amount of such excess.

(j) The term "Reservation" means monies that have been set aside and made available for payments under this contract.

10. WARRANTY OF CONSTRUCTION (FAR 52.246-21 APR 1984).

a. In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph i of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or

design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of:

- (1) The Contractor's failure to conform to contract requirements; or
- (2) Any defect of equipment, material, workmanship, or design furnished.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

e. The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:

- (1) obtain all warranties that would be given in normal commercial practice;
- (2) require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and
- (3) enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

h. In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

i. Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

j. This warranty shall not limit the Government's rights under the "INSPECTION AND ACCEPTANCE" clause of this contract with respect to latent defects, gross mistakes, or fraud.

11. YEAR 2000 COMPLIANCE. In accordance with FAR 39.106, the Contractor shall ensure that with respect to any design, construction, goods, or services under this contract as well as any subsequent task/delivery orders issued under this contract (if applicable), all information technology contained therein shall be Year 2000 compliant. Specifically, the Contractor shall:

a. Perform, maintain, and provide an inventory of all major components to include structures, equipment, items, parts, and furnishings under this contract and each task/delivery order which may be affected by the Year 2000 compliance requirement.

b. Indicate whether each component is currently Year 2000 compliant or requires an upgrade for compliance prior to Government acceptance.

General Decision Number LA980013

General Decision Number LA980013

Superseded General Decision No. LA970013

State: Louisiana

Construction Type:

HEAVY

County(ies):

JEFFERSON ST BERNARD ST JOHN THE BAP
ORLEANS ST CHARLES ST TAMMANY

HEAVY CONSTRUCTION PROJECTS (Excluding Work on Treatment Plants)

Modification Number Publication Date

0 02/13/1998

COUNTY(ies):

JEFFERSON ST BERNARD ST JOHN THE BAP
ORLEANS ST CHARLES ST TAMMANY

SULA2026A 04/01/1990

Rates Fringes

HEAVY CONSTRUCTION:

CARPENTERS 12.21 2.60

CONCRETE FINISHERS 13.22 1.68

ELECTRICIANS 12.62 1.68

LABORERS:

Common 7.54

PAINTERS 11.83 1.18

PIPELAYERS 8.29

REINFORCING STEEL SETTERS 12.69 3.08

TRUCK DRIVERS 7.76

POWER EQUIPMENT OPERATORS:

Backhoes 10.37

Bulldozers 10.00

Front End Loaders 11.61 2.50

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(v)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.)

and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

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SECTION 01100 - GENERAL PROVISIONS

1. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER.

a. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled "DEFAULT (FIXED PRICE CONSTRUCTION)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied.

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS
BASED ON (5) DAY WORK WEEK

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
9	8	6	5	5	7	10	7	6	5	6	6

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day.

d. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days,

and issue a modification in accordance with the Contract Clause entitled "DEFAULT (FIXED PRICE CONSTRUCTION)". (ER 415-1-15 dated 31 Mar 89).

2. **DAMAGE TO WORK.** The responsibility for damage to any part of the permanent work shall be as set forth in the Contract Clauses of the contract entitled "PERMITS AND RESPONSIBILITIES." However, if, in the judgement of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood, earthquake, hurricane, or tornado which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit price or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work, an equitable adjustment pursuant to the Contract Clause entitled "CHANGES" will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Any costs associated with flooding of dewatered areas as directed by the Contracting Officer will be paid for by an equitable adjustment pursuant to the Contract Clause entitled "CHANGES". Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

3. **SAFETY PROVISIONS.** The safety provisions as specified herein refer to the Sep 1996 edition of EM 385-1-1.

a. Accident Investigations and Reporting. Refer to EM 385- 1-1, Section 01.D. Accidents shall be investigated and reports completed by the immediate supervisor of the employee(s) involved and reported to the Contracting Officer or his/her representative within one working day after the accident occurs. . All data reported must be complete, timely and accurate. A follow-up report shall be submitted when the estimated lost time days differs from the actual lost time days.

b. Accident Prevention Program. Refer to Contract Clause entitled "ACCIDENT PREVENTION" of this contract. Within 15 days after receipt of Notice of Award of the contract, and at least 7 days prior to the prework conference, four copies of the Accident Prevention Program shall be submitted to the Contracting Officer for review and acceptance. The program shall be prepared in the following format:

(1) An executed LMN Form 385-7-R (Jan 97), Administrative Plan (available upon request), see Appendix A of EM 385-1-1.

(2) Executed LMN 385-6-R and Form 385-43R (Jan 97), Activity Hazard Analysis (available upon request), see Figure 1-1 of EM 385-1-1.

(3) A copy of company policy statement regarding accident prevention.

(4) When marine plant and equipment are in use under a contract, the method of fuel oil transfer shall be included on LMV Form 414R, Fuel Oil Transfer, (available upon request). (Refer to 33 CFR 156).

The Contractor shall not commence physical work at the site until the program has been accepted by the Contracting Officer, or his/her authorized representative. At the Contracting Officer's discretion, the Contractor may submit his/her Activity Hazard Analysis only for the first phase of construction provided that it is accompanied by an outline of the remaining phases of construction. All remaining phases shall be submitted and accepted prior to the beginning of work in each phase. Also refer to Section 1 of EM 385-1-1.

c. Comprehensive Hazard Communication Program. The Contractor shall develop, implement, and maintain at the workplace a written, Comprehensive Hazard Communication Program (see Section 01.B.04 of EM 385-1-1) that includes identification of potential hazards as prescribed in 29 CFR Part 1910.1200 and/or 1926.59, effects of exposure and control measures to be used for chemical products and physical agents that may be encountered during the performance of work on this contract, provisions for container labeling, Material Safety Data Sheets, and employee training program, and other criteria in accordance with 29 CFR Part 1910.1200 and/or 1926.59. Training shall include communication methods and systems to be used (i.e., voice, hand signals, radios or other means), and training in the use and understanding of material safety data sheets and chemical product hazard warning labels. Prior to bringing hazardous substances, as defined in 29 CFR 1910.1200 and/or 1926.59, onto the job site, a copy of the Hazard Communication Program and the Material Safety Data Sheets of each substance shall be submitted to the Contracting Officer and made available to the Contractor's employees as part of his/her Accident Prevention Program.

d. Daily Inspections. The Contractor shall perform daily safety inspections and record them on the forms approved by the Contracting Officer. Reports of daily inspections shall be maintained at the jobsite in accordance with Section 01440, "CONTRACTOR QUALITY CONTROL". The reports shall be records of the daily inspections and resulting actions. Each report shall include, as a minimum, the following:

- (1) Phase(s) of construction underway during the inspection.
- (2) Locations of areas where inspections were made.

(3) Results of inspections, including nature of deficiencies observed and corrective actions taken, or to be taken, date, and signature of the person responsible for its contents.

e. Safety Sign. The Contractor shall furnish, erect, and maintain a safety sign at the site, as located by the Contracting Officer. The sign shall conform to the requirements of this paragraph and the drawing included at the end of this section. The lettering shall be black, the castle red, and the background white. Upon request, the Government will furnish two decals of the engineer castle. When placed on a floating plant, the sign may be half size. The sign shall be erected as soon as practicable, but not later than 15 calendar days after the date established for commencement of work. The data required shall be current.

f. Ground Fault Protection. Electrical equipment used on this contract shall be equipped with ground fault circuit interrupters in accordance with EM 385-1-1, Section 11.C.05.

g. Haul Roads. Whenever practical, one-way haul roads shall be used on this contract. Haul roads built and maintained for this work shall comply with the following:

(1) One-way haul roads for off-the-road equipment; e.g., belly dumps, scrapers, and off-the-road trucks shall have a minimum usable width of 25-feet. One-way haul roads for over-the-road haulage equipment only (e.g., dump trucks, etc.) may be reduced to a usable width of 15-feet. When the Contracting Officer determines that it is impractical to obtain the required width for one-way haul roads (e.g., a road on top of a levee), a usable width of not less than 10-feet may be approved by the Contracting Officer, provided a positive means of traffic control is implemented. Such positive means shall be signs, signals, and/or signalmen and an effective means of speed control.

(2) Two-way haul roads for off-the-road haulage equipment shall have a usable width of 60-feet. Two-way haul roads for over-the-road haulage equipment only may be reduced to a usable width of 30-feet.

(3) Haul roads shall be graded and otherwise maintained to keep the surface free from potholes, ruts, and similar conditions that could result in unsafe operation.

(4) Grades and curves shall allow a minimum sight distance of 200-feet for one-way roads and 300-feet for two-way roads. Sight distance is defined as the centerline distance an equipment operator (4.5-feet above the road surface) can see an object 4.5-feet above the road surface. When conditions make it impractical to obtain the required sight distance (e.g., ramps over levees), a positive means of traffic control shall be implemented.

(5) Dust abatement shall permit observation of objects on the roadway at a minimum distance of 300-feet.

(6) Haul roads shall have the edges of the usable portion marked with posts at intervals of 50-feet on curves and 200-feet maximum elsewhere. Such markers shall extend 6-feet above the road surface and, for nighttime haulage, be provided with reflectors in both directions.

h. Safety Fence. The Contractor shall provide, erect, and maintain a temporary continuous safety fence around the limits of work as shown on the drawings. The fabric for the safety fence shall be zinc coated hog wire mesh at least 47 inches in height or "Orange Safety Net" 48" in height. Posts shall be round wood posts or steel T-posts and shall be at least 6½ feet long, 3½ inches in diameter, and may be untreated. In areas where wood posts are not practical, steel T-posts in concrete filled 10 gallon buckets may be used. Posts shall extend at least 48 inches above ground and shall be spaced at a maximum of 10 feet on center. Swing gates shall be at least 12 feet wide by 48 inches high. The swing gate frame shall be fabricated of either 1-3/8 inch O.D. tubular steel, or ¼ inch angle iron brace with an adjustable brace wire to prevent sagging. Gates shall be fitted with hinges and shall be supported by 1-3/8 inch O.D. tubular steel posts embedded in 3 feet of concrete. The fabric from the gates shall be the same as that for the fence. All gates shall be closed and padlocked at the end of each work day. When necessary, an owner of a facility located within the limits of work will obtain keys from the Contractor. The Contractor shall provide and maintain on the fence "KEEP OUT" signs every 100 feet facing out from the work. Details of the safety fencing and location shall be submitted to the Contracting Officer for approval. No separate measurement or payment will be made for this work. Payment for all work associated with the safety fence shall be distributed amongst the existing bid items.

i. Means of Escape for Personnel Quartered, or Working on Floating Plant. Two means of escape shall be provided for assembly, sleeping, and messing areas on floating plants. For areas involving 10 or more persons, both means of egress shall be through standard size doors opening to different exit routes. Where nine or fewer persons are involved, one of the means of escape may be a window (minimum dimensions 24-inches by 36-inches) which leads to a different exit route. Refer to Section 19 of EM 385-1-1.

j. Emergency Alarms and Signals.

(1) Alarms. Emergency alarms shall be installed and maintained on all floating plant requiring a crew where it is possible for either a passenger or crewman to be out of sight or hearing from any other person. The alarm system shall be operated from the primary electrical system with standby batteries on trickle charge that will automatically furnish the required energy during an electrical-system failure. A sufficient number of signaling devices shall be placed on each deck so that the sound can be heard distinctly at

any point above the usual background noise. All signaling devices shall be so interconnected that actuation can occur from at least one strategic point on each deck.

(2) Signals.

(a) Fire Alarm Signals. The general fire alarm signal shall be in accordance with paragraph 97.13-15b of the Coast Guard Rules and Regulations for Cargo and Miscellaneous Vessels, Sub-Chapter I, 1 Sep 77 (CG 257).

(b) Abandon Ship Signals. The signal for abandon ship shall be in accordance with paragraph 97.13-15c of the reference cited in 4.10.2.1 above.

(c) Man-Overboard Signal. Hail and pass the word to the bridge. All personnel and vessels capable of rendering assistance shall respond.

k. Hurricane Plan. A detailed plan for protection and evacuation of personnel and the Contractor's plant, in the event of an impending hurricane or storm, is required as an enclosure to the Contractor's Accident Prevention Program. This plan shall be submitted to the Contracting Officer, or his/her representative, for review prior to the preconstruction conference. The plan shall include at least the following:

(1) The time each phase of the plan will be put in effect. The time shall be the number of hours remaining for the storm to reach the worksite if it continues at the predicted speed and direction.

(2) The safe harbor for personnel and plant specifically identified.

(3) The name of the boat which will be used to move the plant, its type, capacity, speed, and availability.

(4) The estimated time necessary to move the plant to the safe harbor after movement is started.

l. Hazardous Energy Protection. The Contractor shall develop, implement and maintain at the workplace, a written Control of Hazardous Energy (Lockout/Tagout) System. Refer to Section 12 of EM 385-1-1.

4. INSPECTOR'S FIELD OFFICE.

a. The Contractor shall furnish, throughout the contract period, for the exclusive use of the Government employees, a temporary waterproof building, or trailer, to be

utilized as a field office. It shall be conveniently located at the site of construction and shall be independent of any building, or trailer, used by the Contractor. Toilet facilities and potable water shall be provided within the Inspector's office. It shall be equipped with approved electrical wiring, private telephone service, a telephone answering machine, at least one ceiling lamp receptacle, at least one double convenience outlet, and the required switches and fuses, to provide 110-volt power for lighting and operating a laptop computer and printer. It shall be equipped with an air conditioning unit to provide cooling in warm or hot weather, and a heater, properly installed and vented in accordance with the National Fire Protection Association Code, for heating in cold weather, as required. The Contractor shall make the necessary arrangements to obtain or to generate the power required to operate the air conditioning unit, lights, and laptop computer and printer, and the power or fuel required for the heater, and shall bear the cost thereof. A drafting table providing a working surface having dimensions of at least 4-feet by 6-feet (which may consist of a piece of plywood, at least 3/4-inch thick, hinged to a wall of the building with hinged legs) shall be installed in the building. The building shall have a built-in locker, extending from the floor to the ceiling, having dimensions of at least 2- feet by 5-feet, with a shelf 12-inches from the top, and one door equipped with two hinges, a hasp and a padlock. All exterior doors and window frames of the building shall be equipped with iron security guards. The door shall also be equipped with butt hinges and a cylinder lock. One draftsman's stool, two strong chairs and one desk shall be provided. The building or trailer shall conform to the following minimum requirements:

Ceiling height, not less than	6-feet 9-inches
Floor space, no less than	240 square feet
Windows, not less than	2
Doors, outside	1
Rooms	1

Screens over doors and windows; walls and ceilings shall be insulated; and interior walls finished.

b. The building, or trailer, shall be removed by the Contractor after completion of all work under this contract and before final acceptance thereof. No separate payment will be made for furnishing, maintaining, providing the prescribed utilities, and removing the inspector's field office, but the cost of the same shall be distributed throughout the existing bid items. In the event the Contractor fails to furnish the required facilities, the Government may elect to procure the required facilities and deduct all costs from amounts due or to become due under this contract.

c. The Contractor shall provide daily janitorial services for this and other buildings at the site throughout the life of the contract. The cost of this service shall be distributed throughout the existing bid items and there shall be no separate payment.

5. **PROJECT SIGN.** Prior to commencement of work, the Contractor shall construct a project sign at the site of the work at a location directed by the Contracting Officer. The sign which will identify the work with the Corps of Engineers shall be 4 feet by 6 feet in size and shall conform to the requirements of the PROJECT SIGN drawing attached at the end of these General Requirements. The lettering for the 2 feet by 4 feet section of the sign with the Corps logo shall be white, all other lettering shall be black. Lettering for the project name shall be Helvetica Bold, all other lettering shall be Helvetica Regular. No separate payment will be made for construction and erection of the project sign and all costs in connection therewith will be considered an incidental obligation of the Contractor. Upon completion of the work, the sign shall become the property of the Contractor and shall be removed from the job site.

6. **RIGHTS-OF-WAY.**

a. Rights-of-way for construction purposes and for access through private lands to the work site will be furnished by the Government without cost to the Contractor, as shown on the contract drawings. If the right-of-way for access is used by the Contractor, he/she shall, at his/her expense, be required to do all work necessary to make such right-of-way suitable for traveling to and from the work site. Upon completion of the contract work, any such access roadway and right-of-way furnished by the Government shall be left in a condition satisfactory to the Contracting Officer.

b. The Contractor shall procure, without expense or liability to the Government, all additional lands, access roads, or rights-of-way desired for his/her own convenience in the performance of the work. The Contractor shall notify the Contracting Officer of his/her intention and, if required by the Contracting Officer, secure clearances from both the Louisiana State Historical Preservation Office and the Louisiana Archaeological and Antiquities Commission. Any agreements or permits with levee boards, parishes, or political subdivisions for moving material and equipment will also be the responsibility of the Contractor. Any delays to the Contractor resulting from delays in procuring such additional lands, access roads, right-of-way, or permits for moving material and equipment for his/her own use will not be made a basis of any claim for increase in the cost or time of performance of the work. The Contractor shall make his/her own investigations to determine the conditions, restrictions, and difficulties which may be encountered in the transportation of material and equipment to the work site.

7. **CERTIFICATES OF COMPLIANCE.** Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in three (3) copies. Each certificate shall be signed by an official authorized to certify on behalf of the manufacturing company and shall contain the name and address of the 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 specified requirements.

8. ENVIRONMENTAL LITIGATION.

a. If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the Contract Clause entitled "SUSPENSION OF WORK". The period of such suspension, delay or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

b. The term "environmental litigation", as used herein, means a lawsuit alleging that the work has an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

9. UTILITIES AND IMPROVEMENTS.

a. All known utilities within the limits of the work, such as pipes, communication lines, power lines, etc., that would interfere with construction work will be removed, modified or relocated by local interests or utility companies at no cost to the Contractor unless otherwise noted in the plans and/or specifications. The Contractor, however, shall cooperate with the authorities or company representatives and shall conduct his/her operations in such manner as to result in a minimum of inconveniences to the owners of said utilities. The Contractor shall notify each utility owner by certified mail 45 days, 15 days, and again telephonically 72 hours prior to the date utilities must be moved and provide a copy of these notifications to the Contracting Officer. A list of those known utilities to be effected is shown in a table on the drawings. See paragraph entitled "COORDINATION OF WORK" in this section.

b. Any unidentified pipes or structures which may be found within the limits of the work during the course of construction shall not be disturbed nor shall construction or excavation be performed at these locations unless and until approved by the Contracting

Officer. Payment for ordered excavation, if any, will be made in accordance with the Contract Clause entitled "DIFFERING SITE CONDITIONS".

10. PERMISSIBLE HOURS OF WORK. Normal work hours should be limited to between 7:30 A.M. and 6:00 P.M. Monday through Friday unless prior permission is obtained from the Contracting Officer for work day and/or work hour variations. When the Contractor elects to work on weekends, holidays, and nights, notice shall be given to the Contracting Officer, in writing, in advance of commencement of such operations to permit suitable arrangements for inspection to be made. Adequate lighting for thorough inspection of night operations shall be provided by the Contractor at his/her own expense.

11. HANDBOOK FOR CONCRETE AND CEMENT (CRD-C). The handbook for concrete and cement can be obtained from U.S. Army Engineer Waterways Experiment Station, ATTN: Information Technology Lab, Publishing Group, 3909 Halls Ferry Road, Vicksburg, Mississippi 39180.

Complete Ed. (Vol. 1 and 2) \$30.00

Supplements and revisions to the Handbook are sold on a subscription basis at the price of \$10.00 per year per copy of Handbook. Separate CRD-C Specifications are available for distribution without charge in limited quantities only.

12. AGGREGATE SOURCES.

a. Concrete aggregates meeting the quality requirements of these specifications have been produced from the sources listed below:

<u>Producer</u>	<u>Nearest Town to Pit*</u>	<u>Pit Designation</u>
A. B. Chisum Gravel Co.	Sicily Island, LA	A. B. Chisum Sand & Gravel
American Sand & Gravel Co.	Hattiesburg, MS	Plant A
American Sand & Gravel Co.	Hattiesburg, MS	Plant E
American Sand & Gravel Co.	Hattiesburg, MS	Plant F
Blain Sand & Gravel, Inc.	Crystal Spring, MS	Moon Pit (BBS-Lindsey)
D. & J. Construction	Aimwell, LA	Aimwell Pit
Feliciana Sand & Gravel Co.	Jackson, LA	Harvey Pit
Feliciana Sand & Gravel Co.	Jackson, LA	Mckowen Pit
Feliciana Sand & Gravel Co.	Jackson, LA	Thompson Pit
Industrial Companies, Inc.	Grangeville, LA	Industrial Gravel
Jackson Ready-Mix Concrete Co.	Crystal Springs, MS	Contractors of Louisiana
Lambert Gravel Co., Inc.	Bains, LA	Pit # 715-11
Louisiana Industries, Inc.	DeRidder, LA	Harvey Garrett lease(G-2)
		Anacoco Creek Plant

Louisiana Industries, Inc.	Grangeville, LA	Dinkman Plant
Louisiana Industries, Inc.	Grangeville, LA	Hornsby Plant
Louisiana Industries, Inc.	Pearl River, LA	Honey Island Operation (Pit #1)
Louisiana Industries, Inc.	Pearl River, LA	Honey Island Operation (Pit #2)
Louisiana Industries, Inc.	Ball, LA	Paradise Plant
Louisiana Industries, Inc.	Perryville, LA	Perryville Plant
Louisiana Industries, Inc.	Enon, LA	Price Plant
Louisiana Industries, Inc.	Woodworth, LA	Woodworth Plant
Martin Marietta Aggregates	Smithland, KY	Three Rivers Quarry
Mears Sand & Gravel Co.	Watson, LA	Penny & Easterly Leases
Quick Sand & Gravel, Inc.	Watson, LA	Easterly lease
Rebel Sand & Gravel Co.	Watson, LA	Plant 6
Rebel Sand & Gravel Co.	Watson, LA	Plant 6c
Rebel Sand & Gravel Co.	Watson, LA	Plant 9
Reed Crushed Stone Co., Inc.	Gilbertsville, KY	Gilbertsville Quarry
Standard Gravel Co.	Pearl River, LA	Nicholson Plant (Nic-7)
Standard Gravel Co.	Enon, LA	Enon Pit (C-10 & CZ-30 Leases)

* "Nearest Town to Pit" according to LDOTD Official State Highway Map.

b. Concrete aggregates may be furnished from any of the above listed sources or at the option of the Contractor may be furnished from any other source designated by the Contractor and approved by the Contracting Officer, subject to the conditions hereinafter stated and as specified in Section 03301.

c. After the award of the contract, the Contractor shall designate in writing only one source or one combination of sources from which he/she proposes to furnish aggregates. If the Contractor proposes to furnish aggregates from a source or from sources not listed above, he/she may designate only a single source or single combination of sources of aggregates. If a source for coarse and/or fine aggregate so designated by the Contractor is not approved for use by the Contracting Officer, the Contractor may not submit for approval other sources but shall furnish the coarse and/or fine aggregate, as the case may be, from a source listed above at no additional cost to the Government.

d. Approval of a source of concrete aggregate is not to be construed as approval of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials do not conform to the quality requirements of ASTM C 33-93 (CRD-C 133), Concrete Aggregates. Aggregate gradations shall be in accordance with the specified requirements of Section 03301.

Materials produced from any source, including those listed above, shall also meet all the requirements of Section 03301 of the Technical Specifications.

e. It is the Contractor's responsibility to determine that the aggregate source or combination of sources selected is capable of supplying the quantities and gradations needed and at the rates needed to maintain the scheduled progress of the work. The inability of a source or combination of sources to maintain the necessary volume shall not be the basis for any claim for a time extension.

13. STONE SOURCES.

a. On the basis of information and data available to the Contracting Officer, stone meeting the quality requirements of these specifications has been produced from the sources listed below:

<u>Producer</u>	<u>Nearest Town to Pit*</u>	<u>Pit Designation</u>
Bellefontaine Quarry, Inc.	Florissant, MO Ft. Bellefontaine, MO)	Bellefontaine Quarry
Bussen Quarries, Inc.	Mehlville, MO	Bussen Quarry
Central Stone Co.	Withers Mill, MO (Monroe City, MO)	Pit # 1
Central Stone Co.	Danby, MO (Crystal City, MO)	Plattin Quarry
Central Stone Co.	Perry, MO	Pit # 9
Gifford-Hill and Co.	Delight, AR	Delight Quarry
Granite Mountain Quarries	Sweet Home, AR	Granite Mountain Quarry #1
Hoover Incorporated Industrial Mineral Products Division/3M	Iuka, MS Little Rock, AR	Allsboro Quarry 3M Arch Street Quarry
Martin Marietta Aggregates	Smithland, KY	Three Rivers Quarry
Martin Marietta Aggregates	Uniontown, MO	Appleton Quarry
Martin Marietta Aggregates	Cave In Rock, IL	Plant # 1
Meridian Aggregate Co.	Black Rock, AR	Valley Stone Quarry
Pine Bluff Sand and Gravel Co.	Delaware, AR	River Mountain Quarry
Reed Crushed Stone Co., Inc.	Lake City, KY	Gilbertsville Quarry
Springfield Underground (Barnhart Limestone)	Barnhart, MO	Barnhart Quarry
Tower Rock Stone Co.	Scott City, MO	Grays Point Quarry
Tower Rock Stone Co.	St. Genevieve, MO	Bussem Quarry
Vulcan Materials Co.	Cherokee, AL	Cherokee Quarry
Vulcan Materials Co.	Iuka, MS	Iuka Plant

* "Nearest Town to Pit" according to Rand McNally Road Atlas copyrighted 1995.

b. Stone may be furnished from any of the above listed sources, or at the option of the Contractor may be furnished from any other source designated by the Contractor and accepted by the Contracting Officer, subject to the conditions hereinafter stated.

c. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of supplying the quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work.

d. After the award of the contract, the Contractor shall designate in writing only one source or one combination of sources from which he/she proposes to furnish stone. If the Contractor proposes to furnish stone from a source not listed above, he/she may designate only a single additional source for stone. Samples for acceptance testing shall be provided as required by Section 02273 of the Technical Specifications. If a source for stone so designated by the Contractor is not accepted for use by the Contracting Officer, the Contractor may not propose other sources but shall furnish the stone from a source listed above at no additional cost to the Government.

e. Acceptance of a source of stone is not to be construed as acceptance of all material from the source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. Materials produced from a listed or unlisted source shall meet all requirements of Section 02273 of these Technical Specifications.

14. SIGNAL LIGHTS. The Contractor shall display signal lights and conduct his/her operations in accordance with U. S. Coast Guard regulations governing lights and day signals to be displayed, as set forth in Commandant, U. S. Coast Guard Instruction M16672.2, Navigation Rules, International - Inland (COMDTINST M16672); 33 CFR 81, Appendix A (International); and 33 CFR 84 through 33 CFR 90 (Inland) as applicable.

15. STATE TAXES.

a. The bid submitted in response to this Invitation shall not include any amount whatever for payment of any of the following taxes, fees or charges:

(1) The Louisiana "Severance Tax" imposed by LSA R.S. 47:631 and made applicable to the dredging of fill material from rivers and bodies of water within the State of Louisiana by the Severance Tax Regulations promulgated by the Collector of Revenue dated 31 March 1968.

(2) Any amounts claimed by the Louisiana Department of Wildlife and Fisheries for the privilege of removing fill from the water bottoms of the State of Louisiana.

b. If the Contractor is required to pay or bear the burden of any tax, fee, or charge described in paragraphs a(1) and/or a(2) above, the contract prices shall be increased by the amount which the Contractor is required to pay to the State of Louisiana; provided, however, that no increase in contract price shall be made for any liability the Contractor may incur as a result of his/her fault or negligence or his/her failure to follow the instructions of the Contracting Officer (CO).

c. The Contractor shall promptly notify the Contracting Officer of all matters pertaining to taxes, fees, or charges as described herein which reasonably may be expected to affect the contract price and shall at all times follow the directions and instructions of the Contracting Officer in regard to the payment of such taxes, fees, or charges.

d. Before any increase in contract price becomes effective in accordance with the provisions of this clause, the Contractor shall warrant in writing that no amount of such taxes, fees, or charges was included in the contract price as a contingency reserve or otherwise.

e. In addition to the costs allowed by subparagraph b, the Contracting Officer may also allow an increase in contract price for costs or expenses which accrue to the Contractor as a result of any directions or instructions received from the CO.

16. REQUIRED INSURANCE (RAILROADS).

a. Before commencing any work under this contract adjacent to or on the premises of the Railroad Companies, the Contractor shall procure and maintain in force, so long as work shall continue upon such premises, and at its sole expense, comprehensive general and automobile liability insurance with contractual liability endorsement and products and completed operation hazards included, which shall provide the following kinds and amounts of insurance:

(1) Contractor's Public Liability and Property Damage Liability Insurance. Similar insurance in the same amounts will be provided by or in behalf of any subcontractors to cover their operations.

Combined Single Limit for Bodily Injury Liability, Property Damage Liability and Physical Damage to Property - \$2,000,000 per occurrence
Aggregate Limit - \$6,000,000 for the term of the policy

(2) Contractor's Protective Public Liability and Property Damage Liability Insurance. This insurance will be required in addition to the above when any work is performed by subcontractor.

Combined Single Limit for Bodily Injury Liability, Property Damage Liability and Physical Damage to Property - \$2,000,000 per occurrence
Aggregate Limit - \$6,000,000 for the term of the policy

(3) Railroad's Protective Public Liability and Property Damage Liability Insurance. This insurance policy will name the individual Railroad Companies involved as insured with respect to the operations of the Contractor or any subcontractor employed by the Contractor and shall be on the form of Railroad Protective Policy as accepted by the Association of American Railroads and Mutual Insurance Rating Bureau.

Combined Single Limit for Bodily Injury Liability, Property Damage Liability and Physical Damage to Property - \$2,000,000 per occurrence
Aggregate Limit - \$6,000,000 for the term of the policy

b. The Contractor shall not commence any of the said work until evidence of such insurance is furnished to the Contracting Officer and the Railroad Companies in a form satisfactory to them. In addition, the Contractor shall furnish evidence of a commitment by the Insurance Company to notify the Contracting Officer and the Railroad Companies in writing of any material change or cancellation is of such required insurance for any reason at least 30 days before such change or cancellation is effective. The Contractor shall furnish evidence of insurance for review by the Railroad Company to the address as follows:

Mr. D.W. Fries, A.R.M.
Risk Manager
Norfolk Southern Corporation
Three Commercial Plaza
Norfolk, VA 23510-2191

c. The Contractor will be required to provide the Railroad Companies with a certificate of insurance to which will be attached on endorsement, the form of which will be furnished by the Railroad Companies and prepared by the Insurer.

17. WORK ON OR ADJACENT TO RAILROAD. The following will apply to contract operations on or adjacent to the premises of the Railroad Companies:

a. The Contractor shall, before entering upon the premises of a Railroad Company, contact in writing the Contracting Officer, the Board of Levee Commissioners of the Orleans Levee District, the Board of Commissioners of the East Jefferson Levee District, and

the New Orleans Sewerage and Water Board. The Board of Levee Commissioners of the East Jefferson Levee District will make arrangements for the Contractor to secure written permission from an authorized representative of the Railroad Company for the use and occupancy of its premises. The Contractor shall furnish to the Railroad Engineer a Schedule of Work, and confer with officials of the Railroad Company relative to its requirements for clearances, operation and general regulations.

b. The Contractor shall fully coordinate his/her work with the operations of the Railroad Companies. The Contractor shall notify the Contracting Officer (CO) in writing 30 days in advance of commencing work.

c. The Contractor shall comply with all established pertinent regulations and requirements of the Interstate Commerce Commission and the Railroad Companies.

d. The Contractor shall perform all work adjacent to or on the property of the Railroad Companies so as not to interrupt or delay the operation of trains over the tracks in use, or to interfere with communications and signal lines adjacent to said tracks or upon said premises except under arrangements between the Contractor and the Railroad Companies. During the progress of such work, the Contractor shall maintain liaison with the Railroad Companies' officers and representatives as may be designated by the Railroad Companies so as to ascertain the time of passage of trains at the site of the work, and to clear the railroad tracks and facilities of men, equipment and obstructions to permit free flow of railroad traffic. In the event the Contractor requires a crossing of the Railroad Companies' right-of-way and tracks at other than a public crossing with its machinery or equipment incident to the contract, the Contractor shall first enter into an agreement satisfactory to the Railroad companies setting forth the terms and conditions with respect to the establishment, use, and removal of such crossing.

e. The Contractor shall, at all times during the period of construction, keep the railroad tracks and roadbed free of materials, earth, mud, rocks and other debris.

f. The Contractor shall keep all equipment, tools and materials stored at least 15-feet from the center line of any usable track. Explosives or other highly flammable substances will not be stored on Railroad Companies right-of-way without the prior approval of the Railroad Companies' representative.

g. Flagging Protection or Watchman Services. The Contractor shall be responsible for arranging with the Railroad Company for flagging protection or watchman service, which is required whenever his/her equipment and/or men are working within 50-feet of the centerline of any operable track, or over, under or adjacent thereto. Flagging or watchman service will also be required whenever boom equipment machinery is working closer to the track centerline than boom length (horizontally extended and at right angles to the track) plus 15-feet. The Contractor shall give 72 hours advance notice to the

Railroad's Division Superintendent in order that flagging protection or watchman service can be arranged and provided. No work shall be undertaken until said flagman or watchmen are at the job site.

h. The Contractor shall remove all tools, equipment and materials from the Railroad Companies premises promptly upon completion of work, restoring premises to the same state and condition as when the Contractor entered thereon.

i. The Contractor shall remove any liens against the Railroad Companies' property arising from performance of work hereunder by the Contractor or any subcontractor.

j. The Contractor agrees to release, defend and indemnify the Railroad Companies from and against all loss, damage, claims, costs, expenses and liability for bodily injury to our death of any persons and loss of or damage to any property and loss of use thereof (including but not limited to employees, subcontractors, agents, invitees and the property of each party hereto) arising out of or in any way connected with the work under said agreement upon or adjacent to Railroad Companies property, whether or not caused or contributed to by the presence or operation of Railroad Companies trains, engines, cars or other equipment, structures or facilities of the Railroad Companies or any other party, or by negligence or alleged negligence on the part of the Railroad Companies agents, employees, contractors, subcontractors or invitees. In the event any part of the provisions of this section are determined by any statutory enactment or judicial decision to be void or enforceable, then this section shall not fail in its entirety but will be enforceable to the extent permitted by law. This provision shall include any other railroad company using Railroad Companies property with Railroad Companies' consent and any affiliate, subsidiary or lessor of the Railroad Companies.

k. Inspection Services. The Railroad Companies will furnish such watching, flagging and inspection services as outlined below during construction, all cost of which is to be reimbursed by the Contractor.

(1) Flagging Service. This service will be provided during all times that tracks are or may probably be occupied or fouled by materials, equipment or work of the Contractor. Any encroachment closer than 50-feet horizontally from centerline of track and any crane positioned such that drop of its boom can so encroach upon horizontal clearances shall be considered a condition requiring flagging services. The Railroad Company will provide flagging service with one man normally required at all times when the Contractor is performing the work which requires this service, but sufficient time must be given so arrangements can be made. If work is done at points separated by more than one mile it is likely that more than one flagman will be required.

(2) Watchman Service. The purpose of this service is to insure that Contractor's operations do not damage railroad facilities nor foul operations unless flagging

service has been arranged. The watchman assigned will flag trains if they deem necessary, but such service is intended to eliminate the need of unplanned flagging. Such service will be required at all times that work is done (or crane boom can fall) within 15-feet of centerline of track when any work is done in Railroad's embankment under or adjacent to track or when work is done above any track. In general, one watchman will be expected to cover work within a one mile stretch along the tracks. Work more widely scattered will require additional watchmen.

l. Before commencing any work under the contract whether on or adjacent of the rights-of-way of the Railroad Companies, the Contractor and applicable subcontractors shall procure and keep in effect during the period of such work, at the Contractor's own cost and expense insurance in accordance with the above General Provision entitled "REQUIRED INSURANCE (RAILROAD)." Payment for furnishing the required insurance will be made at the contract lump sum price for "Railroad Insurance".

m. All costs associated with crossing or working adjacent to railroad tracks shall be included in the Contractor mobilization and demobilization cost.

18. **COMMERCIAL WARRANTY.** The Contractor agrees that the standard commercial equipment furnished under this contract shall be covered by the most favorable commercial warranties the manufacturer gives to any customer for such equipment, and that the remedies provided herein are in addition to and do not limit any rights afforded to the Government by any other clause of this contract. Two copies of the warranties shall be furnished by the Contractor to the Contracting Officer.

19. **ACCESS PLAN.** The Contractor shall submit an access plan to be reviewed and approved by the Contracting Officer to include, as a minimum, the following:

a. Layout drawings showing the location of all equipment, office structures, toilets, and storage areas for materials.

b. Show mobilization and demobilization routing and locations of large equipment, such as draglines, cranes, etc. while on the jobsite.

c. Show waterway channels or canals used to mobilize and demobilize equipment and materials and show access routes and docking areas of all marine equipment with respect to the jobsite.

20. **TEMPORARY POWER.** The Contractor is responsible for all temporary power for butterfly valves, walkway lights, construction trailers, and all other power needed for the contract. The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for

the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

21. PAYMENT FOR MATERIALS DELIVERED OFFSITE. Pursuant to the contract clause entitled "PAYMENTS UNDER FIXED PRICE CONSTRUCTION CONTRACTS (APR 1989)" materials delivered to the Contractor at locations other than the site of the work may be taken into consideration in making progress payments if included in invoice for payment estimates and if all the conditions of the Contract Clauses are fulfilled. Payment for items delivered to locations other than the work site shall be limited to materials which have been approved (if required by the technical specifications) and fabricated to the point where they are identifiable to an item of work required under this contract. Such payment shall be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items by the prime Contractor. These invoices must show the dollar value of the materials and labor incorporated into them. The delivery size shall be acceptable to the Government and the materials shall be available for inspection by the Government prior to any consideration for payment. Payment for materials delivered offsite is limited to steel sheet piling, steel H-piles, sluice gates, and the aluminum bulkheads.

22. EMERGENCY OPERATION OF DRAINAGE PUMPING STATION NO. 6.

a. Pump Station No. 6 is an operating facility which must remain in full operation throughout construction covered by this contract. The Contractor shall furnish a detailed construction plan to the Contracting Officer for his approval showing how this requirement will be met. The project work schedule specified in the contract clause entitled "Schedules for Construction Contracts (APR 1984)" shall be based on the approved construction plan. If the Contractor's construction plan, sequence and/or methods require the use of the existing structure of Pump Station No. 6 for any purpose, he shall perform engineering analysis and calculations to ascertain that the purpose for which he intends to use the existing structure will not jeopardize the structural integrity of the same or any part, component, or portion thereof. Any damages, direct or indirect, caused to the property of others due to Contractor's failure to comply with this requirement or negligence in calculations shall be the sole responsibility of the Contractor.

b. The Sewerage and Water Board's drainage pumping system is an intricate network of canals and pumping system located throughout Orleans Parish. The pumping system has both the flexibility and capability of manipulating and moving flows from an overloaded portion in the system to a lightly loaded portion to allow use of pumping capacity available in such areas of the system.

c. The term "dry weather flow" is hereby defined as that flow which occurs when there is no precipitation over the drainage basin which contributes run-off to the drainage

ditches, pipes and canals which are connected to the canal under consideration; all other flows shall be considered "wet weather flows".

d. The terms upstream and downstream when used in these specifications are hereby defined as follows:

(1) Upstream: Direction pointing away from Pumping Station No. 6 on suction side and pointing to Pumping Station No. 6 on discharge side regardless of the direction of the flow in the canal.

(2) Downstream: Direction pointing away from Pumping Station No. 6 on discharge side and pointing to Pumping Station No. 6 on suction side regardless of the direction of the flow in the canal.

23. FLOODING, DAMAGES AND EXCAVATION REQUIREMENTS.

a. General. The nature and scope of the work under this contract requires the Contractor to perform work within the discharge basin of Drainage Pumping Station No. 6. Even though the Contractor will be allowed to construct a temporary cofferdam as shown on the drawings and as specified elsewhere, the construction area is still subject to flooding caused by one or a combination of all of the occurrences specified below:

(1) Operation of any pumping station due to a precipitation event anywhere within the system.

(2) Ongoing construction within the system.

(3) Routine maintenance and testing of equipment at any pumping station.

(4) A partial or complete breakdown of any pumping station.

b. Flooding Events Due to Operation of Pumping Station No. 6. The flooding of the Contractor's work area will occur when:

(1) Pumps are used to pump wet weather flows due to a precipitation event anywhere and/or due to occurrence of any one or combination of events specified in paragraph a above.

(2) The dry weather flow is being pumped.

c. Evacuation Requirements: The Contractor shall monitor local weather forecasts and schedule his operations in the discharge basins and discharge canal accordingly to minimize the extent of delays and damage to both temporary and permanent construction.

The Contracting Officer will notify the Contractor or his designated personnel at the project site fifteen minutes prior to:

(1) The S&WB's intention of starting the pumps to pump the wet weather flow.

(2) Intention of the SW&B to pump dry weather flow.

d. The fifteen minute advanced notice will be given only during working hours and shall be communicated in person or by telephone and the Contractor's evacuation of the discharge basin commence immediately upon the notification. The Contractor shall be responsible for removing all his equipment, personnel, and loose materials from the discharge basin within this fifteen minute period. Any loss or damage to equipment and materials left in the discharge basin or injury to personnel after expiration of the fifteen minute advance notice will be the sole responsibility of the Contractor and no compensation for such losses, damages or injuries will be made by the government.

e. The Contractor shall be responsible to remove all equipment and loose materials from the discharge basin and/or discharge canal at the end of each work day. Any losses, damages or injuries incurred due to non-compliance with this requirement shall be the sole responsibility of the Contractor.

f. Damage caused to permanent work performed by the Contractor in the discharge basin as a result of pumping station operations and/or as a result of overtopping of temporary cofferdams will be compensated by an equitable adjustment under the contract clause entitled "CHANGES". For the purpose of this adjustment, the permanent work is hereby defined as any part of construction under this contract which when completed will remain in place and become an integral component of the proposed expansion.

g. The Contractor will be compensated by an equitable adjustment under the contract clause entitled "CHANGES" for additional operating expenses each time the work area is flooded by direction of the Contracting Officer. If the Government fails to provide the designated advance notice, all Contractor's damages and delays will be compensated for by an equitable adjustment under the contract clause entitled "CHANGES".

h. The Contractor shall prepare and submit a detailed evacuation plan to the Contracting Officer, for approval, detailing his intentions for the evacuation of personnel, equipment and materials during work in discharge basin (i.e. demolition, slab construction, wall construction, pile driving, etc.) for approval not later than forty-five (45) days prior to beginning work.

24. ORDER OF WORK AND SCHEDULE. The Contractor as part of the contract requirements shall follow the following order of work for all major construction activities and deliveries.

1. Demolish existing retaining wall and foundation between pumps G and H.
2. Construct and dewater cofferdam at east monolith.
3. Drive test piles and perform pile load tests.
4. Construct east monolith and phase such that a maximum of only one pump is out of service at any given time.
5. Test sluice gates at east monolith.
6. Flood east monolith cofferdam and pull sheeting and backfill voids.
7. Construct and dewater cofferdam at west monolith.
8. Construct west monoliths and phase such that a maximum of only one pump is out of service at one time.
9. Test sluice gates at west monoliths.
10. Flood west monolith cofferdam and pull sheeting and backfill voids. The Contractor's means and methods, construction process, etc. shall insure the following:
 - (1) At no time shall the contractor's construction activities interfere with the operation of the station.
 - (2) At no time shall the contractor's construction activities cause more than one (1) pump to be out of service.
 - (3) All construction at the East Monoliths shall be complete and all pumps operational prior to the commencement of construction on the West Monoliths.
 - (4) A detailed sequence of events showing how the contractor will abandon the cofferdam area for the purposes of flooding same.

25. CO-ORDINATION OF WORK. All required relocation of utilities shall be fully coordinated by the Contractor with the facility owners so that no delays or adverse impacts are experienced. Any difficulty encountered when attempting to contact a facility owner

shall be promptly brought to the attention of the Contracting Officer. The facility owner and their respective points of contact are:

ENTERGY - All Electrical Feeds and Power Poles

Wayne Burlette, Electrical
527 Magnolia Street
New Orleans, Louisiana 70112
595-3584 fax 595-3596

NO S&WB -

For general coordination:
Mr. Jack Huercamp, Operations
8800 South Claiborne Ave.
New Orleans, LA 70118
865-0435 fax 865-0403

For gravity sewer systems:
Mr. Mark Arnold
8800 South Claiborne Avenue
New Orleans, Louisiana 70118
865-0435 fax 865-0403

ORLEANS LEVEE DISTRICT

Mr. Stevan Spencer
Chief Engineer
Lakefront Airport
Administration Bldg., Suite 202
New Orleans, LA 70124
243-4048 fax 246-6262

EAST JEFFERSON LEVEE DISTRICT

Mr. Alan Francigues
Chief Engineer
East Jefferson Levee District
203 Plauche Court
Harahan, LA 70123
733-0087 fax 733-2255

26. **VIBRATION MONITORING.** An independent testing laboratory, retained by the Orleans Levee Board, will monitor vibrations during pile driving operations. The Contractor shall coordinate monitoring of vibrations by notifying the Contracting Officer

and the Orleans Levee Board by certified mail at least 15 days prior to starting pile driving operations.

27. HURRICANE PROTECTION. The Contractor, during construction of the project, shall provide a continuous flood protection across the floodwall gap caused by its removal for accessing construction equipment. The Contractor, in the event of an approaching hurricane or other threatening weather or tidal events and at the direction of the Contracting officer, shall pull existing I-wall sheet piling to elevation 14.6 NGVD and close the gap. The Contractor shall redrive sheet piling, as required for accessing the construction equipment, after all danger of hurricane induced flooding is over and/or as directed by the CO. Payment for pulling and redriving sheet piling specified herein will be made by an equitable adjustment under the Contract Clause entitled "CHANGES".

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SECTION 01300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1. SUBMITTAL CLASSIFICATION. Submittals are classified as follows:

1.1 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." Any reference to Government approval by the Contracting Officer (CO) includes the approving authority of the CO, the Administrative Contracting Officer (ACO), or the Contracting Officer's representative (COR).

1.2 Information Only. 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.

2. APPROVED SUBMITTALS. The Contracting Officer's approval of submittals 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 which may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the 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 considered unless accompanied by an explanation of why a substitution is necessary.

3. 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, a notice in accordance with the Contract Clause "CHANGES" shall be given promptly to the Contracting Officer.

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

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

5. GENERAL. 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 sections. 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 Area Office address listed in the paragraph entitled SITE VISIT ASSISTANCE in Section 00100. 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 item shall be stamped, signed, and dated by the CQC representative 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 manufacturers Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

6. SUBMITTAL REGISTER. At the end of this section is one set of ENG Forms 4288 listing each item of equipment and material for which submittals are required by the specifications. Columns "c" thru "q" have been completed by the Government. The Contractor shall complete columns "a", "b", and "r" thru "w", and return 4 completed copies to the Contracting Officer for approval within 14 calendar days after Notice to Proceed for approval. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. This register and the progress schedules shall be coordinated.

7. 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 30 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.

8. TRANSMITTAL FORM. The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor at the preconstruction conference. 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.

9. SUBMITTAL PROCEDURE. Submittals shall be made as follows:

9.1 Procedures. Procedures for submittals will be stipulated by the Contracting Officer's Representative at the preconstruction conference.

9.2 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.

10. 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".

11. 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 date. Three (3) copies of the submittal will be retained by the Contracting Officer and 1 copy of the submittal will be returned to the Contractor.

12. 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 and will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work. This 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.

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

POLLUTION PREVENTION PLAN

The Contractor shall review the Pollution Prevention Plan (PPP) for compliance. In addition, the Contractor shall ascertain that his subcontractors have reviewed the plan, and that they comply with its provisions. The Pollution Prevention Plan is as follows:

1. The project site is located south of Lake Pontchartrain at Pumping Station No. 6 on the 17th Street Canal, on the Jefferson and Orleans Parish line, and just south of Interstate 10 (I-10). The approximate latitude and longitude are 29° 59' 17" and 90° 07' 29". The work consists of constructing a continuous line of flood protection across the pumping station. This protection will incorporate reinforced concrete capped steel sheet piling I-wall, pile founded reinforced concrete sluice gate monoliths, reinforced concrete canal lining, aluminum bulkheads, and cast iron sluice gates with electric operators. Site work will include placing armor stones adjacent to the fronting structure, modifications to existing utilities, dewatering, cofferdam construction, clearing and grubbing, excavation (braced and conventional), embankment, backfill and other incidental work thereto.

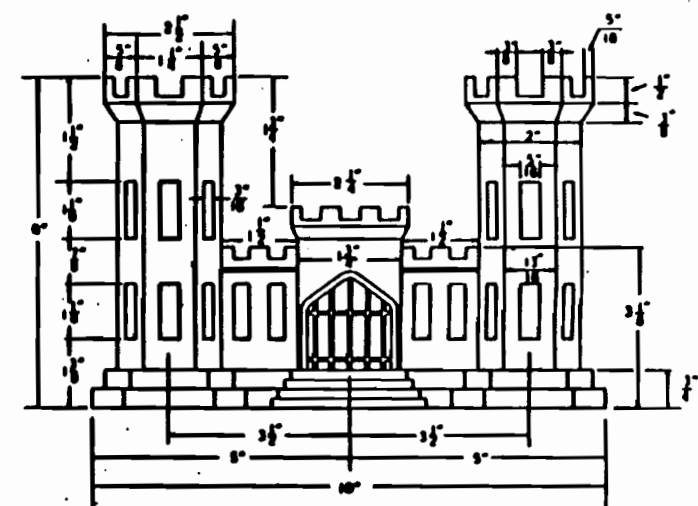
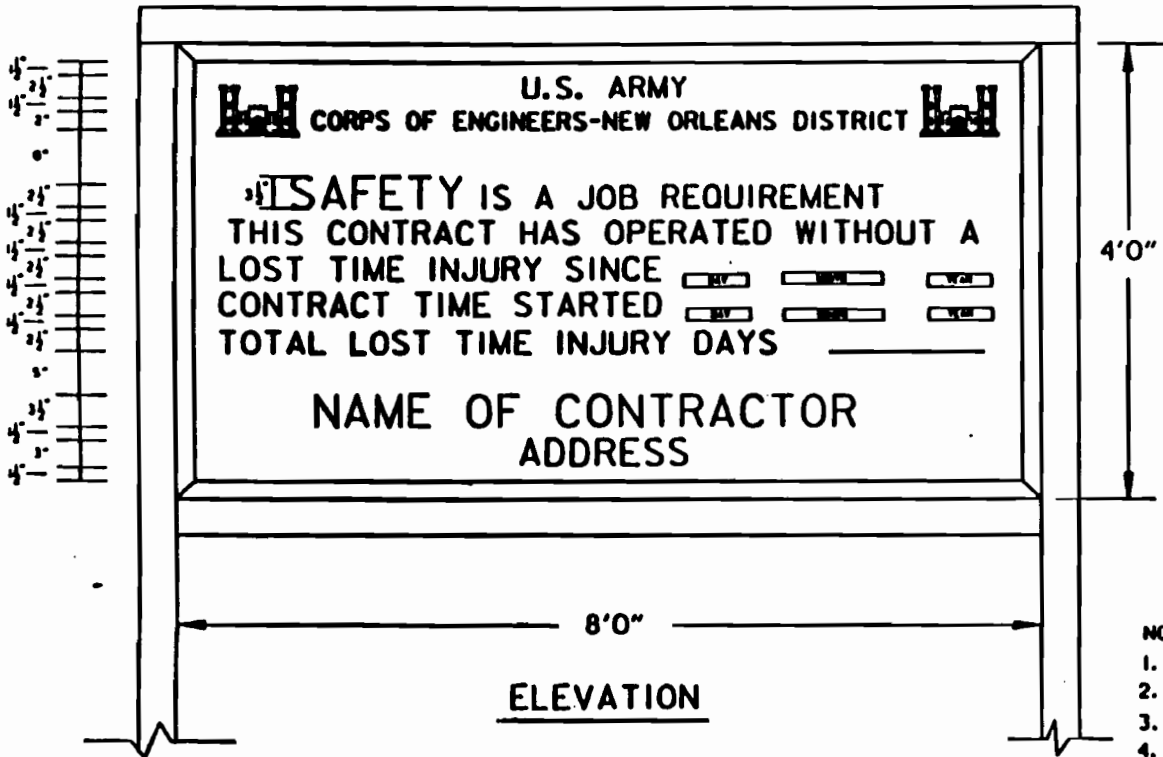
2. The total project area is approximately 1 acre. Approximately 1/4 acre is expected to undergo excavation and/or dewatering during construction.

3. The project site consists of an existing pumping station with connecting levee/I-wall flood protection. The floodside of the pumping station and levee/I-wall system drains storm water run off directly into the 17th Street Outfall Canal. The protected side of the pumping station and levee/I-wall system drains storm water run off from storm water drains. These drains are connected to the local drainage system which delivers the storm water to the pumping station. The pumping station then discharges the storm water into the outfall canal. These areas are regulated under Section 404 of the Clean Water Act (CWA). The Contractor shall perform all work required for the prevention of environmental pollution, as set forth Section 01431 "ENVIRONMENTAL PROTECTION".

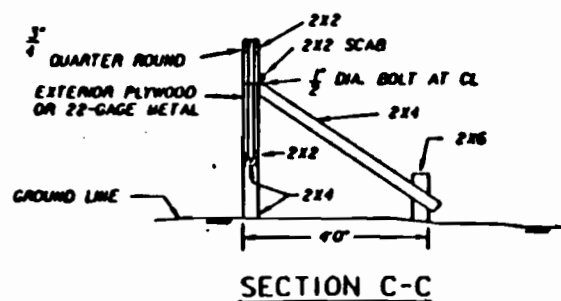
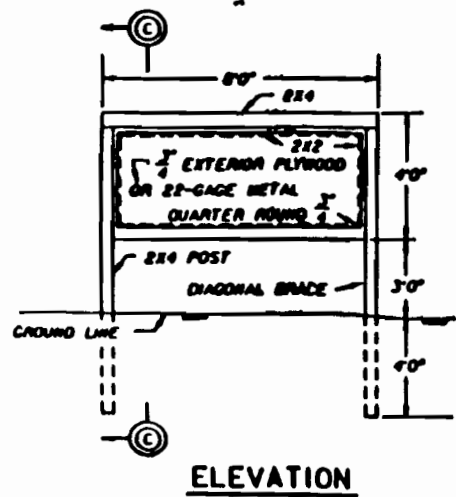
4. The estimate of runoff coefficient for the project site is 0.3. There is no increase in impervious area after construction.

5. Lake Pontchartrain is the receiving water.

6. Upon completion of the structure all disturbed areas will be fertilized and seeded where applicable.



- NOTES:
1. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN A DURABLE SIGN AS SHOWN
 2. WOOD IN CONTACT WITH GROUND SHALL BE TREATED LUMBER.
 3. ALL EXPOSED SURFACES SHALL BE WHITE HOUSE PAINT.
 4. LETTERING SHALL BE BLACK.
 5. ENGINEER CASTLE SHALL BE RED. DECALS FURNISHED BY GOVERNMENT MAY BE USED IN LIEU OF DETAIL.
 6. 22 GA. STEEL METAL MAY BE USED IN LIEU OF PLYWOOD.



SCALE: NONE

1 FEB 1992

U S ARMY ENGINEER DISTRICT NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS LOUISIANA



SAFETY SIGN

SUBMITTAL REGISTER (ER 415-1-10)																	CONTRACT NO.									
TITLE AND LOCATION LAKE PONTCHARTRAIN AND VICINITY HURRICANE PROTECTION, HIGH LEVEL PLAN, FRONTING PROTECTION FOR PUMPING STATION #6, 17TH STREET OUTFALL CANAL											CONTRACTOR					SPECIFICATION NUMBER										
ACTIVITY NO	TRANS-MITTAL NO	I E M N O	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL							CLASSIFICATION		CONTRACTORS SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION		REMARKS					
					D R U A C E E I A E M R P V	I N S T B T T I O N R E P E R E P V	R U H T R F S R R E P E R E P V	C E R T I F I C A T E D O F O T O M O G R A P H Y	C E R T I F I C A T E D O F O T O M O G R A P H Y	C E R T I F I C A T E D O F O T O M O G R A P H Y	C E R T I F I C A T E D O F O T O M O G R A P H Y	C E R T I F I C A T E D O F O T O M O G R A P H Y	C E R T I F I C A T E D O F O T O M O G R A P H Y	C E R T I F I C A T E D O F O T O M O G R A P H Y	I N G O V A R I E T Y	S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	C O D E	D A T E		S U B M I T T O G O V E R N M E N T	C O D E	D A T E		
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	
			1	1100-3	Accident Prevention Program	X										X	CD									
			2	1100-3	Comp Hazard Communication Program	X										X	CD									
			3	1100-12	Aggregate Sources	X										X	CD									
			4	1100-13	Stone Sources	X									X	ED-QM										
			5	1100-16 & 17	Insurance	X									X	CD										
			6	01100-18	Access Plan	X										X	CD									
			7	01300-8	Submittal Register			X								X	CD									
			8	01431-5	Notice of Intent (NOI)	X										X	CD									
			9	02070-3	Demolition Plan	X	X	X	X	X	X	X				X	CD									
			10	02101-4	Utility Modification, Shop Drawings	X	X	X	X	X						X	CD									
			11	02140-6	Dewatering Design	X	X	X	X						X	ED-FB										
			12	02171-4	Cofferdam, temporary Earth Retaining Struc	X	X									X	ED-FB ED-TF									
			13	02220-3	Excavation Plan	X	X									X	ED-FB									
			14	02246-3 02246-3	Geotextile Separator	X		X	X	X	X	X				X	ED-FB									
			15	02273-4	Stone rip Rap, test results and gradation	X									X	CD										

SUBMITTAL REGISTER (ER 415-1-10)																				CONTRACT NO.																				
TITLE AND LOCATION: LAKE PONTCHARTRAIN AND VICINITY HURRICANE PROTECTION, HIGH LEVEL PLAN, FRONTING PROTECTION FOR PUMPING STATION #8, 17TH STREET OUTFALL CANAL										CONTRACTOR					SPECIFICATION NUMBER																									
ACTIVITY NO.	TRANSMITTAL NO.	ITEM NO.	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSIFICATION	CONTRACTORS SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS																
					I D A W D I A T G A	N R C H U I I O G S	S T E E E U L M S	T R A M P O L N R T E S	C E R T I F I C A T E S	I N G O V A R E P E R P V N R I E V W D O L N E R	S R R C A P O T O M O E V W D O L N E R	E M C A P O T O M O E V W D O L N E R	R E P E R P V N R I E V W D O L N E R	R E P E R P V N R I E V W D O L N E R		F I L E S	S U B M I T T E D	A P P R O V E D B Y	M A T E R I A L N E E D E D B Y	D A T E	C O D E	S U B M I T T E D T O G O V E R N M E N T	D A T E		C O D E															
																										f	g	h	i	j	k	l	m	n	o	p	q	r	s	t
			16	02315-4-1	H-Pile, Equipment Descriptions	X															X	ED-F8																		
			17	02315-4-3	H-Pile, Delivery, Storage and Handling Plan	X	X															X	CD																	
			18	02315-4-4	H-Pile, Placement Plan		X																X	CD																
			19	02316-4-5	H-Pile, Driving Records									X	X										ED-F8															
			20	02315-5-3	H-Pile, Splice	X	X																X	ED-TF																
			21	02366-4-1	Test Pile Procedure and Equipment	X																	X	ED-F8																
			22	02355-4-2-1	Test Pile Driving Records									X	X										ED-F8															
			23	02366-10	Test Pile Repots									X											ED-F8															
			24	02411-5-1	Steel Sheet Pile Driving Equipments	X																		X	ED-F8															
			25	02411-5-2	Steel Sheet Pile Shop Drawings		X																	X	ED-TF															
			26	02411-5-3	Steel Sheet Pile Material Test Certificates									X			X								ED-QM															
			27	02411-5-4	Steel Sheet Pile Driving Records									X	X										ED-F8															
			28	02450-6	Driving Services, Inspection report Fertilizer,									X	X										CD															
			29	02935-5-1	Weight Tickets and Quantitative Analysis	X									X		X								CD															
			30	02935-6-1	Fertilizer Invoices	X										X									CD															

SUBMITTAL REGISTER (ER 415-1-10)																	CONTRACT NO								
TITLE AND LOCATION: LAKE PONTCHARTRAIN AND VICINITY HURRICANE PROTECTION, HIGH LEVEL PLAN, FRONTING PROTECTION FOR PUMPING STATION #8, 17TH STREET OUTFALL CANAL														CONTRACTOR					SPECIFICATION NUMBER						
A C T I V I T Y N O	TRANS- MITTAL NO	I T E M N O	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL								CLASSI- FICATION	CONTRACTOR'S SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION		REMARKS				
					D R A W I N G S	I N S T R U C T I O N S	C A L C U L A T I O N S	H I S T O R Y	T E S T I N G	R E P O R T S	P H O T O G R A P H S	C E R T I F I C A T E S		I N F O R M A T I O N	O V E R S E E I N G	S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	C O D E D A T E	S U B M I T T O G O V E R N M E N T D A T E		C O D E D A T E			
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
			31	03101-3.1	Concrete Formwork, Shop Drawings	X	X								X										
			32	03101.3.2	Concrete Formwork, Manufacturer's Literature								X												
			33	03150-4.1	Waterstop Testing	X							X												
			34	03150-8.1	Waterstop, Longitudinal Splice	X									X										
			35	03210-5.1	Reinforcing Steel, Shop Drawings	X									X										
			36	03210-5.2	Reinforcing Steel, Test Reports					X				X											
			37	03210-5.3	Disposition Records							X	X												
			38	03301-5.1.1	Concrete Mix	X					X			X											
			39	03301-5.1.2	Cement and Pozolan						X	X			X										
			40	03301-5.1.5	Aggregates										X										
			40	03301-5.1.5	Water	X									X										
			41	03301-5.2	Manufacturer's Certificates							X			X										
			42	03301.5.3	Plant, Equipments and Methods, Mixers Conveying Equipments, Placing and Curing	X									X										
			43	03301.5.3.7	COLD-WEATHER REQUIREMENTS	X									X										
			44	03301.5.3.8	Hot Weather Requirements	X									X										
			45	03301.7.5.2.2	Trial Mixtures Test Results	X							X												

NOTE THIS REGISTER IS NOT NECESSARILY COMPLETE THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING A COMPREHENSIVE REGISTER

SUBMITTAL REGISTER (ER 415-1-10)																	CONTRACT NO.								
TITLE AND LOCATION: LAKE PONTCHARTRAIN AND VICINITY HURRICANE PROTECTION, HIGH LEVEL PLAN, FRONTING PROTECTION FOR PUMPING STATION #8, 17TH STREET OUTFALL CANAL										CONTRACTOR							SPECIFICATION NUMBER								
ACTIVITY NO.	TRANSMITTAL NO.	ITEM NO.	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CONTRACTORS SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION		REMARKS			
					DRAWINGS	INSTRUMENTS	TESTS	CERTIFICATIONS	PERMITS	GOVERNMENT APPROVALS	REVISIONS	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER		OTHER		
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
		46	05500-3 1	MISCELLANEOUS METALWORK SHOP DRAWINGS	X											X									
		47	05500-3 2 05501-4 4	MISCELLANEOUS METALWORK Certification	X											X									
		48	05501-4 1	SHOP DRAWINGS	X											X									
		49	05501-4	Stairway Handrail & Coupling	X											X									
		50	05801-5 4	Walkway Safety Grating	X											X									
		51	05801-5 1	Bulkhead & Appurtenant, Shop drawings	X											X									
		52	05801-5 3	Bulkhead & Appurtenant, Test Report							X					X									
		53	05801-5 4	Bulkhead & Appurtenant, Seal Samples											X	X									
		54	08840-8 1	PAINTING Paints & Thinner	X										X		X								
		55	08840-8 2	Paint & Thinner	X										X		X								
		56	08840-8 3	PAINTING Property Brands of Paints							X						X								
		57	08840-8 4(1)	PAINTING - QUALIFICATIONS AND EXPERIENCE OF SAFETY & HEALTH REPS										X	X		X								
		58	11285-4	Sluice Gate, Shop Drawings	X											X									
		59	18120-4	Wire and Cable	X											X									
		60	18500 4	Product Data and Shop Drawings	X	X										X									

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SECTION 01431 - ENVIRONMENTAL PROTECTION

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SECTION 01431 - ENVIRONMENTAL PROTECTION

1. SCOPE. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all work required for the prevention of environmental pollution and the handling, removal, transportation and disposal of any hazardous and/or regulated solid waste generated during and as the result of construction operations under this contract except for those measures set forth in other provisions of these specifications. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to man; or degrade the utility of the environment for esthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, and land, and involves noise, solid waste-management, management of radiant energy and radioactive materials, as well as other pollutants including hazardous wastes, materials, substances and chemicals.

