

THIS PROJECT IS ADVERTISED ON AN UNRESTRICTED BASIS  
AS A STAND-ALONE "C" TYPE INVITATION FOR BID (IFB) SOLICITATION

SOLICITATION NO: **W9127822B0003**  
CADD NO: **CHC22001**

SPECIFICATIONS

FOR

**MOBILE HARBOR, ALABAMA  
DEEPENING AND WIDENING - PHASE 4**

**MOBILE, ALABAMA**

THIS IS A CIVIL WORKS PROGRAM PROCUREMENT AND IS NOT FUNDED BY THE  
DEPARTMENT OF DEFENSE

*"GOOD ENGINEERING RESULTS IN A BETTER ENVIRONMENT"*



US Army Corps of Engineers  
BUILDING STRONG®

U.S. ARMY ENGINEER DISTRICT, MOBILE  
109 St. Joseph St  
Mobile, Alabama 36602



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**NOTICE TO BIDDERS**

**SEE NOTE 8. LACK OF REGISTRATION IN THE SAM DATA BASE WILL RENDER BIDDER INELIGIBLE FOR AWARD**

BEFORE SIGNING AND MAILING THIS BID, PLEASE TAKE NOTE OF THE FOLLOWING. AS FAILURE TO PERFORM ANY ONE OF THESE ACTIONS MAY CAUSE YOUR BID TO BE REJECTED

**THIS CHECKLIST IS DESIGNED FOR YOUR CONVENIENCE TO ASSIST YOU IN COMPLETING YOUR OFFER. ITS COMPLETION DOES NOT GUARANTEE THAT YOUR OFFER WILL BE ACCEPTABLE. A COMPLETE AND ACCEPTABLE OFFER IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.)**

1. **Amendments:** Have you acknowledged receipt of ALL amendments? If in doubt as to the **number** of amendments issued, call Lesley Thomas, Contract Specialist, at 251-441-6511.
2. **Amended Bid Pages:** If any of the amendments furnished new/revised bid pages, then the new/revised bid pages **must** be used in submitting your bid.
3. **Individual Sureties:** Please note requirements for Individual Sureties in Section 00 70 00.
4. **Performance and Payment Bonds:** Please note requirements for bonds in Section 00 70 00, and FAR Clause 52.228-15.
5. **Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity for Construction:** See Section 00 21 13, FAR Clause 52.222-23
6. **Mistakes in Proposal:** Have you reviewed your offer price for possible errors in calculation or work left out?
7. **Your Proposal Should Include the Following:** The SF 1442 (include TIN, DUNS, AND CAGE numbers in the block with your company's name), Completed Bid Schedule, any requirements from Section 00 21 13, Section 00 45 00 and any technical information required by the solicitation. Also include your Joint Venture (JV) agreement if applicable. Have all members sign the SF 1442 or provide a letter authorizing one person to bind the JV or partnership.
8. Your attention is directed to the following clauses:
  - a) FAR Clause 52.204-7, Required System Award Management (SAM) registration. Lack of registration in the SAM database will render bidder ineligible for award. Information on how to register and the time it takes is detailed in the clause.

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<b>SOLICITATION, OFFER AND AWARD</b> <b>(Construction, Alteration, or Repair)</b>	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGES OF PAGES
	W9127822B0003	<input checked="" type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	29 APRIL 2022	1 OF 2

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

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
		CHC22001

7. ISSUED BY	CODE	CT	8. ADDRESS OFFER TO
U.S. ARMY ENGINEER DISTRICT, MOBILE CONTRACTING DIVISION (CESAM-CT) (109 ST. JOSEPH ST. 36602) P.O. BOX 2288 MOBILE, AL 36628-0001			SEE CLAUSE 30 IN SECTION 01 00 01

9. FOR INFORMATION EMAIL :	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
Lesley.M.Thomas@usace.army.mil	Lesley M. Thomas	(251) 441-6511

**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):

**MOBILE HARBOR, ALABAMA, DEEPENING AND WIDENING – PHASE 4, MOBILE, ALABAMA**

\* See Section 00 70 00, Paragraph "COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK".

**\*\* For information pertaining to submission of electronic bids and virtual bid opening, see clause 30 in Section 01 00 01.**

11. The Contractor shall begin performance within \_\_\_\*\_\_\_ calendar days and complete it within \_\_\_\*\_\_\_ 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.)	12B. CALENDAR DAYS
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and \_\_\_\*\*\_\_\_ copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 31 MAY 2022 (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 120 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)

15. TELEPHONE NO. (Include area code)

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

CODE

FACILITY CODE

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

**AMOUNTS**

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

**19. ACKNOWLEDGMENT OF AMENDMENTS**

(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)

20B. SIGNATURE

20C. OFFER DATE

AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)

ITEM

25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO

10 U.S.C. 2304(c) ( )

41 U.S.C. 253(c) ( )

26. ADMINISTERED BY

CODE

27. PAYMENT WILL BE MADE BY

**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 consummates 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



PROPOSAL DATA SHEET

Also include the required, completed and signed SF 1442 in addition to this Proposal Data Sheet.

1.	Name of Solicitation:
2.	Offering Firm's Name As Appears on the SF 1442:  Offering Firm's DUNS number as it appears on the SF 1442:
3.	Mailing Address:
4.	Telephone Number:
5.	Fax Number:
6.	E-mail Address to use for all correspondence:
7.	AUTHORIZED NEGOTIATORS. Far 52.215-11. The Offeror represents that the following person(s) are authorized to negotiate on its behalf with the Government in connection with this solicitation. List name(s), title, and telephone numbers of authorized negotiator(s).  Name of Person(s) Authorized to Negotiate:  Negotiator's Address:  Negotiator's Telephone:  Negotiator's E-mail:

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BIDDER'S NAME: \_\_\_\_\_

BIDDING SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
1.	Mobilization and Demobilization	1	Job	XXX	_____
1.	Channel Dredging	5,793,932	CY	_____	_____
				Total Bid	_____

OFFEROR ELECTS TO WAIVE THE PRICE EVALUATION PREFERENCE  
 FOR HUBZONE SMALL BUSINESS CONCERNS: ( ) NO ( ) YES

(SEE BIDDING SCHEDULE NOTE NOS. 6 AND 7)

NOTES FOR BIDDING SCHEDULE

NOTE NO. 1. To better facilitate the public bid opening process, all modifications to bids are to be submitted on copies of the latest bid schedules as published in the solicitation or the latest amendment thereto. In lieu of indicating additions/deductions to bid items, all bidders should state their revised prices for each item. The company name should be indicated on the face of the bidding schedule to preclude being misplaced.

NOTE NO. 2. Bidders must insert a price on all numbered items of the bidding schedule by the Government. Failure to do so will disqualify the bid.

NOTE NO. 3. All extensions of the unit prices shown will be subject to verification by the Government. In case of variation between the unit price and extension, the unit price will be considered to be the bid.

NOTE NO. 4. If a modification to a bid is submitted and provides for a job adjustment to the total estimated cost, the application of the job adjustment to each unit price and/or job price in the bid schedule must be stated or, if it is not stated, the bidder agrees that the job adjustment shall be applied on a pro rata basis to every bid item in the bid schedule.

NOTE NO. 5. CONDITIONS GOVERNING EVALUATION OF BIDS AND AWARD OF CONTRACTS.

Only one contract will be awarded on this Bid Schedule and award will be made to the low bidder on the Total Bid.

NOTE NO. 6. IMPORTANT NOTICE: Due to the suspension of the utilization of the price adjustment for small disadvantaged businesses (FAR Clause 52.219-23) by the Under Secretary of Defense on March 12, 2010, effective until further notice, said FAR Clause is not included in or made a part of this RFP. FAR Clause 52.219-4, relating to a 10% price evaluation preference for HUB ZONE small business concerns, is included in and made a part of this RFP. PLEASE NOTE HOWEVER that paragraph (b) (3) of the preceding clause is inapplicable also due to the referenced suspension of FAR Clause 52.219-23.

Consequently, if you are a small business qualified as a HUB ZONE and as an SDB, you will only receive the HUB ZONE 10% price evaluation preference in the evaluation process of this RFP.

NOTE NO. 7. This procurement is not restricted to Hubzone Small Business Concerns. However, offerors certifying as a Hubzone Small Business Concern must be certified by the SBA on or prior to date set for receipt of offers.

END OF BID SCHEDULE

EXPLANATION OF BID ITEMS

GENERAL: This section comprises an explanation of the bid items identified in the bid schedule for each item of work. The bid schedule and the contract drawings shall be worked together to identify the various items of work to which each bid item will apply. The Contractor shall bid the work under the applicable bid item for the specific areas identified in the bid schedule. All work specified herein shall be accomplished in accordance with the requirements of the technical provisions of the specifications and the contract drawings. Payment described for the various bid items will be full compensation for all labor, materials, and equipment required to complete the work. Compensation for any item of work described in the contract but not listed in the bid schedule shall be included in the payment for the item of work to which it is made subsidiary.

Bid Item No. 1 - Mobilization/Demobilization:

(a) All costs associated with initial mobilization to the work site at the Bay portion of the Mobile Harbor Shipping Channel in Mobile County, Alabama and final demobilization of all dredge plant, dredge attendant plant, and support equipment will be included in the contract lump sum price for Mobilization and Demobilization, Bid Item No. 1. This shall include any and all costs to (1) construct the necessary features to access and prepare the work site and (2) adapt, modify, reconstruct, and/or reconfigure the dredge plant and/or other equipment to a configuration capable of performing this contract work. No other separate payment shall be made for any such configuration preparations, and payment of this bid item is considered complete compensation for such actions. Sixty percent (60%) of the lump sum price will be paid after completion of the Contractor's mobilization at the work sites. The remaining forty percent (40%) will be paid after 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 paragraph (a) above do not bear a reasonable relation to the cost of the work in this contract. Failure to justify such price to the satisfaction of the Contracting Officer will result in payment, as determined by the Contracting Officer, of -

- (i) Actual mobilization costs at completion of mobilization;
- (ii) Actual demobilization costs at completion of demobilization; and
- (iii) The remainder of this item in the final payment under this contract.

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

Bid Item No. 2 - Channel Dredging:

Payment for Bid Item No. 2 will include all costs associated with the dredging and disposal of approximately 5,793,932 cubic yards of material. The quantity of material to be dredged includes approximately 1,149,914 cubic yards of maintenance material and 4,644,017 cubic yards of new work material. The quantities reported above were derived using the survey data from February 2022 (see APPENDIX C for Volume Report) and the projected shoaling.

Payment will be made for the volume of material dredged between Stations 500+00 and 950+00. For the purpose of acceptance and payment, the work shall be divided into reaches of 1,000 linear feet, or less at partial reaches, unless otherwise directed by the COR. The quantity of material dredged for payment shall be calculated as the difference between the before- and after-dredging surveys of the area within the acceptance prism. The acceptance prism shall be defined as the lines and grades shown on the drawings. Payment will not be made for any volume dredged that exceeds the acceptance prism. Subsidiary features of work including surveying, utility location verification, sea turtle monitoring, and turbidity monitoring shall also be included in this bid item. Details of the surveying requirements are provided in Section 35 20 23.00 36 - DREDGING, paragraph DREDGING SURVEYS. Details of the sea turtle, and turbidity monitoring are provided in section 01 57 20 - ENVIRONMENTAL PROTECTION, paragraph PROTECTION OF FISH AND WILDLIFE.

-End of Section-

<b>BID BOND</b> <i>(See instructions on reverse)</i>	DATE BOND EXECUTED <i>(Must not be later than bid opening date)</i>	<b>OMB Control Number: 9000-0045</b> <b>Expiration Date: 8/31/2022</b>
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Paperwork Reduction Act Statement - This information collection meets the requirements of 44 USC § 3507, as amended by section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 9000-0045. We estimate that it will take 1 hour to read the instructions, gather the facts, and answer the questions. Send only comments relating to our time estimate, including suggestions for reducing this burden, or any other aspects of this collection of information to: General Services Administration, Regulatory Secretariat Division (M1V1CB), 1800 F Street, NW, Washington, DC 20405.

PRINCIPAL <i>(Legal name and business address)</i>	TYPE OF ORGANIZATION <i>("X" one)</i> <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> CORPORATION <input type="checkbox"/> OTHER <i>(Specify)</i>
STATE OF INCORPORATION	

SURETY(IES) *(Name and business address)*

PENAL SUM OF BOND				BID IDENTIFICATION		
PERCENT OF BID PRICE	AMOUNT NOT TO EXCEED				BID DATE	INVITATION NUMBER
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS	FOR <i>(Construction, Supplies or Services)</i>	

**OBLIGATION:**

We, the Principal and Surety(ies) are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally. However, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us. For all other purposes, each Surety binds itself, jointly and severally with the Principal, for the payment of the sum shown opposite the name of the Surety. If no limit of liability is indicated, the limit of liability is the full amount of the penal sum.

**CONDITIONS:**

The Principal has submitted the bid identified above.

**THEREFORE:**

The above obligation is void if the Principal - (a) upon acceptance by the Government of the bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), executes the further contractual documents and gives the bond(s) required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by the principal; or (b) in the event of failure to execute such further contractual documents and give such bonds, pays the Government for any cost of procuring the work which exceeds the amount of the bid.

Each Surety executing this instrument agrees that its obligation is not impaired by any extension(s) of the time for acceptance of the bid that the Principal may grant to the Government. Notice to the surety(ies) of extension(s) is waived. However, waiver of the notice applies only to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

**WITNESS:**

The Principal and Surety(ies) executed this bid bond and affixed their seals on the above date.

PRINCIPAL				
SIGNATURE(S)	1. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>	2. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>	3. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>	Corporate Seal
NAME(S) & TITLE(S) <i>(Typed)</i>	1. _____	2. _____	3. _____	

INDIVIDUAL SURETY(IES)		
SIGNATURE(S)	1. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>	2. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>
NAME(S) <i>(Typed)</i>	1. _____	2. _____

CORPORATE SURETY(IES)					
SURETY A	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>	2. _____ <div style="text-align: right; font-size: x-small;">(Seal)</div>		
	NAME(S) & TITLE(S) <i>(Typed)</i>	1. _____	2. _____		

SURETY B	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY C	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY D	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY E	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY F	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		
SURETY G	NAME & ADDRESS		STATE OF INCORPORATION	LIABILITY LIMIT (\$)	Corporate Seal
	SIGNATURE(S)	1.	2.		
	NAME(S) & TITLE(S) (Typed)	1.	2.		

### INSTRUCTIONS

1. This form is authorized for use when a bid guaranty is required. Any deviation from this form will require the written approval of the Administrator of General Services.
2. Insert the full legal name and business address of the Principal in the space designated "Principal" on the face of the form. An authorized person shall sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
3. The bond may express penal sum as a percentage of the bid price. In these cases, the bond may state a maximum dollar limitation (e.g., 20% of the bid price but the amount not to exceed \_\_\_\_\_ dollars).
4. (a) Corporations executing the bond as sureties must appear on the Department of the Treasury's list of approved sureties and must act within the limitations listed therein. The value put into the LIABILITY LIMIT block is the penal sum (i.e., the face value) of the bond, unless a co-surety arrangement is proposed.  
  
 (b) When multiple corporate sureties are involved, their names and addresses shall appear in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)." In the space designated "SURETY(IES)" on the face of the form, insert only the letter identifier corresponding to each of the sureties. Moreover, when co-surety arrangements exist, the parties may allocate their respective limitations of liability under the bond, provided that the sum total of their liability equals 100% of the bond penal sum.  
  
 (c) When individual sureties are involved, a completed Affidavit of Individual Surety (Standard Form 28) for each individual surety, shall accompany the bond. The Government may require the surety to furnish additional substantiating information concerning its financial capability.
5. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Corporate Seal"; and shall affix an adhesive seal if executed in Maine, New Hampshire, or any other jurisdiction requiring adhesive seals.
6. Type the name and title of each person signing this bond in the space provided.
7. In its application to negotiated contracts, the terms "bid" and "bidder" shall include "proposal" and "offeror."



**AFFIDAVIT OF INDIVIDUAL SURETY***(See instructions on reverse)***OMB Control Number: 9000-0001****Expiration Date: 3/31/2024**

Paperwork Reduction Act Statement - This information collection meets the requirements of 44 USC § 3507, as amended by section 2 of the Paperwork Reduction Act of 1995. You do not need to answer these questions unless we display a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 9000-0001. We estimate that it will take 0.3 hours to read the instructions, gather the facts, and answer the questions. Send only comments relating to our time estimate, including suggestions for reducing this burden, or any other aspects of this collection of information to: U.S. General Services Administration, Regulatory Secretariat Division (M1V1CB), 1800 F Street, NW, Washington, DC 20405.

STATE OF	COUNTY OF	<b>SS.</b>
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I, the undersigned, being duly sworn, depose and say that I am: (1) the surety to the attached bond(s); (2) a citizen of the United States; and of full age and legally competent. Where the sureties are acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us. For all other purposes, each Surety binds itself, jointly and severally with the Principal. I recognize that statements contained herein concern a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious or fraudulent statement may render the maker subject to prosecution under Title 18, United States Code Sections 1001 and 494. This affidavit is made to induce the United States of America to accept me as surety on the attached bond.

1. NAME <i>(First, Middle, Last) (Type or Print)</i>	2A. HOME ADDRESS <i>(Number, Street, City, State, ZIP Code)</i>	
3. TYPE AND DURATION OF OCCUPATION	2B. TELEPHONE NUMBER	2C. EMAIL ADDRESS
	4A. NAME AND ADDRESS OF EMPLOYER <i>(Number, Street, City, State, ZIP Code) (If self-employed, so state)</i>	
4B. EMPLOYER EMAIL ADDRESS	5A. NAME AND ADDRESS OF INDIVIDUAL SURETY BROKER USED <i>(Number, Street, City, State, ZIP Code)</i>	
	5B. SURETY BROKER EMAIL ADDRESS	
6A. NAME AND ADDRESS OF FINANCIAL INSTITUTION SUBMITTING THE PLEDGE OF SECURITIES ON BEHALF OF INDIVIDUAL SURETY <i>(Number, Street, City, State, ZIP Code)</i>	5C. HOME TELEPHONE NUMBER	5D. BUSINESS TELEPHONE NUMBER
	6B. FINANCIAL INSTITUTION EMAIL ADDRESS	6C. ROUTING TRANSIT NUMBER (RTN)
	6D. CONTACT PERSON NAME	6E. CONTACT PERSON TELEPHONE NUMBER
6F. CONTACT PERSON EMAIL ADDRESS		

7. THE FOLLOWING IS A TRUE REPRESENTATION OF THE ASSETS I HAVE PLEDGED TO THE UNITED STATES IN SUPPORT OF THE ATTACHED BOND. *(LIST THE COMMITTEE ON UNIFORM SECURITIES IDENTIFICATION PROCEDURES (CUSIP) NUMBER AND PAR (FACE) AMOUNT OF EACH SECURITY).*

8. IDENTIFY ALL LIENS, JUDGEMENTS, OR ANY OTHER ENCUMBRANCES INVOLVING SUBJECT ASSETS.

9. IDENTIFY ALL BONDS, INCLUDING BID GUARANTEES, FOR WHICH THE SUBJECT ASSETS HAVE BEEN PLEDGED WITHIN THREE YEARS PRIOR TO THE DATE OF EXECUTION OF THIS AFFIDAVIT.

**DOCUMENTATION OF THE PLEDGED ASSET MUST BE ATTACHED.**

10. SIGNATURE	11. BOND AND CONTRACT TO WHICH THIS AFFIDAVIT RELATES ( <i>where appropriate</i> )
---------------	--

**12. SUBSCRIBED AND SWORN TO BEFORE ME AS FOLLOWS:**

a. DATE OATH ADMINISTERED MONTH      DAY      YEAR	b. CITY AND STATE ( <i>or other jurisdiction</i> )		Official Seal
c. NAME AND TITLE OF OFFICIAL ADMINISTERING OATH ( <i>type or print</i> )	d. SIGNATURE	e. MY COMMISSION EXPIRES	

## INSTRUCTIONS

1. Individual sureties on bonds executed in connection with Government contracts must complete and submit this form with the bond. (See Federal Acquisition Regulation (FAR) 28.203, 53.228(e).) The surety must have the completed form notarized.
2. No corporation, partnership, or other unincorporated association or firm, as such, is acceptable as an individual surety (i.e. must be a natural person). Likewise, members of a partnership are not acceptable as sureties on bonds that a partnership or an association, or any co-partner or member thereof, is the principal obligor. An individual surety will not include any financial interest in assets connected with the principal on the bond that this affidavit supports.
3. United States citizenship is a requirement for individual sureties for contracts and bonds when the contract is awarded in the United States. However, when the Contracting Officer is located in an outlying area or a foreign country, the individual surety is only required to be a permanent resident of the area or country in which the contracting officer is located.
4. All signatures of the affidavit submitted must be originals. Affidavits bearing reproduced signatures are not acceptable. An authorized person must sign the bond. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of a firm, partnership, or joint venture, or an officer of the corporation involved.

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## INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity 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 in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.  
  
(b) Enter the full names of the individuals(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.

Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in

Public reporting burden for this collection of information is estimated to average 30 minutes per response, 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 or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

**DISCLOSURE OF LOBBYING ACTIVITIES  
CONTINUATION SHEET**

Approved by OM  
0348-0046

Reporting Entity: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

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## Section 00 21 13 - Instructions to Bidders

### CLAUSES INCORPORATED BY REFERENCE

52.204-22	Alternative Line Item Proposal	JAN 2017
52.214-3	Amendments To Invitations For Bids	DEC 2016
52.214-4	False Statements In Bids	APR 1984
52.214-5	Submission Of Bids	DEC 2016
52.214-6	Explanation To Prospective Bidders	APR 1984
52.214-7	Late Submissions, Modifications, and Withdrawals of Bids	NOV 1999
52.214-18	Preparation of Bids-Construction	APR 1984
52.214-19	Contract Award-Sealed Bidding-Construction	AUG 1996
52.214-34	Submission Of Offers In The English Language	APR 1991
52.214-35	Submission Of Offers In U.S. Currency	APR 1991
52.222-5	Construction Wage Rate Requirements--Secondary Site of the Work	MAY 2014
52.225-12	Notice of Buy American Requirement - Construction Materials Under Trade Agreements	MAY 2014
52.232-14	Notice Of Availability Of Progress Payments Exclusively For Small Business Concerns	APR 1984
52.233-2	Service Of Protest	SEP 2006
52.252-5	Authorized Deviations In Provisions	NOV 2020
252.204-7008	Compliance With Safeguarding Covered Defense Information Controls	OCT 2016
252.204-7019	Notice of NIST SP 800-171 DoD Assessment Requirements	NOV 2020
252.215-7008	Only One Offer	JUL 2019
252.215-7010 (Dev)	Requirements for Certified Cost or Pricing Data and Data Other Than Certified Cost or Pricing Data. (DEVIATION 2020-O0020)	AUG 2020
252.215-7013	Supplies and Services Provided by Nontraditional Defense Contractors.	JAN 2018
252.236-7008	Contract Prices-Bidding Schedules	DEC 1991

### CLAUSES INCORPORATED BY FULL TEXT

#### 52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a firm fixed price (FFP) contract resulting from this solicitation.

(End of provision)

#### 52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(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
25.9%	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 Programs 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 Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer's identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) 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 **portions of the Middle Bay Channel beginning approximately 2 miles north of Gaillard Island thence southerly to a point approximately 1 mile south of the island.**

(End of provision)

#### 52.228-1 BID GUARANTEE (SEP 1996)

(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 **twenty (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 10 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)

#### 52.233-2 SERVICE OF PROTEST (SEP 2006)

(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 Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from **U.S. Army Corps of Engineers, Mobile District, Contracting Division, P.O. Box 2288 Mobile AL 36628-0001.**

(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)

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## Section 00 45 00 - Representations and Certifications

### CLAUSES INCORPORATED BY REFERENCE

52.204-16	Commercial and Government Entity Code Reporting	AUG 2020
52.204-24	Representation Regarding Certain Telecommunications and Video Surveillance Services or Equipment	DEC 2021
52.209-7	Information Regarding Responsibility Matters	OCT 2018
52.209-13	Violation of Arms Control Treaties or Agreements -- Certification	DEC 2021
252.203-7005	Representation Relating to Compensation of Former DoD Officials	NOV 2011
252.204-7007	Alternate A, Annual Representations and Certifications	MAY 2021
252.204-7016	Covered Defense Telecommunications Equipment or Services -- Representation	DEC 2019
252.204-7017	Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services -- Representation	MAY 2021
252.225-7973 (Dev)	Prohibition on the Procurement of Foreign-Made Unmanned Aircraft Systems - Representation (DEVIATION 2020-O0015)	MAY 2020
252.225-7974 (Dev)	Representation Regarding Business Operations with the Maduro Regime (DEVIATION 2020-O0005)	FEB 2020

### CLAUSES INCORPORATED BY FULL TEXT

#### 52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (JAN 2022)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is **237990**.

(2) The small business size standard is **\$3,000,000**.

(3) The small business size standard for a concern that submits an offer, other than on a construction or service acquisition, but proposes to furnish an end item that it did not itself manufacture, process, or produce is 500 employees if the acquisition--

(i) Is set aside for small business and has a value above the simplified acquisition threshold;

(ii) Uses the HUBZone price evaluation preference regardless of dollar value, unless the offeror waives the price evaluation preference; or

(iii) Is an 8(a), HUBZone, service-disabled veteran-owned, economically disadvantaged women-owned, or women-owned small business set-aside or sole-source award regardless of dollar value.

(b)(1) If the provision at 52.204-7, System for Award Management, is included in this solicitation, paragraph (d) of this provision applies.

(2) If the provision at 52.204-7, System for Award Management, is not included in this solicitation, and the Offeror has an active registration in the System for Award Management (SAM), the Offeror may choose to use paragraph (d) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The Offeror shall indicate which option applies by checking one of the following boxes:

(     ) Paragraph (d) applies.

( ) Paragraph (d) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) (1) The following representations or certifications in SAM are applicable to this solicitation as indicated:

(i) 52.203-2, Certificate of Independent Price Determination. This provision applies to solicitations when a firm-fixed-price contract or fixed-price contract with economic price adjustment is contemplated, unless—

(A) The acquisition is to be made under the simplified acquisition procedures in Part 13;

(B) The solicitation is a request for technical proposals under two-step sealed bidding procedures; or

(C) The solicitation is for utility services for which rates are set by law or regulation.

(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed \$150,000.

(iii) 52.203-18, Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements or Statements--Representation. This provision applies to all solicitations.

(iv) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include the provision at 52.204-7, System for Award Management.

(v) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that—

(A) Are not set aside for small business concerns;

(B) Exceed the simplified acquisition threshold; and

(C) Are for contracts that will be performed in the United States or its outlying areas.

(vi) 52.204-26, Covered Telecommunications Equipment or Services--Representation. This provision applies to all solicitations.

(vii) 52.209-2, Prohibition on Contracting with Inverted Domestic Corporations--Representation.

(viii) 52.209-5, Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.

(ix) 52.209-11, Representation by Corporations Regarding Delinquent Tax Liability or a Felony Conviction under any Federal Law. This provision applies to all solicitations.

(x) 52.214-14, Place of Performance--Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.

(xi) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.

(xii) 52.219-1, Small Business Program Representations (Basic, Alternates I, and II). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.

- (A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.
- (B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.
- (C) The provision with its Alternate II applies to solicitations that will result in a multiple-award contract with more than one NAICS code assigned.
- (xiii) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United States or its outlying areas.
- (xiv) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.
- (xv) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.
- (xvi) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial products or commercial services.
- (xvii) 52.223-1, Biobased Product Certification. This provision applies to solicitations that require the delivery or specify the use of USDA-designated items; or include the clause at 52.223-2, Affirmative Procurement of Biobased Products Under Service and Construction Contracts.
- (xviii) 52.223-4, Recovered Material Certification. This provision applies to solicitations that are for, or specify the use of, EPA- designated items.
- (xix) 52.223-22, Public Disclosure of Greenhouse Gas Emissions and Reduction Goals--Representation. This provision applies to solicitations that include the clause at 52.204-7.)
- (xx) 52.225-2, Buy American Certificate. This provision applies to solicitations containing the clause at 52.225-1.
- (xxi) 52.225-4, Buy American--Free Trade Agreements--Israeli Trade Act Certificate. (Basic, Alternates I, II, and III.) This provision applies to solicitations containing the clause at 52.225- 3.
- (A) If the acquisition value is less than \$25,000, the basic provision applies.
- (B) If the acquisition value is \$25,000 or more but is less than \$50,000, the provision with its Alternate I applies.
- (C) If the acquisition value is \$50,000 or more but is less than \$92,319, the provision with its Alternate II applies.
- (D) If the acquisition value is \$92,319 or more but is less than \$100,000, the provision with its Alternate III applies.
- (xxii) 52.225-6, Trade Agreements Certificate. This provision applies to solicitations containing the clause at 52.225-5.
- (xxiii) 52.225-20, Prohibition on Conducting Restricted Business Operations in Sudan--Certification. This provision applies to all solicitations.
- (xxiv) 52.225-25, Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran—Representation and Certification. This provision applies to all solicitations.

(xxv) 52.226-2, Historically Black College or University and Minority Institution Representation. This provision applies to solicitations for research, studies, supplies, or services of the type normally acquired from higher educational institutions.

(2) The following representations or certifications are applicable as indicated by the Contracting Officer:

[Contracting Officer check as appropriate.]

**XX** (i) 52.204-17, Ownership or Control of Offeror.

**XX** (ii) 52.204-20, Predecessor of Offeror.

(iii) 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products.

(iv) 52.222-48, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Certification.

(v) 52.222-52 Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Certification.

(vi) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Alternate I only).

(vii) 52.227-6, Royalty Information.

(A) Basic.

(B) Alternate I.

(viii) 52.227-15, Representation of Limited Rights Data and Restricted Computer Software.

(d) The Offeror has completed the annual representations and certifications electronically in SAM accessed through <https://www.sam.gov>. After reviewing the SAM information, the Offeror verifies by submission of the offer that the representations and certifications currently posted electronically that apply to this solicitation as indicated in paragraph (c) of this provision have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause	Title	Date	Change
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Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on SAM.

(End of provision)



Section 00 70 00 - Conditions of the Contract

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUN 2020
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	MAY 2014
52.203-6	Restrictions On Subcontractor Sales To The Government	JUN 2020
52.203-7	Anti-Kickback Procedures	JUN 2020
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	MAY 2014
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	MAY 2014
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	JUN 2020
52.203-13	Contractor Code of Business Ethics and Conduct	DEC 2021
52.203-17	Contractor Employee Whistleblower Rights and Requirement To Inform Employees of Whistleblower Rights	JUN 2020
52.203-19	Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements	JAN 2017
52.204-4	Printed or Copied Double-Sided on Postconsumer Fiber Content Paper	MAY 2011
52.204-7	System for Award Management	OCT 2018
52.204-10	Reporting Executive Compensation and First-Tier Subcontract Awards	JUN 2020
52.204-13	System for Award Management Maintenance	OCT 2018
52.204-18	Commercial and Government Entity Code Maintenance	AUG 2020
52.204-19	Incorporation by Reference of Representations and Certifications.	DEC 2014
52.204-21	Basic Safeguarding of Covered Contractor Information Systems	DEC 2021
52.204-23	Prohibition on Contracting for Hardware, Software, and Services Developed or Provided by Kaspersky Lab and Other Covered Entities	DEC 2021
52.204-25	Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment	DEC 2021
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	DEC 2021
52.209-9	Updates of Publicly Available Information Regarding Responsibility Matters	OCT 2018
52.209-10	Prohibition on Contracting With Inverted Domestic Corporations	NOV 2015
52.210-1	Market Research	DEC 2021
52.211-13	Time Extensions	SEP 2000
52.211-18	Variation in Estimated Quantity	APR 1984
52.214-26	Audit and Records--Sealed Bidding	JUN 2020
52.214-27	Price Reduction for Defective Certified Cost or Pricing Data - Modifications - Sealed Bidding	JUN 2020
52.214-28 Alt I	Subcontractor Certified Cost or Pricing Data--Modifications-- Sealed Bidding (JUN 2020) - Alternate I	AUG 2020
52.219-4	Notice of Price Evaluation Preference for HUBZone Small Business Concerns	SEP 2021
52.219-8	Utilization of Small Business Concerns	OCT 2018

52.219-9 Alt I	Small Business Subcontracting Plan (NOV 2021) Alternate I	NOV 2016
52.219-16	Liquidated Damages-Subcontracting Plan	SEP 2021
52.219-28	Post-Award Small Business Program Rerepresentation	SEP 2021
52.222-1	Notice To The Government Of Labor Disputes	FEB 1997
52.222-3	Convict Labor	JUN 2003
52.222-4	Contract Work Hours and Safety Standards - Overtime Compensation	MAY 2018
52.222-6	Construction Wage Rate Requirements	AUG 2018
52.222-7	Withholding of Funds	MAY 2014
52.222-8	Payrolls and Basic Records	JUL 2021
52.222-9	Apprentices and Trainees	JUL 2005
52.222-10	Compliance with Copeland Act Requirements	FEB 1988
52.222-11	Subcontracts (Labor Standards)	MAY 2014
52.222-12	Contract Termination-Debarment	MAY 2014
52.222-13	Compliance With Construction Wage Rate Requirements and Related Regulations	MAY 2014
52.222-14	Disputes Concerning Labor Standards	FEB 1988
52.222-15	Certification of Eligibility	MAY 2014
52.222-21	Prohibition Of Segregated Facilities	APR 2015
52.222-26	Equal Opportunity	SEP 2016
52.222-27	Affirmative Action Compliance Requirements for Construction	APR 2015
52.222-35	Equal Opportunity for Veterans	JUN 2020
52.222-36	Equal Opportunity for Workers with Disabilities	JUN 2020
52.222-37	Employment Reports on Veterans	JUN 2020
52.222-40	Notification of Employee Rights Under the National Labor Relations Act	DEC 2010
52.222-50	Combating Trafficking in Persons	DEC 2021
52.222-54	Employment Eligibility Verification	DEC 2021
52.222-55	Minimum Wages for Contractor Workers Under Executive Order 14026	JAN 2022
52.222-62	Paid Sick Leave Under Executive Order 13706	JAN 2022
52.223-6	Drug-Free Workplace	MAY 2001
52.223-17	Affirmative Procurement of EPA-Designated Items in Service and Construction Contracts	AUG 2018
52.223-18	Encouraging Contractor Policies To Ban Text Messaging While Driving	JUN 2020
52.225-11 (Dev)	Buy American - Construction Materials Under Trade Agreements (DEVIATION 2020-O0019)	DEC 2021
52.225-13	Restrictions on Certain Foreign Purchases	DEC 2021
52.226-1	Utilization Of Indian Organizations And Indian-Owned Economic Enterprises	JUN 2000
52.227-1	Authorization and Consent	JUN 2020
52.227-2	Notice And Assistance Regarding Patent And Copyright Infringement	JUN 2020
52.228-2	Additional Bond Security	OCT 1997
52.228-5	Insurance - Work On A Government Installation	JAN 1997
52.228-11 (Dev)	Individual Surety--Pledge of Assets (DEVIATION 2020-O0016)	FEB 2021
52.228-12	Prospective Subcontractor Requests for Bonds	MAY 2014
52.228-14	Irrevocable Letter of Credit	NOV 2014
52.228-15 (Dev)	Performance and Payment Bonds-Construction. (Deviation 2020-O0016)	JUN 2020
52.229-3	Federal, State And Local Taxes	FEB 2013
52.232-5	Payments under Fixed-Price Construction Contracts	MAY 2014
52.232-16	Progress Payments	DEC 2021

52.232-17	Interest	MAY 2014
52.232-23	Assignment Of Claims	MAY 2014
52.232-27	Prompt Payment for Construction Contracts	JAN 2017
52.232-33	Payment by Electronic Funds Transfer--System for Award Management	OCT 2018
52.232-39	Unenforceability of Unauthorized Obligations	JUN 2013
52.232-40	Providing Accelerated Payments to Small Business Subcontractors	DEC 2021
52.233-1	Disputes	MAY 2014
52.233-3	Protest After Award	AUG 1996
52.233-4	Applicable Law for Breach of Contract Claim	OCT 2004
52.236-1	Performance of Work by the Contractor	APR 1984
52.236-2	Differing Site Conditions	APR 1984
52.236-3	Site Investigation and Conditions Affecting the Work	APR 1984
52.236-4	Physical Data	APR 1984
52.236-4	Physical Data	APR 1984
52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984
52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984
52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-12	Cleaning Up	APR 1984
52.236-13	Accident Prevention	NOV 1991
52.236-15	Schedules for Construction Contracts	APR 1984
52.236-16	Quantity Surveys	APR 1984
52.236-21	Specifications and Drawings for Construction	FEB 1997
52.236-26	Preconstruction Conference	FEB 1995
52.242-5	Payments to Small Business Subcontractors	JAN 2017
52.242-13	Bankruptcy	JUL 1995
52.242-14	Suspension of Work	APR 1984
52.243-4	Changes	JUN 2007
52.244-6	Subcontracts for Commercial Products and Commercial Services	JAN 2022
52.246-12	Inspection of Construction	AUG 1996
52.248-3	Value Engineering-Construction	OCT 2020
52.249-2 Alt II	Termination For Convenience Of The Government (Fixed Price) (Apr 2012) - Alternate II	SEP 1996
52.249-10	Default (Fixed-Price Construction)	APR 1984
52.252-6	Authorized Deviations In Clauses	NOV 2020
52.253-1	Computer Generated Forms	JAN 1991
252.201-7000	Contracting Officer's Representative	DEC 1991
252.203-7000	Requirements Relating to Compensation of Former DoD Officials	SEP 2011
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	DEC 2008
252.203-7002	Requirement to Inform Employees of Whistleblower Rights	SEP 2013
252.203-7003	Agency Office of the Inspector General	AUG 2019
252.204-7000	Disclosure Of Information	OCT 2016
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7006	Billing Instructions	OCT 2005
252.204-7012	Safeguarding Covered Defense Information and Cyber Incident Reporting	DEC 2019

252.204-7015	Notice of Authorized Disclosure of Information for Litigation Support	MAY 2016
252.204-7018	Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services	JAN 2021
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Country that is a State Sponsor of Terrorism	MAY 2019
252.219-7003	Small Business Subcontracting Plan (DOD Contracts)	DEC 2019
252.223-7004	Drug Free Work Force	SEP 1988
252.223-7008	Prohibition of Hexavalent Chromium	JUN 2013
252.225-7012	Preference For Certain Domestic Commodities	DEC 2017
252.225-7048	Export-Controlled Items	JUN 2013
252.225-7052 (Dev)	Restriction on the Acquisition of Certain Magnets, Tantalum, and Tungsten (DEVIATION 2020-O0006)	OCT 2020
252.225-7972 (Dev)	Prohibition on the Procurement of Foreign-Made Unmanned Aircraft Systems (DEVIATION 2020-O0015)	MAY 2020
252.232-7003	Electronic Submission of Payment Requests and Receiving Reports	DEC 2018
252.232-7010	Levies on Contract Payments	DEC 2006
252.232-7017	Accelerating Payments to Small Business Subcontractors-- Prohibition on Fees and Consideration	APR 2020
252.236-7000	Modification Proposals-Price Breakdown	DEC 1991
252.236-7001	Contract Drawings, and Specifications	AUG 2000
252.236-7002	Obstruction of Navigable Waterways	DEC 1991
252.236-7004	Payment for Mobilization and Demobilization	DEC 1991
252.242-7004	Material Management And Accounting System	MAY 2011
252.242-7006	Accounting System Administration	FEB 2012
252.243-7001	Pricing Of Contract Modifications	DEC 1991
252.247-7023	Transportation of Supplies by Sea	FEB 2019

#### CLAUSES INCORPORATED BY FULL TEXT

#### 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within **20** 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 **545 days after notice to proceed**. The time stated for completion shall include final cleanup of the premises.

\*The Contracting Officer shall specify either a number of days after the date the contractor receives the notice to proceed, or a calendar date.

(End of clause)

#### 52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of **\$ 6,396.00** for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until

the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

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SECTION 01 00 00

ADDITIONAL SPECIAL CONTRACT REQUIREMENTS

PART 1 GENERAL

1.1 SUBMITTALS

See the technical sections for approval and detail requirements for submittals. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES and the required technical section:

SD-11 Closeout Submittals

Contractor Prepared As-Built Drawings; G, OP

1.2 CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS

(a) The Contractor will be furnished with one CD-ROM containing a reproducible copy of the advertised solicitation, including all contract clauses, drawings, and specifications. Paper copies of the specifications and drawings will be the responsibility of the Contractor. The work shall conform to the technical provisions outlined in the specifications and the contract drawings.

(b) 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 they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

(c) The Contractor shall check all drawings furnished them immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. Figures marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

(d) The list of drawings and maps provided in the Index Sheet of the Plans for this solicitation are hereby incorporated by reference into these specifications.

NOTE: Refer to the folio of drawings for the index of drawings in this solicitation.

1.3 PHYSICAL DATA

Data and information furnished or referred to below is for the Contractor's information. The Government will not be responsible for any interpretation or conclusion drawn from the data or information by the Contractor.

(a) General: The indications of physical conditions on the drawings and in the specifications are the result of site investigations and surveys.

(b) Location: The work to be done under these specifications is located within the lower bay portion of the Mobile, Alabama Shipping Channel, located in the southern most reach of the channel from Stations 625+00 to 950+00. The Ocean Dredge Material Disposal Site (ODMDS) for the project is located in the Gulf of Mexico, southwest of the channel. It is approximately 12 miles to the closest point, and approximately 23 miles from the furthest point. The current disposal site bottom elevations are approximately -38 to -46 feet Mean Lower Low Water (MLLW). The crest elevation of dredged material placed within the ODMDS shall not exceed elevation -30 feet MLLW.

(c) Contractor's Investigation Responsibility: The Contractor should investigate submerged, surface, and overhead structures in the work areas and other locations which may be necessary to traverse. The exact location, depths, and height of submarine cables, pipes, highlines, etc. (as applicable), are not known and it will be necessary for the Contractor to ascertain interference problems and notify the respective owners in advance of dredging operations. The Contractor shall make all arrangements with the respective owners of the structure to assure satisfactory completion of dredging in the vicinity with a minimum interruption of service, and shall perform operations in such a manner as will avoid damage to these facilities.

(d) Weather Conditions: The sites of the work are exposed to local disturbances in the Mobile Harbor, which may cause suspension of the work for short unknown periods of time. During tropical hurricanes which may occur from June to December, inclusive, the project channels do not afford a safe refuge for floating plant. There are no unusual currents except during floods, when velocities of 2 to 4 miles per hour may be expected; however, the Contractor should investigate all sites of work and determine for himself the requirements of the work. Under ordinary conditions, the Mean Tidal Range is 1.2 feet. The working season extends over the entire year. Tides in Mobile Harbor are affected by extended periods of strong north or south winds.

(e) Transportation Facilities: The work areas are accessible by water via the Gulf Intracoastal Waterway and the Gulf of Mexico. The Contractor shall investigate any limitations imposed by bridges or other structures on water access to the project site. Highway access (Federal, state, and local) is available to the near vicinity of all work areas. Rail and highway transportation is available to Mobile, Alabama. Water transportation is available to the site of the work. The Contractor shall make their own investigation of available roads for transportation, load limits for bridges and roads, and other road conditions affecting the transportation of materials and equipment to the work sites.

(f) Channel Traffic: The traffic using the Mobile, Alabama Shipping Channel is considered to be a combination of heavy and large commercial vessels, and various sized recreational craft, respectively. The type of traffic consists of general cargo ships, fuel tankers, tow boats, Navy ships, charter fishing boats, passenger boats, and pleasure craft. CAUTION: When navigation conditions become hazardous due to inclement weather (fog, storm, etc) or other circumstances, the Contractor shall maintain appropriate communication with project traffic. The Contractor shall particularly comply with all U.S. Coast Guard regulations pertaining to proper activation of fog (and any other) signaling devices (sound, light, etc).



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

#### 1.4 TIME EXTENSIONS

Notwithstanding any other provisions of this contract, it is mutually understood that the time extensions for changes in the work will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion dates for all other portions of the work will not be altered and may further provide for an equitable readjustment of liquidated damages under the new completion schedule. Change orders involving time extensions must be obtained in writing from the Government's Representative.

#### 1.5 CONTRACTOR PREPARED AS-BUILT DRAWINGS

(a) General: In accordance with SPECIAL CONTRACT REQUIREMENT paragraph: CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS, the Government will furnish the Contractor on CD-ROM one electronic set of solicitation drawing files and any amendments for use in preparation of as-built drawings by the Contractor. Copies of the drawings will be the responsibility of the Contractor. The as-built drawings shall be a record of the construction as completed by the Contractor. They shall include all the information shown on the contract set of drawings and a record of all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings, and all changes which are made after final inspection of the contract work. In the event the Contractor accomplishes additional work which changes the as-built conditions after submission of the as-built drawings, the Contractor shall furnish revised and/or additional drawings as required to depict as-built conditions. The requirements for these additional drawings will be the same as for the as-built drawings included in the original submittal.

(b) Red line as-built drawings: The Contractor shall have on his staff, personnel to mark up a set of paper copy construction drawings to show the as-built conditions. These as-built marked copies shall be kept current and available on the job site at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded, as the events occur, by means of details and notes. The Contractor shall call attention to entries by red lining areas affected. The red line as-built drawings will be jointly inspected for accuracy and completeness by the Contracting Officer's Representative and a responsible

representative of the Contractor prior to submittal of each request for payment. The Contracting Officer Representative's approval of the current status of the as-built drawings shall be a prerequisite to the approval of request for progress payment and request for final payment under the contract. The drawings shall show the following information, but not be limited thereto:

(1) The location and description of any utility lines or other installations of any kind or description known to exist within the construction area that are not already shown on the contract drawings. The location includes dimensions to permanent features.

(2) The location and dimensions of any changes within the construction area.

(3) All changes or modifications which result from the final inspection.

(c) Submittal of as-built drawings for review and approval: The Contractor shall participate in monthly review meetings with the Contracting Officer's Representative to show the progress made the preceding month and make all required changes. At time of final construction inspection, the Contractor shall submit one copy of the red lined as-built drawings to the Contracting Officer's Representative for his review and approval. The as-built drawings shall be certified as to their correctness by the signature of an authorized representative of the Contractor. Upon Government approval of the Contractor's red lined copy of the as-built drawings, the Contractor shall prepare and provide two electronic sets of as-built drawings by incorporating the red line marked up notations on the construction drawings into the electronic set of solicitation drawings and amendments. In addition to the electronic sets of as-built drawings which shall be submitted on a CD-ROM, the Contractor shall also submit a full size set of as-built paper drawings. Submittals are to be to the Contracting Officer's Representative not later than ten (10) calendar days after project completion date.

(d) Final Drawing Format:

(1) The solicitation drawing files and any amendments thereto will be furnished to the Contractor in electronic format. The solicitation drawing files have been prepared using MicroStation. The Contractor shall utilize a file format that is compatible with the latest version of MicroStation to revise/redraft each solicitation drawing and/or amendment drawing to reflect all changes made during construction as indicated by the red line marked up notations on the construction drawings. Revisions/redrafting shall match the font styles, sizes, and formats; line weights/thicknesses and styles/types; and all other drafting elements used on the solicitation drawing/amendments. All elements must be incorporated into each as-built drawing file; the use of reference files shall not be permitted.

(2) All revisions made to the solicitation drawings and/or amendment drawings to reflect changes made during construction shall be flagged and shall have the revision block completed as follows. The entry in the description column of the revision block shall read "AS-BUILT". The date of the revision and one approving initial from a responsible person within the Contractor's Firm shall also be included in the revision block. Above the drawing title block the drawing will be labeled in bold letters "AS-BUILT". The flagged changes and revision block format shall be

in accordance with the examples shown in the Mobile District Design Manual located on the Internet at

<http://www.sam.usace.army.mil/Missions/MilitaryMissions/Engineering/Engineering-Design-Manual/>

The Contractor shall also furnish a revised index of drawings to match the actual design drawings. The drawing title blocks shall be in a uniform format to match the requirements as specified in the Design Manual.

(3) The two electronic sets of as-built drawing files shall be submitted in a format that is compatible with the latest version of MicroStation.

(4) The hard copy reproducible set of as-built drawings shall be submitted unbound on paper. The drawings shall be the full size.

(e) Payment: No separate payment will be made for preparation of the as-built drawings required under this contract. All costs will be considered a subsidiary obligation of the contract.

#### 1.6 ATTENDANT PLANT

(a) Attendant plant shall be composed of such barges, fuel, water, pipe derrick, anchor, etc., floating, submerged, and slip joint discharge pipe, and other attendant or auxiliary plant as may be required for operations under these specifications whether or not these items are specifically mentioned. The auxiliary and attendant plant shall be in good condition and of sufficient size and capability to efficiently serve the dredge.

(b) Radio Telephone: The Contractor shall furnish and maintain the following radios for communication with the Corps of Engineers, United States Coast Guard, and other vessels: Radio(s) must be certified as being operable on the specified frequencies and powers by a licensed radio technician. A copy of the certification must be furnished to the Contracting Officer prior to final acceptance of the dredging plant.

(1) A Marine VHF Radio, FCC type accepted with the following channels: Channel 16, (156.8 MHZ), Channel 13, (156.65 MHZ), Channel 12, (156.6 MHZ), Channel 14, (156.7 MHZ), and Channels 26 and 28 for public correspondence. A separate receiver must be provided on Channel 13, (156.6 MHZ) in compliance with Public Law 92-63.

(2) In addition to the above-mentioned radios, the Contractor shall provide additional space in the inspector's office as specified in the paragraph entitled "Inspector's Office" for placement of one VHF marine radio. The radio shall be able to receive all VHF marine channels and scan two channels continuously. The radio will be furnished at the expense of the Contractor.

(c) Transport Vessel: The Contractor shall provide one transport vessel, with twin propellers, not less than 40 feet in overall length, with enclosed space for three passengers, to adequately operate in all areas included in the scope of work. This vessel must have an operator on site at all times; be capable of traveling at a speed of 20 knots (23 MPH) or greater in good weather and capable of traveling safely at night and in intense fog; (such vessel shall meet or exceed US Coast Guard regulations for vessels 65 feet or less in length); and the vessel shall have a

Certificate of Inspection by the US Coast Guard, or at least from a Marine Surveyor. This vessel shall be for the primary use of the Government Inspector. The use of this vessel for Contractor's crew changes, or any other use of this vessel by the Contractor shall be secondary to the Government Inspector shift changes. This vessel shall be equipped with the following at a minimum: built-in fuel tanks with correctly operating fuel gauges; marine and company radios; windshield wipers; running and spot lights; and all required survey equipment. The Contractor shall secure satisfactory landing location for this vessel.

#### 1.7 PRECONSTRUCTION CONFERENCE

(a) A preconstruction conference will be arranged by the Government's representative after award of contract and before commencement of work. The Government's representative will notify the Contractor of the time and date set for the meeting. At this conference, the Contractor shall be oriented with respect to Government procedures and line of authority, contractual, administrative, and construction matters. Additionally, a schedule of required submittals will be discussed.

(b) The Contractor shall bring to this conference the submittals listed in Section 01 33 00 Paragraph entitled Preconstruction Submittals in either completed or draft form.

#### 1.8 PROJECT SIGN

The Contractor shall furnish and install a project sign and a safety performance sign at the location designated by the Contracting Officer's Representative within 60 calendar days after notice to proceed. The signs shall be constructed as indicated on the figures bound herein. Size, lettering, color, and paint shall conform to the details shown in Figure 5B "Construction Sign," Figure 5C "Fabrication and Mounting Guidelines," and Figure 5D "Safety Performance Sign," bound herein. All parts of frames and signs shall be given a primer coat of oil paint and a minimum of two finish coats of white semi-gloss paint. The Contractor shall maintain the sign in a "like new" condition throughout the life of the project, repainting and replacing members as necessary to accomplish this requirement. No direct payment will be made for the signs or maintenance of the signs.

#### 1.9 DATUM AND BENCHMARKS

The plane of reference of Mean Lower Low Water (MLLW) as used in these specifications is that determined by the benchmark and tide gage data as on file at the U.S Army, Corps of Engineers, Mobile District Office and the Irvington Site Office. The Contractor can obtain such data from the Project Engineer, Irvington Site Office, telephone (251)957-6019.

#### 1.10 FINAL EXAMINATION AND ACCEPTANCE

(a) As soon as practicable (within 14 calendar days or less if agreed to by the Contracting Officer) after completion of the entire work or any designated section thereof (if the work is divided into sections), as in the opinion of the Contracting Officer, the work in this section will not be subject to damage by further operations under the contract, such work (required dredging prism) will be thoroughly examined at the cost and expense of the Government by sounding or by sweeping, or both, as determined by the Contracting Officer, for determination of ACCEPTABILITY of PERFORMANCE by the Contractor. Should any shoals, lumps, or other lack

of contract required dredging prism depth, width, or slope (i.e. lack of acceptable contract performance) be disclosed by this examination, the Contractor will be required to remove same by dragging or dredging the affected surface until the acceptable condition is corrected. Before-dredging and after-dredging quantity computations will be made using this 1V:5H slope. Acceptance will be based on the required dredging prism only. The contract drawings include typical sections showing the existing channel dimensions, the required O&M dredging prism, the required new work dredging prism, and the allowable overdepth. If the unacceptable shoal (work) area(s) of the channel bottom/slope is soft and the shoal (work) area(s) is small and forms no material obstruction to navigation, the removal of such shoal(s) may be waived at the discretion of the Contracting Officer. If re-dredging is required to correct the unacceptable work, the dredging will be paid at the current unit price for dredging, however, the maximum payment quantity (original and re-dredgings) will not exceed the original computed pay quantity in the required dredging prism (plus any applicable allowable overdepth quantity, as applicable) based on the original before-dredging surveys. The Contractor or their authorized representative will be notified when soundings and/or sweepings are to be made, and will be permitted to accompany the survey party. When the original or unacceptable area(s) is found to be in a satisfactory condition, it will be accepted finally. Should more than two sounding or sweeping operations by the Government over an area be necessary by reason of work for the removal of unacceptable shoals disclosed at a prior sounding or sweeping, the cost of such third and any subsequent sounding or sweeping operations will be charged against the Contractor at the rate of \$2,200.00 per day for each day in which the Government (or Government A-E Contractor) plant is engaged in sounding or sweeping and/or is enroute to or from the site or held at or near the said site for such operations. For the purpose of acceptance, the work to be done will be divided into approximate 1,000-foot sections as defined below:

Dredging Reach No.	From Station	To Station
1-45	500+00	950+00

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

(c) After acceptance by the Government, of the whole or part of the work, but before the Contractor has effected demobilization, should any shoals, lumps, or other lack of required contract depth be disclosed by an examination made by the Government, the Contractor may be requested to remove any such shoal by using the on-site dredging plant and process, to be paid at the original contract rate for dredging in this location. This additional dredging is subject to a supplemental agreement under the contract and is only activated by the Contracting Officer (and if funds are available).

(d) Shoaling in the dredging prism, which occurs in the whole or part of the work not yet offered by the Contractor as candidate for acceptance examination by the Government, is the responsibility of the Contractor (notwithstanding other clauses or provisions of this contract). The Contractor should order the accomplishment of all the work of this

contract in such a manner that causes the least exposure to such in-process shoaling.

1.11 PERFORMANCE EVALUATION OF CONTRACTOR

As a minimum, the Contractor's performance will be evaluated upon final acceptance of the work. However, interim evaluation may be prepared at any time during the contract performance when determined to be in the best interest of the Government.

The evaluation will be completed in the Contractor Performance Assessment Reporting System (CPARS), and the Contractor will be rated either exceptional, very good, satisfactory, marginal, or unsatisfactory in the areas of Quality, Schedule, Cost Control, Management, Small Business, Regulatory, and Other Areas. The Contractor will be advised of any unsatisfactory rating, either in an individual element or in the overall rating, prior to completing the evaluation, and all Contractor comments will be made a part of the official records. Performance Evaluation Reports will be available to all DOD Contracting offices for their future use in determining Contractor responsibility, in compliance with DFARS 36.201(c)(1).

-- End of Section --

The use of signs to identify Corps managed or supervised design, construction, and rehabilitation projects - both for military and civil works - is an important part of efforts to keep the public informed of Corps work. For this purpose, a construction project sign package has been adopted. This package consists of two signs: one for project identification and the other to show on-the-job safety performance of the contractor.

These two signs are to be displayed side by side and mounted for reading by passing viewers. Exact placement location will be designated by the contracting officer's representative.

The panel sizes and graphic formats have been standardized for visual consistency throughout all Corps operations.

Panels are fabricated using HDO plywood or aluminum with dimensional lumber uprights and bracing. The sign faces are nonreflective vinyl.

All legends are to be die-cut or computer-cut in the sizes and typefaces specified and applied to the white panel background following the graphic formats shown on pages 16-2 and 16-3. The Communication Red panel on the left side of the construction project sign with Corps Signature (reverse version) is screen-printed onto the white background.

A display of these two signs is shown on the following two pages. Mounting and fabrication details are provided on page 16-4.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Below are two samples of the Construction Project Identification sign showing how this panel is adaptable for use to identify either military (top) or civil works projects (bottom). The graphic format for this 4'x 6' sign panel follows the legend guidelines and layout as specified below. The large 4'x 4' section of the panel on the right is to be white with black legend. The 2'x 4' section of the sign on the left

with the full Corps Signature (reverse version) is to be screen-printed Communication Red on the white background. The designation of a sponsor in the area indicated is optional with Military or Civil Works construction signs. Signs may list one sponsoring entity. If agreement on a sponsor designation cannot be achieved, the area should be left blank.

This sign is to be placed with the Safety Performance sign shown on the following page. Mounting and fabrication details are provided on page 16-4.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Modified IAW ECB 2020-1

Legend Group 1: One- to two-line description of Corps relationship to project.  
Color: White  
Typeface: 1.25" Helvetica Regular  
Maximum line length: 19"

Legend Group 2: Division or District Name (optional). Placed below 10.5" reverse Signature (6" Castle).  
Color: White  
Typeface: 1.25" Helvetica Regular

Legend Group 2a: One- to three-line identification of Military or Civil Works sponsor (optional). Place below Corps Signature to cross-align with Group 5a-b.  
Color: White  
Typeface: 1.25" Helvetica Regular  
Maximum line length: 19"

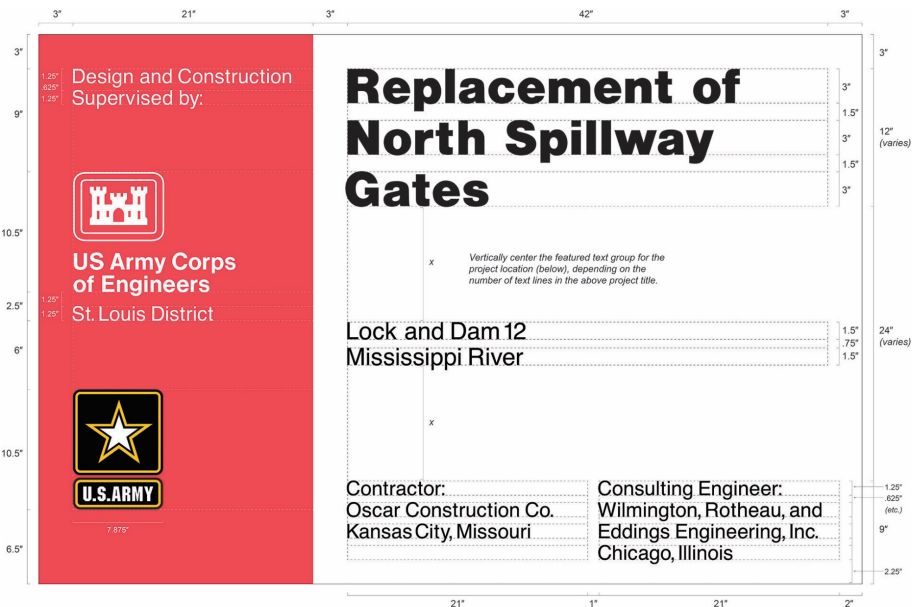
Legend Group 3: One- to three-line project title legend describes the work being done under this contract.  
Color: Black  
Typeface: 3" Helvetica Bold  
Maximum line length: 42"

Legend Group 4: One- to two-line identification of project or facility (civil works) or name of sponsoring department (military).  
Color: Black  
Typeface: 1.5" Helvetica Regular  
Maximum line length: 42"

Cross-align the first line of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

Legend Groups 5a-b: One- to five-line identification of prime contractors including: type (architect, general contractor, etc.), corporate or firm name, city, state. Use of Legend Group 5 is optional.  
Color: Black  
Typeface: 1.25" Helvetica Regular  
Maximum line length: 21"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	various	4'x6'	4"x4"	HDO-3	48"	WH-RD/BK



Each contractor's safety record is to be posted on Corps managed or supervised construction projects and mounted with the Construction Project Identification sign specified on page 16-2.

The graphic format, color, size and typeface used on the sign are to be reproduced exactly as specified below. The

title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-

mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: Standard two-line title "Safety is a Job Requirement" with 8" (outside diameter) Safety Green first aid logo.  
Color: To match Pantone system 347  
Typeface: 3" Helvetica Bold  
Color: Black

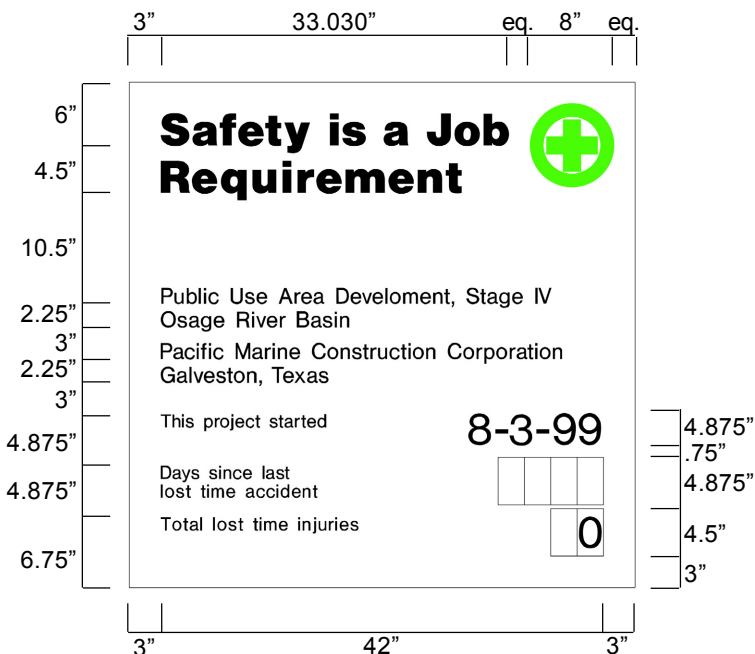
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.  
Color: Black  
Typeface: 1.5" Helvetica Regular  
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black  
Typeface: 1.5" Helvetica Regular  
Maximum line length: 42"

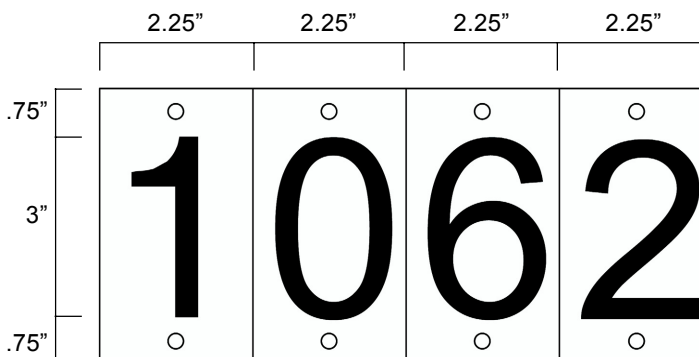
Legend Group 4: Standard safety record captions as shown.  
Color: Black  
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.  
Color: Black  
Typeface: 3" Helvetica Regular  
Plate size: 2.5" x 4.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4'x4'	4"x4"	HDO-3	48"	WH/BK-SG



All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer representative and shall conform to the size, format, and typographic standards shown on pages 16-2 and 16-3. Detailed specifications for HDO plywood panel preparation are provided in Appendix B.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

For additional information on the proper method to prepare sign panel graphics, contact the district Sign Program Manager.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B.

Sign graphics to be prepared on a white nonreflective vinyl film with positionable adhesive backing.

All graphics except for the Communication Red background with Corps Signature on the project sign are to be die-cut or computer-cut nonreflective vinyl, prespaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on pages 16-2 and 16-3.

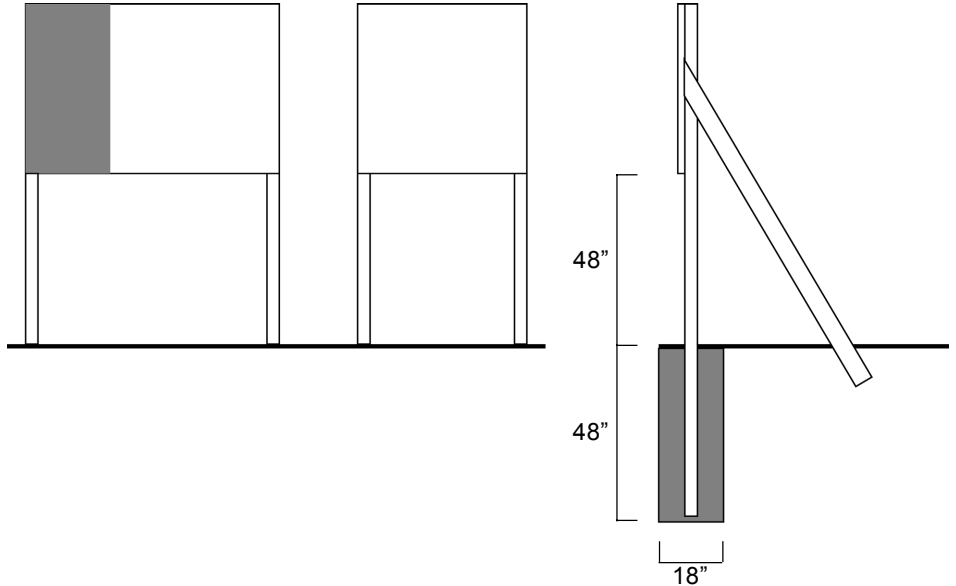
The 2'x 4' Communication Red panel (to match Pantone system 032) with full Corps Signature (reverse version) is to be screen-printed on the white background. Identification of the district or division may be applied under the signature with white cut vinyl letters prepared to Corps standards.

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of uprights to reinforce installation as shown.



**Construction Project Identification Sign**  
**Legend Group 1: Corps Relationship**

1. \_\_\_\_\_
2. \_\_\_\_\_

**Legend Group 2: Division/District Name**

1. \_\_\_\_\_
2. \_\_\_\_\_

**Legend Group 2a: Military/Civil Works Sponsor**

1. \_\_\_\_\_
2. \_\_\_\_\_

**Legend Group 3: Project Title**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**Legend Group 4: Facility Name**

1. \_\_\_\_\_
2. \_\_\_\_\_

**Legend Group 5: Contractor/A&E**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Legend Group 5b: Contractor/A&E**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Safety Performance Sign**

**Legend Group 2: Project Title**

1. \_\_\_\_\_
2. \_\_\_\_\_

**Legend Group 3: Contractor/A&E**

1. \_\_\_\_\_
2. \_\_\_\_\_



**Response to SF-308 Request for  
Davis-Bacon Project Wage Determination**

**Project Wage Decision Number:** 2022AL-19334308-042822

**Superseded Project Wage Decision:** AL20210008

**State:** Alabama

**County:** Mobile

**Construction Type:** Heavy Dredging

**Agency:** U.S. Army Corps of Engineers

**Solicitation Number:** W9127822B003

**Project Name:** Dredging and Hopper Dredging

**Description of Work (as clarified):**

Dredging Construction Projects (Self-Propelled Hopper Dredging Only)

**Date of Decision:** 04/28/2022

**Expires:** 11/07/2022

**Modification Number:** 0

<b>Classification</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>
Self-Propelled Hopper Dredge	\$15.00	\$ 0.00
Self-Propelled Hopper Dredge Drag Tenders	\$15.00	\$ 0.00

This wage determination is specifically for the project listed above. It cannot be used for any other purpose including contracts and or projects.

Further, in the event the above referenced contract is subject to Executive Order (EO) 14026 and the approved conformed hourly wage rate (not including any fringe benefits) is less than the EO minimum wage, you are required to comply with the minimum wage requirements of EO 14026,

codified at 29 CFR Part 10. Please note that this EO 14026 applies to contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). See <https://www.dol.gov/agencies/whd/government-contracts/eo14026> for additional information regarding EO 14026, including coverage and minimum wage requirements.

If you have any questions and or additional comments, please do not hesitate to contact me at [thomas.rhontia@dol.gov](mailto:thomas.rhontia@dol.gov).