2. QUALITY CONTROL.

2.1 General. The Contractor shall establish and maintain quality control for environment protection to assure compliance with contract specifications and maintain records of his quality control for all construction operations including but not limited to the following:

(1) Submit plan of Environment Pollution Control. Include in the plan, a Pollution Prevention Plan (copy enclosed). For Contractor work activities (such as painting, metal finishing, etc.) that will involve bringing hazardous chemicals, hazardous substances or hazardous materials onto the project site, include in the plan a Hazard Communication Program and Safe Storage Plan. For Contractor activities that anticipate generation of hazardous wastes at the project site, include in the plan a waste identification /determination and waste disposal plan. For Contractor on-site activities that pose a risk of an oil or hazardous substance spill, include in the plan a Spill Reporting and Response Plan.

(2) Procure applicable Federal, State, and Local regulations on pollution control.

(3) Air Pollution - Checks made on dust, smoke, noise.

(4) Water Pollution - Checks made on disposal of water, oil, etc.

(5) Land Pollution - Checks made on disposal of debris, restoration of temporary construction sites, etc.

(6) Training Course for Employees.

2.2 Reporting. The original and two copies of these records, as well as the records of corrective action taken, shall be furnished the Government daily. Format of report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

3. APPLICABLE REGULATIONS. In order to prevent, and to provide for abatement and control of any environmental pollution arising from construction activities in the performance of this contract, the Contractor and his subcontractors shall comply with all applicable Federal, State, and Local laws, and regulations as well as USACE regulations concerning environmental pollution control and abatement and any regulations referred to in the following paragraphs. For hazardous wastes, materials, substances and chemicals applicable regulations shall include, but are not limited to, 29 CFR 1910.106, 29 CFR 1910.1200, 40 CFR 260-268, 40 CFR 279, 40 CFR 355, 40 CFR 372, 49 CFR 171-178 and USACE EM 385-1-1.

4. NOTIFICATION. The Contracting Officer will notify the Contractor in writing of any non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess cost of damages by the Contractor.

5. LPDES STORM WATER DISCHARGE RULE. This project is authorized to discharge storm water associated with construction activity under the terms and conditions imposed by Louisiana Department of Environmental Quality (LDEQ) storm water general permit. A Notice of Intent (NOI) and our Pollution Prevention Plan (PPP) tailored to the construction site is attached at the end of this section. The enclosed NOI shall be posted at the work site. The Contractor shall complete, sign, and submit a separate NOI to the LDEQ forty-eight (48) hours before the start of construction and shall comply with all applicable pollution prevention controls, monitoring, and reporting requirements. After completion of construction, the Contractor shall submit a Notice of Termination (NOT) to the LDEQ, with a copy furnished to the Contracting Officer. By submission of this form, the Contractor is informing LDEQ that construction has been completed and the area is stabilized. A blank copy of the NOT(Form 3510-7), with instructions, is provided at the end of this section.

6. **SUBCONTRACTORS.** Compliance with the provisions of this section by subcontractors will be the responsibility of the Contractor.

7. **IMPLEMENTATION.** Within 10 days after receipt of notice to proceed, or otherwise directed below, the Contractor shall:

(1) Submit in writing his/her proposals for implementing environmental pollution control at the project site, disposal of debris, non-hazardous wastes and hazardous wastes generated at the project site as well as storage and management of regulated materials, substances and chemicals brought onto and used at the project site.

(2) Meet with representatives of the Contracting Officer to develop mutual understanding relative to compliance with this provision and administration of the environmental pollution control program.

(3) If applicable, submit a plan for the handling, removal, transportation and disposal of hazardous and/or regulated solid wastes generated as a result of the Contractor's operation.

8. PROTECTION OF LAND RESOURCES.

8.1 General. The land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. The Contractor shall confine his/her construction activities to areas defined by the plans or specifications, [including borrow areas to be cleared]. The following additional requirements are intended to supplement and clarify the requirements of Contract Clauses for "PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS," "OPERATIONS AND STORAGE AREAS", and "CLEANING UP".

8.2 Prevention of Landscape Defacement. Except in areas to be cleared and as provided in paragraph 8.3, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without the approval of the Contracting Officer. Felling of trees shall be performed in such a manner as to avoid damage to trees to be left standing. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's operations or equipment; he shall protect adequately such trees. Earth that is displaced into uncleared areas shall be removed. All monuments and markers shall be protected before beginning operations near them. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the Contractor's expense. Trees that are scarred shall be immediately painted with an acceptable tree wound paint. Any trees which are

damaged beyond restoration shall be removed and disposed of as directed in paragraph 12.

8.3 Temporary Excavation and Embankments. If the Contractor proposes to construct temporary roads or embankments and excavation for plant and/or work areas, he shall obtain approval of the Contracting Officer prior to start of such temporary work.

8.4 Post-Construction Cleanup or Obliteration. The Contractor shall obliterate all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, and stockpiles of excess or waste materials upon completion of construction. The Contractor will be required to restore the construction area to near natural conditions which will permit the growth of vegetation.

8.5 Recording and Preserving Historical and Archeological Finds. All items having any apparent historical or archeological interest which are discovered in the course of any construction activities shall be carefully preserved. The Contractor shall leave the archeological find undisturbed and shall immediately report the find to the Contracting Officer so that the proper authorities may be notified.

9. PROTECTION OF WATER RESOURCES.

9.1 Contamination of Water. The Contractor shall not pollute lakes, ditches, rivers, bayous, canals, groundwater, waterways, or reservoirs with fuels, oils, bitumens, calcium chloride, insecticides, herbicides, or other similar materials harmful to fish, shellfish, or wildlife, or materials which may be a detriment to outdoor recreation.

9.2 Disposal of Materials. The methods and locations of disposal of materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., within the right-of-way limits shall be such that harmful debris will not enter lakes, ditches, rivers, bayous, canals, groundwater, waterways, or reservoirs by erosion, and thus prevent the use of the area for recreation or present a hazard to wildlife.

9.3 Erosion Control. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits. Temporary erosion and sediment control measures such as berms, dikes, drains, hay bales, erosion control fences or curtains, or sedimentation basins, if required to meet the above standards, shall be provided and maintained until permanent drainage and erosion control facilities are completed and operative. The area of bare soil exposed at any one time by construction operations shall not exceed that necessary to perform the work. Stream crossings by fording with equipment shall be limited to control turbidity and in areas of frequent crossings temporary culverts or bridges shall be installed. Any temporary culverts or

bridges shall be removed upon completion of the project. Fills and waste area shall be constructed by selective placement to eliminate silts or clays on the surface that will erode and contaminate adjacent streams.

10. PROTECTION OF FISH AND WILDLIFE. The Contractor shall at all times perform all work and take such steps required to prevent any interference of disturbance to fish and wildlife. The Contractor will not be permitted to alter water flows or otherwise disturb native habitat adjacent to the project area which are critical to fish or wildlife.

11. JANITOR SERVICES. The Contractor shall furnish daily janitorial services for all the offices, shops, laboratories, or other buildings being used by the Contractor or Government employees, whether existing or Contractor furnished, and perform any required maintenance of the facilities and grounds during the life of the contract. Toilet facilities shall be kept clean and sanitary at all times. Services shall be performed at such a time and in such a manner to least interfere with the operations but will be accomplished only when the buildings are in daily use. Services shall be accomplished to the satisfaction of the Contracting Officer. The Contractor shall also provide daily trash collection and cleanup of the buildings and adjacent outside areas, snow removal as required, and shall dispose of all discarded debris, aggregate samples and concrete test samples in a manner approved by the Contracting Officer.

12. DISPOSAL OF NON-REGULATED DEBRIS. All debris resulting from construction operations on this contract shall be disposed of in accordance with 02210-5.

13. DISPOSAL OF HAZARDOUS AND/OR REGULATED SOLID WASTES. If any hazardous or regulated solid wastes will be generated as a result of the Contractor's operations, the Contractor shall submit a plan which details the proper handling, removal, transportation and disposal of such wastes. The plan shall identify what types of hazardous and/or regulated solid wastes will be generated and shall list the hazards involved with each waste. All waste generated on-site by the Contractor must be properly identified within 30 days of generation. No regulated wastes shall be allowed to accumulate on-site for more than 90 days. Regulated solid wastes are those listed in the Louisiana Administrative Code (LAC), Title 33, Environmental Quality, Part VII, Solid Waste Regulations (Feb 93). The plan shall include Material Safety Data Sheets (MSDS), if applicable, for all wastes expected to be generated.

13.1 Hazardous Wastes. For the handling, removal, transportation and disposal of any generated hazardous wastes, the plan shall conform to the requirements of 29 CFR 1910.120. All employees of the Contractor or his/her Subcontractors that will be directly involved in the handling and/or removal of hazardous wastes shall be trained in accordance with 29 CFR 1910.120. In addition, the employees shall have undergone a medical evaluation in accordance with 29 CFR 1910.120. The Contractor shall include copies of employees' certifications and medical examinations as part of the plan specified

herein. The plan shall also address the proper Personnel Protective Equipment (PPE) that the employees will be required to wear during the handling and removal of hazardous wastes. The Contractor shall obtain an EPA ID# and Hazardous Waste Disposal Manifests and shall sign the manifests as the generator. Wastes shall be transported via state and Federal approved hazardous waste transporter and disposed of at a state and Federal approved temporary, storage and disposal (TSD) facility. Copies of licenses and certifications of the transporter and TSD shall be included in the plan. The plan shall list the name and address of each transporter and TSD to be utilized. The Contractor shall be responsible for any sampling and analysis required by the TSD for characterization purposes. The Contractor shall submit to the Contracting Officer completed copies of all Hazardous Waste Disposal Manifests with five (5) days after ultimate disposal at the TSD. Other regulations applicable to the handling, removal, transportation and disposal of hazardous wastes are: 40 CFR 261 "Identification and Listing of Hazardous Wastes"; 40 CFR 262 "Standards Applicable to Generators of Hazardous Wastes"; 40 CFR 268 "Land Disposal Restrictions"; and, Louisiana Administrative Code (LAC), Title 33, Environmental Quality, Part V., Hazardous Waste and Hazardous Materials (December 31, 1993).

13.2 Regulated Solid Wastes. For the handling, removal, transportation and disposal of any generated regulated solid wastes, the plan shall conform to the requirements of Louisiana Administrative Code (LAC), Title 33, Environmental Quality, Part V., Solid Waste Regulation (February 1993). Solid wastes shall be transported to a Federal and state approved TSD, oil recycler or Industrial Type I Landfill. The Contractor shall identify in the plan how he/she intends to dispose of each solid waste. The plan shall include the name, address, licenses and certifications of each disposal facility that will be used. If disposal manifests are required, the Contractor shall sign them as the generator. The Contractor shall be responsible for any sampling and analyses that may be required by the disposal facility(ies) for characterization purposes. Licenses and certifications of the transporter and disposal facilities shall be included in the plan. The Contractor shall submit to the Contracting Officer a completed copy of any waste disposal manifests within five (5) days after ultimate disposal.

14. MAINTENANCE OF POLLUTION CONTROL FACILITIES. During the life of this contract the Contractor shall maintain all facilities constructed for pollution control under this contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created. Early in the construction period the Contractor shall conduct a training course that will emphasize all phases of environmental protection.

15. REPORTING OF POLLUTION SPILLS. In the event that an oil spill or chemical release occurs during the performance of this contract, the Contractor is required to contact the National Response Center, telephone number 1-800-424-8802 as soon as possible, or if telephone communication is not possible, the nearest U.S. Coast Guard office may be contacted by radio to report the spill, (33 CFR 153.203). The Contractor shall comply with

any instructions from the responding agency concerning containment and/or cleanup of the spill.

16. MEASUREMENT AND PAYMENT.

16.1 Environment Protection. No separate measurement or payment will be made for environment protection. Payment for the environment protection work covered under this section shall be distributed throughout the existing bid items.

16.2 Hazardous Waste. No separate measurement will be made for the development and implementation of the requirements specified in paragraph 13. Payment for the development of the Plan, handling, removal, transportation and disposal of hazardous and/or regulated solid wastes shall be made as an equitable adjustment in contract price under the Contract Clause entitled "CHANGES."

See Reverse for Instructions

NPDES
FORM



United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under a NPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section II of this form intends to be authorized by a NPDES permit issued for storm water discharges associated with industrial activity in the State identified in Section III of this form. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Permit Selection. You must indicate the NPDES Storm Water general permit under which you are applying for coverage. Check one of these, following:

Baseline Industrial

Baseline Construction

Multi-Sector (Group Permit)

II. Facility Operator Information

Name: U.S. ARMY CORPS OF ENGINEERS Phone: 504 865 1121

Address: P.O. BOX 60267 Status of Owner/Operator: F

City: NEW ORLEANS State: LA ZIP Code: 70160-0267

III. Facility/Site Location Information

Name: LK POINT VIC HILP HURRICANE PROT Is the facility located on Indian Lands? (Y or N)

Address: P.S. 617TH STREET, OUTFALL CANAL

City: NEW ORLEANS State: LA ZIP Code:

Latitude: 29 59 17 Longitude: 90 17 29 Quarter: Section: Township: Range:

IV. Site Activity Information

MS4 Operator Name: ORLEANS PARISH

Receiving Water Body: LAKE POINT CHARITRAIN

If you are filing as a co-permittee, enter storm water general permit number:

SIC or Designated Activity Code Primary: CIO 2nd:

Is the facility required to submit monitoring data? (1, 2, 3, or 4) 1

If You Have Another Existing NPDES Permit, Enter Permit Number:

Multi-Sector Permit Applicants Only:

Based on the instructions provided in Addendum H of the Multi-Sector permit, are species identified in Addendum H in proximity to the storm water discharges to be covered under this permit, or the areas of BMP construction to control those storm water discharges? (Y or N)

Will construction (land disturbing activities) be conducted for storm water controls? (Y or N)

Is applicant subject to and in compliance with a written historic preservation agreement? (Y or N)

V. Additional Information Required for Construction Activities Only

Project Start Date: 10/02/98 Completion Date: 09/30/98

Estimated Area to be Disturbed (in Acres):

Is the Storm Water Pollution Prevention Plan in compliance with State and/or Local sediment and erosion plans? (Y or N) Y

VI. Certification: The certification statement in Box 1 applies to all applicants. The certification statement in Box 2 applies only to facilities applying for the Multi-Sector storm water general permit.

BOX 1

ALL APPLICANTS:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BOX 2

MULTI-SECTOR STORM WATER GENERAL PERMIT APPLICANTS ONLY:

I certify under penalty of law that I have read and understand the Part I.B. eligibility requirements for coverage under the Multi-Sector storm water general permit, including those requirements relating to the protection of species identified in Addendum H.

To the best of my knowledge, the discharges covered under this permit, and construction of BMPs to control storm water run-off, are not likely to and will not likely adversely affect any species identified in Addendum H of the Multi-Sector storm water general permit or are otherwise eligible for coverage due to previous authorization under the Endangered Species Act.

To the best of my knowledge, I further certify that such discharges, and construction of BMPs to control storm water run-off, do not have an effect on properties listed or eligible for listing on the National Register of Historic Places under the National Historic Preservation Act, or are otherwise eligible for coverage due to a previous agreement under the National Historic Preservation Act.

I understand that continued coverage under the Multi-Sector general permit is contingent upon maintaining eligibility as provided for in Part I.B.

Print Name: COL WILLIAM J. CONNER

Date: 10/6/24/98

Signature: [Handwritten Signature] LTC

Instructions - EPA Form 3610-6
Notice Of Intent (NOI) For Storm Water Discharges Associated With Industrial Activity
To Be Covered Under a NPDES General Permit

Who Must File A Notice Of Intent (NOI) Form

Federal law at 40 CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under a NPDES Storm Water General Permit. If you have questions about whether you need a permit under the NPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a state agency, telephone or write to the Notice of Intent Processing Center at (703) 931-3230.

Where To File NOI Form

NOIs must be sent to the following address Storm Water Notice of Intent (4203)
401 M Street, S.W.
Washington, DC 20460

Completing The Form

You must type or print, using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on the form, call the Notice of Intent Processing Center at (703) 931-3230.

Section I Permit Selection

You must indicate the NPDES storm water general permit under which you are applying for coverage. Check one box only. The Baseline Industrial and Baseline Construction permits were issued in September 1992. The Multi-Sector Permit became effective October 1, 1995.

Section II Facility Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility:
F = Federal, S = State, M = Public (other than federal or state), P = Private.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete street address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state and either the latitude and longitude of the facility to the nearest 15 seconds or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site. Do not provide a P.O. Box number as the street address.

Indicate whether the facility is located on Indian lands.

Section IV Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g., municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water(s).

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate the monitoring status of the facility. Refer to the permit for information on monitoring requirements. Indicate the monitoring status by entering one of the following:

- 1 = Not subject to monitoring requirements under the conditions of the permit.
- 2 = Subject to monitoring requirements and required to submit data.
- 3 = Subject to monitoring requirements but not required to submit data.
- 4 = Subject to monitoring requirements but submitting certification for monitoring exclusion.

List, in descending order of significance, up to two 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section III of this application. If you are applying for coverage under the construction general permit, enter "CO" (which represents SIC codes 1500 - 1799).

For industrial activities defined in 40 CFR 122.26(b)(14)(i)-(ii) that do not have SIC codes that accurately describe the principal products produced or services provided, use the following 2-character codes:

- HZ = Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26 (b)(14)(iv)].
- LF = Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26 (b)(14)(v)].
- SE = Steam electric power generating facilities, including coal handling sites [40 CFR 122.26 (b)(14)(vi)].
- TW = Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26 (b)(14)(ix)]; or,
- CO = Construction activities [40 CFR 122.26 (b)(14)(x)].

If there is another NPDES permit presently issued for the facility or site listed in Section III, enter the permit number. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Facilities applying for coverage under the Multi-Sector storm water general permit must answer the last three questions in Section IV. Refer to Addendum H of the Multi-Sector general permit for a list of species that are either proposed or listed as threatened or endangered. "BMP" means "Best Management Practices" that are used to control storm water discharges.

Indicate whether any construction will be conducted to install or develop storm water runoff controls.

Section V Additional Information Required for Construction Activities Only

Construction activities must complete Section V in addition to Sections I through IV. Only construction activities need to complete Section V.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, permits, or storm water management plans.

Section VI Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1990 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor, or

For a municipality, state, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2138, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

NPDES
FORM



United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under a NPDES General Permit for Storm Water Discharges Associated with Industrial Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the NPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Permit Information

NPDES Storm Water General Permit Number: _____

Check Here If You are No Longer the Operator of the Facility:

Check Here If the Storm Water Discharge is Being Terminated:

II. Facility Operator Information

Name: _____ Phone: _____

Address _____

City: _____ State: _____ ZIP Code: _____

III. Facility/Site Location Information

Name _____

Address _____

City: _____ State: _____ ZIP Code: _____

Latitude: _____ Longitude: _____ Quarter: _____ Section: _____ Township: _____ Range: _____

IV Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

Print Name: _____ Date: _____

Signature: _____

Instructions for Completing Notice of Termination (NOT) Form

Who May File a Notice of Termination (NOT) Form

Permittees who are presently covered under an EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit (including the 1995 Multi-Sector Permit) for Storm Water Discharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26(b)(14), or when they are no longer the operator of the facilities

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a NPDES general permit have otherwise been eliminated. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of nrap, gabions or geotextiles) have been employed.

Where to File NOT Form

Send this form to the the following address:
Storm Water Notice of Termination (4203)
401 M Street, S.W.
Washington, DC 20460

Completing the Form

Type or print, using upper-case letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, telephone or write the Notice of Intent Processing Center at (703) 931-3230.

Instructions - EPA Form 3810-7
Notice of Termination (NOT) of Coverage Under The NPDES General Permit
for Storm Water Discharges Associated With Industrial Activity

Section I Permit Information

Enter the existing NPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, telephone or write your EPA Regional storm water contact person.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box.

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township and range (to the nearest quarter section) of the approximate center of the site.

Section IV Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor, or

For a municipality, State, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

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SECTION 01440 - CONTRACTOR QUALITY CONTROL

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SECTION 01440 - CONTRACTOR QUALITY CONTROL

PART 1 - GENERAL

1. REFERENCES. The American Society For Testing And Materials (ASTM) 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.

D 3740-94	Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
E 329-93b	Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

2. GENERAL. The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause entitled "INSPECTION OF CONSTRUCTION". The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3. QUALITY CONTROL PLAN.

3.1 General. The Contractor shall furnish for review by the Government, not later than 15 days after receipt of notice of award, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause entitled "INSPECTION OF CONSTRUCTION". The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan

will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2 Content of the CQC Plan. The CQC plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters will also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01300, "SUBMITTAL PROCEDURES".

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It

could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.3 Acceptance of Plan. Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his/her CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.4 Notification of Changes. After acceptance of the QC plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

4. COORDINATION MEETING. After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the Quality Control Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

5. QUALITY CONTROL ORGANIZATION.

5.1 General. The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

5.2 CQC System Manager. The Contractor shall identify as CQC System Manager an individual within his/her organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the

Contractor. The CQC System Manager shall be a construction person with a minimum of 3 years in related work. This CQC System Manager shall be on the site at all times during construction and will be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate will be the same as for the designated CQC System Manager.

5.3 CQC Personnel. In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: civil/structural and a submittals clerk. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.

Experience Matrix

<u>Area</u>	<u>Qualifications</u>
a. Civil/Structural	Graduate Civil/Structural Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
b. Submittals	Submittal Clerk with 1 yr experience

5.4 Additional Requirement. In addition to the above experience and education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at the New Orleans District and other Corps of Engineers districts.

5.5 Organizational Changes. The Contractor shall maintain his/her CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

6. SUBMITTALS. Submittals shall be made as specified in Section 01300, "SUBMITTAL PROCEDURES". The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

7. CONTROL. Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

7.1 Preparatory Phase. This phase shall be performed prior to beginning work on each definable feature of work and shall include:

- a. A review of each paragraph of applicable specifications.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government Quality Assurance personnel shall be notified at least 48 hours in advance of beginning the preparatory control phase. The Contractor shall submit a written agenda of the topics to be discussed at the preparatory meeting on the day prior to the meeting date. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions

shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

7.2 Initial Phase. This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels is appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

7.3 Follow-up Phase. Daily checks shall be performed to assure control activities, including control testing, are providing continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

7.4 Additional Preparatory and Initial Phases. Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

8. TESTS.

8.1 Testing Procedure. The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Depending upon the workload by the Government inspecting agency, acceptance or rejection of the Contractor proposed testing laboratory is usually done approximately 60 to 120 days after notification is received from the Contractor. The certification will be valid for two years. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, will be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an off-site or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

8.2 Testing Laboratories.

8.2.1 Capability Check. The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

8.2.2 Capability Recheck. If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$3500.00 to reimburse the Government for each

succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

8.3 Onsite Laboratory. The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

8.4 Furnishing or Transportation of Samples for Testing. Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory f.o.b., at the following address:

For all Materials Except Painting Materials and Quality Assurance Concrete Test Cylinders.

Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, Mississippi 39180-6199

For Painting Materials.

Physical address:

U.S. Army Construction
Engineering Research Laboratory
Interstate Research Park
2902 Newmark Drive
Champaign, Illinois 61821

Mailing address:

U.S. Army Construction
Engineering Research Laboratory
P.O. Box 9005
Champaign, Illinois 61826-9005

For Quality Assurance Concrete Test Cylinders. (Samples must be delivered on federal workdays between 8:00 am and 3:00 pm.)

U.S. Army Corps of Engineers
New Orleans District
Soils and Materials Processing Unit

7400 Leake Ave
New Orleans, Louisiana 70118

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office. Details on the soils and materials testing laboratory and additional instructions for delivery of the QA samples will be given at the preconstruction conference.

9. COMPLETION INSPECTION.

9.1 Pre-final inspection at the completion of all work or any increment thereof established by a completion time stated in the Special Contract Requirement clause entitled "COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph 10, and shall include the estimated date by which the deficiencies will be corrected. Once this is accomplished the Contractor shall notify the Government that the work is complete and is ready for the Government's "Prefinal" inspection. The Government will perform this inspection to verify that the work is complete. A Government "Prefinal Punch List" will be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected and so notify the Government so that a "Final" inspection with the customer can be scheduled. Any items noted on the "Final" inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

9.2 Final Acceptance Inspection. The Contractor's Quality Control Inspection personnel, his/her superintendent or other primary management person and the Contracting Officer's representative will be in attendance at this inspection. Additional Government personnel including, but not limited to, those from the New Orleans District, Lower Mississippi Valley Division, and local interest may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon notice from the Contractor. This notice will be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and must include the Contractor's assurance that all specific items previously identified to the Contractor as being acceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause entitled "INSPECTION OF CONSTRUCTION".

10. DOCUMENTATION. The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals reviewed, with contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement. These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and two(2) copies of these records in report form shall be furnished to the Government daily within 12 hours after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

11. **SAMPLE FORMS.** Sample forms for guidance in preparing the CQC Plan are enclosed at the end of this section.

12. **NOTIFICATION OF NONCOMPLIANCE.** The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

13. **PAYMENT.** Separate payment will not be made for providing and maintaining an effective quality control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

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SECTION 01620 - STORAGE AND PROTECTION

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SECTION 01620 - STORAGE AND PROTECTION

PART 1 - GENERAL

1. **STORAGE.** Contractor shall be responsible for providing off-site storage arrangements. This work shall be considered a subsidiary obligation of the Contractor. Off-site storage arrangements shall be acceptable to the Contracting Officer for all materials and equipment not incorporated into the work but included in Progress Payments. Such off-site storage arrangements shall be presented in writing, and shall afford adequate and satisfactory security and protection. Off-site storage facilities shall be accessible to the Contracting Officer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

2. **SHOP PAINTING.** All steel and iron surfaces shall be protected by suitable paint or coatings applied in the shop as specified in Section 09940. Surfaces which will be inaccessible after assembly shall be protected for the life of the equipment. Exposed surfaces shall be finished smooth, thoroughly cleaned, and filled as necessary to provide a smooth uniform base for painting. Surfaces to be painted after installation shall be shop painted with at least two coats of a primer which will adequately protect the equipment until finish coats are applied. Electric motors, speed reducers, starters, and other self-contained or enclosed components shall be shop finished with a high-grade oil-resistant enamel as long as it does not interfere with the operation of the component parts. Coatings shall be suitable for the environment where the equipment is installed.

3. **LUBRICATION.** Equipment shall be adequately lubricated by systems which require attention no more frequently than weekly during continuous operation. Lubrication systems shall not require attention during start-up or shutdown and shall not waste lubricants.

3.1 Lubricants of the type recommended by the equipment manufacturer shall be provided in sufficient quantity to fill all lubricant reservoirs and to replace all consumption during testing, start-up, and operation prior to acceptance of equipment by the Government.

3.2 Lubrication facilities shall be convenient and accessible.

4. **BOLTS.** Equipment suppliers shall furnish suitable bolts for each item of equipment. Anchor bolts, if required, together with templates or setting drawings, shall be delivered sufficiently early to permit setting the anchor bolts when the structural concrete is placed. Bolts shall comply with the requirements specified in other sections.

5. MEASUREMENT AND PAYMENT. No separate measurement will be made for providing offsite storage and maintaining adequate security and protection for those materials. Payment for designated materials stored offsite shall be in accordance with the General Provision entitled "PAYMENT FOR MATERIALS DELIVERED OFFSITE". Other materials shall be paid for per the applicable contract unit prices and lump sum prices when they are incorporated into the final contract work.

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SECTION 01730 - OPERATION AND MAINTENANCE DATA AND MANUALS

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SECTION 01730 - OPERATION AND MAINTENANCE DATA AND MANUALS

PART 1 - GENERAL

1. GENERAL. All Contractor supplied equipment shall have adequate operations and maintenance information provided for any equipment which requires maintenance or other attention. The equipment supplier shall prepare an operation and maintenance manual for each type of equipment listed on the equipment schedule as specified in Section 01300. Parts lists and operating and maintenance instructions shall be furnished for other equipment not listed in the equipment schedule.

1.1 Operation and maintenance manuals shall include the following:

- A. Equipment function, normal operating characteristics, and limiting conditions.
- B. Assembly, installation, alignment, adjustment, and checking instructions.
- C. Operating instructions for start-up, routine and normal operation, regulation and control, shutdown, and emergency conditions.
- D. Lubrication and maintenance instructions.
- E. Guide to "troubleshooting".
- F. Parts lists and current pricing information. (Also provide the predicted list of parts subject to wear.)
- G. Outline, cross section, and assembly drawings; engineering data; and wiring diagrams.
- H. Test data and performance curves, where applicable.

1.2 The operation and maintenance manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered, or which may be required by Contractor.

PART 2 - PRODUCTS

2. MANUALS. Manuals and other data shall be printed on heavy, first quality paper, 8-1/2 by 11 inch size with standard 3-hole punching. Drawings and diagrams shall be reduced to 8-1/2 by 11 inches or 11 by 17 inches. Where reduction is not practicable,

larger drawings shall be folded separately and placed in envelopes which are bound into the manuals. Each envelope shall bear suitable identification on the outside.

PART 3 - EXECUTION

3. **COPIES.** Three (3) preliminary copies of each manual, temporarily bound in heavy paper covers bearing suitable identification, shall be submitted to the Contracting Officer prior to the date of shipment of the equipment. After review by the Contracting Officer, six final copies of each operation and maintenance manual shall be prepared and delivered to the Contracting Officer no later than 30 days prior to placing the equipment in operation. Final manuals and all parts lists and information shall be assembled in substantial, permanent, three-ring or three-post binders. As much as possible, material shall be assembled and bound in the same order as specified, and each volume shall have a table of contents and suitable index tabs.

3.1 All material shall be marked with Project identification, and inapplicable information shall be marked out or deleted.

3.2 Shipment of equipment will not be considered complete until all required manuals and data have been received.

4. **MEASUREMENT AND PAYMENT.** No separate measurement and payment will be made for preparation and submission of O&M Data and Manuals as stated in this section. Payment for all costs associated therewith shall be included in the applicable contract unit prices and lump sum prices contained in the bidding schedule.

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SECTION 02070 - SELECTIVE DEMOLITION

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SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all plant, equipment, labor, and materials and to perform all operations in connection with the demolition and removal of the existing wall at discharge tube (G), existing 18" slab fronting discharge tubes (A thru F), a portion of west I-wall to get access to the site, abandoned timber piles, rip-rap and all other miscellaneous demolition as indicated on the drawings. Also included is the removal and replacement of chain link fence and gates where indicated on the drawings.

2. QUALITY CONTROL.

2.1. **General.** The Contractor shall establish and maintain quality control for demolition operations to assure compliance with contract requirements, and maintain records for his quality control for all construction operations including but not limited to the following:

(1) Establish physical layout and dimensions of the existing slabs, and other associated items that are slated for demolition and removal as indicated on the contract drawings and specified herein;

(2) equipment, including type, size and suitability for the prescribed demolition and removal;

(3) disconnection, abandoning, and/or removal of utilities;

(4) worksite inspection and demolition techniques;

(5) method and location of disposition;

(6) procedures for assuring the safety of persons and property subject to damage and injury resulting from demolition operations; provision for maintenance of access around the site of demolition work; and,

(7) compliance with all safety requirements and regulations.

2.2. **Reporting.** The original and two copies of those records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily. Format of this report shall be prescribed in Section 01440 - CONTRACTOR QUALITY CONTROL.

3. SUBMITTALS.

3.1 Demolition Plan. Prior to commencing work, the Contractor shall submit a detailed plan for demolition, removal and disposal of items designated on the drawings for such work. The plan shall provide for safe conduct of the work, protection of property which is to remain undisturbed and coordination with other work in progress. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations (See Section 01100 - General Provisions paragraph entitled, "ORDER OF WORK AND SCHEDULE"). The Contractor shall submit his plan to the Contracting Officer for approval. The plan shall include procedures to accomplish the following:

- (1) Schedule for completion of all demolition work included in the specifications and shown on the drawings;
- (2) plans for dismantling, removing, and disposing of the existing slabs and walls including procedures and methods to provide necessary supports, lateral bracing and shoring when required;
- (3) methods of storage and/or disposal;
- (4) proposals for control of environmental pollution;
- (5) safety precautions to protect personnel and property; and
- (6) all other associated work.

3.2. Records. The Contractor shall create and submit records of all pertinent information, instructions and directions received verbally or in writing from any local, State or Federal agencies. Any personnel or agencies these contacts direct the Contractor to, shall also be included in the Contractor's records. All such instructions shall be submitted to the Contracting Officer for approval prior to the Contractor complying with said instructions or directions. These records shall contain the following information received:

- (1) name of the person giving information and the agency or office represented by that person.
- (2) date the information was received.
- (3) the method of message transmittal (verbal, written, etc.).
- (4) a copy of any written information received.

(5) written notification to the Contracting Officer if the Contractor deems any instructions he receives are beyond the scope of his Contract.

(6) the information and instructions received.

3.3 Receipts. The Contractor shall submit copies of all licenses, certifications, notifications and receipts required or issued for the equipment, methods and disposal areas used for disposing of the materials removed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

4. **PROTECTION OF EXISTING WORK.** During the life of this contract, the site will not be vacated and will remain in operation. The Contractor shall perform all work required under this Contract in such a manner that surfaces not affected by removal work shall remain undisturbed and normal activities at the site may continue with the least possible interference. Prior to beginning work, the Contractor shall thoroughly familiarize himself with all details of the work and working conditions, verify all dimensions in the field, and advise the Contracting Officer of any discrepancy before performing the work. All work necessary for completion of the work specified in this section shall be in accordance with the applicable sections of this specification. The Contractor shall take all necessary precautions to insure against damage to existing equipment to be reused, or to remain property of the owner. The Contractor shall maintain safe access to the operable pumps at all times.

5. DEMOLITION AND REMOVAL.

5.1 General. Demolition and removal shall proceed in an orderly manner, from top to bottom and end to end of the structures being demolished. Demolition shall be performed in such a manner as to minimize inconvenience and hazard to the personnel in the vicinity of the demolition operations. All demolition shall be performed in accordance with Section 01100-General Provisions paragraph entitled "ORDER OF WORK AND SCHEDULE".

5.2 Wall at Discharge Tube "G". The wall at the discharge pump and all its components and foundation shall be demolished and removed.

5.2.1 West I-Wall For Equipment Access. The Contractor shall remove, from expansion joint to expansion joint, a segment of existing west I-wall capping for accessing his/her construction equipment. The Contractor shall protect existing 3-bulb rubber seal and steel sheet piling from being damaged during demolition of concrete cap and while accessing construction equipments. Upon completion of the work, the Contractor shall, if

required, pull the sheet piling to its original cutoff elevation, reinstall joint seal material and reconstruct the I-wall to its original shape and elevation.

5.3 Existing 18" slab fronting discharge tubes "A" thru "F" shall be demolished and removed.

5.4 Demolition of existing fencing where required for construction shall be removed and replaced in accordance with details shown on drawing 7-10.

5.5 All other items indicated on Drawing 2-3 including all abandoned timber pile marked for removal, steel and timber sheet piling shall be demolished and removed to facilitate the construction of the gate's structure.

5.6 Protection of Personnel.

5.6.1 Shoring and Bracing.

5.6.1.1 During the demolition work, the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in or around the demolition site. No area, section, or component of slabs, walls, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while personnel remove debris or perform other work in the immediate area.

5.6.1.2 Slabs, walls, or other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition may be allowed to remain standing without additional bracing, shoring or lateral support until demolished. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

5.7 Use of Explosives. Use of explosives will not be permitted.

6. DISPOSAL OF MATERIALS. All suitable excavated material shall be stockpiled and reused as required. All other materials resulting from demolition and removal operations shall be the property of the Contractor and shall be completely removed and disposed of offsite .

7. MEASUREMENT AND PAYMENT. No measurement will be made for the work covered under this section. Payment for selective demolition will be made at the contract lump sum price for "Selective Demolition". Price and payment shall constitute full

compensation for furnishing all plant, labor, equipment and materials, and performing the work in accordance with these specifications.

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SECTION 02101 - UTILITY MODIFICATIONS

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all plant, labor, equipment, shop drawings, and materials required to perform the operations in connection with the modification of existing utilities. The work specified herein includes providing passage of a utility line through the existing floodwall, modifying portions of an existing utility, and constructing a new drain line with drainage as specified. The Contractor shall be responsible for coordinating with the utility owner, and all work required to facilitate the passage of the utility through the sheet piling, as shown on the drawings. All work shall be inspected and approved by the Contracting Officer before covering with backfill. No elevations, slopes, or dimensions of the existing utility shall be changed unless specified on the drawings or otherwise directed by the Contracting Officer. Coordination requirements with the effected utility owners are specified in the General Provision entitled "UTILITIES AND IMPROVEMENTS" and "COORDINATION OF WORK".

2. **APPLICABLE PUBLICATIONS.** The publications listed below form a part of this specification to the extent specified herein. The publications are referred to in the text by the basic designation only.

2.1 American Society for Testing and Materials (ASTM) Standards.

A 53-84 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated,
Welded and Seamless

2.2 American Welding Society, Inc. (AWS) Publications.

D1.1-88 Structural Welding Code - Steel

2.3 American Water Works Association (AWWA) Publication.

C 900-DR18 Polyvinyl Chloride (PVC) Pipe, 12 inch and larger.

2.4 Federal Specification (Fed Spec.).

SS-S-210 Sealing Compound, Preformed Plastic, for Expansion
Joints and Pipe Joints

3. **QUALITY CONTROL.**

3.1 General. The Contractor shall establish and maintain quality control for utility modification operations to assure compliance with the contract specifications and maintain

records of his quality control for all construction operations including but not limited to the following:

(1) checking construction operations and certifying compliance with applicable sections of the specifications,

(2) checking operations including concrete work, welding, and earth work, and certifying with applicable sections of the specifications,

(3) checking materials to be used in utility modification, including plastic sealant, clamps, pipe sleeves, and casting seals and pipe sleeves attached to sheet piling. The Contractor shall certify that all materials are in compliance with applicable regulations.

3.2 Reporting. The original and two copies of these records of tests, as well as the records of corrective action taken shall be furnished to the Government daily. Format of report shall be as prescribed in Section 01440 "CONTRACTOR QUALITY CONTROL".

4. SUBMITTALS FOR APPROVAL.

4.1 Schedule. Thirty days before work is performed on any utility, the Contractor shall prepare and submit for approval of the Contracting Officer a schedule indicating the proposed date and time each utility service will be interrupted and the date and time of permanent replacement.

4.2 Shop Drawings. The Contractor shall prepare and submit for the approval of the Contracting Officer complete shop drawings showing details of the sleeves, casing seals, and couplings, and all work associated with the drain line and drainage structures.

5. QUALITY OF WORK.

5.1 All excavation and backfill adjacent to the floodwall required for modifications to existing utilities shall conform to the applicable provisions of Section 02225 "EMBANKMENT, BACKFILL AND PIPE BEDDING".

5.2 The elevations, slopes, and dimensions of the existing utilities shall not be changed unless shown on the drawings or directed by the Contracting Officer.

5.3 All work for passage of the new utility through the steel sheet piling and all piping shall conform to the applicable details shown on the drawings and applicable provisions herein. The work shall be inspected and approved by the Contracting Officer before covering with backfill.

5.4 All welding shall conform to the applicable provisions of AWWA C 206 and AWS D1.1.

PART 2 - PRODUCTS

6. PIPE SLEEVES AND ACCESSORIES.

6.1 General Contractor shall remove and redrive sheet piling and/or construct floodwall as indicated on the drawings with a new steel sleeve for passing a drain line through the existing flood wall as indicated on the drawings. Additionally, the Contractor will install drain lines, catch basins and connect a drain line into an existing box culvert within the project area of the station as shown on the drawings. Temporary bypass connections if required are the Contractor's responsibility. After all work has been inspected and approved by the Contracting Officer, the Contractor shall connect or reconnect the utility. The Contractor shall be responsible for all structural backfill and levee embankment.

6.2 Cooperation With Owners. The Contractor shall carefully plan and expeditiously prosecute his work in such manner as to cause the least interruption to services of the S&WB feeder lines. The Contractor shall coordinate the utility modifications with the utility owners so that no delay, interference or access problems occur.

6.3 Materials.

6.3.1 Steel Pipe Sleeves. Steel pipe sleeves for utility modifications shall meet the requirements of ASTM A 53, Type S, Grade B, and shall be of the shapes and sizes shown on the drawings.

6.3.2 Neoprene Rubber Sleeve and Stainless Steel Bands and Clamps. Neoprene rubber sleeves type casing seal with stainless steel bands and clamps shall be as manufactured by Pipeline Seal and Insulator Co., model "C", or approved equal.

6.3.3 Plastic Sealant. Plastic sealant shall conform to the applicable provisions of Fed. Spec. SS-S-210A.

6.3.4 Other Materials. All other materials shall conform to the applicable requirements indicated on the drawings or in other sections of the specifications.

6.4 Cutting Holes in Piling. Holes for installing pipe sleeves shall be appropriate size and shall be located in the web of the steel sheet piling. The location shall be at the elevation shown on the drawings.

6.5 Sleeves. Sleeves shall be of appropriate size and shall be constructed and installed in strict accordance with the details shown on the drawings.

6.6 Connections. All connections shall be welded and conform to the requirements of 05501-7.

6.7 Coatings. Steel pipe shall be coated in accordance with Section 09940 "Painting".

7. DRAIN LINE.

7.1 The new drain line shall be Polyvinyl Chloride (PVC) pipe manufactured in accordance with AWWA C-900 (Latest Edition) and shall be U.L. Listed. Pipe shall be furnished in standard lengths with integral bells or couplings using elastomeric gaskets conforming to AWWA C-900. Fittings shall be of cast iron conforming to ANSI A 21.10 with rubber gasketed joints conforming to ANSI A 21.11. Couplings utilized shall be Dresser Style 38 or approved equals at locations shown on the drawings.

7.2 At points of tie-in to existing structures, the Contractor shall provide a penetration via a wall sleeve as shown on the drawings for a new outfall drain line.

PART 3 - EXECUTION

8. MODIFICATIONS TO UTILITIES.

8.1 Sewerage and Water Board of New Orleans (S. & W.B.) Items.

8.1.1 The installation of the PVC pipe shall conform to the manufacturer's recommendation. The trench bottom shall be relatively smooth and free from roots, etc. The trench shall be backfilled with semicompacted fill as specified in Section 02225, paragraph 6.1 after the pipe is set and properly bedded with crushed limestone and set in accordance with that shown on the drawings for this project and specified herein in other sections.

8.1.2 Utility Structures. The installation of catch basins shall conform to the applicable requirements as shown on the drawings.

9. MEASUREMENT AND PAYMENT. Modifications to existing utilities will not be measured for payment. Payment for modifications to utilities including the work associated with the new drain line and its associated structures will be made at the contract lump sum price for "Utility Modifications". Prices and payment shall constitute full compensation for furnishing all labor, equipment, excavation, bedding, backfill, lumber and all other materials required to perform the work specified above.

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SECTION 02140 - DEWATERING

PART 1 - GENERAL

1. **SCOPE.** The work provided for herein consists of furnishing all plant, equipment, labor, and materials, and equipment and performing all operations required for designing, furnishing, installing, and operating a system to dewater the cofferdammed or excavated area, and maintaining these areas free from water during construction operations, rewatering the area under controlled conditions at the termination of the dewatering, and removing the system.

2. QUALITY CONTROL.

2.1 **General.** The Contractor shall establish and maintain quality control for all dewatering operations to assure compliance with contract requirements and maintain records of his quality control for all construction operations, including but not limited to the following:

- (1) Designing
- (2) Fabrication and workmanship.
- (3) Installation, operation, and removal.
- (4) Monitoring free water surface and piezometric elevations.
- (5) Measuring effluent from dewatering system.
- (6) Monitoring of sanding.

2.2 **Reporting.** Two (2) copies of these records and tests, as well as the corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440 - Contractor Quality Control. Reports of operation and inspection shall include the following data: piezometric elevation, canal stages, time of operation of each pump, time of operation of each wellpoint segment and/or each well, effluent discharge, sanding rates, problems encountered, proposed actions, and any other pertinent data.

3. **SUBMITTALS.** The Contractor shall submit to the Contracting Officer for information details of his proposed dewatering facilities. These details must be presented in the form of Shop Drawings, including the type of system, planned layout and sizes of wells, jet eductors and/or wellpoints, headers, including all lengths requiring burial, collectors, ditches, piezometers, sumps and pumps; number, type, location, elevation,

proposed method of installation, and proposed methods of testing of piezometers; facilities for measuring the flow of water pumped from each well and/or wellpoint segment of the dewatering system; facilities and proposed schedule for monitoring of sanding; provisions for disposal of water from the dewatering system; and plan of operation including flooding and rewatering plans. If, during the progress of the work, the installed dewatering system proves inadequate to meet the requirements specified, including piezometers, the Contractor shall, at its expense, furnish, install, and operate such additional dewatering facilities and/or make such changes, either in features of the system or the plan of operation, as may be necessary to perform the required dewatering without additional cost to the government. The Contracting Officer must be informed in writing of changes and additions prior to implementation.

3.1 All modifications to the design presented above must be designed and stamped by a Registered Professional Engineer. The Registered Professional Engineer must be present at the Contractor Quality Control preparatory and initial inspections. The contractor must, as a part of the Quality Control, furnish a signed statement by the design professional engineer stating that the installation is in conformance with the design.

4. GENERAL. All permanent work under this contract except as otherwise specified shall be carried on in areas free of water. The Contractor shall design, furnish, install, operate, and maintain such facilities necessary to accomplish the following:

(1) Collect and dispose of all surface water in the protected area regardless of source.

(2) Control and dispose of all surface water around the periphery of the excavation areas to prevent such water from entering the excavation.

(3) Lower and maintain the water table at least 3 feet below the excavation slopes and at least 3 feet below the bottom of the excavation. The water table shall not be drawn down more than 5 feet below the bottom of the excavation and excavation slopes.

(4) Install and monitor construction piezometers both inside the cofferdam or excavated area and at the limit of construction as indicated on drawing 3-1.

(5) Relieve excess hydrostatic pressures in all foundation layers above EL. -50 ft NGVD to prevent upheaval of, or any form of damage to, the foundation.

5. DEFINITIONS.

(1) Dewatering defines the lowering of the ground water below the slopes and bottom of the excavation to ensure dry, firm working conditions and the reduction to

safe levels of any hydrostatic uplift pressures in any confined foundation strata and/or aquifers which is necessary to ensure the stability and integrity of the foundation.

(2) Dewatering system defines the machinery, equipment, and appurtenances necessary for and related to the accomplishment of dewatering, and the collection and disposal of all surface water within the protected area.

(3) Flooding of the excavation is defined as the controlled process of filling the excavation with water to a specified elevation and at a specified rate.

(4) Unwatering is defined as the process of removing all water within an excavation.

(5) Rewatering is defined as the controlled process of placing water in the completed structure and/or excavation to its naturally occurring elevation at a specified rate when the construction is completed and the dewatering system is no longer required.

6. DESIGN. The dewatering system shall be designed and stamped by a Registered Professional Engineer. The dewatering system shall be designed using accepted professional methods of engineering design consistent with the best current practice.

7. DEWATERING REQUIREMENTS. The dewatering system shall be of a type and capacity to accomplish all requirements specified herein.

(1) The dewatering system shall be designed, installed, and operated to dewater the excavation for canal stages up to and including elevation 4 ft NGVD at the construction site. The dewatering system must also include standby pumping and power-supply such that a continuously operable system is available during power outages, pump failures, etc.

(2) The system shall be of such capacity that it will lower and maintain the free-water and hydrostatic pressures in the foundation and piezometric levels to an elevation at least 3 feet below all earth slopes and excavation surfaces lying within the area, inclusive of the interior slopes of the cofferdam embankments proper. The system shall have sufficient capacity to accomplish this desired result, allowing for normal variation in soil properties and foundation conditions.

(a). Piezometers shall be used to measure the effects of dewatering at the right-of-way limits.

(3) The water level shall be maintained continuously as specified above so that construction operations can be performed without interruption due to wet conditions.

(4) No upward or vertical or lateral flow of ground water into the excavated area will be permitted at any time. The dewatering system shall be designed, constructed/installed, and operated at all times, including unwatering, rewatering, and/or flooding so as to prevent movement and/or piping of the foundation, excavation slopes, and fill materials. The system shall be operated as necessary during dewatering, unwatering, flooding, and rewatering so as to maintain piezometric levels, within the dewatered area, at or beneath the elevation of the water level in the excavation.

(5) The system may consist of wells, jet eductors, wellpoints, pumps, standby pumps, sumps, sump pumps, ditches, and necessary appurtenances capable, at all canal stages less than or equal to the design stage defined in (1), of intercepting seepage before it exits on any interior surface or excavation face and of providing control of surface water. The system shall be operated as required in (3) above to prevent flooding filter materials and fresh concrete; and shall be designed to control a rainfall intensity 11 inches in 24 hours. Protection of all slopes will be required to prevent erosion under normal surface runoff and construction conditions. Slope protection may include proper drainage, mulching, vegetation, geosynthetic, etc.

(6) Unwatering of an excavation need not be accomplished by sumping alone, but may utilize sumping in addition to positive dewatering accomplished with a system meeting the requirements of (5) above. Unwatering shall at all times fulfill the requirements of (4) above.

(7) Rewatering and/or flooding of the area shall be accomplished by directing surface and ground water into the area. The dewatering system shall be kept operating at full capacity during such conditions, with dewatering effluent being directed into the excavation. Protection of slopes and excavation surfaces shall be provided as necessary to prevent erosion during flooding operations. No upward or lateral flow of ground water into the excavation will be permitted.

(8) Burying of headers will be allowed only in areas and to depths absolutely necessary for protection against damage at construction equipment crossings.

(9) Six piezometers shall be installed by the Contractor to monitor free water-surface elevations and to monitor piezometric elevations to evaluate the effectiveness of the dewatering system in fulfilling the requirements specified herein. The Contractor shall make a minimum of two readings per piezometer, per 24-hour period, a minimum of 8 hours apart, based on a 7-day week. These piezometer readings, along with corresponding canal stage readings, shall be recorded and reported to the Contracting Officer within 12 hours after they are obtained.

(10) The system shall include mechanical means, such as an in-line Venturi meter for measuring the effluent from each wellpoint segment and/or each well as well as

the total effluent of the dewatering system. Devices and techniques used in measurement shall be standard in the industry. The Contractor shall make a minimum of one reading per instrument, biweekly.

(11) The system shall be designed, installed, and operated in a manner which will preclude removal of materials from the foundation by the pumping operation (hereafter referred to as "sanding"). After installation, each well, jet eductor, or wellpoint segment shall be individually pump tested at maximum design flow rate to verify acceptability with respect to sanding. The dewatering system shall be designed and constructed/installed so as to permit periodic measuring of sanding characteristics of each well and/or wellpoint segment. Any well or wellpoint segment found sanding at a rate exceeding 1 pint per 25,000 gallons of effluent at any time during this contract shall be replaced at no additional cost to the Government.

(12) The rate of flooding the excavation shall meet the Contracting Officers requirements for operation of the pumping station, yet provide for a stable excavation. Additional provisions and requirements for emergency flooding are specified in the General Provisions entitled "EMERGENCY OPERATION OF DRAINAGE PUMPING STATION NO. 6" and "FLOODING, DAMAGES, AND EXCAVATION REQUIREMENTS".

8. INITIAL TESTING. Upon installation of the system, the Contractor shall test and evaluate the completed system to demonstrate that the system is, in fact, capable of performing the intended dewatering operation as outlined herein. This testing shall include complete falling-head tests to be conducted on each piezometer. The contractor shall give 24-hour advance notice of his intention to perform testing to the Contracting Officer. The documentation of results of the test must be provided to the Contracting Officer within 48 hours of completion.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

9. OPERATION. The Contractor will be required to perform such dewatering and to maintain the work areas in a dry condition as long as is necessary for the work under this contract. Once an area is dewatered, it shall be maintained in a dewatered condition until all work in that area is completed, unless flooding is directed by the Contracting Officer. In the event that flooding is deemed necessary by the Contracting Officer, the protected area shall be flooded in accordance with the sequence of flooding proposed by the Contractor and approved by the Contracting Officer. However, the Contractor shall not flood the protected areas without approval to do so by the Contracting Officer. If flooding is directed by the Contracting Officer, the Contractor will be compensated for damages in accordance with the General Provision entitled "DAMAGES TO WORK" and the Contract Clause entitled "Changes" as applicable. If flooding occurs because of the

Contractor's fault, negligence, or convenience, all costs resulting from such flooding will be borne by the Contractor. Commencement of dewatering subsequent to flooding shall be subject to prior approval of the Contracting Officer.

10. MAINTENANCE AND SERVICING. The Contractor shall be responsible for the maintenance, servicing, and repairs of the entire dewatering system and appurtenances during the life of the contract, including replacement of any and all wells, jet eductors, wellpoints, and piezometers performing unsatisfactorily.

11. REMOVAL. The dewatering facilities required to maintain a dry condition within the protected area shall be maintained until completion of the work within the protected area, and then shall be completely removed. However, no dewatering facilities of any kind shall be removed without prior approval of the Contracting Officer. All wells, jet eductors, wellpoints, pumps, and appurtenances employed in the dewatering system and all materials other than earth shall remain the property of the Contractor and shall be removed from the site of the work. All holes created by removal of dewatering facilities shall be plugged in accordance with LADOTD water well closure criteria. Any approvals of the implementation and/or removal plans by the Contracting Officer do not shift the responsibility for the removal of the system from the contractor to the Government. Nor does it relieve the contractor of his responsibility to provide a removal plan, which comports with industry standards and prudent construction practices.

12. MEASUREMENT AND PAYMENT. No measurement will be made for dewatering. Payment for dewatering will be made at the contract lump sum price for "Construction Dewatering". Price and payment shall constitute full compensation for furnishing all plant, labor, material, and equipment; designing, furnishing, installing, maintaining, operating, flooding, rewatering, and removing the dewatering facilities; maintaining the dewatered area; and all work incidental thereto including construction of dikes, sumps, installation of wellpoints, jet eductors, wells, pumps, piezometers, removal of wellpoints, jet eductors, wells, and piezometers, plugging holes, maintaining protection dikes and closure dams, protection of slopes and all other work which may be necessary to accomplish the specified dewatering results and which is not specified to be paid for separately. Fifty percent of the lump sum price will be paid when installation of the dewatering system has been completed, tested, evaluated, and the piezometric level of the ground water has been lowered to the limits and elevations as specified. Forty percent of the lump-sum price will be prorated on the basis of the estimated number of months that dewatering will be required and will be paid monthly. The remaining 10 percent of the lump-sum price will be paid when the dewatering system has been removed as required herein and cleanup in connection therewith has been completed.

The Contractor will be paid for the percentage of the lump sum price equal to the area dewatered for the cofferdam phase area divided by the entire area to be dewatered. The percentage calculated shall be multiplied by fifty percent for installation, as stated above;

forty percent prorated on the basis of the estimated number of months, as stated above;
and ten percent for removal, as stated above.

PIEZOMETER INSTALLATION REPORT

Project:				Levee District:				
Location (Sta.):		Offset from Centerline:		Piez. No.				
Piez. Type:		Depth of Piez:		Riser Pipe Diam:				
Piez. Tip Set In (Soil Type):		Soil Sample No:		Boring Diam:				
Method of Installation:								
Type of Protection For Piezometer:						Vent:		
Ground Elevation:		Elevation Top of Riser:		Elevation Piez. Tip:				
Filter:		From Elevation:		To Elevation:				
Seal:		From Elevation:		To Elevation:				
Installed By:			Contract No:			Foreman:		
Date of Installation:			Date of Observations:					
Method of Testing Piezometers:								
Time	Elapsed Time (minutes)	Depth To Water (feet)	Time	Elapsed Time (minutes)	Depth To Water (feet)	Time	Elapsed Time (minutes)	Depth To Water (feet)
REMARKS:								

Inspector

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SECTION 02171 - TEMPORARY RETAINING STRUCTURES

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SECTION 02171 - TEMPORARY RETAINING STRUCTURES

1. **SCOPE.** This work covered by this section shall consist of designing, furnishing, installing, maintaining and subsequently removing all temporary retaining structures (steel sheet piling for cofferdam as shown on the drawings and sheeting, shoring or bracing where required to protect existing utilities, pumping station structures and personnel). The Contractor shall be solely responsible for the design, layout, construction, maintenance and subsequent removal and disposal of all elements of the temporary retaining structures.

2. QUALITY CONTROL.

2.1 **General.** The Contractor shall establish and maintain quality control for all operations to assure compliance with contract specifications and maintain records of his/her quality control for all construction operations, including but not limited to the following:

- (1) Materials (Type, Strength, etc.).
- (2) Installation.
- (3) Interlock (Inspection and Strength).
- (4) Placing (Location, Alignment, etc.)
- (5) Driving (Hammer, Tip El., Top El.).
- (6) Cutting.
- (7) Welding.

2.2 **Reporting.** The original and two copies of these records and tests, including corrective action taken, shall be furnished to the Government daily. Format of the report shall conform to Section 01440, "CONTRACTOR QUALITY CONTROL".

3. RELATED WORK SPECIFIED ELSEWHERE.

3.1 Excavation, Section 02220.

3.2 Dewatering, Section 02140.

3.3 Steel Sheet Piling. Section 02411.

4. DESIGN CALCULATIONS.

4.1 Cantilever Cofferdam. The Cantilever Cofferdam system (PA36/18 and PA 48/18) as shown on the drawings has been designed except for incidental work. All incidental work such as walkway, butterfly gates and other similar features associated with the Cantilever Cofferdam (PA 6/18 and PA 48/18) are shown for illustration purposes only. The Contractor shall be responsible for the design of these features and its connections. The walkway shall be designed for 100 psf live load.

4.1.1 West Cantilever Cofferdam (PA 48/18). The temporary retaining structure shall have a top elevation of 4.0 NGVD. The minimum sheet pile tip elevation for the cofferdam is -56.0 NGVD.

4.1.2 East Cantilever Cofferdam (PA 36/18). The temporary retaining structure shall have a top elevation of 4.0 NGVD. The minimum sheet pile tip elevation for the cofferdam is -64.0 NGVD.

4.2 The Contractor may elect, at his/her option, to use a substitute cofferdam system, he/she shall design the cofferdam as specified herein and shall submit four (4) copies for the information of the Contracting Officer.

4.2.1 Alternative Contractor Design Cofferdam. The design shall be performed by a Registered Professional Civil Engineer. The Contractor shall follow design procedures using the wedge-type method of developing soil pressure for estimating the external forces, set forth in "Steel Sheet Piling Design Manual" excluding the Danish Rules Method published by U.S. Steel Corp. or Pile Buck Inc. or the Free Earth or Fixed Earth methods in the Virginia Tech Dept of Civil Engineering paper "An Engineering Manual for Sheet Pile Walls" dated November 1987. The design performed by the Contractor shall evaluate the overall stability and sizing of the sheet piling and other structural elements for the temporary retaining structures. The Contractor shall use and rely upon the soil borings, design shear strength and unit weight profiles contained in the accompanying plans and specifications for his/her design. The structure shall meet all the requirements of Corps of Engineers Safety Manual EM385-1-1 for fall protection and ingress and egress. The minimum sheet pile tip elevation required for cut-off of recharge of strata having excess hydrostatic water levels is -50.0 NGVD. As a minimum this tip elevation shall be provided regardless of that computed in overturning computation.

4.2.2 The cofferdam sheet pile shall be hot rolled sheet pile. The Contractor shall be required to use continuous interlocking steel sheet piles including interlocking corners. The sheet piles must be in good condition and capable of providing a tight interlocking connection, which will retard the infiltration of ground water. The Contractor shall promptly remove any sheeting, damaged or rejected by the Contracting Officer.

4.2.3 The design of the temporary retaining structure shall be performed and stamped by a Registered Professional Civil Engineer. The design of the sheet pile wall shall be developed using a method of analysis indicated in paragraph 4.2.1 above with the safety factor applied to the soil properties, such as a free earth or fixed earth method. The soil properties used shall be those presented in the figure attached at the end of this section.

(a) The safety factor used in the geotechnical design for the determination of the overturning tip elevation and moments is 1.30 in the short-term (Q) case analysis and 1.0 for the long-term (S) shear strength cases. For design of the sheet pile wall the water conditions outside the excavation must be EL 4.0 NGVD, while the water inside the cofferdam excavation is in draw down condition. The design shall also include the loading influence of any equipment, which may be operated adjacent to the cofferdam. The design shall include a live load of 100 psf for the walkway. The design shall include the installation and connection of butterfly gates.

(b) In the design of anchors and deadmen the designer must develop a minimum safety factor of 2.0 for the soil resistance against pull out.

(c) The structural design of the temporary retaining structure including braces and anchors shall be designed in accordance with the requirements stated in paragraph 4.2.1. The earth pressures for the structural design of these wall braces and anchors may be based upon a wedge-type method applying a safety factor chosen by the designer which may be as low as 1.0.

4.3 All modifications to the design presented above shall be designed and stamped by a Registered Professional Civil Engineer. The Registered Professional Civil Engineer must be present at the Contractor Quality Control preparatory and initial inspections. The contractor shall, as a part of the Quality Control, furnish a signed statement by the design Registered Professional Civil Engineer stating that the installation is in conformance with the design.