Sincerely,

*Rhontia S. Thomas-Johnson*

RhonTia Thomas-Johnson

Chief, Branch of Construction Wage Determinations

202-693-0806

[Thomas.rhontia@dol.gov](mailto:Thomas.rhontia@dol.gov)

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## 1. BOARD OF CONTRACT APPEALS

The agency board of contract appeals having jurisdiction over all appeals from final decisions of the Contracting Officer under the Contract Disputes Act of 1978 is the Armed Services Board of Contract Appeals, Skyline Six, 5109 Leesburg Pike, 7TH Floor, Falls Church, Virginia 22041.

End of Paragraph

## 2. REQUESTS FOR INFORMATION

Any questions about this solicitation, including technical questions about plans and specifications, shall be submitted via the Bidder Inquiry Portal in ProjNet at <https://www.projnet.org>. To submit and review inquiry items, prospective vendors will need to use the Bidder Inquiry Key presented below and follow the instructions listed below the key for access. A prospective vendor who submits a comment /question will receive an acknowledgement of their comment/question via email, followed by an answer to the comment/question after it has been processed by our technical team. All timely questions and approved answers will be made available through ProjNet.

Questions shall be submitted no later than **17 May 2022** at 2:00 p.m. Central Time to allow time for a response, and amendment to the solicitation if necessary. On this date and time the portal will be closed.

For technical questions, no other means of communication, e-mail, fax, or telephone will be accepted. Oral exchanges between Offerors or Bidders and the government prior to award of the contract will not be binding. In addition to information available to Offerors or Bidders on the Bidder Inquiry Portal, any information concerning this solicitation will be furnished to all Offerors or Bidders as an amendment to the solicitation if the information is necessary to the submittal of offers or bids.

**The Solicitation Number is: W9127822B0003**  
**The Bidder Inquiry Key is: H2EPSW-S2YZJP**

### **Specific Instructions for ProjNet Bid Inquiry Access:**

1. From the ProjNet home page linked above, click on **Quick Add** on the upper right side of the screen.
2. Identify the Agency. This should be marked as **USACE**.
3. Key. Enter the **Bidder Inquiry Key** listed above.
4. Email. Enter the email address you would like to use for communication.
5. Click Continue. A page will then open saying that a user account was not found and will ask you to create one using the provided form.
6. Enter your First Name, Last Name, Company, City, State, Phone, Email, Secret Question, Secret Answer, and Time Zone. Make sure to remember your Secret Question and Answer as they will be used from this point on to access the ProjNet system.
7. Click Add User. Once this is completed you are now registered within ProjNet and are currently logged into the system.

### **Specific Instructions for Future ProjNet Bid Inquiry Access:**

1. For future access to ProjNet, you will not be emailed any type of password. You will utilize your Secret Question and Secret Answer to log in.
2. From the ProjNet home page linked above, click on **Quick Add** on the upper right side of the screen.
3. Identify the Agency. This should be marked as **USACE**.
4. Key. Enter the **Bidder Inquiry Key** listed above.

5. Email. Enter the email address you used to register previously in ProjNet.
6. Click Continue. A page will then open asking you to enter the answer to your Secret Question.
7. Enter your Secret Answer and click Login. Once this is completed you are now logged into the system.

Note: Questions/comments should be entered in the system one at a time. Lists of questions uploaded into ProjNet, regardless of the format, will not be answered.

Offerors are requested to review the solicitation and amendments in their entirety, as well as to review the Bidder Inquiry Portal for previous questions and responses, prior to submission of a new inquiry on the Portal.

**CAUTION: ANY INQUIRY SUBMITTED AND ANSWERED WITHIN THIS SYSTEM, WILL BE ACCESSIBLE TO VIEW BY ALL INTERESTED OFFERORS OR BIDDERS ON THIS SOLICITATION.**

The call center for the ProjNet operates weekdays from 8 AM to 5 PM U.S. Central Time Zone. The telephone number is 1-800-428-HELP.

End of Paragraph

### 3. DESCRIPTION OF WORK

In general, the work for Phase 4 of the Mobile Harbor, Alabama Project shall consist of deepening and widening portions of the Middle Bay Channel beginning approximately 2 miles north of Gaillard Island thence southerly to a point approximately 1 mile south of the island.

NOTE: The above general outline of features of the work does not in any way limit the responsibility of the Contractor to perform all work and furnish all plant, labor, equipment and materials required by the specifications and the drawings referred to therein. The cost of this work is estimated to be between \$25,000,000 and \$100,000,000.

End of Paragraph

### 4. PREAWARD INFORMATION

Each bidder shall furnish either with his bid or within 3 days after a request is made for submittal of preaward data a statement of whether he is now or ever has been engaged in any work similar to that covered by the specifications herein, the dollar value thereof, the year in which such work was performed, and the manner of its execution, and giving such other information as will tend to show the bidder's ability to prosecute the required work. The "such other information" referred to above shall include but is not limited to the following:

a. The name and address of the office or firm under which such similar work was performed. Include names and telephone numbers of personnel within each organization who are familiar with the prospective contractor's performance.

b. A list of key personnel available for the instant project and their qualifications.

- c. A copy of bidder's latest financial statement, including the names of banks or other financial institutions with which the bidder conducts business. If the financial statement is more than 60 days old, a certificate should be attached stating that the financial condition is substantially the same, or if not the same, the changes that have taken place. Such statements will be treated as confidential.
- d. A list of present commitments, including the dollar value thereof, and name of office under which the work is being performed. Include names and telephone numbers of personnel within each organization who are familiar with the prospective contractor's performance.
- e. If the bid exceeds \$1,000,000 and the prospective contractor is a large business concern, he must submit a subcontracting plan in compliance with the Contract Clause entitled SMALL BUSINESS SUBCONTRACTING PLAN.

End of Paragraph

## 5. CONTRACT PRICES - BIDDING SCHEDULE

Payment for the various items listed in the Bidding Schedule shall constitute full compensation for furnishing all plant, labor, equipment, appliances, materials and bonds (performance and payment), and for performing all operations required to complete the work in conformity with the drawings and specifications. All costs for work not specifically mentioned in the Bidding Schedule shall be included in the contract prices for the items listed.

End of Paragraph

## 6. REQUIRED INSURANCE

The Contractor shall procure and maintain during the entire period of his performance under this contract, the following minimum insurance in accordance with the Contract Clause entitled "Insurance-Work on a Government Installation." Workmen's Compensation and Employers' liability Insurance:

Workmen's Compensation and Occupational Disease Coverage in accordance with statutory limits.  
Employers' Liability Coverage with a minimum limit of \$100,000.

Comprehensive Automobile Liability Insurance:

Bodily injury coverage with minimum limits of \$200,000 per person and \$500,000 per occurrence. Property Damage Coverage with a minimum limit of \$20,000 per occurrence.

Comprehensive General Liability Insurance:

Bodily injury coverage with minimum limits of \$500,000 per occurrence.

End of Paragraph



## 7. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

(a) This clause does not apply to terminations.

(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 arrangements, 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."

End of Paragraph

## 8. U.S. ARMY CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385- 1-1

This paragraph applies to contracts and purchase orders that require the contractor to comply with EM 385-1-1 (e.g., contracts that include the Accident Prevention clause at FAR 52.236-13 and/or other safety provisions). EM 385-1-1 and its changes are available at <http://www.usace.army.mil/Safety-and-Occupational-Health/EM-385-1-1-2008-Being-Revised/>. The Contractor shall be responsible for complying with the current edition and all changes posted on the web through the date that is 10 calendar days prior to the date offers are due. If the solicitation is amended to extend the time set for receipt of offers, the 10 calendar days rule stated above shall be applied against the amended date. (For example, if offers are due on 10 April, all changes posted on or before 31 March shall apply to the contract. If the time for receipt of offers is extended from 10 April to 20 April, all changes posted on or before 10 April shall apply to the contract.)

End of Paragraph

## 9. AFFILIATED BIDDERS

(a) Business concerns are affiliates of each other when, either directly or indirectly, (1) one concern controls or has the power to control the other, or (2) a third party controls or has the power to control both.

(b) Each bidder shall submit with its bid an affidavit stating that it has no affiliates, or containing the following information.

(1) The names and addresses of all affiliates of the bidder.

(2) The names and addresses of all persons and concerns exercising control or ownership of the bidder and any or all of its affiliates, and whether they exercise such control or ownership as common officers, directors, stockholders, holding controlling interest, or otherwise.

Please check when applicable:

\_\_\_\_\_ The offeror certifies that it has no affiliates.

\_\_\_\_\_ The offeror certifies that it is affiliated with the concerns designated on an attached affidavit.

End of Paragraph

## 10. MANPOWER REPORTING (DEC 2012)

The Office of the Assistant Secretary of the Army (Manpower & Reserve Affairs) operates and maintains a secure Army data collection site where the contractor will report ALL contractor manpower (including subcontractor manpower) required for performance of this contract. The contractor is required to completely fill in all the information in the format using the following web address <https://www.sam.gov>. The required information includes:

- (1) Contracting Office, Contracting Officer, Contracting Officer's Technical Representative;
- (2) Contract number, including task and delivery order number;
- (3) Beginning and ending dates covered by reporting period;
- (4) Contractor name, address, phone number, e-mail address, identity of contractor employee entering data;
- (5) Estimated direct labor hours (including subcontractors);
- (6) Estimated direct labor dollars paid this reporting period (including subcontractors);
- (7) Total payments (including subcontractors);
- (8) Predominant Federal Service Code (FSC) reflecting services provided by contractor (and separate predominant FSC for each subcontractor if different);
- (9) Estimated data collection cost;

(10) Organizational title associated with the Unit Identification Code (UIC) for the Army Requiring Activity (the Army Requiring Activity is responsible for providing the contractor with its UIC for the purposes of reporting this information);

**Note: UIC for Mobile District Civil Works funded projects is W2SR04 and Military funded projects is W07404. If you are unsure of the funding type, contact your COR or Contract Specialist.**

(11) Locations where contractor and subcontractors perform the work (specified by zip code in the United States and nearest city, country, when in an overseas location, using standardized nomenclature provided on website);

(12) Presence of deployment or contingency contract language; and

(13) Number of contractor and subcontractor employees deployed in theater this reporting period (by country).

As part of its submission, the contractor will also provide the estimated total cost (if any) incurred to comply with this reporting requirement. Reporting period will be the period of performance not to exceed 12 months ending September 30 of each government fiscal year and must be reported by 31 October of each calendar year. Contractors may use a direct XML data transfer to the database server or fill in the fields on the website. The XML direct transfer is a format for transferring files from a contractor's systems to the secure web site without the need for separate data entries for each required data element at the web site. The specific formats for the XML direct transfer may be downloaded from the web site.

(End of clause)

## 11. MANUALS AND PUBLICATIONS

Engineering manuals and Concrete Research Division Publications may be obtained from the addresses given below.

Engineering Manuals:

U. S. Army, Corps of Engineers  
Publications Depot  
2803 -52nd Avenue  
Hyattsville, MD 20781-1102

Concrete Research Division Publications:

U.S. Army Engineer Waterways Experiment Station  
ATTN: Publications Distribution Unit  
P.O. Box 631  
Vicksburg, MS 39180

End of Paragraph

## 12. BULLETIN BOARD

Immediately upon beginning of work under this contract, the Contractor shall provide at the job site a weatherproof glass-covered bulletin board for displaying the fair employment poster, wage rates, and safety bulletins and posters. Emergency telephone numbers and reporting instructions for ambulance, physician, hospital, fire and police shall be posted. The bulletin board shall be located in a conspicuous place easily accessible to all and legible copies of the aforementioned data shall be displayed until work under the contract is completed. No direct payment will be made for the bulletin board.

End of Paragraph

## 13. LABOR REPORTS

The Contractor shall promptly furnish and shall cause any subcontractors to furnish in like manner within 7 days after the regular payment date of each weekly payroll to the Contracting Officer, a copy of such payroll together with a statement of compliance with respect to the wages paid each of its employees (which shall not be deemed to apply to persons in classifications higher than laborers and mechanics and those who are the immediate supervisors of such employees) engaged on the work. If the Contractor or any of his subcontractors fail to furnish copies of such payrolls, the Contracting Officer may disapprove all or part of any progress payment estimate for the period covered by such payrolls until they are received by him. The Contractor shall also prepare and furnish such labor reports as may be required by the Department of Labor.

End of Paragraph

## 14. PROTECTION OF MATERIAL AND WORK

The Contractor shall at all times protect and preserve all materials, supplies and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to enclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies, and work performed are not adequately protected by the Contractor such property may be protected by the Government and the cost thereof may be charged to the Contractor or deducted from any payments due him.

End of Paragraph

## 15. ENGLISH-SPEAKING REPRESENTATIVE

At all times when any performance of the work at any site is being conducted by any employee of the Contractor or his subcontractors, the Contractor shall have a representative present at each site who has the capability of receiving instructions in the English language, fluently speaking the English language and explaining the work operations to persons performing the work in the language that those performing the work are capable of understanding. The Contracting Officer shall have the right to determine whether the proposed representative has sufficient technical and bilingual capabilities, and the Contractor shall immediately replace any individual not acceptable to the Contracting Officer.

End of Paragraph

## 16. PROHIBITION AGAINST CONTRACTING WITH INDIVIDUALS OR ENTITIES DESIGNATED AS SIGNIFICANT NARCOTICS TRAFFICKERS

Pursuant to Executive Order 12978 entitled "Blocking Assets and Prohibiting Transactions with Significant Narcotic Traffickers" dated October 21, 1995, the offeror certifies that it has not and will not be involved in business transactions with individuals or business entities designated as significant narcotics traffickers under this Executive Order. For a current listing of specially designated nationals and blocked persons, contact the Office of Foreign Assets Control, Department of the Treasury, Washington, DC 22201; telephone 202/622-2420.

End of Paragraph

## 17. CONTRACTOR PAYMENT REQUEST

A copy of CESAM Form 1151 entitled PROMPT PAYMENT CERTIFICATION AND SUPPORTING DATA FOR CONTRACTOR PROGRESS PAYMENT INVOICE is included hereinafter, with instructions, following the Wage Rates. This form will be used in conjunction with the CONTRACT CLAUSE entitled PAYMENTS UNDER FIXEDPRICE CONSTRUCTION CONTRACTS. The contracting Officer will provide copies of the form to the Contractor upon request. The Contractor shall complete the form, sign the certification and submit it with each progress payment invoice.

End of Paragraph

## 18. PARTNERING

In order to most effectively accomplish this contract, the Government proposes to form a cohesive partnership with the Contractor and its subcontractors. This partnership would strive to draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget and on schedule. This partnership would be bilateral in make-up and participation will be totally voluntary. Any cost associated with implementing this partnership will be agreed to by both parties and will be shared equally with no change in contract price.

End of Paragraph

## 19. POTABLE WATER

Testing of all potable water storage facilities and dispensing systems with a storage capacity of ten or more gallons, will be conducted by an independent testing laboratory approved by the Contracting officer as follows:

- (1) Prior to the commencement of work.
- (2) Minimum of monthly, after start of work for the duration of the contract.
- (3) After any repairs or modifications are made to the potable water storage or dispensing systems.
- (4) After any intake of potable water into the storage system.

All samples shall meet state and local water quality standards for potable water. A copy of all test results will be forwarded to the Contracting Officer within seven working days for his review.

In the event a tested sample fails to meet state and local water quality standards, all dispensing outlets connected to the failing water storage shall be labeled as non-potable and other means of potable water shall be obtained until water quality can be provided to meet the required standards.

To insure potable water maintains water quality standards all portable potable water dispensing units shall be checked daily for cleanliness. All hoses used in the transfer of potable water shall be conspicuously marked and kept in such a manner as to keep them from being contaminated. These hoses shall be used for potable water transfer only.

End of Paragraph

## 20. PRESERVATION OF HISTORICAL, ARCHEOLOGICAL AND CULTURAL RESOURCES

(a) If known historical, archeological and cultural resources exist within the Contractor's work area, they have been designated on the contract drawings. The Contractor shall install protection for these resources as shown on the drawings and shall be responsible for their preservation during the contract.

(b) If, during construction activities, the Contractor observes items that might have historical or archeological value, such observations shall be reported immediately to the Contracting Officer so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in the destruction of these resources and shall prevent his employees from trespassing on, removing, or otherwise damaging such resources.

End of Paragraph

## 21. WORK IN QUARANTINED AREA

The work called for by this contract involves activities in counties quarantined by the Department of Agriculture to prevent the spread of certain plant pests which may be present in the soil. The Contractor agrees that all construction equipment and tools to be moved from such counties shall be thoroughly cleaned of all soil residues at the construction site with water under pressure and that hand tools shall be thoroughly cleaned by brushing or other means to remove all soil. In addition, if this contract involves the identification, shipping, storage, testing, or disposal of soils from such a quarantined area, the Contractor agrees to comply with the provisions of ER 1110-1-5 and attachments, a copy of which will be made available by the Contracting Officer upon request. The Contractor agrees to assure compliance with this obligation by all subcontractors.

End of Paragraph

## 22. KEY PERSONNEL, SUBCONTRACTORS AND OUTSIDE ASSOCIATES OR CONSULTANTS

Any key in-house personnel, subcontractors and outside associates or consultants required by the Contractor in connection with the services covered by the contract will be limited to individuals or firms that were

specifically identified and agreed to during negotiations. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated key personnel, subcontractors, associates, or consultants.

End of Paragraph

### 23. ACCOMMODATIONS AND MEALS FOR INSPECTORS

a. The Contractor shall furnish regularly to inspectors on board the dredge or other craft upon which they are employed, a suitable separate room for office purposes. The room shall be fully equipped and maintained to the satisfaction of the Contracting Officer; it shall be properly heated, ventilated, and lighted, and shall have a desk which can be locked, a chair for each inspector, and washing conveniences. The entire cost to the Contractor for furnishing, equipping, and maintaining the foregoing accommodations shall be included in the contract price. If the Contractor fails to meet these requirements, the facilities referred to above will be secured by the Contracting Officer, and the cost thereof will be deducted from payments to the Contractor.

b. If the Contractor maintains on this work an establishment for the subsistence of his own employees, he shall, when required, furnish the inspectors employed on the work, and to all Government agents who may visit the work on official business, meals of a quality satisfactory to the Contracting Officer. The Contractor will be responsible for collecting from all inspectors and other Government agents the following amount per person for each meal: Breakfast - \$2.25, Lunch - \$3.25 and Dinner - \$3.50.

End of Paragraph

### 24. SEAGOING BARGE ACT

The Seagoing Barge Act (46 U.S. C. 395 et seq.) applies to this project. In the event the low bidder contemplates using plant that requires U.S. Coast Guard certification to comply with this Act, the low bidder shall within 15 calendar days after bid opening submit a copy of said certificate to the Contracting Officer. Failure to produce the certificate within the required time shall subject the bidder to a determination of nonresponsibility.

End of Paragraph

### 25. DELIVERY, PROSECUTION AND TERMINATION

(a) The dredge and attendant plant shall be delivered by and at the expense of the Contractor to the Mobile District's navigation projects located in Mobile County, Alabama.

(b) The Contractor shall prosecute the work assigned him with faithfulness and energy, and at all times endeavor to meet the schedule of dredging operations as determined by the Contracting Officer.

(c) Upon termination of the lease, the plant will be released to the Contractor.

End of Paragraph

## 26. SUNDAYS, HOLIDAYS AND NIGHTS

Due to the nature of the work, a twenty-four (24) hour operation will be performed on a seven (7) day week schedule. Work shall be performed on days declared by Congress as holidays for per diem employees that fall within the work described above. Deviation from the work week contracted for will be subject to the approval of the Contracting Officer. -

Operation Day. The dredge, together with the necessary attendant plant and with adequate crew, shall be operated 24 hours per day on an optional shift basis.

End of Paragraph

## 27. RETAINAGE--SMALL BUSINESS SUBCONTRACTING REPORTING

Reference is made to contract clause(s) 252.219-7003, Small Business Subcontracting Plan (DoD Contracts) and 52.219-16, Liquidated Damages--Small Business Subcontracting Plan. In order to ensure compliance with these clauses, retainage will be withheld from progress payments due the contractor in an amount sufficient to protect the Government's ability to assess Liquidated Damages for failure to submit timely SF 294 and SF 295 reports.

The formula for retainage is as follows:

"Total dollar amount proposed for subcontracting to small business multiplied by percentage of actual progress on the contract, up to a maximum of 10% of the given progress payment, shall be withheld from the next progress payment due after a contractor fails to submit a required report. If one or more reports have been submitted before such failure, formula for determining the amount of retainage will be adjusted by deducting any amounts reported as subcontracted to small business from the total dollar amount proposed to be subcontracted and the difference multiplied by the percent of actual progress, up to a maximum of 10% of the given progress payment."

End of Paragraph

## 28. JOINT VENTURE BID REQUIREMENTS

When bidding as a Joint Venture, all members of the Joint Venture must sign all contract documents and must complete the Representations and Certifications unless a written agreement by the Joint Venture is furnished with the bid designating one firm with the authority to bind the other member(s) of the Joint Venture. In addition, a copy of the Joint Venture Agreement fully executed by both parties must be submitted with the bid. Failure to comply with the foregoing requirements may render the bid non-responsive. For 8(A) Joint Ventures, the Joint Venture shall also submit evidence that it has notified and discussed the proposed joint venture with its SBA Servicing Agency. Additionally, for 8(A) Set-aside procurements, all prospective Joint Ventures must comply with Title 13 Code of Federal Regulations (CFR) Part 124.513. Award to an 8(A) Joint Venture shall be contingent upon SBA approval of the 8(A) Joint Venture Agreement. For HubZone Set-Aside procurements, and awards to HUBZone small business concerns, a HUBZone Joint Venture must comply with 13 CFR 126.616.

End of Paragraph



## 29. SMALL BUSINESS SUBCONTRACTING PLAN

(a) This clause does not apply to small business concerns.

(b) Offerors who are large businesses, upon request by the Contracting Officer, shall submit a subcontracting plan in accordance with the contract clause in Section 00 70 00, FAR 52.219-9, Small Business Subcontracting Plan.

(c) Approval of subcontracting plan by the Contracting Officer will be contingent upon providing a plan that includes realistic goals and makes a good faith effort to acquire services and supplies from small businesses

End of Paragraph

## 30. PROCEDURES FOR SUBMISSION OF BIDS AND VIRTUAL BID OPENING

In accordance with FAR 14.202-8 and FAR Part 4.5, bidders will be required to submit their bids in response to this IFB solicitation by 2 pm CST on **05 April 2022** via electronic means, to include bid bonds. Physical copies of bid bonds will not be required to be submitted unless otherwise requested by the Contracting Officer at a later date.

All prospective contractors and their subcontractors and suppliers must be registered in SAM.gov before they will be allowed to download solicitation information. Contractors must be registered in the System for Award Management (SAM) at <https://www.sam.gov/portal/public/SAM/> prior to award of this contract. Solicitation documents, plans and specifications will only be available via the Procurement Integrated Enterprise Environment (PIEE) website <https://wawf.eb.mil> OR <https://piee.eb.mil> OR <https://piee.eb.mil/xhtml/unauth/home/login.xhtml>. See attachments **PIEE Solicitation Module Vendor Access Instructions** and **SOP PIEE Proposal Manager Offeror for instructions on getting access to the PIEE Solicitation Module and submitting your proposal. Registration for plans and specifications should be made via the Procurement Integrated Enterprise Environment (PIEE) website <https://wawf.eb.mil>**. If you are not registered, the United States Government is not responsible for providing you with notifications of any changes to this solicitation. The solicitation will be available only as a direct download. This solicitation will not be issued on CD-ROM. Neither telephonic, mailed, nor fax requests will be accepted. **Registration should be completed one week prior to the issue date.** It is therefore the Contractor's responsibility to monitor the website daily for the solicitation to be posted, and for any posted changes or amendments to this solicitation. The plans and specifications and all notifications of changes to this solicitation shall only be made through this posting and modifications hereto. Plans and specifications will not be provided in a printed-paper format; however, the Government reserves the right to revert to paper medium when it is determined to be in the Government's best interest. NOTE: This solicitation is in .pdf format and requires Adobe Acrobat Reader. Adobe Acrobat Reader may be downloaded free of charge at <http://www.adobe.com/products/reader>.

Bidders that are interested in submitting bids will use the Procurement integrated Enterprise Environment (PIEE) Module, which provides a time stamped notification to the Government when a file is uploaded. Interested bidders should contact Lesley Thomas at [lesley.m.thomas@usace.army.mil](mailto:lesley.m.thomas@usace.army.mil) to obtain a unique "request code" needed for each offeror to upload their bids. Once bidders receive this code, they will be allowed to upload their bids from **04 March 2022** at 0900 am up to **05 April 2022** by 2 pm CST. A timely bid is the one time-stamped by Procurement integrated Enterprise Environment before the deadline established above.

The public bid opening will be held virtually on **05 April 2022** at 2:30 pm CST. Interested parties are welcome to participate by joining the teleconference call via WebEx. The details of the teleconference are provided below:

Link: <https://usace1.webex.com/meet/humphrey.w.mararo>

For audio call: 844-800-27

Access Code: 1993169849

End of Paragraph

PROMPT PAYMENT CERTIFICATION AND SUPPORTING DATA FOR CONTRACTOR PROGRESS PAYMENT INVOICE

Contractor Name and Address	Contract No.	Est. No.	Date	Discount Terms
Description and Location of Work	Designated Contractor Official and Address for Payment		Defective Invoice Notification (Name, Title, Telephone)	
Subcontractor Name	Total Amount Subcontracted	Subcontractor Amount Included This Payment Est	Previous Subcontractor Payments	Subcontractor Earnings Deducted by Contractor (Total to Date)
				<div style="text-align: right;">             _____              \$           </div>

I hereby certify, to the best of my knowledge and belief, that:

- (1) The amounts requested are only for performance in accordance with the specifications, terms and conditions of the contract;
- (2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of Chapter 39 of Title 31, United States Code; and
- (3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

\_\_\_\_\_  
 (NAME)  
 (TITLE)

\_\_\_\_\_  
 (DATE)

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SECTION 01 32 01.00 10

PROJECT SCHEDULE: BAR CHART

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittal

PROJECT SCHEDULE AND CURVE; G,OP

PART 2 EXECUTION

2.1 GENERAL REQUIREMENTS

Prepare for approval a Practicable Project Schedule and Curve, as specified herein. Show in the schedule the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. Provide a schedule that is a forward planning as well as a project monitoring tool.

2.2 BASIS FOR PAYMENT

The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

2.3 PROJECT SCHEDULE AND CURVE

The Project Schedule shall be in the form of a chart consisting of a series of bars graphically indicating the sequence proposed to accomplish each work feature or operation. Each bar will represent a work feature, system or series of activities within the construction project. The chart shall be prepared to show the starting and completion dates of all work features on a linear horizontal time scale beginning with date of Notice to Proceed and indicating calendar days to completion. Interdependence of status of activities shall be shown. Horizontal time scale shall allow identification of the first work day each week, which shall be identified. Space between bars shall be allowed for future revisions and notations. The Initial Project Schedule shall be submitted for approval within fifteen (15) calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail. The initial schedule shall be reviewed by the Government to determine compliance with contract requirements and realistic completion of the project in the period indicated. A revised project schedule shall be submitted based on Government review, if required.

With the Project Schedule, the Contractor shall also submit for approval a progress curve which reflects the intended schedule for completing the work. The progress curve (S-Curve) will be plotted to reflect Cumulative Progress (Percent) based on placement along the y-axis and Time along the x-axis.

#### 2.3.1 SCHEDULE AND PROGRESS CURVE UPDATE

Approved Schedule and Progress Curve will be updated monthly during the entire duration of construction. Not later than four days after the Monthly Progress Meeting the Contractor shall submit the updated Project Schedule and Progress Curve. The updated versions shall include all approved contract revisions, progress of each activity to date of submission, and adjustments. Contractor shall also provide a very brief narrative report as required to indicate any problem areas, anticipated delays, impact on schedule, and corrective action.

#### 2.3.2 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include on-site meetings or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor will describe, on an activity by activity basis, all proposed revision and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will review activity progress, proposed revisions, and adjustments as appropriate.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

05/11

PART 1 GENERAL

1.1 SUMMARY

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's Quality Control (CQC) System Manager to check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals 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 are to be scheduled and made prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's material Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to or the start of the next major phase of the construction on a multi-phase contract, includes schedules, tabular list of data, or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

#### SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

#### SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

#### 1.2.2 Approving Authority

Office or designated person authorized to approve submittal.

#### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with this section.

#### SD-01 Preconstruction Submittals

Submittal Register; G, OP



Fleeting Area Plan; G, OP

Pipeline Route Plan; G, OP

#### 1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

##### 1.4.1 Government Approved (G)

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

##### 1.4.2 Information Only (FIO)

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

#### 1.5 PREPARATION

##### 1.5.1 Transmittal Form

Use the attached sample transmittal form (ENG Form 4025) for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are also included in the QCS software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

#### 1.6 QUANTITY OF SUBMITTALS

##### 1.6.1 Number of Copies of SD-02 Shop Drawings

Submit four copies of submittals of shop drawings requiring review and approval by the Government.

##### 1.6.2 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

Unless otherwise specified, submit three sets of administrative submittals.

#### 1.7 INFORMATION ONLY SUBMITTALS

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

requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

#### 1.8 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM) ).

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

##### 1.8.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

##### 1.8.2 Contractor Use of Submittal Register

Update the following fields with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

#### 1.8.3 Approving Authority Use of Submittal Register

Update the following fields.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

#### 1.8.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

#### 1.9 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.
- b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."
- c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.
- d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

#### 1.10 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

- a. Note date on which submittal was received.
- b. Review submittals for approval within scheduling period specified and

only for conformance with project design concepts and compliance with contract documents.

- c. Identify returned submittals with one of the actions defined in paragraph entitled, "Review Notations," of this section and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. 2 copies of the approved submittal will be retained by the Contracting Officer and 2 copies of the submittal will be returned to the Contractor.

#### 1.10.1 Review Notations

Contracting Officer review will be completed within 30 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

- a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.
- b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.
- c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.
- d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

#### 1.11 DISAPPROVED OR REJECTED SUBMITTALS

Contractor shall make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes," is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

#### 1.12 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that the general

method of construction, materials, detailing and other information are satisfactory.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions.

After submittals have been approved or accepted 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.

#### 1.13 STAMPS

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

CONTRACTOR  (Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s)
SIGNATURE: _____
TITLE: _____
DATE: _____

-- End of Section --



## INSTRUCTIONS

1. Section 1 will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmits mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288 for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

### THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- |   |  |    |  |
|---|--|----|--|
| A | -- Approved as submitted.  | E  | -- Disapproved (See attached).   |
| B | -- Approved, except as noted on drawings.  | F  | -- Receipt acknowledge.  |
| C | -- Approved, except as noted on drawings.<br>Refer to attached sheet resubmission required | FX | -- Receipt acknowledged, does not comply<br>as noted with contract requirements. |
| D | -- Will be returned by separate correspondence.  | G  | -- Other ( <i>Specify</i> )  |
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.



**SUBMITTAL REGISTER**

CONTRACT NO. \_\_\_\_\_

TITLE AND LOCATION  
MOBILE HARBOR, DEEPENING AND WIDENING ALABAMA PHASE IV

CONTRACTOR \_\_\_\_\_

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS			
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE		DATE OF ACTION	MAILED TO CONTR/	DATE RCD FRM APPR AUTH
		01 00 00	SD-11 Closeout Submittals																
			Contractor Prepared As-Built Drawings;	1.5	G OP														
		01 32 01.00 10	SD-01 Preconstruction Submittals PROJECT SCHEDULE AND CURVE;	2.3	G OP														
		01 33 00	SD-01 Preconstruction Submittals Submittal Register	1.8	G OP														
			Fleeting Area Plan		G OP														
			Pipeline Route Plan		G OP														
		01 35 26	SD-01 Preconstruction Submittals Accident Prevention Plan (APP)	1.6	G SO														
			SD-06 Test Reports																
			Monthly Exposure Reports	1.4															
			Notifications and Reports	1.11															
			Accident Reports	1.11.2	G SO														
			LHE Inspection Reports	1.11.3															
			SD-07 Certificates																
			Crane Operators/Riggers	1.5.1.6															
			Standard Lift Plan	1.6.2.2	G SO														
			Critical Lift Plan	1.6.2.3	G SO														
			Naval Architecture Analysis	1.6.2.3	G SO														
			Activity Hazard Analysis (AHA)	1.7															
			Confined Space Entry Permit	1.8.1															
			Hot Work Permit	1.8.1															
			Certificate of Compliance	1.11.4															

## SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION  
MOBILE HARBOR, DEEPENING AND WIDENING ALABAMA PHASE IV

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
		01 35 26	License Certificates														
		01 45 00.00 10	SD-01 Preconstruction Submittals														
			Contractor Quality Control (CQC) Plan	3.2	G OP												
			Contractor Quality Control (CQC) Plan	3.2	G OP												
			SD-06 Test Reports														
			Verification Statement	3.9.2													
		35 20 23.00 36	SD-01 Preconstruction Submittals														
			Instrumentation data		G OP												
			Surveys		G OP												
			Disposal Area Surveys		G OP												
			Manufacturer's guarantee	3.4.4	G OP												
			Order of Work Plan	1.3	G OP												
			Survey Plan	3.4.2	G OP												
			Dredge Plant Instrumentation Plan		G OP												
			Accident Prevention Plan (App)	1.7.1	G OP												
			Quality Control Plan	3.4.5	G OP												
		35 20 23.13	SD-07 Certificates														
			- Letter of National Dredging		G OP												
			Quality Management Program														
			Certification														

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS  
11/15

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems,

Subsystems and Components

- ASSE/SAFE Z359.6 (2009) Specifications and Design Requirements for Active Fall Protection Systems
- ASSE/SAFE Z359.7 (2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)

- ASME B30.20 (2013; INT Oct 2010 - May 2012) Below-the-Hook Lifting Devices
- ASME B30.22 (2010) Articulating Boom Cranes
- ASME B30.26 (2015; INT Jun 2010 - Jun 2014) Rigging Hardware
- ASME B30.3 (2016) Tower Cranes
- ASME B30.5 (2014) Mobile and Locomotive Cranes
- ASME B30.8 (2015) Floating Cranes and Floating Derricks
- ASME B30.9 (2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

- ASTM F855 (2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

- IEEE 1048 (2003) Guide for Protective Grounding of Power Lines
- IEEE C2 (2012; Errata 1 2012; INT 1-4 2012; Errata 2 2013; INT 5-7 2013; INT 8-10 2014; INT 11 2015; INT 12 2016) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 10 (2013) Standard for Portable Fire Extinguishers
- NFPA 241 (2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and Demolition Operations
- NFPA 51B (2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata

3-4 2014; AMD 4-6 2014) National  
Electrical Code

NFPA 70E (2015; ERTA 1 2015) Standard for  
Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements  
Manual

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

29 CFR 1910 Occupational Safety and Health Standards  
29 CFR 1910.146 Permit-required Confined Spaces  
29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag  
Out)  
29 CFR 1910.333 Selection and Use of Work Practices  
29 CFR 1915 Confined and Enclosed Spaces and Other  
Dangerous Atmospheres in Shipyard  
Employment  
29 CFR 1915.89 Control of Hazardous Energy  
(Lockout/Tags-Plus)  
29 CFR 1926 Safety and Health Regulations for  
Construction  
29 CFR 1926.1400 Cranes and Derricks in Construction  
29 CFR 1926.16 Rules of Construction  
29 CFR 1926.450 Scaffolds  
29 CFR 1926.500 Fall Protection  
CPL 2.100 (1995) Application of the Permit-Required  
Confined Spaces (PRCS) Standards, 29 CFR  
1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing

to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

#### 1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

#### 1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

#### 1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

#### 1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g., mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

#### 1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

#### 1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

#### 1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

#### 1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

#### 1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

#### 1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

#### 1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

#### 1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the

work, or the project.