4.4 If the Contractor's construction plan, sequence and/or methods require the use of the existing pumping station structure for any purpose, he/she shall perform engineering analysis and calculations to ascertain that the purpose for which he intends to use the existing structure will not jeopardize the structural integrity of the same or any part, component, or portion thereof. Any damages, direct or indirect, caused to that property and to the property of others due to contractor's failure to comply with this requirement or negligence in calculations shall be the sole responsibility of the Contractor.

5. SUBMITTALS. Submittals shall be in accordance with Section 01300 – "SUBMITTAL PROCEDURES". No work shall proceed until the submittals are acknowledged by the Contracting Officer (CO). The Contractor shall submit, for the

information of the Contracting Officer, four (4) copies of the following:

5.1 A detailed layout of temporary earth retaining structures on standard size (28" x 40") sheets. These drawings shall clearly show:

(a) All pertinent dimensions and locations of these structures with reference to the project centerline (Wall Line, Baseline, etc.).

(b) Material grade, weight, type, length and designation of steel sheet pile section used.

(c) Bracing details.

(d) Excavation sequence and procedure.

(e) Provisions made for dewatering, indicating stage of excavation versus necessary draw down, water loading conditions, soil loads and equipment loads.

(f) Details of steel piping, walkway, connection of butterfly gates, bracing and shoring as shown on the plans.

(g) Any other items incidental or significant to this work.

5.2 The shop drawings specified in 5.1 above shall bear the stamp and signature of the Registered Professional Civil Engineer.

5.3 Equipment Descriptions. The Contractor shall submit complete descriptions and operating information of pile driving equipment to the Contracting Officer for approval 30 days prior to commencement of the cofferdam construction.

5.4 Certificates. The Contractor shall furnish the Contracting Officer manufacturer's certificates indicating piling type, dimensions, chemical composition and section properties.

6. REMOVAL OF MATERIAL.

6.1 The removal of temporary earth retaining structures will not be permitted until suitable backfill between the finished structure and the sheet pile wall of the temporary earth retaining structures is satisfactorily placed and compacted to an elevation approximately one (1) foot below the finished surface. Suitable backfill and compaction requirements shall be as defined in Section 02225 - "EMBANKMENT, BACKFILL AND PIPE BEDDING".

6.2 The removal of the temporary earth retaining structures shall be accomplished in a manner not injurious to the properties adjacent to and in the proximity of the project excavations.

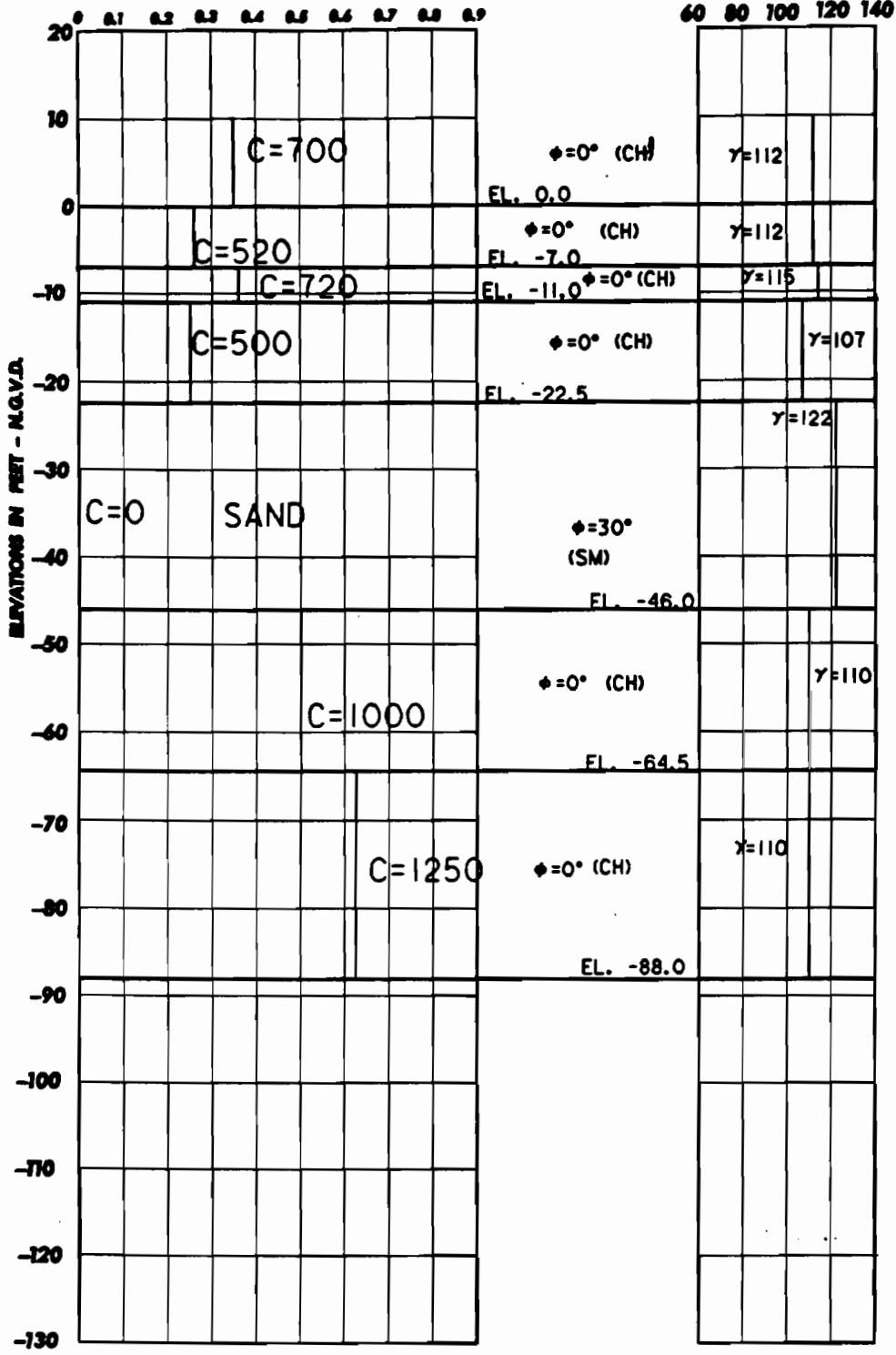
6.3 If steel sheeting is left in place, the upper part of the sheeting shall be cut off and removed three (3) feet below the finished grade and the inside of pipe backfilled in accordance with Section 02411 - "STEEL SHEET PILING". All bracing above this level shall also be removed. Lower bracing shall be left in place.

6.4 Wood sheeting, where applicable, shall be left in place except the upper part of the sheeting shall be cut off and removed three (3) below the finished ground surface after backfilling. All bracing above this level shall also be removed. Lower bracing shall be left in place.

7. MEASUREMENT AND PAYMENT. No separate measurement will be made for the work covered and specified in this section. Unless specified otherwise, payment for the work covered in this section shall be included in the contract unit or lump sum prices for the items to which the work considered to be incidental. Payment for the installation of the east and west cofferdams shall be made under the contract lump sum prices for "Cofferdam (East Monolith)" and "Cofferdam (West Monolith)" respectively. Price and payment shall constitute full compensation for furnishing all plant, labor, equipment and material, and performing all operations necessary including the Contractor's furnished optional design of the cofferdam.

⊙ SHEAR STRENGTH
TONS /SQ.FT.

WET DENSITY
POUNDS /CU.FT.



S-CASE
SHEAR STRENGTHS
(CH) $\phi=23^\circ$ C=0
(SM) $\phi=30^\circ$ C=0

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

17TH ST. OUTFALL CANAL
SOIL DESIGN PARAMETERS
PUMPING STA NO. 6



U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

02171-6

DESIGNED BY: VOJKOVICH	PLOT SCALE: 20:1	PLOT DATE: JUN 98	CARD FILE SHEET: FILE NO. H-2-405
DRAWN BY: WOODS	CHECKED BY: RICHARDSON	DATE: JUN 98	

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SECTION 02210 - CLEARING AND GRUBBING

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SECTION 02210 - CLEARING AND GRUBBING

1. SCOPE. The work covered by this section consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for the clearing and grubbing of the areas specified herein or indicated on the drawings, for the removal and disposal of all cleared and grubbed materials, and for the filling of all holes caused by grubbing operations, as specified herein.

2. QUALITY CONTROL. The Contractor shall establish and maintain quality control for clearing and grubbing operations to assure compliance with contract requirements, and maintain records of his quality control for all construction operations including but not limited to the following:

(1) Clearing. Limits, transverse clearing limits percentage of area complete; type of material.

(2) Grubbing. Limits, transverse grubbing limits percentage of area complete; type of material.

(3) Disposition of Cleared and Grubbed Materials. Method and location of disposition; damage to timber or improvements which are not to be cleared.

2.1 The original and two copies of these records of inspections and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

3. GENERAL REQUIREMENTS. All clearing and grubbing work for embankments shall be completed in advance of embankment construction. In locations where work on drainage structures is performed prior to embankment construction, all clearing and grubbing shall be completed in advance of the structure and for at least 10-feet on each side of the structure, within the limits of construction. If regrowth of vegetation or trees occurs after clearing and grubbing and before placement of fill, the Contractor will be required to clear and grub the area again prior to embankment construction, and no payment will be made for this additional clearing and grubbing.

4. CLEARING.

4.1 General. Clearing, unless otherwise specified, shall consist of the complete removal above the ground surface of all trees, stumps, down timber snags, brush, vegetation, loose stone, abandoned structures, fencing and similar debris. Growth

standing in water in areas which are not drained in accordance with 02225 may be cut off so as not to protrude more than 12-inches above the existing water surface.

4.2 Vegetation. Vegetation to be removed shall consist of crops, grass, bushes, and weeds. Close-growing grass and other vegetation shall be removed from areas to receive semicompacted or road fill to provide a complete bare earth surface immediately prior to foundation preparation. Removal of vegetation from the side of existing levees shall be limited to 100-feet in advance of embankment placement. Acceptance of the vegetation removal operation shall precede the initiation of foundation preparation in the area from which vegetation has been removed.

4.3 Miscellaneous Debris. The Contractor shall also remove all debris, and other materials which remains after buildings or other structures have been removed.

4.4 Areas to be Cleared.

4.4.1 General. The entire area to be occupied by the embankment, together with strips 5-feet wide contiguous thereto, above ground structures, and riprap within the right-of-way shall be cleared.

5. GRUBBING.

5.1 General. Grubbing shall consist of the removal of all stumps, roots, buried logs, pipes, drains, and other unsuitable matter as described in 02225.

5.2 Areas to be Grubbed. Grubbing shall be performed within the limits of the embankment and all structures together with the 5-foot strips contiguous thereto. All roots and other projections over 1½-inches in diameter shall be removed to a depth of 3-feet below the natural surface of the ground or surface of existing embankments and to a depth of 3-feet below the subgrade for the foundation of structures. The areas to be grubbed are those specific areas within the limits specified herein above from which trees, stumps, down timber, snags, and other projections have been removed. In the event the areas specified in 02225 are not drained, and growth and projections standing in water are cut off as permitted in paragraph 4.1, grubbing within such areas will not be required.

5.3 Filling of Holes. All holes caused by grubbing operations and removal of pipes and drains, excluding holes in channels and ditches, shall be backfilled with suitable material in 12-inch layers to the elevation of the adjacent ground surface, and each layer compacted to a density at least equal to that of the adjoining undisturbed material. Suitable material should be as defined in Section 02225.

6. DISPOSAL OF CLEARED MATERIAL, CONSTRUCTION/DEMOLITION DEBRIS AND OTHER WASTES.

6.1 General. All debris resulting from clearing and grubbing operations shall, be removed from the site. The Contractor shall make a reasonable effort to channel merchantable material into the commercial market to make beneficial use of materials resulting from clearing and grubbing operations. All waste generated on-site by the Contractor must be promptly identified and waste determinations made within 30 days of generation. Contractor must identify whether a waste is subject to regulation as hazardous waste, toxic substance, used oil or other regulated waste. No regulated wastes shall be allowed to accumulate on-site for more than 90 days. If the Contractor discovers or comes into contact with any hazardous chemicals or other materials other than those addressed in this specification, the Contractor shall immediately notify the Contracting Officer, and the Contracting Officer will make a determination as to the course of action. The Contractor shall provide the Contracting Officer copies of waste identification/determination, manifests and disposal certificates of wastes generated by work performed under this contract. This information shall be kept on file for a period of at least 3 years.

6.2 Removal from Site of Work. The Contractor shall comply with all applicable Federal, State, and Local laws. The Contractor shall, at his option, either retain for his own use or dispose of by sale or otherwise, such materials of value. The Government is not responsible for the protection and safekeeping of any materials retained by the Contractor. Such materials shall be removed from the site of the work before the date of completion of the work. If debris from clearing operations is placed on adjacent property, the Contractor shall obtain, without cost to the Government, additional right-of-way for such purposes. Such material shall be so placed as not to interfere with roads, drainage or other improvements and in such a manner as to eliminate the possibility of its entering into channels, ditches, or streams. The Contractor shall submit written evidence to the Contracting Officer that he has obtained from the property owner permission for disposal of material on the owner's property. The written evidence shall consist of an authenticated copy of the conveyance under which the Contractor acquired the property rights and access thereto, prepared and executed in accordance with the laws of the State of Louisiana. If temporary rights are obtained by the Contractor, then the period of time shall coincide with the Special Contract Requirement entitled "COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, plus any extension authorized under Contract Clause entitled DEFAULT (Fixed-Price Construction), subparagraph (b) (1). However, delay resulting from acquisition of additional rights-of-way for disposal areas will not qualify as excusable delays.

7. MEASUREMENT AND PAYMENT. No measurement will be made for clearing, grubbing, and vegetation removal. Payment for clearing, grubbing, and vegetation removal will be made at the contract lump sum price for "Clearing and Grubbing". Price and payment shall constitute full compensation for furnishing all plant, labor, material and

equipment and performing all operations necessary for clearing, grubbing, and vegetation removal of the areas specified herein or indicated on the drawings, for removing and disposing of all cleared, grubbed, and vegetation removal materials, and for filling holes resulting from grubbing operations, and placing embankment to replace earthen material removed as a result of vegetation removal operations

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SECTION 02220 - EXCAVATION

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SECTION 02220 - EXCAVATION

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all plant, labor, materials and equipment, and performing all operations necessary for designing, installing, and removing the braced excavation, structural excavation, other excavation and all excavation incidental to the construction of the project as specified herein or as shown on the drawings.

2. **QUALITY CONTROL.** The Contractor shall establish and maintain quality control for excavation operations to assure compliance with contract specifications and maintain records of his quality control for all construction operations including but not limited to the following:

(1) Layout of work and surveys consisting of type and location.

(2) Excavation. Check grade and slope for compliance with design sections; visual classification of material; disposition of excavated material.

(3) Compliance Surveys. Compliance surveys will be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed and the actual excavation completed. The Contractor shall perform, plot and submit compliance cross section surveys at a minimum of 100 foot intervals over each phase of construction at locations determined by the Contracting Officer. The Contractor shall furnish the Contracting Officer plotted cross-sections and original field notes. The cross-sections shall be plotted by the Contractor on a minimum scale of 1 inch equals 10 feet horizontally and 1 inch equals 5 feet vertically.

2.2 Reporting. The original and two copies of these records of inspection and test, as well as the records of corrective action taken shall be furnished the Government daily. The format of this report shall be as prescribed in Section 01440, "Contractor Quality Control".

3. EXCAVATION.

3.1 General. Excavation consists of the removal and placement in the ultimate designated position of all materials of whatever nature encountered. Excavation shall be performed to the lines, grades and sections indicated on the drawings or as otherwise required. The Contractor shall submit an excavation plan, in writing, for review by the Contracting Officer, allowing a minimum of 30 days for review, and shall not begin excavation until the Contracting Officer's approval has been received. Excavation may be

performed by any approved method which will accomplish the desired results. Intermediate slopes shall be no steeper than the final specified slopes in the area.

3.1.1 Safety Requirements. The methods and operation outlined in the excavation plan shall comply with all local codes and laws, and authorities having jurisdiction. The Contractor shall submit his proposed method of construction which shall include the methods for excavating, protection of existing utilities, sheeting, shoring and bracing, and backfilling which he plans on using to perform the work included in the contract documents. The plan shall include but not be limited to:

- a. Type of major excavation equipment and type of equipment and method of driving sheeting.
- b. Sheeting, shoring and bracing plan.
- c. Hauling equipment, and proposed excavation quantities.
- d. Proposed haul routes of excavation and material supply equipment if required.
- e. Handling and storage of materials on site.
- f. Provisions for compliance with permits and regulations.

The Contractor shall include in his plan a section describing aspects of the project where a modification of the proposed plan will occur due to field conditions. This shall include a detailed explanation of the methods of construction which he plans to use in specific areas or as required by the Contracting Officer.

The Contractor shall revise his plan when the Contractor's construction operation being used on the project changes materially from the original submittal or as required by the Contracting Officer.

3.2 Cofferdam Excavation. The Contractor shall make all excavations for the construction of the east and west monoliths as shown on the drawings and stated in the specifications. The Contractor shall provide all plants, labor, material, and equipment and perform all operations required for furnishing, installing, and operating a system to dewater the braced excavation, in accordance with Section 02140. The Contractor shall submit to the Contracting Officer for review, complete construction details for the braced excavation. Work shall not begin until the Contractor has received required approvals.

3.3 Channel Excavation. Channel excavation is that excavation and fine grading outside the limits of the cofferdam excavation and within the limits of the canal. Channel

excavation shall consist of the excavation of material to the lines, grades, and sections indicated on the drawings within the tolerances specified in paragraph 5 and the disposal of excavated material in accordance with paragraph 4.5.2.

3.4 Utility Excavation. All utility excavations shall be to the limits as shown on the drawings.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

4. EXCAVATION REQUIREMENTS.

4.1 Reserved.

4.2 Slides. Should sliding occur in any excavated section either during its construction or after its completion, but prior to acceptance, the Contractor shall remove such portions of the slide as the Contracting Officer may direct. In the event the slide is caused through fault or negligence of the Contractor, the slide shall be removed by the Contractor at his expense. In the event the slide is not due to the fault or negligence of the Contractor, payment for removal will be made by an equitable adjustment under the Contract Clause entitled "CHANGES".

4.3 Shoaling. In the event shoaling occurs in any part of the excavation after completion but prior to acceptance of the job as a whole, the Contractor shall remove such portions of the shoal material as the Contracting Officer may direct. Removal of shoal material will be made by an equitable adjustment under the Contract Clause entitled "CHANGES". The Contractor shall supply sufficient plant to be made available on a timely basis for the purpose of shoal removal.

4.4 Working in the Vicinity of Structures. The Contractor shall exercise caution when excavating in the vicinity of existing structure. In particular, extreme care shall be exercised in the vicinity of the discharge tubes. Any damage resulting from excessive or improper excavation in the bottom or side of the discharge tubes, or by any fault of the Contractor will be the responsibility of the Contractor, and repair of such damage will be made by the Contractor at no cost to the Government.

4.5 Disposition of Excavated Materials.

4.5.1 Suitable Materials. Excavated materials which are suitable for incorporation in the backfill or fill shall either be placed directly therein, or temporarily stockpiled (at no additional cost to the Government) in an area as shown on the plans. A separate approved area shall be those areas designated as Contractors staging areas noted on plans or other

locations approved by the Contracting Officer. Excess suitable material shall be disposed of as specified in paragraph 4.5.2 below.

4.5.2 Unsuitable and/or Excess Suitable Materials. Materials from required excavation which, as defined in 02225-5.2 are unsuitable for backfill or fill materials and/or excess suitable material, shall become the property of the Contractor and shall be removed from the site for disposal at no cost to the Government.

5. TOLERANCES.

5.1 The structural foundations and stone protection foundations shall be excavated to the lines, grades and sections indicated on the drawings, except as otherwise provided herein. All foundations shall be on solid undisturbed or properly compacted material. The bottom and side slopes of excavation shall be accurately finished to within the following tolerances:

5.1.1 For surface on which concrete will be placed the allowable vertical tolerance is 1/10 of a foot above and below the theoretical line and grade. Neither extreme of such tolerance may be continuous over an area greater than 200 square feet and abrupt changes from one extreme to the other will not be permitted.

5.1.2 For surfaces on which stone protection will be placed the allowable vertical tolerances is ± 3 inches(0.25 ft.). Except that neither extreme of such tolerance may be continuous over an area greater than 200 square feet and abrupt changes from one extreme to the other will not be permitted.

5.1.3 For all other areas, a vertical tolerance of 6 inches (0.5 ft.) above the specified grade and 6 inches(0.5 ft.) below the grade will be permitted. Except that neither extreme of such tolerance may be continuous over an area greater than 200 square feet and abrupt changes from one extreme to the other will not be permitted. The horizontal tolerance will be plus or minus 6 inches(0.5 ft.).

5.2 Over-excavated Surfaces. Over-excavation shall be corrected at no additional cost to the Government in the following manner:

5.2.1 For over-excavation of surfaces on which concrete will be placed, the over-excavation shall be filled with stabilization concrete.

5.2.2 Over-excavation not covered above shall be backfilled with approved selected materials, placed in layers not more than 6 inches in thickness prior to compaction, moistened or dried if necessary, and each layer compacted by tamping or rolling to a density at least equal to that of the adjacent undisturbed material.

5.3 Removal and Replacement of Unsuitable Materials. If at any point in the excavation the foundation material is found to be unsuitable, it shall be removed as directed by the Contracting Officer and replaced with suitable materials and compacted as specified by the Contracting Officer. Payment will be made by an equitable adjustment under the Contract Clause entitled "CHANGES".

6. MEASUREMENT.

6.1 General. No separate measurement will be made for excavation of any structure or utilities being relocated, installed or connected to. No separate measurement will be made for utility excavations, these items shall be included with the appropriate associated work item.

6.2 Cofferdam Excavation: Cofferdam excavation will not be measured for payment.

6.3 Channel Excavation. Channel excavation will not be measured for payment.

7. PAYMENT.

7.1 Cofferdam Excavation. Payment for cofferdam excavation and all costs in connection therewith shall be made at the applicable contract lump sum price for "Cofferdam Excavation (East Monolith)", or "Cofferdam Excavation (West Monolith)". Price and payment shall constitute full compensation for furnishing all plant, labor, equipment and materials for installation of sheeting, wales, anchors, tiebacks, bracing, struts, excavating, fine grading, disposal of materials, fill and/or all other materials and operations incidental thereto, including removal of all materials.

7.2 Channel Excavation. Payment for channel excavation will be made at the contract lump sum price for "Channel Excavation". Price and payment shall constitute full compensation for furnishing all plant, labor, material, and equipment for excavating and fine grading, transporting, and dumping the material at its ultimate designated position.

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SECTION 02225 - EMBANKMENT, BACKFILL AND PIPE BEDDING

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SECTION 02225 - EMBANKMENT, BACKFILL AND PIPE BEDDING

1. **SCOPE.** The work covered by this section consists of furnishing all plant, labor, equipment, and materials, except as otherwise specified in Section 02220, "EXCAVATION", and other incidental earthwork as may be necessary to complete the embankments, fills, backfills, and pipe bedding as shown on the drawings, and as hereinafter specified.

2. **QUALITY CONTROL.** The Contractor shall establish and maintain quality control for embankment construction operations to assure compliance with contract requirements, and maintain records of his quality control for all construction operations including but not limited to the following:

(1) **Equipment.** Type, size, and suitability for construction of the prescribed work.

(2) **Foundation Preparation.** Breaking surface in advance of embankment construction, and during fill placement when necessary, drainage of foundation and partially completed fill.

(3) **Materials.** Suitability of materials for use in backfill and embankment.

(4) **Construction.** Layout, maintaining existing drainage, moisture control, thickness of layers, spreading and compacting.

(5) **Grade and Cross Section.** Crown width, crown slope, side slopes, and grades.

(6) **Roads and Ramps.** Location and placement of fills for ramps in accordance with specified dimensions and grades.

(7) **Grade Tolerances.** Check fills to determine if placement conforms to prescribed grade and cross section.

(8) **Slides.** Location and limits; methods and equipment used where remedial work has been directed.

(9) **Control Testing.**

a. **Contractor Testing.** The Contractor shall perform all control testing such as soil classification, moisture content, control compaction curves, and

in-place density. The Contractor shall perform as a minimum, the specified number of each of the tests to demonstrate to the satisfaction of the Contracting Officer that the specifications are in compliance. Testing shall be performed by a Government approved testing agency or organization. Criteria used for obtaining Government approval shall be in accordance with ASTM D 3740. Tests performed shall be pursued in such a manner that the results are obtained and furnished to the Government within 24 hours. No additional payment will be made for control testing required in this paragraph. All cost in connection therewith shall be included in the appropriate item for the type of material used except as noted. The following tests are required to provide adequate control:

b. Soil Classification Tests. Determination of soil classification shall be in accordance with the Unified Soil Classification System. Atterberg Limits Test required for soil classification shall be performed in accordance with ASTM D 2487 and ASTM D 4318. One Atterberg test shall be obtained from the sample material used for each control compaction curve.

c. Control Compaction Curves - Compacted Fills. Control compaction curves shall be established in accordance with ASTM D 698. Two control compaction curves will be required for each type of random material from each source. Where construction operations result in blending of several types of material prior to or during fill placement within the embankment design sections, two control compaction curves will be required for each resulting blend of material and will be utilized in lieu of those required for the "unblended materials". The average of the two tests shall be the controlling optimum moisture content and maximum density, subject to verification by the Contracting Officer as specified herein.

d. In-Place Density Tests. In-place density tests for semicompacted fill material shall be made in accordance with ASTM D 2922 (Nuclear Method) or ASTM D 1556 (Sand Cone Method), and shall be made at a minimum frequency of one density test per lift or 100 cubic yards of semicompacted or compacted fill placed in section. The location of the test shall be representative of the area being tested or as directed by the Contracting Officer. Density tests performed in accordance with ASTM D 2922 (Nuclear Method) shall be verified by in place density test results obtained from ASTM D 1556 (Sand Cone Method). One verification test will be required for every ten nuclear density tests performed. The nuclear test and the verification test shall be conducted concurrently at the same site and on the same material. Density test for bedding material shall be in accordance with ASTM D698 and shall be made at a minimum frequency of one density per lift or 100 cubic yards.

e. Moisture Content Tests. Moisture content tests at each density test location shall be taken to assure compliance with requirements for fill placement within the design sections as specified in paragraph 6.1. Determination of moisture content shall be performed in accordance with ASTM D 2216.

f. In addition to the above frequency of tests, additional tests are required as follows:

(a.) Where the Contracting Officer's representative has reason to doubt the adequacy of the compaction or moisture control.

(b.) Where the Contractor is concentrating fill operations over a relatively small area.

(c.) Where special compaction procedures are being used.

(d.) When embankment materials change substantially, the Contracting Officer may direct additional testing.

(e.) Areas not meeting the specified density shall be retested at no additional cost to the Government, after corrective measures have been applied.

2.1 Government Testing. As a control, the Government will perform assurance and check tests for maximum density for all materials in accordance with ASTM D 698. If values for maximum density as determined by the Contractor and as determined by the Government do not agree, the Government will determine the values to be used. The Government will also perform check and assurance testing of the other control testing required by the Contractor as specified herein.

2.2 Reporting. The original and two copies of these records of inspections and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

2.3 Applicable Publications. The following publications, referred to before and thereafter by the basic designation only, form a part of this specification to the extent indicated by the references thereto:

2.3.1 American Society for Testing and Materials (ASTM) Standard.

D 698-91	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using a 5.5 lb.Rammer and a 12-inch Drop
D 1556-90	Density of Soil in Place by the Sand-Cone Method
D 2216-90	Laboratory Determination of Water, (Moisture) Content of Soil-Aggregate Mixtures

D 2922-91	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
D 3740-94a	Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction
ASTM D 4253-91	Standard Test Method for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D 4254-91	Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
D 2487-93	Classification of Soils for Engineering Purposes
D 4318-93	Liquid Limit, Plastic Limit, and Plasticity Index of Soils

2.3.2 Louisiana Standard Specifications for Roads and Bridges (1992 Edition)

3. EQUIPMENT.

3.1 Miscellaneous Equipment. Scarifiers, disks, spring-tooth or spike-tooth harrows, spreaders, power tampers, and other equipment shall be types suitable for construction of embankment and backfill.

3.2 Sprinkling Equipment. Sprinkling equipment shall be designed to apply water uniformly and in controlled quantities to variable widths of surface.

4. EMBANKMENT, BACKFILL AND PIPE BEDDING FOUNDATION PREPARATION.

4.1 After clearing and grubbing and any required excavation of the embankment foundation test pits and other similar cavities and depressions shall be broken down, where so directed, to flatten out the slopes. The entire earth surface on or against which fill is to be placed, except areas covered with water and not drained as specified, shall be thoroughly broken to a depth of 6 inches. Areas on which geotextiles are to be placed shall be dressed, to provide a smooth surface within the allowable tolerance, and left unbroken. If for any cause, this broken surface becomes compacted in such a manner that, in the opinion of the Contracting Officer, a plane of seepage or weakness might be induced, it shall again be adequately scarified before depositing material thereon.

4.2 Drainage. The foundation receiving fill and all partially completed fill shall be kept thoroughly drained except for areas outside of cofferdam limits and within the channel is not required.

4.3 Frozen Ground. No fill shall be placed upon frozen ground.

5. EMBANKMENT, BACKFILL AND PIPE BEDDING MATERIALS.

5.1 General. The embankment and backfill material except nonplastic embankment materials shall be semicompacted fill material obtained from suitable material available on-site. The available on-site borrow areas include, the existing outflow channel and other required excavations as prescribed in SECTION 02220 - EXCAVATION. These areas are available only to the excavation limits extent shown on the drawings or specified. Bedding materials are not available on site and shall be obtained by the Contractor from off site sources. The embankment and backfill shall be constructed of earth that is free from unsuitable and frozen materials as defined in paragraphs 5.2 and 5.3.

5.2 Unsuitable Materials. Materials which are classified as unsuitable for embankment or backfill material are defined as masses of organic matter, sticks, branches, roots, and other debris. As earth from the designated borrow areas may contain excessive amounts of wood, isolated pieces of wood will not be considered objectionable in the embankment provided their length does not exceed 1 foot, their cross-sectional area is less than 4 square inches, and they are distributed throughout the fill. Not more than 1 percent by volume of objectionable material shall be contained in the earth material placed in each cubic yard of the levee or around the structure. Pockets and/or zones of wood shall not be placed in the embankment.

5.3 Frozen Materials. Under no circumstances shall frozen earth, snow, or ice be placed in an embankment or used as backfill. The Contracting Officer may require the wasting of frozen material in order that construction may proceed, and such material wasted, if directed by written order of the Contracting Officer, will be paid as specified in Section 02220.

5.4 Bedding Material for Pipe. Material shall be limestone and from a source approved by the Contracting Officer. Graded aggregate for 16 inch or less pipes shall be No. 67. Graded aggregate for 18 inch or greater pipes shall be No. 57.

The limestone shall meet the following gradations when tested in accordance with DOTD TR 113:

U. S. Sieve Number	Grade No. 57 Percent	Grade No. 67 Percent
1 1/2"	100	—
1"	95 - 100	100
3/4"	—	90 - 100
1/2"	25 - 60	—
3/8"	—	20 - 55
#4	0 - 10	0 - 10
#8	0 - 5	0 - 5

The limestone shall have an absorption rate of not more than 1.5 percent and an abrasion loss of not more than 30 percent when tested in accordance with test method AASHTO T96.

6. EMBANKMENT, BACKFILL AND PIPE BEDDING CONSTRUCTION.

6.1 Semicompacted Fill.

6.1.1 General. Semicompacted fill shall not be placed in water. The materials for semicompacted fill shall be placed or spread in layers, the first layer not more than 6 inches in thickness and the succeeding layers not more than 12 inches in thickness prior to compaction.

6.1.2 Moisture Control. The Contractor shall control the moisture content of the embankment and backfill material. The optimum moisture content shall be determined in accordance with paragraph 2.3(1). The Contractor shall perform the necessary work in moisture control to bring the embankment material within the moisture content range specified in paragraph 6.1.3. If the backfill material is too wet, it shall either be stockpiled and allowed to drain and/or the wet material shall be processed by disking and harrowing, if necessary, until the moisture content is reduced sufficiently. If the material is too dry, it shall either be prewet or sufficient moisture shall be uniformly distributed in each layer before compacting. If the top or contact surfaces of a partial fill section becomes too dry to permit suitable bond between these surfaces and the additional fill be placed thereon, the Contractor shall loosen the dried materials by scarifying, disking, or other approved

methods, and shall recompact this layer in accordance with the applicable requirements of paragraph 6.1.3. If the top or contact surfaces of a partial fill section becomes too wet to permit suitable bond between these surfaces and the additional backfill to be placed thereon, the wet material shall be scarified and permitted to dry, assisted by disking or harrowing. The material shall be recompact in accordance with the applicable requirements of paragraph 6.1.3. No additional payment will be made for any moisture control required in this paragraph.

6.1.3 Compaction. The first and each successive layer of semicompacted fill material shall be compacted to at least 90 percent of maximum dry density as determined by ASTM D 698, at a moisture content within the limits of plus 5 to minus 3 percent of optimum.

6.2 Bedding Material for Pipe. A minimum layer of (9") bedding, as shown on the Drawings, shall be placed as a foundation for the concrete base slab and footings not pile supported. When the base foundation is in clay or organic soils, twice the above thickness of bedding shall be provided, unless otherwise directed by the Contracting Officer. Bedding material compaction shall consist of the placement of bedding in lifts not exceeding 18 inches and compacted by a drum roller or plate vibrating compactor. This mechanical compactor must make a minimum of two passes over every area of the bedding. Compacted bedding shall be enclosed in a filter fabric in areas that require a granular material backfill, i.e. under roads, sidewalks, or other structural items. Compact all bedding material to 95 percent ASTM D698.

6.3 Dressing. The entire embankment including topsoil where specified, shall be brought to not less than the prescribed design section, within allowable tolerance, at all points. Unreasonable roughness of the surface shall be dressed out to permit fertilizing and seeding operations.

7. ACCESS ROADS, RAMPS AND CROSSINGS.

7.1 Access Roads.

7.1.1 Access roads shall be located and constructed as approved by the Contracting Officer. They shall be designed to maintain the intended traffic, to be free draining and shall be constructed by the placement of fill as specified in paragraph 6.1 and shall be maintained in good condition throughout the contract period and restored to pre-construction conditions upon completion of the project. In addition to all Contract Clauses, the Contractor shall take note of the Contract Clauses entitled "PERMITS AND RESPONSIBILITIES" and "OPERATIONS AND STORAGE AREAS" in the performance of the work required herein. The Contractor should also be aware that truck routes and truck speed limits are subject to change and he should check with the appropriate state and/or

parish officials for the applicable regulations in performance of this construction work. In addition to the requirements stated above, the Contractor shall furnish and use equipment (i.e., front-end loaders and street sweepers) as necessary to continuously keep any public street used free and clean of mud and other debris resulting from his hauling operations. This is necessary to insure safe operation of all vehicles using public streets. No separate payment will be made for this work.

7.1.2 The Contractor shall water down the access roads which are within the construction easement area as necessary to keep dust from being wind blown or drifting into the adjacent subdivision.

8. GRADE TOLERANCES. All embankments shall be constructed to the design grade and cross sections shown on the drawings. For semicompacted fill, at all points, a tolerance of 3/10 of 1 foot above or below the prescribed design grade and cross section shown will be permitted in the final dressing provided that the area drains, there are no abrupt humps or depressions in surfaces or bulges in the width of crown the side slopes are uniform. Any partial fill or temporarily stockpiled material placed within the design section shall not exceed the design grade or design slopes of the embankment by more than 3/10 of 1 foot and shall have side slopes not steeper than that shown on the drawings.

9. SLIDES. Should a slide occur in any part of the embankment during its construction, or after its completion, but prior to its acceptance, the Contractor shall, upon written order of the Contracting Officer, either cut out and remove the slide from the embankment and then rebuild that portion of the embankment, or construct a stability berm of such dimension, and placed in such manner, as the Contracting Officer shall prescribe. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed at no additional cost to the Government. In case the slide is not the fault of the Contractor, the repair shall be made by an equitable adjustment under the "CHANGES" clause of the contract. The method of slide correction will be determined by the Contracting Officer.

10. MEASUREMENT AND PAYMENT. Semicompacted fill, pipe bedding and any other required incidental embankment will not be measured for payment. Payment for all semicompacted fill, bedding and fill placed as required in embankments will be made at the contract lump sum price for "Embankment". Additionally, no payment for semicompacted fill placed as required to construct the monoliths will be made. Price and payment shall constitute full compensation for furnishing all plant, labor, equipment and material and performing all operations necessary including compacting the material and moisture control. There will be no separate payment for pipe bedding, timber planking, sheeting and shoring or any other item required for this work as the cost for this shall be included in the contract lump sum price for "Utility Modifications".

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SECTION 02245 - SEPARATOR GEOTEXTILE FOR UTILITY
LINES AND UTILITY STRUCTURES

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SECTION 02245 - SEPARATOR GEOTEXTILE FOR
UTILITY LINES AND UTILITY STRUCTURES

1. SCOPE. The work provided for herein consists of furnishing all plant, labor, material, equipment and performing all operations required for furnishing, hauling, and placing the separator geotextiles, complete, as specified herein and on the contract drawings, and maintaining the geotextile until placement of backfill is compacted and accepted.

2. APPLICABLE PUBLICATIONS. The current issues of the American Society for Testing and Materials (ASTM) publications listed below, but referred to thereafter by basic designation only, form a part of this Specification to the extent indicated by the references thereto:

D 883-93	Standard Terminology Relating to Plastics
D 1683-90a	Failure In Seams Of Woven Fabrics
D 4439-92a	Standard Terminology for Geosynthetics
D 4491-92	Water Permeability of Geotextiles By Permittivity
D 4632-91	Grab Breaking Load and Elongation of Geotextiles
D 4751-93	Determining Apparent Opening Size of a Geotextile

3. GEOTEXTILE REQUIREMENTS.

3.1 Geotextile. The geotextile shall be a woven pervious sheet made with plastic yarn as defined by ASTM D 883. The geotextile shall meet the physical requirements listed in Table No. 1. The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, amide, or vinylidene-chloride, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultra-violet exposure. The Contractor shall use a geotextile that is chemically compatible with the material that will be placed on or in the vicinity of the geotextile. Leachate from the material shall not deteriorate the geotextile. The edges of the geotextile shall be selvaged.

3.2 Seams and Laps. Seams or laps may be utilized to produce panels of geotextile large enough to cover the area required. Seams or laps shall be perpendicular to the centerline of the structure or utility. Seams or laps shall not run parallel with the direction of the centerline or utility.

3.2.1 Seams. All seams shall be sewn using thread meeting the requirements for plastic yarn specified in paragraph 3.1. The sheets of geotextile shall be sewn at the factory or other approved location. Seam strengths shall meet the requirements of Table 1.

3.2.2 Laps. Geotextile panels placed shall be overlapped a minimum of 2 feet with the upstream panel on top of the downstream panel.

3.3 Acceptance Requirements. All brands of geotextile and all seams used in construction will be accepted on the following basis. At least 30 days prior to installation, the Contractor shall furnish to the Contracting Officer, in duplicate, a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile. The certificate shall contain the signer's title, the name and address of the Contractor, the contract number, and the project name and location. The mill certificate or affidavit shall attest that the geotextile meets the chemical, physical, and manufacturing requirements stated in this specification and that the seams used meet the seam requirements. A 5-foot by 5-foot sample of each geotextile that the Contractor plans to use shall accompany the certificate. If seams are used, then an additional 5-foot by 5-foot sample containing a sample seam in the center of the geotextile sample shall be submitted with the certificate.

4. SHIPMENT AND STORAGE. The geotextile shall be shipped and maintained in a heavy duty protective cover until it is placed. During all periods of shipment and storage, the geotextile shall be protected from direct sunlight, ultra-violet rays, temperatures greater than 140 degrees Fahrenheit, mud, dirt, and other contaminants.

5. GEOTEXTILE INSTALLATION. The geotextile shall be placed in the manner and at the locations shown on the drawings. The Contractor shall prepare the surface to receive the geotextile to insure that the surface is relatively smooth and free of obstructions, depressions, debris, soft or low density pockets of material, or stone which could damage the geotextile during placement. At the time of installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. The geotextile shall be protected at all times during construction to insure that the geotextile's original chemical and physical properties are not changed. The work shall be scheduled so that all of the geotextile that is placed is covered with a layer of the specified material by the end of each workday. Failure to comply shall require replacement of geotextile. Any geotextile that is rejected or damaged shall be replaced by the Contractor at no additional cost to the Government.

6. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for geotextile. All costs associated with providing and installing the geotextile in accordance with the contract documents should be included under all applicable bid items that pertain to the work.

TABLE NO. 1

PHYSICAL REQUIREMENTS FOR SEPARATOR GEOTEXTILE

<u>Physical Property</u>	<u>Test Procedure</u>	<u>Acceptable Values</u>
Tensile Strength (*)	ASTM D 4632	200 pounds minimum in any principle direction
Seam Strength(**)	ASTM D 1683	200 pound per inch minimum
Elongation at Break	ASTM D 4632	15 % minimum in any principle direction
Apparent Opening	ASTM D 4751	No finer than the U.S. Size (AOS) Standard Sieve No. 50 and no coarser than the U.S. Standard Sieve No. 30.
Geotextile	ASTM D 4491	The Permittivity of the geotextile shall be greater than 0.35 per second
Flow Rate	ASTM D 4491	Minimum of 40 gallons per minute per square foot

(*) Value represents minimum average roll value of new geotextile received from the manufacture or distributor (i.e., any roll in a lot shall meet or exceed the minimum value in the table).

(**) All of the samples shall yield test values that are greater than or equal to the minimum value that is specified.

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SECTION 02246 - GEOTEXTILE SEPARATOR UNDER WATER

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SECTION 02246 - GEOTEXTILE SEPARATOR UNDER WATER

1. **SCOPE.** The work provided for herein consists of furnishing all plant, labor, material, equipment and performing all operations required for furnishing, hauling, and placing geotextile separator, under water where required, complete, as specified herein and on the contract drawings, and maintaining the geotextile until placement of the stone cover is completed and accepted.

2. **APPLICABLE PUBLICATIONS.** The current issues of the American Society for Testing and Materials (ASTM) publications listed below, but referred to thereafter by basic designation only, form a part of this Specification to the extent indicated by the references thereto:

D 883-92	Standard Terminology Relating to Plastics
D 1683-90a	Failure In Seams Of Woven Fabrics
D 4491-89	Water Permeability of Geotextiles By Permittivity
D 4632-91	Grab Breaking Load and Elongation of Geotextiles
D 4751-87	Determining Apparent Opening Size of a Geotextile

3. GEOTEXTILE REQUIREMENTS.

3.1 **Geotextile.** The geotextile shall be a woven pervious sheet made with plastic yarn as defined by ASTM D 883. The geotextile shall meet the physical requirements listed in Table No. 1. The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, amide, or vinylidene-chloride, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultra-violet exposure. The edges of the geotextile shall be selvedged.

3.2 **Seams.** Geotextile panels shall be sewn at the factory into a geotextile piece that is large enough to cover the area under each structure, including the two foot overhang around the edges. All seams shall be sewn using thread meeting the requirements for plastic yarn specified in paragraph 3.1. Seam strengths shall meet the requirements of Table 1. All seams shall be perpendicular to the centerline of the structure. Seams or laps are not allowed to run parallel with the direction of the centerline.

3.3 **Acceptance Requirements.** Geotextile and seams used in construction will be accepted on the following basis. At least 30 days prior to installation, the Contractor shall

furnish to the Contracting Officer, in duplicate, a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile. The certificate shall contain the signer's title, the name and address of the Contractor, the contract number, and the project name and location. The mill certificate or affidavit shall attest that the geotextile meets the chemical, physical, and manufacturing requirements stated in this specification and that the seams used meet the seam requirements. A 5-foot by 5-foot sample of each geotextile that the Contractor plans to use shall accompany the certificate. An additional 5-foot by 5-foot sample containing a sample seam in the center of the geotextile sample shall be submitted with the certificate.

4. SHIPMENT AND STORAGE. The geotextile shall be shipped and maintained in a heavy duty protective cover until it is placed. During all periods of shipment and storage, the geotextile shall be protected from direct sunlight, ultra-violet rays, temperatures greater than 140 degrees Fahrenheit, mud, dirt, and other contaminants.

5. GEOTEXTILE INSTALLATION. The geotextile shall be placed in the manner and at the locations shown on the drawings. The Contractor shall prepare the surface to receive the geotextile to insure that the surface is relatively smooth and free of obstructions, depressions, debris, soft or low density pockets of material, or stone which could damage the geotextile during placement. At the time of installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. The geotextile shall be protected at all times during construction to insure that the geotextile's original chemical and physical properties are not changed. The work shall be scheduled so that all of the geotextile that is placed is covered with a layer of the specified material by the end of each workday. Failure to comply shall require replacement of geotextile. All wrinkles and sags shall be stretched out immediately before stone is placed on the geotextile. The geotextile shall be protected from damage during placement of stone. This shall be accomplished by limiting the height of drop to less than 1 foot or the water surface, whichever is greater. In the event that this damages the geotextile, the stone shall be placed directly on the geotextile with zero height of drop. Before placement of stone, the Contractor shall demonstrate that the placement technique will not damage the geotextile. Any geotextile that is rejected or damaged shall be replaced by the Contractor at no additional cost to the Government.

6. MEASUREMENT AND PAYMENT. No separate measurement will be made for geotextile placed under water. Payment for geotextile will be included in the contract unit price for "Armor Stone (Rip-Rap)". Price and payment shall constitute full compensation for all costs of furnishing, delivery, storage, testing, placement or geotextile and all incidental costs thereto.

TABLE NO. 1

PHYSICAL REQUIREMENTS FOR SEPARATOR GEOTEXTILE

<u>Physical Property</u>	<u>Test Procedure</u>	<u>Acceptable Values</u>
Tensile Strength (*)	ASTM D 4632	200 pounds minimum in any principle direction
Seam Strength(**)	ASTM D 1683	200 pound per inch minimum
Elongation at Break	ASTM D 4632	15 % minimum in any principle direction
Apparent Opening	ASTM D 4751	No finer than the U.S. Size (AOS) Standard Sieve No. 50 and no coarser than the U.S. Standard Sieve No. 30.
Geotextile	ASTM D 4491	The permittivity of the geotextile shall be greater than 0.35 per second
Flow Rate	ASTM D 4491	Minimum of 40 gallons per minute per square foot

(*) Value represents minimum average roll value of new geotextile received from the manufacture or distributor (i.e., any roll in a lot shall meet or exceed the minimum value in the table).

(**) All of the samples shall yield test values that are greater than or equal to the minimum value that is specified.

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SECTION 02273 - ARMOR STONE RIPRAP AND CRUSHED STONE

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7.	LMVD STANDARD TEST METHOD FOR GRADATION OF STONE	02273-5

SECTION 02273 - ARMOR STONE RIPRAP AND CRUSHED STONE

1. SCOPE. The work provided for herein consists of furnishing all plant, labor, equipment and materials, and performing all operations in connection with the installation of riprap stone

2. APPLICABLE PUBLICATIONS. The following publications referred to thereafter by basic designation only, form a part of this specification to the extent indicated:

American Society for Testing and Materials (ASTM). Corresponding CRD Standards are indicated where available.

C 127-88
(CRD-C 107)

Standard Test Method for Specific Gravity and
Absorption of Coarse Aggregate

3. QUALITY CONTROL.

3.1 General. The Contractor shall establish and maintain quality control for all stone protection, to ensure compliance with contract requirements, and shall maintain records of the quality control for all construction operations. All information pertaining to inspection and quality control shall be included in the quality control reports to be furnished to the Contracting Officer including but not limited to the following:

(1) Submission of stone samples for quality testing, if from other than an approved source.

(2) Inspection of materials before they are incorporated into the work to insure compliance with contract requirements.

(3) Cleanliness of stone.

(4) Gradation of stone.

(5) Quantity of stone delivered and placed each day.

(6) Surveys. Prior to any construction, the Contractor shall locate all PI's shown on the contract drawings from which the layout of work is established. All surveys shall be performed by qualified survey personnel. The Contractor shall layout the work and take the following surveys of placed stone for compliance with the grades, limits and tolerances set by these plans and specifications.

(a) Cross sections of the groundline perpendicular to the channel every 25-feet. These cross sections shall extend the entire width of stone protection.

(b) Final armor stone compliance sections within 7 days after placement of armor stone and at the same location as the groundline cross sections of item (a) above.

Elevations shall be recorded every 5-feet and for every break in slope for all cross sections. Compliance cross section surveys shall be taken at each repair reach and, if the section is found to be within the grades, limits and tolerance, that reach will be accepted. Duplicating field books shall be used to record all surveys. From the information in the field books, the Contractor shall plot the cross sections and profiles on a scale agreeable to both the Contractor and the Contracting Officer's Representative. If a total station instrument is used to perform the survey, the Contractor shall submit a copy of the survey data on magnetic media, print out of the survey data, and computer-plotted profiles and cross sections from the original data. Plotted cross sections and profiles plus duplicate notes shall be kept at the jobsite at all times and made available to the Government inspectors as required. The Contractor shall furnish to the Contracting Officer's Representative the completed original field books and final plotted cross sections and profiles as each item of work is completed.

3.2 Reporting. The original and two copies of the records of inspection and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

4. MATERIALS.

4.1 Armor Stone.

4.1.1 General. All stone shall be a hard, durable material as approved by the Contracting Officer. The sources from which the Contractor proposes to obtain the material shall be selected well in advance of the time when the material will be required. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, seams and other defects that would tend unduly to increase its deterioration from natural causes. The inclusion of objectionable quantities of dirt, sand, clay and rock fines will not be permitted. Gradation shall conform to the gradation requirements specified in paragraph 4.1.3. Neither the width nor thickness of any piece shall be less than one third of its length. The faces of individual pieces of stone shall be roughly angular, not rounded in shape. Field stone, rectangular block stone, slabs, and rounded boulders will not be accepted.

4.1.2 Sources and Evaluation Testing. Stone shall be obtained in accordance with the provisions in the General Provision entitled "STONE SOURCES" (see Section 01100). If the Contractor proposes to furnish stone from a source not listed in "STONE SOURCES", the Government will make such investigations as necessary to determine whether acceptable stone can be produced from the proposed source. Satisfactory service records on work outside the Corps of Engineers will be acceptable. If no such records are available, the Government will make tests to assure the acceptability of the stone. The tests to which the stone may be subjected will include petrographic analysis, specific gravity, abrasion, unit weight, absorption, wetting and drying, freezing and thawing and such other tests as may be considered necessary by the Contracting Officer. The following guidance is provided for use by the Contractor in analyzing a source of stone not listed in "STONE SOURCES". Stone that weighs less than 155 pounds per cubic foot or has more than 2 percent absorption will not be accepted unless other tests and service records show that the stone is satisfactory. The method of test for unit weight and absorption will be ASTM C 127 using bulk specific gravity, S.S.D. Samples of stone from a source not listed in "STONE SOURCES" shall be submitted to the Contracting Officer for testing and acceptance prior to delivery of any stone to the site of the work. Samples shall consist of at least seven pieces of stone, roughly cubical in shape and weighing not less than 100 pounds each. All such samples shall be taken by the Contractor under the supervision of the Contracting Officer. The samples shall be shipped at the Contractor's expense to the Waterways Experiment Station, Vicksburg, Mississippi, at least 90 days in advance of the time of the placing of the stone is expected to begin. The tests will be conducted in accordance with applicable Corps of Engineers methods of tests given in the Handbook for Concrete and Cement, and will be performed at the Waterways Experiment Station, Vicksburg, Mississippi. The cost of testing will be borne by the Government.

4.1.3 Gradation of Stone. Gradation tests of stone shall be accomplished at the quarry. Tests by weight shall be made by the Contractor in the presence of the Contracting Officer's Representative. The Contractor shall notify the Contracting Officer not less than 3 working days in advance of each test. In the event of nonavailability of the Government representative, the Contractor shall perform the tests and certify to the Contracting Officer that the stone shipped complies with the specifications. A minimum of one test shall be performed from each source. Each test sample shall be representative of the stone being shipped and consist of not less than 15 tons for stone. Percentage determinations shall be made for each stone weight specified. Gradation test data shall be recorded on LMV form 602-R "Gradation Test Data Sheet," a copy of which is shown at the end of this section. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarrying process, and all stone represented by the failed tests shall be set aside and not incorporated into the work. Any additional test required because of the failure of an initial test sample will not be considered as one of the other required tests. Certification and test results will represent stone shipped from the quarry and must be received by the Government representative before the stone is used in the work. The Contractor shall designate on the test form that portion (in tons) of the lot

tested which is applicable to this contract. Any deviation from the reported tonnage shall be corrected on a revised gradation test form. The Contracting Officer may direct, under the Contract Clause entitled "INSPECTION OF CONSTRUCTION" (FAR 52.246-12), additional testing of stone furnished to the worksite if the stone appears, by visual inspection, to be of questionable gradation or quality. Refer to paragraph 7 of this section for the gradation test method. The following represents the gradation requirements for stone.

<u>Stone Weight</u> <u>(LBS)</u>	<u>Cumulative %</u> <u>Finer (By Wt.)</u>
150 - 200	5 Max.
125 - 150	5 - 15
75 - 125	15 - 40
25 - 75	40 - 55
Under 25	10 Max.

5. STONE PLACEMENT. Stone shall be placed within the limits shown on the contract drawing. All stone shall be placed by clamshell bucket, stone grab, or by some other method approved by the Contracting Officer that will not drop or cast the stone, but will release the stone in such a manner that they will be properly interlocked with the underlying or adjacent stones to resist displacement by wave action and provide a uniform and compact section. Each stone shall be firmly set and well supported by underlying and adjacent stone. Stone shall be constructed, within the specified tolerance, to the lines and grades shown on the contract drawings. The Contractor shall relocate the unsatisfactorily placed stone within the specified limits for payment or the weight of the stone so misplaced will be estimated by the Contracting Officer's Representative and the payment deductions shall be determined from this estimate and the bid unit price of the stone. The larger stones shall be well distributed and the entire mass of stones in their final position shall be graded to conform to the gradation specified. The finished stone shall be free from objectionable pockets of small stones and clusters of larger stones. Placing stone by dumping it at the top of the slope and pushing it down the slope will not be permitted. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during final placing; or by other methods of placement which will produce the specified results. Rearranging of individual stones by mechanical equipment will be required to the extent necessary to obtain a reasonably well-graded distribution of stone sizes as specified above. The Contractor shall maintain the stone until accepted and any material displaced prior to acceptance and due to the Contractor's negligence shall be replaced at his expense and to the lines and grades shown on the contract drawings.

6. MEASUREMENT AND PAYMENT.

6.1 Armor Stone Riprap.

6.1.1 Measurement. The unit of measurement for stone satisfactorily placed in the work will be the ton (2,000 pounds). Quantities will be computed to the nearest whole ton. When stone is delivered by truck from a quarry or railroad siding, it shall be weighed on approved scales before being placed in the work. The scales shall be located as near the site of the work as is practicable and shall be tested as often as necessary to ensure accurate weights, as determined by the Contracting Officer. The Contractor shall furnish the scales and shall weigh the stone in the presence of a Contracting Officer's representative, who will certify to the correctness thereof. Weight certificates furnished by a public weighmaster will be acceptable in lieu of such procedures when authorized by the Contracting Officer.

6.2 Payment. Payment for armor stone will be made at the applicable contract unit price for "Armor Stone (Rip-Rap)". Price and payment shall constitute full compensation for all costs of furnishing, hauling, placing and maintaining the armor stone.

7. LMVD STANDARD TEST METHOD FOR GRADATION OF STONE.

7.1 General.

7.1.1 Sample Selection. The most important part of the test and the least precise is the selection of a representative sample. No "standard" can be devised; larger quarry run stone is best sampled at the shot or muck pile by given direction to the loader; small graded stone is best sampled by random selection from the transporting vehicles. If possible, all parties should take part in the sample selection, and agree before the sample is run, that the sample is representative.

7.1.2 Selection of Size for Separation. It is quite possible and accurate to run a gradation using any convenient sizes for separation, without reference to specifications. After the test is plotted on a curve, then the gradation limits may be plotted. Overlapping gradations with this method are no problem. It is usually more convenient, however, to select points from the gradation limit, such as the minimum 50% size, the minimum 15% size, and one or two others, as separate points.

7.2 Procedure.

7.2.1 Select a representative sample (See paragraph 7.1.1), weigh and dump on hard stand.

7.2.2 Select specific sizes (see example) on which to run "individual weight larger than" test. Procedure is similar to the standard aggregate gradation test for "individual weight retained".

7.2.3 Determine the largest size stone in the sample. (100% size)

7.2.4 Separate by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, with identified weights, for visual comparison in separating the obviously "larger than" stones. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weigh each size group, either individually or cumulatively.

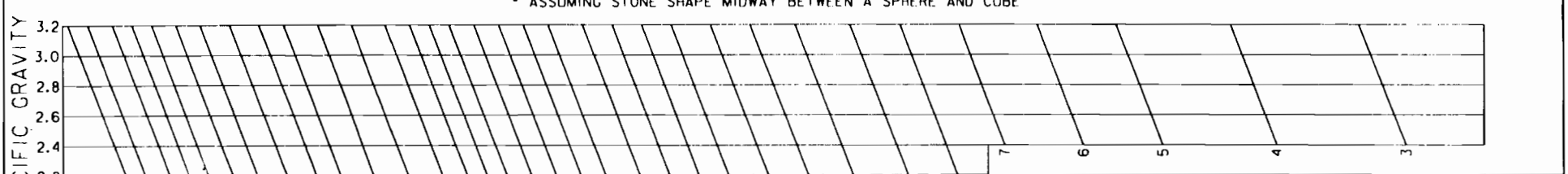
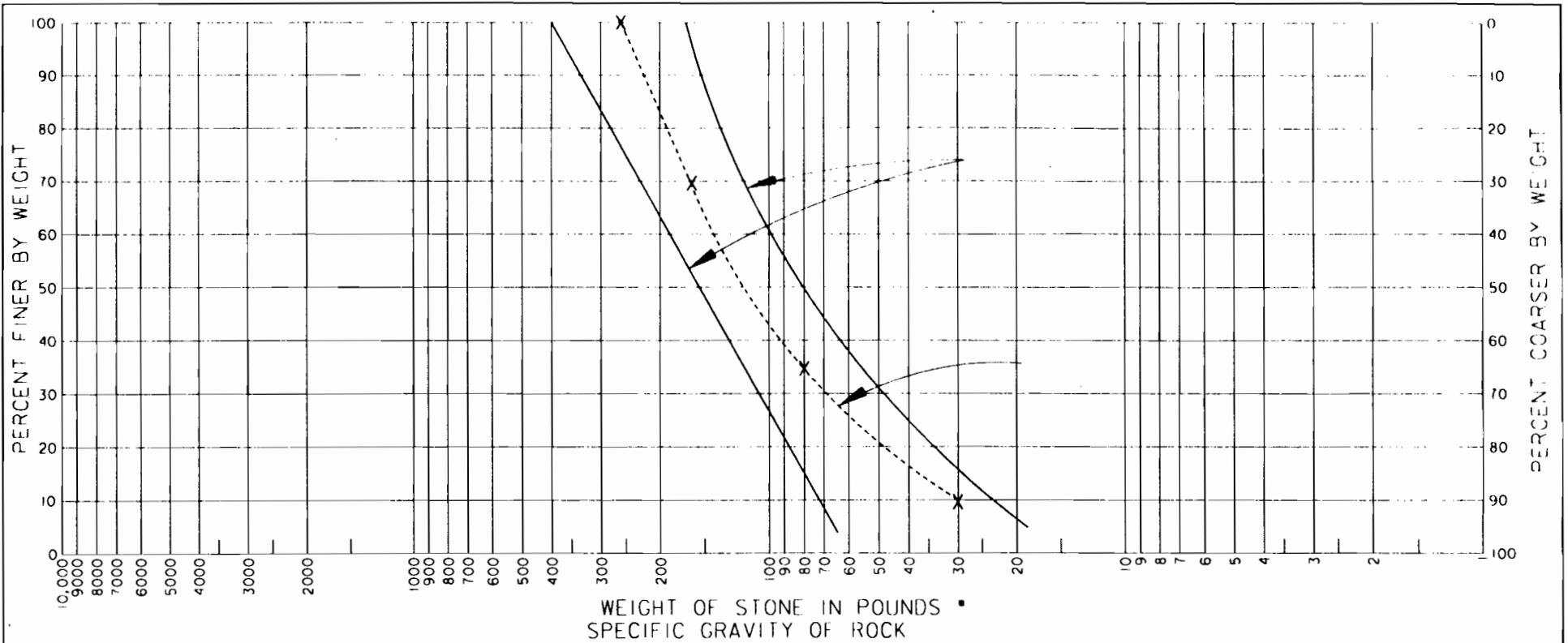
7.2.5 Paragraph 7.2.4 will result in "individual weight retained" figures. Calculate individual percent retained (heavier than) and cumulative percent retained and cumulative percent passing (lighter than). Plot percent passing, along with the specifications limits on Eng Form 4055 and fill-in and document test on LMV Form 602-R.

EXAMPLE GRADATION	
SPECIFICATIONS	
STONE WEIGHT IN LBS.	PERCENT FINER BY WEIGHT
400 - 160	100
160 - 80	50
80 - 30	15

EXAMPLE WORKSHEET				
STONE SIZE LBS.	INDIVIDUAL WEIGHT RETAINED	INDIVIDUAL % RETAINED	CUMULATIVE % RETAINED	CUMULATIVE % PASSING
400	0	0	0	100
160	9,600	30	30	70
80	11,200	35	65	35
30	8,000	25	90	10
Less Than 30	3,200	10	100	0

TOTAL 32,000 lbs.

NOTE: Largest stone 251 lbs.

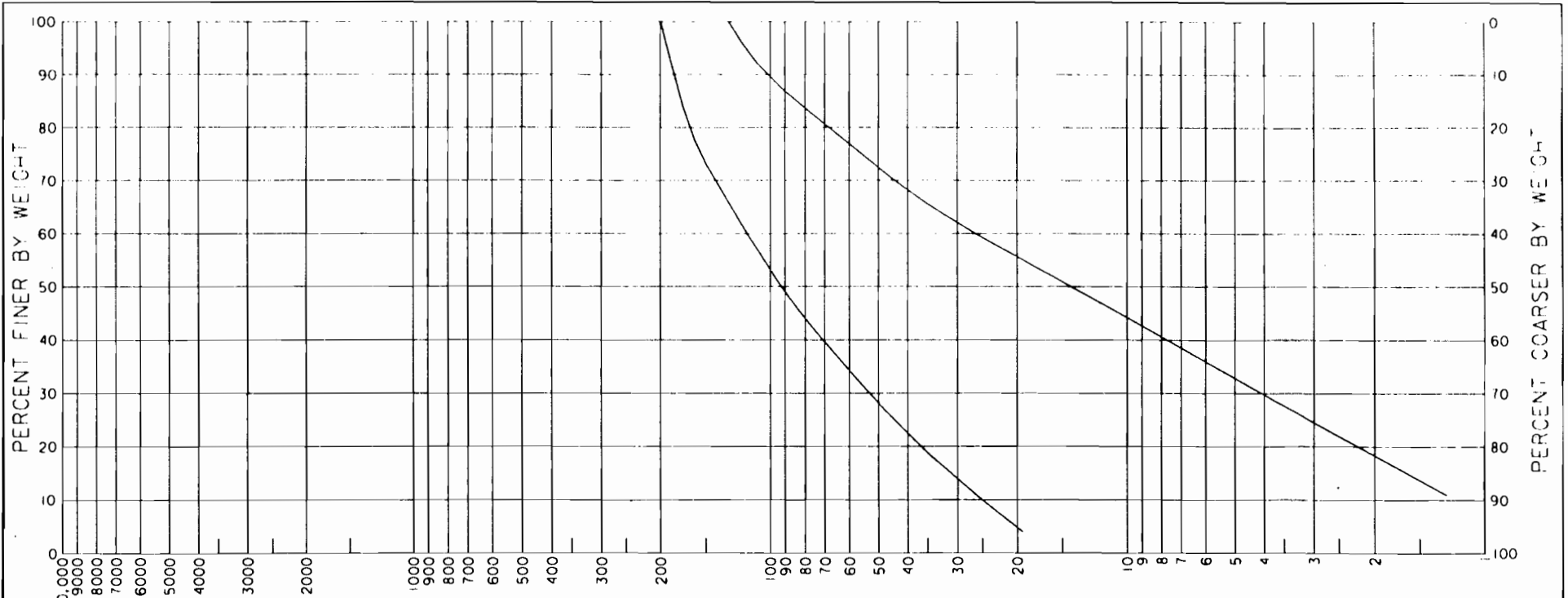


PROJECT _____

AREA _____

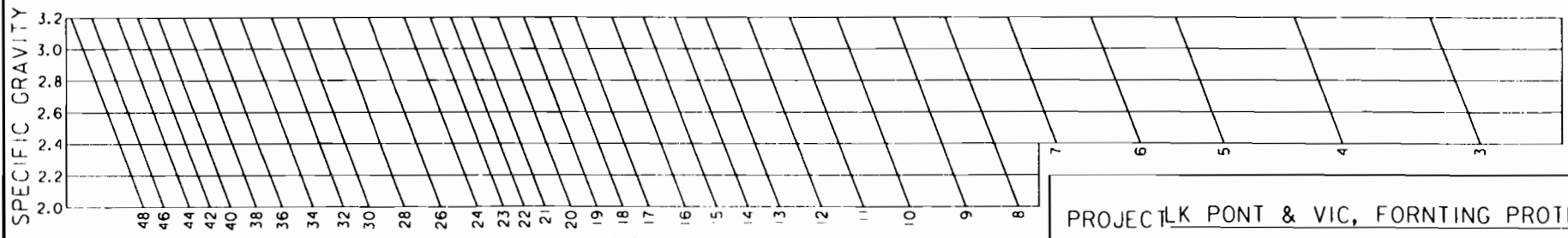
DATE _____

RIPRAP GRADATION CURVES



WEIGHT OF STONE IN POUNDS •
 SPECIFIC GRAVITY OF ROCK 2.5

• ASSUMING STONE SHAPE MIDWAY BETWEEN A SPHERE AND CUBE



Armor Stone

Stone Wt. In Lbs.	Percent Finer By Wt.
150-200	5 MAX
125-150	5 - 15
75-125	15 - 40
40-55	15 - 40
10 MAX	15 - 40

PROJECT LK PONT & VIC, FRONTING PROTEC'N
 AREA PS #6, ORL AND JEFFER PARISHES, LA
 DATE OCT 1998

RIPRAP GRADATION CURVES

GRADATION TEST DATA SHEET

Quarry _____ Type of Stone Tested _____
 Date of Test _____ Testing Rate _____ Tons

TEST REPRESENTS

Contract No.	District	Tons
TOTAL		

GRADATION

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

Remarks: _____

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

Instructor Representative _____

Government Representative _____

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SECTION 02315 - STEEL H-PILING

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SECTION 02315 - STEEL H-PILING

1. SCOPE. The work covered by this section consists of furnishing all plant, equipment, labor, and materials and performing all operations in connection with the installation of steel H-piles in accordance with these specifications and applicable drawings.

2. QUALITY CONTROL.

2.1 List of Requirements. Requirements for materials, tests, machinery, workmanship, and other measures for quality control shall be as specified and shown in the drawings. The Contractor shall provide continuous inspection of all operations for quality control and record the results for submitting to the Contracting Officer to show compliance with the contract requirements. The Contractor's quality control records shall include but not be limited to the following items:

- (1) materials;
- (2) delivery, storage, and handling;
- (3) placing (location, alignment, etc.);
- (4) driving records;
- (5) cutting;
- (6) record keeping; and,
- (7) splices.

3. APPLICABLE PUBLICATIONS. The following American Society for Testing and Materials (ASTM) standards referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

A36-91a Carbon Structural Steel

4. SUBMITTALS.

4.1 Equipment Descriptions. The Contractor shall submit descriptions of pile driving equipment, delivery, storage and handling methods, placement plans, driving records, quality control records, and other submittals to the Contracting Officer for approval as required. Submittals shall be adequately detailed to thoroughly depict intended methods or processes. Submittals not satisfactory to the Contracting Officer will

be rejected. Complete descriptions of pile driving equipment, including hammers, power packs, extractors, leads, and other appurtenances shall comply with the requirements of paragraph 7.1 and shall be submitted for approval at least 30 days prior to commencement of work.

4.2 Shop Drawings. Shop drawings for piles shall provide details and dimensions of all shop and field fabrications.

4.3 Delivery, Storage, and Handling Plans. Plans for the proposed methods of delivery, storage, and handling of piles shall comply with the requirements of paragraphs 6.1 and 6.2 and shall be submitted for review and approval at least 30 days prior to delivery of piles to the job site.

4.4 Placement Plans. Placement plans shall show the proposed methods for controlling the location and alignment of piles as required in paragraph 7.2.2 and shall be submitted for review and approval at least 30 days prior to delivery of piles to the job site.

4.5 Driving Records. Original records of pile driving operations for each pile driven shall be submitted daily. Recorded data for piles shall include the data specified in paragraph 7.2.3, unusual driving conditions, interruptions or delays during driving, and any other pertinent information. The format for driving records shall be in accordance with the format provided by the Contracting Officer.

4.6 Quality Control Records. Original quality control records, including records of any corrective actions, shall be submitted weekly.

5. MATERIALS.

5.1 Steel. Steel for H-piles shall conform to the requirements of ASTM A36.

5.2 H-Piles. H-piles shall be HP14x73 sections as shown in the drawings and shall have standard square ends unless otherwise directed. Lengths of piles shall be determined as specified in paragraph 7.2.1.

5.3 Pile Splices. Pile splices shall be made with continuous groove welds. Splice details shall be submitted to the Contracting Officer for approval prior to construction.

5.4 Coatings. Piles shall be painted in accordance with Section 09940 "Painting".

6. DELIVERY, STORAGE, AND HANDLING.

6.1 Delivery and Storage. Delivery and storage plans shall be submitted for approval as specified in paragraph 4.3. Piles shall be stacked during delivery and storage

so that each pile is maintained in a straight position and is supported every 10 feet or less along its length (ends inclusive) to prevent exceeding the maximum permissible camber or sweep. Piles shall not be stacked more than 5 feet high unless approved by the Contracting Officer.

6.2 Handling. The method of handling piles shall be submitted for approval as required in paragraph 4.3. Piles shall be lifted using a cradle or multiple point pick-up to ensure that the maximum permissible camber or sweep is not exceeded due to insufficient support, except that a one-point pick-up may be used for lifting piles that are not extremely long into the driving leads. Point pick-up devices shall be of the type that clamp to both pile flanges at each pick-up point. Holes may be burned in the flanges or webs of piles above the cutoff length for lifting piles into the leads. Piles shall not be dragged across the ground. The Contractor shall inspect the camber, sweep, web, and flanges of piles for damage before transporting them from the site storage area to the driving area. Camber and sweep shall be checked by placing piles on a firm, level surface and rotating them. The maximum permissible camber and/or sweep shall be 2 inches over the length of the pile. The Contracting Officer will check piles for damages and excessive camber or sweep immediately prior to placement in the driving leads. Damaged piles or piles with camber or sweep exceeding 2 inches will be rejected for use and replaced at no additional cost to the Government.

7. INSTALLATION.

7.1 Pile Driving Equipment. The Contractor shall select the proposed pile driving hammer and driving system as specified and submit it to the Contracting Officer for approval as required in paragraph 4.1. Final approval of the proposed hammer and driving system is subject to the satisfactory completion and approval of pile tests. Changes in the selected pile driving system will not be allowed after the system has been approved by the Contracting Officer except as directed by the Contracting Officer. No additional contract time will be allowed for Contractor proposed changes in the approved driving system.

7.1.1 Pile Driving Hammers. Pile driving hammers shall be of the impact type hammer.

7.1.1.1 Impact Hammers. Impact hammers shall be steam, air, or diesel hammers of the single acting, double-acting, or differential acting type. The size or capacity of hammers shall be as recommended by the manufacturer for the pile weight and soil formation to be penetrated. Boiler, compressor or engine capacity shall be sufficient to operate hammers continuously at the full rated speed. Hammers shall have a gage to monitor hammer bounce chamber pressure for diesel hammers or pressure at the hammer for air and steam hammers. This gage shall be operational during the driving of piles and shall be mounted in an accessible location for monitoring by the Contractor and the Contracting Officer. The Contractor shall provide bounce chamber pressure gage

correction tables and charts for the type and length of hose to be used with the pressure gage to the Contracting Officer. The Contractor shall submit the following information for each impact hammer proposed:

- (1) make and model;
- (2) ram weight (pounds);
- (3) anvil weight (pounds);
- (4) rated stroke (inches);
- (5) rated energy range (foot-pounds);
- (6) rated speed (blows per minute);
- (7) steam or air pressure, hammer, and boiler and/or compressor (pounds per square inch);
- (8) rated bounce chamber pressure curves or charts, including pressure correction chart for type and length of hose used with pressure gage (pounds per square inch);
- (9) pile driving cap, make, and weight (pounds);
- (10) cushion block, dimensions, and material type; and,
- (11) power pack description.

A scale (inches) (diagram of scale is attached at the end of this section) shall be fixed to the hammer's ram guide and a pointed indicator on the ram, near the scale, to allow a reading of the ram drop. Installation of both scale and indicator shall be in such a manner that the drop of the ram can be read by observing the highest and the lowest position of the indicator and scale. Both the scale and the indicator shall be easily legible to observers on the ground during operations. The Contractor shall record the ram drop of the pile hammer when recording the blows per foot as specified in the Pile Driving Record.

7.1.1.2 Vibratory Hammers. The use of vibratory hammers will not be allowed.

7.1.2 Pile Driving Leads. Impact hammers shall be supported and guided with fixed extended leads or fixed underhung leads. Two intermediate supports for the pile in the leads shall be provided to reduce the unbraced length of the pile during driving and pulling.

7.1.3 Pile Extractors. Pile extractors may be vibratory and/or impact pile driving hammers. Impact hammers are required for pulling piles not extractable with vibratory hammers.

7.1.4 Jetting Equipment. Jetting shall not be allowed.

7.2 Permanent Piles.

7.2.1 Lengths. The estimated quantities of piles listed in the unit price schedule to be furnished by the Contractor are given for bidding purposes only. The Contracting Officer will determine the actual lengths of piles required to be driven below cutoff elevation for the various locations in the work and will furnish the Contractor a quantities list indicating lengths and locations of all piles to be furnished and placed. This pile length determination will be made from the results of pile load tests.

7.2.2 Placement. Pile placement plans shall be submitted for approval as required in paragraph 4.4. Piles shall be placed accurately in the correct location and alignments, both laterally and longitudinally, and to the vertical lines as shown in the drawings. The Contractor shall establish a permanent base line during pile driving operations to provide for inspection of pile placement by the Contracting Officer. The base line shall be established prior to driving permanent piles and shall be maintained during the installation of the permanent piles. Prior to driving and with the pile head seated in the hammer, the Contractor shall ensure that each pile has been aligned correctly and that the orientation of the web about the center line of the pile is as shown in the drawings. A final lateral deviation from the correct location at the cutoff elevation of not more than 3 inches will be permitted for vertical piles. A final variation in alignment of not more than 1/4-inch per foot of longitudinal axis will be permitted. A final variation in rotation of the pile about the center line of the web of not more than 7.5 degrees will be permitted. The correct relative position of all piles shall be maintained by the use of templates or by other approved means. Piles not located properly or exceeding the maximum limits for rotation, lateral deviation, and/or variation in alignment shall be pulled and redriven at a location directed by the Contracting Officer at no additional cost to the Government.

7.2.3 Driving. Piles shall not be driven within 100 feet of concrete less than 7 days old nor within 30 feet of concrete less than 28 days old unless otherwise authorized by the Contracting Officer. A complete and accurate driving record of piles shall be compiled and submitted as required in paragraph 4.5. The driving record for impact hammers shall include pile dimensions and location, pile identification number, date driven, original pile length, tip elevation, description of hammer used, rate of hammer operation, length of bounce pressure hose, number of blows required for each foot of penetration throughout the entire length of each pile and for each inch of penetration in the last foot of penetration, total driving time in minutes and seconds for each pile, and other pertinent information as required or requested by the Contracting Officer. When driving long piles

of high-slenderness ratio, special precautions shall be taken to ensure against overstressing and leading away from a plumb or true position. Permanent and test piles shall be driven with hammers of the same model and manufacturer, same energy and efficiency, and using the same driving system. The hammers shall be operated at all times at the speed and under the conditions recommended by the manufacturer subject to the approval of the Contracting Officer. Once pile driving has begun, all conditions (such as alignment, batter, cushions, etc.) shall be kept constant. Each pile shall be driven continuously and without interruption until the required depth of penetration has been attained. Deviation from this procedure will be permitted only when driving is stopped by causes that reasonably could not have been anticipated. The controlling depth of penetration will be determined by the Contracting Officer. Jetting shall not be used to assist driving piles. A pile that cannot be driven to the required depth because of an obstruction shall be pulled and redriven or shall be cut off and abandoned, whichever is directed by the Contracting Officer. When driving piles in clusters or under conditions of relatively close spacing, observations shall be made to determine heave. Heaved piles shall be backdriven to the original depth of penetration without additional cost to the Government. Piles damaged or impaired for use during driving shall be pulled and replaced with new piles or shall be cut off and abandoned and new piles driven as directed by the Contracting Officer without additional cost to the Government. The Contracting Officer may require that any pile be pulled for inspection. Piles pulled at the direction of the Contracting Officer and found to be in suitable condition shall be redriven at a location directed by the Contracting Officer and payment therefore will be made in accordance with paragraph 9.4.1. Piles pulled at the request of the Contracting Officer and found to be damaged shall be replaced by new piles at the Contractor's expense. After piles are driven, they shall be cut off square at the indicated cutoff elevation. Any voids occurring around piles due to pile driving or as the result of pulling piles shall be backfilled with a cement-sand-bentonite slurry as specified in paragraph 02411-9.5.

7.2.4 Pile Splicing. The fabrication and welding procedures for splicing piles shall be as shown in the drawings. Ends of the piles to be spliced shall be square so that full contact can be made between the abutting flanges and webs. Squaring, where required, shall be done by saw cutting or flame cutting with a straight edge.

8. MEASUREMENT.

8.1 Furnishing and Delivering. Permanent piles will be measured for payment for furnishing and delivering by the linear foot of piles required as determined by the Contracting Officer and furnished to the Contractor. No payment will be made for lengths of piles exceeding required lengths.

8.2 Driving. Permanent piles will be measured for payment for driving on the basis of lengths, to the nearest tenth of a linear foot, along the axis of each pile acceptably in place below the elevation shown in the drawings.

9. PAYMENT.

9.1 Furnishing and Delivering. Payment for furnishing and delivering the required lengths of permanent H-piles will be made at the applicable contract unit price per linear foot for "Furnish Steel H-Piles (HP 14x73)," with price and payment constitutes full compensation for all costs of furnishing and delivering piles to the work site.

9.2 Driving. Payment for driving permanent piles, measured as specified in paragraph 8.2, will be made at the applicable contract unit price per linear foot for "Driving Steel H-Piles (HP 14x73)," with price and payment constituting full compensation for costs of handling, driving, measuring heave, redriving heaved piles, cutting off piles at the cutoff elevation, compiling and submitting pile driving records, backfilling voids around piles, and any other items incidental to driving piles to the required elevation.

9.3 Cutoffs. Costs of cutting piles and removing the cutoff portions from the site shall be included in the applicable contract unit price for the payment item covered in paragraph 9.1.

9.4 Pulled Piles.

9.4.1 Undamaged Piles. Piles pulled at the direction of the Contracting Officer and found to be undamaged will be paid for as follows:

(1) The cost of furnishing and delivering piles will be included in the contract unit price per linear foot for "Furnish Steel H-Piles (HP 14x73)".

(2) The cost of driving piles will be included in the contract unit price per linear foot for "Driving Steel H-Piles (HP 14x73)".

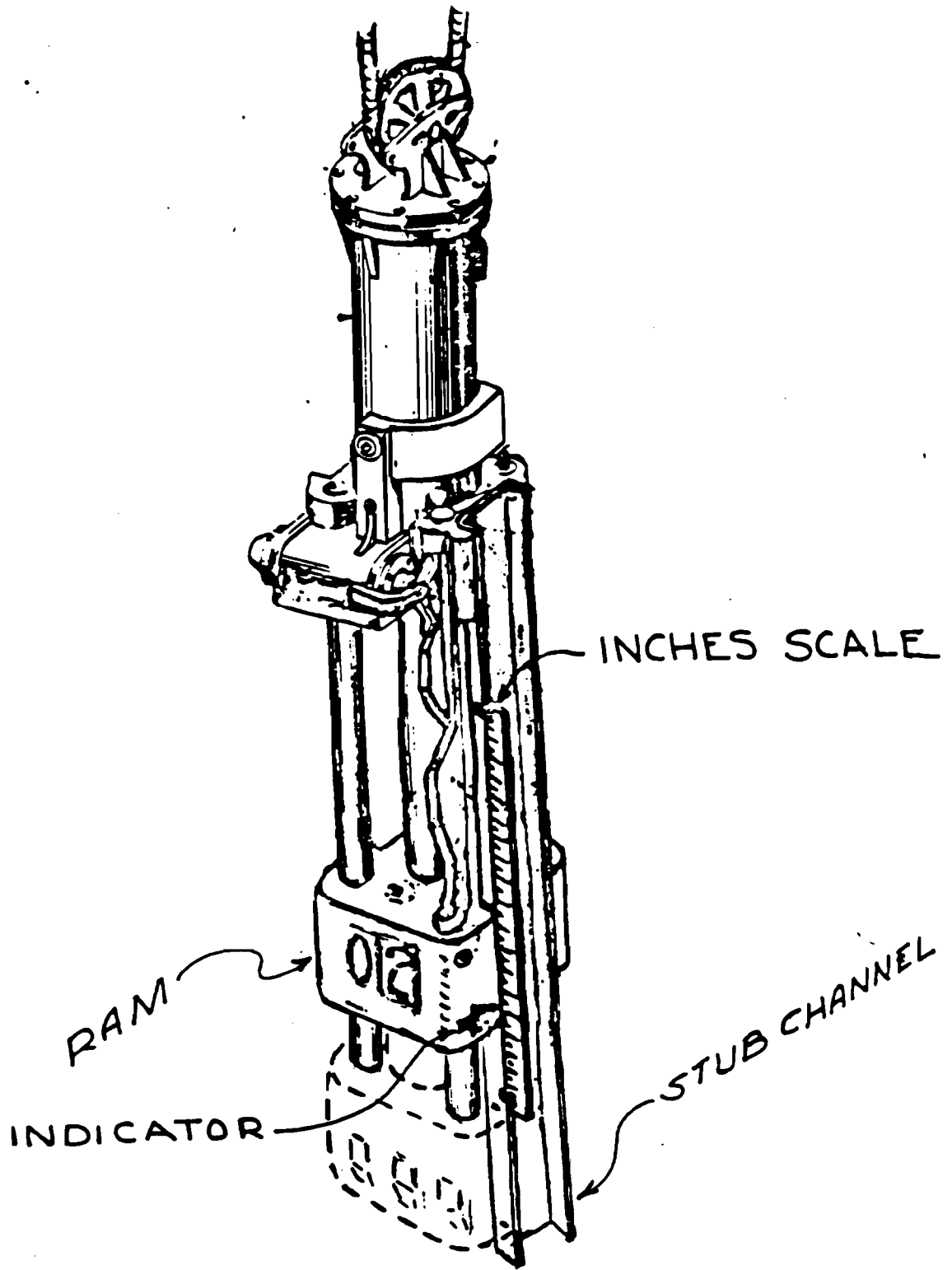
(3) The cost of pulling piles will be paid for at twice the applicable contract unit price for linear foot for "Driving Steel H-Piles (HP 14x73)".

(4) The cost of redriving piles will be included in the contract unit price per linear foot for "Driving Steel H-Piles (HP 14x73)".

9.4.2 Damaged Piles. No payment will be made for furnishing, delivering, driving, pulling, and disposing of piles pulled and found to be damaged. New piles replacing damaged piles will be paid for at the applicable contract unit price for items covered in paragraphs 9.1 and 9.2.

9.5 Filling Voids Around Driven Piles. No separate payment will be made for backfilling voids around piles with fill material. All costs in connection therewith shall be included in the contract unit price for driving piles covered in paragraph 9.2.

9.6 Pile Splices. No separate payment will be made for piles splices. Costs for piles splices shall be included in payment for "Furnish Steel H-Piles (HP 14x73)".



PILE HAMMER

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SECTION 02355 - PILE LOAD TESTS

PART 1 - GENERAL

1. SCOPE. The work covered by this section consists of furnishing all plant, equipment, labor, and materials, and performing all operations in driving, testing, pulling, and removing of steel H-piles, in accordance with these specifications and as shown on the drawings. Test methods described herein are generally in accordance with ASTM D 1143. The Contractor shall submit his plan for conducting compression tests and tension tests to the Contracting Officer for approval a minimum of 15 days prior to the beginning of the tests. The test pile site is located on the drawings.

2. RELATED WORK SPECIFIED ELSEWHERE. Steel H-Piling. Section 02315, "STEEL H-PILING".

3. APPLICABLE PUBLICATIONS. The following publications, referred to thereafter by basic designation only, form a part of this specification to the extent indicated:

American Society for Testing and Materials (ASTM).

D 1143-87	Method of Testing Piles Under Static Axial Compressive Load
D 3689	Standard Test Method for Individual Piles Under Static Axial Tensile Load

4. QUALITY CONTROL.

4.1 General. The Contractor shall establish and maintain quality control for all operations to assure compliance with the contract requirements and maintain records of his quality control for all construction operations including, but not limited to, the following:

(1) Facilities and personnel providing for installation and reading by the Contractor of all measuring devices.

(2) Compression test (pile number, location); loading frames and description (number, size, type, and location of supporting piles); sequence and method of loading; records of measurements, and driving records.

(3) Tension Test (Pile Number); Description of loading yoke and yoke installation (number, size, type and location of supporting piles); sequence and method of loading, records of measurements, and driving records.

4.2 Reporting. The original and two copies of these records and tests, as well as records of corrective action taken, shall be furnished to the Government daily. Format of reports other than test data shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

4.2.1 The Contractor shall furnish all data from each pile tested within 24 hours after completion of each test. Blow counts shall be recorded for each foot of each test pile and, in addition, the Contractor shall complete revised LMN Form 1119 (Pile Driving Report) and furnish copies to the Contracting Officer. The Pile Driving Report shall include, but not necessarily be limited to, unusual driving conditions, interruptions or delays during driving and any other information considered pertinent. Pile test data shall be recorded for all items shown in paragraph 10. Copies of these forms shall also be furnished to the Contracting Officer.

PART 2 - PRODUCTS

5. TYPES AND PROPERTIES.

5.1 Types. Steel H-piles shall conform to the requirements of Section 02315. Tip elevations are shown on the drawings.

5.2 Properties. Pile properties shall conform to the requirements of Section 02315 for steel piles.

PART 3 - EXECUTION

6. PLACING TEST PILES. Test piles TP1 and TP2 shall be driven vertically to the tip elevation and at the locations shown on the drawings. A variation from the vertical of not more than 1/4-inch per foot of longitudinal axis will be permitted. Any pile driven and not meeting the above requirements shall be pulled and redriven by the Contractor at no additional cost to the Government.

7. DRIVING TEST PILES. The service pile driving procedures specified in Section 02315 also apply to the driving of test piles. The hammer used for driving the test piles shall be the same hammer that will be used to drive the service piles.

8. TEST PILE LOADING.

8.1 Scope. This part covers procedures for testing vertical foundation piles to determine the response of the pile to a static compressive or tensile load applied axially to the pile. Determination of the allowable compression and tensile loads for the pile is made by the incremental loading and measurement of the pile deformation.

8.1.1 Reserved.

8.1.2 Compression Test. Test Piles (TP1 and TP2) shall be furnished in the lengths required and driven as directed by the Contracting Officer as shown on the drawings. Pile TP1 (tip elevation -92.00) will be subjected to a compression load test. Minimum time period of 21 days shall be allowed to elapse between driving of the piles and the initiation of a compression test. If the results of the compression test on the pile are not acceptable, the Contracting Officer will direct the Contractor to perform an additional compression test on pile TP2 (tip elevation -101.00). There will be no payment nor additional time granted for delays incurred between driving of test piles and initiation of pile tests.

8.1.3 Tension Test. Upon completion of satisfactory compression testing, the Contracting Officer will direct the Contractor to proceed with the tension test on the pile which has been acceptably tested in compression. A minimum time period of 14 days shall be allowed to elapse between completion of the compression test and initiation of the tension test when the tests are performed on the same pile. There will be no payment for delays required between compression and tension pile tests.

8.2 General Procedures. The Contractor shall provide and be responsible for furnishing all necessary apparatus, measuring equipment, and personnel to install, test, and extract the test piles described within this specification in its entirety. The recording and reporting of all data shall be the responsibility of the Contractor. However, the Contracting Officer shall have free access to the pile test data at any time. A Government representative will be present during the load tests. The Contractor shall provide the Contracting Officer 72 hours notice prior to initiating each pile load test in order that arrangements may be made to have a Government representative present during the test. The reduction, analysis, and interpretation of the test data will be accomplished by Government personnel after completion of each pile test. Additional pile tests may be required as determined by the Contracting Officer. In order to prevent disturbances to the instrumentation readings, construction activities, equipment movement, or operation of construction equipment, will not be permitted within 200 feet of any load test in progress.

8.3 Loading Frames. Loading frames shall be constructed so that the loads are applied axially to minimize eccentric loading. Design considerations such as sizes, numbers, and material of specific beams, support piles, bearing plates, etc., shall be the responsibility of the Contractor and subject to approval of the Contracting Officer. Included with his plan for conducting the tests, the Contractor shall submit computations used in the design of the loading frame. The computations shall be certified by a registered professional engineer. For the compression test, a steel bottom bearing plate of appropriate thickness for the loads involved shall not be less than the size of the pile butt, nor less than the area covered by the base of the hydraulic jack. A top bearing plate shall have a size not less than the load cell head, nor less than the total width of the reactor beam(s). In the tension load test, the design of pile tension connection shall be the

responsibility of the Contractor and subject to the approval of the Contracting Officer. Reaction for the load frame may be provided by anchor piles or dead load. The anchor piles or support piles for the loading frame shall be placed as far from the test piles as practicable, but in no case less than a clear distance of 8-feet (2.1 m). The box or platform shall be loaded with any suitable material such as soil, rock, concrete, steel, or water filled tanks with a total weight (including that of the test beams(s) and box or platform) at least 10 percent greater than the anticipated maximum test load. The anticipated maximum test load is three times the service load. Service loads are shown in this section of the specifications.

8.4 Apparatus for Applying Pile Load and Measuring Movement. All equipment related to the load test (extensometers, level, load cell, hydraulic jack, scales, mirrors, etc.) and testing shall be furnished and operated by the Contractor. The hydraulic jack shall be equipped with a pressure reading gage calibrated in tons and with a ram having a spherical bearing head to minimize eccentric loading. The jack shall be capable of maintaining constant loads between load changes and shall be calibrated prior to the test so that the load applied is controllable to within 5 percent. The load cell (non-self-leveling) shall be an electric strain gage type equipped with a readout device. Load cells shall be calibrated prior to the test to an accuracy within 2 percent of the applied load. The changing and maintaining of loads on each test pile shall be done utilizing the load cell as the primary loading device and pressure gage on the jack as a backup. However, both readings shall be recorded. Extensometers shall be used to measure pile movement and shall have dial gages with stems having at least a 2-inch (51 mm) travel, or sufficient gage blocks shall be provided to allow this travel with shorter gage stems. Gages shall be read to an accuracy of 0.001-inch (0.025 mm). Smooth bearing surfaces perpendicular to the direction of the measurements shall be provided for by the gage stems. The hydraulic jack, load cell, and extensometers shall be calibrated both before the start and after the completion of the testing program, by a certified testing laboratory for both the loading and unloading cycles and calibration curves furnished to the Contracting Officer. The calibration curves shall be load cell strain readings versus load in tons. In developing the calibration curves, the load cell shall be placed above the jack in the testing machine and the loads shall be applied through the ram to the load cell to the testing machine in the actual working manner of the field loading system. Two reference beams, one on each side of the pile, shall be independently supported with supports firmly embedded in the ground at a clear distance of not less than 8-feet (2.5 m) from the test pile, and 7 to 8 feet (2.1 to 2.5 m) from the support piles. Reference beams shall be of sufficient stiffness to prevent excessive deflections. Reference beam stakes shall have 5-feet (1.5 m) minimum penetration. If steel reference beams are used, one end of each beam shall be free to move as the length of the beams change with temperature variations. As a backup to the extensometers, an engineer's level and scale shall be used to check the movement of the test pile. The level shall also be used to check the movement of the support piles. Scales used to measure pile movements shall read to 1/64th of an inch or to 0.01 inch (0.25 mm). Target rods shall read 0.001 foot (0.3 mm). All dial gages, scales, and reference points shall be clearly

marked with a reference number or letter to assist in recording data accurately. Readings from the surveyor's level may be taken on a target rod or a scale and shall be referenced to two permanent benchmarks located outside the immediate test area or the surveyor's level shall be mounted on an object of fixed elevation (for example, a driven pile) outside of the immediate test area. Readings shall be taken on two fixed points or scales on opposite sides of the pile or pile cap or on a single fixed point or scale in the center of the pile top or pile cap. Readings shall be taken on a sufficient number of support piles and on the reference beams to establish if there is any movement. A tarpaulin of minimum dimension of 12-feet x 12-feet shall be installed by the Contractor to protect at all times the instrumentation, measuring system, and prevent adverse temperature variations.

8.5 Loading Procedure and Measurement of Pile Movement. The anticipated service loads for the piles and load tests are shown on the drawings. After the test piles are driven, the Contractor shall allow a time period of not less than 21 days to elapse before loading the test piles. Apply loads to the pile in increments of 25% of the anticipated service load up to 100% of the service load. Each increment shall be applied in 4 minutes and held for 60 minutes taking readings every 15 minutes. Remove the applied load in decrements equalling 75%, 50%, 25% and 0% of the service load. Each decrement shall be removed in 4 minutes and held for 15 minutes. Reapply the load in increments of 25% of service load up to 100% of the service load; each increment shall be applied in 4 minutes and held for 15 minutes. Continue applying loads in increments of 25% of the service load up to 200% of the design load. Each increment shall be applied in 4 minutes and held for 60 minutes taking readings every 15 minutes. Hold this load at 200% of the design load for 24 hours taking readings every 15 minutes for the first hour then every 60 minutes there after. Remove the load in increments of 50% of the service load; each decrement shall be removed in 4 minutes and held for 15 minutes. Reapply the loads in 25% increments of the service load up to 200% of the service load applying each increment in 4 minutes and holding for 15 minutes. Continue applying the load in increments of 25% of the service load up to 300% of the service load. Applying each increment in 4 minutes and holding for 60 minutes taking readings every 15 minutes. Hold the load at 300% for 2 hours taking readings at 15 minutes, 30 minutes, 45 minutes, 60 minutes, and 120 minutes. Remove the load in 75% decrements of the service load to 0% of the service load. Remove each decrement in 4 minutes and hold for 15 minutes. For purposes of stopping pile tests in progress, failure is achieved when the full extent of the extensometers is reached. If failure occurs before the load reaches 300 percent of the service load then the load shall be removed in 4 equal decrements allowing 15 minutes between decrements. Test apparatus shall not be removed from the pile until approval is received from the Government. To illustrate the loading and pile measurement procedures, a test schedule is provided following this paragraph.

COMPRESSION PILE TEST SCHEDULE

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
	0:00		
14.38	0:04	4 min.	25% service load. Hold each increment for 60 minutes.
	0:19	15 min.	
	0:34	15 min.	
	0:49	15 min.	
28.25	1:04	15 min.	50% service load.
	1:08	4 min.	
	1:23	15 min.	
	1:38	15 min.	
	1:53	15 min.	
43.13	2:08	15 min.	75% service load.
	2:12	4 min.	
	2:27	15 min.	
	2:42	15 min.	
	2:57	15 min.	
	3:12	15 min.	
57.50	3:16	4 min.	100% service load.
	3:31	15 min.	
	3:46	15 min.	
	4:01	15 min.	
	4:16	15 min.	
43.13	4:20	4 min.	75% service load. Hold each decrement for 15 minutes.
	4:35	15 min.	
28.75	4:39	4 min.	
	4:54	15 min.	50% service load.
14.38	4:58	4 min.	
	5:13	15 min.	25% service load.
0.00	5:17	4 min.	
	5:32	15 min.	0% service load. Hold each increment for 15 minutes.
14.38	5:36	4 min.	
	5:51	15 min.	
28.75	5:55	4 min.	50% service load.
	6:10	15 min.	

COMPRESSION PILE TEST SCHEDULE (Continued)

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
43.13	6:14	4 min.	75% service load.
	6:29	15 min.	
57.50	6:33	4 min.	100% service load.
	6:48	15 min.	
71.87	6:52	4 min.	125% service load. Hold each increment for 60 minutes.
	7:07	15 min.	
86.25	7:22	15 min.	150% service load.
	7:37	15 min.	
	7:52	15 min.	
	7:56	4 min.	
	8:11	15 min.	
	8:26	15 min.	
	8:41	15 min.	
100.63	8:56	15 min.	175% service load.
	9:00	4 min.	
	9:15	15 min.	
	9:30	15 min.	
115	9:45	15 min.	200% service load. Hold for 24 hours.
	10:00	15 min.	
	10:04	4 min.	
	10:19	15 min.	
	10:34	15 min.	
	10:49	15 min.	
	11:04	15 min.	
	12:04	60 min.	
	13:04	60 min.	
	14:04	60 min.	
	15:04	60 min.	
	16:04	60 min.	
	17:04	60 min.	
	18:04	60 min.	
19:04	60 min.		
20:04	60 min.		
21:04	60 min.		
22:04	60 min.		

COMPRESSION PILE TEST SCHEDULE (Continued)

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
	23:04	60 min.	
	24:04	60 min.	
	25:04	60 min.	
	26:04	60 min.	
	27:04	60 min.	
	28:04	60 min.	
	29:04	60 min.	
	30:04	60 min.	
	31:04	60 min.	
	32:04	60 min.	
	33:04	60 min.	
	34:04	60 min.	
86.25	34:08	4 min.	150% service load. Hold each decrement for 15 minutes.
	34:23	15 min.	
	34:27	4 min.	100% service load.
	34:42	15 min.	
28.75	34:46	4 min.	50% service load.
	35:01	15 min.	
0.00	35:05	4 min.	0% service load. End 1st Cycle.
	35:20	15 min.	Start 2nd Cycle.
14.38	35:24	4 min.	25% service load. Hold each increment for 15 minutes.
	35:39	15 min.	
28.75	35:43	4 min.	50% service load.
	35:58	15 min.	
43.13	36:02	4 min.	75% service load.
	36:17	15 min.	
57.50	36:21	4 min.	100% service load.
	36:36	15 min.	
71.87	36:40	4 min.	125% service load.
	36:55	15 min.	
86.25	36:59	4 min.	150% service load.
	37:14	15 min.	
100.63	37:18	4 min.	175% service load.
	37:33	15 min.	

COMPRESSION PILE TEST SCHEDULE (Continued)

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
115.00	37:37	4 min.	200% service load.
	37:52	15 min.	
129.38	37:56	4 min.	225% service load. Hold each increment for 60 minutes.
	38:11	15 min.	
	38:26	15 min.	
	38:41	15 min.	
	38:56	15 min.	
143.75	39:00	4 min.	250% service load.
	39:15	15 min.	
	39:30	15 min.	
	39:45	15 min.	
	40:00	15 min.	
158.13	40:04	4 min.	275% service load.
	40:19	15 min.	
	40:34	15 min.	
	40:49	15 min.	
	41:04	15 min.	
172.5	41:08	4 min.	300% service load. Hold for 2 hours.
	41:23	15 min.	
	41:38	15 min.	
	41:53	15 min.	
	42:08	15 min.	
	43:08	60 min.	
129.38	43:12	4 min.	225% service load. Hold decrement for 15 minutes.
	43:27	15 min.	
86.25	43:31	4 min.	150% service load.
	43:46	15 min.	
43.13	43:50	4 min.	75% service load.
	44:05	15 min.	
0.00	44:09	4 min.	0% service load.
	44:24	15 min.	End 2nd Cycle.

END OF TEST

Service design load = 57.5 Tons

TENSION PILE TEST SCHEDULE

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
6.25	0:04	4 min.	25% design load. Hold each increment for 60 minutes.
	0:19	15 min.	
	0:34	15 min.	
	0:49	15 min.	
	1:04	15 min.	
12.50	1:08	4 min.	50% design load.
	1:23	15 min.	
	1:38	15 min.	
	1:53	15 min.	
	2:08	15 min.	
18.75	2:12	4 min.	75% design load.
	2:27	15 min.	
	2:42	15 min.	
	2:57	15 min.	
	3:12	15 min.	
25.00	3:16	4 min.	100% design load.
	3:31	15 min.	
	3:46	15 min.	
	4:01	15 min.	
	4:16	15 min.	
18.75	4:20	4 min.	75% design load. Hold each decrement for 15 minutes.
	4:35	15 min.	
12.50	4:39	4 min.	50% design load.
	4:54	15 min.	
6.25	4:58	4 min.	25% service load.
	5:13	15 min.	
0.00	5:17	4 min.	0% service load. Hold each increment for 15 minutes.
	5:32	15 min.	
6.25	5:36	4 min.	25% service load.
	5:51	15 min.	
12.50	5:55	4 min.	50% service load.
	6:10	15 min.	
18.75	6:14	4 min.	75% service load.

TENSION PILE TEST SCHEDULE (Continued)

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
	6:29	15 min.	
25.00	6:33	4 min.	100% service load.
	6:48	15 min.	
31.25	6:52	4 min.	125% service load. Hold each increment for 60 minutes.
	7:07	15 min.	
	7:22	15 min.	
	7:37	15 min.	
	7:52	15 min.	
37.50	7:56	4 min.	150% service load.
	8:11	15 min.	
	8:26	15 min.	
	8:41	15 min.	
	8:56	15 min.	
43.75	9:00	4 min.	175% service load.
	9:15	15 min.	
	9:30	15 min.	
	9:45	15 min.	
	10:00	15 min.	
50.00	10:04	4 min.	200% service load. Hold for 24 hours.
	10:19	15 min.	
	10:34	15 min.	
	10:49	15 min.	
	11:04	15 min.	
	12:04	60 min.	
	13:04	60 min.	
	14:04	60 min.	
	15:04	60 min.	
	16:04	60 min.	
	17:04	60 min.	
	18:04	60 min.	
	19:04	60 min.	
	20:04	60 min.	
	21:04	60 min.	
	22:04	60 min.	
	23:04	60 min.	
	24:04	60 min.	

TENSION PILE TEST SCHEDULE (Continued)

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
	25:04	60 min.	
	26:04	60 min.	
	27:04	60 min.	
	28:04	60 min.	
	29:04	60 min.	
	30:04	60 min.	
	31:04	60 min.	
	32:04	60 min.	
	33:04	60 min.	
	34:04	60 min.	
37.50	34:08	04 min.	150% service load. Hold each decrement for 15 minutes.
	34:23	15 min.	
	34:27	04 min.	100% service load.
	34:42	15 min.	
12.50	34:46	04 min.	50% service load.
	35:01	15 min.	
0.00	35:05	04 min.	0% service load. End 1st Cycle.
	35:20	15 min.	Start 2nd Cycle.
6.25	35:24	04 min.	25% service load. Hold each increment for 15 minutes.
	35:39	15 min.	
12.50	35:43	04 min.	50% service load.
	35:58	15 min.	
18.75	36:02	04 min.	75% service load.
	36:17	15 min.	
25.00	36:21	04 min.	100% service load.
	36:36	15 min.	
31.25	36:40	04 min.	125% service load.
	36:55	15 min.	
37.50	36:59	04 min.	150% service load.
	37:14	15 min.	
43.75	37:18	04 min.	175% service load.
	37:33	15 min.	
50.00	37:37	04 min.	200% service load.
	37:52	15 min.	

TENSION PILE TEST SCHEDULE (Continued)

<u>Load (Tons)</u>	<u>Elapsed Time</u>	<u>Incremental Time</u>	<u>Remarks</u>
56.25	37:56	04 min.	225% service load. Hold each increment for 60 minutes.
	38:11	15 min.	
	38:26	15 min.	
	38:41	15 min.	
	38:56	15 min.	
62.50	39:00	4 min.	250% service load.
	39:15	15 min.	
	39:30	15 min.	
	39:45	15 min.	
	40:00	15 min.	
68.75	40:04	4 min.	275% service load.
	40:19	15 min.	
	40:34	15 min.	
	40:49	15 min.	
	41:04	15 min.	
75.00	41:08	4 min.	300% service load. Hold for 2 hours.
	41:23	15 min.	
	41:38	15 min.	
	41:53	15 min.	
	42:08	15 min.	
	43:08	60 min.	
56.25	43:12	4 min.	225% service load. Hold decrement for 15 minutes.
	43:27	15 min.	
37.50	43:31	4 min.	150% service load.
	43:46	15 min.	
18.75	43:50	4 min.	75% service load.
	44:05	15 min.	
0.00	44:09	4 min.	0% service load.
	44:24	15 min.	End 2nd Cycle.

END OF TEST

Service design load - 25 tons to be revised.

8.6 In the event of flooding of the excavation the pile load test will start again from the beginning of the test schedule unless the test pile was at or past the 200% design load on the test schedule then the Contracting Officer has the option of stopping the pile load test.

8.7 Additional Load Cycles. Any load cycles not accomplished in accordance with these specifications shall be redone at the direction of the Contracting Officer.

9. TEST MEASUREMENT. Measurements of compression and tension loads, deflections and settlements, of the test piles and reports on all test piles shall be made by the Contractor. The lengths of steel service piles as determined by the result of the load tests shall be determined by the Contracting Officer and furnished to the Contractor within 25 days after receipt of the last test report.

10. REPORTS. The report of the load tests shall include the following items where applicable:

10.1 General.

- (1) Project Identification
- (2) Location

10.2 Pile Installation Equipment.

- (1) Make, model, type, and size of hammer
- (2) Weight of hammer and ram
- (3) Stroke of ram
- (4) Rated energy and operating speed of hammer
- (5) Type and thickness of capblocks and pile cushions
- (6) Weight and dimensions of drive-cap and follower

10.3 Test and Support Piles.

- (1) Identification of test pile(s)
- (2) Type of piles

- (3) Pile material including basic specifications
- (4) Dimensions of pile
- (5) Pile weight as driven
- (6) Date cast (precast)
- (7) Concrete strength of pile when driven and test (approximate)
- (8) Reinforcement used
- (9) Effective prestress
- (10) Which piles vertical-batter
- (11) Degree of batter
- (12) Driven length
- (13) Embedded length
- (14) Tested length, and
- (15) Final elevation of piles butt referenced to fixed datum (identify datum)

10.4 Pile Installation - Test and Support.

- (1) Date driven
- (2) Date concreted (cast-in-place)
- (3) Pre-excavation or jetting - depth, size, pressures, duration, etc.
- (4) Operating of hammer during final driving
- (5) Driving log, blows per foot
- (6) Final penetration resistance, blows per inch
- (7) Description of special installation procedures used, and

(8) Notation of any unusual occurrences during installation

10.5 Pile Testing.

- (1) Date tested
- (2) Type of test pile
- (3) Type of load application apparatus
- (4) Number of support piles of each test
- (5) Instrumentation used to measure pile movement
- (6) Special testing procedures used
- (7) Temperature and weather conditions during test
- (8) Tabulation of all load-time-movement reading
- (9) Gages, scales, and reference points identified
- (10) Adjustment made to field data and explanation
- (11) Notation of any unusual occurrences during test, and
- (12) Test jack and other required calibration reports

11. REMOVAL OF PILES. After the pile tests are completed and accepted at each site, all support piles, test piles, and casing shall be pulled and removed from the test site. The remaining holes in the ground shall be filled to within 2 feet of the ground surface with the cement-bentonite-sand slurry specified in 02411-9.5. The upper 2 feet of the hole shall be filled with earth.

12. MEASUREMENT AND PAYMENT.

12.1 Furnishing and Driving Test Pile. No separate measurement will be made for furnishing and driving test piles. Payment for two (2) test piles and all costs in connection therewith will be included in the contract lump sum price for "Furnish and Drive Test Piles". Price and payment shall constitute full compensation for furnishing all plant, labor, equipment, and materials for furnishing and driving test piles, removal of piles and casings, backfilling the pile holes, and all operations incidental thereto.

12.2 Pile Test. Pile tests will be measured by the number of pile tests performed. Payment for pile tests will be made at the applicable contract unit prices for "First Compression Test", "All Over One (1) Compression Test", "First Tension Test", "All Over One (1) Tension Test". Price and payment shall include calibration of the extensometers, load cell, and hydraulic jack; placing and removing test loads and test equipment; and all operations incidental thereto.

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SECTION 02411 - STEEL SHEET PILING
PART 1 - GENERAL

1. SCOPE. The work covered by this section consists of furnishing all plant, equipment, labor and materials and performing all operations in connection with the installation of Contractor furnished steel sheet piling in accordance with these specifications and applicable drawings.

2. RELATED WORK SPECIFIED ELSEWHERE.

2.1 Metalwork Fabrication. Section 05501, Metalwork Fabrication, Machine Work, And Miscellaneous Provisions.

2.2 Temporary Retaining Structures. Section 02171.

2.3 Painting. Section 09940.

3. APPLICABLE PUBLICATIONS. The following American Society for Testing and Materials (ASTM) standards of the issues listed below and referred to thereafter by basic designation only from a part of this specification to the extent indicated by the references thereto:

A 36-94	Carbon Structural Steel
A 252-93	Seamless Steel Pipe Piles
A 328-90	Steel Sheet Piling
A 572-92a	High-Strength Low-Alloy Columbian-Vanadium Steels of Structural Quality

4. QUALITY CONTROL. Requirements for material tests, workmanship and other measures for quality control shall be as specified herein and in Section 05501.

4.1 Materials Tests. 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.

5. SUBMITTALS. The Contractor shall submit descriptions of sheet piling driving equipment, shop drawings, test procedures, test reports and certificates, sheet piling driving records and other submittals to the Contracting Officer for review and approval in accordance with Section 01300 - SUBMITTAL PROCEDURES. Submittals and associated work not satisfactory to the Contracting Officer will be rejected.

5.1 Equipment Descriptions. 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.

5.2 Cofferdam and Excavation Plan. Prior to beginning temporary retaining structures operations, and as a part of the excavation plan, the Contractor shall submit in writing to the Contracting Officer his proposed plan (cofferdam and excavation) to comply with the requirements of this section and Sections 02220, 02140, 02171 and all drawings or items specified elsewhere herein. The Contractor shall submit layout and detail drawings for constructing the cantilever cofferdams to include shop drawings for details of installation, type and lengths of sheet piling, steel piping, walkway, connection of butterfly gates, bracing and shoring as shown on the drawings. No excavation work shall be allowed to commence until the Contractor has fulfilled this requirement. The cofferdam sheeting system (PA 36/18 and PA 48/18) has been appropriately designed, however, all incidental features such as connections, walkway (100 psf live load), installation of butterfly gates, and any other incidental features, will require a design by a Louisiana registered Civil Engineer to be provided by the Contractor. Additionally, should a substitute piling system which is not an equal to the PA 36/18 and PA 48/18 system shown, in the opinion of the Contracting Officer, shall be substantiated by a Contractor provided design performed by a Louisiana registered Civil Engineer.

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

5.4 Materials Test Certificates. Materials test certificates shall be submitted for each shipment and identified with specific lots prior to installing piling. Identification data should include piling type, dimensions, section properties, heat analysis number, chemical composition, mechanical properties and mill identification mark.

5.5 Driving Records. 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.

6. QUALITY CONTROL.

6.1 General. The Contractor shall establish and maintain quality control for pile driving operations to assure compliance with contract specifications and maintain records

of his quality control for all construction operations including, but not limited to, the following:

- (1) Accurate location, alignment and plumbness of piling.
- (2) Full and proper engagement of interlocks.
- (3) Driving (pile hammer and rate of operation).
- (4) Final position; depth of penetration; tip and cut-off elevations.
- (5) Uplift and vertical tolerances after driving.
- (6) Location and elevation of any obstruction encountered and action directed by Contracting Officer.
- (7) Pulled piles and re-driving.
- (8) Length of cover plate and weld size.
- (9) Manufacture and driving of fabricated sections.
- (10) Cutting and Splicing (Welding).
- (11) Stockpiling and Storage.
- (12) Removal and disposal of damaged piles.

6.2 Reporting. The original and two copies of these records and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "Contractor Quality Control".

7. **DELIVERY, STORAGE AND HANDLING**. Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. The steel sheet piling shall have the manufacturer's logo and mill identification which corresponds to the certified tests reports stamped on each unspliced length in a minimum of two locations. Sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Storage of sheet piling should also facilitate required inspection activities.

PART 2 - MATERIALS

8. MATERIALS.

8.1 Steel for sheet piling shall conform to the requirements of ASTM A 328 (Fy = 39 ksi). Sheet piling, including special fabricated sections, shall be of the type and dimensions indicated on the drawings, and be of a design such that when in place they will be continuously interlocked throughout their entire length. All sheet piling shall be provided with standard pulling holes located approximately 4 inches below the top of the pile, unless otherwise shown or directed. Piling shall have the minimum properties equivalent to those listed in the following table and as specified.

8.2 Fabricated "PA 48/18" or "PA 36/18" Sections. Steel pipe piles in the PA36/18 and PA 48/18 systems shall conform to ASTM A252, Grade 3 (Fy = 45 ksi) with a minimum wall thickness of 0.50 inches. The outside diameters of the pipes in systems PA 36/18 and PA 48/18 are 36 inches and 48 inches, respectively.

8.3 The PA 36/18 and PA 48/18 are composite piling systems composed of two (2) AZ18 sheet piling between 36" and 48" outside diameter 0.5" wall pipes, respectively. Each pipe has interlocks welded at the centerline to receive the sheet piling.

PROPERTIES OF SECTIONS

Type of section	Nominal web thickness (inches)	Section modulus (in ³ /ft of wall)	Moment of inertia (in ⁴ /ft of wall)	Nominal section depth (inches)	Minimum interlock strength (lbs/lin in)	theoretical driving width (inches)
PZ 22	0.375	18.1	154.7	9	N/A	22
PZ 27	0.375	30.2	184.2	12	N/A	18
AZ 18	0.375	33.5	250.4	14.96	N/A	24.80
CZ 114	N/A	31.62	211.6	13.39	N/A	24.02
PSA 23	0.375	2.4	N/A	N/A	12,000	16
PA 36/18	N/A	74.76	1345.8	N/A	N/A	N/A
PA 48/18	N/A	110.89	2661.0	N/A	N/A	N/A

8.4 Substitute Sheet Pile Sections. The Contractor may elect to substitute for the sheet piling shown on the contract drawings and specified above, in accordance with paragraph 8.4.1 or 8.3.2, 8.3.3 and 8.3.4 below. No cold rolled steel sheeting shall be allowed as specified in Section 02171, paragraph 4.5.

8.4.1 At no additional cost to the Government, new Z-type steel sheet piling conforming to ASTM A 328, may be substituted for the specified section with prior approval, and if the proposed sections meet the minimum properties as specified in the previous table.

8.4.2 The PA 36/18 and PA 48/18 may be substituted with another system meeting the minimum properties, with prior approval. This substitution shall be submitted as a system substitution and not a component substitution. The submittal shall be accompanied by a design showing all deflections, stresses and verifying whether the system acts noncompositely or compositely. All stresses shall meet U.S. Army Corps of Engineers requirements. This design shall be prepared and stamped by a Professional Civil Engineer registered in the State of Louisiana (see paragraph 5.2).

8.4.3 When proposing substitute piling, the Contractor shall submit, for approval, the following items at no additional cost to the Government:

- 1) Complete shop drawings of the proposed sections showing the dimensions and details of the alternate piling including all fabricated and corner sections.
- 2) A complete layout of the alternate sheet piling. The P.I. Stations, I-wall transitions and Gate Monolith lengths shall remain unchanged.
- 3) The PA system shall be accompanied by a design as described in paragraphs 8.3.2 and 5.2.

8.4.4 All new sheet piling shall be provided in full lengths.

8.5 The PA 48/18 system may be used as a substitution for an equivalent length of the PA 36/18 system such that the economy of reuse is realized. This substitution shall conform with paragraph 8.3.3.

PART 3 - EXECUTION

9. INSTALLATION.

9.1 Placing and Driving.

9.1.1 Placing. Any excavation required within the area where sheet pilings are to be installed shall be completed prior to placing sheet pilings. Pilings shall be carefully located as shown on the drawings. Pilings shall be placed as true to line as possible. Suitable temporary wales, templates, or guide structures shall be provided to insure that the piles are placed and driven to the correct alignment. Piles shall be placed in a plumb

position with each pile interlocked with adjoining piles for its entire length, so as to form a continuous diaphragm throughout the length of each run of piling wall. Interlocks shall be properly engaged.

9.1.2 Driving. All piles shall be driven to the depths shown on the drawings and shall extend to the cut-off elevation indicated. A tolerance of 1-1/2 inches above or below the indicated cut-off elevation will be permitted. Pilings shall be driven by approved methods so as not to subject the pilings to damage and to insure proper interlocking throughout their lengths. Pile hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer. A protecting cap shall be employed in driving, when required, to prevent damage to the tops of pilings. Pilings damaged during driving or driven out of interlock shall be removed and replaced. All piles shall be driven without the aid of a water jet, unless otherwise authorized. Adequate precautions shall be taken to insure that piles are driven plumb. Sheet piling shall not be driven more than 1/4 inch per foot out of plumb in the plane of the wall nor more than 1/8-inch per foot out of plumb perpendicular to the plane of the wall. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb more than 1/4-inch per foot in the plane of the wall or 1/8-inch per foot perpendicular to the plane of the wall, the assembled piling shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/4 inch per foot of length. Unless specifically indicated otherwise, each run of piling wall shall be driven to grade progressively from the start and pilings in each run shall be driven alternately in increments of depth to the required depth or elevation. On each day of sheetpile driving, the Contractor shall stab only the number of piles that can be driven to grade by the end of the day, and all piling stabbed shall be driven to grade by the end of each working day except that the last two piles may remain tapered up to receive the next days piles. No pile shall be driven to a lower elevation than those behind it in the same run except when the piles behind it cannot be driven deeper or in areas where there will be wall penetrations or obstructions are encountered. In this case, piling will be allowed to remain above final grade until the obstruction is removed or the penetration is completed. Alternately, if it is determined that an obstruction cannot be removed, the Contractor shall make such changes in design alignment of the pile structure as may be deemed necessary by the Contracting Officer to insure the adequacy and stability of the structure. Payment for the additional labor and materials necessitated by such changes will be made at the applicable contract prices. If the piling next to the one being driven tends to follow below final grade, it may be pinned to the next adjacent piling. The Contractor is advised that buried stumps or similar debris may be encountered periodically on the sheet pile wall alignment and appropriate consideration should be given to hard driving conditions should they occur. Piles shall not be driven within 100 feet of concrete less than 7 days old nor within 30 feet of concrete less than 28 days old.

9.1.3 Emergency Locking System on Pile Driving Head. All pile driving equipment shall be equipped so as to prevent piles from falling when a single or multiple power failure occurs after the pile driving head is attached to the pile.

9.2 Cutting Off and Splicing. Piles extending above grade in excess of the specified tolerance, and which cannot be driven deeper, shall be cut off to the required grade. The Contractor shall also trim the tops of piles excessively battered during driving, when directed to do so, at no cost to the Government. Cut-offs shall become the property of the Contractor and shall be removed from the worksite. Piles driven below the elevations indicated for the top of piles and piles which, because of damaged heads, have been cut off to permit further driving and are then too short to reach the required top elevation, shall be extended to the required top elevation by welding an additional length, when directed, without cost to the Government. Should splicing of additional lengths be necessary, the splice shall consist of an approved butt joint with a weld that fully penetrates the web. Welded extensions shall be a minimum of 6 inches in length. Piles adjoining spliced piles shall be full length unless otherwise approved. When piles are to be driven in sections and spliced together, they shall be delivered on site in full lengths and cut for splicing only after delivery. Only those portions of the originally uncut pile shall be spliced together to form the final in-place full-length pile. Splices for these piles shall conform to the details shown on the drawings. Welding of splices shall conform to the requirements of Section 05501. Ends of pilings to be spliced together shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. The Contractor may cut holes in the piles for bolts, rods, drains or utilities at locations and of sizes shown on the drawings or as directed. All cutting shall be done in a neat and workmanlike manner. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the remaining metal. Holes, other than bolt holes, shall be reasonably smooth and of the proper size for rods and other items to be inserted.

9.3 Inspection of Driven Piling. The Contractor shall inspect the interlocked joints of driven pilings extending above ground. Pilings found to be damaged or driven out of interlock shall be removed and replaced.

9.4 Pulling and Redriving. The Contractor may be required to pull selected piles after driving, for test and inspection, to determine the condition of the piles. Any pile so pulled and found to be damaged to the extent that its usefulness in the structure is impaired shall be removed from the work and the Contractor shall furnish and drive a new pile to replace the damaged pile. Piles pulled and found to be in satisfactory condition shall be redriven.

9.5 Void Backfill. Where voids adjacent to the permanent steel sheet piling are induced by pile driving operations, or where voids exist due to pulling temporary piling, the Contractor shall backfill with a cement-sand-bentonite slurry by the tremie or pump down method such that any water in the void is not mixed with but displaced by the slurry. The slurry shall consist of one part cement, two parts bentonite, and three parts sand mixed with enough water to produce a slurry liquid enough to thoroughly fill voids but have no less than twelve pounds of solids per gallon.

9.6 Painting. Pilings that are to be painted, shall be painted in accordance with Section 09940. The unpainted portion of sheet piling which are to be embedded in concrete shall be free from surface contaminants such as oil, loose particles, or similar debris that would prohibit bonding between the concrete and sheet piling.

10. QUANTITIES. The estimated quantities of sheet piling listed in the unit price schedule of the contract to be furnished by the Contractor are given for bidding purposes only. Sheet piling quantities for payment shall consist of the square feet of piling acceptably installed. This quantity shall consist of the lengths of piles driven below the elevations indicated for the top of piles times the length along the wall alignment as shown on the drawings.

11. MEASUREMENT AND PAYMENT.

11.1 Measurement.

11.1.1 Driven Steel Sheet Piling. Measurement of driven steel sheet piling will be by the square foot of piling acceptably installed. The length of each pile driven will be measured to the nearest tenth of a linear foot and converted to square feet for payment purposes. Square footage shall be determined by multiplying the number of piles times the measured length acceptably driven below the cut-off elevation shown on the drawings times the theoretical driving width of the pile. The number of piles paid for shall not exceed the number of piles indicated on the approved shop drawings. When driven piles are directed to be cut off before reaching the penetration depth shown on the drawings, that portion cut off will be measured for payment on the basis of its total length, provided that the length is not greater than the difference between the total length of piles shown on the plans for that location and the length of piles driven below the cut-off elevation. No deduction will be made for holes cut for drains and utilities in computing the area of steel sheet pile structures. The portion of any pile driven below the tip elevation shown on the drawings will not be measured for payment unless overdriving is directed by the Contracting Officer.

11.1.2 Pulled Piles. Piles ordered pulled for inspection will be measured for payment by the square foot. Square footage will be determined by multiplying the

theoretical driving width of the pile by the length pulled above the cut-off elevation shown on the drawings. Redriving of such piles, when required, shall be measured for payment by the square foot, which shall be determined by multiplying the theoretical driving width of the pile by the length redriven below the cut-off elevation shown on the drawings.

11.1.3 Void Backfill. The sheet piling void backfill will not be measured for payment.

11.1.4 PA 36/18 and PA 48/18 Systems. PA 36/18 and PA 48/18 systems will not be measured for payment.

11.2 Payment.

11.2.1 Sheet Piling. Payment for steel sheet piling, acceptably installed and measured in accordance with paragraph 11.1, will be made at the applicable contract unit price per square foot for "Piling, Steel Sheet, Type PZ-22", "Piling, Steel Sheet, Type CZ-114", and "Piling, Steel Sheet, Type PSA-23". Price and payment shall constitute full compensation for fabricating, adding cover plates, neoprene, sealants painting, furnishing, handling, driving, cutting holes, backfilling voids, and all other work incidental to acceptably installing the steel sheet piling. No payment shall be made for fabricated corners, miscellaneous structural sections, bolts, sheet metal or any other incidental items, rather the cost for these items shall be included in the contract lump sum price for "Miscellaneous Metalwork".

11.2.2 Pulled Piles. Piles which are directed to be pulled for inspection and found to be in good condition will be paid for at the contract price for furnishing and driving the pile in its original position. The cost of pulling will be paid for at 25 percent of the contract unit price and when such piles are redriven, the cost of redriving will be paid for at 25 percent of the contract unit price for that portion of the pile acceptably redriven below the cut-off elevation. When piles are pulled and found to be defective and/or damaged due to Contractor negligence, no payment will be made for originally furnishing and driving such piles, nor for the operation for pulling. Piles replacing defective or damaged piles will be paid for at the applicable contract unit price. Piles which are pulled and found to be damaged through no fault of the Contractor, will be paid for at the applicable contract unit price for originally installing the damaged pile plus 25% of the applicable contract unit price for the cost of pulling. Subsequently, when a new pile is furnished and driven, it shall be paid for at the applicable contract unit price. There will be no payment for existing sheet piles which are removed for the purposes of connecting existing sections to new sheeting. Payment for these connections, bolts, structural sections, and all appurtenant structures shall be paid for under the contract lump sum price for "Miscellaneous Metalwork".

11.2.3 Void Backfill. No direct payment shall be made for void backfill, rather the cost of this item shall be paid for under the associated piling or cofferdam pay item.

11.2.4 PA 36/18 and PA 48/18 Systems. No separate payment shall be made for PA 36/18 and PA 48/18 systems, rather the cost of these systems shall be included under the applicable contract lump sum prices for "Cofferdam (East Monolith)" and "Cofferdam (West Monolith)", respectively.