#### 1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

#### 1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

- a. Death, regardless of the time between the injury and death, or the length of the illness;
- b. Days away from work (any time lost after day of injury/illness onset);
- c. Restricted work;
- d. Transfer to another job;
- e. Medical treatment beyond first aid;
- f. Loss of consciousness; or
- g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

#### 1.2.17 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

#### 1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the Crane High Hazard working group mishap reporting form.

#### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;



submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, SO

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G, SO

LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G, SO

Critical Lift Plan ; G, SO

Naval Architecture Analysis; G, SO

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

License Certificates

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.5 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's

safety program and government-accepted Accident Prevention Plan. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

#### 1.5.1.2 Contractor Quality Control (QC) Manager:

The Contractor Quality Control Manager cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties.

#### 1.5.1.3 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for information in consultation with the Safety Office.

##### 1.5.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

##### 1.5.1.3.2 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

##### 1.5.1.4 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards, Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

- a. Prepare class presentations that cover construction-related safety requirements.
- b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.
- c. Update training course materials whenever an update of the EM 385-1-1 becomes available.
- d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.
- e. Request, review and incorporate student feedback into a continuous course improvement program.

#### 1.5.1.5 USACE Dredging Contract Requirements

##### 1.5.1.5.1 SSHO Staffing for USACE Dredging Contracts

- a. Dredging contracts may include several project sites; this contract will require a minimum of 1 full time SSHO(s) assigned per project site. SSHO may be collateral duty in specific conditions listed below.
- b. An example of one dredging project site is reflected in each of the following:
  - (1) a mechanical dredge, tug(s) and scow(s), scow route, and material placement site; or
  - (2) a hydraulic pipeline dredge, attendant plant, and material placement site; or,
  - (3) a hopper dredge (include land-based material placement site - if applicable.)
- c. Individual dredging project sites with work force less than 8 employees, the SSHO may be a collateral duty, with the same responsibilities of a full time SSHO.
- d. Hopper dredges with USCG-Documented crews may designate an officer as a collateral-duty SSHO instead of having a full-time SSHO if the officer meets the SSHO training and experience requirements.

##### 1.5.1.5.2 SSHO Requirements for Dredging

- a. In addition to requirements stated elsewhere in this specification, the SSHO shall be present at the project site, located so they have full mobility and reasonable access to all major work operations, for at least one shift in each 24 hour period when work is being done. The SSHO, or Alternate SSHO, shall be available during all shifts for immediate verbal consultation and notification, either by phone or radio. The SSHO shall be a full-time, dedicated position, except as noted above. The SSHO shall report to a senior project (or corporate) officials.

- b. The SSHO must inspect all work areas and operations during initial set-up and at least monthly observe and provide personal oversight on each shift during dredging operations for projects with many work sites, more often for those with less work sites.
- c. For projects with multiple shifts or when SSHO is temporarily off-site, an Alternate SSHO will be assigned to insure SSHO coverage for the project at all times work activities are conducted. The Alternate SSHO must meet the same requirements and assume the responsibilities of the project SSHO. The Alternate SSHO position may be a collateral duty.
- d. If the SSHO is off-site for a period longer than 24 hours, a qualified replacement SSHO shall be provided and shall fulfill the same roles and responsibilities as the primary/initial SSHO.

#### 1.5.1.5.3 Designated Representative (DR) Requirements for Dredging

- a. Designated Representatives (DR) are collateral duty safety personnel, with safety duties in addition to their full-time occupation, and support and supplement the SSHO efforts in managing, implementing and enforcing the Contractor's Safety and Health Program. DRs shall be individual(s) with work oversight responsibilities, such as masters, mates, fill foremen, and superintendents. DRs should not be positions requiring continuous mechanical or equipment operations, such as equipment operators.
- b. A DR shall be appointed for all remote work locations more than 45 minutes' travel time from the SSHO's duty location, typically including dredged material placement sites, towing and scow operations, and other operations.
- c. The DRs will perform safety program tasks as designated by the SSHO and report safety findings to the SSHO/Alternate SSHO. The SSHO shall document results of safety findings and provide information for inclusion in the CQC reports to the Government Representative.

#### 1.5.1.5.4 Safety Personnel Training Requirements for Dredging

- a. The SSHO, Alternate SSHO, and Designated Representatives for dredging contracts shall take either the OSHA 30-hour Construction Safety Course or an equivalent 30 hours of formal safety and health training covering the subjects of the OSHA 30-hour Course (see EM 385-1-1 Appendix A, paragraph 4.b) applicable to dredging work and given by qualified instructors.
- b. The SSHOs shall also have taken 24 hours of formal classroom or online safety and health related coursework in the past four (4) years. Hours spent as an instructor in such courses will be considered the same as attending them, but each course only gets credit once (i.e., Instructing a 1-hour asbestos awareness course 5 times in the past 4 years provides one hour credit for training).
- c. The SSHO, Alternate SSHO, and Designated Representatives shall have a minimum of three years' continuous experience within the past 5 years in supervising/ managing dredging, marine or land-based construction, work managing safety programs or processes, or conducting hazard analyses and developing controls in activities or environments with

similar hazards. This is in lieu of the construction experience required by paragraph 01.A.17.b, EM 385-1-1.

#### 1.5.1.6 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

#### 1.5.2 Personnel Duties

##### 1.5.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily quality control report.
- b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.
- c. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.
- d. Maintain applicable safety reference material on the job site.
- e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.
- f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.
- g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.
- h. Ensure subcontractor compliance with safety and health requirements.
- i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).
- j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.
- k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

### 1.5.3 Meetings

#### 1.5.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.
- c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

#### 1.5.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, or foremen must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

### 1.6 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and

monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Industrial Hygienist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

#### 1.6.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

- a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.
- b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

## 1.6.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

### 1.6.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

### 1.6.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

### 1.6.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

- a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.
- b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of floating cranes. The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE



qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

- c. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

#### 1.6.2.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

#### 1.6.2.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

#### 1.6.2.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

#### 1.7 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor,

subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFO. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

#### 1.7.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

#### 1.7.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFO must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

### 1.8 DISPLAY OF SAFETY INFORMATION

#### 1.8.1 Safety Bulletin Board

Within one calendar day after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

- a. Confined space entry permit.
- b. Hot work permit.

#### 1.8.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

- a. Date deficiency identified;
- b. Description of deficiency;
- c. Name of person responsible for correcting deficiency;
- d. Projected resolution date;
- e. Date actually resolved.

#### 1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

#### 1.10 EMERGENCY MEDICAL TREATMENT

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

#### 1.11 NOTIFICATIONS and REPORTS

##### 1.11.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

##### 1.11.2 Accident Reports

- a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report Form 3394, and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.
- b. Near Misses: Report all "Near Misses" to the GDA, using local mishap

reporting procedures, within 24 hrs. The Contracting Officer will provide the Contractor the required forms. Near miss reports are considered positive and proactive Contractor safety management actions.

- c. Conduct an accident investigation for any load handling equipment accident (including rigging gear accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

#### 1.11.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

#### 1.11.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

#### 1.12 HOT WORK

##### 1.12.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Fire Marshall. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Marshall's phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE MARSHALL IMMEDIATELY.

##### 1.12.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium (Be) and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

#### 1.13 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

##### 1.13.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

##### 1.13.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

##### 1.13.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

##### 1.13.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

#### 1.14 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. Submit these documents to the District Dive Coordinator (DDC) for review and acceptance at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

#### 1.15 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment,

debris, and other objects that could be blown away or against existing facilities.

- c. Ensure that temporary erosion controls are adequate.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

- a. Hard Hat
- b. Long Pants
- c. Appropriate Safety Shoes
- d. Appropriate Class Reflective Vests

#### 3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

#### 3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

### 3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 15 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer and the Public Utilities representative to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

### 3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

### 3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

#### 3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

#### 3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M, ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

##### 3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1,

Sections 21.0 through 21.0.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

#### 3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

#### 3.4.3 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

#### 3.4.4 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

#### 3.4.5 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of



EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

### 3.5 EQUIPMENT

#### 3.5.1 Material Handling Equipment (MHE)

- a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.
- c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

#### 3.5.2 Load Handling Equipment (LHE)

- a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.
- b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA and ASME B30.9 Standards.
- c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.
- e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.
- f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.
- g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

- h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.
- i. All employees must keep clear of loads about to be lifted and of suspended loads.
- j. Use cribbing when performing lifts on outriggers.
- k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.
- m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.
- n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.
- o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
- p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

### 3.5.3 Machinery and Mechanized Equipment

- a. Proof of qualifications for operator must be kept on the project site for review.
- b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

## 3.6 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

### 3.6.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing

the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

### 3.6.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local and Host Nation requirements applicable to where work is being performed.

### 3.6.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

### 3.6.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

### 3.6.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS  
02/19

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g., ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

ASTM INTERNATIONAL (ASTM)  
100 Barr Harbor Drive, P.O. Box C700  
West Conshohocken, PA 19428-2959  
Ph: 610-832-9500  
Fax: 610-832-9555  
E-mail: [service@astm.org](mailto:service@astm.org)  
Internet: <https://www.astm.org/>

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)  
445 and 501 Hoes Lane  
Piscataway, NJ 08854-4141  
Ph: 732-981-0060 or 800-701-4333  
Fax: 732-981-9667  
E-mail: [onlinesupport@ieee.org](mailto:onlinesupport@ieee.org)  
Internet: <https://www.ieee.org/>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)  
1 Batterymarch Park  
Quincy, MA 02169-7471  
Ph: 800-344-3555  
Fax: 800-593-6372  
Internet: <https://www.nfpa.org>

U.S. ARMY CORPS OF ENGINEERS (USACE)  
CRD-C DOCUMENTS available on Internet:  
<http://www.wbdg.org/ffc/army-coe/standards>  
Order Other Documents from:  
Official Publications of the Headquarters, USACE  
E-mail: [hqpublications@usace.army.mil](mailto:hqpublications@usace.army.mil)  
Internet: <http://www.publications.usace.army.mil/>  
or  
<https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)  
8601 Adelphi Road  
College Park, MD 20740-6001  
Ph: 866-272-6272  
Internet: <https://www.archives.gov/>  
Order documents from:  
Superintendent of Documents  
U.S. Government Publishing Office (GPO)  
732 N. Capitol Street, NW  
Washington, DC 20401  
Ph: 202-512-1800 or 866-512-1800  
Bookstore: 202-512-0132  
Internet: <https://www.gpo.gov/>

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

SECTION 01 45 00.00 10

QUALITY CONTROL  
11/16

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM D3740 (2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E329 (2014a) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Bid Schedule item.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G, OP

SD-06 Test Reports

Verification Statement

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with the Contract Clause titled "Inspection of Construction." QC

consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all construction operations, both onsite and offsite, and be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

### 3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

The Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction" shall be submitted as a pre-construction submittal prior to the start of work. The Government will consider an interim plan for the first 15 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 accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

#### 3.2.1 Content of the CQC Plan

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 will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager that reports to the project superintendent.
- 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. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Copies of these letters must be furnished to the Contracting Officer.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 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 approved by



the Contracting Officer are required to be used.)

- 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. Establish verification procedures 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, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

### 3.2.2 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 the Contractor Quality Control(CQC) Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

### 3.2.3 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

### 3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must 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 will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There can be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

### 3.4 QUALITY CONTROL ORGANIZATION

#### 3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems, and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

#### 3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a construction person with a minimum of 5 years in related work. This CQC System Manager is on the site at all times during construction and is employed by the prime Contractor. The CQC System Manager must be assigned as CQC System Manager but may have duties as project superintendent in addition to quality control. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

#### 3.4.3 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

#### 3.4.4 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

### 3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

### 3.6 CONTROL

CQC 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 are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

#### 3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.
- b. Review of the Contract drawings.
- c. Check to assure that all materials and 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. 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. 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. 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 needs to be notified at least 24 hours in advance of beginning the preparatory control phase. 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. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

### 3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

- a. Check 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 are in compliance with the contract.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required samples as 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 needs to be notified at least 24 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.
- g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

### 3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

### 3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases 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.

### 3.7 TESTS

#### 3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. 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. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

#### 3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at:

##### 3.7.2.1 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 are required to meet criteria detailed in ASTM D3740 and ASTM E329.

##### 3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge to be determined by the Contracting Officer's Representative 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.

### 3.7.3 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.

## 3.8 COMPLETION INSPECTION

### 3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in the ADDITIONAL SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection with the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

### 3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the work has been completed in accordance with the contract requirements. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

### 3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative are required to be in attendance at the final acceptance inspection. Additional Government personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, 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 titled "Inspection of Construction".

### 3.9 DOCUMENTATION

#### 3.9.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

- a. The name and area of responsibility of the Contractor/Subcontractor.
- 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 control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of 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 and deliverables 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 specifications.

#### 3.9.2 Verification Statement

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control (CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

### 3.10 SAMPLE FORMS

A Daily Contractor Quality Control (CQC) Report (Form 696) is enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can 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 will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --



SECTION 01 45 00.15 10

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM)  
11/16

PART 1 GENERAL

1.1 REFERENCES

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements  
Manual

1.2 Contract Administration

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Contractor uses the Government-furnished Construction Contractor Mode of RMS, referred to as RMS CS, to record, maintain, and submit various information throughout the contract period. The Contractor mode user manuals, updates, and training information can be downloaded from the RMS web site (<http://rms.usace.army.mil>). The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Import/Export of Data

1.2.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible between the Government and Contractor. Correspondence, pay requests, and other documents comprising the official contract record are also to be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10PROJECT SCHEDULE, Section 01 33 00 SUBMITTAL PROCEDURES, and Section 01 45 00.00 10 QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through RMS. Also, there is no separate payment for establishing and maintaining the RMS database; costs

associated will be included in the contract pricing for the work.

1.3 RMS SOFTWARE

RMS is a Windows-based program that can be run on a Windows based PC meeting the requirements as specified in Section 1.3. The Government will make available the RMS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor will be responsible to download, install and use the latest version of the RMS software from the Government's RMS Internet Website. Any program updates of RMS will be made available to the Contractor via the Government RMS Website as the updates become available.

1.3.1 RMS CONTRACTOR'S MODE (CM)

RMS Contractor's Mode or RMS CM is the replacement for Quality Control System or QCS. The database remains the same. References to RMS in this specification includes RMS CM.

1.4 SYSTEM REQUIREMENTS

The following is the minimum system configuration required to run RMS and Contractor Mode:

Minimum RMS System Requirements	
Hardware	
Windows-based PC	1.5 GHz 2 core or higher processor
RAM	8 GB
Hard drive disk	200 GB space for sole use by the QCS system
Monitor	Screen resolution 1366 x 768
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 4 Mbs per user
Software	
MS Windows	Windows 7 x 64 bit (RMS requires 64 bit O/S) or newer
Word Processing software	Viewer for MS Word 2013, MS Excel 2013, or newer

Minimum RMS System Requirements	
Microsoft.NET Framework	Coordinate with Government QA Representative for free version required
Email	MAPI compatible
Virus protection software	Regularly upgraded with all issued manufacturer's updates and is able to detect most zero day viruses.

## 1.5 RELATED INFORMATION

### 1.5.1 RMS User Guide

After contract award, download instructions for the installation and use of RMS from the Government RMS Internet Website.

## 1.6 CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for RMS. The Government will provide data updates to the Contractor as needed. These updates will generally consist of submittal reviews, correspondence status, Quality Assurance(QA) comments, and other administrative and QA data.

## 1.7 DATABASE MAINTENANCE

Establish, maintain, and update data in the RMS database throughout the duration of the contract at the Contractor's site office. Submit data updates to the Government (e.g., daily reports, submittals, RFI's, schedule updates, payment requests) using RMS. The RMS database typically includes current data on the following items:

### 1.7.1 Administration

#### 1.7.1.1 Contractor Information

Contain within the database the Contractor's name, address, telephone numbers, management staff, and other required items. Within 7 calendar days of receipt of RMS software from the Government, deliver Contractor administrative data in electronic format in RMS.

#### 1.7.1.2 Subcontractor Information

Contain within the database the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed. Assign each subcontractor/trade a unique Responsibility Code, provided in RMS. Within 7 calendar days of receipt of RMS software from the Government, deliver subcontractor administrative data in electronic format.

#### 1.7.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

#### 1.7.1.4 Equipment

Contain within the Contractor's RMS database a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

#### 1.7.1.5 Management Reporting

RMS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of RMS. Among these reports are: Progress Payment Request worksheet, Quality Assurance/Quality Control (QA/QC) comments, Submittal Register Status, Three-Phase Control checklists.

#### 1.7.1.6 Request For Information (RFI)

Exchange all Requests For Information (RFI) using the Built-in RFI generator and tracker in RMS.

### 1.7.2 Finances

#### 1.7.2.1 Pay Activity Data

Include within the RMS database a list of pay activities that the Contractor develops in conjunction with the construction schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities equals the amount of each CLIN. The sum of all CLINs equals the contract amount.

#### 1.7.2.2 Payment Requests

Prepare all progress payment requests using RMS. Complete the payment request worksheet, prompt payment certification, and payment invoice in RMS. Update the work completed under the contract, measured as percent or as specific quantities, at least monthly. After the update, generate a payment request report using RMS. Submit the payment request, prompt payment certification, and payment invoice with supporting data using RMS CM. If permitted by the Contracting Officer, email or a optical disc may be used. A signed paper copy of the approved payment request is also required and will govern in the event of discrepancy with the electronic version.

### 1.7.3 Quality Control (QC)

RMS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements. Maintain this data on a daily basis. Entered data will automatically output to the

RMS generated daily report. Provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 00.00 10 QUALITY CONTROL. Within seven calendar days of Government acceptance, submit a RMS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

#### 1.7.3.1 Daily Contractor Quality Control (CQC) Reports.

RMS includes the means to produce the Daily CQC Report. The Contractor can use other formats to record basic Quality Control(QC) data. However, the Daily CQC Report generated by RMS must be the Contractor's official report. Summarize data from any supplemental reports by the Contractor and consolidate onto the RMS-generated Daily CQC Report. Submit daily CQC Reports as required by Section 01 45 00.00 10 QUALITY CONTROL. Electronically submit reports to the Government within 24 hours after the date covered by the report. Also provide the Government a signed, printed copy of the daily CQC report.

#### 1.7.3.2 Deficiency Tracking.

Use RMS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using its Quality Control (QC) punch list items. Maintain a current log of its QC punch list items in the RMS database. The Government will log the deficiencies it has identified using its Quality Assurance (QA) punch list items. The Government's QA punch list items will be included in its export file to the Contractor. Regularly update the correction status of both QC and QA punch list items.

#### 1.7.3.3 QC Requirements

Develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in RMS. Update data on these QC requirements as work progresses, and promptly provide the information to the Government via RMS.

#### 1.7.3.4 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS.

#### 1.7.3.5 Labor and Equipment Hours

Log labor and equipment exposure hours on a daily basis. The labor and equipment exposure data will be rolled up into a monthly exposure report.

#### 1.7.3.6 Accident/Safety Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be provided via RMS CM. Regularly update the correction status of the safety comments. In addition, utilize RMS to advise the Government of any accidents occurring on the jobsite. A brief supplemental entry of an accident is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 300.

#### 1.7.3.7 Features of Work

Include a complete list of the features of work in the RMS database. A feature of work is associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

#### 1.7.3.8 Hazard Analysis

Use RMS CM to develop a hazard analysis for each feature of work included in the CQC Plan. The Activity Hazard Analysis will include information required by EM 385-1-1, paragraph 01.A.13.

#### 1.7.4 Submittal Management

The Government will provide the initial submittal register in electronic format. Thereafter, maintain a complete list of submittals, including completion of data columns. Dates when submittals are received and returned by the Government will be included. Use RMS CM to track and transmit submittals. ENG Form 4025, submittal transmittal form, and the submittal register update is produced using RMS. RMS will be used to update, store and exchange submittal registers and transmittals. In addition to requirements stated in specification 01 33 00, actual submittals are to be stored in RMS CM, with hard copies also provided. Exception will be where the Contracting Officer specifies only hard copies required, where size of document cannot be saved in RMS CM, and where samples, spare parts, color boards, and full size drawings are to be provided.

#### 1.7.5 Schedule

Develop a construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE. Input and maintain in the RMS database the schedule either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 PROJECT SCHEDULE). Include with each pay request the updated schedule. Provide electronic copies of transmittals.

#### 1.7.6 Import/Export of Data

RMS includes the ability to import schedule data using SDEF.

#### 1.8 IMPLEMENTATION

Use of RMS CM as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS CM system. RMS CM is an integral part of the Contractor's management of quality control.

#### 1.9 MONTHLY COORDINATION MEETING

Update the RMS CM database each workday. At least monthly, generate and submit a schedule update. At least one week prior to submittal, meet with the Government representative to review the planned progress payment data submission for errors and omissions.

Make required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will not be accepted. The

Government will not process progress payments until all required corrections are processed.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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<b>CONTRACTOR'S QUALITY CONTROL REPORT (QCR)</b> (ER 1180-1-6)		DATE:	REPORT NO.:
CONTRACT NUMBER AND NAME OF CONTRACTOR:		DESCRIPTION AND LOCATION OF THE WORK:	
<b>WEATHER CLASSIFICATION:</b> CLASS A No interruptions of any kind from weather conditions occurring on this or previous shifts. CLASS B Weather occurred during this shift that caused a complete stoppage of all work. CLASS C Weather occurred during this shift that caused a partial stoppage of work. CLASS D Weather overhead excellent or suitable during shift. Work completely stopped due to results of previous adverse weather. CLASS E Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner. OTHER Explain.		<b>CLASSIFICATION:</b> CLASS _____ <b>TEMPERATURE:</b> MAX _____ MIN _____ <b>PRECIPITATION:</b> INCHES _____	
<b>CONTRACTOR/SUBCONTRACTORS AND AREA OF RESPONSIBILITY FOR WORK PERFORMED TODAY:</b> <i>(Attach list of items of equipment either idle or working as appropriate.)</i> a. _____ b. _____ c. _____ d. _____ e. _____ f. _____ g. _____ 1. <b>WORK PERFORMED TODAY:</b> (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above.)  <b>PURPOSE: Contractors Daily QC Report. Revision necessitated by EIG recommendation</b> <b>MONTHLY USAGE: 1,500</b> <b>PRESCRIBING DIRECTIVE: ER 1180-1-6</b> <b>FUNCTIONAL CODE: 1180 Series - Engineer Contracts</b>			
2. <b>TYPE AND RESULTS OF INSPECTION:</b> (Indicate whether: P - Preparatory, I - Initial, or F - Follow-up and include satisfactory work completed or deficiencies with action to be taken.)			
3. <b>TESTS REQUIRED BY PLANS AND/OR SPECIFICATIONS PERFORMED AND RESULTS OF TESTS:</b>			

4. VERBAL INSTRUCTIONS RECEIVED: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

5. REMARKS: (Cover any conflicts in plans, specifications or instructions: acceptability of incoming materials: offsite surveillance activities; progress of work, delays, causes and extent thereof; days of no work with reasons for same.)

6. SAFETY: (Include any infractions of approved safety plan, safety manual or instructions from Government personnel. Specify corrective action taken.)

INSPECTOR

CONTRACTOR'S CERTIFICATION: I certify that the above report is complete and correct and that all material and equipment used, work performed and tests conducted during this reporting period were in strict compliance with the contract plans and specifications except as noted above.

CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE

SECTION 01 57 20

ENVIRONMENTAL PROTECTION (PIPELINE HYDRAULIC DREDGE)

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 during maintenance and new work dredging of the Mobile Harbor, Alabama federally authorized navigation project designated in this contract, except for those measures set forth in other Technical Provisions of these specifications.

For the purpose of this specification, environmental pollution is defined as: a) the presence of chemical, physical, or biological elements or agents that adversely affect human health or welfare; b) unfavorably alter ecological balances; c) affect other species of designated importance of man; or d) 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 control, solid-waste management, as well as control of other pollutants.

2. APPLICABLE REGULATIONS: The Contractor and his subcontractors in the performance of this contract, shall comply with all applicable Federal, state, and local laws and regulations and/or requirements concerning environmental pollution control and abatement (including special conditions specified by the U.S. Fish and Wildlife Service), all applicable provisions of the U.S. Army Corps of Engineers Manual, EM 385-1-1, entitled "Safety and Health Requirements", in effect on the date of solicitation, and the specific requirements stated elsewhere in the contract specifications.

3. NOTIFICATION: The Contracting Officer will notify the Contractor in writing of any noncompliance 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 costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

4. CONTRACTORS: When conducting maintenance and new work dredging of the Mobile Harbor Federal navigation channel in Alabama, the Contractor and their subcontractors shall comply with all requirements under the terms and conditions set out in the certifications by the Alabama Department of Environmental Management (ADEM), U.S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS) in compliance with the provisions of the Contract and applicable Federal, state, and local environmental laws and regulations. Compliance with the provisions of this section by subcontractors will be the responsibility of the Contractor.

a) Prior to commencement of the work, the Contractor shall, after receipt of Notice of Award of the Contract and at least 7 days prior to the Preconstruction Conference, submit in writing the above Environmental Protection Plan, and shall meet with representative(s) of the Contracting

Office, to Lekesha Reynolds via email at [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil), to develop mutual understanding relative to compliance with this provision and administration of the environmental protection program.

b) The Contractor shall record on daily reports any problems in complying with laws, regulations and ordinances and corrective action taken.

c) The Contractor shall prepare a listing of resources needing protection (i.e., upland vegetation, wetlands, oyster reefs, landscape features, air quality, noise levels, surface and groundwater quality, fish and wildlife, and historical, archeological and cultural resources) within authorized work areas.

d) The Contractor shall prepare a contaminant prevention statement that identifies all potentially hazardous substances on the job site and the intended actions to be taken to prevent the accidental or intentional introduction of such materials into the air, the water or the ground.

e) The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes or failure to follow the procedures identified in the environmental protection plan.

f) The Contractor shall keep dredging and placement activities under surveillance and shall exercise all necessary controls to minimize damage to the environment by noise from equipment and various activities. Areas that have noise levels greater than 85-dB continuously, or 140-dB peak (unweighted) impulse, must be designated as noise hazardous areas. These work areas must have caution signs displayed at the perimeter of the noise area indicating the presence of hazardous noise levels and requiring the use of hearing protection devices.

g) The Contractor shall detail special provisions taken to meet Federal, state, and local laws and regulations regarding the storage and handling of solid and hazardous waste materials.

5. IMPLEMENTATION: Prior to commencement of the work, the Contractor shall after receipt of Notice of Award of the Contract and at least 7 days prior to the Preconstruction Conference, submit in writing the above Environmental Protection Plan to Lekesha Reynolds via email at [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil), and shall meet with representative(s) of the Contracting Office to develop mutual understanding relative to compliance with this provision and administration of the environmental protection program.

6. PROTECTION OF WATER RESOURCES: The Contractor shall not pollute any water bodies including streams, lakes, bays, estuaries, or other marine or fresh waters with fuels, oils, trash, acids, or any other harmful materials. It is the responsibility of the Contractor to investigate and comply with all applicable Federal, state, county, and municipal laws concerning water pollution. The discharge of plastics of any kind within estuarine or marine waters is strictly prohibited. All work under this contract shall also be performed in such a manner that objectionable conditions will not be created in proximity to the project areas.

a) The Contractor shall ensure dredging and the placement of material is in accordance with the plans and specifications included herein and shall be performed with minimum damage to the environment.

b) The contract designates areas for placement of all dredged material. No other areas are approved for dredged material placement.

c) The Contractor shall limit the depth of cut in a single swing of the dredge to that depth that precludes the collapse of the facing material or control the dredge speed to obtain a reasonable progress without producing excessive turbidity.

d) The Contractor must comply with all turbidity and monitoring standards and other specific conditions set forth in the water quality standards. Ambient turbidity levels shall not exceed background turbidity by more than 50 Nephelometric Turbidity Units. If turbidity resulting from the project exceeds these levels, the Contractor will cease activities until turbidity levels are in compliance. Should work stoppage occur, the Contractor will notify the U.S. Army Corps of Engineers [Contracting Officer and Planning and Environmental Division, Coastal Environment Team (ATTN: Ms. Lekesha Reynolds at 251-690-3260)]. Turbidity Monitoring Reports shall be emailed on a weekly basis to Ms. Lekesha Reynolds at [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil) and Mr. Don Mroczko at [Donald.e.mroczko@usace.army.mil](mailto:Donald.e.mroczko@usace.army.mil).

e) Any material moved by the dredge, pipeline, or any other such equipment shall be moved in such a way that: a) material will not be placed outside of the placement site boundaries as specified by the Contract; and b) safeguards against excess turbidity and suspended solids entering any adjacent water body. Work shall be performed in such a way as not to impact local wetland areas.

f) Special measures shall be taken to prevent chemicals, fuels, oils, and greases at the open water and upland placement sites or along the pipeline from entering area waters, at all times.

g) The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in area designated by the Contracting Officer. The Contracting Officer shall approve all temporary movement or relocation of Contractor facilities.

h) Discharge of any pollutant into the watercourse is strictly prohibited, except as otherwise specified or allowed in other sections of the Technical Specifications.

i) Additional Data Collection. For internal monitoring purposes only (not related to environmental compliance or regulatory conditioning), the Contractor shall collect a basic suite of water quality parameters to include total water depth, temperature, dissolved oxygen, pH, and salinity at a frequency of twice daily. The data shall be collected at surface, mid, and bottom depth levels. Coordinates shall be provided at all sampling locations, and at the dredge location, along with time of day and existing weather conditions to include tides. These additional data collection parameters shall be reported in an excel spreadsheet format.

7. MOBILE OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS): Placement of the dredged sediments via bottom-dump scow within the ODMDS will be conducted in accordance with the conditions specified below in the July 14, 2020 (as amended by letter dated July 17, 2020) Section 103 concurrence letter from U.S. Environmental Protection Agency (EPA) and the Site Management and Monitoring Plan (SMMP). These documents are included in the Environmental Appendix Cooperating Agency Certifications.

a) Mobile Maintenance Ocean Disposal Conditions

(1) A bathymetry survey of the ODMDS release zone will be conducted within three months prior to initiation of disposal activities.

(2) A bathymetry survey of the ODMDS release zone will be conducted within thirty days of completion of disposal activities.

(3) All disposal will be initiated at least 330 feet within the boundaries of the Mobile ODMDS.

(4) The following special conditions for Dredging Units will be followed:

Dredging Unit	Load Limit	Dredge Unit Boundary	
		From Station	To Station
DU3	15,000	191+00	244+66
DU4A	15,000	268+18	610+00
DU4B	15,000	610+00	799+00
DU5A	15,000	799+00	960+00
DU5B *	13,500	960+00	1143+00
DU6A *	13,000	1143+00	1320+00
DU7A	15,000	1485+00	1628+00
DU12	15,000	244+66	268+18

*\* Emphasis added to highlight Load Limits.*

**Note: The Phase 4 reach of the Mobile Harbor Deepening and Widening is defined as between Stations 500+00 and 950+00. These stations are located entirely within dredge units DU4A, DU4B, and DU5A which carry load limits of 15,000CY.**

8. RECORDING AND PRESERVING HISTORICAL AND ARCHEOLOGICAL FINDS: All items having any apparent historical or archeological interest, which are discovered in the course of any removing of material and placement activities, shall be carefully preserved and protected. The Contractor shall leave the archaeological find undisturbed, secure the site to the extent reasonably possible, and immediately report the find to the Contracting Officer so the proper authorities may be notified. Existing historical, archeological and cultural resources for avoidance within the Contractor's work area will be so designated by the Contracting Officer. The Contracting Officer will further coordinate with the Mobile District Archeological Staff (attn: Mr. Mike Malsom PD-EI, (251) 690-2023 and Dr. Patrick M. O'Day, PD-EI (251) 690-2326) to obtain the precise coordinates for avoidance areas if needed. Any new sites would be identified and adequately marked in the field for assessment by the USACE staff, and any known sites in the removal or placement footprint will be marked for avoidance prior to dredging.

NEW DISCOVERIES

If new and unanticipated Historic Properties are inadvertently discovered during implementation of the undertaking, the Mobile District will cease all work in the vicinity of the discovery until it can be evaluated. If the property is determined to be NRHP eligible, the Corps shall consult with the State Historic Preservation Office (SHPO), Federally Recognized Tribes, and other interested parties to develop a treatment plan according to Stipulation lv (Historic Properties Treatment Plan).

9. PROTECTION OF LAND RESOURCES: The environmental resources within the project boundaries and those outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications. The Contractor shall perform a preconstruction survey, which includes but is not limited to photographs, and provide this to the Contracting Officer prior to dredging and placement activities.

a) It is intended that the land resources outside the limits of permanent work performed under this contract be preserved in their present condition or be restored to natural conditions, after completion of dredging and placement activities.

b) The Contractor shall be required to maintain all work areas within or outside of the project boundaries free from dust that would cause a hazard or nuisance to others.

c) The Contractor shall obliterate all signs of temporary support facilities, such as haul roads, work areas, structures, foundations of temporary structures, or any other vestiges of activities as directed by the Contracting Officer.

d) Solid wastes (excluding clearing debris) include any waste generated by the Contractor which meets the most complete definition of solid waste as described by Federal, state and local laws and regulations. Solid waste shall be placed in containers that are emptied on a regular schedule. All handling and placement shall be conducted to prevent spillage and contamination.

e) Hazardous waste shall be stored, removed from the work area and disposed of in accordance with Federal, state and local laws and regulations.

f) The Contractor shall use drainage ditches, low ground pressure equipment, matting, geogrids, and/or other types of soil reinforcement in some areas to enable vehicle traffic and other activity.