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SECTION 02450 - DIVING SERVICES

PART 1 - GENERAL

1. SCOPE. The work provided for herein consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for diving services required for the installation of butterfly valves and other associated framing in the temporary cofferdam.

2. RELATED WORK SPECIFIED ELSEWHERE.

2.1 Miscellaneous Metalwork. Section 05500.

2.2 Metalwork Fabrication, Machine Work, and Miscellaneous Provisions. Section 05501.

2.3 Butterfly Valves. Section 11285.

3. SAFETY AND HEALTH REFERENCES. Equipment and procedures shall comply with the most stringent of the following for the particular application:

EM 385-1-1 (Sep 1996)	U.S. Army Corps of Engineers Safety and Health Requirements Manual
ER 385-1-86	Underwater Diving
NAVSEA 0994-LP-001-9010	US Navy Diving Manuals Volumes I and II
NAVSEA 0994-LP-001-0921	Safety practices of the Association of Diving Contractors

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

4. DESCRIPTION OF DIVING SERVICES.

4.1 General. The Contractor shall determine the methods used to accomplish the work, with full regard for safety and efficiency. The diving services to be performed include, but are not limited to, the installation of butterfly valves in the temporary cofferdam and any other associated framing.

4.2 Cutting and Welding. Cutting and welding procedures are specified in Section 05501.

5. DIVING CONDITIONS. Divers may be expected to encounter conditions which affect the ease or safety of operations. Some of the conditions which may be encountered are: reduced or zero visibility and unpredictable currents. The Contractor shall notify the Contracting Officer at least two days in advance of all dive operations.

6. DIVING EQUIPMENT.

6.1 General. All diving equipment shall be provided and used by the Contractor, including any special equipment which may be required for a given dive. Normal equipment shall be provided at no additional cost to the Government, and shall include: two way communications; air compressors and ancillary equipment; bailout bottles; harnesses; helmets; hoses; fuel; knives; hand and/or power tools; boarding ladders; rope; underwater cutting and welding equipment; etc. Special equipment shall include water-jet pumps and equipment. Despite the provision of bail-out bottles as normal equipment, the use of SCUBA for normal operations or emergencies shall not be allowed without the prior approval of the New Orleans District Diving Coordinator, Mr. Bill Clendenon. Mr. Clendenon can be contacted at (504) 862-1995.

6.2 Air Supply Requirements. Divers using surface-supplied air shall be provided with a primary air supply of at least 4.5 cubic feet per minute at all depths, and a backup air supply in compliance with Section 30.C.06 of EM 385-1-1.

7. MAINTENANCE OF DIVING EQUIPMENT.

7.1 General. All maintenance to be performed on diving equipment shall be performed on non-duty hours. All diving equipment shall be delivered to the worksite in a ready-to-operate condition, with the exception of loading fuel in the compressors. An equipment inspection, held jointly by the dive supervisor and the District Dive Coordinator or his authorized representative, shall be held before beginning diving operations. The form for this inspection shall be the "Safety Inspection Checklist for Diving Operations", which is available upon request.

7.2 Equipment Inspection. Any equipment which is brought to the worksite after the initial inspection shall also be inspected before being placed into service. This also applies to equipment removed from the worksite and returned at a later time.

7.3 Inspection Reports. Inspection reports shall include as a minimum, the following:

(1) The phase of work underway during the inspection. If other work is being performed by others in conjunction with the diving services, the phase of work for these other activities shall be included.

(2) The locations or areas where the safety inspections were performed.

(3) The results of the safety inspections, including the nature of deficiencies observed and corrective actions taken.

(4) The date and time of the inspection; and

(5) The signatures of the personnel responsible for the contents of the inspection report.

8. **SAFETY INDOCTRINATION.** The Contractor shall be responsible for initiating and maintaining a safety and health program which complies with the safety and health references described in paragraph 3. The program shall include initial indoctrination and continuing training for all employees who shall work under this contract.

9. **MEDICAL FITNESS TO DIVE.** The Contractor shall insure that all divers are medically fit to dive. This shall include a physical examination within the past twelve months, or following any physical injury which may affect the diver's fitness if such an injury has occurred within the past twelve months. The results of the physical examination shall be submitted as part of the Accident Prevention Plan specified in paragraph 16. In addition, the Dive Supervisor shall verify the divers' health and well-being at the dive site before allowing the diver to enter the water.

10. **DIVER'S EXPERIENCE AND QUALIFICATIONS.** Divers shall be experienced at the depth they will be diving, the task to be performed, and the equipment to be used. All divers, including standby divers, shall be qualified divers. Qualification shall consist of certification of successful completion of training by a recognized commercial diving school, or a certified record of past diving experience. Copies of the certification for each diver shall be provided by the Contractor prior to diving operations as part of the Accident Prevention Plan specified in paragraph 16.

11. **FOUR-MAN DIVE TEAMS.**

11.1 **General.** A four-man dive team shall be used whenever entry into confined spaces is not anticipated. The Contractor may provide additional personnel for his/her own convenience, at no additional cost to the Government.

11.2 **Requirements.** A four-man dive team consists of one dive supervisor, two divers, and one tender. Assignments may be rotated among the certified divers if desired

in order to limit bottom time for any given diver for safety reasons. If such rotation is to occur, this fact must be stated in the diving operations plan. One diver is designated as a stand-by diver, who shall be wearing his/her normal equipment (except helmet) and prepared to enter the water whenever the primary diver is in the water. The stand-by diver is not allowed to work as a tender or have any other duties while the primary diver is in the water. If the stand-by diver is required to enter the water, the dive supervisor may act as a tender.

11.3 Manning Levels. Manning levels for dive teams are listed in Appendix N of EM 385-1-1.

11.4 Diver Communication. The divers shall have two-way radio communication with the surface at all times.

12. SHIFT DIVING. Should the nature of the diving operations require twenty-four hour operations, the Contractor shall provide two complete dive teams for such operations. Each dive team shall work a maximum twelve-hour shift. No dive team personnel may work two or more consecutive shifts, including the dive supervisor. The second shift may use the same equipment used by the first shift. If separate equipment is used for the second shift, then an additional equipment inspection shall be performed.

13. DECOMPRESSION DIVES. Decompression dives will not be performed.

14. REQUIRED SAFETY EQUIPMENT FOR NON-DIVERS. Except for the diver in the water and the stand-by diver, all personnel on the dive team shall wear safety equipment (flotation aids, hard hats, hearing and eye protection, etc.) as required by EM 385-1-1. The stand-by diver is exempt from the requirement for flotation aids, but is required to wear a hard hat. When no divers are in the water, all dive team personnel shall wear the required safety equipment without exception.

15. FIRST AID AND CPR CERTIFICATION. All members of the dive team shall be certified to administer first aid and cardiopulmonary resuscitation (CPR). Copies of the certification cards shall be submitted as part of the Accident Prevention Plan.

16. ACCIDENT PREVENTION PLAN.

16.1 General. A written, comprehensive accident prevention plan for all diving activities shall be submitted to and approved by, the New Orleans District Diving Coordinator prior to commencing diving operations. A copy of the approved plan shall be maintained on-site during all dives.

16.2 Requirements. The accident prevention plan shall include the following at a minimum:

(1) An executed LMN Form 385-7-R (Jan 97), Administrative Plan (available upon request), see Appendix A and Section 28.B.01 of EM 385-1-1.

(2) Executed LMN 385-6-R and Form 385-43R (Jan 97), Activity Hazard Analysis (available upon request), see Figure 1-1 and Section 28.B.01 of EM 385-1-1.

(3) A proposed dive operations plan for each separate dive, in accordance with Section 30.A.13 of EM 385-1-1. Included shall be the procedure of dive operations when navigation traffic is present.

(4) Copies of the required First Aid and CPR certification, Diver Certifications and physical examination reports.

16.2.1 Sample. Paragraph 16.2(2) of the Accident Prevention plan refers to statement of the hazards which are anticipated in conjunction with the dive and what precautions will be taken to prevent these hazards from developing into an accident. A typical group of entries may be:

ACTIVITY HAZARD ANALYSIS	
Safety Hazard	Precautionary Action Taken
Air Compressor Failure	Back-up supply of either a bailout bottle or second hose connected to a separate air supply.
Diver Incurring Air Embolism	Dive crew must be trained in emergency first aid procedure. Local ambulance and Med-Evac Helicopter phone numbers are posted. Nearby hyperbaric chambers have been located and confirmed.
Decompression Sickness	Dives will not be performed at depths that required decompression.
Exposure to Current	Diver is tethered to floating plant and voice communications are maintained at all times when the surface supply system is used. Line-pull signals must be maintained when SCUBA is used.
Power Equipment Mishandling	Power equipment will be energized/deenergized only upon specific verbal request of diver or proper line-pull signals.

16.3 Submittal Requirements. One copy of the Contractor's "Safe Practices Manual" shall be submitted for review prior to the first dive. This manual will be retained by the District Diving Coordinator and will not be returned.

17. RECORD-KEEPING. A record of all dives shall be kept. In addition, a completion report shall be prepared following all inspection or survey dives, which includes a description of the condition of all items surveyed or inspected. Clear, readable sketches shall be prepared to supplement the text descriptions. A copy of each diver's log shall be submitted to the District Dive Coordinator or his/her authorized representative.

18. MEASUREMENT AND PAYMENT. No measurement will be made for diving services. Payment for diving services will be made at the contract lump sum for "Diving Services". Price and payment shall constitute full compensation for furnishing all plant, labor, equipment and materials necessary for preparing and submitting the diving plan, performing all operations necessary for diving services required for the installation of the butterfly valves and other associated framing in the temporary cofferdam and all operations incidental thereto, including compliance with the safety and health provisions, all as specified herein.

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SECTION 02935 - FERTILIZING AND SEEDING

1. **SCOPE.** The work provided for herein consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for finished dressing, fertilizing and seeding. All green areas, except as specified otherwise herein and as indicated on the drawings, shall be fertilized and seeded if affected by the Contractor's activities. Fertilizing and seeding of the new embankment and backfill areas shall be performed upon completion of embankment construction. The period of the year in which fertilizing and seeding operations are performed in a particular area will determine the seeding specification in Table I which shall be followed for that area. Only one of the seeding specifications listed in Table I will be required for each particular area.

2. QUALITY CONTROL.

2.1 **General.** The Contractor shall establish and maintain quality control for finished dressing, fertilizing, and seeding operations and shall maintain records of his quality control for all construction operations including, but not limited to, the following:

(1) **Preparation of Ground Surface.** Location and quality of finished dressing, including necessary clearing, filling, or dressing out of washes, smoothness and uniformity of surfaces, and time of year.

(2) **Fertilizing.** Quality of materials. Areas fertilized, quantity applied, and method of application.

(3) **Seeding.** Quality and type of seed, area covered, rate of application, quantity of seed used, and method of distribution.

2. **Reporting.** The original and two copies of these records of inspections and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

3. **AREAS TO BE TREATED.** Fertilizing and seeding shall be performed on all disturbed areas within the construction limits and on all newly constructed embankments, and as indicated on the drawings.

4. COMMENCEMENT, PROSECUTION, AND COMPLETION.

4.1 **General.** Preparation of the ground surface, fertilizing, and seeding operations shall be accomplished during the applicable growing season as specified in Table I.

4.2 Sequence of Work. The sequence of operations for work prescribed in this section, except mowing, shall be as follows:

- (1) Preparation of Ground Surface.
- (2) Fertilizing.
- (3) Seeding.
- (4) Watering.

Fertilizing and seeding operations shall commence upon completion of embankment construction.

5. MATERIALS.

5.1 Fertilizer. Fertilizer shall be uniform in composition and free-flowing. The fertilizer shall meet the requirements for commercial fertilizer and shall contain, per acre, 60 pounds of available nitrogen, 60 pounds of available phosphorous, and 60 pounds of available potash. The fertilizer shall be delivered to the site in bags or other convenient containers or delivered in bulk. If delivered in bags or containers, the fertilizer shall be fully labeled in accordance with the applicable state fertilizer laws and shall bear the name, tradename or trademark, and warranty of the producer. Should the commercial fertilizer be furnished in bulk, the Contractor shall furnish certified weight tickets and a certified quantitative analysis report, in triplicate, from a recognized testing laboratory certifying the nutrient ratio of the materials.

5.2 Soil for Repairs. For fill of areas to be repaired, soil shall be of a quality at least equal to that which exists in areas adjacent to the area to be repaired. Soil used shall be relatively free from roots, stones, and other materials that hinder grading, planting, and maintenance operations and shall be free from objectionable weed seeds and toxic substances.

5.3 Seed. Seed labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act shall be furnished by the Contractor. Seed shall be furnished in sealed, standard containers unless written exception is granted. Seed that is wet or moldy or that has been otherwise damaged in transit or storage will not be acceptable. The specifications for seeds shall conform to the following and be seeded at the following rates:

Table I

Seeding Period and Grasses to be Used	Minimum Purity%	Minimum Germination%	Minimum Rate Lbs/Acre
2 March - 14 September Hulled Common Bermuda Grass	95	87	50
15 September - 1 March Unhulled Common Bermuda Grass	95	87	50
Ryegrass	97	82	35

5.4 Water. Water shall be free from oil, acid, alkali, salt, and other substances harmful to growth of grass.

6. SUBMITTALS. The Contractor shall submit the following items in accordance with Section 01300, "SUBMITTAL PROCEDURES".

6.1 Fertilizer. Duplicate signed copies of invoices from suppliers shall be furnished. Invoices shall show quantities and percentage of nitrogen, phosphorus, and potash. Upon completion of the project, a final check of the total quantity of fertilizer used will be made against total area treated, and if minimum rates of application have not been met, an additional quantity of material sufficient to make up the minimum application rate shall be distributed as directed.

6.2 Seed. The Contracting Officer shall be furnished duplicate signed copies of statements certifying that each container of seed delivered is labeled in accordance with the Federal Seed Act and is at least equal to the requirements specified in paragraph 5.3. This certification shall be obtained from the supplier and shall be furnished on or with all copies of seed invoices.

7. PREPARATION OF GROUND SURFACE.

7.1 General. Equipment, in good condition, shall be provided for the proper preparation of the ground and for handling and placing all materials. Equipment shall be approved by the Contracting Officer before work is started.

7.2 Clearing. Prior to grading and tilling, vegetation and debris that may interfere with fertilizing and seeding operations shall be mowed, grubbed, and raked; and shall be disposed of satisfactorily, as specified in 02210.

7.3 Grading. Previously established grades and slopes shall be maintained in a true and even condition on the areas to be fertilized and seeded. Necessary repairs to

previously graded areas shall be repaired with material as described in paragraph 5.2. The material shall be placed and compacted in accordance with SECTION 02225. Where grades have not been established, the areas shall be graded as shown, and all surfaces shall be left in a true and even condition.

7.4 Tillage. After the areas required to be fertilized and seeded have been brought to the specified grades, the soil shall be tilled to a depth of at least 2-inches by plowing, disking, harrowing, or other approved method until the condition of the soil is acceptable. The work shall be performed only during periods when, beneficial results are likely to be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. Undulations or irregularities in the surface to be fertilized and seeded shall be dressed before the next specified operation.

8. APPLICATION OF FERTILIZER. Fertilizer, as specified in paragraph 5.1, shall be distributed uniformly over areas to be seeded and shall be incorporated into the soil to a depth of at least 2-inches by disking, harrowing, or other acceptable methods. Incorporation of fertilizer may be part of the operation specified in paragraph 8.4.

9. SEEDING.

9.1 General. The applicable seed shall be sown at the rate and time as indicated in Table I, unless otherwise directed in writing. A satisfactory method of sowing shall be employed, using approved mechanical power-drawn seeders, mechanical hand- seeders, broadcast-seeders, or other approved methods. When delays in operations extend the work beyond the most favorable planting season for the species designated, or when conditions are such by reason of drought, high winds, excessive moisture, or other factors that satisfactory results are not likely to be obtained, work shall be halted and resumed only when conditions are favorable or when approved alternative or corrective measures and procedures have been effected. If inspection during or after seeding operations indicates that areas have been left unplanted or other areas have been skipped, additional seed shall be applied.

9.2 Broadcast Seeding. If the broadcast method of seeding is used, seed shall be broadcast with approved sowing equipment and distributed uniformly over designated areas. Seed shall be covered to an average depth of ¼-inch by brush harrow, spike-tooth harrow, chain harrow, cultipacker, or other approved devices. Seed shall not be broadcast during windy weather.

9.3 Damage To Seeding. The Contractor shall be fully responsible for any damage to the seeded areas caused by his operations. Areas that become damaged as a result of poor workmanship or failure to meet the requirements of the specifications may be ordered repaired and reseeded to specification requirements, without additional cost to the Government.

10. MOWING. The seeded areas shall be mowed with approved mowing equipment to a height of 3 to 4-inches whenever the height of vegetation becomes 6 to 8-inches. When the amount of cut grass is heavy, it shall be removed to prevent destruction of the underlying turf. The Contractor shall perform periodic and final grass mowing within the limits of work for the duration of this contract.

11. MEASUREMENT. No measurement will be made for fertilizing and seeding satisfactorily performed. No measurement will be made for placement of material required for any necessary repairs as described in paragraph 9.3.

12. PAYMENT. Payment for fertilizing and seeding, measured as described in paragraph 11 and other incidental work, except disposal of debris, will be made at the contract lump sum price for "Fertilizing and Seeding". Price and payment shall constitute full compensation for furnishing all plant, labor, materials and equipment and performing the work, including any necessary repairs, in accordance with these specifications.

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SECTION 03101 - FORMWORK FOR CONCRETE

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SECTION 03101 - FORMWORK FOR CONCRETE

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all materials and equipment and performing all labor for the forming of concrete in the structures included in these specifications.

2. QUALITY CONTROL.

2.1 **General.** Forms, embedded items, ties and other accessories as specified in paragraph 7.2, shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer that they are ready to receive concrete. Inspection of forms for concrete shall include a detailed evaluation of leakage control measures, type and application of release agent, and form cleanliness to avoid dirt transfer to the concrete.

2.2 **Reporting.** The results of each inspection shall be reported in writing and shall include, but not be limited to, the following:

- (1) Removal of extraneous material from forms.
- (2) Check of joints for mortar tightness.
- (3) Type of form material required for the concrete finish.
- (4) Falsework and/or bracing.
- (5) Alignment, tolerances, and dimensions.
- (6) Chamfering.
- (7) Form coating.

The original and two copies of these reports, as well as corrective action taken, shall be furnished to the Government daily. The format of these reports shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

3. RELATED WORK SPECIFIED ELSEWHERE.

3.1 **Cast-In-Place Structural Concrete.** Section 03301.

3.2 **Reinforcing Steel.** Section 03210.

3.3 Expansion Joints. Section 03150.

3.4 Contractor Quality Control. Section 01440.

4. APPLICABLE PUBLICATIONS. The following publications, referred to thereafter by basic designation only, form a part of this specification to the extent indicated:

4.1 American Concrete Institute (ACI) Standards.

ACI 347R-94 Formwork for Concrete

4.2 U. S. Department of Commerce, National Institute of Standards and Technology (NIST). Product Standards.

PS 1-83 Construction and Industrial Plywood

5. SUBMITTALS.

5.1 Shop Drawings. Drawings and design computations for all formwork (including prefabricated forms) shall be submitted in accordance with Section 01300 - SUBMITTAL PROCEDURES, at least 45 days before either fabrication on site or before delivery of prefabricated forms. The drawings and data submitted shall include the type, size, quantity and strength of all materials of which the forms are to be made; the plan for jointing of facing panels; details affecting the appearance; type and location of form ties; and the assumed design values and loading conditions.

5.2 Manufacturer's Literature. Manufacturers literature shall be submitted for plywood, concrete form hard board, form accessories, prefabricated forms, and form coating proposed for use.

PART 2 - PRODUCTS

6. DESIGN. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the Contractor. The submittals shall include the member properties, allowable material stresses and form dimensions. The computations shall include the design of individual members for stress and deflection. Load diagrams are also required. The approval of the design is required before any concrete is placed. The formwork shall be designed for loads, lateral pressure and allowable stresses in accordance with Chapter 2 of ACI 347R. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall have sufficient rigidity to maintain specified tolerances. For Class A finish, the design shall be made to limit deflection of facing material between studs as well as deflection of studs and walers to 0.0025 times the span.

7. MATERIALS.

7.1 Forms and Finishes. Forms shall be fabricated with facing materials that produce the specified construction tolerance requirements of 03301-5.2 and the surface requirements of 03301-5.3.

7.1.1 Class "A" Finish. This class of finish shall apply to all exterior formed surfaces not covered by backfill. The form facing material shall be composed of new, well-matched tongue and groove lumber or new plywood panels conforming to NIST Product Standard PS-1, Grade B Concrete Form, Class I; High Density Overlay, all Exterior Type. The Grade B Side shall be stamped as such and shall face the concrete.

7.1.4 Class "D" Finish. This class of finish shall apply to all unexposed surfaces. The sheathing may be of wood or steel.

7.2 Form Accessories. Ties and other similar form accessories to be partially or wholly embedded in the concrete shall be of a commercially manufactured type. After the ends or end fasteners have been removed, the embedded portion of metal ties shall terminate not less than 2-inches from any concrete surface either exposed to view or exposed to water. Plastic snap ties may be used in locations where the surface will not be exposed to view. Form ties shall be constructed so that the ends or end fasteners can be removed without spalling the concrete. Safety factors for form ties, anchors and hangers shall comply with the standards of ACI 347R, Table 2.4. The use of tapered ties is not allowed.

7.3 Form Coating. Form coating shall be a commercial formulation of satisfactory and proven performance that will not bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds.

PART 3 - EXECUTION

8. INSTALLATION. Forms shall be mortar tight, properly aligned and adequately supported to produce concrete surfaces meeting the surface requirements of 03301-5.3, and conforming to construction tolerances of 03301-5.2. Where concrete surfaces are to be permanently exposed to view, joints in form panels shall be arranged to provide a pleasing appearance. Where forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface so as to obtain accurate alignment of the surface and to prevent leakage of mortar. All possible efforts shall be made to minimize the occurrence of butt joints in the forms. Forms shall not be reused if there is any evidence of surface wear and tear or defects which would impair the quality of the surface. All surfaces of forms and embedded materials shall be cleaned of any mortar from previous concreting and of all other foreign material before concrete is placed in

them. The failure of a form or any system used in conjunction with a form in the placement of a floodwall that in any way affects the integrity of the form or tolerance of the floodwall shall necessitate the immediate removal of the form and any concrete placed prior to the failure. All costs for salvage of reinforcing, and for removal and clean up shall be borne by the Contractor. Any form material removed shall not be returned to service until it has been satisfactorily shown to the Contracting Officer, that the cause for the failure has been corrected and proper steps have been added to the Contractor's Quality Control Plan to prevent a recurrence.

9. **CHAMFERING.** All exposed joints, edges and external corners shall be chamfered by molding placed in the forms unless the drawings specifically state that chamfering is to be omitted or as otherwise specified. When wood chamfering strips do not prevent leakage of paste or water, an elastomeric type shall be employed. Chamfered joints shall not be permitted where earth or rockfill is placed in contact with concrete surfaces. Chamfered joints shall be terminated twelve inches outside the limit of the earth or rockfill so that the end of the joints will be clearly visible.

10. **COATING.** Forms for exposed or painted surfaces shall be coated with form oil or a form-release agent before the form or reinforcement is placed in final position. The use of waste oil or used oil as a form-release agent or form oil is prohibited. The coating shall be used as recommended in the manufacturer's printed or written instructions. Forms for unexposed surfaces may be wet with water in lieu of coating immediately before placing concrete, except that in cold weather with probable freezing temperatures coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete. Coatings that discolor concrete or are incompatible with their concrete materials are prohibited.

11. **REMOVAL.** Forms shall not be removed without approval and all removal shall be accomplished in a manner which will prevent injury to the concrete. Forms shall not be removed before the expiration of the minimum time indicated in paragraph 11.2, except as otherwise directed or specifically authorized. When conditions of the work are such as to justify the requirement, forms will be required to remain in place for a longer period.

11.1 **Inspection of Concrete Placement.** The Contractor shall place the first monolith in its entirety and remove the formwork as indicated in paragraph 11 prior to placing concrete in any other monolith. The Contractor shall notify the Contracting Officer's Representative immediately after the forms are removed so that an on-site inspection of the concrete work can be made. No patching or repair shall be permitted until after the inspection is made. Curing operations shall not be altered. Recommendations, as a result of the inspection, shall be made part of the Contractor's Quality Control for all future concrete work.

11.2 Unsupported Concrete. Formwork for walls, columns, sides of base slabs and other vertical type forms not supporting the weight of concrete shall not be removed in less than 18 hours of cumulative time, not necessarily consecutive, after concrete placement is completed during which the temperature of the air surrounding the concrete is above 50 degrees F.

12. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for formwork and all costs in connection therewith shall be included in the contract prices for the items of work to which the work is incidental.

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SECTION 03150 - EXPANSION AND CONSTRUCTION JOINTS

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SECTION 03150 - EXPANSION AND CONSTRUCTION JOINTS

PART 1 - GENERAL

1. SCOPE. This section covers the materials, techniques and workmanship requirements for forming expansion and construction joints in concrete

2. RELATED WORK SPECIFIED ELSEWHERE. Major requirements for concrete work are specified in Section 03301, "CAST-IN-PLACE STRUCTURAL CONCRETE".

3. APPLICABLE PUBLICATIONS. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

3.1 American Society for Testing and Materials (ASTM) Standards (with corresponding U.S. Army Corps of Engineers Handbook for Concrete and Cement (CRD) Specifications where indicated.)

D 1751-83
(CRD-C 508) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non- extruding and Resilient Bituminous Types)

D 1752-83
(CRD-C 509) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

3.2 U.S. Army Corps of Engineers Handbook for Concrete and Cement (CRD) Specifications.

CRD-C 513-74 Rubber Waterstops

CRD-C 572-74 Polyvinylchloride Waterstop

4. QUALITY ASSURANCE.

4.1 Materials Tests for Non-Metallic Waterstops. Samples of materials and splices as required in paragraph 5.2 shall be visually inspected and tested by and at the expense of the Government for compliance with CRD-C 513 or CRD-C 572, as applicable. If a sample fails to meet the specification requirements, new samples shall be provided and the cost of retesting will be deducted from payments due the Contractor at the rate of \$920.00 (for materials complying with CRD-C-513) or \$810.00 (for materials complying with CRD-C-572) per material sample retested and \$150.00 per splice sample retested.

NOTE: TESTING OF NON-METALLIC WATERSTOPS WILL BE PERFORMED BY THE WATERWAYS EXPERIMENT STATION (WES).

4.2 Qualifications of Splicing Procedures for Waterstops. Procedures for splicing waterstops shall be demonstrated in the presence of the Contracting Officer for approval. Procedures and performance qualifications for splicing non-metallic waterstops shall be demonstrated by the manufacturer at the factory and the Contractor at the job site by each making three splice samples of each size and type of finished waterstops for inspection, testing and subsequent approval.

5. SUBMITTALS.

5.1 Test Reports. Certified manufacturer's test reports shall be provided for premolded expansion-joint filler strips and waterstops to verify compliance with the applicable specification.

5.2 Samples. The Contractor shall submit waterstop materials and splice samples for inspection and testing and shall identify each so as to indicate manufacturer, type of material, size and quantity of material and shipment represented. Each material sample shall be a piece not less than 12-inches long cut from each 200-feet of finished waterstop furnished, but not less than a total of 4 linear feet of each type and size furnished. For spliced segments of waterstops to be installed in the work, one splice sample of each size and type for every 50 splices made in the factory and every 10 splices made at the job site shall be furnished for inspection and testing. The splice samples shall be made using straight run pieces with the splice located at the mid-length of the sample and finished as required for the installed waterstop. The total length of each splice sample shall be not less than 12-inches long. Test samples shall be furnished at least 60 days prior to the installation of waterstops in the work.

PART 2 - PRODUCTS

6. MATERIALS.

6.1 Premolded Expansion Joint Filler Strips. Premolded expansion joint filler strips shall conform ASTM D 1751 or ASTM D 1752, Type I or resin impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

6.2 Non-Metallic Waterstops. Rubber waterstops shall conform to CRD-C 513. Polyvinylchloride waterstops shall conform to CRD-C 572.

PART 3 - EXECUTION

7. INSTALLATION. Joint locations and details, including materials and methods of installation of joint fillers and waterstops, shall be as specified, shown on the drawings and as directed. In no case shall any fixed metal be continuous through an expansion joint.

7.1 Construction and Expansion Joints.

7.1.1 The construction joints shall be provided with a keyway wherever shown on the drawings. Unless a keyway is specifically shown, the construction joint shall be plain faced.

7.1.2 When concrete is being placed at a point where a construction joint is to be made, the showing edge of the joint shall be brought to a neat line, by being either formed, trimmed or finished.

7.1.3 Concrete surfaces to which other concrete is to be bonded shall be prepared for receiving the next lift or adjacent concrete by cleaning with either air-water cutting, sandblasting, or high pressure water jet. The surfaces of construction joints shall be kept continuously wet for the first 12 hours during the 24-hour period prior to placing concrete.

7.1.4 At least two (2) hours shall elapse after depositing concrete in the columns or walls before depositing in beams, girders or slabs supported thereon. Beams, girders, brackets, column capitals and haunches shall be considered as part of the floor system and shall be placed integrally therewith.

7.1.5 All construction joints shall be finished flush unless chamfer grooves are called for on the drawings.

7.1.6 Expansion Joints. Premolded filler strips shall be accurately positioned and secured against displacement to clean, smooth concrete surfaces. Material used to secure premolded fillers to concrete shall not harm the concrete. The groove shall be thoroughly cleaned of all laitence, curing compound, foreign materials, and protrusions of hardened concrete. Any dust shall be blown out of the groove with oil-free compressed air.

7.2 Waterstops. Waterstops shall be installed in joints as shown on the drawings or as otherwise directed. Waterstops shall be carefully and correctly positioned during installation to eliminate faulty installation that may result in joint leakage. Adequate provision shall be made to support and protect the waterstops during the progress of the work. Any waterstop punctured or damaged shall be replaced or repaired at the Contractor's expense. The concrete shall be thoroughly consolidated in the vicinity of the waterstop. Suitable guards shall be provided to protect exposed projecting edges and ends of partially embedded waterstops from damage when concrete placement has been discontinued.

7.3 Splices. Joints in waterstops shall be spliced together by qualified splicers using the approved splicing procedures to form a continuous watertight diaphragm.

7.3.1 Non-Metallic Waterstops. All splices shall be made on a bench in a temporary shop provided at the site of the installation or at the manufacturer's plant. A miter guide and portable power saw shall be used to cut the ends to be joined to insure good alignment and contact between joined surfaces. The continuity of the characteristic features of the cross section of the waterstop shall be maintained across the splice.

7.3.2 Rubber Waterstops. Splices shall be vulcanized in accordance with the manufacturer's recommendations.

7.3.3 Polyvinylchloride Waterstops. Splices shall be made by heat sealing the adjacent surfaces in accordance with the manufacturer's written recommendations, approved procedure. A thermostatically controlled electric source of heat shall be used to make all splices. The correct temperature at which splices should be made will differ with the material concerned but the applied heat should be sufficient to melt but not char the plastic. Waterstops shall be reformed at splices with a remolding iron with ribs or corrugations to match the pattern of the waterstop. The spliced area, when cooled and bent by hand in as sharp an angle as possible, shall show no sign of separation.

8. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for construction or expansion joints, and waterstops as specified in this section. All costs in connection therewith shall be included in the contract prices for the items to which the work is incidental thereto.

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SECTION 03210 - REINFORCING STEEL

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SECTION 03210 - REINFORCING STEEL

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all equipment, materials and labor for providing and placing steel bars, steel welded wire fabric, and accessories for concrete reinforcement.

2. QUALITY CONTROL.

2.1 **Materials Tests.** The Contractor shall have required material tests performed by an approved laboratory to demonstrate that the materials are in conformance with the specifications. Tension tests shall be performed on full cross section specimens in accordance with ASTM E 8, using a gage length that spans the extremities of specimens with welds or sleeves included. Tests shall be at the Contractor's expense.

2.2 **General.** The Contractor shall establish and maintain quality control for proper installation of all work covered in this section to assure compliance with contract specifications and maintain records of his quality control for all construction operations including but not limited to the following:

- (1) Minimum concrete cover of reinforcement steel.
- (2) Number, size, and location of placement.
- (3) Maintain adequate splicing lengths where required.

2.3 **Reporting.** The original and two copies of these records and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

3. RELATED WORK SPECIFIED ELSEWHERE.

3.1 **Formwork.** Section 03101, "FORMWORK FOR CONCRETE".

3.2 **Joints.** Section 03150, "EXPANSION AND CONSTRUCTION JOINTS".

3.3 **Concrete.** Section 03301, "CAST-IN-PLACE STRUCTURAL CONCRETE".

4. **APPLICABLE PUBLICATIONS.** The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

4.1 American Concrete Institute (ACI) Standards.

ACI 318-89	Building Code Requirements for Reinforced Concrete
SP-66	ACI Detailing Manual - 1980

4.2 American Society for Testing and Materials (ASTM) Standards.

A 615-87a	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
E 8-88	Tension Testing of Metallic Materials

5. SUBMITTALS.

5.1 Shop Drawings. The Contractor shall prepare and submit complete shop drawings to the Contracting Officer for approval in accordance with Section 01300 - SUBMITTAL PROCEDURES. Shop drawings shall include the details of bar supports including types, sizes, spacing and sequence.

5.2 Test Reports. Certified test reports of reinforcement steel showing that the steel complies with the applicable specifications shall be submitted to the Contracting Officer. Reports shall be furnished for each steel shipment and shall be identified with specific lots prior to use of the steel in the work.

5.5 Disposition Records. A system of identification which shows the disposition of specific lots of approved materials in the work shall be established and submitted to the Contracting Officer before completion of the contract.

6. MATERIALS.

6.1 Reinforcing Steel. Billet-steel bars shall conform to ASTM A 615, Grade 60 for bar sizes 3 through 11, including the following requirements:

(1) Tension test specimens shall be bars of full cross section as rolled for all sizes.

(2) The bend test requirements shall be based upon 180 degree bends of full size bars for all grades of steel. The bend diameters for bend tests shall be as indicated in the following table and shall be measured on the inside of bars:

<u>Bar Size</u>	<u>Maximum Diameter</u>
#3, #4 and #5	4 bar diameters
#6, #7 and #8	5 bar diameters
#9, #10 and #11	5 bar diameters

6.2 Reinforcing Steel Accessories.

6.2.1 Bar Supports. Bar supports shall conform to ACI Publication SP-66. Bar supports for formed surfaces exposed to view or to be painted shall be plastic protected wire, stainless steel, or precast concrete supports. Precast concrete supports shall be wedge-shaped, not larger than 3½-inches x 3½-inches, of thickness equal to that indicated for concrete cover, and shall have an embedded hooked tie-wire for anchorage. If formed surface is exposed to view, precast concrete supports shall be the same quality, texture, and color as the finish surface.

6.2.2 Wire Ties. Wire ties shall be 16-gage or heavier black annealed wire.

7. INSTALLATION. Reinforcement steel and accessories shall be placed as specified and as shown on contract drawings and approved shop drawings. Placement details of steel and accessories not specified or shown on the drawings shall be in accordance with ACI Publication SP-66 or ACI 318. Reinforcement shall be fabricated to shapes and dimensions shown, placed where indicated within the specified tolerances, and adequately supported during concrete placement. At the time of concrete placement all steel shall be free from loose, flaky rust, scale (except tight mill scale), mud, oil, grease, or any other coating that might reduce the bond with the concrete.

7.1 Hooks and Bends. Reinforcement bars may be mill or field bent. All bars shall be bent cold unless otherwise authorized. No bars partially embedded in concrete shall be field bent unless indicated on the drawings or otherwise authorized. All hooks or bends shall be in accordance with ACI 318.

7.2 Placing Tolerances.

7.2.1 Spacing of Bars. Bars shall be spaced as indicated on the drawings or as otherwise directed. The spacing between adjacent bars and the distance between layers may not vary from the indicated position by more than one bar diameter nor more than 1-inch, whichever is less.

7.2.2 Concrete Cover. The minimum and maximum concrete cover of main reinforcement steel shall be as indicated on the drawings. The concrete tolerances shall be as follows:

<u>Minimum Cover</u>	<u>Maximum Cover</u>
6" (15.2 cm)	6-1/2" (16.5 cm)
4" (10.2 cm)	4-3/8" (11.1 cm)
3" (7.6 cm)	3-3/8" (8.6 cm)
2-1/2" (6.3 cm)	2-3/4" (7.0 cm)
2" (5.1 cm)	2-1/4" (5.7 cm)
1-1/2" (3.8 cm)	1-3/4" (4.4 cm)
1" (2.5 cm)	1-1/8" (2.9 cm)
3/4" (1.9 cm)	7/8" (2.2 cm)

7.3 Splicing. Splices in reinforcement steel shall be as specified, shown on the drawings or as directed by the Contracting Officer. Bars may be spliced at alternate or additional locations at no additional cost to the Government, subject to the approval of the Contracting Officer. Except as provided herein, all splicing shall be in accordance with approved splicing procedures and the requirements of ACI 318. Bars larger than No. 11 shall be spliced with mechanical connectors or butt welded in accordance with ACI 318. The splice shall be submitted to the Contracting Officer for approval.

7.3.1 Lap Splices. Lap Splices shall be used only for bars smaller than size #14. Bar laps may be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete, but shall not be spaced farther apart than one-fifth the required length of lap nor 6- inches. Lengths of laps for bars shall conform to the requirements of ACI 318, except when otherwise shown on the drawings.

8. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for reinforcement bars and accessories. Payment for furnishing and placing reinforcement bars and accessories shall be included in the contract prices for the items of work to which the reinforcement bars and accessories are incidental.

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SECTION 03301 - CAST-IN-PLACE STRUCTURAL CONCRETE

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SECTION 03301 - CAST-IN-PLACE STRUCTURAL CONCRETE

PART 1 - GENERAL

1. SCOPE. The work covered by this section consists of furnishing all plant, labor, materials, and performing all operation in connection with furnishing and placing cast-in-place concrete as indicated on drawings and specified herein.

2. RELATED WORK SPECIFIED ELSEWHERE.

2.1 Expansion and Construction Joints. Section 03150

2.2 Reinforcing Steel. Section 03210

2.3 Formwork for Concrete. Section 03101

3. APPLICABLE PUBLICATIONS. The following publications referred to thereafter by basic designation only, form a part of this specification to the extent indicated:

3.1 American Concrete Institute (ACI) with corresponding CRD standard indicated where available.

211.1-91	(CRD-C99)	Selecting Proportions for Normal, Heavyweight and Mass Concrete
305R-91		Hot Weather Concreting
318-89 Rev 1992		Building Code Requirements for Reinforced Concrete

3.2 American Society for Testing and Materials (ASTM) with corresponding CRD standard indicated where available.

C 29-91a	(CRD-C 106)	Unit Weight and Voids in Aggregate
C 31-91	(CRD-C 11)	Making and Curing Concrete Test Specimens in the Field
C 33-93	(CRD-C 133)	Concrete Aggregates
C 39-93a	(CRD-C 14)	Compressive Strength of Cylindrical Concrete Specimens

C 42-94 (CRD-C 27)	Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
C 70-79 (CRD-C 111)	Surface Moisture in Fine Aggregate
C 94-94 (CRD-C 31)	Ready-Mixed Concrete
C 127-88 (CRD-C 107)	Specific Gravity and Absorption of Coarse Aggregate
C 128-93 (CRD-C 108)	Specific Gravity and Absorption of Fine Aggregate
C 136-95a (CRD-C 103)	Sieve Analysis of Fine and Coarse Aggregates
C 143-90a (CRD-C 5)	Slump of Hydraulic Cement Concrete
C 150-95 (CRD-C 201)	Portland Cement
C 171-92 (CRD-C 310)	Sheet Materials for Curing Concrete
C 172-90 (CRD-C 4)	Sampling Freshly Mixed Concrete
C 192-90a (CRD-C 10)	Making and Curing Concrete Test Specimens in the Laboratory
C 231-91b (CRD-C 41)	Air Content of Freshly Mixed Concrete by the Pressure Method
C 260-94 (CRD-C 13)	Air-Entraining Admixtures for Concrete
C 309-94 (CRD-C 304)	Liquid Membrane-Forming Compounds for Curing Concrete
C 494-92 (CRD-C 87)	Chemical Admixtures for Concrete
C 566-89 (CRD-C 113)	Total Moisture Content of Aggregate by Drying
C 595M-95 (CRD-C 203)	Blended Hydraulic Cements
C 597-83 (CRD-C 51)	Pulse Velocity Through Concrete
C 618-94a (CRD-C 255)	Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

C 803-90 (CRD-C 59)	Penetration Resistance of Hardened Concrete
C 805-94 (CRD-C 22)	Rebound Number of Hardened Concrete
C 1017-92 (CRD-C 88)	Chemical Admixtures for Use in Producing Flowing Concrete
C 1064-86 (CRD-C 3)	Temperature of Freshly Mixed Portland Cement Concrete
C 1077-95a (CRD-C 553)	Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
C 1107-91a (CRD-C 621)	Packaged Dry, Hydraulic Cement Grout (Non-Shrink)
D 75-87 (CRD-C 155)	Sampling Aggregates

3.3 Concrete Plant Manufacturer's Bureau (CPMB).

9th Revision (CRD-C 514)	Concrete Plant Standards (1 Jan 90)
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3.4 National Institute of Standards and Technology (NIST).

Handbook 44 1995 Edition	Specifications, Tolerance and Other Technical Requirements for Commercial Weighing and Measuring Devices
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3.5 U.S. Army Corps of Engineers Handbook for Cement and Concrete (CRD-C).

94-95	Surface Retarders
100-75	Sampling Concrete Aggregate and Aggregate Sources and Selection of Material for Testing
104-80	Calculation of Fineness Modulus of Aggregate
112-69	Surface Moisture in Aggregate by Water Displacement
143-62	Meters for Automatic Indication of Moisture in Fine Aggregate
400-63	Water for Use in Mixing or Curing Concrete

521-81

Frequency and Amplitude of Vibrators for Concrete

3.6 Louisiana Standard Specifications for Roads and Bridges (LSSRB) 1992 Edition, State of Louisiana, Department of Transportation and Development (LDOTD).

1003.02

Aggregates for Portland Cement Concrete and Mortar

3.7 Commercial Item Description(CID).

A-A-1555

Water Paint, Powder, (Cementitious White and Colors)

4. QUALITY ASSURANCE.

4.1 Preconstruction Sampling and Testing.

4.1.1 Aggregates. The aggregate sources listed in the GENERAL PROVISION entitled "AGGREGATE SOURCES", have been determined to be capable of producing materials of a quality acceptable for this project. Proposed materials produced from similar strata, or of similar quality as those originally tested, will be approved. If the Contractor proposes to furnish aggregates from a source not listed in "AGGREGATE SOURCES", samples consisting of not less than 500 pounds of each size coarse aggregate and 300 pounds of fine aggregate taken under the supervision of the Contracting Officer in accordance with CRD-C 100 shall be delivered to the Waterways Experiment Station (3909 Halls Ferry Road) in Vicksburg, MS within 15 days after notice to proceed. Sampling and shipment of samples shall be at the Contractor's expense. From 90 to 120 days will be required to complete evaluation of the aggregates. Testing by and at the expense of the Government will be in accordance with applicable CRD or ASTM test methods. Tests to which aggregate may be subjected are specific gravity, absorption, cycles of freezing and thawing in concrete, alkali-aggregate reaction, organic impurities, and any other test necessary to demonstrate that the aggregate is of a quality that is at least equivalent to those sources listed in "AGGREGATE SOURCES".

4.1.2 Cementitious Materials, Admixtures, Curing Compound. At least 60 days in advance of concrete placement, the Contractor shall notify the Contracting Officer of the source of materials, along with sampling location, brand name, type, and quantity to be used in the manufacture and/or curing of the concrete.

4.1.2.1 Air-entraining admixtures or other chemical admixtures that have been in storage at the project site for longer than 6 months or that have been subjected to freezing will be retested at the expense of the Contractor when directed by the Contracting Officer and will be rejected if test results indicate non-compliance with paragraph 7.3.

4.2 Construction Testing By Government. The Government will sample and test 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. When cylinders are molded, slump and air content will be determined in accordance with ASTM C 143 and ASTM C 231, respectively. Test samples for each class of concrete will be taken at least once every 8-hour shift or for every 150 cubic yards placed, whichever requires more samples. From each sample, three compression test specimens will be made in accordance with ASTM C 31. Compression test specimens will be protected and cured while in the field in accordance with paragraphs 9.1 and 9.2 of ASTM C 31. If cylinders are not delivered to the testing laboratory within 24 to 48 hours after molding, they will be submerged in a water tank provided by the Contractor, where the surrounding water temperature is maintained by the Contractor at 73.4 ± 3 degrees F. Cylinders will be transported with cushioning material and in accordance with ASTM C 31. Compression testing will be performed in accordance with ASTM C 39. One cylinder will be tested at 7 days for information and two will be tested at 28 days (90 if pozzolan used) for acceptance.

5. EVALUATION AND ACCEPTANCE.

5.1 Concrete Strength. The strength of the concrete will be considered satisfactory so long as the averages of all sets of three consecutive test results equals or exceeds the specified compressive strength, f'_c , and no individual test (average of two companion cylinders) result falls below f'_c by more than 500 pounds per square inch. Additional analysis or testing may be required at the Contractor's expense when the strength of the concrete in the structure is considered potentially deficient.

5.1.1 Investigation of Low-Strength Test Results. When any individual strength test of standard-cured companion test cylinders falls below f'_c by more than 500 pounds per square inch or if tests of field-cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized. Nondestructive testing in accordance with ASTM C 597, C 803, or C 805 may be permitted by the Contracting Officer to determine the relative strengths at various locations in the structure as an aid in evaluating concrete strength in place or for selecting areas to be cored. Such tests, unless properly calibrated and correlated with other test data, shall not be used as a basis for acceptance or rejection.

5.1.2 Testing of Cores. When the strength of concrete in place is considered potentially deficient, cores shall be obtained and tested in accordance with ASTM C 42. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores will be determined by the Contracting Officer to least impair the strength of the structure. If the concrete in the

structure will be dry under service conditions, the cores shall be air dried (temperature 60 to 80 degrees F, relative humidity less than 60 percent) for 7 days before testing and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be tested after moisture conditioning in accordance with ASTM C 42. Concrete in the area represented by the core testing will be considered adequate if the average strength of the cores is equal to at least 85 percent of the specified strength requirement and if no single core is less than 75 percent of the specified strength requirement.

5.1.3 Load Tests. If the core tests are inconclusive or impractical to obtain or if structural analysis does not confirm the safety of the structure, load tests may be directed by the Contracting Officer in accordance with the requirements of Chapter 20 of ACI 318. Concrete work evaluated by structural analysis or by results of a load test shall be corrected in a manner satisfactory to the Contracting Officer. All investigations, testing, load tests, and correction of deficiencies will be performed and approved by the Contracting Officer at the expense of the Contractor, except that if all concrete is found to be in compliance with the plans and specifications, the cost of investigations, testing, and load tests will be at the expense of the Government.

5.2 Construction Tolerances. Variation in alignment, grade, and dimensions of the structures from the established alignment, grade, and dimensions shown on the drawings shall be within the tolerances specified in the following tables:

TABLE 1

CONSTRUCTION TOLERANCES FOR
REINFORCED CONCRETE CONSTRUCTION

(1) Variations from the plumb:	In any 10 feet of length.....1/4 inch
a. In the lines and surfaces of columns, piers, and walls and in arises	Maximum for entire length.....1 inch
b. For exposed corner columns, control-joint grooves, and other conspicuous lines	In any 20 feet of length.....1/4 inch Maximum for entire length.....1/2 inch
(2) Variation from the level or from the grades indicated on the drawings:	In any 10 feet of length.....5/16 inch In any bay or in any 20 feet of length..... 3/8 inch
a. In slab soffits, ceilings, and beam soffits, and in	Maximum for entire length.....3/4 inch

arises

b. In exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines	In any bay or in any 20 feet of length.....	1/4 inch
	Maximum for entire length.....	1/2-inch
(3) Variation of the linear building lines from established position in plan	In any 20 feet.....	1/2 inch
	Maximum.....	1 inch
(4) Variation of distance between walls, columns, partitions	1/4 inch per 10 feet of distance, but not more than 1/2 inch in any one bay, and not more than 1 inch total variation	
(5) Variation in the sizes and locations of sleeves, floor openings, and wall openings	Minus.....	1/4 inch
	Plus.....	1/2 inch
(6) Variations in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls	Minus.....	1/4 inch
	Plus.....	1/2 inch
(7) Footings:		
a. Variation of dimensions in plan	Minus.....	1/2 inch
	Plus.....	2 inches
	when formed or plus 3-inches when placed against unformed excavation.	
b. Misplacement of eccentricity	2 percent of the footing width in the direction of misplacement but not more than.....2 inches	
c. Reduction in thickness	Minus.....	5 percent of specified thickness
(8) Variation in steps:	Riser.....	.plus or minus 1/8 inch
a. In a flight of stairs	Tread.....	plus or minus 1/4 inch
b. In consecutive steps	Riser.....	plus or minus 1/16 inch
	Tread.....	plus or minus 1/8 inch

5.2.1 Level and grade tolerance measurements for slabs shall be made as soon as possible after finishing. When forms or shoring is used, the measurements shall be made prior to removal.

5.3 Surface Requirements. The surface requirements for the classes of finish required by 03101-7.1, shall be as hereinafter specified. Allowable irregularities are designated "abrupt" or "gradual" for purposes of providing for surface variations. Offsets resulting from displaced, misplaced, or mismatched forms, or sheathing, or by loose knots in sheathing, or other similar form defects, shall be considered "abrupt" irregularities. Irregularities resulting from warping, unplaneness, or similar uniform variations from planeness, or true curvature, shall be considered "gradual" irregularities. "Gradual" irregularities will be checked for compliance with the prescribed limits with a 5-ft template, consisting of a straightedge for plane surfaces and a shaped template for curved or warped surfaces. In measuring irregularities, the straightedge or template may be placed anywhere on the surface in any direction, with the testing edge held parallel to the intended surface.

<u>Class of Finish</u>	<u>Irregularities (Maximum Allowed)</u>	
	<u>Abrupt, inches</u>	<u>Gradual, inches</u>
A	1/8	1/4

5.4 Appearance. Permanently exposed surfaces shall be cleaned, if stained or otherwise discolored, by a method that does not harm the concrete and that is approved by the Contracting Officer.

6. SUBMITTALS. The Contractor shall submit the following items in accordance with Section 01300 - SUBMITTAL PROCEDURES.

6.1 Test Reports.

6.1.1 Concrete mixture proportions shall be determined by the Contractor in accordance with the requirements in paragraph 8, and submitted for approval. The quantities of all ingredients per cubic yard and nominal maximum coarse aggregate size that will be used in the manufacture of each quality of concrete shall be stated. Proportions shall indicate the weights of cement, pozzolan (if used), and water; weights of aggregates in a saturated surface-dry condition; and the quantities of admixtures. The submission shall be accompanied by test reports from a laboratory complying with ASTM C 1077 which show that proportions thus selected will produce concrete of the qualities indicated. The submission shall provide information specified in paragraph 8.5, and if applicable, paragraph 8.3. Concrete compression strength results submitted shall include specific gravity and absorption of fine and coarse aggregates determined by ASTM C 128 and ASTM C 127, respectively; slump; air content; and concrete temperature. No substitution shall be made in the source or type of materials used in the work without additional tests to show that the new materials and quality of concrete are satisfactory.

6.1.2 Cement and pozzolan will be accepted on the basis of the manufacturer's certification of compliance, accompanied by mill test reports, stating that materials meet

the requirements of the specification under which they are furnished. Certification and mill test reports shall be from current production and be representative of the particular lot furnished. No cement or pozzolan shall be used until notice of acceptance has been given by the Contracting Officer. Cement and pozzolan will be subject to check testing from samples obtained at the mill, at transfer points, or at the project site, as scheduled by the Contracting Officer, and such sampling will be by or under the supervision of the Government at its expense. Material not meeting specifications shall be promptly removed from the site of work.

6.1.3 Reserved.

6.1.4 Non-shrink Grout.

6.1.4.1 General. Descriptive literature of the grout proposed for use shall be furnished together with a certificate from the manufacturer stating that it is suitable for the application or exposure for which it is being considered. In addition, a detailed plan shall be submitted for approval, showing equipment and procedures proposed for use in mixing and placing the grout.

6.1.4.2 Prepackaged material requiring only the addition of water will be accepted on the basis of certified laboratory test results showing that the material meets the requirements of ASTM C 1107. When fine aggregate is to be added, the Contractor shall also furnish for approval the mixture proportions together with certified copies of laboratory test results indicating that the mixture is in conformance with the requirements of ASTM C 1107.

6.1.4.3 Mixture proportions using a volume-change controlling ingredient shall be submitted for approval. The submittal shall include the mixture proportions of all ingredients and certified copies of laboratory test results indicating that the materials and the mixture is in conformance with the requirements of ASTM C 1107.

6.1.5 Aggregates. Information identifying the aggregate source to be used along with gradation tests for fine and coarse aggregates shall be submitted for approval. The gradation test for fine aggregate shall include the No. 8 and No. 30 sieve sizes.

6.1.6 Water. The name of the source of mixing and curing water (and documentation that mixing water meets CRD-C 400, if undrinkable) shall be submitted for conformance with paragraph 7.5.

6.2 Manufacturer's Certificate.

6.2.1 Reserved.

6.2.2 Impervious-sheet curing materials shall be certified for compliance with all specification requirements.

6.2.3 Air-entraining admixtures shall be certified for compliance with all specification requirements.

6.2.4 Other chemical admixtures shall be certified for compliance with all specification requirements.

6.2.5 Curing compounds shall be certified for compliance with all specification requirements.

6.3 Review of Plant, Equipment, and Methods.

6.3.1 Batch Plant. Details of the data on concrete plant shall be submitted for review by the Contracting Officer for conformance with paragraphs 9.1 and 9.2.

6.3.2 Mixers. The make, type, and capacity of concrete mixers proposed for mixing concrete shall be submitted for review by the Contracting Officer for conformance with paragraphs 9.1 and 9.3. The results of the initial mixer uniformity tests as required in paragraph 16.2.12 shall be submitted at least 5 days prior to the initiation of placing.

6.3.3 Conveying. A description of the methods and equipment for transporting, handling, and depositing the concrete shall be submitted for review by the Contracting Officer for conformance with paragraph 10.

6.3.4 Placing. A description of all placing equipment and methods shall be submitted for review by the Contracting Officer for conformance with paragraph 11.

6.3.5 Joint Cleanup. A description of the methods and equipment proposed for joint cleanup and waste disposal shall be submitted for review by the Contracting Officer for conformance with paragraph 11.4.

6.3.6 Curing. A description of the curing media, equipment and methods to be used shall be submitted for review by the Contracting Officer for conformance with paragraph 14.

6.3.7 Cold-Weather Requirements. If concrete is to be placed under cold-weather conditions, a description of the proposed materials, methods, and protection shall be submitted for approval by the Contracting Officer for conformance with paragraphs 12.3 and 14.5.

6.3.8 Hot-Weather Requirements. If concrete is to be placed under hot-weather conditions, a description of the proposed materials and methods shall be submitted for approval by the Contracting Officer for conformance with paragraphs 12.4 and 13.1.1.

PART 2 - PRODUCTS

7. MATERIALS.

7.1 Cementitious materials shall be portland cement, portland-pozzolan cement, or portland cement in combination with pozzolan and shall conform to appropriate specifications listed below.

7.1.1 Portland Cement. ASTM C 150, Type I or II, low alkali, except the maximum amount of C_3A in Type I cement shall be 15 percent.

7.1.2 High-Early-Strength Portland Cement. ASTM C 150, Type III, low alkali, used only when specifically approved in writing.

7.1.3 Reserved.

7.1.4 Portland-Pozzolan Cement. ASTM C 595, Type IP (MS) (MH) with Table 2 mortar expansion limits.

7.1.5 Pozzolan shall conform to ASTM C 618, Class C or F, with the alkali requirement of Table 1A and with the requirement for multiple factor of Table 2A.

7.2 Aggregates shall be produced from the sources and under the conditions described in paragraph 4.1.1 and Section 01100. Fine and coarse aggregates shall conform to the grading requirements of either ASTM C 33 or LSSRB 1003.02. The quality of all aggregates shall conform to ASTM C 33. The nominal maximum size shall be as listed in paragraph 8.2.3.

7.3 Chemical admixtures to be used, when required or permitted, shall conform to the appropriate specification listed below:

7.3.1 Air-Entraining Admixture. ASTM C 260.

7.3.2 Reserved.

7.3.3 Water-Reducing or Retarding Admixtures. ASTM C 494, Type A, B, or D.

7.3.4 High-Range Water Reducer. ASTM C 494, Type F or G. The admixture may be used only when approved by the Contracting Officer, such approval being contingent upon particular mixture control as described in the Contractor's Quality Control Plan.

7.4 Curing Materials.

7.4.1 Impervious-Sheet Materials. ASTM C 171, type optional, except polyethylene film shall not be used.

7.4.2 Membrane-Forming Curing Compound. ASTM C 309, Type 1- D [or 2], Class B.

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

7.6 Non-shrink grout shall conform to ASTM C 1107 and shall be a commercial formulation suitable for the application proposed.

8. MIXTURE PROPORTIONING.

8.1 General. For each portion of the structure, mixture proportions shall be selected so that the following requirements are met.

8.2 Properties.

8.2.1 Specified Compressive Strength f'_c , shall be as follows:

<u>Compressive Strength (psi)</u>	<u>Structure or Portion of Structure</u>
4,000 @ 28* days	All structures
2,500 @ 28* days	4-inch stabilization slab

* 90 if pozzolan used

8.2.2 Maximum water-cementitious ratio shall be as follows:

<u>Water-Cementitious Ratio, by wt</u>	<u>Structure or Portion of Structure</u>
0.45	All structures
0.64	4-inch stabilization slab

8.2.3 Nominal maximum-size coarse aggregate shall be either 1½ inches or 1 inch except ¾-inch nominal maximum-size coarse aggregate shall be used when any of the following conditions exist: the narrowest dimension between sides of forms is less than 7½-inches; the depth of the slab is less than 4½-inches; the minimum clear spacing between reinforcing and sheet piling is less than 2 inches; or the minimum clear spacing between reinforcing is less than 2 inches.

8.2.4 Air content as determined by ASTM C 231 shall be between 4 and 7 percent except that when the nominal maximum size coarse aggregate is ¾ inch, it shall be between 5 and 7 percent.

8.2.5 Slump shall be determined in accordance with ASTM C 143 and shall be within the range of 1 to 4 inches. Where placement by pump is approved, the slump shall not exceed 6 inches and shall remain within a 3-inch band.

8.2.6 Pozzolan Content. If pozzolan is used, it shall range between 20 and 35 percent by absolute volume of the total cementitious materials.

8.3 Determining Standard Deviation. Test records from which a standard deviation is calculated shall:

(a) represent materials, quality control procedures, and conditions similar to those expected at the proposed work;

(b) not be from a project where the allowable changes in materials and/or proportions were more restricted than for the proposed work;

(c) represent concrete produced to meet a specified strength or strengths, f'_c , within 1000 psi of that specified for the proposed work;

(d) consist of at least 30 consecutive tests or two groups of consecutive tests totaling at least 30 tests;

(e) be from different batches;

(f) be the average of strengths from two cylinders made from the same sample of concrete and tested at the age indicated in paragraph 8.2; and

(g) be from concrete that was produced within one year of the time when concrete placement is expected to begin for the proposed work.

8.3.1 For 30 Test Records. Use an unmodified standard deviation and calculate f_{cr} as specified in paragraph 8.4.1 .

8.3.2 For 15 to 29 Test Records. Where a concrete production facility does not have 30 test records, but does have a record based on 15 to 29 consecutive tests, a modified standard deviation may be established as the product of the standard deviation based on 15 to 29 tests and modification factor from the following table. Calculate f_{cr} as specified in paragraph 8.4.1.

<u>Number of Records *</u>	<u>Modification Factor for Standard Deviation</u>
15	1.16
20	1.08
25	1.03
30 or more	1.00

*Interpolate for intermediate numbers of records.

8.3.3 For Less Than 15 Test Records. No standard deviation is needed. Calculation of f_{cr} shall be as specified in paragraph 8.4.2.

8.4 Required Average Compressive Strength, f_{cr} . In meeting the strength requirements specified in paragraph 8.2.1, the selected mixture shall have proportions so as to produce a f_{cr} exceeding f'_c as indicated in paragraphs 8.4.1 or 8.4.2..

8.4.1 For 15 to 30 Records. If a standard deviation is calculated as specified in paragraphs 8.3.1 or 8.3.2, f_{cr} shall be determined based on the value of f'_c and the standard deviation, S , as follows:

<u>Standard Deviation, S</u>	<u>Required Average Compressive Strength, f_{cr} (psi)</u>
Less than or equal to 505	$f'_c + 1.34 S$
Greater than 505	$f'_c + 2.33 S - 500$

8.4.2 For less than 15 Records. When a concrete production facility does not have field strength test records for calculation of standard deviation, f_{cr} shall be determined based on the value of f'_c as follows:

<u>Specified Compressive Strength, f'_c (psi)</u>	<u>Required Average Compressive Strength, f_{cr} (psi)</u>
Less than 3000	$f'_c + 1000$
3000-5000	$f'_c + 1200$
Greater than 5000	$f'_c + 1400$

8.5 Documenting Average Strength. Documentation that proposed concrete proportions produce the required average strength, f_{cr} , determined in paragraph 8.4 shall be based on previous field experience (paragraph 8.5.1) or laboratory trial batches (paragraph 8.5.2).

8.5.1 Field Experience. Required average strength can be documented by field experience if compressive strength test records consisting of not less than 10 consecutive tests and encompassing a period of not less than 60 days are used. Test records shall represent similar materials to those proposed and similar conditions to those expected. Changes in materials, conditions, and proportions within the test record shall not have been more closely restricted than those for the proposed work.

8.5.2 Laboratory Trial Batches. The laboratory used to develop information required by this section shall comply with ASTM C 1077.

8.5.2.1 Representative samples for all concrete materials proposed for this project and a copy of this section of the contract specifications entitled "CAST-IN-PLACE STRUCTURAL CONCRETE" shall be delivered to the laboratory that performs the concrete proportioning at least 60 days (120 when pozzolan used) before concrete placement is expected to begin. Samples of approved aggregates shall be obtained in accordance with the requirements of ASTM D 75. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by manufacturer's test reports indicating compliance with applicable specification requirements. When all of these materials have been delivered, the name, address, and phone number of this laboratory and a list of the sources and types of all concrete materials shall be submitted to the Contracting Officer.

8.5.2.2 Trial mixtures having proportions, consistencies, maximum slump and maximum air content suitable for the work shall be made based on ACI 211.1, using at least three different water- cementitious ratios which will produce a range of strengths encompassing those required for the work. The target water- cementitious ratios required in paragraph 8.2.2 include the total weight of cement plus pozzolan, converted from absolute volume as described in ACI 211.1. Trial mixtures shall be designed in accordance with the procedure in ACI 211.1, Chapter 6, using the absolute volume basis for determining the required amount of fine aggregate. Format for submittal of mixture proportions shall be in accordance with ACI 211.1, paragraph 7.3.7.2. The dry rodded weight per cubic foot of the coarse aggregate determined according to ASTM C 29; the fineness modulus of the fine aggregate determined according to CRD-C 104; and the yield, slump and air content shall be reported. For each water-cementitious ratio at least three test cylinders for each test age shall be tested in accordance with ASTM C 39 at 7 and 28 days (also 90 if pozzolan used). From these test results a curve shall be plotted and submitted showing the relationship between water-cementitious ratio and strength at design age.

PART 3 - EXECUTION

9. PRODUCTION EQUIPMENT.

9.1 Capacity. The batching and mixing equipment shall have a capacity of at least 30 cubic yards per hour.

9.2 Batching plant shall conform to the requirements of the Concrete Plant Standards of CPMB and as specified; however, rating plates attached to batch plant equipment are not required.

9.2.1 Equipment. The batching controls shall be semiautomatic, or automatic. The semiautomatic batching system shall be provided with interlocks such that the discharge device cannot be actuated until the indicated material is within the applicable tolerance. The batching system shall be equipped with an accurate recorder or recorders that meet the requirements of the Concrete Plant Standards of CPMB. Separate bins or compartments shall be provided for cement, pozzolan and each size group of aggregate. Aggregates shall be weighed either in separate weigh batchers with individual scales or cumulatively in one weigh batcher on one scale. Aggregate shall not be weighed in the same batcher with cement, or pozzolan. If both cement and pozzolan are used, they may be weighed cumulatively provided that the portland cement is weighed first. If weighed, water shall not be weighed cumulatively with another ingredient. Water batcher filling and discharging valves shall be so inter-locked that the discharge valve cannot be opened before the filling valve is fully closed. An accurate mechanical device for measuring and dispensing each admixture shall be provided. Each dispenser shall be interlocked with the measuring and discharging operation of the water so that each admixture is separately measured and discharged automatically in a manner to obtain uniform distribution throughout the batch in the specified mixing period. Admixtures shall not be combined prior to introduction in water or sand. The plant shall be arranged so as to facilitate the inspection of all operations at all times. Suitable facilities shall be provided for obtaining representative samples of aggregates from each bin or compartment.

9.2.2 Scales. The weighing equipment shall conform to the applicable requirements of NIST Handbook 44, except that the accuracy shall be plus or minus 0.2 percent of scale capacity. The Contractor shall provide standard test weights and any other auxiliary equipment required for checking the operating performance of each scale or other measuring devices. The tests shall be made at the frequency required in paragraph 16.2.4 and in the presence of a Government Inspector.

9.2.3 Batching Tolerances.

9.2.3.1 Weighing Tolerances. Whichever of the following tolerances is greater shall apply, based on required scale reading.

<u>Material</u>	<u>Percent of Required Weight</u>	<u>Percent of Scale Capacity</u>
Cementitious materials	± 1	± 0.3
Aggregate	± 2	± 0.3
Water	± 1	± 0.3
Admixture	± 3	± 0.3

9.2.3.2 Volumetric Tolerances. For volumetric batching equipment, the following tolerances shall apply to the required volume of material being batched:

Water: Plus or minus 1 percent.

Admixtures: Plus or minus 3 percent.

9.2.4 Moisture Control. The plant shall be capable of ready adjustment to compensate for the varying moisture content of the aggregates and to change the weights of the materials being batched. An electric moisture meter complying with the provisions of CRD-C 143 shall be provided for measuring moisture in the fine aggregate. The sensing element shall be arranged so that the measurement is made near the batcher charging gate of the sand bin or in the sand batcher.

9.3 Mixers.

9.3.1 General. The mixers shall not be charged in excess of the capacity recommended by the manufacturer. The mixers shall be operated at the drum or mixing blade speed designated by the manufacturer. The mixers shall be maintained in satisfactory operating condition, and the mixer drums shall be kept free of hardened concrete. Should any mixer at any time produce unsatisfactory results, its use shall be promptly discontinued until it is repaired.

9.3.2 Concrete plant mixers shall be tilting, non-tilting, horizontal shaft, or vertical-shaft type, or pugmill type and shall be provided with an acceptable device to lock the discharge mechanism until the required mixing time has elapsed. The mixing time and uniformity shall conform to all the paragraphs in ASTM C 94 applicable to central-mixed concrete.

9.3.3 Truck Mixers. Truck mixers, the mixing of concrete therein, and concrete uniformity shall conform to the requirements of ASTM C 94. A truck mixer may be used either for complete mixing (transit-mixed) or to finish the partial mixing done in a stationary mixer (shrink-mixed). Each truck shall be equipped with two counters from which it will be possible to determine the number of revolutions at mixing speed and the number of revolutions at agitating speed.

10. CONVEYING EQUIPMENT.

10.1 General. The conveying equipment shall have a capacity of at least 30 cubic yards per hour. Concrete shall be conveyed from mixer to forms as rapidly as practicable and within the time interval in paragraph 12.2 by methods that will prevent segregation or loss of ingredients. Any concrete transferred from one conveying device to another shall be passed through a hopper that is conical in shape and shall not be dropped vertically more than 8 feet, except where suitable equipment is provided to prevent segregation and where specifically authorized.

10.2 Buckets. The interior hopper slope shall be not less than 58 degrees from the horizontal, the minimum dimension of the clear gate opening shall be at least 5 times the nominal maximum size aggregate, and the area of the gate opening shall be not less than 2 square feet. The maximum dimension of the gate opening shall not be greater than twice the minimum dimension. The bucket gates shall be essentially mortar tight when closed and may be manually, pneumatically, or hydraulically operated except that buckets larger than 2 cubic yards shall not be manually operated. The design of the bucket shall provide means for positive regulation of the amount and rate of deposit of concrete in each discharge position.

10.3 Transfer Hoppers. Concrete may be charged into nonagitating hoppers for transfer to other conveying devices. Transfer hoppers shall be capable of receiving concrete directly from delivery vehicles and have conical-shaped discharge features. The machine shall be equipped with a hydraulically operated gate and with a means of external vibration to effect complete and easy discharge. Concrete shall not be held in nonagitating transfer hoppers more than 30 minutes.

10.4 Trucks. Truck mixers operating at agitating speed or truck agitators used for transporting plant-mixed concrete shall conform to the requirements of ASTM C 94. Nonagitating equipment may be used for transporting plant-mixed concrete over a smooth road when the hauling time is less than 15 minutes. Bodies of nonagitating equipment shall be smooth, watertight, metal containers specifically designed to transport concrete, shaped with rounded corners to minimize segregation, and equipped with gates that will permit positive control of the discharge of the concrete.

10.5 Chutes. When concrete can be placed directly from a truck mixer, agitator, or nonagitating equipment, the chutes attached to this equipment may be used. A discharge deflector shall be used when required by the Contracting Officer. Separate chutes and other similar equipment will not be permitted for conveying concrete except when specifically approved.

10.6 Belt Conveyors. Belt conveyors may be used when approved. Such conveyors shall be designed and operated to assure a uniform flow of concrete from mixer

to final place of deposit without segregation of ingredients or loss of mortar and shall be provided with positive means for preventing segregation of the concrete at the transfer points and the point of placing. Belt conveyors shall be constructed such that the idler spacing shall not exceed 36 inches. If concrete is to be placed through installed horizontal or sloping reinforcing bars, the conveyor will discharge concrete into a hopper through a pipe or elephant trunk that is small enough in diameter and long enough to extend through the reinforcing bars. In no case shall concrete be discharged to free fall through the reinforcing bars.

10.7 Pump Placement. Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure type. The pipeline shall be rigid steel pipe or heavy duty flexible hose. The inside diameter of the pipe shall be at least 3 times the nominal maximum-size coarse aggregate in the concrete mixture to be pumped but not less than 4 inches. The maximum-size coarse aggregate shall not be reduced to accommodate the pumps. The distance to be pumped shall not exceed limits recommended by the pump manufacturer. The concrete shall be supplied to the concrete pump continuously. When pumping is completed, concrete remaining in the pipeline shall be ejected without contamination of concrete in place. After each operation, equipment shall be thoroughly cleaned, and flushing water shall be wasted outside of the forms.

11. PREPARATION FOR PLACING.

11.1 Embedded Items. Before placement of concrete, care shall be taken to determine that all embedded items are firmly and securely fastened in place as indicated on the drawings, or required. Embedded items shall be free of oil and other foreign matter such as loose coatings of rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into voids.

11.2 Concrete on Earth Foundations. Earth surfaces upon which concrete is to be placed shall be clean, damp, and free from frost, ice, and standing or running water. Prior to placement of concrete, the earth foundation shall have been satisfactorily compacted in accordance with the provisions of Section 02225.

11.3 Reserved.

11.4 Construction Joint Treatment.

11.4.1 General. Concrete surfaces to which other concrete is to be bonded shall be prepared for receiving the next lift or adjacent concrete by cleaning with either air-water cutting, sandblasting, or high pressure water jet. The surfaces of construction joints shall

be kept continuously wet for the first 12 hours during the 24-hour period prior to placing concrete.

11.4.2 Cleaning.

11.4.2.1 Air-Water Cutting. Air-water cutting of a construction joint shall be performed at the proper time and only on horizontal construction joints. The surface shall be cut with an air-water jet to remove all laitance and to expose clean, sound, mortar and coarse aggregate, but not so as to undercut the edges of the larger particles of aggregate. The air pressure used in the jet shall be 100 pounds per square inch plus or minus 10 pounds per square inch, and the water pressure shall be just sufficient to bring the water into effective influence of the air pressure. When approved by the Contracting Officer, a retarder complying with the requirements of CRD C 94 may be applied to the surface of the lift in order to prolong the period of time during which air-water cutting is effective. Prior to receiving approval, the Contractor shall furnish samples of the material to be used and shall demonstrate the method to be used in applications. After cutting, the surface shall be washed and rinsed as long as there is any trace of cloudiness of the wash water. The surface shall again be washed just prior to placing the succeeding lift. Where necessary to remove accumulated laitance, coatings, stains, debris, and other foreign material, sandblasting will be required as the last operation before placing the next lift.

11.4.2.2 High-Pressure Water Jet. A stream of water under a pressure of not less than 3,000 pounds per square inch may be used for cleaning. Its use shall be delayed until the concrete is sufficiently hard so that only the surface skin or mortar is removed and there is no undercutting of coarse- aggregate particles. Where the cleaning occurs more than 2 days prior to placing the next lift or where work in the area subsequent to the cleaning causes dirt or debris to be deposited on the surface, the surface shall be cleaned again as the last operation prior to placing the next lift. If the water jet is incapable of a satisfactory cleaning, the surface shall be cleaned by sandblasting.

11.4.2.3 Sandblasting. When employed in the preparation of construction joints, sandblasting shall be performed as the final operation completed before placing the following lift. The operation shall be continued until all accumulated laitance, coatings, stains, debris, and other foreign materials are removed. The surface of the concrete shall then be washed thoroughly to remove all loose materials. The surface shall again be washed just prior to placing the succeeding lift.

11.4.2.4 Waste Disposal. The method used in disposing of waste water employed in cutting, washing, and rinsing of concrete surfaces shall be such that the waste water does not stain, discolor, or affect exposed surfaces of the structures, or damage the environment of the project area. The method of disposal shall be subject to approval.

11.4.2.5 Surface Condition. The surface of the lift shall be damp at the time of placement of the next lift and shall be free of standing water.

12. PLACING.

12.1 General. The placing equipment shall have a capacity of at least 30 cubic yards per hour. Concrete placement will not be permitted when, in the opinion of the Contracting Officer, weather conditions prevent proper placement or consolidation. Concrete shall be deposited as close as possible to its final position in the forms, and in so depositing, there shall be no vertical drop greater than 5 feet except where suitable equipment is provided to prevent segregation and where specifically authorized. Depositing of the concrete shall be so regulated that it may be effectively consolidated in horizontal layers 1½-feet or less in thickness with a minimum of lateral movement. The amount deposited in each location shall be that which can be readily and thoroughly consolidated. Sufficient placing capacity shall be provided so that concrete placement can be kept plastic and free of cold joints while concrete is being placed.

12.2 Time Interval Between Mixing and Placing. Concrete shall be placed within 30 minutes after discharge into nonagitating equipment. When concrete is truck mixed or when a truck mixer or agitator is used for transporting concrete mixed by a concrete plant mixer, the concrete shall be delivered to the site of the work, and discharge shall be completed within 1½-hours after introduction of the cement to the aggregates. When the length of haul makes it impossible to deliver truck-mixed concrete within these time limits, batching of cement and a portion of the mixing water shall be delayed until the truck mixer is at or near the construction site.

12.3 Cold-Weather Placing. Concrete shall not be placed without a procedure approved in accordance with paragraph 6.3.7 when the concrete is likely to be subjected to freezing temperatures before the expiration of the curing period. The ambient temperature of the space adjacent to the concrete placement and surfaces to receive concrete shall be above 32 degrees F. The placing temperature of the concrete having a minimum dimension less than 12 inches shall be between 55 and 75 degrees F. The placing temperature of the concrete having a minimum dimension greater than 12 inches shall be between 50 and 70 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete-placing temperatures. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals, or other materials shall not be mixed with the concrete to prevent freezing.

12.4 Hot-Weather Placing. Concrete shall be properly placed and finished with approved procedures in accordance with paragraph 6.3.8. The concrete-placing temperature shall not exceed 90 degrees F. Cooling of the mixing water and/or aggregates will be required to obtain an adequate placing temperature. An approved retarder shall be used to facilitate placing and finishing when concrete temperatures exceed 85 degrees F.

Steel forms and reinforcement shall be cooled prior to concrete placement when steel temperatures are greater than 120 degrees F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

12.5 Consolidation. Immediately after placement, each layer of concrete, including flowing concrete, shall be consolidated by internal vibrating equipment. Vibrators shall not be used to transport concrete within the forms. Hand spading may be required with internal vibrating along formed surfaces permanently exposed to view. Vibrating equipment shall at all times be adequate in number of units and power to properly consolidate the concrete. A spare vibrator shall be kept on the job site during all concrete placing operations. Form or surface vibrators shall not be used unless specifically approved. Vibrators of the proper size, frequency, and amplitude shall be used for the type of work being performed in conformance with the following requirements:

<u>Application</u>	<u>Head Diameter</u> <u>—Inches</u>	<u>Frequency</u> <u>—VPM</u>	<u>Amplitude</u> <u>—Inches</u>
Thin walls, beams, etc	1¼ - 2½	9,000 - 13,500	0.02 - 0.04
General construction	2 - 3½	8,000 - 12,000	0.025 - 0.05

The frequency and amplitude shall be within the range indicated in the table above as determined in accordance with paragraph 16.2.9. The vibrator shall be inserted vertically at uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1½ times the radius of action of the vibrator. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if such exists. It shall be held stationary until there is a general cessation in escape of large bubbles of entrapped air at the surface of the concrete (generally 5 to 15 seconds) then withdrawn slowly at about 3 inches per second.

13. FINISHING.

13.1 Unformed Surfaces.

13.1.1 General. The ambient temperature of spaces adjacent to surfaces being finished shall be not less than 50 degrees F. In hot weather when the rate of evaporation of surface moisture, as determined by use of Figure 2.1.5 of ACI 305R, may reasonably be expected to exceed 0.2 pound per square foot per hour, provisions for windbreaks, shading, fog spraying, or wet covering with a light-colored material shall be made in advance of placement. These protective measures shall be taken as quickly as finishing operations will allow. All unformed surfaces that are not to be covered by additional concrete or backfill shall have a float finish, unless a trowel finish is specified, and shall be true to the elevation shown on the drawings. Surfaces to receive additional concrete or

backfill shall be brought to the elevation shown on the drawings and left true and regular. Exterior surfaces shall be sloped for drainage unless otherwise shown on the drawings or as directed. Joints shall be carefully made with a jointing or edging tool. The finished surfaces shall be protected from stains or abrasions.

13.1.2 Float Finish. Surfaces shall be screeded and darbied or bullfloated to bring the surface to the required finish level with no coarse aggregate visible. No water, cement, or mortar shall be added to the surface during the finishing operation. The concrete, while still green but sufficiently hardened to bear a man's weight without more than about a 1/4-inch indentation, shall be floated to a true and even plane. Floating may be performed by use of suitable hand floats or power-driven equipment. Hand floats shall be made of magnesium or aluminum. Tolerance for a floated finish shall be true plane within 5/16 inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

13.1.3 Trowel Finish. A trowel finish shall be applied to the top surfaces of all walls and columns. Concrete surfaces shall be finished with a float finish, and after surface moisture has disappeared, the surface shall be troweled to a smooth, even, dense finish free from blemishes including trowel marks. Tolerance shall be true planes within 5/16 inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

13.2 Formed Surfaces. Within 24 hours after form removal, all fins and loose materials permanently exposed to view shall be removed and all tie rod holes and defective concrete repaired. All voids and honeycombs exceeding 1/2 inch in diameter permanently exposed to view and all tie-rod holes, permanently exposed or not, shall be reamed or chipped and filled with dry- pack mortar. Defective areas larger than 36 square inches in any surface, permanently exposed or not, shall be delineated in a rectangular shape by a saw cut a minimum depth of 1 inch. All defective concrete in the delineated area shall be removed and replaced with carefully placed and compacted concrete. The cement used in the mortar or concrete for all surfaces permanently exposed to view shall be a blend of portland cement and white cement properly proportioned so that the final color when cured will be the same as adjacent concrete. Temperature of the concrete, ambient air, replacement concrete, or mortar during remedial work including curing shall be above 50 degrees F. The prepared area shall be dampened, brush-coated with a neat cement grout or with an approved epoxy resin, and filled with mortar or concrete. The mortar shall consist of 1 part cement to 2-1/2 parts fine aggregate. The quantity of mixing water shall be the minimum necessary to obtain a uniform mixture and to permit placing. Mortar shall be thoroughly compacted in place and struck off to adjacent concrete. Replacement concrete shall be drier than the usual mixture and thoroughly tamped into place and finished. Forms shall be used if required. Metal tools shall not be used to finish permanently exposed surfaces. The patched areas shall be cured and protected in accordance with paragraph 13.

13.2.1 General. Surfaces, unless other type of finish is specified, shall be left with the texture imparted by the forms except that defective surfaces shall be repaired as described in paragraph 13.2. Other types of finishes shall be applied to the following structures or portions of structures:

<u>Type of Finish</u>	<u>Structure or Portion of Structure</u>
Cementitious Paint Finish	All exterior wall surfaces and top of top slabs at all sluice gate monoliths above grade

Unless painting of surfaces is required, uniform color of the concrete shall be maintained by use of only one mixture without changes in materials or proportions for any structure or portion of structure that is exposed to view or on which a special finish is required. The form panels used to produce the finish shall be orderly in arrangement, with joints between panels planned in approved relation to openings, building corners, and other architectural features. Forms shall not be reused if there is any evidence of surface wear or defects that would impair the quality of the surface.

13.2.2 Cementitious Paint Finish. As approved by the Contracting Officer and after all required patching, cleaning, and correction of major imperfections have been completed, the concrete surfaces identified above shall be give a cementitious paint finish as hereinafter described. The finish shall not be applied before the initial 7 day moist curing period is complete. The temperature of the air adjacent to the surface shall not be less than 50 degrees F for 24 hours prior to and following the application of the finish. If the temperature of the air adjacent to the surface is above 90 degrees F, the surface shall be cooled prior to the application of the finish by hosing with clean water until it reaches a temperature of 85 degrees F. The finish for any area shall be completed in the same day and the limits of the finished area shall be made at corners or monolith joints. The surfaces to be finished must be structurally sound, clean and free from dirt, form marks, loose mortar particles, paint, films, protective coatings, efflorescence, laitance, etc. The cementitious paint finish shall consist of dampening the surface ahead of the cementitious paint application with clean water. As a base coat, cementitious paint shall be applied at a rate of two pounds per square yard of surface area. The coating shall be uniform, completely filling all pits, air bubbles, and surface voids. All cementitious paint shall conform to CID A-A-1555. Cementitious paint shall be prepared and applied in accordance with the manufacturer's written recommendations. The mixing liquid for cementitious paint shall contain one part "Acryl 60" or equal, to three parts clean water. Two coats of acrylic emulsion paint shall then be applied over the base coat. The cementitious base coat and the acrylic emulsion paint shall be selected by the Contracting Officer's representative. Uniform color shall be maintained by use of only one mixture without any changes in materials or proportions for any structure or portion of structure which is exposed to view or on which a special finish is required.]

14. CURING AND PROTECTION.

14.1 General. All concrete shall be cured by an approved method for a period of 7 days. Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, and mechanical injury. All materials and equipment needed for adequate curing and protection shall be available in working order at the placement site prior to the start of concrete placement. Concrete shall be protected from the damaging effects of rain for 12 hours and from flowing water for 14 days (7 days with Type III cement). Concrete shall be shielded from direct rays of the sun for 3 days. No fire or excessive heat shall be permitted near or in direct contact with concrete at any time.

14.2 Moist Curing. Moist-cured concrete shall be maintained continuously (not periodically) wet for the entire curing period. Vertical surfaces shall be cured using soaker hoses, fog sprayers or sprinklers. Burlap may be used to assist moist curing provided that the wall and burlap are kept continuously saturated, including nights and weekends, and the burlap is kept in contact with the concrete being cured. If water or curing materials stain or discolor concrete surfaces that are to be permanently exposed, they shall be cleaned as required in paragraph 5.4. Where wooden form sheathing is left in place during curing, the sheathing shall be kept wet at all times. Horizontal surfaces may be moist cured by ponding, by covering with a minimum uniform thickness of 2 inches of continuously saturated sand, or by covering with saturated nonstaining burlap or cotton mats. Horizontal construction joints may be allowed to dry for 12 hours immediately prior to the placing of the following lift.

14.3 Membrane Curing.

14.3.1 General. Concrete may be cured with an approved curing compound in lieu of moist curing except that membrane curing shall not be used on surfaces containing protruding steel reinforcement or that are to receive any subsequent treatment depending on adhesion or bonding to the concrete *(i.e. sack- rubbed, cementitious paint, etc). A pigmented-type curing compound shall not be used on surfaces that will be exposed to view when the project is completed.

14.3.2 Application. The curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. The surfaces shall be thoroughly moistened with water, and the curing compound applied as soon as free water disappears. The curing compound shall be applied to unformed surfaces as soon as free water has disappeared. The curing compound shall be applied in a two-coat continuous operation by approved motorized power-spraying equipment operating at a minimum pressure of 75 pounds per square inch and at a uniform continuous coverage of not more than 400 square feet per gallon for each coat. The

second coat shall be applied perpendicular to the first coat. Concrete surfaces that have been subjected to rainfall within 3 hours after curing compound has been applied shall be resprayed by the method and at the coverage herein specified. All concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from pedestrian and vehicular traffic and from any other cause that will disrupt the continuity of the curing membrane.

14.4 Impervious-Sheet Curing. The following concrete surfaces may be cured using impervious sheets: horizontal surfaces only. All surfaces shall be thoroughly wetted and be completely covered with waterproof paper, or polyethylene-coated burlap having the burlap thoroughly water-saturated before placing. The covering shall be laid with light-colored side up. The covering shall be lapped not less than 12 inches and securely weighted down or shall be lapped not less than 4 inches and taped to form a continuous cover with completely closed joints. The sheets shall be weighted to prevent displacement so that they remain in contact with the concrete during the specified length of curing. Coverings shall be folded down over exposed edges of slabs and secured by approved means. Sheets shall be immediately repaired or replaced if tears or holes appear during the curing period.

14.5 Cold Weather. When the daily outdoor low temperature is less than 32 degrees F, the temperature of the concrete shall be maintained above 40 degrees F for the first 7 days after placing. In addition, during the period of protection removal, the air temperature adjacent to the concrete surfaces shall be controlled so that concrete near the surface will not be subjected to a temperature differential of more than 25 degrees F as determined by observation of ambient and concrete temperatures indicated by thermometers furnished by the Government as required and installed adjacent to the concrete surface and 2 inches inside the surface of the concrete. The installation of the thermometers shall be made by the Contractor at such locations as may be directed. Curing compounds shall not be used on concrete surfaces that are maintained at curing temperature by use of free steam.

15. SETTING OF BASE PLATES AND BEARING PLATES.

15.1 General. After being plumbed and properly positioned, column base plates, bearing plates for beams and similar structural members, and machinery and equipment base plates shall be provided with full bearing with dry-pack bedding mortar except where nonshrink grout is approved or required. The space between the top of concrete or masonry-bearing surface and the bottom of the plate shall be approximately 1/24 of the width of the plate, but not less than 1/2-inch for plates less than 12 inches wide. Concrete surfaces shall be rough, clean, and free of oil, grease, and laitance, and they shall be damp. Metal surfaces shall be clean and free of oil, grease, and rust.

15.2 Damp-pack bedding mortar shall consist of 1 part Type I portland cement and 2-1/2 parts of fine aggregate conforming to ASTM C 33, proportioned by weight, and not more than 4-1/2 gallons of water per bag of cement. The space between the top of the concrete or masonry-bearing surface and the bottom of the plate shall be packed with the bedding mortar by tamping or ramming with a bar or rod until the voids are completely filled.

15.3 Nonshrink grout shall conform to the requirements of paragraph 6.1.4 and 7.6. Unless recommended otherwise by the grout manufacturer, the mixture shall include by weight 1-1/2 parts of sound, clean, uncrushed gravel conforming to the size No.8, Table 2, ASTM C-33 in combination with fine aggregate conforming to ASTM C-33, to 1 part portland cement except that no coarse aggregate shall be used when grout is placed in areas with a clearance of less than 2 inches. Water content shall be the minimum that will provide a flowable mixture and completely fill the space to be grouted without segregation, bleeding, or reduction of strength.

15.3.1 Mixing and placing shall be in conformance with the material manufacturer's instructions and as specified therein. Ingredients shall be thoroughly dry mixed before adding water. After adding water, the batch shall be mixed for at least 3 minutes. Batches shall be of size to allow continuous placement of freshly mixed grout. Grout not used within 30 minutes after mixing shall be discarded. The space between the top of the concrete or masonry-bearing surface and the plate shall be filled solid with the grout. Forms shall be of wood or other equally suitable material for retaining the grout and shall be removed after the grout has set. The placed grout shall be worked to eliminate voids; however, overworking and breakdown of the initial set shall be avoided. Grout shall not be retempered or subjected to vibration from any source. Where clearances are unusually small, placement shall be under pressure with a grout pump. Temperature of the grout, and of surfaces receiving the grout, shall be maintained at 65 to 85 degrees F until after setting.

15.3.2 Treatment of Exposed Surfaces. Those types containing metallic aggregate shall have, after the grout has set, the exposed surfaces cut back 1 inch and immediately covered with a parge coat of mortar proportioned by weight of one part portland cement, two parts sand, and sufficient water to make the mixture placeable. The parge coat shall have a smooth, dense finish. The exposed surface of other types of nonshrink grout shall have a smooth, dense finish.

15.3.3 Curing. Grout and parge coats shall be cured in conformance with above paragraph 14.

16. CONTRACTOR QUALITY CONTROL.

16.1 General. The Contractor shall perform the inspection and tests described in paragraph 16.2, and based upon the results of these inspections and tests, he shall take the action required in paragraph 16.3 and submit reports as required in paragraphs 16.3 and 16.4. The laboratory performing the tests shall conform with ASTM C 1077. The individuals who sample and test concrete or the constituents of 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.

16.2 Inspection Details and Frequency of Testing.

16.2.1 Fine Aggregate.

16.2.1.1 Grading. At least once during each shift in which concrete is being delivered, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136 and CRD-C 104, respectively, for the fine aggregate or for each fine aggregate, if it is batched in more than one size or classification. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits. Results of tests shall be reported in writing.

16.2.1.2 Moisture Content. When in the opinion of the Contracting Officer the electric moisture meter is not operating satisfactorily, at least four tests for moisture content shall be conducted in accordance with either ASTM C 70, C 566, or CRD-C 112 during each 8-hour period of mixing plant operation. The times for the tests shall be selected randomly within the 8-hour period. An additional test shall be made whenever the slump is shown to be out of control or excessive variation in workability is reported by the placing foreman. When the electric moisture meter is operating satisfactorily, at least two direct measurements of moisture content shall be made per week to check the calibration of the meter.

16.2.2 Coarse Aggregate.

16.2.2.1 Grading. At least once during each shift that concrete is being delivered, there shall be a sieve analysis in accordance with ASTM C 136 for each size group of coarse aggregate. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor is responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken shall show the results of the five most recent tests including the current test. The Contractor may adopt limits for control coarser than the

specification limits for samples taken other than at the batch plant bins to allow for degradation during handling. Results of tests shall be reported in writing.

16.2.2.2 Moisture Content. A test for moisture content of each size of coarse aggregate in accordance with ASTM C 566 or CRD-C 112 shall be made at least once a shift. When two consecutive readings for smallest size coarse aggregate differ by more than 1.0 percent, frequency of testing shall be increased to that specified for fine aggregate in paragraph 16.2.1.2. These results shall be used to adjust the added water in the control of the batch plant.

16.2.3 Deleterious Substances. When in the opinion of the Contracting Officer a problem exists in connection with deleterious substances in fine or coarse aggregates, tests shall be made in accordance with ASTM C 33 at a frequency not less than one per week. Results of tests shall be reported in writing.

16.2.4 Scales.

16.2.4.1 Weighing Accuracy. The accuracy of the scales shall be checked by test weights at least once a month for conformance with the applicable requirement of paragraph 9.2.2. Such tests shall also be made whenever there are variations in properties of the fresh concrete that could result from batching errors. Results of tests shall be reported in writing.

16.2.4.2 Batching and Recording Accuracy. Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. The Contractor shall provide the necessary calibration devices and confirm that the admixture dispensers described in paragraph 9.2.1 are operating properly. Results of tests shall be reported in writing.

16.2.5 Batch-Plant Control. The measurement of all constituent materials including cement, pozzolan, each size of aggregate, water, and admixtures shall be continuously controlled. The aggregate weights and amount of added water shall be adjusted as necessary to compensate for free moisture in the aggregates. The amount of air-entraining admixture shall be adjusted to control air content within specified limits. A batch report shall be prepared indicating type, amount and source of cement used; type, amount and source of pozzolan used; amount and source of admixtures used; aggregate source; the required aggregate and water weights; and the batched aggregate weight per cubic yard. In addition, batch reports shall contain all information needed to calculate the total mixing water added by the producer, including the amount of water as free moisture on each size of aggregate, water and ice weights per cubic yard and water added in the field for each class of concrete batched as required in paragraph 16.2.4 of ASTM C 94. The batch report shall be furnished to the Contracting Officer upon delivery of each batch of concrete.

16.2.6 Concrete.

16.2.6.1 Air Content. At least two tests for air content shall be made on randomly selected batches of each class of concrete during each 8-hour period of concrete production or at least once a day when concrete is placed. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Tests shall be made in accordance with ASTM C 231. For concrete having a nominal maximum aggregate size of 1 or 1-1/2-inches, the average of each set of two tests shall be plotted on a control chart on which the average is set at 5.5 percent and the upper and lower control limits at 7 and 4 percent, respectively. For concrete having a nominal maximum aggregate size of 3/4-inch, the average shall be set at 6.0 percent and the upper and lower control limits at 7.0 and 5.0 percent, respectively. The control charts shall be furnished to the Contracting Officer.

16.2.6.2 Slump. At least two slump tests shall be made on randomly selected batches of each class of concrete during each day's concrete production in accordance with ASTM C 143. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. The average of each set of two tests shall be plotted on a control chart on which the upper and lower limits are set 1.5 inches above and below the mid-range value. The range shall be plotted on a control chart on which the upper control limit is 3.0 inches. The control chart shall be furnished to the Contracting Officer.

16.2.7 Preparation for Placing. Foundation or construction joints, forms, and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing.

16.2.8 Placing. The placing foreman shall supervise all placing operations, shall determine that the correct quality of concrete or grout is placed in each location as directed by the Contracting Officer, and shall be responsible for measuring and recording concrete temperatures, ambient temperature, weather conditions, placement time, placement duration, yardage placed, and placement method. Concrete temperatures shall be determined in accordance with ASTM C 1064. A report shall be furnished in writing to the Contracting Officer.

16.2.9 Vibrators. The frequency and amplitude of each vibrator shall be determined in accordance with CRD-D 521 prior to initial use and at least once a month when concrete is being placed. Additional tests shall be made when a vibrator does not appear to be adequately consolidating the concrete. The frequency shall be determined while the vibrator is operating in concrete with the tachometer being held against the upper end of the vibrator while almost submerged and just before the vibrator is withdrawn from the concrete. The amplitude shall be determined with the head vibrating in air. Two

measurements shall be taken, one near the tip and another near the upper end of the vibrator head, and these results averaged. The make, model, type, and size of the vibrator and frequency and amplitude results shall be reported in writing.

16.2.10 Curing.

16.2.10.1 Moist Curing. At least once each calendar day during the curing period, an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be reported in writing.

16.2.10.2 Curing Compound. No curing compound shall be applied until it has been verified that the compound is properly mixed and ready for spraying. At the end of each operation, the quantity of compound used and the area of concrete surface covered shall be reported, and the rate of coverage in square feet per gallon shall be computed. The report shall state whether coverage is uniform.

16.2.10.3 Impervious-Sheet Curing. At least once each calendar day during the curing period, an inspection shall be made of all areas being cured using impervious sheets. The condition of the covering and the tightness of the laps and tapes shall be noted and recorded.

16.2.11 Protection. At least once each calendar day during the curing period, an inspection shall be made of all areas subject to cold-weather protection. Deficiencies shall be noted. During removal of protection, measurement of concrete and ambient temperatures shall be recorded at least hourly. A report shall be furnished in writing to the Contracting Officer.

16.2.12 Mixer Uniformity.

16.2.12.1 Concrete Plant Mixer. At the start of concrete placing, and at least once every 6 months when concrete is being placed, uniformity of concrete shall be determined. The tests shall be performed in accordance with ASTM C 94. Whenever adjustments in mixer or increased mixing times are necessary because of failure of any mixer to comply, the mixer shall be retested after adjustment. Results of tests shall be reported in writing.

16.2.12.2 Truck Mixers. At the start of concrete placing and at least once every 6 months when concrete is being placed, uniformity of concrete shall be determined in accordance with ASTM C 94. The truck mixers shall be selected randomly for testing. When satisfactory performance is found in one truck mixer, the performance of mixers of substantially the same design and condition of blades may be regarded as satisfactory. Results of tests shall be reported in writing.

16.3 Action Required.

16.3.1 Fine Aggregate.

16.3.1.1 Grading. When the amount passing any sieve is outside the specification limits, the fine aggregate shall be immediately resampled and retested. If there is another failure on any sieve, the fact shall immediately be reported to the Contracting Officer, and immediate steps shall be taken to rectify the situation.

16.3.1.2 Moisture. Whenever the moisture content of the fine aggregate changes by 0.5 percent or more, the scale settings for the fine-aggregate batcher and water batcher shall be adjusted directly or by means of a moisture compensation device.

16.3.2 Coarse Aggregate Grading. When the amount passing any sieve is outside the specification limits, the coarse aggregate shall immediately be resampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Contracting Officer. Where two consecutive moving averages of five tests are outside specification limits, that fact shall be reported to the Contracting Officer, and immediate steps shall be taken to correct the grading.

16.3.3 Deleterious Substances. When the results for a deleterious substance are outside the specification limit, the aggregate shall be resampled and retested for the deleterious substance that failed. If the second sample fails, that fact shall be reported to the Contracting Officer. When material finer than No. 200 sieve for coarse aggregate exceeds the specification limit, immediate steps, such as washing or other corrective actions, shall be initiated.

16.3.4 Scales. Whenever either the weighing accuracy or batching accuracy is found not to comply with specification requirements, the plant shall not be operated until necessary adjustments or repairs have been made. Discrepancies in recording accuracies shall be corrected immediately.

16.3.5 Concrete.

16.3.5.1 Air Content. Whenever points on the control chart approach the upper or lower control limits, an adjustment should be made in the amount of air-entraining admixture batched. If a single test result is outside the specification limit, such adjustment is mandatory. As soon as practical after each adjustment, another test shall be made to verify the correctness of the adjustment. Whenever a point falls above the upper control limit for range, the dispenser shall be calibrated to ensure that it is operating correctly and with good reproducibility. Whenever two consecutive points for either average or range are outside the control limits, the Contracting Officer shall be notified. Whenever the air content departs from the specified range, the concrete shall not be delivered to the forms.

16.3.5.2 Slump. Whenever points on the control chart approach the upper or lower control limits, an adjustment should be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the total free water does not exceed that amount specified in the approved mixture proportions based on the free water available with the fine aggregate and that amount of water batched. If the adjustments to the batch weights of water and fine aggregate do not satisfactorily produce the required slump, the mixture shall be reproportioned to meet the specified criteria and resubmitted to the Contracting Officer for approval. When a single slump is outside the control limits, such adjustment is mandatory. As soon as practical after each adjustment, another test shall be made to verify the correctness of the adjustment. Whenever the slump exceeds the upper limit stipulated in paragraph 8.2.5, the concrete shall not be delivered to the forms. Whenever two consecutive slump tests, made during a period when there was no adjustment of batch weights, produce a point on the control chart for range above the upper control limit, the slump shall be considered to be out of control, and the additional testing for aggregate moisture content required in paragraph 16.2 shall be undertaken.

16.3.6 Placing. The placing foreman shall not permit placing to begin until he has verified that an adequate number of acceptable vibrators in working order and with competent operators are available. Placing shall not be continued if any pile of concrete is inadequately consolidated. If any batch of concrete fails to meet the temperature requirements, immediate steps shall be taken to improve temperature controls.

16.3.7 Curing.

16.3.7.1 Moist Curing. When a daily inspection report lists an area of inadequate curing, the required curing period for that area shall be extended by 1 day.

16.3.7.2 Curing Compound. When the coverage rate of curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

16.3.7.3 Impervious-Sheet Curing. When a daily inspection report lists any tears, holes, or laps of joints that are not completely closed, the tears and holes shall promptly be repaired or the sheets replaced, the joints closed, and the required curing period for those areas shall be extended by 1 day.

16.3.8 Protection. When any concrete temperature during the period of protection or protection removal fails to comply with the specifications, that fact shall be reported to the Contracting Officer, and immediate steps shall be taken to correct the situation.

16.3.9 Mixer Uniformity. When a mixer fails to meet mixer uniformity requirements, either the mixing time shall be increased or adjustments shall be made to the mixer until compliance is achieved.

16.4 Reports. All results of tests shall be reported as required. Each report shall include the updating of control charts covering the entire period from the start of the construction season through the current week. During periods of cold-weather protection, reports of pertinent temperatures shall be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in preceding paragraphs. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all Contractor quality control records.

17. MEASUREMENT AND PAYMENT. No measurement will be made for reinforced concrete. Payment for concrete will be made at the contract lump sum price for "Reinforced Concrete". Price and payment shall include the cost of all labor, materials, and the use of all equipment and tools required to complete the concrete work and furnishing and installing all miscellaneous metal. Reinforced concrete monoliths consist of base slabs, stabilization slabs, walls, reinforcing steel, formwork, waterstops, joints, expansion joint filler, and other components incidental thereto. Payment for concrete associated with utility installation and manholes and maintenance slabs will not be measured separately, but also included in the contract lump sum price for "Reinforced Concrete".

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SECTION 05500 - MISCELLANEOUS METALWORK

PART 1 - GENERAL

1. SCOPE. The work covered by this section consists of furnishing all plant, labor, materials and equipment, and furnishing and installing the miscellaneous metalwork as shown on the drawings and specified herein and shall include, but is not limited to, the following items:

1.1 Corrosion Resistant Steel (C.R.S.).

1.1.1 Bolts, hex cap screws, anchor bolts, threaded studs, washers, nuts, and set screws.

1.2 Fabricated Steel.

1.2.1 Galvanized floodwall ladders.

1.2.2 Galvanized beams, channels, angels and miscellaneous plate.

1.2.3 Galvanized 18 gage steel sheet metal.

1.3 Fabricated Aluminum.

1.3.1 Aluminum handrail and posts.

1.3.2 Aluminum Grating

2. APPLICABLE PUBLICATIONS. The following publications of the issues listed below but referred to thereafter by basic designation only form a part of this specification to the extent indicated by the references thereto or as required.

2.1 American National Standards Institute (ANSI).

A14.3-92 Ladders-Fixed-Safety

2.2 American Society for Testing and Materials (ASTM).

A 36-94 Carbon Structural Steel

A 123-89a Zinc (Hot Dip-Galvanized) Coatings on Iron and Steel Products

A 276-94b	Stainless and Heat-Resisting Steel Bars and Shapes
A 325-92a	High-Strength Bolts for Structural Steel Joints
A 563-94	Carbon and Alloy Steel Nuts
B 241/B241 M-96	Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
F 593-95	Stainless Steel Bolts, Hex Cap Screws, and Studs
F 594-91	Stainless Steel Nuts

2.3 Federal Specifications (Fed. Spec.).

FF-S-200A(2)	Setcrews: Hexagon Socket, Spline Socket, Headless
FF-W-92B	Washers, Flat (Plain)
SS-S-00210	Sealing Compound, Performed Plastic, for Expansion Joints and Pipe Joints

3. QUALITY CONTROL.

3.1 General. The Contractor shall establish and maintain quality control for proper fabrication and installation of all work covered in this section to assure compliance with contract specifications and maintain records of his quality control for all construction operations including but not limited to the following:

- (1) Fabrication.
- (2) Protective coating.
- (3) Placement and protection.
- (4) Material compliance with plans and specifications.

3.2 Reporting. The original and two copies of these records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily. Format of the report shall be as prescribed in Section 01440, "CONTRACTOR QUALITY CONTROL".

4. SUBMITTALS.

4.1 Shop Drawings. The Contractor shall prepare and submit for approval, complete shop drawings and descriptive literature showing details of all auxiliary items required as indicated herein or on the contract drawings. Shop drawings shall indicate computed weights of structural steel and approval of shop drawings will constitute acceptance of the computed weights shown on these drawings.

4.2 Manufacturer's Certification. The galvanizing compound shall be certified for compliance with all specification requirements.

PART 2 - PRODUCTS

5. FABRICATED AND MANUFACTURED ITEMS.

5.1 General. Fabrication and placement of all fabricated items shall be as indicated on the drawings and shall conform to the applicable provisions of Section 05501, "METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS".

5.2 Materials.

5.2.1 Corrosion Resistant Steel. Corrosion resistant steel shall conform to ASTM A 276, Type 304. High strength corrosion resistant steel shall conform to ASTM A 276, Type 431. Corrosion resistant steel bolts, nuts and washers shall conform to the applicable provisions of 05501-12 except that the material shall be corrosion-resistant steel.

5.2.2 Stainless Steel Bolts, Hex Cap Screws, Nuts, Washers, and Set Screws.

5.2.2.1 Stainless Steel Bolts and Hex Cap Screws. Stainless steel bolts and hex cap screws shall conform to ASTM F 593, Group 2, Alloy 316, Condition CW.

5.2.2.2 Stainless Steel Nuts. Stainless steel nuts shall conform to ASTM F 594, Group 2, Alloy 316, Condition CW.

5.2.2.3 Stainless Steel Washers. Stainless steel washer shall conform to Fed. Spec. FF-W-92B, Type A, Grade 1 (Sizes: Light and Heavy), Class B (Alloy 316). 3

5.2.2.4 Stainless Steel Set Screws. Stainless steel set screws shall conform to Fed. Spec. FF-S-200A(2), Type I, Style 1, Alloy 304.

5.2.3 Carbon Steel Bolts, Nuts and Washers.

5.2.3.1 Carbon Steel Bolts. Carbon steel bolts shall conform to ASTM A325.

5.2.3.2 Carbon Steel Nuts. Carbon steel nuts shall conform to ASTM A563, Grade A, Hex Style.

5.2.3.3 Carbon Steel Washers. Carbon steel washers shall conform to the applicable provisions of Federal Specification FF-W92, Type A, Grade I, Class A.

5.2.4 Structural Carbon Steel. All structural carbon steel, such as beams, angles, channels and miscellaneous plate, shall conform to the requirements of ASTM A36.

5.2.4 Ladders. Ladders shall be fixed-rail metal ladders conforming to the requirements of ANSI A14.3 and to details shown on the drawings. Ladders shall be fabricated of steel conforming to ASTM A 36, and shall be galvanized after fabrication as specified in Section 05501. Fabrication of ladders shall consist of solid-section rod rungs fitted into holes in bar side rails and welded. Splices in side rails shall be made using full penetration welds and shall be a smooth transition between connecting ends without sharp or extensive projections. All welds shall be ground smooth. Ladders shall be anchored to supporting structures with expansion anchors as shown on the construction drawings and specified in paragraph 5.2.4.

5.2.5 Aluminum Handrail and Posts. Aluminum handrail and posts shall meet the specifications for aluminum alloy 6061-T6 and shall conform to the requirements of ASTM B 241. Sizes and framing details shall be as shown on the drawings.

5.2.6 Plastic Sealant. Sealant shall conform to the applicable provisions of Federal Specification SS-S-00210.

5.3 Grout. The non-shrink grout specified on the drawings shall be EMBECO or equal.

5.4 Galvanizing. Hot-dip galvanizing or zinc coating applied on products fabricated from rolled, pressed, or forged steel shapes, plates, bars, and strips shall comply with ASTM A 123. Hot-dip galvanizing or zinc coatings on assembled steel products shall comply with ASTM A 123. Weight of coatings shall be as designated in Table 1 of the ASTM specification for class and thickness of material to be coated, but in no case shall it be less than 1.25 oz. per square foot.

PART 3 - EXECUTION

6. **WORKMANSHIP.** All metalwork fabrication and machine work shall comply with the applicable provisions of Section 05501. All parts shall be properly fabricated, assembled and installed to conform to the shapes, sizes and dimensions indicated on the contract drawings and approved shop drawings.

6.1 At Transition From I-Wall To T-Wall. The steel sheet piling slip joint shall be

surrounded by 18 gage steel sheet metal, as shown on the drawings. The space between the sheet metal and the steel sheet piling shall be filled with a plastic sealant, as shown on the drawings and as specified in paragraph 5.2.6.

6.2 Shop Painting. Corrosion-resistant and galvanized steel items shall not be painted. Corrosion-resistant steel shall be cleaned as specified in paragraph 05501-15.2. Anchors to be bedded in concrete will not be painted. All other ferrous metal shall be cleaned and shop painted before delivery to the project site. Requirements governing cleaning and painting are as specified in Section 09940, "PAINTING".

7. MEASUREMENT AND PAYMENT. No separate measurement and payment will be made for the material and work. Payment for miscellaneous metalwork will be included in the contract lump sum price for "Miscellaneous MetalWork". Price and payment shall constitute full compensation for furnishing and installing all miscellaneous metalwork indicated on the drawings and/or herein specified which is not specified to be paid for under other items of work listed on the bidding schedule.

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SECTION 05501 - METALWORK FABRICATION, MACHINE WORK,
AND MISCELLANEOUS PROVISIONS

PART 1 - GENERAL

1. SCOPE. This section specifies general workmanship requirements, applicable to the fabrication, assembly and testing of various items of metalwork and machine work to insure conformance with the specifications. These requirements are in addition to those contained in the specification sections covering the specific items of work or indicated on the drawings.

2. APPLICABLE PUBLICATIONS. The following publications of the issues listed below but referred to thereafter by basic designation only form a part of this specification to the extent indicated by the references thereto or as required.

2.1 American National Standards Institute (ANSI).

B46.1-85 Surface Texture (Surface Roughness, Waviness and Lay)

2.2 American Society for Testing and Materials (ASTM).

A 36-91 Structural Steel

A 53-93b Pipe, Steel, Black and Hot-dipped, Zinc-Coated Welded and Seamless

A 123-89a Zinc (Hot Dip-Galvanized) Coatings on Iron and Steel Products

A 325-92a High-Strength Bolts for Structural Steel Joints

A 563- Carbon and Alloy Steel Nuts

B 241- Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube

2.3 American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME BPVC).

Section IX Welding and Brazing Qualifications

2.4 American Welding Society, Inc. (AWS) Code.

D 1.1- 94 Structural Welding Code, Steel

D 1.2- Structural Welding Code-Aluminum

2.5 Department of Defense (DOD).

DOD-P-21035 Paint, High Zinc Dust Content, Galvanizing Repair (Metric)
(NAVY)

2.6 Federal Specifications (Fed. Spec.).

FF-W-92B Washers, Metal, Flat (Plain)

2.7 Military Specifications (Mil. Spec.).

MIL-W-13518 Wood Preservative: Tetrachlorophenol and
Pentachlorophenol, Surface Sealing Compound

2.8 Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation (RCRBSI).

Specification for Structural Joints Using ASTM A 325 or A 490 Bolts

2.9 The Aluminum Association, Inc. (AA).

Specifications for Aluminum Structures

3. QUALITY CONTROL.

3.1 Tests of Materials. The Contractor shall, at his expense, perform analyses and tests to demonstrate that all materials are in conformity with the specifications. Should the Contractor desire to use stock materials not manufactured specifically for the work covered by these specifications, he shall submit evidence, satisfactory to the Contracting Officer, that such material conforms to the requirements of the specifications. Detailed tests of these materials will then not be required, if so approved by the Contracting Officer. Tests, except where modified, shall be made as indicated in the respective detailed specifications or on the drawings and, unless otherwise authorized, in the presence of the Contracting Officer. 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.

3.2 Nondestructive Testing. When doubt exists as to the soundness of any material part such part may be subjected to any form of nondestructive testing determined by the Contracting Officer. This may include ultrasonic, magnaflux, dye penetrant, x-ray, gamma ray or any other test that will thoroughly investigate the part in question. The cost of such investigation will be borne by the Government. Any defects will be cause for rejection and rejected parts shall be replaced and retested at the Contractor's expense.

3.3 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.

3.4 Quality Control. The Contractor shall establish and maintain a quality control system to assure compliance with the contract requirements and shall maintain records of all quality control operations covered by these specifications.

4. SUBMITTALS. Contractor submittals shall be in accordance with Section 01300 and as herein specified.

4.1 Shop Drawings. Shop drawings shall be submitted for approval. Drawings shall include catalog cuts, templates, fabrication and assembly details and type, grade and class of materials as appropriate. Elements of fabricated items inadvertently omitted on drawings shall be detailed by the fabricator and indicated on the shop drawings.

4.2 Lists of Materials. The Contractor shall furnish the Contracting Officer 3 copies of all purchase and mill orders, shop orders for materials and work orders, including all new orders placed by Contractors and old orders extended by each supplier. The Contractor, at the time of submittal of shop drawings, shall furnish a list designating the material to be used for each item. Where mill tests are required, purchase orders shall contain the test site address and the name of the testing agency. The Contractor shall also 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 piece, the number of pieces, the total weight, and if shipped by rail in carload lots, the car initial and number. Copies of certified shipping bills, in duplicate, shall be mailed promptly to District Engineer, U.S. Army Corps of Engineers, New Orleans, Louisiana 70160-0267.

4.3 Schedule of Welding Procedures. A complete schedule of welding procedures as described in paragraph 10.1.3 shall be submitted to the Contracting Officer and approved before fabrication commences.

4.4 Certificates. Certificates for material tests, examinations, and welding procedure and operator qualifications shall be submitted for approval as specified.

PART 2 - PRODUCTS

5. GENERAL. All nuts shall be equipped with washers where indicated on the drawings. Beveled washers shall be used where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis.

6. RESERVED.

PART 3 - EXECUTION

7. STRUCTURAL FABRICATION.

7.1 Material. 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 on the drawings, or otherwise approved. Bends, except for minor details, 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 as not to destroy the original properties of the metal. Flame cutting of material other than structural steel shall be subject to approval and, where proposed, shall be indicated on shop drawings submitted to the Contracting Officer. Shearing shall be accurately done and all portions of the work shall be neatly finished. Corners shall be square and true unless otherwise shown on the drawings. Re-entrant cuts shall be filleted to a minimum radius of 3/4-inch unless otherwise approved. Finished members shall be free from twists, bends and open joints. Bolts, nuts and screws shall be tight.

7.2 Dimensional Tolerances for Structural Work. Dimensions shall be measured by means of an approved calibrated steel tape of approximately the same temperature as the material being measured at the time of measurement. The overall dimensions of an assembled structural unit shall be within the tolerances indicated on the drawings or as specified in Sections 05901 and 11285 of these specifications for the item of work. Except as required to meet the requirements above, an allowable variation of 1/32-inch is permissible in the overall length of component members with both ends milled; individual component members without milled ends shall not deviate from the dimensions shown on the drawings by 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.

7.3 Structural Steel Fabrication. Structural steel may be cut by mechanically guided or hand guided torches provided an accurate profile with a smooth surface which is 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.

7.4 Structural Aluminum Fabrication. Laying out and cutting of aluminum shall be in accordance with the AA Specifications for Aluminum Structures.

8. RESERVED.

9. RESERVED.

10. WELDING.

10.1 Structural Steel.

10.1.1 General. Unless otherwise authorized or specified, welding of structural steel shall be by an electric arc welding process using a method which excludes the atmosphere from the molten metal. Welding, unless otherwise specified or authorized shall conform to the applicable provisions of AWS D1.1, Sections 1 thru 7, 9, 10 and 11.

10.1.2 Welding Equipment. All items of welding equipment shall conform to the requirements of AWS D1.1. Electrodes shall be E70-XX.

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

10.1.4 Qualification of Welders and Welding Operators. Welding operators, welders, and tack welders shall be qualified and requalified if necessary for the particular type of work to be done. Qualification shall be in accordance with AWS D1.1, Section 5 or the ASME BPVC, Section IX.

The Contractor shall certify by name to the Contracting Officer the welders and welding operators so qualified, including the date of qualification and code and procedures under which qualified. Prior qualification may be accepted if welders have performed satisfactory work under the code for which qualified within the preceding three months. The Contractor shall require the welder and welding operators to repeat the qualifying tests when, in the opinion of the Contracting Officer, his work indicates a reasonable doubt as to proficiency. In such cases, he shall be recertified, as above, if he successfully passes the retest; otherwise, he shall be disqualified until he has successfully passed a retest. All expenses in connection with qualification and requalification shall be borne by the Contractor.

10.1.5 Technique.

10.1.5.1 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. Only low hydrogen electrodes shall be used for manual shielded metal-arc welding regardless of the thickness of the steel. The AWS designation of the electrodes to be used shall be included in the schedule of welding procedures to be furnished by the Contractor. To maintain low moisture of low hydrogen electrodes, a controlled temperature storage oven shall be used at the job site as prescribed by AWS D1.1, Subsection 4.5.

10.1.5.2 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.

10.1.5.3 Stress-Relief Heat Treatment. Where stress relief heat treatment is specified or shown on the drawings, it shall be in accordance with the requirements of AWS D1.1, Subsection 4.4, unless otherwise authorized or directed by the Contracting Officer.

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

10.1.6.1 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.

10.1.6.2 Temporary Welds. Temporary welds required for fabrication and erection shall be made under the controlled conditions prescribed herein for permanent work. All temporary welds shall be made using low-hydrogen welding electrodes and by welders qualified for permanent work as specified elsewhere in these specifications. Preheat furnished 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 after serving its purpose and ground flush with adjacent surfaces.

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

10.1.7 Inspection. Welding shall be subject to inspection by the Contracting Officer to determine conformance with the requirements of AWS D1.1, and the approved welding procedures and provisions stated elsewhere in these specifications. The Contracting Officer will require nondestructive examination of designated welds and may require supplemental examination of any joint or coupon cut from any location in any joint. The Contractor shall maintain an approved inspection system and perform required inspections in accordance with the Contract Clause entitled "INSPECTION OF CONSTRUCTION".

10.1.7.1 Visual Examination. Prior to any welding, the Contractor shall visually inspect the preparation of material for welding to assure compliance with Section 3 of AWS D1.1. All 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 insure compliance with the requirements of AWS D1.1, Section 3 and Section 9, Part D. Defects shall be corrected as provided in paragraph 10.1.7.4.

10.1.7.2 Test Coupons. The Government reserves the right to require the Contractor to remove coupons from completed work when doubt as to soundness cannot be resolved by nondestructive examination. Should any two coupons cut from the work of any welder show strengths under test, less than that specified for the base metal it will be considered evidence of negligence or incompetence and such welder shall be removed from the work. When coupons are removed from any part of a structure, the members cut shall be repaired in a neat workman like manner with joints of the proper type to develop

the full strength of the members, with peening as approved or directed to relieve residual stress. The expense for removal and testing of the coupons, repair of cut members and the performance of nondestructive examination of repairs shall be assigned to the Government or the Contractor in accordance with the Contract Clause entitled "INSPECTION AND ACCEPTANCE".

10.1.7.3 Supplemental Examination. The Government reserves the right to perform supplemental nondestruction examinations as deemed necessary when the soundness of any weld is in doubt and to detect cracking or similar defects that might occur during shipment or erection and before final acceptance by the Government. The cost of such inspection will be borne by the Government. The repairs and the reexamination of repairs will be performed by the Contractor at no additional cost to the Government.

10.1.7.4 Repairs. Defective weld metal shall be removed by air carbon-arc or oxygen gouging to sound metal. Oxygen gouging shall not be used on ASTM A 514 steel. The surfaces shall be thoroughly cleaned before welding. The resulting cavities shall be rewelded in compliance with Article 6.6 of AWS D1.1. When deemed necessary by the Contracting Officer the Contractor shall submit a welding repair plan for approval before repairs are made. Welds that have been repaired shall be retested by the same methods used in the original inspection. All costs of repairs and testing shall be borne by the Contractor, except for repair of members cut to remove test coupons which were found to contain acceptable welds.

10.1.7.5 Oxygen Cutting. In all oxygen cutting, flame shall be so adjusted and manipulated as to avoid cutting beyond the prescribed lines. Cut surfaces and edges shall be left free of slag.

10.2 Aluminum. Welding of aluminum shall conform to the AA Specifications for Aluminum Structures, Section 7 or AWS D1.2, Sections 1 through 7, 9 and 10. A complete schedule of welding procedures for each aluminum structure to be welded shall be submitted for approval. The welding process and welding operators shall be qualified as required by AWS D1.2, Section 5 or the AA Specifications for Aluminum Structures, Subsection 7.2.4 in accordance with the methods described in the ASME BPVC, Section IX. A certified report giving the results of all tests performed shall be furnished for approval.

11. RESERVED.

12. BOLTED CONNECTIONS.

12.1 Structural Steel Connections. Bolts, nuts and washers shall be of the type specified or indicated on the drawings. All nuts shall be equipped with washers except for high strength bolts. Beveled washers shall be used where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis. Where the use of high

strength bolts is specified or indicated on the drawings, the materials, workmanship and installation shall conform to the applicable provisions of the RCRBSJ Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

12.1.1 **Bolt Holes.** Bolt holes shall be accurately located, smooth, perpendicular to the member and cylindrical.

12.1.1.1 Holes for regular bolts shall be drilled or subdrilled and reamed in the shop and shall not be more than 1/16- inch larger than the diameter of the bolt.

12.1.1.2 Holes for fitted bolts shall be match-reamed or drilled in the shop. Burrs resulting from reaming shall be removed. The threads of bolts shall be entirely outside of the holes. The body diameter of bolts shall have tolerances as recommended by ANSI B4.1 for the class of fit specified. Fitted bolts shall be fitted in reamed holes by selective assembly to provide an LN-2 fit.

12.1.1.3 Holes for high strength bolts shall have diameters of not more than 1/16-inch larger than the bolt diameters. If the thickness of the material is not greater than the diameter of the bolts the holes may be punched. If the thickness of the material is greater than the diameter of the bolt, the holes may be drilled full size or subpunched or subdrilled at least 1/8-inch smaller than the diameter of the bolts and then reamed to full size. Poor matching of holes will be cause for rejection. Drifting done during assembly shall not distort the metal or enlarge the holes. For slight mismatching, reaming to a larger diameter of the next standard size bolt will be allowed.

13. RESERVED.

14. MACHINE WORK.

14.1 **General.** Unless otherwise shown on the shop drawings, all tolerances, allowances and gages for metal fits between plain, non-threaded, cylindrical parts shall conform to ANSI B4.1 for the class of fit as shown or otherwise required. Where fits are not shown they shall be suitable as approved by the Contracting Officer. Tolerances for machine-finished surfaces designated by non-decimal dimensions shall be within 1/64-inch. Sufficient machining stock shall be allowed on placing pads to insure true surfaces of solid material. Finished contact or bearing surfaces shall be true and exact to secure full contact. Journal surfaces shall be polished and all surfaces shall be finished with sufficient smoothness and accuracy to insure proper operation when assembled. Parts entering any machine shall be carefully and accurately machined and all like parts shall be interchangeable, except that parts assembled together for drilling or reaming of holes or machining will not be required to be interchangeable with like parts. All drilled holes shall be accurately located.

14.2 Finished Surfaces.

14.2.1 Where surface finishes are indicated on the drawings or specified herein, the symbols used or finishes specified shall be in accordance with ANSI B46.1. Values of required roughness height specified are arithmetical average deviations expressed in micro inches. Roughness specified is the maximum value and any lesser degree will be satisfactory unless otherwise indicated on the drawings. Compliance with surface requirements shall be determined by sense of feel and visual inspection of the work compared to Roughness Comparison Specimens, in accordance with the provisions of ANSI B46.1. Values of roughness width and waviness height are not specified, but shall be consistent with the general type of finish specified by roughness height. Flaws such as scratches, ridges, holes, peaks, cracks or checks which will make the part unsuitable for the intended use will be cause for rejection.

14.2.2 Where the finish is not indicated or specified, the type of finish shall be that which is most suitable for the surface to which it applies and shall be consistent with the class of fit required. Surfaces to be machine finished shall be indicated on the shop drawings by symbols which conform to ANSI B46.1.

14.3 Unfinished Surfaces. So far as practicle, all work shall be laid out to secure proper matching of adjoining unfinished surfaces. Where there is a large discrepancy between adjoining unfinished surfaces, they shall be chipped and ground smooth, or machined, to secure proper alignment. Unfinished surfaces shall be true to the lines and dimensions shown on the drawings and shall be chipped or ground free of all projections and rough spots. Depressions or holes not affecting the strength or usefulness of the parts shall be filled in a manner approved by the Contracting Officer.

14.4 Pin holes shall be bored true to gages, smooth, straight and at right angles to the axis of the member. The boring shall be done after the member is securely fastened in position.

15. MISCELLANEOUS PROVISIONS.

15.1 Metallic Coatings.

15.1.1 Zinc Coatings. Zinc coatings shall be applied in a manner and of a thickness and quality conforming to ASTM A 123. In all cases where zinc coatings are destroyed by cutting, welding or other causes, the affected areas shall be regalvanized by the following methods. 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 regalvanized by a repair compound conforming to DOD-P-21035.