10. PROTECTION OF FISH AND WILDLIFE: The Contractor shall at all times perform all work and take such steps required to prevent any significant interference or disturbance (as determined by the Contracting Officer) to fish and wildlife.

a) The Contractor will not be permitted to alter water flows or otherwise disturb native habitats adjacent to the project area, which, in the opinion of the Contracting Officer, are critical to fish or wildlife. Fouling or polluting of water will not be permitted.

b) Wastewater shall be processed, filtered, ponded, or otherwise treated, if applicable, prior to their release from project area into waterways.

c) If applicable, the removed material placement operation return water shall not impact any areas of seagrasses, shellfish beds, or wetland areas.

d) The Contractor must perform all work within the compliance specifications of the Alabama Coastal Program to the maximum extent practicable.

e) Maintenance and New Work dredging of Mobile Harbor Federal navigation project is restricted to dimensions designated in this contract and placement of material in approved placement sites only.

f) The Contractor shall take all necessary precautions to ensure that maintenance and new work dredging activities do not adversely impact any listed threatened and/or endangered species protected under the Endangered Species Act.

g) The Contractor shall take all necessary precautions to ensure that activities conducted during the course of this project do not adversely impact listed threatened and endangered species or their critical habitats. The Contractor shall instruct all personnel associated with the project of the potential presence of manatees, sea turtles, and the Gulf sturgeon in the area, and the need to avoid collisions with and harming these animals. The Contractor shall further instruct all personnel that the area is designated as Gulf sturgeon critical habitat. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, sea turtles, Gulf sturgeon, dolphins or whales; or destroying or adversely modifying critical habitat of these species which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. The Contractor must take special precautions to ensure adequate protection for wildlife resources.

- (1) If a collision occurs or a dead manatee, sea turtle or Gulf sturgeon is observed, a Stranding Report form should be completed and filed with NOAA. A copy of the form can be found at the Sea turtle stranding and salvage network (STSSN) website at: <https://www.nrc.gov/docs/ML1434/ML14345A279.pdf>
- (2) *Any collision with and/or injury to a manatee shall be reported immediately to the U.S. Fish and Wildlife Service in Daphne (251-441-5181).* Please also provide a copy to Mobile District Coastal Environment Office, Ms. Lekesha Reynolds at: [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil)

h) When using cutterhead dredging equipment, to minimize the potential of intercepting sea turtles/Gulf sturgeon, every effort shall be made to minimize pump operation while the dragheads/cutterheads are suspended in the water column including but not limited to the following:

- (1) When initiating dredging, suction through the dragheads/cutterhead shall be allowed just long enough to prime the pumps. Then the dragheads/cutterheads must be placed firmly on the bottom.
- (2) When lifting the dragheads/cutterhead from the bottom, suction through the dragheads/cutterheads shall be allowed just long enough to clear the lines, then must cease.
- (3) Pumping water through the dragheads/cutterhead shall cease while maneuvering or during travel to/from the placement area.
- (4) Raising the dragheads/cutterheads off the bottom to increase suction velocities is not acceptable.
- (5) During turning and repositioning operations the pumps must either be shut off or reduced in speed to the point where no suction velocity or vacuum exists.



i) PROTECTION OF MANATEES: Where manatees are known to occur and/or at required navigation channel designated by U.S. Fish and Wildlife Service, as stated in the Manatee Protection Guidelines 10(a) below and in the Environmental Appendix Cooperating Agency Certifications, in order to ensure that manatees are not adversely affected by the dredging activities authorized by this contract, the Contractor utilize the State and/or USFWS Standard Manatee Construction Conditions.

(1) Manatee Precautions - The manatee is an endangered mammal protected by Federal and State Laws. The Contractor shall observe the following precautions and other manatee precautions as stipulated by the regulatory agencies for the project:

- (a.) The contractor shall instruct all personnel associated with the project of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatees.
- (b.) The contractor shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973.
- (c.) Siltation barriers shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to, or exit from, essential habitat.
- (d.) All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- (e.) If manatees are seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure their protection. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. Operation of any equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.
- (f.) Temporary signs concerning the manatees shall be posted prior to and during all construction/dredging activities. All signs are to be removed by the lessee/grantee upon completion of the project. A sign measuring at least 3' by 4' which reads *Caution: Manatee Area* will be posted in a location prominently visible to water related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8'-6" by 11" which reads *Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50 feet of operation. Any collision with and/or injury to a manatee shall be reported immediately to the U.S. Fish and Wildlife Service in Daphne (251-441-5181).*

11. PROTECTION OF AIR RESOURCES: All fuel-burning equipment shall be properly maintained to prevent violations of State or Federal Air Pollution Standards or interference with inhabitants of the area by causing drastic changes in their accustomed environment. If burning is required, the Contractor should obtain a burn permit from the local fire department, if necessary. Daily inspections will be made of all fuel-burning equipment. Immediate corrective action shall be taken if exhaust emissions are found to be excessive.

12. MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING DREDGING AND PLACEMENT ACTIVITIES: During the life of this contract, the Contractor shall maintain all facilities constructed for pollution control 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. During the construction period the Contractor should conduct frequent training courses for all maintenance personnel. The curricula should include methods of detection of pollution, familiarity with pollution standards and measures for prevention or mitigation of environmental pollution.

13. SANITATION: The Contractor must provide suitable sanitation devices for the proper storage of all sanitary sewage. The Contractor shall ensure that all floating plants operate according to an approved waste management plan as required by 33 CFR Part 151. The dumping of sanitary sewage effluent and/or solids into the navigable waters surrounding the job is strictly prohibited.

14. PAYMENT: No separate payment will be made for work covered under this section and all costs in connection therewith will be considered a subsidiary obligation of the Contractor and covered under the contract unit and/or lump-sum prices in the Bidding Schedule.

SECTION 01 57 20.00 10

ENVIRONMENTAL PROTECTION (HOPPER DREDGE)

PART 1 GENERAL

1.1 APPLICABLE REGULATIONS

The Contractor and their subcontractors in the performance of this contract, shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement, all applicable provisions of the Corps of Engineers Manual, EM 385-1-1, entitled "Safety and Health Requirements", in effect on the date of solicitation, and the specific requirements stated elsewhere in the contract specifications.

1.2 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 during the dredging activities for the Mobile Harbor project, except for those measures set forth in other Technical Provisions of these specifications. For the purpose of this specification, environmental pollution is defined as: a) the presence of chemical, physical, or biological elements or agents that adversely affect human health or welfare; b) unfavorably alter ecological balances; c) affect other species of designated importance of man; or d) degrade the utility of the environment for aesthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, and land, and involves noise control, solid waste management, as well as control of other pollutants.

1.3 CONTRACTOR

The Contractor and their subcontractors shall comply with all requirements under the terms and conditions set out in the permits or certifications issued by the Alabama Department of Environmental Management (ADEM) and in compliance with the provisions of the Contract and applicable Federal, state, and local environmental laws and regulations. Compliance with the provisions of this section by subcontractors shall be the responsibility of the Contractor.

a. The Contractor shall submit an Environmental Protection Plan, in accordance with provisions as specified.

b. The Contractor shall record on daily reports any problems in complying with laws, regulations and ordinances, and corrective action taken.

c. The Contractor shall prepare a listing of resources needing protection (i.e., upland vegetation, wetlands, oyster reefs, submerged aquatic vegetation, air quality, noise levels, surface and groundwater quality, fish and wildlife, historical, archeological, and cultural resources) within authorized work areas.

d. The Contractor shall prepare a pollution prevention plan that identifies all potentially hazardous substances on the job site and the intended actions to be taken to prevent the accidental or intentional introduction of such materials into the air, the water or the ground.

e. The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes or failure to follow the procedures identified in the environmental protection plan.

f. The Contractor shall keep dredging and placement activities under surveillance and shall exercise all necessary controls to minimize damage to the environment by noise from equipment and various activities. Areas that have noise levels greater than 85-dB continuously or 140-dB peak (unweighted) impulse must be designated as noise hazardous areas. These work areas must have caution signs displayed at the perimeter of the noise area indicating the presence of hazardous noise levels and requiring the use of hearing protection devices.

g. The Contractor shall detail special provisions taken to meet Federal, state, and local laws and regulations regarding the storage and handling of solid and hazardous waste materials.

#### 1.4 PAYMENT

No separate payment will be made for work covered under this section and all costs in connection therewith will be considered a subsidiary obligation of the Contractor and covered under the contract unit and/or lump sum prices in the Bidding Schedule.

#### 1.5 ENVIRONMENTAL PROTECTION PLAN

a) Prior to commencement of the work, the Contractor shall, after receipt of Notice of Award of the Contract and at least 7 days prior to the Preconstruction Conference, submit in writing the Environmental Protection Plan, and shall meet with representative(s) of the Contracting Office, to Lekesha Reynolds via email at [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil), to develop mutual understanding relative to compliance with this provision and administration of the environmental protection program.

#### 1.6 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State, or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PROTECTION OF WATER RESOURCES

The Contractor shall not pollute any water bodies including streams, lakes, bays, estuaries, or other marine or fresh waters with fuels, oils, acids, or any other harmful materials. It is the responsibility of the Contractor to investigate and comply with all applicable Federal, state, county, and municipal laws concerning water pollution. The discharge of plastics of any kind within estuarine or marine waters is strictly prohibited. All work under this contract shall also be performed in such a manner that objectionable conditions will not be created in proximity to the project areas.

a. The Contracting Officer Representative will designate the proposed areas for excavation and the location of approved placement areas. No other areas are approved for the placement or excavation of material.

b. The Contractor shall comply with all turbidity and monitoring standards and other conditions set forth in the water quality standards as specified by the Alabama Department of Environmental Management (ADEM). The Contractor will monitor turbidity (NTU's) in the work area throughout the life of the contract to ensure that the Contractor complies with the permit requirements. Turbidity measurements must be taken daily at the dredge and discharge sites and a background location to be determined by the Contractor. The turbidity monitoring report (included in the Environmental Compliance Appendix) shall be filled out and submitted weekly to the Contracting Officer who will then forward to the Mobile District coastal Environment Staff: Ms. Lekesha Reynolds, PD-EC by email [Lekesha.w.reynolds@usace.army.mil](mailto:Lekesha.w.reynolds@usace.army.mil). The Contractor shall provide the name(s) and credentials of the person(s) responsible for turbidity monitoring in the Environmental Protection Plan. If turbidity at the placement site exceeds 50 NTUs above background levels outside the prescribed mixing zones, as specified in the permit, the contractor shall cease activities until corrective actions have been taken and turbidity levels have returned to within compliance levels. Should work stoppage occur, the Contractor shall immediately notify the Contracting Officer Representative.

c. Special measures shall be taken to prevent chemicals, fuels, oils, and greases at the beach placement site or along the pipeline from entering area waters, at all times.

d. Contractor shall maintain Best Management Practices (BMPs) at all times during operations to minimize turbidity at both the dredge and placement sites.

e. Discharge of any pollutant into the watercourse is strictly prohibited, except as otherwise specified or allowed in other sections of the Technical Specifications.

f. Wastewater shall be processed, filtered, ponded, or otherwise treated prior to their release from project area into waterways.

g. All dredging equipment must have approved marine sanitation devices. Staging areas must have approved onsite wastewater treatment facilities.

h. For internal monitoring purposes only (not related to environmental compliance or regulatory conditioning), the Contractor shall collect a basic suite of water quality parameters to include total water depth, temperature, dissolved oxygen, pH, and salinity at a frequency of twice daily. The data shall

be collected at surface, mid, and bottom depth levels. Coordinates shall be provided at all sampling locations, and at the dredge location, along with time of day and existing weather conditions to include tides. These additional data collection parameters shall be reported in an excel spreadsheet format.

### 3.2 MOBILE OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)

Placement of the dredged sediments within the ODMDS will be conducted in accordance with the conditions specified below in the Section 103 concurrence letter from U.S. Environmental Protection Agency (EPA) and the Site Management and Monitoring Plan (SMMP). Both of these documents are included in the Environmental Compliance Appendix.

#### a. Mobile Maintenance Ocean Disposal Conditions

- (1) A bathymetry survey of the ODMDS release zone will be conducted within three months prior to initiation of disposal activities.
- (2) A bathymetry survey of the ODMDS release zone will be conducted within thirty days of completion of disposal activities.
- (3) All disposal will be initiated at least 330 feet within the boundaries of the Mobile ODMDS.
- (4) The following special conditions for Dredging Units will be followed:

Dredging Unit	Load Limit	Dredge Unit Boundary	
		From Station	To Station
DU3	15,000	191+00	244+66
DU4A	15,000	268+18	610+00
DU4B	15,000	610+00	799+00
DU5A	15,000	799+00	960+00
DU5B *	13,500	960+00	1143+00
DU6A *	13,000	1143+00	1320+00
DU7A	15,000	1485+00	1628+00
DU12	15,000	244+66	268+18

\* *Emphasis added to highlight Load Limits.*

**Note: The Phase 4 reach of the Mobile Harbor Deepening and Widening is defined as between Stations 500+00 and 950+00. These stations are located entirely within dredge units DU4A, and DU4B, and DU5A which carry load limits of 15,000CY.**

### 3.3 RECORDING AND PRESERVING HISTORICAL AND ARCHEOLOGICAL FINDS

All items having any apparent historical or archeological interest, which are discovered in the course of any removing of material and placement activities shall be carefully preserved. The Contractor shall leave the archaeological find undisturbed and immediately report the find to the Contracting Officer Representative and the Mobile District Archeological Staff (Attn: Mr. Mike Malsom PD-EI, (251) 690-2023, Dr. Patrick O'Day, PD-EI (251) 690-2326) so the proper authorities may be notified. Existing historical, archeological and cultural resources within the Contractor's work area will be so designated by the Contracting Officer Representative. All activities associated with these resources shall be coordinated through the Mobile District Archeological Staff

(Attn: Mr. Mike Malsom PD-EI, (251) 690-2023, Dr. Patrick O'Day, PD-EI (251) 690-2326).

#### NEW DISCOVERIES

If new and unanticipated Historic Properties are inadvertently discovered during implementation of the Undertaking, the Mobile District will cease all work in the vicinity of the discovery until it can be evaluated. If the property is determined to be NRHP eligible, the Corps shall consult with the SHPO, Federally Recognized Tribes, and other interested parties to develop a treatment plan according to Stipulation lv (Historic Properties Treatment Plan).

#### 3.4 PROTECTION OF LAND RESOURCES

The environmental resources within the project boundaries and those outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine their activities to areas defined by the drawings and specifications. The Contractor shall perform a preconstruction survey, which includes but is not limited to photographs, and provide this to the Contracting Officer Representative prior to dredging and placement activities.

a. It is intended that the land resources outside the limits of permanent work completed under this contract be preserved in their present condition or be restored to natural conditions, after completion of dredging and placement activities.

b. The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in an area approved by the Contracting Officer Representative. The Contracting Officer Representative shall approve all temporary movement or relocation of Contractor facilities.

c. The Contractor shall be required to maintain all work areas within or without the project boundaries free from dust that would cause a hazard or nuisance to others.

d. The Contractor shall obliterate all signs of temporary support facilities such as haul roads, work areas, structures, foundations of temporary structures, or any other vestiges of activities as directed by the Contracting Officer Representative.

e. The Contractor shall construct or install all temporary and permanent erosion and sedimentation control features at the placement site and along the pipeline route.

f. Solid wastes (excluding clearing debris) includes any waste generated by the Contractor which meets the most complete definition of solid waste as described by Federal, state and local laws and regulations. Solid waste shall be placed in containers that are emptied on a regular schedule. All handling and disposal shall be conducted to prevent spillage and contamination.

g. Hazardous waste shall be stored, removed from the work area and disposed of in accordance with Federal, state and local laws and regulations.

h. The Contractor shall use drainage ditches, low ground pressure equipment, matting, geogrids, and/or other types of soil reinforcement as necessary to enable vehicle traffic and other activity.

### 3.5 PROTECTION OF FISH AND WILDLIFE

The Contractor shall at all times perform all work and take such steps required to prevent any significant interference or disturbance (as determined by the Contracting Officer Representative) to fish and wildlife.

a. The Contractor will not be permitted to alter water flows or otherwise disturb native habitats adjacent to the project area, which, in the opinion of the Contracting Officer Representative or their appointed representative, are critical to fish or wildlife. Fouling or polluting of water will not be permitted.

b. The Contractor must perform all work within compliance specifications of the permit issued by the Alabama Department of Environmental Management (ADEM) which is included in the Environmental Compliance Appendix.

c. Threatened and Endangered Species: The Contractor shall take all necessary precautions to ensure that activities conducted during the course of this project do not adversely impact listed threatened and endangered species. The Contractor shall instruct all personnel associated with the project of the potential presence of manatees, sea turtles, and Gulf sturgeon in the area, and the need to avoid collisions with and harming these animals. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, sea turtles, Gulf sturgeon, dolphins or whales; or destroying or adversely modifying critical habitat of these species which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973. The Contractor must take special precautions to ensure adequate protection for wildlife resources.

(1) The Contractor shall adhere to all Federal, State, and local laws and regulations including the Gulf of Mexico Regional Biological Opinion (GRBO) (2003, as amended in 2005 and 2007).

(2) The Contractor shall coordinate all activities associated with these resources with the Coastal Environment Team, Mobile District (Attn: Ms. Lekesha Reynolds, PD-EC at 251-690-3260, bb 251-327-8650 or Mr. Don Mroczo, PD-EC at 251-690-3185).

(3) If there are any incidents (live or dead) involving threatened or endangered species, the Contractor shall notify the Contracting Officer, Contracting Officer Representative, and the following individual(s) **within 24 hours:**

- Ms. Lekesha Reynolds 251-690-3260 (251-327-8650 (after-hours) or Ms. Jennifer Jacobson 251-690-2724, 251-472-7589 (after hours) U.S. Army Corps of Engineers, PD-EC
- "If a live turtle is recovered from the dredge it shall be immediately transported by a NMFS permitted and approved protected species Observer to the nearest sea turtle and marine mammal rehabilitation facility such as the Institute for Marine Mammal Studies (MMS), 10801 Dolphin Ln, Gulfport, MS 39503, 1-888-767-3657, or 1-228-896-9182 and email [contactus@imms.org](mailto:contactus@imms.org). Also notify



the USACE, Mobile District, Chief of Coastal Environmental, PD-EC, Ms. Lekesha Reynolds, 251-690-3260, or BB 251-327-8650, Lekesha.W.Reynolds@usace.army.mil and Mr. Don Mroczko, 251-690-3185, donald.e.mroczko@usace.army.mil.

The Contracting Officer will direct the contractor as to any required shutdown procedures or necessary changes in dredge operation as to reduce the likelihood of additional incidents. The contractor shall suspend dredging immediately if:

- a. Two or more turtle incidents occur within 24 hours
  - b. Two turtles incidents, of the same species, occur during dredging
  - c. Four turtle incidents, regardless of species, occur during dredging
  - d. One gulf sturgeon incident during dredging
- d. Protection of Manatees: See "Standard Manatee Construction Conditions" in Environmental Compliance Appendix.

(1) Manatee Sighting: If a manatee(s) is sighted within 100 yards of the project area, all appropriate precautions shall be implemented by the Contractor to ensure protection of the manatee. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee is closer than 50 feet to moving equipment or the project area, the equipment shall be shut down and all construction activities shall cease within the waterway to ensure protection of the manatee. Construction activities shall not resume until the manatee has departed the project area. Animals must not be herded away or harassed into leaving. If construction activity shall cease, the Contractor shall notify the Contracting Officer.

(2) Manatee Signs: Prior to commencement of construction, each vessel involved in construction activities shall display at the vessel control station, or in a prominent location visible to all employees operating the vessel, a temporary sign at least 8-1/2" x 11" reading, "CAUTION: MANATEE HABITAT/IDLE SPEED IS REQUIRED IN CONSTRUCTION AREA." In the absence of a vessel, a temporary 3' x 4' sign reading "CAUTION: MANATEE AREA" shall be posted adjacent to the issued construction permit. A second temporary sign measuring 8-1/2" x 11" reading "CAUTION: MANATEE HABITAT. IDLE SPEED IS REQUIRED IF OPERATING A VESSEL IN THE CONSTRUCTION AREA. ALL EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION. ALL COLLISIONS WITH AND/OR INJURY TO A MANATEE SHALL BE REPORTED IMMEDIATELY TO THE USFWS IN DAPHNE (251-441-5181)" shall be posted at the dredge operator control station and at a location prominently adjacent to the issued construction permit. The Contractor shall remove the signs upon completion of construction.

(3) Manatee Sighting Reports: Any collisions with a manatee, or sighting of any injured or incapacitated manatee, shall be reported immediately to the Contracting Officer or their appointed representative.

(4) Report Submission: The Contractor shall maintain a log detailing sightings, collisions, or injuries to manatees occurring during the contract period. All data in original form shall be forwarded directly to the Mobile District, Planning and Environmental Division, Coastal Environment Team, P.O. Box 2288 Mobile, Alabama 36628-0001, (Attn: Mr. Don Mroczko) and the Area Engineer within 10 days of collection.

e. Protection of Sea Turtles and Gulf Sturgeon - Hopper Dredging Only: the Contractor shall implement the following conditions:

(1) Observers: The contractor shall supply NMFS-approved protected species Observers to be aboard the hopper dredges to monitor the hopper dredged material, screening, and dragheads for sea turtles and Gulf sturgeon. Observer coverage shall be 100 percent (24 hr/day). During transit to and from the placement area, the Observer shall monitor from the bridge during daylight hours for the presence of endangered species. During dredging operations, while dragheads are submerged, the Observer shall continuously monitor the inflow and/or overflow screening for turtles and Gulf sturgeon and/or parts of these species. Upon completion of each load cycle, dragheads should be monitored as the draghead is lifted from the sea surface and is placed on the saddle in order to assure that any sea turtle that may be impinged is not lost or un-accounted for. Observers shall physically inspect dragheads and inflow and overflow screening/boxes for threatened and endangered species takes.

(2) Operations and Dredging Endangered Species System (ODESS) Reporting System: The ODESS system, which consists of a tablet computer with an Internet connection, shall be a standalone system, exclusive to other systems, and shall have USACE ODESS data collection and reporting software, referred to as the ODESS Field collector (FC) tool, installed by USACE ODESS support personnel. In the event hardware or software problems prevent the storage or transmission of the collected data, paper copies of the latest ODESS forms and information shall be maintained and submitted to ODESS support and the USACE Inspector or Contracting Officer Representative according to the schedule outlined in the contract specifications. Hardware and Software requirements for the system can be found at the end of this section.

Prior to the initiation of the project, Observers shall be familiar with the operation of the ODESS FC tool and proficient in its use so as to be able to prepare and transmit the results of their observations. ODESS system webinar training can be requested by contacting ODESS Support at [ODESS@usace.army.mil](mailto:ODESS@usace.army.mil) or 1-877-840-8024.

Depending on the target audience (Observer, dredging Contractor, USACE District personnel, or other Federal agencies), ODESS training could, in addition to the webinar training, consist of demonstrating the steps involved in setting up the FC tool on the dredge, loading Observer-collected data and attachments into the FC tool, submitting these data and attachments to the ODESS database, and/or navigating around the ODESS public website to view and pull down data and/or decision-making information for later analysis.

(3) ODESS Monitoring Reports: Observers shall record the results of the threatened and endangered species monitoring in the ODESS system by filling in the appropriate electronic forms on the ODESS FC tool and transmitting the data to the ODESS database. If there is an issue with recording data straight to the FC tool due to the logistical nature of how the Observer is collecting this data, paper copies of these forms can be downloaded from the ODESS public website (<http://dgm.usace.army.mil/odess/#/download>) and later entered into the FC tool when the Observer has the best opportunity.

Prior to the start of dredging, Observers shall verify that the ODESS FC tool is installed and operational on a dredge's dedicated tablet computer and that a viable Internet connection is available. In addition, before a project is initiated, on the ODESS FC tool homepage Observers shall retrieve (or "pull down") project-specific information from the ODESS database and perform a one-time setup of the dredging project by establishing the dredge name and time zone. During the project, the following forms shall be used in the FC tool and submitted to the ODESS database at the indicated reporting frequency:

(a) Load Data Form: Observers shall complete the Load Data Form, including a description of screen contents and sea conditions, based on their observations. This form shall be completed and transmitted to the ODESS database for each load. At the end of each Observer shift, or when an Internet signal is available (not to exceed 24 hours from the start of the shift), the Observer shall submit all of their Load Data Forms. If this is not possible due to hardware or software problems, the Observer shall revert to email submission of the forms to [ODESS@usace.army.mil](mailto:ODESS@usace.army.mil), [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil), and [Donald.e.mroczo@usace.army.mil](mailto:Donald.e.mroczo@usace.army.mil).

(b) Sea Turtle Incidental Data Form: If a sea turtle or its remains are identified during a load inspection, after the appropriate parties are notified via telephone, a Sea Turtle Incidental Data Form shall be completed and submitted to the ODESS database as soon as possible (not to exceed 12 hours after the incident). Any applicable documentation (scanned copies of the paper Observer load and incident forms, species photos, etc.) shall be included as electronic attachments (.JPG or .PDF) and submitted using the FC tool.

(c) Sturgeon Incidental Data Form: If a sturgeon or sturgeon parts are identified during a load, after the appropriate parties are notified, a Sturgeon Incidental Data Form shall be completed and submitted to the ODESS database as soon as possible (not to exceed 12 hours after the incident). Any applicable documentation (scanned copies of the paper Observer load and incident forms, species photos, etc.) shall be included as electronic attachments (.JPG or .PDF) and submitted using the FC tool.

(d) Marine Mammal Observation Data Form: If a large whale is observed, both the Dredge Load and the Marine Mammal Observation Data Forms shall be completed and submitted (not to exceed 12 hours after the observation) to ODESS Support at [ODESS@usace.army.mil](mailto:ODESS@usace.army.mil) consistent with the endangered species compliance section of the contract specification.

(4) The contractor shall provide a digital camera, with an image resolution capability of 300 dpi, in order to photographically report all incidental sea turtle and Gulf sturgeon takes during dredging operations. Immediately following an incidental take of a sea turtle or Gulf sturgeon, images shall be provided to accompany load data and incidental take forms submitted to the ODESS system. The nature of findings shall be fully described in the incidental take forms including references to photographs.

(5) Screening: Sea turtle Observers are required on hopper dredges and shall provide for 100% inflow screening of dredged material; 100% overflow screening is recommended. If conditions prevent 100% inflow screening, inflow screening may be reduced gradually, as further detailed in the following paragraph, but 100% overflow screening is then required.

(6) Screen Size: The hopper's inflow screens shall have 4-inch by 4-inch screening. If the Contracting Officer Representative, in consultation with Observers and the draghead operator, determines that the draghead is clogging and reducing production substantially, the screens may be modified sequentially: mesh size may be increased to 6-inch by 6-inch, then 9-inch by 9-inch, then 12-inch by 12-inch openings. Further clogging may compel removal of the screening altogether, in which case effective 100% overflow screening would be required. The Contactor Officer Representative shall request permission before doing so by contacting Mobile District Coastal Environmental Team (Ms. Lekesha Reynolds 251-690-3260) prior to the reductions in screening. The Contactor shall provide an explanation for such reduction in the dredging report.

(7) Dredging Pumps: Standard operating procedure shall be that dredging pumps are disengaged by the operator when the dragheads are not firmly on the bottom, to prevent impingement or entrainment of sea turtles within the water column.

(8) Sea Turtle Deflector Requirements:

(a) Sea Turtle Deflecting Draghead: A state-of-the-art rigid deflector draghead must be used on all hopper dredges in all Gulf of Mexico channels and sand mining sites at all times of the year and shall be installed while performing hopper dredging operations under this contract. The contractor shall submit drawings showing the proposed sea turtle deflector device and its attachment to the equipment being used. Drawings submitted shall include the approach angle for any and all depths to be dredged during the dredging. A copy of the approved drawings and calculations shall be available on the vessel during the dredging.

(b) Hopper Dredge Equipment: Hopper dredge drag heads shall be equipped with rigid sea turtle deflectors, which are rigidly attached. No dredging shall be performed by the hopper dredge without a turtle deflector device that has been approved by the Contracting Officer Representative.

(c) Deflector Design: The leading v-shaped portion of the deflector shall have an included angle of less than 90 degrees. Internal reinforcement shall be installed in the deflector to prevent structural failure of the device. The leading edge of the deflector shall be designed to have a plowing effect of at least 6" depth when the drag head is being operated. Appropriate instrumentation or indicator shall be used and kept in proper calibration to insure the critical "approach angle."

If adjustable depth deflectors are installed, they shall be rigidly attached to the drag head using either a hinged aft attachment point or an aft trunnion attachment point in association with an adjustable pin front attachment point or cable front attachment

point with a stop set to obtain the 6" plowing effect. This arrangement allows fine-tuning the 6" plowing effect for varying depths. After the deflector is properly adjusted there shall be NO openings between the deflector and the drag head that are more than 4" by 4".

(9) Training - Personnel on Hopper Dredges: The USACE may, as necessary, conduct thorough training on measures of dredge operation that will minimize takes of sea turtles and Gulf sturgeon. It shall be the goal of each hopper dredging operation to establish operating procedures that are consistent with those that have been used successfully during hopper dredging in other regions of the coastal United States, and which have proven effective in reducing turtle/dredge interactions.

f. Sea Turtle and Gulf Sturgeon Trawling and Relocation - Trawling and relocation shall be conducted during Hopper Dredging within Mobile Bar Channel unless otherwise directed by the Contracting Officer Representative. Trawling outside of the Bar Channel is not required unless there is a take. The Contractor shall implement the following Trawling and Relocation conditions:

(1) Trawling Requirements: Relocation trawling shall be conducted to remove sea turtles (with the exception of leatherback sea turtles, which shall be photographed in the trawling net and immediately released in place, see below) and Gulf sturgeon from the construction areas during dredging to help prevent entrainment by the dredge. In addition, giant manta rays may be present in the work areas. Observers shall not handle giant manta rays or take any physical measurements. If a giant manta ray is captured in the trawl, it shall be photographed in the trawling net and immediately released in place. Trawling shall begin at least 12 hours prior to dredging. Based on the trawling results, the Government will decide if there is a need to continue trawling. Daily trawling results shall be sent to the USACE, Mobile District, Chief of Coastal Environmental, PD-EC, Ms. Lekesha Reynolds, Lekesha.W.Reynolds@usace.army.mil and Don Mroczko, donald.e.mroczko@usace.army.mil. Based on the trawling results, the Mobile District, Planning Division, Coastal Environmental will decide on if there is a need to continue trawling. Methods and equipment shall be standardized including data sheets, nets, trawling direction to tide, length of station, length of tow, and number of tows per station. Data on each tow shall be recorded in on Trawling Report form. The trawler shall be equipped with 60-foot nets constructed from 8-inch mesh (stretch) fitted with mud rollers and flats as specified in the Turtle Trawl Nets Specifications appended to the end of this Section. Paired net tows shall be made for 12 hours per day or night, as directed by the Contracting Officer or their appointed representative. The tows shall be performed in shifts, to be determined by the Contracting Officer or their appointed representative. The trawler shall be available for operation 24 hours a day. If two (2) separate trawlers are required, they shall operate side-by-side, as much as practicable. If multiple dredges are utilized, the trawler(s) shall be used for each dredge actively performing dredging operations. If the dredging operations are coordinated so that only one (1) dredge is actively dredging, trawler(s) shall be required for only that dredge. If dredging operations cease for a period of 12 hours or more, relocation trawling shall be conducted for a minimum of 4 hours prior to resuming dredging operations. The trawler(s) shall be positioned ahead of the hopper dredge and as close to the hopper dredge as safely

possible to give maximum coverage ahead of the dredging cut. The dredge and trawler(s) shall work closely together to implement techniques and procedures that will minimize the opportunity for turtles and Gulf sturgeon to enter the dredging path between the trawler(s) and dredge. NOTE: ALL TRAWLING ACTIVITIES, VESSELS AND EQUIPMENT SHALL COMPLY WITH THE CONTRACTOR'S ACCIDENT PREVENTION PLAN AND THE REQUIREMENTS OF EM 385-1-1, U.S. ARMY CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL. Trawling shall be conducted with and against the tidal flow at a speed between 2.5 to 3.5 knots using repetitive 15- to 30-minute (total time) trawls in the work area. Trawl tow-time duration shall not exceed 30 minutes (doors in - doors out) and trawl speeds shall not exceed 3.5 knots. Positions at the beginning and end of each tow shall be determined from the Global Positioning System (GPS) equipment. Tow speed shall be recorded at the approximate midpoint of each tow. Acceptable GPS criteria shall be in accordance with EM 1110-1-1003, paragraph 5.3 and Table 5-1. This EM 1110-1-1003 can be located at the following website:

<http://www.publications.usace.army.mil/USACEPublications/EngineerManual.s.aspx> or can be purchased directly from the Government Printing Office by calling (202) 512-1800. The postal address is Superintendent of Documents, P. O. Box 371954, Pittsburgh, Pennsylvania 15250-7954 or on line at <http://bookstore.gpo.gov/>.

(2) Water Quality and Physical Measurements: Water temperature measurements shall be taken at the water surface each day using a laboratory thermometer. Weather conditions shall be recorded from visual observations and instruments on the trawler. Weather conditions, air temperature, wind velocity and direction, sea state-wave height, and precipitation shall be recorded on the Trawling Report form. High and low tides shall be recorded.

(3) Approved Sea Turtle Trawling and Relocation Supervisor: Trawling shall be conducted under the supervision of a crewmember that possesses the required permits for handling endangered species, experienced in sea turtle capture or is a NMFS-approved Observer. A letter of approval from NMFS shall be provided to the Contracting Officer or their appointed representative prior to commencement of trawling.

(4) Repair and Replacement of Damaged Trawl Nets: The Contractor, at the time of mobilization, shall provide trawl nets, which meet the requirements specified in the Turtle Trawl Net Specifications at the end of this section. Trawl nets that are damaged shall be repaired or replaced by the Contractor at no additional expense to the Government. Tools, supplies and materials for repairing nets shall be kept aboard the trawler. In the event of damage to trawl nets, one hour shall be allowed to either repair or replace them. The Contractor shall have at least one set of replacement nets immediately available at all times, to ensure that the dredging work is not adversely delayed due to trawler down-time for replacing damaged nets. It is recommended that a second set of replacement nets be available aboard the trawler.