15.2 Cleaning of Corrosion-Resisting Steel. After fabrication, oil, paint and other foreign substances shall be removed from corrosion-resisting steel surfaces. Cleaning shall be done by vapor degreasing or by the use of cleaners of the alkaline, emulsion or solvent type. After the surfaces have been cleaned they shall be given a final rinsing with clean water followed by a 24-hour period during which the surfaces are intermittently wet with clean water and then allowed to dry for the purpose of inspecting the clean surfaces. The surfaces shall be visually inspected for evidence of paint, oil, grease, welding slag, heat treatment scale, iron rust or other forms of contamination. If evidence of foreign substance exist, the surface shall be cleaned in accordance with the applicable provisions of Section 6 of ASTM A 380. The proposed method of treatment shall be furnished for approval. After treatment the surfaces shall be visually reinspected. Brushes used to remove foreign substances shall utilize only stainless steel or nonmetallic bristles. Any contamination occurring subsequent to the initial cleaning shall be removed by one or more of the methods indicated above.

15.3 Protection of Finished Work. Machined surfaces shall be thoroughly cleaned of foreign matter. All finished surfaces shall be protected by suitable means. Unassembled pins and bolts shall be oiled and wrapped with moisture resistant paper or protected by other approved means. Finished surfaces of ferrous metals to be in bolted contact shall be washed with a rust inhibitor and coated with an approved rust resisting compound for temporary protection during fabrication, shipping and storage periods. Finished surfaces of metals which will be exposed after installation shall be painted as specified in Section 09900, "PAINTING", except that painting of corrosion resisting steel or nonferrous metals will not be permitted unless specifically authorized or specified.

16. INSTALLATION.

16.1 General. 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 by a representative of the Contracting Officer prior to installation. Disassembly, cleaning and lubrication will not be required except where there is indication that such work is 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 over stress the threads. When a half nut is used for the purpose of locking a full nut, the half nut shall be placed first and followed by the full nut. Threads of all bolts, except high strength bolts, nuts and screws shall be lubricated by graphite and oil 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.

16.2 Alignment and Setting. Each machinery or 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. Machines shall be set true to the elevations shown on the drawings.

16.3 Blocking and Wedges. All blocking and wedges used during installation for the support of parts to be grouted in foundations shall be removed before final grouting unless otherwise directed by the Contracting Officer. Blocking and wedges left in the foundations with the approval of the Contracting Officer shall be of steel or iron.

16.4 Foundations and Grouting. Concreting of sub-bases and frames and the final grouting under parts of machines shall be in accordance with good construction procedures.

17. MEASUREMENT AND PAYMENT. No separate measurement and payment will be made for the material and work covered under this section and all costs in connection therewith shall be included in the applicable contract price for the items to which the work pertains.

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SECTION 05901 - BULKHEAD AND APPURTENANT ITEMS

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SECTION 05901 - BULKHEAD AND APPURTENANT ITEMS

PART 1 - GENERAL

1. **SCOPE.** The work provided for herein consists of furnishing all plant, labor, material; and equipment and performing all operations required to fabricate, deliver, store, paint, test, and position the bulkheads, complete with sill beams (including anchor bolts and second pour concrete), embedded side seal plates(including anchor bolts), operator/hoist, operator pedestal and any necessary appurtenances and accessories, all as specified herein and as shown on the contract drawings.

2. RELATED WORK SPECIFIED ELSEWHERE.

2.1 Concrete. Section 03301 - CAST-IN-PLACE STRUCTURAL CONCRETE.

2.2 Miscellaneous Metal. Section 05500 - MISCELLANEOUS METAL MATERIALS, STANDARD ARTICLES AND SHOP FABRICATED ITEMS.

2.3 Metalwork. Section 05501 - METALWORK FABRICATION, MACHINE WORK AND MISCELLANEOUS PROVISIONS.

2.4 Painting. Section 09940 - PAINTING.

3. **APPLICABLE PUBLICATIONS.** The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references and contract drawings thereto:

3.1 American Society for Testing and Materials (ASTM) Standards.

A 36-94	Carbon Structural Steel
A 126-93	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
A 276-94b	Stainless and Heat-Resisting Steel Bars and Shapes
B 209-95	Aluminum and Aluminum-Alloy Sheet and Plate
B 308-95a	Aluminum-Alloy 6061-T6 Standard Structural Shapes, Rolled or Extruded
B 584-93b	Copper Alloy Sand Castings for General Applications

D 395-89(1994)	Rubber Property - Compression Set
D 412-92	Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
D 471-95	Rubber Property - Effect of Liquids
D 572-88	Rubber Deterioration by Heat and Oxygen
D 2240-91	Rubber Property - Durometer Hardness
F 593-95	Stainless Steel Bolts, Hex Cap Screws and Studs
F 594-91	Stainless Steel Nuts

3.2 Aluminum Association (AA).

Aluminum Design Manual - Specifications and Guidelines for Aluminum Structures (First Edition, 1994).

4. QUALITY CONTROL.

4.1 General. The Contractor shall establish and maintain quality control for the work performed under this section of the specifications to assure compliance with contract requirements and shall maintain records of his quality control for all operations including but not limited to the following:

- (1) Inspection in the shop for proper materials.
- (2) Shop fabrication and assembly.
- (3) Non-destructive weld testing of the bulkheads.
- (4) Painting.
- (5) Preparation for shipment.
- (6) Inspection of the worksite for damage to and defects in the bulkheads.
- (7) Storage at the worksite.
- (8) Trial operation, adjustment of bulkheads, and appurtenant parts.

(9) Installation, alignment and adjustment of the seal plates and angles, seal beams, anchor bolts, washers, and nuts.

4.2 Reporting. The original and two copies of these records and tests, as well as the records of corrective action, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01440, "Contractor Quality Control".

5. SUBMITTALS.

5.1 Shop Drawings. Prior to performing any fabrication on the bulkheads, complete detailed shop drawings for the bulkheads and appurtenant embedded items shall be submitted by the Contractor for approval in accordance with Section 01300 - SUBMITTAL PROCEDURES. Drawings shall show complete details of materials, dimensions, tolerances, proposed welding sequences, location and types of nondestructive weld tests and all details required to locate, assemble, erect, and install the bulkheads, stems, lift and accessories at the job site. Any component part of fabricated items omitted on contract drawings shall be detailed on the shop drawings by the fabricator as well as details specified in related work sections.

5.2 Lists of materials shall be submitted by the Contractor as specified in SECTION 05501.

5.3 Test Reports. Certified manufacturer's test reports shall be provided for rubber seals to verify compliance with the applicable specification and fitness for application.

5.4 Samples. Rubber seal materials and splice samples shall be submitted for inspection and Contracting Officer approval. Samples shall include a sample of each type of corner splice required. Splices shall be made using the same method, materials and equipment that will be used for seals furnished at the job site. Total length of each splice sample shall be not less than 12 inches long. Samples shall be furnished at least 60 days prior to the installation of rubber seals in the work.

PART 2 - PRODUCTS

6. MATERIALS.

6.1 Aluminum.

6.1.1 Skin Plate. ASTM B 209, type 6061-T6.

6.1.2 Structural Aluminum. The bulkhead structural angles specified and shown on the drawings shall be fabricated from aluminum conforming to ASTM B 308, Type 6061-T6.

6.1.3 Aluminum Plate - Structural. The bulkhead end plates, stiffeners, adjustment plates, braces, bearing bars, lift eye plates, and other aluminum not otherwise indicated or specified shall be fabricated from aluminum conforming to the requirements of ASTM B 209, Type 6061-T6.

6.1.4 Seal Deflection Bars The seal deflection bars shall be fabricated from aluminum conforming to the requirements of ASTM B 209, Type 6061-T6.

6.2 Structural Steel. The bulkhead-slot guide angles, bulkhead-slot base WT sections, stiffeners, bars, and other bulkhead- slot steel not otherwise indicated or specified shall be fabricated from steel conforming to the requirements of ASTM A 36.

6.3 Stainless Steel.

6.3.1 Retainer Bars and Bolts for Seals. The seal retaining bars shall be fabricated from corrosion resisting steel conforming to the requirements of ASTM A 276, Hot or Cold Finish, Condition A, Class C, Type 304. Seal retaining bars and embedded metals shall be as specified in Section 05500.

6.3.2 Fasteners Including Assembly Bolts. All fasteners shall be stainless steel conforming to the requirements of ASTM F 593, Type 304 and ASTM F-594, Type 304 or ASTM A 276, Type 304, as indicated on the drawings.

6.3.3 Stems. Stems shall be ASTM A 276, Type 304 stainless steel. Stem threads shall be of the machine cut Acme type.

6.3.4 Seal Angles and Plates. Seal angles and plates shall be fabricated from corrosion resisting steel conforming to the requirements of ASTM A 276, hot or cold finish, Condition A, Class C, Type 304. Seal angles and plates shall be as specified in Section 05500.

6.4 Bulkhead Seals. Bulkhead seals shall be made of rubber to the shapes, sizes, and dimensions shown on the drawings. The rubber seals shall be molded only and the material shall be compounded of natural rubber or a copolymer of butadiene and styrene, or a blend of both and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers. Physical characteristics shall meet the following requirements:

PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
Tensile Strength	3000 psi (min)	ASTM D 412

Elongation at Break	450% (min)	ASTM D 412
300% Modulus	900 psi (min)	ASTM D 412
Durometer Hardness	60 to 70	ASTM D 2240
Water Absorption	5% by weight (max)	ASTM D 471
Compression Set	30% (max)	ASTM D 395
Tensile Strength After Oxygen Bombing Agent	80% (min) of tensile strength	ASTM D 572

PART 3 - EXECUTION

7. FABRICATION. Except as otherwise specified, all welding, weld inspection, metalwork fabrication, machine work, assembly, erection and testing shall be in accordance with applicable provisions of SECTION 05501.

7.1 Painting. Stainless steel metal, rubber seals, bearing surfaces and metalwork of the sill and seal plates that are to be embedded in concrete shall not be painted. Machined surfaces shall be protected as specified in SECTION 05501.

7.2 Rubber Seals. Seals shall be furnished in straight strips, except for specials, of such length that field splicing will be held to a minimum. Upon approval of the Contracting Officer, seals may be furnished completely or partially fabricated. Splicing shall be done in strict accordance with the recommendations of the manufacturer as approved by the Contracting Officer. Splices shall have a tensile strength of not less than 50 percent of the unspliced material. All splices shall be vulcanized. Special corner and angle pieces shall be integrally molded or shall be fabricated specials made up of vulcanized splices.

7.3 Embedded Metals. Embedded metals including plates, angles, and studs shall be as specified in Section 05500.

7.4 Bulkhead Stems. Each stem shall be the size and length as indicated on the drawings. Stem threads shall be of the machine cut Acme type. The stem to bulkhead connection shall be made with a 7/8 inch x 6 inch C.R.S. bolt and nut, as shown on the drawings. The threads of the connecting bolt shall be excluded from the shear plane, as shown on the drawings.

7.5 Operator. The benchstand hoists shall be sized to permit operation of the gate under the full operating head with a maximum effort of 40 pounds on the crank or

handwheel. The hoist type shall have a double gear reduction. The housing for the benchstand hoist shall be a weatherproof cast-iron lift housing constructed of material conforming to ASTM A 126, Class B. The hoist nut shall be manganese bronze conforming to ASTM B 584, alloy C865. The hoist nut shall be flanged and supported on nonmetallic thrust washers, ball or roller bearings. The nonmetallic thrust washers, ball and roller bearings shall adequately take the thrust developed during the opening and closing of the bulkhead. Lubrication fittings shall be provided for lubrication of the hoist bearings and gears without disassembly of the hoist. Suitable seals shall be provided to prevent entry of foreign matter. The operator shall incorporate a 15" (minimum) long handcrank constructed from material conforming to ASTM A 126, Class B, and be capable of being removed from the benchstand hoist. The handcrank shall be constructed for maximum operation forces of the benchstand hoist. The handcrank shall be constructed for maximum operation forces of the benchstand hoist. The direction of the crank rotation to open the gate shall be clearly and permanently marked on the hoist. The operator shall also be suitable for use with portable powered drivers.

7.6 Attaching Bolts. All necessary bolts necessary for attaching Operator to Offset Operator Stand shall be furnished by the operator manufacturer. The size and capacity of the bolts shall be as recommended by the Operator Manufacturer.

7.7 Operator Stand. The benchstand pedestal shall be an offset pedestal specifically designed and sized for the maximum loading of the benchstand hoist. The centerline of the stem will be offset from the edge of the benchstand hoist beam as shown on the drawings. The base for the pedestal shall be a minimum thickness and size of the pedestal base plate shall be 1-1/2" x 1'-5" x 1'-31/2" and shall be constructed from structural steel conforming to ASTM A 36. The remainder of the frame for the offset pedestal shall be constructed of material conforming to ASTM A 36 and capable of supporting all loads created by operation of the benchstand hoist. All welding necessary for construction of the offset pedestal shall be performed in accordance with AWS D1.1.

7.8 Operator Stand Anchor Bolts. Anchor bolts and nuts for the benchstand hoist pedestal shall be C.R.S. conforming to ASTM A 276, type 304. The length, size, and location of the anchor bolts and nuts shall be as shown on the drawings.

7.9 All necessary attaching bolts, anchor bolts and nuts not specified or shown on the drawings shall be ASTM A 276, type 304, stainless steel and shall be furnished by the bulkhead manufacturer.

8. SHIPPING. Prior to shipping all machined surfaces and steel surfaces which will be embedded in concrete shall be cleaned of all dirt, rust, weld spatter, and other foreign coatings, not including closely adhering mill scale. Machined surfaces and nongalvanized carbon steel surfaces shall be then coated with a rust preventive meeting the applicable requirements of Mil. Spec. MILC- 16173 for "Grade 2". This coating shall be removed

before the item is embedded in concrete. All small parts and components shall be boxed. All large parts and elements shall be protected by wooden pads, blocking, and other sturdy and suitable arrangements which will prevent damage during loading, shipment, unloading, storage, and subsequent handling. The various elements of the bulkheads shall be provided with lifting connections to facilitate handling during loading, unloading, and erection and installation. The connections shall be so located and reinforced as to prevent warping and misalignment of the bulkheads. Any eyebolts, special slings, strongbacks, and other devices used in loading and handling the gate elements after fabrication in the shop shall be furnished for unloading and handling at the destination.

9. TEMPORARY STORAGE. Upon delivery at the worksite, the bulkheads, exclusive of boxed parts and components, shall be stored on blocking not less than 8 inches above a base of either sand, shell or gravel. The blocking shall be constructed from material that will not have any detrimental affects on the bulkheads. All boxed parts and components shall be stored in a dry and covered, out of the weather, area in accordance with Section 01620.

10. INSTALLATION AND TRIAL OPERATION.

10.1 Installation. The installation of all parts shall be done by the Contractor in a workmanlike manner and in accordance with detailed technical installation procedures supplied by the gate manufacturer. It shall be the Contractor's responsibility to handle, store and install the gate operating mechanism and accessories in strict accordance with the manufacturer's drawings and recommendations.

10.1.2 Appurtenant Items. Anchor bolts to be set in the first placement concrete shall be set to templates of the drilling of the sill and/or seal beams or plate members and shall be firmly and securely fastened in place as specified in Section 03301. The sill and/or seal beams or plates shall be assembled, set in the recesses on the anchor bolts, and adjusted to exact position by means of adjusting nuts. Such bracing and supports as may be necessary to hold and maintain the liners in proper position during placement of concrete in the recesses shall be furnished and installed by the Contractor. All dimensions shown on the drawings shall be rigidly adhered to. The installation shall comply with the following conditions:

(1) Each sill beam shall be normal to the centerline of the bulkhead and in correct relation to other items. The sill beam shall be square and level, and set flush with concrete to provide a smooth flow surface.

(2) Side and top seal members shall be set plumb and square, to the dimensions and tolerances shown on the drawings, all in correct relationship to the bulkheads.

10.2 Testing and Trial Operation. Upon completion of the bulkhead installation, the bulkhead shall be completely opened and closed several times to ensure that it operates freely. The contractor shall notify the Contracting Officer at least 5 days prior to commencing the testing. The Contractor shall demonstrate that each bulkhead is operational in its appropriate bulkhead slot. Prior to dry testing, the rubber side seals shall be coated with vegetable soap to reduce dry friction on side seal plates during raising and lowering. During all testing the bulkheads shall be visually inspected to insure that all parts are properly fitted and that seals remain fully in contact with seal plates. Any malfunctions or discrepancies disclosed as a result of these tests shall be promptly remedied by the Contractor at no additional expense to the Government, and retests conducted.

11. STORAGE. Prior to completion of the contract, each bulkhead shall be placed in its open/storage position.

12. MEASUREMENT AND PAYMENT. The aluminum bulkheads and appurtenant items will not be measured for payment. Payment will be made at the contract lump sum price for "Aluminum Bulkheads". Price and payment shall constitute full payment for fabricating, delivering, painting, storing, testing, installing aluminum bulkheads and any necessary appurtenances and accessories, all as specified herein and as shown on the contract drawings, including all beams, angles, plates, skinplates, rubber seals, seal plates and angles, studs, hinges, fasteners, stems, operators, operator pedestals, and welding, and any other incidentals required to furnish complete and operable bulkheads.

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SECTION 09940 - PAINTING

PART 1 GENERAL

1. **SCOPE.** The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, appliances, and materials and performing all operations in connection with preparation of surfaces and application of paint and other specified materials. This work shall be accomplished in complete and strict accordance with the specifications and the applicable drawings and shall be subject to the terms and conditions of the contract.

1.1 **Work Performance.** Work shall be performed in accordance with the requirements of 29 CFR 1910, 29 CFR 1926, EM 385-1-1, and other references as listed herein. Matters of interpretation of the standards shall be submitted to the Contracting Officer for resolution before starting work. Where the regulations conflict, the most stringent requirements shall apply.

2. QUALITY CONTROL.

2.1 **General.** The Contractor shall establish and maintain quality control for painting operations to assure compliance with contract specifications and maintain records of his quality control for all construction operations including but not limited to the following:

- (1) Cleaning and preparation of surfaces.
- (2) Paint and formulations.
- (3) Number of coats and rates of applications.
- (4) Protection of painted surfaces.
- (5) Safety and Industrial Hygiene monitoring.

2.2 **Reporting.** The original and two copies of these records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily. Format of this report shall be as prescribed in Section 01440, "Contractor Quality Control".

3. **APPLICABLE PUBLICATIONS.** 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.

3.1 American National Standards Institute (ANSI).

Z87.1a-89 Occupational and Educational Eye and Face Protection

3.2 American Society for Testing and Materials (ASTM).

D 843-90 Nitration Grade Xylene

D 1186-93 Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base

D 4417-93 Measurement of Surface Profile of Blast Cleaned Steel

3.3 Code of Federal Regulations (CFR).

29 CFR 1910.20 Access to Employee Exposure and Medical Records

29 CFR 1910.94 Ventilation

29 CFR 1910.134 Respiratory Protection

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1910, Subpart I Personal Protective Equipment

29 CFR 1926 Safety and Health Regulations for Construction

40 CFR 50.6 National Primary and Secondary Ambient Air Quality Standards for Particulate Matter

40 CFR 58, App E Probe Siting Criteria for Ambient Air Quality Monitoring

40 CFR 60, App A, Mtd 22 Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 262 Standards Applicable to Generators of Hazardous Waste

40 CFR 262.22 Number of Copies

40 CFR 263 Standards Applicable to Transporters of Hazardous Waste

49 CFR 171, Subchapter C Hazardous Materials Regulations

3.4 Engineering Manual (EM).

EM 385-1-1 U.S. Army Corps of Engineers Safety and Health Requirements Manual(3 Sep 96 Edition)

3.5 National Fire Protection Association (NFPA).

NFPA 70 National Electrical Code

3.6 National Institute for Occupational Safety and Health (NIOSH).

NIOSH Pub No. 84-100 (1984; Supple 1985, 1987, 1988, & 1990)
NIOSH Manual of Analytical Methods

3.7 Steel Structures Painting Council Specifications (SSPC).

Paint 16-91 Coal Tar Epoxy-Polyamide Black (or Dark Red) Paint

SP 1-82 Solvent Cleaning

SP 5-91 White Metal Blast Cleaning

SP 7-91 Brush-Off Blast Cleaning

4. SUBMITTALS. Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300, "SUBMITTAL PROCEDURES":

4.1. Statements.

4.1.1 Qualifications and Experience: GA. The Contractor shall provide certification pursuant to paragraph 5 for all job sites. Submittal of the qualifications and experience of any additional qualified and competent persons the CIH, IH, CSP employs to provide on-site safety and health will also be provided. Acceptance of this submission must be obtained prior to the submission of other required safety and health submittal items.

4.1.2 Accident Prevention Plan; GA. The requirements included in Section 01 of EM 385-1-1 shall be followed by the Contractor when preparing the Accident Prevention Plan. The plan shall be prepared for all sites and shall include, but is not limited to, each of the topic areas listed in Table 1-1 therein and the requirements of paragraph 7; each topic shall be developed in a concise manner to include management and operational aspects.

4.1.3 Confined Space Procedures; GA. The Contractor shall develop detailed written standard operating procedures for confined spaces for all job sites in accordance with 29 CFR 1910.146 and as further described in this paragraph.

4.1.3.1 The Contractor shall supply certificates of calibration for all testing and monitoring equipment. The certificates of calibration shall include: type of equipment, model number, date of calibration, firm conducting calibration, and signature of individual certifying calibration.

4.1.3.2 The procedures shall include methods of inspection of personal protective equipment prior to use.

4.1.3.3 The procedures shall include work practices and other engineering controls designed to reduce airborne hazardous chemical exposures to a minimum.

4.1.3.4 The procedures shall include specification of the design and installation of ventilation systems which shall provide adequate oxygen content and provide for the dilution of paint solvent vapor, lead, and other toxic particulates within the confined space. In addition, the Contractor shall include plans to evaluate the adequacy of air flow patterns.

4.1.4 Respiratory Protection Program; GA. The Contractor shall develop a comprehensive written respiratory protection program for all job sites in accordance with 29 CFR 1910.134, 29 CFR 1926.62, and Section 05.E of EM 385-1-1.

4.1.5 Airborne Sampling Plan; GA. The Contractor shall develop an Airborne Sampling Plan for all job sites detailing the NIOSH Pub No. 84-100, Factory Mutual, or Underwriters Laboratories approved equipment, equipment calibration procedures, sampling methods, sampling to be performed, and analytical procedures to be used based on the type of work to be performed and anticipated toxic contaminants to be generated. The Contractor shall include the name of the accredited laboratory, listed by the American Industrial Hygiene Association (AIHA), to be used to conduct the analysis of any collected air samples. In addition, the Contractor shall provide the Contracting Officer with a copy of the test results from the laboratory within 5 working days of the sampling date and shall provide results from direct-reading instrumentation on the same day the samples are collected.

4.1.6 Ventilation Assessment: GA. The Contractor shall develop a plan to provide ventilation assessment for all job sites as required by paragraph 7.6.1.

4.1.7 Medical Surveillance Plan: GA. The Contractor shall develop a plan to provide medical surveillance to the workforce for all job sites as required in paragraph 8 and provide a statement from the examining physician indicating the name of each employee evaluated and any limitations which will preclude the employee from performing the work required. The statement shall include the date of the medical evaluation, the physician's name, signature, and telephone number. Medical records shall be maintained as required by 29 CFR 1910.20.

4.1.8 Waste Classification, Handling, and Disposal Plan: GA. The Contractor is responsible for assuring the proper disposal of all hazardous and nonhazardous waste generated during the project. Therefore, the Contractor shall develop a Waste Classification, Handling, and Disposal Plan for all job sites in accordance with the requirements of 40 CFR 261 and 40 CFR 262. In addition, the following provisions shall be included:

4.1.8.1 Hazardous waste shall be placed in closed containers and shall be shielded adequately to prevent dispersion of the waste by wind or water. Any evidence of improper storage shall be cause for immediate shutdown of the project until corrective action is taken.

4.1.8.2 Nonhazardous waste shall be stored in closed containers separate from hazardous waste storage areas.

4.1.8.3 All hazardous waste shall be transported by a licensed transporter in accordance with 40 CFR 263 and 49 CFR 171, Subchapter C.

4.1.8.4 All nonhazardous waste shall be transported in accordance with local regulations regarding waste transportation.

4.1.8.5 In addition to the number of manifest copies required by 40 CFR 262.22, one copy of each manifest will be supplied to the Contracting Officer prior to transportation.

4.1.9 Reserved.

4.1.10 Ambient Air Monitoring Plan for Particulate Emissions: GA. For all jobs requiring tight control on emissions where lead is not present, the Contractor shall develop a plan for monitoring emissions of particulate matter 10 microns or less in size (PM-10). The plan shall comply with the requirements of EPA regulation 40 CFR 50.6 and shall include provisions for halting work and correcting the containment in the event

unacceptable emissions occur. The positioning of air monitoring equipment shall be in accordance with 40 CFR 58, App E, Subpart (8). In addition, a minimum of two PM-10 monitors shall be used at the project site, one down wind from the project and one in the area of greatest public access (e.g. playground, school yard, or homeowner's yard). When the project is in an area where there are critical receptors nearby, monitoring shall be conducted throughout the entire period that abrasive blasting and cleanup operations are performed. Otherwise, monitoring shall be performed 4 of the first 8 days, and on a regular basis thereafter for a sum total of 25 percent of the time surface preparation and debris cleanup are performed. Failure to meet air quality regulatory limits shall require air monitoring to be repeated immediately after corrective actions have been taken. The Contractor shall also conduct preproject PM-10 monitoring. The preproject PM-10 monitoring shall be conducted a minimum of 2 weeks prior to the beginning of the project. The monitoring shall continue for a minimum of 3 days to establish background levels. A report of the results shall be submitted to the Contracting Officer within 48 hours and shall include:

- a. Name and location of jobsite.
- b. Date of monitoring.
- c. Time of monitoring (i.e., time monitoring begins and ends each day).
- d. Identification and serial number of monitoring units.
- e. Drawing showing specific location of monitoring units.
- f. Drawing showing specific location of paint removal operation and the method of removal or work activity being performed.
- g. Wind direction and velocity.
- h. A flow chart verifying the rate of air flow across the filter throughout the sampling period.
- i. Name and address of laboratory.
- j. Laboratory test procedure.
- k. Laboratory test results.
- l. Signatures of field and laboratory technicians conducting the work.

4.1.11 Visible Emissions; GA. For all jobs requiring tight control on emissions where lead is not present, the Contractor shall develop a plan monitoring the visible emissions from the project. The time of emissions shall be measured in accordance with 40 CFR 60, App A, Mtd 22. The plan shall also include the provisions for halting work and correcting the containment in the event unacceptable emissions are observed. General statements shall not be used; specific methods, procedures, and details are required. Random emissions from the containment shall not exceed 1 percent of the work day. The Contractor shall document each time that the work is halted due to a violation of the visible emissions criteria. Documentation shall include the cause for shutdown and the corrective action taken to resolve the problem.

4.2 Samples.

4.2.1 Special Paint Formulas; GA. Samples of special paint formulas, listed in paragraph 12 shall be submitted. The ingredient samples shall be clearly identified by commercial name, trade designation, manufacturer, batch or lot number, and such other data as may be required. For all epoxy type paints submitted for laboratory testing, a list of ingredient raw materials identifying commercial name, trade designation, manufacturer, batch or lot number, and such other data as may be required shall be furnished.

4.2.2 Proprietary paints. When the required quantity of a particular type or color of a paint is 10 gallons or less, a proprietary, name-brand, shelf item paint of the same type and with similar properties to the material specified may be proposed without sampling. Proprietary paints are any which do not follow the formulas in paragraph 12, or the complete specification requirements of Federal, Military, and Steel Structures Painting Council specifications. To receive consideration, a statement from the supplier that the paint is appropriate as to type, color, and gloss and is a premium grade of paint shall be furnished.

4.2.3 Thinners; GA. Samples shall be submitted of the thinners which are those solvents used to reduce the viscosity of the paint.

4.3 Records.

4.3.1 Inspections and Operations; GA. The Contractor shall document and submit records of inspections and operations performed. Submittals shall be made on a timely basis and shall include but are not limited to:

a. Inspections performed, including the area of the structure involved and the results of the inspection.

b. Surface preparation operations performed, including the area of the structure involved, the mode of preparation, the kinds of solvent, abrasive, or power tools employed, and whether contract requirements were met.

c. Thinning operations performed, including thinners used, batch numbers, and thinner/paint volume ratios.

d. Application operations performed, including the area of the structure involved, mode of application employed, ambient temperature, substrate temperature, dew point, relative humidity, type of paint with batch numbers, elapsed time between surface preparation and application, elapsed time for recoat, condition of underlying coat, number of coats applied, and if specified, measured dry film thickness or spreading rate of each new coating.

5. QUALIFICATIONS. Qualifications and experience shall comply with the following.

5.1 Certified Professional. The Contractor shall provide a person who is qualified and competent as defined in Section 01 of EM 385-1-1, will develop the required safety and health submittal, and will be responsible for on-site safety and health during the contract period. The person shall be a Certified Industrial Hygienist (CIH), an Industrial Hygienist (IH), or a Certified Safety Professional (CSP) with a minimum of 3 years of demonstrated experience in similar related work. The Contractor shall certify that the Certified Industrial Hygienist (CIH) holds current and valid certification from the American Board of Industrial Hygiene (ABIH), that the IH is considered board eligible by written confirmation from the ABIH, or that the CSP holds current and valid certification from the American Board of Certified Safety Professionals. The CIH, IH, or CSP may utilize other qualified and competent persons, as defined in EM 385-1-1, to conduct on-site safety and health activities as long as these persons have a minimum of 3 years of demonstrated experience in similar related work and are under the direct supervision of the CIH, IH, or CSP.

5.2 Certified Laboratory. The Contractor shall provide documentation which includes the name, address, and telephone number of the laboratories to be providing services.

6. SAMPLING AND TESTING. The Contractor shall allow at least 30 days for sampling and testing. Sampling may be at the jobsite or source of supply. The Contractor shall notify the Contracting Officer when the paint is available for sampling. Sampling of each batch shall be witnessed by the Contracting Officer unless otherwise specified or directed. A 1-quart sample of paint and thinner shall be submitted for each batch proposed for use. The sample shall be labeled to indicate formula or specification number and nomenclature, batch number, batch quantity, color, date made, and applicable project

contract number. Testing will be performed by the Government. Costs for retesting rejected material will be deducted from payments to the Contractor at the rate of \$300.00 dollars for each sample retested.

7. SAFETY AND HEALTH PROVISIONS. Paragraph 7 supplements the requirements of EM 385-1-1, paragraph (1). In any conflict between Section 01 of EM 385-1-1 and this paragraph, the provisions herein shall govern.

7.1 Abrasive Blasting. The Contractor shall comply with the requirements in Section 06.H of EM 385-1-1.

7.1.1 Hoses And Nozzles. In addition to the requirements in Section 20 of EM 385-1-1, hoses and hose connections of a type to prevent shock from static electricity shall be used. Hose lengths shall be joined together by approved couplings of a material and type designed to prevent erosion and weakening of the couplings. The couplings and nozzle attachments shall fit on the outside of the hose and shall be designed to prevent accidental disengagement.

7.1.2 Workers Other Than Blasters. Workers other than blasting operators working in close proximity to abrasive blasting operations shall be protected by utilizing MSHA/NIOSH-approved half-face or full-face air purifying respirators equipped with high-efficiency particulate air (HEPA) filters, eye protection meeting or exceeding ANSI Z87.1 and hearing protectors (ear plugs and/or ear muffs) providing at least 20 dBA reduction in noise level.

7.2 Cleaning with Compressed Air. Cleaning with compressed air shall be in accordance with Section 20.B.5 of EM 385-1-1 and personnel shall be protected as specified in 29 CFR 1910.134.

7.3 Cleaning with Solvents.

7.3.1 Ventilation. Ventilation shall be provided where required by 29 CFR 1910.146 or where the concentration of solvent vapors exceeds 10 percent of the Lower Explosive Limit (LEL). Ventilation shall be in accordance with 29 CFR 1910.94, paragraph (c)(5).

7.3.2 Personal Protective Equipment. Personal protective equipment shall be provided where required by 29 CFR 1910.146 and in accordance with 29 CFR 1910, Subpart I.

7.4 Paint Application.

7.4.1 Ventilation. When using solvent-based paint in confined spaces, ventilation shall be provided to exchange air in the space at a minimum rate of 5,000 cubic feet per minute per spray gun in operation. It may be necessary to install both a mechanical supply and exhaust ventilation system to effect adequate air changes within the confined space. All air-moving devices shall be located and affixed to an opening of the confined space in a manner that assures that the airflow is not restricted or short circuited and is supplied in the proper direction. Means of egress shall not be blocked. Ventilation shall be continued after completion of painting and through the drying phase of the operation. If the ventilation system fails or the concentration of volatiles exceeds 10 percent of the LEL (except in the zone immediately adjacent to the spray nozzle), painting shall be stopped and spaces evacuated until such time that adequate ventilation is provided. An audible alarm that signals system failure shall be an integral part of the ventilation system. The effectiveness of the ventilation shall be checked by using ventilation smoke tubes and making frequent oxygen and combustible gas readings during painting operations. Exhaust ducts shall discharge clear of the working areas and away from possible sources of ignition.

7.4.2 Explosion Proof Equipment. Electrical wiring, lights, and other equipment located in the paint spraying area shall be of the explosion proof type designed for operation in Class I, Division 1, Group D, hazardous locations as required by the NFPA 70. Electrical wiring, motors, and other equipment, outside of but within 20 feet of any spraying area, shall not spark and shall conform to the provisions for Class I, Division 2, Group D, hazardous locations. Electric motors used to drive exhaust fans shall not be placed inside spraying areas or ducts. Fan blades and portable air ducts shall be constructed of nonferrous materials. Motors and associated control equipment shall be properly maintained and grounded. The metallic parts of air-moving devices, spray guns, connecting tubing, and duct work shall be electrically bonded and the bonded assembly shall be grounded.

7.4.3 Further Precautions.

- a. Workers shall wear nonsparking safety shoes.
- b. Solvent drums taken into the spraying area shall be placed on nonferrous surfaces and shall be grounded. Metallic bonding shall be maintained between containers and drums when materials are being transferred.
- c. Insulation on all power and lighting cables shall be inspected to ensure that the insulation is in excellent working condition and is free of all cracks and worn spots. Cables shall be further inspected to ensure that no connections are within 50 feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

7.4.4 Ignition Sources. Ignition sources, to include lighted cigarettes, cigars, pipes, matches, or cigarette lighters shall be prohibited in area of solvent cleaning, paint storage, paint mixing, or paint application.

7.5 Health Protection.

7.5.1 Respirators. During all spray painting operations, spray painters shall use approved SCBA or SAR (air line) respirators, unless valid air sampling has demonstrated contaminant levels to be consistently within concentrations that are compatible with air-purifying respirator Assigned Protection Factor (APF). Persons with facial hair that interferes with the sealing surface of the facepiece to face seal or interferes with respirator valve function shall not be allowed to perform work requiring respiratory protection. Air-purifying chemical cartridge/canister half- or full-facepiece respirators that have a particulate prefilter and are suitable for the specific type(s) of gas/vapor and particulate contaminant(s) may be used for nonconfined space painting, mixing, and cleaning (using solvents). These respirators may be used provided the measured or anticipated concentration of the contaminant(s) in the breathing zone of the exposed worker does not exceed the APF for the respirator and the gas/vapor has good warning properties or the respirator assembly is equipped with a NIOSH-approved end of service life indicator for the gas(es)/vapor anticipated or encountered. Where paint contains toxic elements such as lead, cadmium, chromium, or other toxic particulates that may become airborne during painting in nonconfined spaces, air-purifying half- and full-facepiece respirators or powered air-purifying respirators equipped with appropriate gas vapor cartridges, in combination with a high-efficiency filter, or an appropriate canister incorporating a high-efficiency filter, shall be used.

7.5.2 Protective Clothing and Equipment. All workers shall wear safety shoes or boots, appropriate gloves to protect against the chemical to be encountered, and breathable, protective, full-body covering during spray-painting applications. Where necessary for emergencies, protective equipment such as life lines, body harnesses, or other means of personnel removal shall be used during confined-space work.

8. **MEDICAL STATUS**. Prior to the start of work and annually thereafter, all Contractor employees working with or around paint systems, thinners, blast media, those required to wear respiratory protective equipment, and those who will be exposed to high noise levels shall be medically evaluated for the particular type of exposure they may encounter. The evaluation shall include:

- a. Audiometric testing and evaluation of employees who will work in the noise environments.
- b. Vision screening (employees who use full-facepiece respirators shall not wear contact lenses).

c. Medical evaluation shall include, but shall not be limited to, the following:

(1) Medical history including, but not limited to, alcohol use, with emphasis on liver, kidney, and pulmonary systems, and sensitivity to chemicals to be used on the job.

(2) General physical examination with emphasis on liver, kidney, and pulmonary system.

(3) Determination of the employee's physical and psychological ability to wear respiratory protective equipment and to perform job-related tasks.

(4) Determination of baseline values of biological indices for later comparison to changes associated with exposure to paint systems and thinners or blast media, which include: liver function tests to include SGOT, SGPT, GGPT, alkaline phosphates, bilirubin, complete urinalysis, EKG (employees over age 40), blood urea nitrogen (bun), serum creatinine, pulmonary function test, FVC, and FEV, chest x-ray (if medically indicated), blood lead (for individuals where it is known there will be an exposure to materials containing lead), other criteria that may be deemed necessary by the Contractor's physician, and Physician's statements for individual employees that medical status would permit specific task performance.

9. CHANGE IN MEDICAL STATUS. Any employee whose medical status has changed negatively due to work related chemical and/or physical agent exposure while working with or around paint systems and thinners, blast media, or other chemicals shall be evaluated by a physician, and the Contractor shall obtain a physicians statement as described in paragraph 8 prior to allowing the employee to return to those work tasks. The Contractor shall notify the Contracting Officer in writing of any negative changes in employee medical status and the results of the physicians reevaluation statement.

10. PAINT PACKAGING, DELIVERY, AND STORAGE. Paints shall be processed and packaged to ensure that within a period of one year from date of manufacture, they will not gel, liver, or thicken deleteriously, or form gas in the closed container. Paints, unless otherwise specified or permitted, shall be packaged in standard containers not larger than 5 gallons, with removable friction or lug-type covers. Each container of paint or separately packaged component thereof shall be labeled to indicate the purchaser's order number, date of manufacture, manufacturer's batch number, quantity, color, component identification and designated name, and formula or specification number of the paint together with special labeling instructions, when specified. Paint shall be delivered to the job in unbroken containers. Paints that can be harmed by exposure to cold weather shall be stored in ventilated, heated shelters. All paints shall be stored under cover from the elements and in locations free from sparks and flames.

PART 2 PRODUCTS

11. SPECIAL PAINT FORMULAS. Special paints shall have the composition as indicated in the formulas listed herein. Where so specified, certain components of a paint formulation shall be packaged in separate containers for mixing on the job. If not specified or otherwise prescribed, the color shall be that naturally obtained from the required pigmentation.

12. PAINT FORMULATIONS. Formula C-200a, Coal Tar-Epoxy (Black) Paint shall conform to SSPC Paint 16 manufactured with Type 1 pitch. In addition to standard labeling, container labels shall include the term, Corps of Engineers Formula C-200a.

13. INGREDIENTS FOR SPECIAL PAINT FORMULAS. Xylene shall conform to ASTM D 843.

14. TESTING. Solvents in epoxy paints and thinners shall be subject to analysis by programmed temperature gas chromatographic methods and/or spectrophotometric methods, employing the same techniques that give reproducible results on prepared control samples known to meet the specifications. If the solvent being analyzed is of the type consisting primarily of a single chemical compound or a mixture of two or more such solvents, interpretation of the test results shall take cognizance of the degree of purity of the individual solvents as commercially produced for the paint industry.

PART 3 EXECUTION

15. CLEANING AND PREPARATION OF SURFACES TO BE PAINTED.

15.1 General Requirements. Surfaces to be painted shall be cleaned before applying paint or surface treatments. Deposits of grease or oil shall be removed in accordance with SSPC SP 1, prior to mechanical cleaning. Solvent cleaning shall be accomplished with mineral spirits or other low toxicity solvents having a flashpoint above 100 degrees F. Clean cloths and clean fluids shall be used to avoid leaving a thin film of greasy residue on the surfaces being cleaned. Items not to be prepared or coated shall be protected from damage by the surface preparation methods. Machinery shall be protected against entry of blast abrasive and dust into working parts. Cleaning and painting shall be so programmed that dust or other contaminants from the cleaning process do not fall on wet, newly painted surfaces, and surfaces not intended to be painted shall be suitably protected from the effects of cleaning and painting operations. Welding of, or in the vicinity of, previously painted surfaces shall be conducted in a manner to prevent weld spatter from striking the paint and to otherwise reduce coating damage to a minimum; paint damaged by welding operations shall be restored to original condition. Surfaces to be painted that will be inaccessible after construction, erection, or installation operations are completed shall be painted before they become inaccessible.

15.2 Ferrous Surfaces Subject to Severe Exposure. Ferrous surfaces subject to extended periods of immersion or as otherwise required shall be dry blast-cleaned to SSPC SP 5. The blast profile, unless otherwise specified, shall be 1.5 to 2.5 mils as measured by ASTM D 4417, Method C. Appropriate abrasive blast media shall be used to produce the desired surface profile and to give an angular anchor tooth pattern. If recycled blast media is used, an appropriate particle size distribution shall be maintained so that the specified profile is consistently obtained. Steel shot or other abrasives that do not produce an angular profile shall not be used. Weld spatter not dislodged by blasting shall be removed with impact or grinding tools and the areas reblasted prior to painting. Surfaces shall be dry at the time of blasting. Blast cleaning to SSPC SP 5 shall be done in the field and, unless otherwise specifically authorized, after final erection. Within 8 hours after cleaning, prior to the deposition of any detectable moisture, contaminants, or corrosion, all ferrous surfaces blast cleaned to SSPC SP 5 shall be cleaned of dust and abrasive particles by brush, vacuum cleaner, and/or blown down with clean, dry, compressed air, and given the first coat of paint. All abrasives used in sandblasting operations shall contain less than 1% silica, unless approved in writing by the Contracting Officer.

16. PAINT APPLICATION.

16.1 General. The finished coating shall be free from holidays, pinholes, bubbles, runs, drops, ridges, waves, laps, excessive or unsightly brush marks, and variations in color, texture, and gloss. Application of initial or subsequent coatings shall not commence until the Contracting Officer has verified that atmospheric conditions and the surfaces to be coated are satisfactory. Each paint coat shall be applied in a manner that will produce an even, continuous film of uniform thickness. Edges, corners, crevices, seams, joints, welds, rivets, corrosion pits, and other surface irregularities shall receive special attention to ensure that they receive an adequate thickness of paint. Spray equipment shall be equipped with traps and separators and where appropriate, mechanical agitators, pressure gauges, pressure regulators, and screens or filters. Air caps, nozzles, and needles shall be as recommended by the spray equipment manufacturer for the material being applied. Airless-type spray equipment may be used only on broad, flat, or otherwise simply configured surfaces, except that it may be employed for general painting if the spray gun is equipped with dual or adjustable tips of proper types and orifice sizes.

16.2 Mixing and Thinning. Paints shall be thoroughly mixed, strained where necessary, and kept at a uniform composition and consistency during application. Paste or dry-powder pigments specified to be added at the time of use shall, with the aid of powered stirrers, be incorporated into the vehicle or base paint in a manner that will produce a smooth, homogeneous mixture free of lumps and dry particles. Where necessary to suit conditions of the surface temperature, weather, and method of application, the paint may be thinned immediately prior to use. Thinning shall generally be limited to the addition of not more than 1 pint per gallon of the proper thinner; this general limitation shall not apply when more specific thinning instructions are provided.

Paint that has been stored at low temperature, shall be brought up to at least 70 degrees F before being mixed and thinned, and its temperature in the spray tank or other working container shall not fall below 60 degrees F during the application. Paint that has deteriorated in any manner to a degree that it cannot be restored to essentially its original condition by customary field-mixing methods shall not be used and shall be removed from the project site. Paint and thinner that is more than 1 year old shall be resampled and resubmitted for testing to determine its suitability for application.

16.3 Atmospheric and Surface Conditions. Paint shall be applied only to surfaces that are above the dew point temperature and that are completely free of moisture as determined by sight and touch. Paint shall not be applied to surfaces upon which there is detectable frost or ice. Except as otherwise specified, the temperature of the surfaces to be painted and of air in contact therewith shall be not less than 45 degrees F during paint application nor shall paint be applied if the surfaces can be expected to drop to 32 degrees F or lower before the film has dried to a reasonably firm condition. During periods of inclement weather, painting may be continued by enclosing the surfaces and applying artificial heat, provided the minimum temperatures and surface dryness requirements prescribed previously are maintained. Paint shall not be applied to surfaces heated by direct sunlight or other sources to temperatures that will cause detrimental blistering, pinholing, or porosity of the film.

16.4 Time Between Surface Preparation and Painting. Surfaces that have been cleaned and/or otherwise prepared for painting shall be primed as soon as practicable after such preparation has been completed but, in any event, prior to any deterioration of the prepared surface.

16.5 Method of Paint Application. Unless otherwise specified, paint shall be applied by brush or spray to ferrous and nonferrous metal surfaces. Special attention shall be directed toward ensuring adequate coverage of edges, corners, crevices, pits, rivets, bolts, welds, and similar surface irregularities. Other methods of application to metal surfaces shall be subject to the specific approval of the Contracting Officer.

16.6 Measurement on Ferrous Metal. Film thickness or spreading rates shall be as specified hereinafter. Where no spreading rate is specified, the paint shall be applied at a rate normal for the type of material being used. In any event, the combined coats of a specified paint system shall completely hide base surface and the finish coats shall completely hide undercoats of dissimilar color. Where dry film thickness requirements are specified for coatings on ferrous surfaces, measurements shall be made with one of the thickness gages listed below. They shall be calibrated and used in accordance with ASTM D 1186. They shall be calibrated using plastic shims with metal practically identical in composition and surface preparation to that being coated, and of substantially the same thickness (except that for measurements on metal thicker than 1/4 inch, the instrument may be calibrated on metal with a minimum thickness of 1/4 inch). Frequency of

measurements shall be as recommended for field measurements by ASTM D 1186 and reported as the mean for each spot determination. The instruments shall be calibrated or calibration verified prior to, during, and after each use. Authorized thickness gages:

- a. Mikrotest, Elektro-Physik, Inc.
- b. Inspector Gage, Elcometer Instruments, Ltd.
- c. Positest, Defelsko Corporation
- d. Minitector, Elcometer Instruments, Ltd.
- e. Positector 2000, Defelsko Corporation

16.7 Progress of Painting Work. Where field painting on any type of surface has commenced, the complete painting operation, including priming and finishing coats, on that portion of the work shall be completed as soon as practicable, without prolonged delays. Sufficient time shall elapse between successive coats to permit them to dry properly for recoating, and this period shall be modified as necessary to suit adverse weather conditions. Paint shall be considered dry for recoating when it feels firm, does not deform or feel sticky under moderate pressure of the finger, and the application of another coat of paint does not cause film irregularities such as lifting or loss of adhesion of the undercoat. All coats of all painted surfaces shall be unscarred and completely integral at the time of application of succeeding coats. At the time of application of each successive coat, undercoats shall be cleaned of dust, grease, overspray, or foreign matter by means of airblast, solvent cleaning, or other suitable means. Cement and mortar deposits on painted steel surfaces, not satisfactorily removed by ordinary cleaning methods, shall be brushoff blast cleaned and completely repainted as required. Undercoats of high gloss shall, if necessary for establishment of good adhesion, be scuff sanded, solvent wiped, or otherwise treated prior to application of a succeeding coat. Field coats on metal shall be applied after erection except as otherwise specified and except for surfaces to be painted that will become inaccessible after erection.

16.8 Contacting Surfaces. When riveted or ordinary bolted contact is to exist between surfaces of ferrous or other metal parts of substantially similar chemical composition, such surfaces will not be required to be painted, but any resulting crevices shall subsequently be filled or sealed with paint. Contacting metal surfaces formed by high-strength bolts in friction-type connections shall not be painted. Where a nonmetal surface is to be in riveted or bolted contact with a metal surface, the contacting surfaces of the metal shall be cleaned and given three coats of the specified primer. Unless otherwise specified, corrosion-resisting metal surfaces, including cladding therewith, shall not be painted.

16.9 Drying Time Prior to Immersion. Minimum drying periods after final coat prior to immersion shall be at least 7 days. Minimum drying periods shall be increased twofold if the drying temperature is below 65 degrees F and/or if the immersion exposure involves considerable abrasion.

16.10 Protection of Painted Surfaces. Where shelter and/or heat are provided for painted surfaces during inclement weather, such protective measures shall be maintained until the paint film has dried and discontinuance of the measures is authorized. Items that have been painted shall not be handled, worked on, or otherwise disturbed until the paint coat is fully dry and hard. All metalwork coated in the shop or field prior to final erection shall be stored out of contact with the ground in a manner and location that will minimize the formation of water-holding pockets; soiling, contamination, and deterioration of the paint film, and damaged areas of paint on such metalwork shall be cleaned and touched up without delay. The first field coat of paint shall be applied within a reasonable period of time after the shop coat and in any event before weathering of the shop coat becomes extensive.

16.11 Coal Tar-Epoxy (Black) Paint (Formula C-200a).

16.11.1 Mixing. Component B shall be added to previously stirred Component A and thoroughly mixed together with a heavy-duty mechanical stirrer just prior to use. The use of not more than 1 pint of xylene thinner per gallon of paint will be permitted to improve application properties and extend pot life. The pot life of the mixed paint, extended by permissible thinning, may vary from 2 hours in very warm weather to 5 or more hours in cool weather. Pot life in warm weather may be extended by precooling the components prior to mixing; cooling the mixed material; and/or by slow, continuous stirring during the application period. The mixed material shall be applied before unreasonable increases in viscosity take place.

16.11.2 Application. Spray guns shall be of the conventional type equipped with a fluid tip of approximately 0.09 inch in diameter and external atomization, seven-hole air cap. Material shall be supplied to the spray gun from a bottom withdrawal pot or by means of a fluid pump; hose shall be 1/2 inch in diameter. Atomization air pressure shall not be less than 80 psi. High-pressure airless spray equipment may be used only on broad, simply configured surfaces. Brush application shall be with a stiff-bristled tool heavily laden with material and wielded in a manner to spread the coating smoothly and quickly without excessive brushing. The coverage rate of the material is approximately 110 square feet per gallon per coat to obtain 20 mils (dry thickness) in a two-coat system. The paint shall flow together and provide a coherent, pinhole-free film. The direction of the spray passes (or finish strokes if brushed) of the second coat shall be at right angles to those of the first where practicable.

16.11.3 Subsequent Coats. Except at the high temperatures discussed later in this paragraph, the drying time between coal tar-epoxy coats shall not be more than 72 hours, and application of a subsequent coat as soon as the undercoat is reasonably firm is strongly encouraged. Where the temperature for substrate or coating surfaces during application or curing exceeds or can be expected to exceed 125 degrees F as the result of direct exposure to sunlight, the surfaces shall be shaded by overhead cover or the interval between coats shall be reduced as may be found necessary to avoid poor intercoat adhesion. Here, poor intercoat adhesion is defined as the inability of two or more dried coats of coal tar-epoxy paint to resist delamination when tested aggressively with a sharp knife. Under the most extreme conditions involving high ambient temperatures and sun-exposed surfaces, the drying time between coats shall not exceed 10 hours, and the reduction of this interval to a few hours or less is strongly encouraged. Where the curing time of a coal tar-epoxy undercoat exceeds 72 hours of curing at normal temperatures, 10 hours at extreme conditions, or where the undercoat develops a heavy blush, it shall be given one of the following treatments before the subsequent coat is applied:

a. Etch the coating surface lightly by brushoff blasting, using fine sand, low air pressure, and a nozzle-to-surface distance of approximately 3 feet.

b. Remove the blush and/or soften the surface of the coating by wiping it with cloths dampened with 1-methyl-2-pyrrolidone solvent or with Bitumastic 2CB solvent marketed by the Kopcoat, Inc or an approved equal. The solvents may be applied to the surface by fog spraying followed by wiping, but any puddles of solvent must be mopped up immediately after they form. The subsequent coat shall be applied in not less than 15 minutes or more than 3 hours after the solvent treatment.

16.11.4 Ambient Temperature. Coal tar-epoxy paint shall not be applied when the receiving surface or the ambient air is below 50 degrees F nor unless it can be reasonably anticipated that the average ambient temperature will be 50 degrees F or higher for the 5-day period subsequent to the application of any coat.

16.11.5 Safety. In addition to the safety provisions in paragraph 7, other workmen as well as painters shall avoid inhaling atomized particles of coal tar-epoxy paint and contact of the paint with the skin.

17. PAINT SYSTEMS APPLICATION. The required paint systems and the surfaces to which they shall be applied are shown in this paragraph, and/or in the drawings. Supplementary information follows.

17.1 Fabricated and Assembled Items. Items that have been fabricated and/or assembled into essentially their final form and that are customarily cleaned and painted in accordance with the manufacturer's standard practice will be exempted from equivalent surface preparation and painting requirements described herein, provided that:

a. Surfaces primed (only) in accordance with such standard practices are compatible with specified field-applied finish coats.

b. Surfaces that have been primed and finish painted in accordance with the manufacturer's standard practice are of acceptable color and are capable of being satisfactorily touched up in the field.

c. Items expressly designated herein to be cleaned and painted in a specified manner are not coated in accordance with the manufacturer's standard practice if different from that specified herein.

17.2 Surface Preparation. The method of surface preparation and pretreatment shown in the tabulation of paint systems is for identification purposes only. Cleaning and pretreatment of surfaces prior to painting shall be accomplished in accordance with detailed requirements previously described.

17.3 System No. 6. Paint shall be spray or brush applied with a minimum of two coats to provide a minimum total thickness at any point of 16 mils. The specified film thickness shall be attained in any event, and any additional (beyond two) coats needed to attain specified thickness shall be applied at no additional cost to the Government.

18. PAINTING SCHEDULES.

SYSTEM NO. 6

Items or surfaces to be coated:

(a) All sheet piling from cut-off to EL. (-)12.00 excluding the portion encased in concrete. Interlock grooves of the sheet piling shall not be painted. The unpainted portions of sheet piling which are to be embedded in concrete shall be free from surface contaminants such as oil, loose particles or similar conditions that would prohibit bonding between the concrete and sheet piling.

(b) All manway covers, drainage gates and steel pipe sleeves exposed.

(c) All damaged metal surfaces. Pre-painted items shall be recoated in accordance with the manufacturer's recommendation and all sheet pile shall be coated with coal tar epoxy.

<u>SURFACE PREPARATION</u>	<u>1st COAT</u>	<u>2nd COAT</u>	<u>3rd COAT</u>
White metal blast cleaning	Coal tar-epoxy C-200a (black)	Coal tar-epoxy C-200a (black)	Coal tar-epoxy C-200a (black) (if needed to attain required thickness)

PAINTING EXISTING CONSOLES

(1) Each console and end panel shall be thoroughly cleaned of all oil, grease, weld splatter, and surface rust prior to priming and painting.

(2) Cleaning shall include a complete washdown with Sherwin Williams or Dupont metal preparation, No. 57175 as listed on the drawings.

(3) All minor visible surface scratches dents, and imperfections shall be filled and sanded flat and smooth prior to finishing.

(4) Paint coatings shall be applied in accordance with the manufacturer's recommended procedures for air atomized spary processes. Brush or roller application of primer or paint will not be accepted.

(5) All surfaces shall have a high gloss finish, free of runs, drips, and uneven paint coverage. Any console with such imperfections shall be rejected by the Board Engineer and shall be refinished as previously specified.

(6) All interior and exterior surfaces, except aluminum mounting panels, shall be coated with Dupont Imron polyurethane enamel automotive finish, as specified below:

(a) Prime coat of self-etching gray primer consisting of #615S primer and #616S converter. If necessary, reduction up to a maximum of 10% by volume may be accomplished using #8100S retarder.

(b) Finish coat of #78387U Light Blue, per chart chip #69, using #192S activator and #8485S reducer, limited to 10% by volume.

19. PROTECTION OF NON-PAINTED ITEMS AND CLEANUP. Walls, equipment, fixtures and all other items in the vicinity of the surfaces being painted shall be maintained free of damage by paint or painting activities. Prompt cleanup of any paint spillage and prompt repair of any painting activity damage shall be required.

20. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for painting. Payment for all painting work performed and for all materials furnished under the section of the specifications for painting will be included in the contract unit or lump sum prices for which the work is incidental to.

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SECTION 11285 - SLUICE GATES, FLOOR STANDS
AND TEMPORARY BUTTERFLY GATES

PART 1 - GENERAL

1. SCOPE. The work provided for herein consists of furnishing all plant, labor, materials, equipment, manufacturing, factory testing, delivering, storing, installing and field testing eighteen (18) sluice gates, with floor stands a electrical operators and seven (7) butterfly gates, complete with all necessary accessories and appurtenances, all as shown on the drawings or specified herein. It should be noted that the butterfly gates utilized for the east side cofferdam shall be reused for the west side cofferdam.

2. QUALITY CONTROL.

2.1 General. The Contractor shall establish and maintain quality control for sluice gates and butterfly gates operations to assure compliance with contract requirements and maintain records of his quality control for all construction operations, including but not limited to the following:

- (1) Machine work.
- (2) Shop painting and certification that coatings are applicable to salt air and salt water site conditions.
- (3) Galvanizing.
- (4) Use of specified materials and equipment.
- (5) Shop assembly and tests.
- (6) Preparation for shipment and storage.
- (7) Inspection at the worksite for damage to and defects in all material and equipment.
- (8) Storage at the worksite.
- (9) Field painting.
- (10) Installation and tests.
- (11) Operation and maintenance after installation.

2.2 **Reporting.** The original and four copies of these records of inspection and tests, as well as the corrective action taken, shall be furnished to the Government daily. Format of the report shall be as specified in Section 01440, "CONTRACTOR QUALITY CONTROL".

3. REFERENCED PUBLICATIONS AND STANDARDS. The following publications of the issues listed below, but referred to hereafter by basic designation only, form a part of this specification to the extent indicated by references thereto.

3.1 American Society for Testing and Materials (ASTM).

A 36-89	Structural Steel
A 48-83	Gray Iron Castings
A 108-90a	Steel Bars, Carbon, Cold Finished, Standard Quality
A 123-89	Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel, Plates, Bars, and Strip
A 153-82	Zinc Coatings (Hot-Dip) on Iron and Steel Hardware
A 193-89	Alloy Steel Bolting Materials for High-Temperature Service
A 194-88	Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service
A 276-89a	Stainless and Heat-Resisting Steel Bars and Shapes
A 320-88	Alloy Steel Bolting Materials for Low-Temperature Service
A 582-87	Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished
B 21-83b	Naval Brass Rod, Bar, and Shapes
B 98-90	Copper-Silicon Alloy Rod, Bar, and Shapes

B 584-90	Copper Alloy Sand Castings for General Applications
D 2000-75	Rubber Products in Automotive Applications, Classification System

3.2 Steel Structures Painting Council Surface Preparation Specifications (SSPC).

SP 10-89	Surface Preparation Specification No. 10 Near-White Blast Cleaning
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3.3 Military Specifications (Mil. Spec.).

MIL-P-21035B	Paint, High Zinc Dust Content Galvanizing Repair
MIL-C-16173D and Am. 2	Corrosion Preventive Compound, Solvent Cutback, Cold Application

3.4 American Gear Manufacture's Association (AGMA).

420.04

4. SHOP DRAWINGS. Prior to construction of the gatewell monolith, complete shop drawings of the gate shall be submitted to the Contracting Officer for review and approval in accordance with Section 01300 - SUBMITTAL PROCEDURES. Drawings of any items made specially or specifically for this project shall be true shop drawings, but catalog cuts will be sufficient for standard manufactured articles, and outline drawings of such equipment may be used in the assembly drawings. However, for those items for which true shop drawings are not required, sufficient descriptive data and/or other information, in addition to the catalog cuts, shall be submitted to demonstrate compliance with the specifications. Appropriate computations shall be submitted to substantiate the adequacy of the floor stands with electrical operators. The embedded items and structural openings and clearances, which are dependent upon the floor stands, shall be included with the shop drawings.

5. EQUIPMENT TO BE INSTALLED AND/OR FURNISHED. The following equipment, together with all necessary accessories and appurtenances, shall be installed or furnished for a complete operational system with all other items required for a complete in place operational system.

(1) Eighteen gate assemblies including rubber seal, bronze seal bars, wedges, filler blocks and shims, and gate structure.

(2) Eighteen gate frames, including steel angles, bars and plates, bronze seal bars and bearing bars.

(3) Eighteen sill beams, including support angles and adjustable tees.

(4) Eighteen interconnected shafts and flexible couplings.

(5) Eighteen lift nuts.

(6) Eighteen gate stems.

(7) Eighteen stem guides.

(8) Eighteen thrust nuts.

(9) Eighteen floor stand pedestals.

(10) Eighteen actuators, motors, gears, operator push button station, wiring and all appurtenant items required for complete operating in place system.

(11) Seven butterfly gates and assemblies (frames, shaft, seal, actuator, motor, control wiring and all other appurtenant items) required for a complete installed in place operational system.

(12) All control panels, wiring, switches and all other appurtenant items required to remotely control permanent and temporary gates at the locations shown.

(13) One portable hydraulic and hand(wheel type) operator shall be furnished.

The following paragraphs may at times describe or refer to only one item, assembly or arrangement, but these requirements shall apply to all such items, assemblies or arrangements furnished under these specifications.

6. DESIGN. The interconnected electrical-operated floor stands with motors shall be products of a manufacturer who has been regularly engaged during the past five years in the production of similar-sized gate equipment and hoists for the design heads specified herein. Working stresses shall not exceed the lower value of either one-third of the yield strength or one-fifth of the ultimate strength of the material. The floor stand accessories and appurtenances shall be designed for installation as shown on the contract drawings.

7. WORKMANSHIP. All workmanship, whether in the factory or the field, shall be performed in a skillful and workmanlike manner by qualified mechanics under competent

supervision and direction and in accordance with the best modern practice for the various trades involved and for the manufacture of high-grade machinery. All parts shall have accurately machined mounting and bearing surfaces so that they can be assembled without fitting, chipping or remachining. All parts shall conform to the design dimensions and shall be free of all defects in either workmanship or material that will impair their service. All attaching bolt holes shall be accurately drilled to the layout indicated on the shop drawings.

PART 2 - PRODUCTS

8. MATERIALS. All materials shall be free from defects and imperfections, of recent manufacture and unused, and of the classifications and grades specified herein unless otherwise approved by the Contracting Officer. All materials shall be painted and coated with factory applied coat in accordance with the manufacturer's recommendation. The coating shall be required to resist rusting in a salt water environment as exists at the site. Material not specifically described shall, as far as practicable, conform to the latest specifications of the American Society for Testing and Materials. All materials, supplies and articles not manufactured by the Contractor shall be the products of recognized reputable manufacturers. Samples of materials shall be submitted for approval when so directed. Equipment, materials and articles installed, furnished, or used without such approval shall be at the risk of subsequent rejection.

8.1 Iron Castings. Material for iron castings shall meet the applicable requirements of either ASTM A 48 for "Class Nos. 30A, 30B or 30C" for the sluice gates and ASTM A126, "Class B or C" for the butterfly gates.