(5) Equipment Breakdown: The contractor shall be placed in a non-pay status when trawling equipment breakdown is such that the trawler does not operate during the day. Pay time shall resume when trawling operations recommence.

(6) Suspension of Dredging and Relocation Trawling: Should there be dangerously high seas that would cause the trawler to leave the dredging area when relocation trawling is required, the dredge may continue to operate, as long as no turtles or Gulf sturgeon are taken and subject to the discretion of the Contracting Officer.

(7) Turtle Excluder Devices: Approval for trawling for sea turtles without Turtle Excluder Devices (TEDs) on hopper dredge dragheads must be obtained from NMFS (contact Ms. Kelly Shotts at Kelly.Shotts@noaa.gov). Any necessary State or Federal clearances for the capture and relocation of sea turtles shall also be obtained. Approvals shall be submitted to the Contracting Officer or their appointed representative prior to trawling.

(8) Handling During Trawling: Sea turtles and sturgeon captured pursuant to relocation trawling shall be handled in a manner designed to ensure their safety and viability, and shall be released over the side of the vessel, away from the propeller, and only after ensuring that the vessel's propeller is in the neutral, or disengaged, position (i.e., not rotating). Resuscitation guidelines are located in the Environmental Compliance Appendix. All leatherback sea turtles are to be photographed in the trawler net and immediately released in place (are not to be relocated).

(9) Captured Turtle and Gulf Sturgeon Holding Conditions: Turtles and Gulf sturgeon may be held briefly for the collection of important scientific measurements, prior to their release. Captured turtles shall be kept moist, and shaded whenever possible, until they are released, according to the requirements below. Captured Gulf sturgeon shall be held in a suitable well-aerated seawater enclosure until they are released according to the requirements below.

(a) Take and Release Time During Trawling - Turtles: Turtles shall be kept no longer than 12 hours prior to release and shall be released not less than three (3) nautical miles (nmi) from the excavation site. If two or more released turtles are later recaptured, subsequent turtle captures shall be released not less than (5) five nautical miles away. If it can be done safely and without injuries to the turtle, turtles may be transferred onto another vessel for transport to the release area to enable the relocation trawler to keep sweeping the dredge site without interruption. Minor skin abrasions resulting from trawl capture are considered non-injurious. Injured sea turtles shall be immediately transported to the nearest sea turtle rehabilitation facility. Also notify the Coastal Environmental Team, Mobile District, Ms. Lekesha Reynolds by phone at 251-690-3260 office or by email at Lekesha.w.reynolds@usace.army.mil. Observer(s), or their appointed representative(s), shall transport injured turtles to a rehabilitation facility as soon as possible. The NOAA Fisheries-approved turtle transporters shall be used for this purpose.

Mississippi

Institute for Marine Mammal Studies (MMS)  
10801 Dolphin Ln, Gulfport, MS 39503, phone 1-888-767-3657, or 1-228-896-9182 email contactus@imms.org.

FLORIDA (partial list)

Gulf World  
15412 Front Beach Rd  
Panama City Beach, FL 32413  
Tel. 850-234-5271

Emerald Coast Wildlife Rescue  
406 Mountain Dr  
Destin, FL 32541  
Tel. 850-/650-1880

Florida's Gulfarium  
1010 Miracle Strip Parkway SE  
Ft. Walton Beach, FL 32548  
Tel. 850-243-9046

(b) Take and Release Time During Trawling - Gulf Sturgeon: Gulf sturgeon shall be released immediately after capture, away from the dredge site, unless the trawl vessel is equipped with a suitable well-aerated seawater holding tank, container, trough or pool where a maximum of one sturgeon may be held for not longer than 30 minutes before it must be released or relocated away from the dredge site. Leatherbacks shall be photographed and then released in place.

(10) Scientific Measurements: When safely possible, all turtles (with the exception of leatherback sea turtles) shall be measured (standard carapace measurements including body depth), tagged, weighed, and a tissue sample taken prior to release. When safely possible, all Gulf sturgeon shall be measured (fork length and total length), tagged, weighed, and a tissue sample taken prior to release. Any external tags shall be noted and data recorded onto the Tagging form. Only NMFS approved protected species Observers or Observer candidates in training under the direct supervision of a NMFS-approved Observer shall conduct the tagging/measuring/weighing/tissue sampling operations. All sea turtles and sturgeon shall be photographed and the photographs shall be submitted with the tagging and/or trawling reports.

(11) Turtle Flipper External Tagging: All sea turtles captured by relocation trawling shall be flipper-tagged prior to release with external tags which shall be obtained prior to the start of dredging from the University of Florida's Archie Carr Center for Sea Turtle Research. The NMFS-approved protected species Observer aboard these relocation trawlers shall flipper-tag with external tags (e.g., Inconel tags) captured sea turtles. Columbus crabs or other organisms living on external sea turtle surfaces may also be sampled and removed.

(12) PIT Tagging: PIT tagging of sea turtles and Gulf sturgeon is not required if the NMFS-approved protected species Observer does not have prior training or experience in said activity. However, if the Observer has received prior training in PIT tagging procedures, then the Observer shall PIT tag the animal prior to release (in addition to the standard external tagging):

(a) Sea turtle PIT tagging must then be performed in accordance with the protocol detailed at NMFS' Southeast Fisheries Science



Center's web page:  
<http://www.sefsc.noaa.gov/species/turtles/Observers.htm>.

(b) Gulf sturgeon PIT tagging must then be performed in accordance with the protocol detailed at the NMFS SERO PRD Web site.

(c) PIT tags used must be sterile, individually wrapped tags to prevent disease transmission. PIT tags should be 125 kHz, glass-encapsulated tags-the smallest ones made.

(13) Other Sampling Procedures: All other tagging and external or internal sampling procedures (e.g., blood letting, laparoscopies, anal and gastric lavages, mounting satellite or radio transmitters, etc.) performed on live sea turtles or live sturgeon are not permitted unless the Observer holds a valid sea turtle or sturgeon research permit authorizing this activity, either as the permit holder, or as designated agent of the permit holder.

(14) Trawler Reporting: At the end of each day, a report (including details about the tow, details about the turtles/sturgeons relocated, and all required photographs in .JPG or .PDF) shall be emailed by the Contractor to USACE, Mobile District, Chief of Coastal Environmental, PD-EC, Ms. Lekesha Reynolds, [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil) and Mr. Don Mroczko, [donald.e.mroczko@usace.army.mil](mailto:donald.e.mroczko@usace.army.mil). The results of each trawl shall be recorded on the Trawling Report. Sample forms are provided in the Environmental Compliance Appendix. Following completion of the project, an electronic copy of the trawling reports shall be forwarded to USACE, Mobile District, Chief of Coastal Environmental, PD-EC, Ms. Lekesha Reynolds, [Lekesha.W.Reynolds@usace.army.mil](mailto:Lekesha.W.Reynolds@usace.army.mil) and the COR within 10 working days of dredging completion.

g. Collateral or "Piggy Back" Research - Hopper Dredging/Trawling Relocation Only: Any sea turtle research activities proposed by the contractor, or outside parties, to be conducted in association with USACE funded actions, including endangered species monitoring, relocation trawling operations, or use of turtles acquired by these operations shall comply with the following general requirements, and any specific requirements developed by the Corps on a case-by-case basis as requests are received:

(1) The USACE shall be given at least 60 days to review and comment on any such research proposals. The point of contact for this review is Safra Altman ([Safra.Altman@usace.army.mil](mailto:Safra.Altman@usace.army.mil)) at the Engineer Research and Development Center (ERDC) in Vicksburg MS.

(2) No such research shall be conducted without the express consent of USACE.

(3) The USACE shall be given the opportunity to review and comment on any potential publication or interpretation of resulting data prior to release. The point of contact for this review is Dena Dickerson at the ERDC.

(4) The party or parties conducting the research shall possess a valid research permit pursuant to Section 10 of the Endangered Species Act; and will be responsible for any other Federal, State or local permits or authorizations required, including any requirement of the National Environmental Policy Act (NEPA).

(5) Any injuries, including lethal takes resulting from sea turtle handling activity beyond USACE contract requirements shall be the responsibility of the researcher.

(6) Acknowledgment that the research was conducted with the assistance of USACE shall be included in any resulting publication or report, at the discretion of USACE.

(7) Research activities shall not hinder USACE contracted operations, nor result in any additional cost to the Government.

(8) Research personnel not directly employed by USACE contractors or subcontractors shall not board contracted vessels without signing an appropriate waiver of liability and/or other documents required by USACE.

h. PIT-Tag Scanning - Hopper Dredging/Trawling Relocation Only: All sea turtles (with the exception of leatherback sea turtles) and Gulf sturgeon captured by relocation trawling or hopper dredges shall be thoroughly scanned for the presence of PIT tags prior to release using a multi-frequency scanner powerful enough to read multiple frequencies (including 125, 128, 134 and 400-kHz tags) and read tags deeply embedded deep in muscle tissue (e.g., manufactured by Trovan, Biomark, or Avid). Turtles whose scans show they have been previously PIT tagged shall be externally flipper tagged. The data collected (PIT tag scan data and external tagging data) shall be submitted to NOAA, NMFS, Southeast Fisheries Science Center, Attn: Lisa Belskis, 75 Virginia Beach Drive, Miami, Florida 33149. All data collected shall be submitted in electronic format within 60 working days to Lisa.Belskis@noaa.gov; and Sheryan.Epperly@noaa.gov. Sea turtle external flipper tag and PIT tag data generated and collected by relocation trawlers shall also be submitted to the Cooperative Marine Turtle Tagging Program (CMTTP), on the appropriate CMTTP form, at the University of Florida's Archie Carr Center for Sea Turtle Research.

Gulf sturgeon data (PIT tag scan data and external tagging data) shall be submitted within 60 days of project completion to NOAA, National Marine Fisheries Service, Protected Resources Division, 263 13th Avenue South, St. Petersburg, Florida 33701, or by fax: (727)824-5309; or by e-mail: takereport.nmfsser@noaa.gov, Attn: Dr. Stephania Bolden.

i. Handling Fibropapillomatose Turtles: NMFS-approved protected species Observers onboard a relocation trawler or hopper dredges are not required to handle or sample the viral fibropapillomatose tumors if they believe there is a health hazard to themselves and choose not to. When handling sea turtles infected with fibropapilloma tumors shall either: 1) clean all equipment that comes in contact with the turtle (tagging equipment, tape measures, etc.) with mild bleach solution, between the processing of each turtle or 2) maintain a separate set of sampling equipment for handling animals displaying fibropapilloma tumors or lesions.

j. Requirement and Authority to Conduct Tissue sampling for Genetic Analyses - Hopper Dredging/Trawling Relocation Only: All alive or dead sea turtles (with the exception of leatherback sea turtles) and Gulf sturgeon captured by relocation trawling or dredging shall be tissue-sampled prior to release by a NMFS-approved protected species Observer.

(1) Sea turtle tissue samples shall be taken in accordance with NMFS' Southeast Fisheries Science Centers' (SEFSC) procedures for sea turtle genetic analyses (included in the Environmental Compliance Appendix). Tissue samples shall be properly stored and mailed within 60 days of completion of dredging project, to NOAA, National Marine Fisheries Service, Southeast Fisheries Science Center, Attn: Lisa Belkis, 75 Virginia Beach Drive, Miami, Florida 33149.

(2) Gulf sturgeon tissue samples (i.e., fin clips or barbel clips) shall be taken in accordance with NMFS SERO's Protected Resources Division's Gulf sturgeon Tissue Sampling Protocol found at NMFS SERO PRD Website. Tissue samples shall be properly stored and mailed to SERO PRD (Attn: Dr. Stephania Bolden) within 60 days of dredging completion.

k. Equipment Lighting: During the sea turtle nesting season and emergence season May 1 to October 31, lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the water's surface and nesting beach while meeting all Coast Guard, COE EM 385-1-1, and OSHA requirements. Light intensity of lighting plants should be reduced to the minimum standard required by U.S. Coast Guard and/or OSHA for General Construction areas, in order not to misdirect sea turtles. Shields should be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area.

### 3.6 PROTECTION OF AIR RESOURCES

All fuel burning equipment shall be properly maintained to prevent violations of State or Federal Air Pollution Standards or interference with inhabitants of the area by causing drastic changes in their accustomed environment. If burning is required, the Contractor should obtain a burning permit from the local fire department, if necessary. Daily inspections will be made of all fuel burning equipment. Immediate corrective action shall be taken if exhaust emissions are found to be excessive.

### 3.7 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING DREDGING AND PLACEMENT ACTIVITIES

During the life of this contract, the Contractor shall maintain all facilities constructed for pollution control 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. During the dredging period the Contractor should conduct frequent training courses for his maintenance personnel. The curricula should include methods of detection of pollution, familiarity with pollution standards and measures for prevention or mitigation of environmental pollution.

### 3.8 SANITATION

The Contractor must provide suitable sanitation devices for the proper storage of all sanitary sewage. The Contractor shall ensure that all floating plant operates according to an approved waste management plan as required by 33 CFR Part 151. The dumping of sanitary sewage effluent and/or solids into the waters surrounding the job is strictly prohibited.

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SECTION 35 20 23.00 36

DREDGING  
04/04

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The descriptions and requirements below are general in nature and are supplied to allow the Contractor to develop a unit cost for dredging within the defined boundaries. For bidding purposes, it is the intent of the Government to issue a contract for deepening the Mobile Ship Channel in accordance with the specifications and drawings included herein. The work to be performed under this contract includes furnishing of all plant, labor, materials, and equipment and the performance of all work required for the construction of project improvements at Mobile Ship Channel in accordance with the contract drawings and specifications. The work includes dredging in the Mobile Ship Channel and the satisfactory disposal of all dredged materials. Allowable overdepth dredging is also included in the contract and will be paid for at the applicable required dredging rate.

1.2 REFERENCES

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

1.3 ORDER OF WORK

The Contractor shall control the order of work and shall submit a written order of work plan for the approval of the Contracting Officer's Representative prior to commencement of the work. This plan shall show the Contractor's delineated area to be used for disposal of dredged material from this work within the approved limits of the ocean dredge material disposal site (ODMDS) as shown on the contract drawings. The Contractor's Order of Work plan shall also include detail of the Contractor's operational method for dredging, dredged material transportation, and disposal method of all dredged materials. The Contractor shall determine the requirements for staging and fabrication areas for dredging equipment based on his proposed operational methods. Acquisition of real estate interests in any such area and/or required permits for the particular type land use shall be the sole responsibility of the Contractor, the Government being held harmless from any liability or legality of procurement, use, or restoration. Should the Contractor employ more than one dredge unit on the project, additional work locations shall be approved by the Contracting Officer's Representative. The Contractor shall give the Contracting Officer's Representative ten (10) days written advance notice of the date he plans to modify his order of work in order that required Government actions may be started sufficiently in advance of the Contractor's operations, including the installation of baselines and other survey controls.

#### 1.4 CHARACTER OF MATERIALS

##### 1.4.1 Logs of Borings and Laboratory Data.

The boring logs and lab data for this project are located in Appendix A of this specification. Locations of borings are shown within the contract drawings. The borings represent conditions at the time of drilling operations. The Contractor shall make his own interpretation(s) of this information in determining the character of materials to be dredged. All classifications of soils, both visual and laboratory, are in accordance with the Unified Soil Classification System, sompatible with ASTM D 2487.

##### 1.4.2 Materials to Be Removed

Material to be removed under this contract (within the required dredging prisms) includes O&M material and new work, previously undredged material. Additionally, some large and small debris, not indicated on the boring logs or contract drawings, may exist within the limits of the required work. The Contractor may also find that the material to be removed contains various non-soil substances such as fibrous debris (trees, roots, stumps, etc.), metal cables, wire, rubble, etc. Records of previous dredging, consisting of cross sections, history cards and/or general data on past contract dredging, are available at the Irvington Site Office of the Mobile District, Corps of Engineers, 7861 13th Street, Irvington, AL 36544, (251) 957-6019.

#### 1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. Submittals having an "OP" designation are to be submitted to the Operations Division, of the U.S. Army Corps of Engineers, Mobile District. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

##### SD-01 Data

Instrumentation data; G|OP

Written instructions, etc., to explain data format used for instrumented dredging equipment.

Surveys; G|OP

Before- and after-dredging surveys of project excavation limits.

Disposal Area Surveys; G|OP

Before- and after-disposal surveys of disposal areas.

##### SD-13 Certificates

Manufacturer's guarantee; G|OP

Accuracy of electronic positioning system for dredging surveys.

Order of Work Plan; G|OP

The Order of work plan shall include deposition plans and an electronic verification plan.

Survey Plan; G|OP

Written plan presenting the job survey effort.

Dredge Plant Instrumentation Plan; G|OP

Current Dredging Quality Management Certification

Accident Prevention Plan (App); G, OP

Quality Control Plan; G, OP

1.6 NOTICES

1.6.1 Start Work

The Contractor shall give the Contracting Officer's Representative five (5) days written advance notice of the date he plans to begin dredging work in order that required Government actions, such as the installation of baselines and other survey controls, can be started sufficiently in advance of the Contractor's operations.

1.6.2 Work Hours

Should the Contractor elect to work on Sundays, holidays, or at night, advance notice of this intent shall be given the Contracting Officer's Representative within a reasonable time, specifying both the dates and hours of the proposed work. Notification is not meant to restrict the Contractor, but to allow the government time to coordinate quality assurance inspections. Adequate lighting to facilitate thorough inspection of night operations shall be provided by the Contractor at no additional cost to the Government.

1.7 GENERAL SAFETY REQUIREMENTS

The requirements of this paragraph shall be made part of the Contractor's Accident Prevention Program submittal. The Contractor shall provide specific details of actions proposed to fulfill these requirements.

1.7.1 Accident Prevention Plan

The paragraph entitled "PRECONSTRUCTION CONFERENCE" of SECTION 01 00 00 requires an accident prevention program incorporating safety features and procedures from Engineer Manual EM 385-1-1, which are applicable to all aspects of the Contractor's dredging operations. In addition to these features, the following safety requirements shall be incorporated into the Contractor's accident prevention program. An accident prevention plan (app) describing the Contractor's accident prevention program shall be provided.

1.7.2 Plant Fleeting Area

The Contractor shall designate a plant fleeting area within which all idle components of plant equipment shall be stored. The area shall be marked

by "hazardous area" buoys, properly placed and marked with reflective tape to give adequate nighttime warning to mariners. In addition to these buoys, a lighted warning sign, as specified in Section 8.A. of EM 385-1-1, shall be prominently displayed on the equipment in the fleeting area. This sign shall be well lighted and have reflective borders. Multiple lengths of floating pipeline may be placed side-by-side within this fleeting area only if protected by a barge at each end, and shall not be placed in a manner so as to extend outside the barges. Floating pipeline within this fleeting area, not protected at each end by barges, may be placed in single rows and end-to-end only. The requirement for buoys and a lighted warning sign, as specified above, also applies to this configuration.

### 1.7.3 Dredge Pipeline Markings (Submerged and Floating)

Pipelines, for the purpose of critical markings, are defined as submerged and floating only. Submerged pipelines are defined as those that rest on, are positioned on, or are anchored to, the water column bottom at all times. Other pipelines are defined as floating for purposes of these markings requirements. These definitions apply whether there is dredge slurry flowing through the pipeline or not. Stored pipeline is covered elsewhere in this Section.

#### 1.7.3.1 Submerged Pipeline Markings

The location or position of the entire length of submerged pipeline shall be marked with signs, buoys, lights, or flags as required by the U.S. Coast Guard (USCG) and as approved by the Contracting Officer's Representative. Signs, buoys, and flags shall be constructed of, or coated with, reflective material that can be detected by marine radar and is easily visible when illuminated by a spotlight beam. The local USCG and U.S. Army Corps of Engineers (USACE) have agreed that the following marking elements are sufficient:

One row of signs, buoys, lights of constant yellow color and of intensity sufficient to be visible for at least one mile on a clear night, flags, or an appropriate combination of these, more or less equally spaced along the submerged pipeline length in sufficient number to define the alignment (length and course) of the pipeline.

#### 1.7.3.2 Floating Pipeline Markings

The position of the entire length of floating pipeline, both rubber and metallic, shall be marked with lights as required by the USCG and approved by the Contracting Officer's Representative. The local USCG and USACE have agreed that the following marking elements are sufficient and in accordance with 33 CFR 88.15:

a. one row of yellow lights, more or less equally spaced, which:

- (1). flash 50 to 70 times per minute;
- (2). are visible all around the horizon for at least 2 miles on a clear night;
- (3). are not less than 1 meter nor more than 3.5 meters above the water surface;
- (4). are sufficient in number to clearly show the pipeline's



alignment (length and course). The lights shall be spaced not more than 10 meters apart where a pipeline crosses a navigable channel (see paragraph below for further lighting requirements of channel crossings).

b. two red lights at each end of the pipeline length, which are:

(1). visible all around the horizon for at least 2 miles on a clear night;

(2). stacked 1 meter apart in a vertical line with the lower light at the same distance above the water as the flashing yellow lights along the rest of the pipeline.

#### 1.7.4 Pipelines Crossing Navigable Channels

At navigable channel crossings, pipelines may be either of two types, submerged or floating (floating crossings are further defined as fixed and non-fixed opening types):

##### 1.7.4.1 Submerged pipeline crossings

Submerged pipeline crossings shall meet the following requirements.

a. The pipeline shall be configured in such a fashion (joints, bends, etc.) that it allows a safe passageway to usual vessel traffic with dimensions equal to or greater than the project channel dimensions (bottom width, side slopes and depth);

b. The pipeline must have two lights at each side of the safe passageway, which are:

(1). visible all around the horizon for at least 2 miles on a clear night;

(2). stacked 1 meter apart in a vertical line with the lower light not less than 1 meter nor more than 3.5 meters above the water surface; and

(3). of red color matching the standard USCG channel marking convention.

##### 1.7.4.2 Floating Pipeline Crossings

Floating pipeline crossings shall meet the following requirements:

Fixed, non-opening, drop loop crossings shall have two red lights stacked at each side of the safe passageway which meet the requirements of 1.7.4.1.b.(1)., 1.7.4.1.b.(2) and 1.7.4.1.b.(3) above, and have depth and width of the loop equal to or greater than the channel project dimensions.

Non-fixed, opening type crossings shall have two stacked red lights at each side of the to-be-presented safe passageway, which meet the criteria of 1.7.4.1.b.(1) and 1.7.4.1.b.(2) above, and have the capability to be quickly disconnected (opened), on proper notice by approaching traffic, to allow safe vessel passage.

#### 1.7.5 Plant Inspection

All plants, in use or idle, shall be inspected at least once per shift by the Contractor inspector to assure that buoys, signs, and lights are in place and that all lights are operating properly. Daily reports by the Contractor shall identify inspection personnel and indicate the time of inspection of plant in use and in storage within the fleeting area. An adequate number of reserve batteries and lights shall be stored on the dredge(s) or on other readily accessible plant equipment at all times in order that non-functioning lights can be repaired or replaced.

#### 1.7.6 Public Awareness

The Contractor shall facilitate public awareness of potential navigation hazards presented by dredge operation and plant storage within the fleeting area by ensuring that announcement of the beginning of work is carried by local newspapers, radio and television stations, and waterway user association publications. Details provided in the announcement shall include beginning date, work schedule, work location, fleeting area location, and recommended boat operation in the vicinity of work areas. Periodic work updates and/or status announcements shall be made whenever necessary and at least on a monthly basis throughout the term of this contract. The Contractor shall provide and maintain sturdy and prominently displayed "Warning Signs" at all public boat marinas within ten (10) miles of the dredging operations and plant fleeting area. The warning signs shall be constructed as prescribed on the drawing entitled "Warning Sign" bound herein. The signs shall have red lettering and castles on a white background with a red reflective border. The information provided on the signs shall be similar to that indicated on the drawing and shall include locations of dredging operations and plant fleeting areas, as applicable. The Contractor shall be responsible for keeping the warning signs updated with appropriate information identifying all active work sites under this contract.

### 1.8 SPECIAL SAFETY REQUIREMENTS

The requirements of this paragraph shall be made part of the Contractor's Accident Prevention Program submittal. The Contractor shall provide specific details of actions proposed to fulfill these requirements.

#### 1.8.1 General

As a part of the Accident Prevention Program submittal, the Contractor shall provide documentation of the "indoctrination" safety briefing for the particular job to be performed by each employee as referenced in Sections 01.B. of EM 385-1-1. This documentation shall include the employee's name, job title, date(s) of safety briefing, and subject(s) of each briefing. When an employee changes jobs, another "indoctrination" safety briefing for the new job shall occur, with the documentation appropriately updated. The Contractor shall ensure that every employee receives appropriate "on-the-job" safety briefings on the first day the employee returns from off-tour time, and regular safety briefings at least every seven (7) days for all on-tour employees. Applicable portions of Sections 01.B. of EM 385-1-1 are referenced. All such briefings shall be documented on the daily Contractor's Quality Control Report (QCR). The Contractor shall ensure that every supervisor located at the job site(s) attends a "staff" safety meeting held at least monthly. The purpose of these safety meetings shall be to review, plan, and establish safety activities for this project. Applicable portions of Sections 01.B. of

EM 385-1-1 are referenced. Documentation of these meetings shall include the employees' names, job titles, dates of meetings, topics covered, summary of actions, and other appropriate information. All such meeting documentation shall be furnished as an attachment to the daily Contractor's Quality Control Report within three (3) days after the meeting. The Contracting Officer's Representative shall be notified of all safety briefings and meetings, and may attend any "indoctrination" safety briefing, "on-the-job" safety briefings or "staff" safety meetings. These briefings and meetings shall be conducted throughout all phases of this contract and shall include the Contractor and subcontractors.

#### 1.8.2 Accident/Incident Investigation and Reporting

The Contractor shall designate a specific company officer as the investigating official referenced by Section 1 of EM 385-1-1. The investigating official shall attend the pre-construction conference. The investigating official's name and other pertinent information including company position, qualifications, experience, and training shall be listed in the Contractor's Accident Prevention Program when submitted for approval. All accidents and incidents shall be personally investigated by this official in accordance with the requirements of EM 385-1-1, and the requirements specified herein and at the pre-construction conference. The investigation official shall sign Block 15.c. of the ENG Form 3394 attesting to his personal participation in the accident or incident investigation process, the accident or incident cause analysis, and the accident or incident cause elimination plans anticipated or recommended. The completed, typed original of ENG Form 3394 shall be submitted to the Contracting Officer's Representative within 24 hours of the accident or Incident. All accidents and incidents shall be immediately reported to the Designated Government Representative. Accident and incident management shall be emphasized and will be further discussed at the Pre-Construction Conference.

#### 1.8.3 Critical Lift Operations with Hoisting Equipment

All hoisting equipment used on this contract shall be performance- and operation-tested in accordance with EM 385-1-1. The planning and conduct of these tests shall be documented using the CRITICAL LIFT PLAN in accordance with EM 385-1-1. These tests shall be conducted for any CRITICAL LIFT OPERATION, i.e., when any one of the following conditions exists:

- (a) Load to be lifted exceeds the original TEST LOAD (TEST LOAD or PERFORMANCE LOAD TEST is made at the beginning of the particular hoisting equipment's start-of-work on this contract).
- (b) The operator will lose sight of the load during lift operation
- (c) The lift operation requires two or more signal persons.
- (d) The rigging procedures to be used on the lift operation are considered unusual.
- (e) The operator or supervisor believes the lift operation should be considered CRITICAL.

The Contractor shall ensure that hoisting equipment operators have been proven competent prior to employment on this contract. A Resume' of each

operator's competence (experience, training, etc.) shall be made part of the Contractor's Quality Control Plan referenced elsewhere in this specification. Hoisting equipment performing duty cycle activities shall undergo the critical lift operation testing procedure for each distinct type of duty cycle activity (dragline activity, clamshell activity, etc.) involved. When any of the conditions under which the original critical lift operation test was conducted for a piece of hoisting equipment changes, another critical lift operation test shall be planned, conducted and documented for that equipment. All documentation for critical lift operation tests shall become part of the permanent contract safety files. All actions specified in the paragraph entitled "General Safety Requirements" shall be part of the Contractor's Accident Prevention Program submittal. The Contractor shall provide specific details of actions proposed to fulfill these requirements.

#### 1.9 INSPECTION OF PLANT

The dredge plant shall be inspected by the Contractor and will be inspected by the Contracting Officer's representative to insure that all dredging plant required under the contract has been mobilized and is in safe working condition.

##### 1.9.1 Contractor's Obligation to Inspect

Before any mechanized equipment is placed in service, it shall be inspected and tested by the Contractor and certified to be in safe operating condition using the Safety Survey Checklist for Floating Plant and the Safety Inspection Checklist for Mobile Construction Equipment forms as prescribed by EM 385-1-1. Records of these tests and inspections shall be provided to the Government prior to Government inspection and shall be maintained at the site by the Contractor.

##### 1.9.2 Government Safety Inspection

Upon completion of mobilization, before starting work, and after the checklist forms are provided to the Government, a safety inspection will be conducted by the Government. The safety inspection will be conducted using the checklists as a guide to denote any deficiencies. Inspections performed by the Government do not relieve the Contractor of his responsibility to perform his own inspections of plant to assure a safe working environment at all times in accordance with contract specifications, EM 385-1-1 and his Accident Prevention Plan.

##### 1.9.3 Hopper Leakage Test

During the safety inspection, the dredge will be required to take on water equivalent to the hopper capacity. In order for the dredge to begin work, it must have no more than a 5% loss in a one hour period. This test may be performed again at any time during the contract when an indication of leakage exists. Should the dredge fail said test, no dredging will take place until the leakage is repaired.

##### 1.9.4 Clearance to Begin Work

Upon completion of the Government's safety inspection, a list of deficiencies, if any, will be given to the Contractor for corrective action. If, in the opinion of the Contracting Officer's Representative, the plant is unsafe or does not meet the terms of the specifications, clearance to begin work will be withheld. In the absence of deficiencies,

the plant will be released to begin work. Inspections performed by the Government do not relieve the Contractor of his responsibility to perform his own inspections of plant to assure a safe working environment at all times in accordance with contract specifications, EM 385-1-1 and his Accident Prevention Plan.

#### 1.9.5 USCG Operator's License

If Dredge (or other marine construction) Plant operation support workboat operators are moving dredge equipment, supplies, personnel, etc. in/at the immediate dredging site, i.e., from one side of the channel to the opposite side, or to/from a shore staging area located not more than approximately ½ mile from the dredge work location/operation and always within sight of the dredge operator, then the work boat operator need not be the holder of a USCG Operator's license. However, if the workboat moves equipment, personnel, supplies, etc., or proceeds "light boat", any significant distance beyond the immediate dredge work location/site, particularly over congested, busy waterways and/or out of sight of the dredge operator, an appropriate licensed operator (must possess a current USCG Operator's License) must be in control of the vessel operation. References: EM 385-1-1 Section 19 Paragraph 19.A.02 b., Volume III of the USCG Marine Safety Manual Section 24.B.3, 46 USC 8904.

#### PART 2 PRODUCTS (Not Applicable)

#### PART 3 EXECUTION

##### 3.1 DREDGING

###### 3.1.1 General

Dredging under this contract shall include removal, transportation, and satisfactory disposal of dredged materials described herein and shown on the contract drawings. Dredging limits shown on the contract drawings were determined based on surveys current during the development of these specifications. The following web site links contain files of the most recent hydrographic surveys for the channel. These surveys and data are provided for information only and may not reflect the current conditions.

Mobile Ship Channel

<https://www.arcgis.com/apps/opsdashboard/index.html#/4b8f2ba307684cf597617bf1b6d2f85d>

###### 3.1.2 Required Dredging

The contract prices shall include the cost of performing the work described below and shown on the contract drawings. Required dredging under this contract includes all material lying within the designated side slopes of one foot vertical to five feet horizontal (1V to 5H) originating at the plane of elevation -52 feet MLLW from Station 625+00 to Station 950+00, at the widths shown on the contract drawings.

###### 3.1.2.1 Side Slope Excavation

Side slope material will be required to be removed when designated as such. Material that is actually removed, within the required dredging limits to provide for final side slopes no flatter than as designated, but not in excess of the amount originally lying above this required dredging limiting side slope, will be estimated and paid for (as applicable),

whether dredged in the original position or by dredging "storage space" below the required side slope plane, at the bottom of the slope, for upslope material capable of falling into the cut. This "storage space", excavated in anticipation of upslope face material falling thereinto, is not subject to the above depth and width overdredging restrictions (if applicable), as long as it is reasonable. The Contractor should refer to the typical section included in the contract drawings for the required dredging, allowable overdepth, and allowable maintenance limits.

### 3.1.3 Allowable Overdepth

To accommodate the imprecision of the dredging process, material removed from within the Mobile Ship Channel alignment limits to a depth of 2 feet below the depth of required dredging will be estimated and paid for at the contract unit price for new work dredging. Side slopes for allowable overdepth will be 1V:0H. The Contractor shall not exceed 2 feet of allowable overdepth dredging.

### 3.1.4 Dredge Material Overflow

Overflow will be limited to forty-five minutes per load unless otherwise approved by the COR. This slurry shall not overflow transport vessel sidewalls while in transit, nor shall it be dumped (or pumped) from the vessel except when placed directly at an authorized disposal area. Mechanical dredge bucket dripping occurring between the excavation point and deposition into dump scows will not be considered overflow.

### 3.1.5 Excessive Dredging

Material removed from beyond the dredging limits shown on the contract drawings shall be considered excessive dredging for which payment will not be made. Payment will be made for removal of shoals performed in accordance with the applicable provisions of the Additional Special Contract Requirements paragraph entitled "FINAL EXAMINATION AND ACCEPTANCE".

## 3.2 DISPOSAL OF DREDGED MATERIALS

### 3.2.1 General Requirements

All excavated material shall be transported to, and disposed of, in the proper disposal areas as described below. The Contractor shall develop disposal procedures based on these requirements. Costs associated with the requirements of disposal of dredge materials shall be included in the Bidding Schedule unit prices for dredging.

### 3.2.2 Deposition Plan

A deposition plan, based on the requirements and limitations specified hereinafter, shall be submitted by the Contractor (as a part of the requirements in the paragraph entitled "ORDER OF WORK") to the Contracting Officer's Representative for approval prior to disposal of any dredged material under this contract. The Contractor shall delineate within the approved limits of the ODMS, as shown on the contract drawings all areas to be used for disposal of dredged material from this work. The Contractor's deposition plan shall include location and methods of disposal of all dredged material from this contract. The Contractor's disposal plan shall be completely explanatory and shall include all assumptions, statements of fact, computations, and a narrative to fully

explain the procedures to be followed during the contract in compliance with the specified method of disposal of dredged material. The Contractor's deposition plan shall address each different disposal situation and include any required monitoring, preparation, or operation and maintenance actions involved. Bids received will be based on using the disposal areas described below.

### 3.2.3 Plant Equipment Layout

The Contractor shall be responsible for selection of a method of construction and/or plant equipment layout that will not cause a hazard to existing navigation nor unduly restrict marine traffic, particularly in the marked navigation channels and the adjacent private docking/mooring fairways.

### 3.2.4 Dredge Material Disposal Areas

The Contractor shall delineate within the limits of the ODMDS as shown on the contract drawing sheet CN109 all areas to be used for disposal of dredged material from this work. The Contractor shall ensure deposition is within the limits of the ODMDS and the Contracting Officer's approved delineated disposal boundary. Disposal shall occur no less than 330 feet inside the site boundaries of the ODMDS as shown on the contract drawings. Dredged material shall be placed so that at no point will depths less than -30 feet mean lower low water (MLLW) occur (i.e., a clearance of 30 feet above the bottom will be maintained).

### 3.2.5 Misplaced Dredged Materials

Any dredged materials deposited at locations or elevations other than those designated or approved by the Contracting Officer's Representative shall be considered misplaced material and shall not be paid for until the Contractor, at his expense, removes and redeposits such misplaced material where directed. Misplaced material will be quantified by volumes calculated from hydrograph surveys and/or DQM measurements. Required removal and redeposit of the misplaced material and any necessary disposal site restoration work shall not be the basis for a time extension or additional compensation under this contract. The Contracting Officer may elect to waive the removal and replacement of misplaced material. If so, material dumped outside the limits of the disposal area will not be eligible for payment.

### 3.2.6 Disposal of Debris and Obstructions

Debris, such as stumps, roots, logs, and any other objects except archeological or historical resources unearthed during dredging operations shall be removed, transported, and satisfactorily disposed of within an upland off-site disposal area secured by the Contractor. Archeological and historical resources shall be addressed as specified in Environmental Protection Paragraph entitled "RECORDING AND PRESERVING HISTORICAL AND ARCHEOLOGICAL FINDS". Removal and disposal of debris and obstructions shall not be measured separately for payment but shall be considered subsidiary to dredging. Removed debris may be temporarily stored until the upland off-site disposal area has been secured by the Contractor. Debris disposal areas shall be approved by the Contracting Officer's Representative prior to use by the Contractor. All costs associated with the required disposal of debris shall be included in the contract unit price for dredging in the Bidding Schedule.

### 3.2.7 Disposal Operation Verification

#### 3.2.7.1 General

For the transport and deposition of dredged materials, the Contractor shall operate under the requirements of SECTION 35 20 23.13, NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SCOW - ULLAGE PROFILE, SECTION 35 20 23.23, NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM HOPPER DREDGE, and SECTION 35 20 23.33, NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM PIPELINE HYDRAULIC DREDGE.

#### 3.2.8 Turbidity Monitoring

The contractor shall monitor turbidity in the work area throughout the life of the contract to ensure the Contractor complies with permit requirements. Turbidity shall be taken once daily, beginning at least two hours after dredging begins during daylight dredging and disposal activities. The Contractor shall utilize a turbidity meter equivalent to the HACH 2100 Portable Turbidimeter for this purpose. Suspension of work resulting from this monitoring shall not be a basis for increase of the contract price or contract duration. Turbidity reports shall be submitted daily to the government representative.

### 3.3 REPORTING REQUIREMENTS

The Contractor shall prepare and submit a Report of Operations and a Contractor's Quality Control (CQC) Report daily. The reports shall be developed in accordance with SECTION 01 45 00.15 10. The Contractor reports shall be prepared for all dredging work activities. A sample of each form for recording the required information is bound herein. In addition to the two daily dredging reports required, the Contractor shall submit a monthly report of operations covering each month or partial month's work on the ENG No. 4267 and/or 27a. The monthly reports shall be submitted to the Contracting Officer's Representative on or before the seventh (7th) day of each month, consolidating the previous month's work. Upon completion of the contract, the Contractor shall submit a consolidated job report, combining the monthly reports. These reports shall be submitted in duplicate, the original and one copy. The Contractor shall complete a narrative completion report combining all reports (696's, 4267's, etc.). The report shall be maintained throughout the life of the project. A draft shall be submitted bi-monthly, with the final narrative completion report being submitted at the end of the contract. The draft and final versions shall be submitted in electronic and hardcopy forms.

#### 3.3.1 Contractor Construction Quality (CCQ) Management

The CCQ System Manager and designated alternates shall have completed the instruction course entitled "Construction Quality Management for Contractors". This course is offered periodically throughout the year at various COE Districts. Upon successful completion of this course, a training certificate, with an expiration date five years from issue, will be awarded to participants. This certification shall be obtained not later than 60 calendar days after the issuance of Notice to Proceed. All costs associated with acquisition of this certification shall be borne by the Contractor.



### 3.4 DREDGING SURVEYS

#### 3.4.1 General

The Government will furnish survey and dredging layout data for each dredging area tangent prior to any dredging. The data will be discussed at the pre-construction conference.

#### 3.4.2 Survey Plan

The Contractor shall prepare and submit for approval of the Contracting Officer's Representative, a written survey plan, presenting the project survey effort from start to completion. The plan shall cover, as a minimum, layout work including baseline control, progress surveys, and monitoring surveys. The plan shall include details of all equipment used for surveying as well as a step by step process of survey efforts. This plan shall coincide with the order of work plan required by the paragraph entitled "Order of Work." The Contractor's survey plan shall show a percentage breakdown of each type of survey phase (baseline control, progress surveys, etc.) of the total survey effort for the project.

#### 3.4.3 Layout of Work

All surveys for baselines, hydrographic survey ranges, cutting ranges, and other necessary survey work shall be performed by standard survey methods as referenced in the paragraph entitled "Soundings." All baselines and markers, whether land or water based, shall be related to existing land based survey markers using coordinate positions furnished by the Government. All such survey work shall be clearly and completely recorded in standard bound field books, and shall be made available for inspection and verification by representatives of the Government. Upon or before completion of the requirements of this contract, the field books and computations shall become the property of the Government. The Contractor shall furnish all electronic positioning and surveying equipment, stakes, poles, flagging, field books, compact discs, and other survey materials and engineering work required for the layouts. Costs associated with the required layout of work and positioning surveys, and all data compilation and computations shall be included in the Bidding Schedule contract unit price for dredging.

#### 3.4.4 Electronic Positioning

While making required surveys, the Contractor shall use an electronic horizontal positioning system (see Section 01 00 00 paragraph entitled "Datum and Bench Marks"). The positioning system shall be range/range, range/azimuth, GPS, DGPS, etc., with manufacturer's guarantee of positional error not greater than 3 meters at any time after calibration.

#### 3.4.5 Quality Control

The Contractor shall establish and maintain a quality control plan for surveying operations to assure compliance with contractual requirements. The Contractor shall maintain records of quality control qualifications for survey personnel. These records shall include, but not be limited to, the following requirements:

- (a) Survey work shall be performed in accordance with the USACE Hydrographic Surveying Engineering Manual, EM 1110-2-1003. The manual can be found at the following link:

<https://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/u43544>

Sole responsibility for accuracy, completeness, and verification of all survey work performed during execution of this contract, with the exception of the initial and final quantity surveys performed by the Government, shall rest with the Contractor.

(b) Daily reports shall be submitted by the Contractor for days when surveying activity is required. The reports shall be prepared and signed by the Contractor's authorized representative. Report submittal to the Contracting Officer's Representative shall be on the duty day following the surveying activity. The reports shall include, but not be limited to, the following: equipment used; location, description, and type of work performed; inspection(s) of work; verbal instructions received and action(s) taken; safety procedures; and cause(s) of delays. All daily reports shall be prepared on SAM Form No. 696 (copy attached hereto).

(c) The Contractor shall be responsible for protection of all vegetation and property within surveying areas. Should any portion of the survey work area require tree trimming or cutting, or use of private property or facilities for any purpose, the Contractor shall obtain specific written consent from the affected property owner(s) prior to commencing any survey work within that area. The Contractor shall save and hold harmless the Government from any liability in connection with required survey activities.

(d) All survey work shall be subject to periodic inspection and verification by the Government, both during and after completion of such work. Should any portion of the surveys be found in error, it shall be the responsibility of the Contractor to correct such error at no cost to the Government. In the event that dredging operations have proceeded based on erroneous survey information, any necessary redredging shall be done at the Contractor's expense. The Contractor should perform verification calculations and calibrations of the survey data furnished by the Government prior to using that data for dredging purposes. All verification and calibration calculations shall be the sole responsibility of the Contractor. Presence of the Government representative at the work site shall not relieve the Contractor of responsibility for providing quality control of the required survey work and shall not relieve the Contractor from the responsibility of taking necessary corrective action should errors be discovered that necessitate redredging. The final determination of acceptable and unacceptable dredged channel sections will be made by the Contracting Officer's Representative.

#### 3.4.5.1 Surveys For Disposal Areas

The Contractor shall perform before- and after-disposal hydrographic condition surveys along repeatable ranges covering the portion of the disposal area to be used for this contract and adjacent bottom within the limits specified herein. The required before and after condition surveys shall be referenced to MLLW. Before- surveys shall be performed within 15 days prior to commencement of disposal operations; the after-, within 5 days of completion of disposal operations at the disposal area. The surveys shall be oriented with ranges (cross sections) spaced four hundred (400) feet apart and extending five hundred (500) feet beyond the approved disposal area limits for this contract. Surveys for open water disposal

areas or monitoring areas, baselines, hydroranges, cutting ranges and all other necessary surveys shall be performed by standard survey methods as referenced in subparagraph (a) of the paragraph entitled "Quality Control" in this specification section. Depths shall be recorded at 25-foot intervals or less, to a vertical accuracy of 0.5 foot or less. The tide shall be observed and recorded at the beginning and end of surveys and each half hour during surveys. Tide elevations shall be read and recorded to the nearest 0.1 foot. All baselines and all markers, whether land or water based, shall be referenced to existing land based survey markers using channel centerline coordinates furnished by the Government. All poles, stakes, flagging, books, compact discs, and/or other survey materials shall be furnished by the Contractor. The Contractor shall submit the survey data in "raw" hardcopy form (fathometer charts, books, scrolls, etc.), plotted form, and in digital form on compact discs within five (5) working days of completion of the surveys. The data furnished on compact discs shall include Microstation CADD drawing files from which hardcopy drawing plots were made. These books and/or compact discs shall, upon or before completion of the requirements of this contract, become the property of the Government. All costs associated with the required surveys and data compilation shall be included in the unit price for dredging.

### 3.5 SOUNDINGS

Soundings for the original and final surveys for the dredged areas as required by the paragraphs entitled "DISPOSAL OF DREDGED MATERIAL" and "DREDGING SURVEYS" in this specification section shall be made by an electronic sounding device. The electronic sounding device shall be similar and equal to the Teledyne Odom Echotrak MKIII echo sounder fathometer depth recorder. All before- and post-dredging quantity computations will be based on high frequency surveys, unless otherwise directed by the Contracting Officer Representative. Automated hydrographic survey data acquired by the Contractor shall be furnished to the Government on compact discs in the form of CADD drawing files in Microstation format. Costs associated with the required soundings and data compilation will be included in the unit price for dredging.

#### 3.5.1 Sounding Equipment

The sounding equipment will consist of a sounding machine/device capable of providing updated soundings on no more than 1/20 second intervals and have an accuracy rating of not less than +/-0.5 feet. Sounding device will have analog charting (real time) within the device and will have all the capabilities of calibrating to a bar check utilizing the Norfolk Method of bar checking. All depths acquired will consist of dual frequency soundings utilizing a high operating 208 Khz frequency transducer and a low operating 41 Khz or 24 Khz frequency transducer. The high frequency soundings will be shown in conjunction with the 41 kHz soundings on the analog chart of the sounding device. All soundings will be acquired on a continuous basis with plotting of data based on the scale and size of the plot and in clearly legible print.

#### 3.5.2 Acquired and Processed Data

The survey system employed shall use a computer and software capable of handling all required data points and the plotting of those points. If the Contractor is utilizing HYPACK to perform required surveys, the Contractor shall submit the HYPACK project files for the specific survey performed. These files contain all the files that make up the survey,

including raw and edited line, log, and tide files associated with each survey, among others. Otherwise, the Contractor shall utilize a system capable of acquiring or converting all unedited raw data (horizontal and vertical) to an IBM ASCII-compatible format prior to submittal to the Government. The ASCII format shall be compatible with the MS DOS Operation system. Sounding files shall contain single line records. Each record shall contain the easting, northing, elevation, date, and time for one sounding. Items in each record shall be separated by space characters (ASCII 32 (10)) and records shall be terminated by a line feed with carriage return. Sounding files shall be no greater than 1.2 MB in size and shall contain the data for no more than 99 section lines. All records shall conform to the format below:

East	North	Elevation	Date	Time
123456.78	876543.21	-42.3	01/15/91	14:22:13.3

The survey system shall provide a means of plotting all data points for submittal in hard copy form according to the requirements listed herein. Routine/verification surveys shall be submitted within 24 hours of the survey and larger surveys shall be submitted within 48 hours of the survey. All plots shall be submitted on full size 22" x 34" (ANSI 'D' size) plot paper or half size, 11" x 17" if approved by the Contracting Officer's Representative, and shall include not less than the following: all navigation aids; a north arrow; station data (corrected to MLLW); date of survey; grid ticks; surveyor's name; vessel name; channel lines and any other pertinent information. The scale of plan view plots shall be 1" = 200' and of cross-sectional plots as specified by the Contracting Officer's Representative. Plan view plots shall delineate actual vessel track along the route taken and display depths acquired along the route at a clearly legible text size. Cross-section plots shall display the channel dimensions in a template format. Data files shall be provided on compact discs in the format previously specified and in unedited form. All hard copy submittals shall consist of edited data with all supporting field notes and scrolls. The Contractor's proposed digital data shall be submitted at the Preconstruction Conference for approval by the Contracting Officer's Representative.

### 3.5.3 Compilation of Processed Data

A compilation of all digital data (surveys, dredge electronic tracking, etc.) collected over the life of the contract by the Contractor shall be consolidated on a CD, or multiple CD's if necessary, indexed in orderly fashion, e.g. type survey (D/A, channel, etc.), such that the overall data collection effort can be easily followed. The Contractor's proposed digital data CD indexing structure shall be submitted at the Preconstruction Conference for approval by the Contracting Officer's Representative. The Contractor shall submit the compiled digital data CD(s) at the completion of the contract.

### 3.6 NAVIGATION AIDS

If necessary, navigation aids located within or near the areas required to be dredged will be removed by the USCG in advance of dredging operations. Relocation of navigation aids shall be discussed and scheduled with the USCG at the pre-construction conference.

-- End of Section --

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SECTION 35 20 23.13

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM  
SCOW - ULLAGE PROFILE

20 October 2020

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the scow's status at all times during the contract and to manage data history. For the purpose of these specifications, a scow is defined as any non-self-propelled vessel used to transport dredged material. This includes, but is not limited to, split-hull scows, pocket scows, hopper barges, and deck barges.

This performance-based specification section identifies the minimum required output and the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office responsible for review of the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00, "SUBMITTAL PROCEDURES":

SD-07 Certificates

- Letter of National Dredging Quality Management Program Certification; G, OP

1.3 PAYMENT

No separate payment shall be made for installation, operation, and maintenance of the DQM-certified system as specified herein for the duration of the dredging operations; all costs in connection therewith will be considered a subsidiary obligation of the Contractor and covered under the contract unit price for dredging in the bidding schedule.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from DQM for the scow instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (<http://dqm.usace.army.mil/Specifications/Index.aspx>), Compliance with these criteria shall be verified by onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. If a system is installed specifically for this contract, in order to ensure that it is capable of transmitting quality data to the DQM database, the QA checks should take place either prior to the start of the contract or, with prior approval of the local USACE District, as soon as practical

after dredging commences. DQM Certification is valid for one year from the date of certification and is contingent upon the system's ability to meet the performance requirements as outlined in Paragraph 3.3, "Performance Requirements." If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the Data Acquisition and Analysis Team may be necessary.

Annual DQM Certification shall be based on the following:

A series of QA checks as outlined on the DQM website  
(<https://dqm.usace.army.mil/Certifications/Index.aspx>)

Verification of data acquisition and transfer as described in  
Paragraph 3.3, "Performance Requirements"

Review of the Dredge Plant Instrumentation Plan (DPIP) as described in  
Paragraph 1.5, "Dredge Plant Instrumentation Plan (DPIP)"

The Dredging Contractor shall have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The Dredging Contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. The Dredging Contractor shall also have on site for the QA checks a tug capable of towing the scow. As a general rule, DQM Data Acquisition and Analysis Team personnel will come with personal protective equipment (PPE) consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed - such as eye protection, safety harnesses, work gloves, or personal location beacons - these items shall be provided to the team while on site. The Contractor shall submit a test data package to the DQM database from the system on each scow and have it accepted by the DQM Support Center prior to scow compliance checks. The Contractor shall also submit data collected during the QA Checks from the scow monitoring system to the DQM database and the Data Acquisition and Analysis Team personnel while on site. It is the Dredging Contractor's obligation to inform the QA team if the location designated for the QA checks has any site-specific safety concerns prior to their arrival on site.

The owner or operator of the scow shall contact DQM at [DQM-AnnualQA@rpsgroup.com](mailto:DQM-AnnualQA@rpsgroup.com) on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule QA checks. This notification is meant to make the Data Acquisition and Analysis Team aware of a target date and the contract on which the plant will be used. At least one week prior to the target date, the Dredging Contractor shall contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor shall then follow up this conversation with a written email confirmation. The owner/operator shall coordinate the QA checks with all local authorities including, but not limited to, the local USACE Contracting Officer's Representative (COR).

Recertification is required for any yard work which produces modification to displacement (for example, a change in scow lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions or addition or subtraction of structure), or changes in sensor type or location; these changes shall be reported in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain certification during this period, the system sensors or hardware should not be disconnected or



removed from the scow. If the system is powered down, calibration coefficients shall be retained.

#### 1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor shall also maintain on the dredge a copy of the DPIP which is easily accessible to Government personnel at all times. This document shall describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed scow-specific data and how the sensor data will be transmitted to the DQM database shall also be included. The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to start of work.

A complete list of the required DPIP contents is provided on the DQM website (<https://dqm.usace.army.mil/Certifications/Index.aspx>). The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to the start of work. Any changes to the computation methods shall be approved by the DQM Support Center prior to their implementation.

#### PART 2 PRODUCTS (Not Applicable)

#### PART 3 EXECUTION

##### 3.1 REQUIREMENTS FOR REPORTED DATA

The Contractor shall provide, operate, and maintain all hardware and software to meet these specifications. The Contractor shall be responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.

Repairs shall be completed within 48 hours of any sensor failure. Upon completion of a repair, replacement, installation, modification, or calibration the Contractor shall notify the Contracting Officer's Representative (COR). The COR may request recalibration of sensors or other hardware components at any time during the contract as deemed necessary.

The Contractor shall keep a log of sensor repair, replacement, installation, modification, and calibration in the onsite copy of the DPIP. The log shall contain a three-year history of sensor maintenance, including the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It shall also contain the name of the person responsible for the sensor work.

Sensors installed shall be capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs.

With the exception of position and any value calculated, reported sensor values should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. The

averaging routine used should be consistent across all event triggers. This information should be documented in the DPIP sections that say "Calculations done external to the instrumentation."

These data-reporting requirements cover the collection of electronic data on a scow through the entire dredging cycle. Disposal events can consist of both open-water disposal and offloading. Open-water disposal is the placement of material via bottom doors or split hull. Offloading is the placement of material via either hydraulic or mechanical means.

#### 3.1.1 Scow Name

Each scow shall be assigned a unique name that will remain constant from one dredging operation to the next.

#### 3.1.2 Contract Number

The USACE-assigned contract number for the project will be reported.

#### 3.1.3 Load Number

A DQM load number shall document the end of a disposal event for a given scow.

#### 3.1.4 Horizontal Positioning

Horizontal positioning shall be recorded as the geographic coordinates of the vessel as indicated by the location of the Global Positioning System (GPS) antenna. All locations shall be obtained using a positioning system operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

#### 3.1.5 Date and Time

The date and time shall be reported to the nearest second and referenced to Universal Time Coordinated (UTC) based on a 24-hour format: yyyy-mm-dd hh:mm:ss.

#### 3.1.6 Hull Status

Hull status is meant to reflect a condition when material could be removed or released from the scow.  
*For this contract, hull status shall register closed prior to leaving the disposal area.*

##### 3.1.6.1 Open-Water Disposal

An open split hull or open bottom door of a scow shall be indicated by reporting an "OPEN" value. A closed split hull or closed bottom door of a scow shall be indicated by reporting a "CLOSED" value. An open status shall be indicated as the bin starts to open, and a closed status shall be indicated only once the bin is fully closed. For pocket scows, the open/closed status shall correspond to the compartment which is first to open and last to close.

### 3.1.6.2 Offloading

For non-dumping scows, an "OPEN" value shall indicate that the bin is in the process of being unloaded, either by pumping or mechanical means.

### 3.1.7 Course

Scow course-over-ground (COG) shall be provided using industry-standard equipment. The Contractor shall provide scow course-over-ground (to the nearest whole degree) with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

### 3.1.8 Speed

Scow speed-over-ground shall be provided in knots using industry-standard equipment with a minimum accuracy of 1.0 knot and resolution to the nearest 0.1 knot.

### 3.1.9 Heading

Scow heading shall be provided using industry-standard equipment. The scow heading shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

### 3.1.10 Draft

All reported draft measurements shall be in feet, tenths, and hundredths with an accuracy of +/- 0.1 foot relative to observed physical draft readings. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). The reported forward draft value shall be equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value shall be equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Sensors shall be placed at an optimum location on the scow to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, significant digits for average draft shall be maintained such that if forward draft were 0.15 and aft draft were 0.1, then the average draft would be 0.125.

### 3.1.11 Displacement

Scow displacement shall be reported in long tons, based on the most accurate method available for the scow. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement shall be 1027 kg/cubic meter and shall be used for an additional interpolation between the fresh and salt water tables.

### 3.1.12 Bin Ullage Sounding

All reported ullage soundings shall be in feet, tenths, and hundredths with an accuracy of +/- 0.1 foot with respect to the combing and be

representative of the forward and aft extents of the hopper as close to the centerline as is possible. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). If sensors must be offset from the centerline of the bin, they should be offset to opposite sides of the vessel. Forward ullage, aft ullage, and average ullage soundings will be reported. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average ullage is calculated for the purpose of determining the hopper volume, significant digits for the average ullage shall be maintained such that if the forward ullage were 0.15 and aft ullage were 0.1, then the average ullage would be 0.125. Special arrangements for pocket scows may be made in consultation with the DQM Support Center.

### 3.1.13 Bin Volume

Scow bin volume shall be reported in cubic yards based on the most accurate method available for the scow. The minimum standard of accuracy for bin volume is interpolation from the bin volume table based on the average ullage soundings.

## 3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system shall be capable of collecting, displaying, and transmitting information to the DQM database. The parameters which shall be reported to the DQM database include trip number, date and time, hull status, scow course, scow speed, scow heading, draft, displacement, ullage, and bin volume. An easily accessible, permanent visual display on the scow shall show in real time the parameters collected by the system in the same units as are used for data submitted to the DQM database. In the event a reported parameter is calculated based on multiple sensors, the sensor values as used in the equation shall be able to be viewed in addition to the required parameter. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within 48 hours of determination of the condition.

### 3.2.1 Telemetry

The Contractor may select any commercial satellite, cellular phone, or other data communications systems available, as long as it is capable of transmitting real-time data as well as enough additional bandwidth to clear historically queued data when a connection is reobtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

The data transmission process from the scow to the DQM database must be automated. The data may be sent from the scow directly to the DQM database or to a shore-based system. Data transmitted to the DQM database should be raw data; any processing of the data conducted shoreside shall be done using repeatable automated software or programming routine. A description of this process shall be included in the DPIIP.

3.2.2 Data Reporting Frequency

Disposal activities shall be logged with high temporal and spatial resolution. Data shall be logged as a series of events. Each set of measurements (time, position, etc.) will be considered an event. Any required information in Paragraph 3.1, "Requirements for Reported Data," that is not an averaged variable (that is, draft and ullage) shall be collected within 1 second of the reported time. Data shall be measured with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Event types "Sailing," "Loading/Stationary," "Offloading," and "Open Water Disposal" are triggered by a time criterion; the criterion should be consistent across the "Sailing" and "Open Water Disposal" event types and should not change for the data collected on a given scow. This criterion should be documented by the Contractor in the DPIIP.

Event Type	Event Trigger Descriptions	Event Time Resolution	Event Position
Loading/Stationary	<p><b>No change in position with hull status closed</b>  An elapsed time of 1 hour since the last event.</p> <p><b>No change in position with hull status open</b>  -----NONCLOSURE-----  In the event a scow has completed an open water disposal and transited back to a holding station without closing the hull, the sampling shall be changed to once per hour.</p>	1 minute	N/A
Sailing	<p><b>Change in position with hull status closed</b>  Time from the last sample equals 1 minute.</p>	1 second	+/-10 ft
Open Water Disposal	<p><b>Hull status open</b>  A position must be recorded within 1 second of the hull status going from closed to open and again within 1 second of the hull status going from open to closed. The position shall be reported at any equal interval from 6 to 12 seconds. This interval shall always remain consistent for the dredge plant.</p>	1 second	+/-10 ft
Offloading	<p><b>Offloading material, hull status reported as open</b>  A position must be recorded within 1 minute arrival at the offload location and within one second of the material starting to be removed from scow. The time from the last sample equals 1 minute.  -----STANDBY OFFLOADING-----  In the event a scow is not being actively offloaded at the offload location for a time equal to one hour, the sampling interval shall be equal to once an hour.</p>	1 second	+/-10 ft
		1 minute	

Example: The scow is stationary for 1 hour and 15 minutes, and then it sails to the disposal area. You should have a "Loading/Stationary" event

at time 0, time 1 hour, and time 1 hour and 15 minutes. Then, for "Sailing," within 1 second of an elapsed time of 1 minute from the 1 hour and 15 minutes event, another event occurs.

### 3.2.3 Data Transmission to the Web Service

A Simple Object Access Protocol (SOAP) web service shall be used to report sensor data to the DQM database. Data shall be transmitted as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an error message, the data shall be stored in a queue and transmitted upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

Contact [dqm-support@usace.army.mil](mailto:dqm-support@usace.army.mil) to obtain the web service URL and the appropriate key credentials and communication protocol.

The data transmission method call takes two arguments: a string containing the plant identifier assigned by the DQM Support Center and a second string containing the XML-formatted sensor data. The method returns the string "OK" if the data is received. If the data is not received, either the web service or the client application throws an error.

### 3.2.4 XML-Formatted Sensor Data String

Each scow event shall be passed as a string on one continuous line of data. The example below is broken up by variable for ease of reading:

```
<?xml version="1.0"?>
<SCOW_DREDGING_DATA version="2.5">
  <SCOW_NAME>AU1994</SCOW_NAME>
  <CONTRACT>W123BA-09-D-0087_RL01</CONTRACT>
  <TRIP_NUMBER>34</TRIP_NUMBER>
  <X_POSITION>-81.670632</X_POSITION>
  <Y_POSITION>41.528987</Y_POSITION>
  <DATE_TIME>2010-08-14 10:50:15</DATE_TIME>
  <SCOW_SPEED>0.0</SCOW_SPEED>
  <SCOW_COURSE>0.0</SCOW_COURSE>
  <HULL_STATUS>OPEN</HULL_STATUS>
  <SCOW_HEADING></SCOW_HEADING>
  <SCOW_FWD_DRAFT></SCOW_FWD_DRAFT>
  <SCOW_AFT_DRAFT></SCOW_AFT_DRAFT>
  <SCOW_AVG_DRAFT></SCOW_AVG_DRAFT>
  <ULLAGE_FWD></ULLAGE_FWD>
  <ULLAGE_AFT></ULLAGE_AFT>
  <ULLAGE_AVG></ULLAGE_AVG>
  <SCOW_BIN_VOLUME></SCOW_BIN_VOLUME>
  <SCOW_DISPLACEMENT></SCOW_DISPLACEMENT>
  <SCOW_LIGHTSHIP></SCOW_LIGHTSHIP>
  <SCOW_TDS></SCOW_TDS>
  <ADDITIONAL_DATA>Some more scow info, if needed</ADDITIONAL_DATA>
</SCOW_DREDGING_DATA>
```

DATE\_TIME values shall be formatted as YYYY-MM-DD HH:MM:SS, as shown above. If, for any reason, a field has no value, the enclosing XML tags

should be sent with nothing between them (for example, <DRAFT\_AFT></DRAFT\_AFT>). The web service cannot handle a "null" value or any other indicators of no value collected.

### 3.2.5 Contractor Data Backup

The Contractor shall maintain an archive of all data sent to the DQM database during the dredging contract. The Contracting Officer's Representative (COR) may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the HTML format which would have been transmitted to the DQM database. Data submission shall be via storage medium acceptable to the COR.

At the end of the dredging contact, the Contractor shall contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. The Contractor shall record in a separate section at the end of the scow's onsite copy of the DPIIP the following information:

- Person who made the call
- Date of the call
- DQM representative who gave permission to discard

### 3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system shall be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see Paragraph 1.4, "National Dredging Quality Management Program Certification"). To meet contract requirements for operability, in addition to certification, the Contractor's system shall provide a data string with values for all parameters while operating, as described within the specifications. Additionally, all hardware shall be compliant with DPIIP requirements outlined in Paragraph 1.5, "Dredge Plant Instrumentation Plan (DPIIP)". Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within 48 hours. Failure by the Contractor to report the required data within the specified time window for scow measurements (see Paragraph 3.2.2, "Data Reporting Frequency," and Paragraph 3.2.3, "Data Transmission to the Web Service") and failure to receive DQM certification prior to dredging will result in withholding of up to 10% of the contract progress payment per clause 52.232-5.

### 3.4 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIIP	Paragraph 1.5, "Dredge Plant Instrumentation Plan (DPIIP)"
DQM SYSTEM	
Sensor instrumentation	Paragraph 3.1, Requirements for Reported Data"
SCOW DATA	
Event documentation	Paragraph 3.2.2, "Data Reporting Frequency"
Data reports	Paragraph 3.2.3, "Data Transmission to the Web Service"

QA EQUIPMENT ON THE DREDGE  
Clear and accurate draft marks  
Ullage tape

-- End of Section --



SECTION 35 20 23.23

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM  
HOPPER DREDGE

22 June 2020

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the dredge's status at all times during the contract and to manage data history.

This performance-based specification section identifies the minimum required output and the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office responsible for review of the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00, "SUBMITTAL PROCEDURES":

- SD-07 Certificates
- Letter of National Dredging Quality Management Program Certification; G, SAM-OP-GW

1.3 PAYMENT

No separate payment shall be made for installation, operation, and maintenance of the DQM-certified system as specified herein for the duration of the dredging operations; all costs in connection therewith shall be considered a subsidiary obligation of the Contractor and covered under the contract unit price for dredging in the bidding schedule.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from DQM for the hopper dredge instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (<http://dqm.usace.army.mil/Specifications/Index.aspx>). Compliance with these criteria shall be verified by annual onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. DQM Certification is valid for one year from the date of the annual QA checks. Certification is contingent upon the system's ability to continuously meet the performance requirements as outlined in Paragraph 3.3, "Performance Requirements." If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the Data Acquisition and Analysis Team may be necessary.

Annual DQM Certification shall be based on the following:

- A series of quality assurance checks as outlined on the DQM website (<https://dqm.usace.army.mil/Certifications/Index.aspx>)
- Verification of data acquisition and transfer as described in Paragraph 3.3, "Performance Requirements")
- Review of the Dredge Plant Instrumentation Plan (DPIP) as described in Paragraph 1.5, "Dredge Plant Instrumentation Plan (DPIP)"

The Dredging Contractor shall have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The Dredging Contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. As a general rule, Data Acquisition and Analysis Team personnel will come with PPE consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed - such as eye protection, safety harnesses, work gloves or personal location beacons - these items shall be provided to the team while on site. It is the Dredging Contractor's obligation to inform the QA team if the location designated for the QA checks has any site-specific safety concerns prior to their arrival on site.

The owner or operator of the dredge shall contact DQM at [DQM-AnnualQA@rpsgroup.com](mailto:DQM-AnnualQA@rpsgroup.com) on an annual basis, or at least three weeks prior to certification expiration, to schedule QA checks for renewal. This notification is meant to make the Data Acquisition and Analysis Team aware of a target date for the annual QA checks for the dredge. At least one week prior to the target date, the Contractor shall contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor shall then follow up this conversation with a written email confirmation. The owner/operator shall coordinate the QA checks with all local authorities, including but not limited to, the local USACE Contracting Officer's Representative (COR).

Recertification is required for any yard work which produces modification to displacement (change in dredge lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions, or addition or subtraction of structure), or changes in sensor type or location; these changes shall be reported in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain its certification during this period, the system sensors or hardware should not be disconnected or removed from the dredge. If the system is powered down, calibration coefficients shall be retained.

#### 1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor shall also maintain on the dredge a copy of the DPIP which is easily accessible to Government personnel at all times. This document shall describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of the computed dredge-specific data and how the sensor data will be transmitted to the DQM database will also be included.

A complete list of the required DPIP contents is provided on the DQM website (<https://dqm.usace.army.mil/Certifications/Index.aspx>).

The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to the start of work. Any changes to the computation methods shall be approved by the DQM Support Center prior to their implementation.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

The Contractor shall provide, operate, and maintain all hardware and software to meet these specifications. The Contractor shall be responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.

Repairs shall be completed within 48 hours of any sensor failure. Upon completion of a repair, replacement, installation, modification, or calibration, the Contractor shall notify the COR. The COR may request recalibration of sensors or other hardware components at any time during the contract as deemed necessary.

The Contractor shall keep a log of sensor repair, replacement, installation, modification, and calibration in the dredge's onboard copy of the DPIP. The log shall contain a three-year history of sensor maintenance, including the time of the sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide required data. It shall also contain the name of the person responsible for the sensor work.

Sensors installed shall be capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs.