8.2 Bronze. Bronze castings for such items as wedges, thrust nuts, lift nuts and couplings shall meet the applicable requirements of ASTM B 584 for "Copper Alloy No. 865". Bronze extrusions for seat facings in the frame and slide shall meet the applicable requirements of ASTM B 21 for "Copper Alloy No. 482".

8.3 Corrosion-resisting Steel. Corrosion-resisting steel rods for stems shall meet the applicable requirements of either ASTM A 276 for "Type 302 or 304" or ASTM A 582 for "Type 303". Corrosion-resisting steel for fasteners shall meet either the above-mentioned specification or ASTM A 320 for "Grades B8, B8F or B8M" or ASTM A 193 for "Identification Symbols B8, B8A, B8M" and ASTM A 194 for "Grades 8, 8F or 8M".

8.4 Structural Steel. Structural steel for the gate, frames, and sill beams shall meet the applicable requirements of ASTM A 36.

8.5 Rubber. Rubber for seals shall meet the applicable requirements of ASTM D 2000 for "Grade R 625".

9. FLOOR STANDS, ACCESSORIES AND APPURTENANCE.

9.1. Sluice Gates.

9.1.1 Description. Floor stands, associated lifting machinery and accessories shall be designed for gates with opening as shown on drawings 2-5 and 2-6 and maximum heads of 20 feet seating and 10 feet unseating. The maximum design conditions shall be established within these heads. Sluice gates shall be manufactured by Rodney Hunt or equal.

9.1.2 Stem, Couplings and Stem Guides. The stem shall be made of corrosion-resisting steel. Stem threads shall be either machine-cut or rolled and of the ACME type. The stem and nut threads shall have sufficient contact area so that the contact pressure will not exceed 5,000 psi when the maximum stem thrust is exerted. The stem thread surfaces in contact with the lift nut shall have not rougher than a 63 micro-inch finish if machine cut or not rougher than a 32 micro-inch finish if roll-formed. The exterior corners of the threads, either during or after machining, shall be given a slight radius of approximately 0.015-inch in order to prevent them from acting as cutting edges as the stem passes through the lift nut. The stem shall be fitted with a tapped hole in the top end for handling. The tapped hole shall be of sufficient diameter and depth for the insertion of an eyebolt of sufficient strength to pick up the entire stem from a horizontal position. The stem shall be provided at its lower end with a threaded 6-inch cube bronze thrust nut which will fit into the pocket provided therefor on the gate. The thrust nut and stem shall be drilled through and one side of the thrust nut threaded so as to be jointed by a corrosion-resistant steel bolt. Stem guides shall be of cast-iron, bronze bushed and mounted on cast-iron brackets. They shall be drilled and slotted so as to be adjustable in two directions and shall be spaced as shown on the drawings. The bronze bushing shall be machine-bored 1/16-inch to 1/8-inch larger than the stem diameter. The stem guide, including the bronze bushing, shall be the two-piece collar type which can be installed and removed with the stem in place. Stem guides shall be attached with C.R.S. anchor bolts. Upper and lower stop nuts shall be installed on the threaded portion of the stem. They shall be placed such that the gate has full range of opening and closing with protection against damage to the stem and operator.

9.1.3 Fasteners. All fasteners used for fastening the floor stands and the stem guides shall be of either silicon bronze or corrosion-resisting steel. The quantity and size of fasteners shall be as recommended by the floor stand manufacturer.

9.1.4 Stem Cover. A stem cover of schedule 20 steel pipe shall be provided. The cover shall be hot-dip galvanized and be provided with a threaded cap. Galvanized fasteners shall be provided to attach the cover to the top of the floor stand. The cover shall be provided with an opening through which the stem may be inspected and lubricated,

and a gasketed cover with wing nuts shall be furnished to seal this opening. It shall also be provided with clearly legible and permanent markings to show the slide position.

9.1.5 Lube Reservoir. A manual lube reservoir shall be installed on each floor stand to feed oil to the lift nut during operation.

9.2 Butterfly Gates.

9.2.1 Description. Butterfly gates shall be square and shall be as manufactured by Hydro Gate or equal. They shall be of the size shown on the contract drawings. Each gate shall be complete with frame, leaf, actuator, and all necessary attaching bolts. Each gate shall be self-contained and when installed in accordance with the manufacturer's recommendations, shall be watertight up to a differential head of 20 ft on the horizontal centerline of the gate.

9.2.2 Gate Leaf. The gate leaf shall be fabricated from ASTM A36 carbon steel. It shall be designed for the maximum head shown on the drawings. Design stresses for all structural parts shall have a safety factor of 3.0 on the yield strength or 5.0 on ultimate strength - whichever is less. A stainless steel seating face shall be furnished around the periphery of the leaf. The four corners of the leaf shall be rounded with a radius not to exceed 7.25 in. to seal with similar rounded corners in the gate frame.

9.2.3 Gate Frame. The gate frame shall be fabricated from ASTM A36 carbon steel to the size shown on the drawings and shall be arranged to be installed as shown in the contract drawings.

9.2.3.1 A resilient, neoprene seal shall be attached firmly to the gate frame to provide a watertight contact with the stainless steel seating face on the gate leaf when the gate is in the fully closed position. All stainless steel parts shall be per ASTM A582, Type 303; or ASTM A276, Type 304 or 304L.

9.2.3.2 The stainless steel back-up angle for the seal shall be positioned accurately and welded to the gate frame. Stainless steel studs shall be welded to the back-up angle on a center-to-center spacing as required to hold the seal in place and provide field adjustment when required. Adjusting segments shall be furnished to contain the downstream side of the resilient seal and push uniformly against the seal for adjustment and to hold it in place. Adjusting fasteners and segments shall be Type 303 or Type 304 stainless steel. The neoprene seal shall be adjustable from the downstream side of the leaf after the gate is installed.

9.2.3.4 Shaft bearing housings shall be bored and supplied with vertical shaft bearings of the self-lubricating type. The maximum unit pressure on the bearing shall not

exceed 2,500 psi when the gate is subjected to the design head shown in the "Gate Schedule".

10. GATE OPERATORS.

10.1 Sluice Gates.

10.1.1 Basic Actuator. The electric valve actuator shall include the motor, actuator unit gearing, limit switch gearing, position limit switches, torque switches, stem nut, declutch lever, and handwheel as a self-contained unit. The actuator shall meet the latest revision of the applicable AWWA specification. The sluice gate actuator shall be as manufactured by Limatorque or equal. The valve actuator motor and all electrical enclosures shall be NEMA 4 (watertight). External gearing (side mounting) such as bevel or spur gearing between the gate stem and the electric actuator is not acceptable. The actuator shall be direct mounted to the gate stem.

10.1.2 Motor. The motor shall be specifically designed for valve actuator service and shall be of high starting torque, totally enclosed, non-ventilated construction. Motor insulation shall be a minimum NEMA Class F, with a minimum continuous temperature rating of 155 degrees C (rise plus ambient) for the duty cycle specified. Optional insulation classes shall be purchased where service conditions warrant. The motor shall be designed for use on a 480V, 3 phase 25hz system.

10.1.2.1 The motor shall be supplied with a NEMA rated FVR starter sized based on the horsepower of the motor. A operator push button station (open/stop/close) with red (open) and green (close) indicating lights shall be supplied. Also supply a 480v to 120v; 25 hertz rated control power transformer and all control wiring. The control power transformer shall be sized to supply 120V power to the motor heaters and 120V control power.

10.1.2.2 The motor shall be of sufficient size to open or close the gate at the maximum stated torque shown on the drawings. The motor shall also be capable of opening and closing the sluice gates at a rate of 12 inches/minute without exceeding the full load rating of the motor. The motor shall be capable of operating at plus or minus 10% of specified voltage. The motor duty rating shall be sufficient for one complete cycle (open-close-open, or reverse) without exceeding its temperature rating. Motor bearings shall be of the anti-friction type, and permanently lubricated.

10.1.2.3 The motor shall be an independent sub-assembly such that the power gearing shall not be an integral part of the motor assembly, to allow for motor or gear changes dictated by system operation requirements.

10.1.2.4 The motor shall be 25 Hz and equipped with internal thermal contacts to protect against motor overload and 120V AC heaters. The required minimum starting torque shall be as listed in the sluice gate table on Dwg. 8-1.

10.1.3 Power Gearing. The actuator shall be a multiple reduction unit with power gearing consisting of spur, helical, or bevel gearing and worm shall be of hardened alloy steel, and the worm gear shall be alloy bronze. All gearing shall be accurately cut. Non-metallic, aluminum or cast gearing shall not be allowed. Anti-friction bearings shall be used throughout.

10.1.3.1 Lubrication. All rotating power train components shall be immersed in grease with provisions for inspection and re-lubrication without disassembly. Lubricants shall be suitable for ambient conditions of minus 20 degrees F to 150 degrees F. (Note to engineer: For ambient conditions outside this range, conditions must be specified as special lubricant must be supplied.) Adequate seals shall be provided on all shafting.

10.1.3.2 Self-Locking Feature. Actuator gearing and/or stem threading shall be self-locking when required by the application.

10.1.3.3 Lost Motion Device. The actuator shall have a built in device, incorporated in the power train and located between the worm gear and actuator drive sleeve, to permit load impact under dynamic efficiency conditions, with a hammer blow effect, to allow the motor to reach full speed before engaging the gate load.

10.1.3.4 Manual Operation. A metallic handwheel shall be provided for manual operation with an arrow to indicate "open" rotation. The handwheel shall not rotate during motor operation. A fused motor shall not prevent manual operation. When in the manual operating mode, the actuator will remain in this mode until the motor is energized, at which time the actuator will automatically return to electric operation. Movement from motor operation to handwheel operation shall be accomplished by a positive padlockable declutch lever which mechanically disengages the motor and related gearing. It shall be impossible for simultaneous manual and motor operation to occur. Friction type declutch mechanism not acceptable.

10.1.3.5 Stem Nut. The valve actuator shall have a removable stem nut (or drive bushing) of high tensile bronze or other material compatible with the valve stem material.

10.1.3.6 Position Limit Switches. Position limit switches and the associated gearing shall be an integral part of the valve actuator. Limit switch gearing shall be of the intermittent type, made of bronze or stainless steel, grease lubricated, and totally enclosed to prevent dirt and foreign matter from entering the gear train. Switches shall be adjustable, allowing for trip points from fully open to fully closed positions of valve travel. They shall not be subject to breakage or slippage due to over-travel. Limit switch contacts

shall be heavy duty, silver plated with wiping action. The actuators shall have 16 contacts, 4 contacts/4 rotor type, all of the same basic design. Contacts shall be convertible from N/O to N/C or reverse. Switch design shall permit visual verification of switch position without disassembly.

10.1.3.7 Torque Switch. Each actuator shall be equipped with a switch, that will interrupt the control circuit in both the opening and closing directions when torque overload occurs or when gates require torque seating in the closed or open position. Contacts shall be silver plated. The torque switch shall have graduated dials for both open and close directions of travel and each shall be independently adjustable, with a positive means to limit the adjustability so as not to exceed the actuator output torque capability. Switch design shall permit visible verification of switch position without disassembly.

10.1.3.8 Switch Contact Ratings. The position limit switch and torque switch shall be rated 600 volts per NEMA standard ICS 2-125, heavy duty.

10.1.3.9 Control Compartment Heater. The control compartment shall be provided with a 120 volt space heater.

10.2. Butterfly Gates.

10.2.1 Basic Actuator. The electric valve actuator shall include the motor, actuator unit gearing, position limit switches, torque switches, declutch lever, and handwheel, as a self-contained unit. The actuator shall meet the latest revision of the applicable AWWA specification. The butterfly gate actuator shall be as manufactured by Limitorque or an approved equal. The actuator motor and all electrical enclosures shall be NEMA 4 (watertight).

10.2.2 Motor. The motor shall be specifically designed for gate actuator service and shall be of high starting torque, totally enclosed, non-ventilated construction. Motor insulation shall be a minimum NEMA Class F, with a maximum continuous temperature rating of 155 degrees C (rise plus ambient) for the duty cycle specified. Optional insulation classes are available if service conditions warrant. The motor shall be designed for use on a 480V, 3 phase 25hz system.

10.2.2.1 The motor shall be supplied with a NEMA rated FVR starter sized based on the horsepower of the motor. A operator push button station (open/stop/close) with red (open) and green (close) indicating lights shall be supplied. Also supply a control power transformer and all control wiring. The control power transformer shall be sized to supply 120V power to the motor heaters and 120V control power.

10.2.2.2 The motor shall be 25 HP and of sufficient size to open or close the valve at the maximum stated torque and be able to open or close the butterfly gate in 90

seconds. The motor shall be capable of operating at plus or minus 10% of specified voltage. The motor duty rating shall be sufficient for one complete cycle (open-close-open, or reverse) without exceeding its temperature rating. Motor bearings shall be of the anti-friction type, and permanently lubricated.

10.2.2.3 The motor shall be an independent sub-assembly such that the power gearing shall not be an integral part of the motor assembly, to allow for motor or gear changes dictated by system operation changes.

10.2.2.4 The motor shall be equipped with internal thermal contacts, to protect against motor overload, and 120 volt heaters. The minimum starting torque required under maximum head conditions is equal to 6,572 ft.lb., and the maximum torque (stall torque) equal 9.858 ft. lb.

10.2.3 Power Gearing. The actuator shall be a multiple reduction unit with power gearing consisting of spur or helical gears and worm gearing. There shall be a self-locking worm gear set in the drive train to maintain valve position. The spur or helical gearing and worm shall be of hardened alloy steel, and the worm gear shall be alloy bronze. All power gearing shall be accurately cut; non-metallic, aluminum, or cast gearing shall not be allowed. Anti-friction bearings with caged balls or rollers shall be used throughout.

10.2.4 Lubrication. All rotating power train components shall be immersed in grease with provisions for inspection and re-lubrication without disassembly. Lubricants shall be suitable for ambient conditions to minus 20 degrees F to 150 degrees F. Adequate seals shall be provided on all shafting.

10.2.5 Lost Motion Device. The actuator shall have a built-in device, which allows the motor to reach full speed before engaging the valve load when required by unscating applications.

10.2.6 Manual Operation. A metallic handwheel shall be provided for manual operation with arrow to indicate "open" rotation. The handwheel shall not rotate during motor operation. A fused motor shall not prevent manual operation. When in manual operating mode, the actuator will remain in this mode until the motor is energized, at which time the actuator will automatically return to electric operation. Movement from motor operation to handwheel operation shall be accomplished by a positive, padlockable, declutching lever, which mechanically disengages the motor and related gearing. It shall be impossible for simultaneous manual and motor operation to occur. Friction type declutch mechanism are not acceptable.

10.2.7 Position Limit Switches. Position limit switches and associated gearing shall be an integral part of the valve actuator. Limit switch gearing shall be of the intermittent type, made of bronze or stainless steel, grease lubricated, and totally enclosed to prevent

dirt and foreign matter from entering the gear train. Limit switch contacts shall be heavy duty and silver plated with wiping action. Where specified, the actuator shall have 16 contacts, 4 contact/4 rotor type, all for the same basic design. As an alternative, a limit switch assembly may be directly coupled to the valve stem, eliminating the need for intermittent gearing, and providing 6 single pole double throw (SPDT) contacts. Eight (SPDT) or 8 double pole, double throw, (DPDT) contacts are available as options. Contacts shall be convertible from N/O to N/C or reverse. Switches shall be adjustable, allowing for trip points from fully open to fully closed positions of valve travel. They shall not be subject to breakage or slippage due to over travel. Switch design shall permit visible verification of switch position without disassembly.

10.2.8 Torque Switch. Each valve actuator shall be equipped with a switch, that will interrupt the control circuit in both the opening and closing directions when valve torque overload occurs. Contacts shall be silver plated. The torque switch shall have graduated dials for both open and close directions of travel, and each shall be independently adjustable. The torque switch shall include a positive means to limit the amount of adjustment so as not to exceed the actuator output torque capability. The activating spring pack shall be of the Belleville spring design. Switch design shall permit visible verifications of switch position without disassembly.

10.2.9 Switch Contact Ratings. The position limit switch and torque switch contacts shall be rated 600 volts per NEMA standard ICS 2-125, heavy duty.

10.2.10 Control Compartment Heater. The control compartment shall be provided with a 120 volt space heater.

10.3 Basis for Design.

10.3.1 When operation at 275% of the units rated load, no part or component of the unit may be stressed beyond 75% of the yield point of the material. In addition, no component shall be stressed more than 20% of the tensile strength of its material when operating at the rated load of the unit.

10.3.2 For purposes of the above calculations, rated load is composed of the weight of the gate and stem, plus frictional forces using a coefficient of friction of 0.35, and maximum design conditions as specified in paragraph 9.1.

10.4 Floor Stand Assembly. All bearings shall be the anti-friction type. All components reductions gearing, stem lift nuts, and bearings shall be enclosed in NEMA Type IV enclosures and mounted on either a steel or cast-iron pedestal with flanged base plate, complete with corrosion-resisting steel anchor bolts and silicon bronze nuts. Reduction gearing shall consist of generated helical gears of heat treated alloy steel. Worms shall be of hardened alloy steel with threads ground and polished. The worm gear

shall be in one piece of high tensile strength bronze, accurately cut. All reduction gearing shall run in lubricant. All gears and other working components shall be carried on heavy-duty ball or roller bearings adequate for all torque and thrust loads imposed by operation of the gate at the specified maximum heads. Suitable seals shall be provided at all points as required to retain the lubricant. The motor-operator shall be of such design as to permit manual operation of the unit in event of portable operator failure or as necessary during servicing. A removable handwheel shall be provided with an arrow with the word "OPEN" cast on the rim of the wheel, indicating the direction of opening. Effort required to operate the floor stand manually with the gate in motion shall not exceed 25 pounds at the wheel rim. A dial-type gate position indicator shall be located at a conveniently visible location near the electric motor connection. The dial-type indicator shall display the gate position during both hand and motor operation. The indicator shall be graduated to show "FULL OPEN" when the bottom of the gate is 1-inch above the top of the culvert. The indicator shall be housed in a watertight enclosure.

10.5 Submittal Data to be Furnished for Review. The Contractor shall furnish the Contracting Officer for his review and approval dimensional outline drawings, catalog data and other information and calculations which will include at least the following:

- (1) Name of floor stand manufacturer.
- (2) Model number and weight.
- (3) Dimensional drawing.
- (4) Descriptive bulletin, including a breakaway drawing illustrating all operating components, a parts list and materials of construction.
- (5) Strength and durability HP ratings of unit per AGMA 420.04.
- (6) The gasoline motor's HP rating, running torque, stall torque, and full load power at set manufacturer's govern rpm setting.
- (7) The maximum and operating stem opening and closing load.
- (8) Equipment sizing calculations, including all related factors and supporting literature.
- (9) The maximum output as well as the starting and running torque of the electric motor operated floor stand with the relief valve inoperative.

11. PAINTING. The floor stand shall be painted with a complete coating system in accordance with the manufacturer's standard practice provided the coating system is

approved by the Contracting Officer, is of acceptable color and is touched up as necessary prior to shipment. A complete description of the manufacturer's standard coating system, including the surface preparation, type of primer and finish coat or coats, dry film thickness and whether baked-on or air-dried shall be submitted for approval.

12. GALVANIZING. The gate frame and sill beam shall be cleaned and hot-dip galvanized in accordance with the applicable requirements of either ASTM A 123 or ASTM A 153. All items shall be galvanized before attachment of seals and bronze accessories. The average minimum weight of the coating shall be 2 ounces per square foot.

13. LUBRICATION AND LUBRICANTS. The floor stand shall be lubricated prior to any use or operation, either in the shop or in the field. Each bearing shall be lubricated through its associated lubrication fitting, and the gears shall be packed with lubricant at assembly. After shop testing, and prior to shipment, the bearings shall be relubricated. Prior to testing in the shop, and to initial operation in the field, the gate seat facings and wedging devices shall be cleaned of all foreign material and lubricated thoroughly with a light grease. Just prior to field assembly, the lift nut and stem threads shall be lubricated. All lubricants shall be as recommended by the floor stand manufacturer and shall be submitted by manufacturer's name and number as part of the shop drawings. At no additional expense to the Government, the Contractor shall furnish an additional 20 pounds of each different floor stand lubricant.

PART 3 - EXECUTION

14. SHOP ASSEMBLY AND TESTS. After completion of initial machining, the gate shall be completely assembled, in the vertical position, and the wedging devices adjusted to exclude a 0.004-inch thickness gage between the frame and slide seating surfaces. Any additional machining needed to achieve this condition shall be performed, any discrepancies or deficiencies discovered as a result of this procedure shall be corrected, and a retest conducted. The slide shall be completely opened and closed in the guides several times to ensure that it operates freely. The gate shall then be disassembled to the extent necessary for shipment. The Contractor shall notify the Contracting Officer sufficiently in advance so that a representative of the Contracting Officer may witness the assembly, testing and disassembly work, unless this requirement is waived in writing by the Contracting Officer. The portable operator floor stand assembly shall be given the standard shop test. The floor stand shall be operated a sufficient length of time to ensure proper assembly and operation. Any malfunctions or discrepancies disclosed as a result of these tests shall be promptly remedied by the Contractor at no additional expense to the Government, and retests conducted.

15. PREPARATION FOR SHIPMENT AND STORAGE AT THE WORKSITE.

15.1 Preparation for Shipment. Prior to shipment from the manufacturer's plant, the Contractor shall prepare the gate and floor stand for shipment as described herein. All large, bulky and/or heavy elements shall be mounted on skids or pallets of ample size and strength to facilitate loading and unloading. All small parts shall be boxed in sturdy wood or heavy corrugated paperboard boxes. A packing list, indicating the contents of each such box and enclosed in a moisture-proof envelope, shall be securely fastened to the outside of the box. The skid and/or pallet mounting and the boxing shall be done in a manner which will prevent damage to the gate and floor stand during loading, shipment, unloading, storage and any associated and/or subsequent handling. Weatherproof covers shall be provided during shipment to protect all items which the Contracting officer designates as requiring such protection. Any special slings, strongbacks, skidding attachments or other devices used in loading the equipment at the manufacturers' and/or fabricators' plants shall be furnished for unloading and handling at the destination and shall become the property of the Government.

15.2 Preparation for Storage. At the conclusion of all shop tests, the gate and floor stand shall be protectively processed for not less than 24-month storage either outdoors or indoors as the case may be, at the destination. Bulky parts of the gate not particularly susceptible to damage from exposure, such as the frame, slide, etc., may be stored outdoors. Other parts, such as fasteners, stem, and the complete floor stand, shall be stored indoors. The Contractor shall furnish for approval, a complete description of the processing method or methods he intends to use, including complete instructions for maintaining the protection during the storage period. Surfaces of items or of portions of items which are to be embedded in or rest on concrete, shall be cleaned of all dirt, rust, and other foreign coatings, not including closely-adhering mill scale, and then coated with a rust preventative meeting the applicable requirements of Mil. Spec. MIL-C-16173 for "Grade 2". This coating shall be removed before the item is installed on or embedded in concrete.

16. STORAGE. Upon delivery at the worksite, bulky parts of the gates, such as the frames, slides and wall thimbles, which have been coated with a complete paint system in the manufacturer's plant, may be stored outdoors provided these parts are stored on wood blocking not less than 8 inches above a base of washed gravel or crushed stone not less than 2 inches thick. The alinement of the wood blocks must be checked at least weekly by the Contractor to correct any settlement that would effect the part's ability to function. All other elements of the gates, and the floor stands, shall be stored in a weathertight building. A framework covered with a plastic film, or any other such expedient or makeshift arrangement, will not be acceptable. The Contractor shall inspect the storage site at least once per day. The Contractor shall submit a detailed description of the proposed storage facilities, and a plan for storage, maintenance and inspection, before any storage actually begins.

17. **ERECTING ENGINEER.** The Contractor shall furnish the services of a competent erecting engineer to supervise and direct the installation and testing of the gates and floor stands furnished under this section. The erecting engineer shall be a full-time employee of, and designated as such by, the gate and floor stand manufacturer, shall have had at least five years of experience installing and designing the type of gate and floor stand furnished under these specifications and shall be subject to the approval of the Contracting Officer. The services of the engineer shall be furnished at no extra cost to the Government. The installation and testing of the thrust nut and the stem into the gate, and the testing of the gate travel and floor stands under the direction and supervision of the erecting engineer shall in no way relieve the Contractor of sole responsibility for the gates and floor stands meeting all requirements of the specifications and fulfilling all the Contractor's guarantees.

18. FIELD INSTALLATION AND TESTS.

18.1 Installation. All installation of the gate, floor stand and appurtenances shall be in accordance with the manufacturer's installation instructions and under the supervision and direction of the erecting engineer specified in paragraph 17. The floor stand and all elements of the gate shall be cleaned of all protective coating used thereon during shipment and storage, and all rust, dirt, grit and other foreign matter shall be removed. The gate shall then be "touch-up" painted with the standard paint provided by the gate manufacturer. The floor stand and each element of the gate shall be carefully and accurately aligned so that after it is fastened in place there will be no binding or excessive pressure or wear in any moving part and no distortion of any member. The wall thimble shall be internally braced during concrete placement. Fasteners shall be tightened uniformly and firmly, but care shall be taken not to overstress either the fastener or the member with which it is associated. Where specified torque values or ranges are cited in the installation instructions, an accurately calibrated torque-wrench, having the proper capacity range, shall be used. Stilson wrenches, cold chisels or other tools, likely to cause injury to the surface of any part, shall not be used in the work of assembly or tightening. All fasteners shall be installed with an anaerobic locking compound similar or equal to that of the LOCTITE Corporation. Cleaning prior to application of the locking compound and adjustment of the torque valves shall follow the manufacturer's recommendations. All shims shall be of either bronze or corrosion resistant steel. Where grouting is required, either an epoxy grout or a ready-to-use, non-shrinking grouting material, requiring only mixing with water at the worksite, shall be used, and use of any grouting material shall be as recommended by the manufacturer. All blocking and wedges used for support during initial grouting shall be removed prior to final grouting.

18.2 Tests. The gate and floor stand shall be operated and tested by and at the expense of the Contractor and under the supervision and direction of the erecting engineer specified in paragraph 18 to determine if they have been properly manufactured, assembled and installed and if they meet the requirements of the specifications. The

Contractor shall notify the Contracting Officer at least 5 days prior to commencing the testing. Check the motor rotation to ensure that the slide moves in the "OPEN" direction upon activation of the "OPEN" position on control mechanism and correct if necessary. The slide shall be raised manually about three inches prior to initial hydraulic operator operation. The "OPEN" control mechanism switch shall be adjusted so the opening cycle does not permit the end of the stem thread to enter the lift nut. In addition, the slide shall be blocked in both directions and the relief valve settings checked. After all adjustments have been properly made, the slide shall be raised and lowered with the use of the hydraulic operator not less than three times. Any malfunctions or discrepancies disclosed as a result of these tests shall be promptly remedied by the Contractor at no additional expense to the Government, and retests conducted.

19. **NAME PLATES.** Each gate floor stand shall be identified by means of a name plate permanently affixed in a conspicuous location. The plate shall bear the manufacturer's name, model designation, serial number, if applicable, and any other pertinent information such as speed, capacity, type, etc. Plates shall be made of corrosion-resisting metal with raised or depressed lettering and contrasting background.

20. **INSTRUCTION PLATES.** As necessary, each floor stand shall be equipped with suitably located instruction plates, including any warnings and cautions describing any special and important procedures to be followed in starting, operating and servicing the equipment. Plates shall be made of corrosion-resisting metal with raised or depressed lettering and contrasting background.

21. **OPERATION AND MAINTENANCE MANUAL AND PARTS LISTS.**

21.1 **Manual.** The Contractor shall furnish 5 copies of manuals containing complete detailed information in connection with the operation, lubrication (includes specific name of lubricant) adjustment, routine and/or special maintenance, disassembly, repair and reassembly of all mechanical, and control components of the gate floor stands furnished under this section.

21.2 **Parts Lists.** The Contractor shall furnish 5 copies of the manufacturer's spare parts lists and/or bulletins for each item of mechanical equipment furnished under this section. These lists and/or bulletins shall clearly show all details and parts, and all parts shall be adequately described and/or have proper identification marks.

21.3 **General.** The operation manual, the maintenance manual, and the parts lists shall be bound separately, shall be approximately 8½ inches by 11 inches, printed on good quality paper and bound between flexible, durable covers. Drawings incorporated in the manual and/or parts lists may be reduced to page size provided they are clear and easily legible, or may be folded into the manual to page size. Photographs and/or catalog cuts of components may be included for identification.

22. MAINTENANCE. After completion of the installation, the Contractor shall continue to maintain and protect the gate and floor stand and shall keep it ready for operation at any time until acceptance thereof.

23. MEASUREMENT AND PAYMENT. The sluice gates, floor stands and hydraulic operator will not be measured for payment. Payment will be made at the contract lump sum price for "Sluice Gates". The butterfly valves will not be measured for payment, but their costs shall be included in the applicable contract lump sum prices for "Cofferdams (East Monolith)" or "Cofferdam (West Monolith)". Price and payment shall constitute full compensation for furnishing all plant, labor, material and equipment and designing, manufacturing, assembling, factory testing, reserving, delivering, storing, installing and field testing the gates, floor stands and hydraulic operator complete, including painting and all appurtenant work, services and parts required.

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SECTION 16050 - ELECTRICAL GENERAL REQUIREMENTS

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5.	MEASUREMENT AND PAYMENT	16050-2

SECTION 16050 - ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1. SCOPE. The work covered by this section consists of furnishing all plant, labor, equipment, materials and performing all operations required for the installation of the general electrical requirements as shown on the drawings and herewith specified.

2. DESCRIPTION OF WORK. Electrical work includes, but is not limited to the following:

- (1) removal of existing electrical work;
- (2) temporary electrical services during construction for temporary valves, lighting, construction machinery, etc.
- (3) new electrical distribution equipment and wiring;
- (4) new weatherproof receptacles;
- (5) new lighting fixtures;
- (6) relocation of the N.O. S&WB's 6.6kW overhead distribution feeder #14 CK if it interferes with construction; and
- (7) install new selector switches and pilot lights in existing control console and wire as shown on the drawings.

3. MATERIALS AND EQUIPMENT.

3.1 Materials and equipment shall conform in all respects to the requirements set forth in these specifications and the accompanying drawings.

3.2 Except as otherwise specified, materials and equipment shall be new and bear the approval label of the Underwriters' Laboratories, Incorporated and all other standards specified herein.

3.3 Phased Construction; Sequencing. Refer to the General Provision entitled "ORDER OF WORK AND SCHEDULE" for provisions for determination of how construction phasing and sequencing requirements may affect performance of electrical work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

4. NATIONAL ELECTRIC CODE COMPLIANCE. Applicable rules of the National Electrical Code and local codes or ordinances shall apply as minimum standards.

5. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for the work covered under this section, and all costs in connection therewith shall be included in the contract lump sum price for "Electrical Work". Payment shall constitute full compensation for furnishing all plant, labor, equipment and materials, and performing the work in accordance with these specifications.

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SECTION 16110 - RACEWAY SYSTEMS

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SECTION 16110 - RACEWAY SYSTEMS

1. SCOPE. The work provided for herein consists of the Contractor furnishing all labor, tools, material and equipment and installing complete electrical raceway systems for the new electrical work. The electrical raceway systems include conduits, junction boxes, handy boxes, enclosures, conduits, cables and ground wires required for this project.

2. APPLICABLE PUBLICATIONS. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of the specifications to the extent indicated by the references thereto:

2.1 Federal Specifications (Fed. Spec.).

W-C-586D	Conduit Outlet Boxes, Bodies, and Entrance Caps, Electrical: Cast Metal
W-F-406D	Fitting for Cable, Power, Electrical and Conduit, Metal, Flexible

2.2 National Fire Protection Association (NFPA).

70-93	National Electrical Code, 1996 Edition
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2.3 National Electrical Manufacturers Association (NEMA) Publications.

FB 1-88	Fitting, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
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2.4 American National Standards Institute (ANSI).

C 80.1-83	Rigid Steel Conduit, Ninth Edition
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2.5 Underwriters Laboratories, Inc. (UL).

6-81	Rigid Metal Conduit, Ninth Edition
50-88	Cabinets and Boxes, Ninth Edition
467-84	Grounding and Bonding Equipment, Sixth Edition
514A-83	Metallic Outlet Boxes, Seventh Edition

3. QUALITY CONTROL.

3.1 General. The Contractor shall establish and maintain records of his quality control for all construction operations, including but not limited to the receiving, installation, checkout and field testing of the raceway systems. The Contractor shall maintain detailed records of quality control as well as any corrective action taken. The records shall include information on the following:

- (1) Manufacturer's tests on the material purchased.
- (2) Inspection for damage and defects in material at the time it is received at the worksite.
- (3) Periodic inspection of the storage area to verify the material and equipment is properly protected from the environment.
- (4) Weekly inspection of the worksite, when work under this section is being performed, to verify that the specified or approved material is being used and is properly protected from the environment.
- (5) Dates the material was received.
- (6) Progress made in installing the material.
- (7) Field testing.
- (8) Maintenance provided after the material is installed.

3.2 Reporting. Three copies of these records and tests, as well as the records of corrective action taken, shall be furnished to the daily Contracting Officer when work under this section is being performed. Format of the report shall be in accordance with Section 01440 - CONTRACTOR QUALITY CONTROL.

4. SUBMITTALS. The Contract shall submit the manufacturer's data for the raceway systems in accordance with Section 01300 - SUBMITTAL PROCEDURES.

5. CONCRETE INSERTS.

5.1 Concrete Inserts. Concrete inserts required for anchoring conduits shall consist of roll-formed stainless steel channels, 1-5/8 inches wide by 7/8 inches deep and length as required, similar to the fabrication design of Unistrut type P3300 Series concrete insert.

5.2 Fasteners. Fasteners to install brackets and hangers shall be corrosion-resistant bolts, nuts, washers and lock washers.

6. CONDUITS AND ACCESSORIES.

6.1 Rigid Steel Conduit. Rigid steel conduit shall meet requirements of ANSI C80.1 and UL 6. All conduit embedded in concrete or installed indoors shall be rigid galvanized steel conduit unless otherwise specified or shown on the contract drawings. Minimum size of conduit shall be 3/4 inch unless noted otherwise on the contract drawings.

6.2 Rigid Aluminum (copper-free) Conduit. Rigid aluminum conduit shall meet requirements of ANSI C80.5, ULB and Federal Specification WW-C-540C. All conduit routed outside of building shall be rigid aluminum conduit unless conduit is shown embedded in concrete. Insulate aluminum conduit if conduit passes through a concrete wall.

6.3 Sealtite Conduit. Liquid-tight, flexible, metallic conduit shall be Type UA (Underwriters Approved) with flexible metal core of interlocking between each convolution on the inside of the conduit. Exterior is covered overall with an extruded PVC jacket to protect against oil, water, chemical and corrosive fumes. Sealtite conduits shall be used at final connections to vibration equipment with the length not to exceed 24 inches. Terminate with Crouse-Hinds Metal Core Conduit Fittings or equals for liquid-tight metallic core flexible conduit, to comply with UL Standard 514A (Outlet Boxes and Fittings) and UL Standard 467 (for grounding and bonding).

6.4 Watertight Hubs. Watertight hubs shall be Myers SCRU-TITE hubs, or approved equal.

6.5 Conduit Fittings. Steel conduit fittings shall be galvanized and meet the applicable requirements of Fed. Spec. W-F-406D. Aluminum conduit fittings shall be copper-free and be used with rigid aluminum conduit.

6.6 Conduit Outlet Bodies. Conduit outlet bodies shall be galvanized when connected to rigid galvanized steel conduit, and meet the requirements of Fed. Spec. W-C-586D. 4

6.7 Expansion Fittings. Expansion fittings for steel conduit shall be of watertight construction with means to insure electrical continuity of the conduit run and to prevent damage to cables.

6.8 Insulated Bushings. Insulated bushings shall be placed on the ends of flexible and rigid conduits terminating in junction boxes, equipment cabinets, and all other

locations where cables and wires exit the conduit. Insulated bushings shall be of the galvanized threaded grounding type.

6.9 Junction and Pull Boxes. Junction and pull boxes shall conform to the applicable requirements of NEMA FB 1 and UL 50. All junction boxes shall be Type 4 and/or Type 4X unless otherwise noted on the contract drawings. Junction and pull boxes shall be constructed of hot dipped mill-galvanized sheet steel unless shown otherwise on the contract drawings. All boxes that are surface mounted shall have a gray enamel inside and outside finish applied by the box manufacturer. Boxes shall be provided with brass or stainless steel cover screws and shall be factory bossed, drilled and tapped as required. Boxes installed in walkways shall have cross-ribbed, checkered covers. Where box sizes are not indicated on the contract drawings, refer to NFPA 70 for minimum size.

6.10 Cable Supports. Cable supports for junction boxes shall be for threaded connection into threaded hubs which are tapped into the bottoms of these junction boxes. The cable supports shall accept male threaded rigid galvanized conduit. The cable support products shall be as manufactured by General Signal OZ/Gedney, or an approved equal.

6.10.1 The bodies shall be malleable iron castings with hot-dip galvanized finish. The fitting shall have female threads at the bottom to accept male threaded rigid steel conduit. Fittings for junction boxes shall have male threads at the top to allow threading into tapped (NPT) openings.

6.10.2 The cable supports shall be Type M or R as conditions dictate and provided with liner and wedging plug drilled for the cable O.D. used.

6.11 Tape Sealant. Tape sealant shall be Thomas & Betts Company cat. No. HSTS25 or an approved equal.

7. CONDUIT INSTALLATION.

7.1 General. Conduit types, sizes, and approximate locations are shown on the contract drawings. The exact location of conduit shall be subject to the approval of the Contracting Officer. All exposed conduit shall be run parallel or perpendicular to walls and ceilings with right angle turns. Bends and offsets shall be held to a minimum. Watertight hubs shall be provided for all conduit entrances to Type 4 and 4X enclosures.

7.2 Bends. Field bends may be used if of the proper radius and carefully made with suitable tools so that the conduit is not flattened. No conduit that has been crushed

or deformed in any way shall be used. The radius of any field bend shall not be less than that required by section 346-10 of the National Electrical Code.

7.3 Drainage. Provision shall be made for draining conduits by sloping them toward junction boxes or cable trenches, where practicable. Junction boxes where conduits drain into shall be equipped with 1-1/2 inch bottom drains, Crouse-Hinds Universal Drain ECD 15 or equal.

7.4 Surface Alignment. Conduit leaving concrete shall be aligned perpendicular to the concrete surface, except where otherwise shown or directed.

7.5 Threaded joints. Ends of metal conduit shall be cut square and reamed to remove rough edges and burrs. Joints shall be made watertight. Metal conduits shall provide electrical continuity for the conduit system or run. Threadless fittings or running thread couplings shall not be used. Metal threaded joints shall be lubricated with oil graphite conducting compound before being made up to insure electrical continuity.

7.6 Supports. All conduits shall be rigidly supported in an approved manner to the applicable concrete, or steel, surfaces. Spacers for embedded conduits shall be suitable for supporting the conduit without injury during installation. A minimum of two spacers shall be provided for supporting each length and the maximum distance between supports shall not exceed 5 feet.

7.7 Core Drilling. Concrete floor slab in control room shall be core drilled to stub conduits into floor trench. The core drilled area shall be tented to prevent control room from being exposed to concrete dust. The tented area shall be vacuumed before removal of tent. Finally, all concrete dust shall be cleaned off of all control panels, switches etc. in control room.

8. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for work covered in this section and all costs in connection therewith shall be included in the contract lump sum price for "Electrical Work". Price and payment shall constitute full compensation for furnishing all tools, labor, material, equipment and constructing the systems complete as specified herein and shown on the contract drawings.

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SECTION 16120 - WIRE AND CABLE

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SECTION 16120 - WIRE AND CABLE

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of the Contractor furnishing all plant, labor, equipment, materials and performing all operations required for the installation of wire and cable as shown on the drawings and herewith specified.

2. DESCRIPTION OF WORK.

2.1 Extent of electrical wire and cable work is indicated by drawings and schedules.

2.2 Types of electrical wire, cable, and connectors specified in this section include the following:

- (1) copper conductors;
- (2) fixture wire; and
- (3) control cable
- (4) shipboard type armored cable.

2.3 Applications of electrical wire, cable, and connectors required for project are as follows:

- (1) for power distribution circuits;
- (2) for lighting circuits;
- (3) for appliance and equipment circuits;
- (4) for motor branch circuits; and,
- (5) for control circuits.

3. QUALITY CONTROL.

3.1 NEC Compliance. Comply with NEC requirements as applicable to construction, installation and color coding of electrical wire and cables.

3.2 UL Compliance. Provide wiring/cabling and connector products which are UL listed and labeled.

4. **SUBMITTALS**. The Contractor shall submit manufacturer's data on wire and cable to the Contracting Officer for approval in accordance with Section 01300 - SUBMITTAL PROCEDURES.

5. **DELIVERY, STORAGE, AND HANDLING**. Handle wire and cable carefully to avoid abrasing, puncturing and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wire/cables is maintained.

PART 2 - PRODUCTS

6. WIRE, CABLE, AND CONNECTORS.

6.1 General. Provide electrical wire, cables, and connectors of manufacturer's standard materials, as indicated by published product information; designed and constructed as recommended by manufacturer, for a complete installation, and for application indicated. Except as otherwise indicated, provide stranded copper conductors with conductivity of not less than 98% at 20 degrees C (68 degrees F).

6.2 Provide factory-fabricated wire of sizes, ampacity ratings, and materials, for applications and services indicated. Where not indicated, provide proper wire selection as determined by the Contractor to comply with project's installation requirements, NEC and NEMA standards. Select from the following UL types, those wire with construction features which fulfill project requirements.

(1) Type THWN. For feeders and branch circuits run in dry or wet locations; max operating temperature 75 degrees C (167 degrees F). Insulation, flame-retardant, moisture and heat resistant, thermoplastic; outer covering, nylon jacket; conductor, annealed copper(stranded).

(2) Type THHN. For #10 and #12 AWG branch circuits only run in dry locations; max operating temperature 90 degrees C (194 degrees F). Insulation, flame-retardant, heat resistant, thermoplastic; outer covering, nylon jacket, conductor, annealed copper(stranded).

6.3 Fixture Wire. Fixture wire shall be of a type listed in Table 402-3 of the NEC, and shall comply with all the requirements of that table.

6.4 Type TC Jacketed Control Cable. Provide UL listed cable. Control cable shall be THHN/THWN insulated, PVC jacketed, rated 600 volts and 90 degrees C dry and 75 degrees C wet. The area of the a/c Type TC cable shall not be greater than .203 sq. inches.

6.5 Control Console Wiring. All wiring shall be #14AWG, stranded, tinned copper type SIS switchboard wire. Insulation shall be gray Vulkene, 500 volt rated.

6.5.1 Wiring terminating on relay or meter studs or under screw heads shall be fitted with AMP insulated shank crimp-on ring tongue terminals. Terminations to box type connections on terminal strips shall be made directly with no additional hardware required.

6.5.2 All wiring shall be labeled as shown on the drawings with AMP vinyl cloth wire markers, or equal numbering method. Jumpers which are not coded on the drawings shall be identified with wire markers in a manner similar to that used elsewhere on the plans. All individual conductors shall be labeled on each end.

6.5.3 Wiring shall be bundled in a neat competent workmanlike manner. Conductors shall be run straight and parallel within each bundle without twisting. Bundles shall be rerouted in a manner similar to that shown on the plans with all bundles run parallel and perpendicular to sides and rear of the consoles.

6.5.4 Bundles shall be secured each three-fourths (3/4") inch of length with nylon self-clinching cable ties. Size of cable ties shall be graduated throughout each bundle with smaller ties used as the number of bundles wires decrease.

6.6 Connectors. General: Provide UL type factory fabricated, metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Where not indicated, provide proper selection as determined by the Contractor to comply with project's installation requirements, NEC and NEMA standards.

PART 3 - EXECUTION

7. INSTALLATION OF WIRE AND CABLE.

7.1 General. Install electrical cables, wire and wiring connectors indicated, in compliance with applicable requirements of NEC, NEMA, UL, and NECA's "Standard of Installation", and in accordance with recognized industry practices.

7.2 Coordinate wire/cable installation work including electrical raceway and equipment installation work, as necessary to properly interface installation of wire/cables with other work.

7.3 Install all wiring in conduit.

7.4 Pull conductors simultaneously where more than one is being installed in same raceway.

7.5 Use pulling compound or lubricant, where necessary; compound used must not deteriorate conductor or insulation.

7.6 Use pulling means, including fish tape, cable, rope and basket weave wire/cable grips which will not damage cables or raceway.

7.7 Install splices and tapes which possess equivalent-or better mechanical strength and insulation ratings than conductors being spliced.

7.8 Use splice and tap connectors which are compatible with conductor material. Use no splice in feeder conductors.

7.9 Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std. 486A and B.

8. FIELD QUALITY CONTROL.

8.1 Prior to energizing circuits, check installed wire and cables with megohm meter to determine insulation resistance levels to ground and between conductors to ensure ANSI and IEEE requirements are fulfilled.

8.2 Prior to energization, test wire and cables for electrical continuity and for short circuits.

8.3 Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

9. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for the work covered under this section, and all costs in connection therewith shall be included in the contract lump sum price for "Electrical Work". Payment shall constitute full compensation for furnishing all plant, labor, equipment and materials, and performing the work in accordance with these specifications.

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SECTION 16405 - PANELBOARDS, DISCONNECT SWITCHES AND RECEPTACLES

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SECTION 16405 - PANELBOARDS, DISCONNECT SWITCHES AND RECEPTACLES

PART 1 - GENERAL

1. **SCOPE.** The work provided for herein consists of furnishing all labor, tools, material and equipment and installing the panelboard, disconnect switches, and receptacles required for this project.

2. RELATED WORK SPECIFIED ELSEWHERE.

2.1 Electrical Work. SECTION 16110 - RACEWAY SYSTEMS.

2.2 Wire and Cable. SECTION 16120 - WIRE AND CABLE.

3. **APPLICABLE PUBLICATIONS.** The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of the specifications to the extent indicated by the references thereto:

3.1 Federal Specifications (Fed. Spec.)

W-C-37B/GEN Circuit Breaker, Molded Case, Branch Circuit and Service

Class 11a, 18a, 21a

W-P-115B, Type I Panel, Panel Distribution
Class I

W-C-596/GEN Connectors, Plug, Receptacle, and Cable Outlet,
Electrical Power

3.2 National Electrical Manufacturers Association (NEMA) Publications.

KS1-90 Enclosed Switches

ICS 6-88 S Enclosures for Industrial Controls and Systems and
Molded Case Switches

4. QUALITY CONTROL.

4.1 General. The Contractor shall establish quality control to assure compliance with contract requirements and maintain detailed records of his quality control for all construction operations, including but not limited to the receiving, installation, checkout

and field testing of the system wiring. These records shall include, as a minimum, information on the following:

- (1) Manufacturer's tests on the material purchased.
- (2) Inspection for damage and defects in material at the time it is received at the work site.
- (3) Periodic inspection of the storage area to verify the material and equipment is properly protected from the environment.
- (4) Weekly inspection of the worksite, when work under this section is being performed, to verify that the specified or approved material is being used and is properly protected from the environment.
- (5) Dates the material was received.
- (6) Progress made in installing the material.
- (7) Field testing.
- (8) Maintenance provided after the material is installed.

4.2 Reporting. Three copies of these records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily when under this section is being performed. The format of this report shall be as prescribed in Section 01440, "Contractor Quality Control".

PART 2 - PRODUCTS

5. DISCONNECT SWITCHES.

5.1 Disconnect switches shall be of the fusible type unless indicated otherwise on the contract drawings.

5.2 Disconnect switches shall be provided in the locations and of the voltage and current ratings as indicated on the contract drawings.

5.3 After the installation is complete each unit shall be inspected for damage and operated to verify the handle and mechanism is performing as intended.

5.4 Fuses shall be dual-element time-delay Bussmann Class RX1.

6. RECEPTACLES.

6.1 General. Duplex, 120 VAC receptacles shall be of the NEMA 5-20R type Hubbell cat # 53CR52 or equal, unless indicated otherwise herein or on the contract drawings. Contact arrangement shall be such that contact is made on two sides of an inserted lead. Receptacle shall be side wired with two screws per terminal. The third grounding pole shall be connected to the metal mounting yoke.

6.2 Outdoor Weatherproof 120 VAC Convenience Outlet Receptacles. Receptacles shall be of the duplex type and meet the requirements of 1996 NEC article 410-57(b).

PART 3 - EXECUTION

7. MEASUREMENT AND PAYMENT. No measurement will be made for the work required by this section. Payment will be included in the contract lump sum price for "Electrical Work". Price and payment shall constitute full compensation for furnishing all tools, labor, material, equipment and constructing the systems complete as specified herein and shown on the contract drawings, including installation, tagging and testing of all cables and wires.

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SECTION 16450 - GROUNDING

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all plant, labor, equipment, materials and performing all operations required for the installation of grounding as shown on the drawings and herewith specified.

2. DESCRIPTION OF WORK.

2.1 Provide grounding as indicated on the drawings or required by the NEC or this section.

2.2 Applications of grounding work in this section include the following:

(1) enclosures; and,

(2) equipment.

3. QUALITY CONTROL.

3.1 NEC Compliance. Comply with NEC requirements as applicable to materials and installation of electrical grounding systems, associated equipment and wiring. Provide grounding products which are UL listed and labeled.

3.2 UL Compliance. Comply with applicable requirements of UL Standards Nos. 467 and 869 pertaining to electrical grounding and bonding.

3.3 IEEE Compliance. Comply with applicable requirements of IEEE Standard 142 and 241 pertaining to electrical grounding.

PART 2 - PRODUCTS

4. GROUNDING SYSTEMS.

4.1 Materials and Component. Except as otherwise indicated, provide electrical grounding systems; with assembly of materials, including cables/wires, connectors, terminals (solderless lugs), grounding rods/and additional accessories needed for complete installation. Where materials or components are not indicated, provide products complying with NEC, UL, IEEE, and established industry standards for applications indicated.

4.2 Conductors. Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC.

4.3 Connectors, Terminals and Clamps. Provide electrical connectors, terminals, lugs and clamps as recommended by connector, terminal and clamp manufacturers for indicated applications.

PART 3 - EXECUTION

5. INSTALLATION OF ELECTRICAL GROUNDING.

5.1 General. Install electrical grounding systems in accordance with applicable portions of NEC, with NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.

5.2 Coordinate with other electrical work as necessary to interface installation of electrical grounding system with other work.

5.3 Weld grounding conductors to underground grounding rods/electrodes.

5.4 Install clamp-on connectors only on thoroughly cleaned metal contact surfaces, to ensure electrical conductivity and circuit integrity.

5.5 Equipment grounding shall be accomplished by utilization of a separate copper grounding conductor run with circuit conductors. This grounding conductor shall be either integral to a multiconductor cable, or a separate bare or insulated conductor pulled in with separate circuit conductors.

6. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for the work covered under this section, and all costs in connection therewith shall be included in the contract lump sum price for "Electrical Work". Payment shall constitute full compensation for furnishing all plant, labor, equipment and materials, and performing the work in accordance with these specifications.

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SECTION 16500 - LIGHTING

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SECTION 16500 - LIGHTING

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of furnishing all plant, labor, equipment, materials and performing all operations required for the installation of lighting as shown on the drawings and herewith specified.

2. QUALITY ASSURANCE.

2.1 **NEC Compliance.** Comply with NEC as applicable to installation and construction of lighting fixtures.

2.2 **UL Compliance.** Provide lighting fixtures which have been UL listed and labeled.

2.3 **CBM Labels.** Provide fluorescent-lamp ballasts which comply with Certified Ballast Manufacturers Association standards and carry the CBM label.

3. RESERVED.

4. **SUBMITTALS.** The Contractor shall submit manufacture's data on lighting fixtures to the Contracting Officer for approval in accordance with Section 01300 - SUBMITTAL PROCEDURES.

4.1 **Product Data.** Submit manufacturer's data on lighting fixtures.

4.2 **Shop Drawings.** Submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in luminaire type alphabetical order, with proposed fixture and accessories clearly indicated on each sheet.

PART 2 - PRODUCTS

5. LIGHTING FIXTURES.

5.1 **General.** The Contractor shall provide lighting fixtures, of sizes, types and ratings indicated; complete with housings, lamps, lamp holders, reflectors, ballasts, starters and wiring.

5.2 **High Intensity Discharge Lamp Ballasts.** The Contractor shall provide HID lamp ballasts, of ratings, types and makes as recommended by lamp manufacturer, which properly matches lamps to power line by providing appropriate voltages and impedances

for which lamps are designed. Ballasts shall limit inrush current to an amount less than operating current.

5.3 The Contractor shall comply with additional fixture requirements contained by Lighting Fixture Schedule shown on drawings.

PART 3 - EXECUTION

6. INSTALLATION OF LIGHTING FIXTURES.

6.1 The Contractor shall install lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation", NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.

6.2 The Contractor shall support fixtures securely and independently from building structure.

7. ADJUST AND CLEAN. The Contractor shall clean lighting fixtures of dirt and debris upon completion of installation.

8. FIELD QUALITY CONTROL. After completion of installation of lighting fixtures, and after circuitry has been energized, the Contractor shall apply electrical energy to demonstrate capability and compliance with requirements. The Contractor shall where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

9. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for the work covered under this section, and all costs in connection therewith shall be included in the contract lump sum price for "Electrical Work". Payment shall constitute full compensation for furnishing all plant, labor, equipment and materials, and performing the work in accordance with these specifications.

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SECTION 16900 - ELECTRICAL CONNECTIONS FOR EQUIPMENT

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SECTION 16900 - ELECTRICAL CONNECTIONS FOR EQUIPMENT

PART 1 - GENERAL

1. **SCOPE.** The work covered by this section consists of the Contractor furnishing all plant, labor, equipment, materials and performing all operations required for the installation of electrical connections for equipment as shown on the drawings and herewith specified.

2. **DESCRIPTION OF WORK.** The extent of electrical connections for equipment is indicated by drawings and schedules. The Contractor shall provide connections for all equipment furnished or installed as part of this work.

3. QUALITY ASSURANCE.

3.1 **NEC Compliance.** The Contractor shall comply with applicable requirements of NEC as to type products used and installation of electrical power connections (terminals and splices), for junction boxes, motor starters, and disconnect switches.

3.2 **IEEE Compliance.** The Contractor shall comply with Std. 241, "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to connections and terminations.

3.3 **UL Compliance.** The Contractor shall comply with UL Std. 486A, "Wire Connectors and Soldering Lugs for Use With Copper Conductors" including, but not indicated. The Contractor shall provide electrical connection products and materials which are UL listed and labeled.

PART 2 - PRODUCTS

4. MATERIALS AND COMPONENTS.

4.1 **General.** For each electrical connection indicated, the Contractor shall provide complete assembly of materials, including but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire-nuts, and other items and accessories as needed to complete the work. This includes disconnect switches and wiring devices if required whether or not shown on the drawings.

4.2 **Connectors and Terminals.** The Contractor shall provide electrical connectors and terminals which mate and match, including sizes and ratings, with equipment terminals and are recommended by equipment manufacturer for intended applications.

4.3 Electrical Connection Accessories. The Contractor shall provide electrical insulating tape, heat-shrinkable insulating tubing and boots, wire nuts and cable ties as recommended for use by accessories manufacturers for type services indicated.

4.4 Conductor Identification. The Contractor shall tag each conductor with preprinted waterproof plastic marker identifying the cable number and the terminal number to which the conductor is connected

PART 3 - EXECUTION

5. INSTALLATION OF ELECTRICAL CONNECTIONS.

5.1 Install electrical connections as indicated; in accordance with equipment manufacturer's written instructions and with recognized industry practices, and complying with applicable requirements of UL and NEC, to ensure that products fulfill requirements.

5.2 Coordinate with other work, including wires/cables, raceway, and equipment installation, as necessary to properly interface installation of electrical connections for equipment with other work.

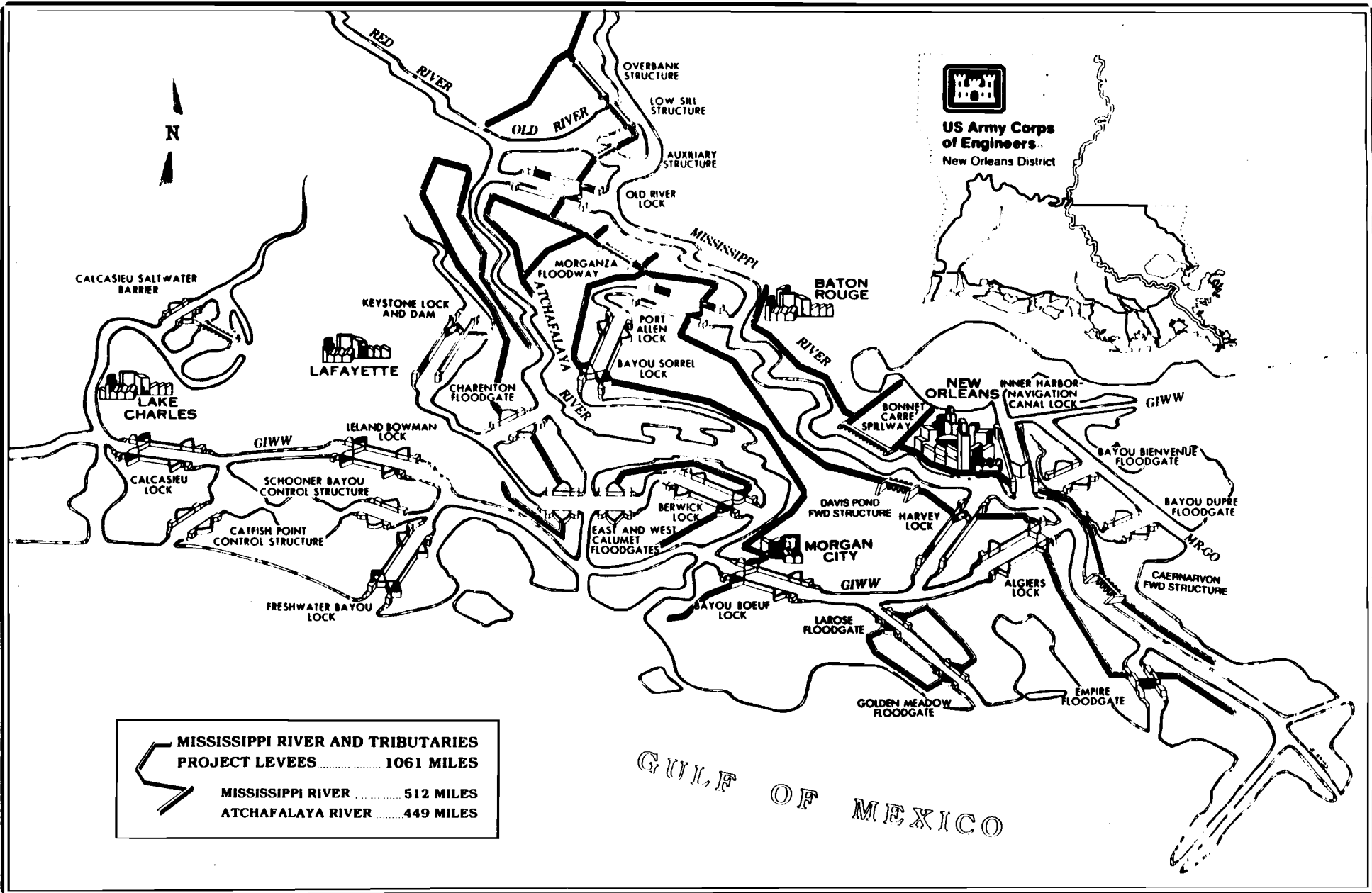
5.3 Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.




6. FIELD QUALITY CONTROL. Upon completion of installation of electrical connections, and after circuitry has been energized with rated power source, test connections to demonstrate capability and compliance with requirements. Ensure that direction of rotation of each motor fulfills requirement. Correct malfunctioning units at site, then retest to demonstrate compliance.

7. MEASUREMENT AND PAYMENT. No separate measurement or payment will be made for the work covered under this section, and all costs in connection therewith shall be included in the contract lump sum price for "Electrical Work". Payment shall constitute full compensation for furnishing all plant, labor, equipment and materials, and performing the work in accordance with these specifications.



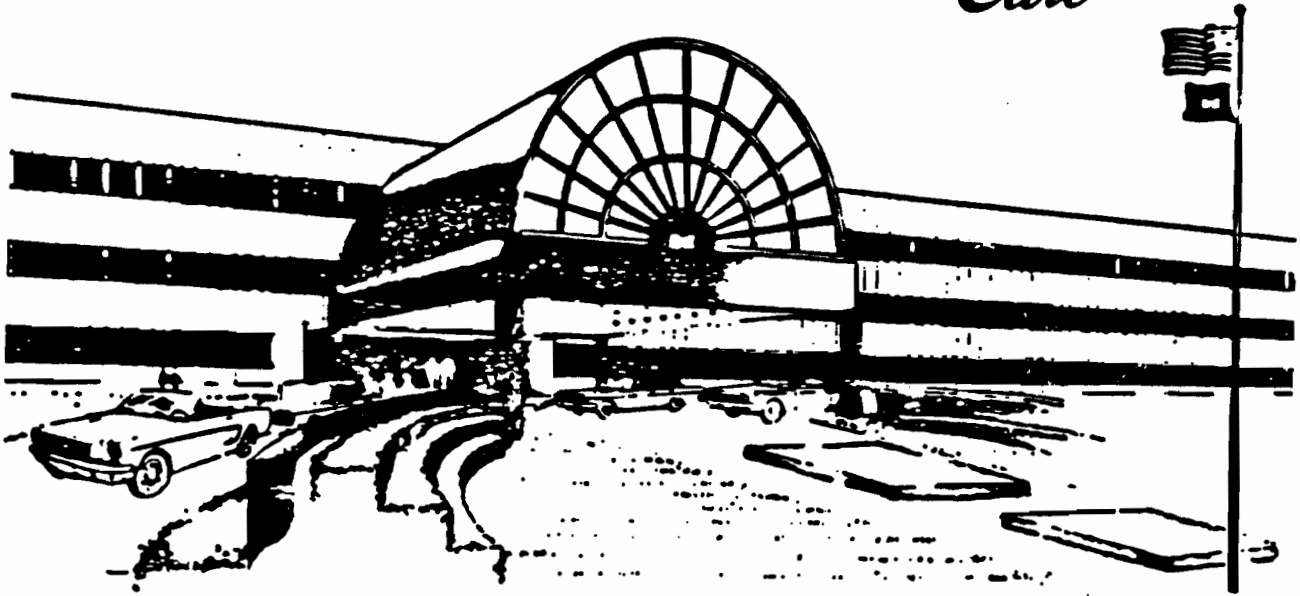
**US Army Corps
of Engineers**
New Orleans District



MISSISSIPPI RIVER AND TRIBUTARIES PROJECT LEVEES	
	MISSISSIPPI RIVER AND TRIBUTARIES PROJECT LEVEES 1061 MILES
	MISSISSIPPI RIVER 512 MILES
	ATCHAFALAYA RIVER 449 MILES

GULF OF MEXICO

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HEADQUARTERS**