Reported sensor values for ullage, draft, and draghead depth should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. This information should be documented in the DPIP sections that say "Calculations done external to the instrumentation."

3.1.1 Date and Time

The date and time shall be reported to the nearest second and referenced to UTC time based on a 24-hour format: mm/dd/yyyy hh:mm:ss. The reported time shall be the time reported by the GPS in the NMEA string.

3.1.2 Load Number

A load number shall document the end of a disposal event. Load numbering will begin at number 1 at the start of the contract and will be incremented by 1 at the completion of each disposal event or emptying of the hopper. Whenever possible, the load number shall be calculated off of the sensors aboard the dredge and shall be a mathematically repeatable routine. Efforts shall be made to include logic that avoids false load

number increments while also not allowing the routine to miss any disposal event. If manual incrementing of the load number is in place, extra attention shall be paid to this value in the quality control process.

### 3.1.3 Horizontal Positioning

All locations shall be obtained using a positioning system operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

#### 3.1.3.1 Vessel Horizontal Positioning

Vessel horizontal positioning shall be recorded as geographic coordinates of the vessel as indicated by the location of the GPS antenna.

#### 3.1.3.2 Draghead Horizontal Positioning

Draghead horizontal positioning shall be recorded as geographic coordinates of the heel on the centerline of the draghead(s). Any offset calculations from the GPS antenna should be described in the DPIIP.

#### 3.1.4 Hull Status

Open/closed status of the hopper dredge, corresponding to the split/non-split condition of a split-hull hopper dredge, shall be monitored. For dredges with hopper doors, the status of a single door that is the first opened during normal disposal operations may be monitored. An "open" value shall indicate that the hopper door is open or, in the case of split-hull dredges, that the hull is split. A "closed" value indicates that the hopper doors are closed or, in the case of split-hull dredges, that the hull is not split.

For this contract, hull status shall register closed prior to leaving the disposal area.

#### 3.1.5 Dredge Course

Dredge course-over-ground (COG) shall be provided using industry-standard equipment. The Contractor shall provide dredge course-over-ground to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

#### 3.1.6 Dredge Speed

Dredge speed-over-ground shall be provided in knots using industry-standard equipment with a minimum accuracy of 1 knot and resolution to the nearest 0.1 knot.

#### 3.1.7 Dredge Heading

Dredge heading shall be provided using industry-standard equipment. The dredge heading shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

#### 3.1.8 Tide

Tide data shall be obtained using appropriate equipment to give the water

level with an accuracy of +/- 0.1 foot and a resolution of 0.01 foot. Tide values above project datum described in the dredging specification shall be entered with a positive sign and those below with a negative sign.

### 3.1.9 Draft

All reported draft measurements shall be in feet, tenths, and hundredths with an accuracy of +/- 0.1 foot relative to observed physical draft readings. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). The reported forward draft value shall be equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value shall be equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Sensors shall be placed at an optimum location on the vessel to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, significant digits for average draft shall be maintained such that if forward draft was 0.15 and aft draft was 0.1, then the average draft would be 0.125.

### 3.1.10 Hopper Ullage Sounding

All reported ullage soundings shall be in feet, tenths, and hundredths with an accuracy of +/- 0.1 foot with respect to the combing and be representative of the forward and aft extents of the hopper as close to the centerline as is possible. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). Forward ullage and aft ullage soundings will be reported. Sensors should be mounted so as to avoid discharge flume turbulence, foam, and any structure that could produce sidelobe errors. If sensors must be offset from the centerline of the hopper, they should be offset to opposite sides of the vessel. If more than one fore or one aft sensor are used, they shall be placed near the corners of the hopper, and the average value of the fore sensors and the average value of the aft sensors shall be reported. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average ullage is calculated for the purpose of determining hopper volume, significant digits for average ullage shall be maintained such that if forward ullage was 0.15 and aft ullage was 0.1, then the average ullage would be 0.125.

### 3.1.11 Hopper Volume

Hopper volume shall be reported in cubic yards, based on the most accurate method available for the dredge. The minimum standard of accuracy for hopper volume is interpolation from the certified hopper volume table, based on the average fore and aft ullage soundings.

### 3.1.12 Displacement

Dredge displacement shall be reported in long tons, based on the most accurate method available for the dredge. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement shall be 1027 kg/cubic meter, and it shall be used

for an additional interpolation between the fresh and salt water tables.

### 3.1.13 Empty Displacement

Empty displacement shall be reported in long tons and shall be the lightship value of the dredge, or the weight of the dredge with no material in the hopper, adjusted for fuel and water consumption.

### 3.1.14 Draghead Depths

Draghead depths shall be reported with an accuracy of +/- 0.5 foot and a resolution to the nearest 0.1 foot as measured from the surface of the water with no tidal adjustments. Minimum accuracies are conditional to relatively calm water. The sensor value reported shall be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged.

### 3.1.15 Slurry Densities

A density metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry density of each dragarm to the nearest 0.001 g/cc with an accuracy of +/- 0.01 g/cc. If the manufacturer does not specify a frequency of recalibration, calibration shall be conducted prior to commencement of work.

### 3.1.16 Slurry Velocities

A flow metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry velocity of each dragarm to the nearest 0.01 fps with an accuracy of +/- 0.5 fps. If the manufacturer does not specify a frequency of recalibration, calibration shall be conducted prior to commencement of work. The slurry velocity shall be measured in the same pipeline inside diameter as that used for the slurry density measurement.

### 3.1.17 Pump RPM

The RPM of any pump being used to move material shall be measured with the highest level of accuracy that is standard on the vessel operational displays, either at the bridge, at the drag tender's controls, or in the engine room. Dredges with multiple pumps per side shall report RPM for the pump that best describes the dredging process (typically the outboard pump).

### 3.1.18 Sea Suction Valve for Dragarm

If sea suction can be taken to bypass suction through the draghead, the sea suction location and valve status will be reported. The status of the valve will change from "closed" to "open" when the valve starts to open and will register "closed" when the valve is fully closed. When applicable, the state of the latch will be reported as "true" or "false." The sea suction location shall be reported in a standard non-changing name string of no more than 20 characters. These field values will always occur in the XML string as a set. The DQM system can accommodate only up to four unique sea suction locations. Suggested options for the naming convention can be found in the example dataset in Paragraph 3.2.8, "Data Format."

### 3.1.19 Pumpout

When the hopper dredge is being pumped out, a "true" value shall be reported; when it is not, a "false" value shall be reported. The only permissible values are "true" and "false."

## 3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system shall be capable of collecting, displaying, and transmitting information to the DQM database. The applicable parameters from Paragraph 3.1, "Requirements for Reported Data," shall be recorded as events locally and continually transmitted to the DQM database anytime an Internet connection is available. The Dredge shall be equipped with a DQM computer system, consisting of a computer, monitor, keyboard, mouse, data modem, UPS, and network hub. The computer system shall be a standalone system, exclusive to the DQM monitoring system, and will have USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within 48 hours of determination of the condition.

### 3.2.1 Computer Requirements

The Contractor shall provide a dedicated onboard computer for use by the DQM system. This computer shall run USACE software and receive data from the Contractor's data-reporting interface. This computer must meet or exceed the following performance specifications:

CPU:	Intel or AMD processor with a (non-overclocked) clock speed of at least 1.6 gigahertz (GHz)
Hard drive:	250 gigabytes (GB); internal
RAM:	4 gigabytes (GB)
Ethernet adapter:	Internal network card with an RJ-45 connector
Ports:	1 free serial port with standard 9-pin connectors; 1 free USB port
Other hardware:	Keyboard, mouse, monitor

The Contractor shall install a fully licensed copy of Windows 7 Professional Operating System or later on the computer specified above. The Contractor shall also install any necessary manufacturer-provided drivers for the installed hardware.

This computer shall be located and oriented to allow data entry and data viewing, as well as to provide access to data ports for the connection of external hardware.

### 3.2.2 Software

The DQM computer's primary function is to transmit data to the DQM shoreside database. No other software which conflicts with this function shall be installed on this computer. The DQM computer will have the USACE-provided Dredging Quality Management Onboard Software (DQMOBS) installed on it by DQM personnel along with USACE-selected software for remote support and management.

### 3.2.3 UPS

The Contractor shall supply an Uninterruptible Power Supply (UPS) for the computer and networking equipment. The UPS shall provide backup power

at 1 kVA for a minimum of ten minutes. The UPS shall interface with the DQM computer to communicate UPS status. The Contractor shall ensure that sufficient power outlets are available to run all specified equipment.

#### 3.2.4 Internet Access

The Contractor shall maintain an Internet connection capable of transmitting real-time data to the DQM server and supporting remote access, as well as enough additional bandwidth to clear historically queued data when a connection is re-obtained. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

The Contractor shall acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the DQM web service. The hardware and software must be configured to allow the DQM Support Center remote access to this computer. Coordination between the dredging company's IT and the DQM Support Center may be required in order to configure remote access through any security, firewall, router, and telemetry systems. Telemetry systems must be capable of meeting these minimum reporting requirements in all operating conditions.

#### 3.2.5 Data Routing Requirements

Onboard sensors shall continually monitor dredge conditions, operations and efficiency and route this information into the shipboard dredge-specific system (DSS) computer to assist in guiding dredge operations. Portions of this Contractor-collected information shall be routed to the DQM computer on a real-time basis. Standard sensor data shall be sent to the DQM computer via an RS-232 9600- or 19200-baud serial interface. The serial interface shall be configured as 8 bits, no parity, and no flow control.

#### 3.2.6 Data Reporting Frequency

Data shall be logged as a series of events. Each event will consist of a dataset containing dredge information as per Paragraph 3.1, "Requirements for Reported Data." Each set of measurements (time, position, etc.) will be considered an event. Any required information in Paragraph 3.1 that is not an averaged variable (draft and ullage) shall be collected within 1 second of the reported time. A data string for an event shall be sent to the DQM computer every 6 to 12 seconds, and this interval shall remain constant throughout the contract; data strings shall never be transmitted more frequently than once per every 5 seconds. Any averaged variable must be collected and computed within this sampling interval.

#### 3.2.7 Data Format

Data shall be reported as an eXtensible Markup Language (W3C standard XML 1.0) document as indicated below. Line breaks and spaces are added for readability, but the carriage return, line feed character combination is added only to delineate records (HOPPER\_DREDGING\_DATA tag) for actual data transmission.



```
{?xml version="1.0"?}
{HOPPER_DREDGING_DATA version = "2.0"}
  {DREDGE_NAME} string32 {/DREDGE_NAME}
    {HOPPER_DATA_RECORD}
      {DATE_TIME} time date string {/DATE_TIME}
      {CONTRACT_NUMBER} string32 {/CONTRACT_NUMBER}
      {LOAD_NUMBER} integer string {/LOAD_NUMBER}
      {VESSEL_X coord_type="LL"} floating point string
{/VESSEL_X}
      {VESSEL_Y coord_type="LL"} floating point string
{/VESSEL_Y}
      {PORT_DRAG_X coord_type="LL"} floating point string
{/PORT_DRAG_X}
      {PORT_DRAG_Y coord_type="LL"} floating point string
{/PORT_DRAG_Y}
      {STBD_DRAG_X coord_type="LL"} floating point string
{/STBD_DRAG_X}
      {STBD_DRAG_Y coord_type="LL"} floating point string
{/STBD_DRAG_Y}
      {HULL_STATUS} OPEN/CLOSED string {/HULL_STATUS}
      {VESSEL_COURSE} floating point string {/VESSEL_COURSE}
      {VESSEL_SPEED} floating point string {/VESSEL_SPEED}
      {VESSEL_HEADING} floating point string {/VESSEL_HEADING}
      {TIDE} floating point string {/TIDE}
      {DRAFT_FORE} floating point string {/DRAFT_FORE}
      {DRAFT_AFT} floating point string {/DRAFT_AFT}
      {ULLAGE_FORE} floating point string {/ULLAGE_FORE}
      {ULLAGE_AFT} floating point string {/ULLAGE_AFT}
      {HOPPER_VOLUME} floating point string {/HOPPER_VOLUME}
      {DISPLACEMENT} floating point string {/DISPLACEMENT}
      {EMPTY_DISPLACEMENT} floating point string
{/EMPTY_DISPLACEMENT}
      {DRAGHEAD_DEPTH_PORT} floating point string
{/DRAGHEAD_DEPTH_PORT}
      {DRAGHEAD_DEPTH_STBD} floating point string
{/DRAGHEAD_DEPTH_STBD}
      {PORT_DENSITY} floating point string {/PORT_DENSITY}
      {STBD_DENSITY} floating point string {/STBD_DENSITY}
      {PORT_VELOCITY} floating point string {/PORT_VELOCITY}
      {STBD_VELOCITY} floating point string {/STBD_VELOCITY}
      {PUMP_RPM_PORT} floating point string {/PUMP_RPM_PORT}
      {PUMP_RPM_STBD} floating point string {/PUMP_RPM_STBD}
      {VALVE_1_LOCATION} string32 {/VALVE_1_LOCATION}
      {VALVE_1_STATUS} open/closed {/VALVE_1_STATUS}
      {VALVE_1_LATCHED} true/false {/VALVE_1_LATCHED}
      {VALVE_2_LOCATION} string32 {/VALVE_2_LOCATION}
      {VALVE_2_STATUS} open/closed {/VALVE_2_STATUS}
      {VALVE_2_LATCHED} true/false {/VALVE_2_LATCHED}
      {VALVE_3_LOCATION} string32 {/VALVE_3_LOCATION}
      {VALVE_3_STATUS} open/closed {/VALVE_3_STATUS}
      {VALVE_3_LATCHED} true/false {/VALVE_3_LATCHED}
      {VALVE_4_LOCATION} string32 {/VALVE_4_LOCATION}
      {VALVE_4_STATUS} open/closed {/VALVE_4_STATUS}
      {VALVE_4_LATCHED} true/false {/VALVE_4_LATCHED}
      {PUMP_OUT_ON} true/false/unknown string {/PUMP_OUT_ON}
    {/HOPPER_DATA_RECORD}
  {/HOPPER_DREDGING_DATA}
  Carriage Return - ASCII value 13
```

Line Feed - ASCII value 10

Example

```
{?xml version="1.0"?}
{HOPPER_DREDGING_DATA version = "2.0"}
  {DREDGE_NAME}Essayons{/DREDGE_NAME}
  {HOPPER_DATA_RECORD}
    {DATE_TIME}04/11/2002 13:12:05{/DATE_TIME}
    {CONTRACT_NUMBER}GDSNWP-11-G-0001{/CONTRACT_NUMBER}
    {LOAD_NUMBER}102{/LOAD_NUMBER}
    {VESSEL_X coord_type="LL"}-80.123333{/VESSEL_X}
    {VESSEL_Y coord_type="LL"}10.123345{/VESSEL_Y}
    {PORT_DRAG_X coord_type="LL"}-80.1233371{/PORT_DRAG_X}
    {PORT_DRAG_Y coord_type="LL"}10.12335{/PORT_DRAG_Y}
    {STBD_DRAG_X coord_type="LL"}-80.123339{/STBD_DRAG_X}
    {STBD_DRAG_Y coord_type="LL"}10.123347{/STBD_DRAG_Y}
    {HULL_STATUS}CLOSED{/HULL_STATUS}
    {VESSEL_COURSE}258{/VESSEL_COURSE}
    {VESSEL_SPEED}3.4{/VESSEL_SPEED}
    {VESSEL_HEADING}302{/VESSEL_HEADING}
    {TIDE}-0.1{/TIDE}
    {DRAFT_FORE}10.05{/DRAFT_FORE}
    {DRAFT_AFT}15.13{/DRAFT_AFT}
    {ULLAGE_FORE}10.11{/ULLAGE_FORE}
    {ULLAGE_AFT}10.22{/ULLAGE_AFT}
    {HOPPER_VOLUME}2555.2{/HOPPER_VOLUME}
    {DISPLACEMENT}4444.1{/DISPLACEMENT}
    {EMPTY_DISPLACEMENT}2345.0{/EMPTY_DISPLACEMENT}
    {DRAGHEAD_DEPTH_PORT}55.10{/DRAGHEAD_DEPTH_PORT}
    {DRAGHEAD_DEPTH_STBD}53.21{/DRAGHEAD_DEPTH_STBD}
    {PORT_DENSITY}1.02{/PORT_DENSITY}
    {STBD_DENSITY}1.03{/STBD_DENSITY}
    {PORT_VELOCITY}22.1{/PORT_VELOCITY}
    {STBD_VELOCITY}23.3{/STBD_VELOCITY}
    {PUMP_RPM_PORT}55{/PUMP_RPM_PORT}
    {PUMP_RPM_STBD}54{/PUMP_RPM_STBD}
    {VALVE_1_LOCATION}Starboard Dragarm{/VALVE_1_LOCATION}
    {VALVE_1_STATUS}open{/VALVE_1_STATUS}
    {VALVE_1_LATCHED>true{/VALVE_1_LATCHED}
    {VALVE_2_LOCATION}Port Dragarm{/VALVE_2_LOCATION}
    {VALVE_2_STATUS}closed{/VALVE_2_STATUS}
    {VALVE_2_LATCHED>false{/VALVE_2_LATCHED}
    {VALVE_3_LOCATION}Port Sea Chest{/VALVE_3_LOCATION}
    {VALVE_3_STATUS}closed{/VALVE_3_STATUS}
    {VALVE_3_LATCHED>false{/VALVE_3_LATCHED}
    {VALVE_4_LOCATION}Starboard Sea Chest{/VALVE_4_LOCATION}
    {VALVE_4_STATUS}open{/VALVE_4_STATUS}
    {VALVE_4_LATCHED>false{/VALVE_4_LATCHED}
    {PUMP_OUT_ON>false{/PUMP_OUT_ON}
  {/HOPPER_DATA_RECORD}
{/HOPPER_DREDGING_DATA}
{cr}
{lf}
{DREDGE_NAME}Essayons{/DREDGE_NAME}
  {HOPPER_DATA_RECORD}
    {DATE_TIME}04/11/2002 13:12:10{/DATE_TIME}
    {CONTRACT_NUMBER}GDSNWP-11-G-0001{/CONTRACT_NUMBER}
    {LOAD_NUMBER}102{/LOAD_NUMBER}
```

```
{VESSEL_X coord_type="LL"}-80.123334{/VESSEL_X}
{VESSEL_Y coord_type="LL"}10.123346{/VESSEL_Y}
{PORT_DRAG_X coord_type="LL"}-80.1233372{/PORT_DRAG_X}
{PORT_DRAG_Y coord_type="LL"}10.12336{/PORT_DRAG_Y}
{STBD_DRAG_X coord_type="LL"}-80.123340{/STBD_DRAG_X}
{STBD_DRAG_Y coord_type="LL"}10.123348{/STBD_DRAG_Y}
{HULL_STATUS}CLOSED{/HULL_STATUS}
{VESSEL_COURSE}259{/VESSEL_COURSE}
{VESSEL_SPEED}3.5{/VESSEL_SPEED}
{VESSEL_HEADING}300{/VESSEL_HEADING}
{TIDE}-0.1{/TIDE}
{DRAFT_FORE}10.00{/DRAFT_FORE}
{DRAFT_AFT}15.15{/DRAFT_AFT}
{ULLAGE_FORE}10.15{/ULLAGE_FORE}
{ULLAGE_AFT}10.20{/ULLAGE_AFT}
{HOPPER_VOLUME}2555.5{/HOPPER_VOLUME}
{DISPLACEMENT}4444.0{/DISPLACEMENT}
{EMPTY_DISPLACEMENT}2345.0{/EMPTY_DISPLACEMENT}
{DRAGHEAD_DEPTH_PORT}55.15{/DRAGHEAD_DEPTH_PORT}
{DRAGHEAD_DEPTH_STBD}53.19{/DRAGHEAD_DEPTH_STBD}
{PORT_DENSITY}1.00{/PORT_DENSITY}
{STBD_DENSITY}1.01{/STBD_DENSITY}
{PORT_VELOCITY}22.5{/PORT_VELOCITY}
{STBD_VELOCITY}23.3{/STBD_VELOCITY}
{PUMP_RPM_PORT}55{/PUMP_RPM_PORT}
{PUMP_RPM_STBD}54{/PUMP_RPM_STBD}
{VALVE_1_LOCATION}Starboard Dragarm{/VALVE_1_LOCATION}
{VALVE_1_STATUS}open{/VALVE_1_STATUS}
{VALVE_1_LATCHED}true{/VALVE_1_LATCHED}
{VALVE_2_LOCATION}Port Dragarm{/VALVE_2_LOCATION}
{VALVE_2_STATUS}closed{/VALVE_2_STATUS}
{VALVE_2_LATCHED}false{/VALVE_2_LATCHED}
{VALVE_3_LOCATION}Port Sea Chest{/VALVE_3_LOCATION}
{VALVE_3_STATUS}closed{/VALVE_3_STATUS}
{VALVE_3_LATCHED}false{/VALVE_3_LATCHED}
{VALVE_4_LOCATION}Starboard Sea Chest{/VALVE_4_LOCATION}
{VALVE_4_STATUS}open{/VALVE_4_STATUS}
{VALVE_4_LATCHED}false{/VALVE_4_LATCHED}
{PUMP_OUT_ON}false{/PUMP_OUT_ON}
{/HOPPER_DATA_RECORD}
{/HOPPER_DREDGING_DATA}
{cr}
{lf}
```

### 3.2.8 Data Reporting

The system shall transmit correctly formatted event data XML strings to the DQM database continuously from mobilization until the last USACE post-dredging survey has been accepted. If the Internet connection (Paragraph 3.25, "Internet Access") is non-operable, manual backups from the dredge computer of the XML data string which would have been transmitted to the DQM computer over the serial connection shall be performed for each day the device is inoperable and submitted to the DQM Support Center within 48 hours. This submission does not replace the requirement of correcting the issue affecting the automatic transmission of data. In the event of data transfer, transmission, or hardware failure, a manually recorded disposal log shall be maintained. It shall consist of a series of events. These events are start of dredging, end of dredging, pre-disposal, and post-disposal. Each event shall include time stamp

(GMT), position (Latitude and Longitude WGS84), draft, ullage, volume, and displacement. Disposal logs shall be submitted on a daily basis to the COR during the time when the system is not operational.

### 3.2.9 Contractor Data Backup

The Contractor shall maintain an archive of all data sent to the DQM computer during the dredging contract. The COR may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the XML format which would have been transmitted to the DQM computer. There shall be no line breaks between the parameters; each record string shall be on separate line. The naming convention for the files shall be {dredgename}\_{StartYYYYMMddhhmmss}\_{EndYYYYMMddhhmmss}.txt. Data submission shall be via storage medium acceptable to the COR.

At the end of the dredging contract, the Contractor shall contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. The Contractor shall record in a separate section at the end of the dredge's onboard copy of the DPIP the following information:

- Person who made the call
- Date of the call
- DQM representative who gave permission to discard

### 3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system shall be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see Paragraph 1.4, "National Dredging Quality Management Program Certification"). To meet contract requirements for operability, in addition to certification, the Contractor's system shall provide a data string with all values for all parameters while operating, as described in the specifications. Additionally, all hardware shall be compliant with hardware requirements (Paragraph 3.2.1, "Computer Requirements"). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within 48 hours. Failure by the Contractor to report the required data within the specified time window for dredge measurements (see Paragraph 3.2.7, "Data Reporting Frequency," and Paragraph 3.2.9, "Data Reporting") will result in withholding of up to 10% of the contract progress payment per clause 52.232-5.

### 3.4 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIP <https://dqm.usace.army.mil/Certifications/Index.aspx>

#### DQM System

Sensor instrumentation	Paragraph 3.1, Requirements for Reported Data"
DQM computer	Paragraph 3.2, "National Dredging Quality Management Program System Requirements"

#### Dredge Data

Event documentation	Paragraph 3.2.8, "Data Reporting"
Dredge data backups	Paragraph 3.2.9, "Contractor Data Backup"

QA Equipment on the Dredge  
Dragarm depth chain  
Ullage tape  
Refractometer  
Water sampling device

-- End of Section --

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SECTION 35 20 23.33

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM  
PIPELINE HYDRAULIC DREDGE

12 March 2021

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the US Army Corps of Engineers (USACE) National Dredging Quality Management Program (DQM) to monitor the dredge's status at all times during the contract and manage data history.

This performance-based specification section identifies the minimum required output as well as the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office responsible for review of the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00, "Submittal Procedures":

SD-07, Certificates

- Letter of National Dredging Quality Management Program Certification; G, SAM-EN-GW

1.3 PAYMENT

No separate payment shall be made for the installation, operation, and maintenance of the DQM-certified system as specified herein for the duration of the dredging operations; all costs in connection therewith shall be considered a subsidiary obligation of the Contractor and covered under the contract unit price for dredging in the bidding schedule.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from the DQM Program for the cutter/suction head hydraulic dredge instrumentation system to be used under this contract. Standard Operating Procedures (SOP) and criteria for certification are presented on the DQM website at <https://dqm.usace.army.mil>.

1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the Dredge Plant Instrumentation Plan (DPIP) on file with the DQM Support Center. While working on site, the Contractor shall also maintain on the dredge a copy of the DPIP, which is easily accessible to Government personnel at all times. This document shall accurately describe the sensors used, the configuration of the system, how sensor data will be collected, how

quality control on the data will be performed, and how the sensors/data-reporting equipment will be calibrated and repaired if it fails. A description of the computed dredge-specific data and how the sensor data will be transmitted to the DQM database shall also be included. Prior to the start of work, the Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan subsequent to its original submission. Requirements and a template for the DPIP are available on the DQM website at <https://dqm.usace.army.mil>.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

The Contractor shall provide, operate, and maintain all hardware and software to meet these specifications. The Contractor shall also be responsible for the replacement, repair, and calibration of the sensors and other necessary data acquisition equipment needed to supply the required data.

The procedure to complete a repair shall be documented and completed as soon as practical. If repair is not possible within two business days of any sensor failure, a plan and timeline to complete the repair shall be submitted. Upon completion of a repair, replacement, installation, modification, or calibration, the Contractor shall notify the Contracting Officer's Representative (COR). The COR may request recalibration of the sensors or other hardware components at any time during the contract as deemed necessary.

The Contractor shall keep a log of sensor repair, replacement, installation, modification, and calibration in the dredge's onboard copy of the DPIP. The log shall contain a three-year history of sensor maintenance, including the time of the sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide the required data. It shall also contain the name of the person responsible for the sensor work.

Sensors installed shall be capable of collecting parameters within the specified accuracies and resolutions indicated in the following subparagraphs and transmit these parameters to the DQM database. All data shall be transmitted in JSON message bundles. Each bundle can contain multiple message types. Sensor data shall be transmitted as work event messages, and data which relates to the operational state of the dredge or its sensors shall be transmitted as state event messages. (See Paragraph 3.3.3, "Parameter Transmission to the Web Service.")

3.1.1 Message Bundle Data

Every message bundle shall contain descriptive data that relates the message to a given dredge plant and date/time. The start of a message bundle shall be identified by the tag "DQM\_data".

3.1.1.1 Messages

Messages contain operational data that populates the DQM database for a dredge plant. A message shall consist of an event type and its associated data (as defined in Paragraph 3.1.1.1.3, "Dredge Events"), a date/time



stamp indicating when the event occurred or started, and a comment providing clarification or metadata about the situation. There are multiple event types, but they all fall into one of two categories - work events and state events.

#### 3.1.1.1.1 Message Time

In a work event message, message time is the date and time that the data is collected from the sensors; in a state event message, message time is the date and time that the state event begins. The message time shall be reported to the nearest second and referenced to Coordinated Universal Time (UTC) time based on a 24-hour format (YYYY-MM-DD HH:MM:SS). In order to ensure accuracy and reliability, the time stamp shall be synchronized to UTC format from an accurate, unchangeable source (for example, a GPS National Marine Electronics Association (NMEA) datastring). Message time shall be identified by the tag "msg\_time".

#### 3.1.1.1.2 Comment

Comments concerning the work event or state event messages being transmitted provide descriptive information that relates to the data. An example of a comment for work event data is information about a sensor issue; an example of a comment for state event data is a description of operations. A comment shall be identified by the introductory tag "comment", and the comment shall consist of no more than 250 characters.

#### 3.1.1.2 Dredge Events - Work Event

There are two types of dredge event messages - work event messages and state event messages. Work event messages contain data that are instantaneously collected or calculated from sensors and are logged as a series of events. Work events are triggered by a time interval change (as described in Paragraph 3.3.2.1, "Work Event Messages"). All work event messages shall be initiated by the header tag "work\_event".

#### 3.1.1.2.1 Vertical Correction

The variation of the water level from the vertical datum for the river stage or tidal gage described in the state events shall be obtained using appropriate equipment to give the water level with an accuracy of +/- 0.1 ft. Vertical correction values above project datum described in the dredging specification shall be entered with a positive sign and those below with a negative sign. The tag for vertical correction shall be "vert\_correction".

#### 3.1.1.2.2 Cutter/Suction Head Location and Movement

The X, Y, and Z components of the cutter/suction head location shall be monitored. Additional calculations made from the observed values determine the rates of movement to track the progress of the dredge.

#### 3.1.1.2.2.1 Cutter/Suction Head Horizontal Position

The forwardmost point of the cutter/suction head shall be obtained using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). It shall be reported as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values reported as negative. Position values shall be identified by the tags "ch\_latitude" and "ch\_longitude".

#### 3.1.1.2.2.2 Cutter/Suction Invert Depth

Cutter/suction invert depth is the depth of the invert of the suction mouth relative to the surface of the water. Instrumentation shall be capable of reporting to an accuracy of +/- 0.5 foot and a resolution to the nearest 0.1 foot with no tidal adjustments. Minimum accuracies are conditional to relatively calm water. The tag "ch\_depth" shall be used to identify the cutter/suction head depth.

#### 3.1.1.2.2.3 Cutter/Suction Head Heading

The cutter/suction head heading is the angle of the centerline of the cutter/suction head and dredge ladder measured relative to true north. All headings shall be provided using industry-standard equipment. The heading shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. The tag "ch\_heading" shall be used to identify the cutter/suction head heading.

#### 3.1.1.2.3 Dredge Activity

Dredge activity shall be monitored using a combination of the following parameters.

##### 3.1.1.2.3.1 Slurry Velocity

A flow-metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry velocity to the nearest 0.01 fps with an accuracy of plus 0.5 fps. If the manufacturer does not specify a frequency of recalibration, calibration shall be conducted prior to the commencement of work. The slurry velocity shall be measured for the same pipeline inside diameter as that used for the slurry density measurement. The tag "slurry\_velocity" shall be associated with this value.

##### 3.1.1.2.3.2 Slurry Density

A density-metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry density to the nearest 0.01 g/cc. It is understood that the accuracy of this sensor can vary based on several factors, including the type of material, the magnitude of the cut, and the length of time since calibration. If the manufacturer does not specify a frequency of recalibration, calibration shall be conducted prior to the commencement of work. Continuous monitoring of this sensor ensures that drift and other factors inherent in the dredging process can be accounted for in monitoring dredge activity. The tag "slurry\_density" shall be associated with this value.

##### 3.1.1.2.3.3 Pump RPM

The pump rpm is the number of revolutions per minute measured for the slurry pump shaft. The shaft revolution rate (rev/min) shall be measured with the highest level of accuracy that is standard on the vessel's operational displays either at the bridge or in the engine room. This value shall be identified by the tag "rpm".

##### 3.1.1.2.3.4 Pump Vacuum

The vacuum pressure of the dredge pump(s) (inches of mercury) shall be

measured as near to the eye as practicable in the pump's suction pipe with the highest level of accuracy that is standard on the vessel's operational displays either at the leverman's controls or in the engine room. Vacuum pressure shall be identified by the tag "vacuum".

#### 3.1.1.2.3.5 Pump Outlet Pressure

The pump outlet pressure shall be measured in the discharge line on the pump side of the flap valve in terms of pounds per square inch (psi) on a gauge. Pump outlet pressure shall be identified by the tag "outlet\_psi".

#### 3.1.1.2.4 Outfall Information (Open Water/Spill Barge Disposal)

The X and Y position of the terminal end of the outfall pipe shall be monitored continuously and the position reported as part of the work event string.

##### 3.1.1.2.4.1 Discharge Horizontal Position

The horizontal position of the outfall end of the discharge pipe shall be obtained using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). It shall be reported as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values being reported as negative. Position values shall be identified by the tags "outfall\_latitude" and "outfall\_longitude".

#### 3.1.1.3 Dredge Events - State Event

There are two types of dredge event messages - work event messages and state event messages. State event messages provide information about the current state of the dredge equipment or operations. They are created and sent only when a state changes. Since state events often cannot be collected in real time, state events are tagged with a date time stamp, referenced to Coordinated Universal Time (UTC), that indicates when the state change happened relative to the work event message tag. This data is considered to be "true" until another state event tag of the same type is received. Each type of state event message shall be indicated by a specific header tag as enumerated in the following subparagraphs. State events can be transmitted along with work event message bundles directly by the contractor using the indicated format, or they can be entered on the "State" tab in the DQM-provided software. However, they should be sent only if the state value changes.

##### 3.1.1.3.1 Message Time

The state event time is the date and time that the event starts. The leverman's time shall be entered to the nearest second as local time and automatically converted to and reported in UTC based on a 24-hour format (YYYY-MM-DD HH:MM:SS). Message time shall be identified by the tag "msg\_time".

##### 3.1.1.3.2 Contract Event

Information concerning the contract under which dredging is being performed shall be reported at the start and completion of each contract using the header tag "contract\_event".

#### 3.1.1.3.2.1 Contract Number

The USACE-assigned contract number for the project shall be reported using the tag "contract\_number".

#### 3.1.1.3.2.2 Contract Start and End

The start and end of a contract shall be reported using the tag "event\_type" with the appropriate value of "start" or "end".

#### 3.1.1.3.3 Tide Station/River Stage Gage Event

Properties associated with the vertical correction (see Paragraph 3.1.1.1.3.1.1, "Vertical Correction") for the tide station/river stage gage shall be grouped together under the header tag "station\_event". This information shall be sent at the start of the contract and each time the dredge has moved enough to change the station being used.

#### 3.1.1.3.3.1 Station Name

The station name is a concise name defining the tide station/river stage gage begin referred to. It shall be introduced by the tag "station\_name", and it shall consist of a descriptor of no more than 25 characters.

#### 3.1.1.3.4 Length of Pipe Event

The leverman's estimate of the length of pipe downflow from the dredge pump, measured to the nearest whole foot, shall be reported under the header tag "pipe\_length\_event". This information shall be sent at the start of the contract and at the completion of each 24-hour period ending at midnight local time.

#### 3.1.1.3.4.1 Floating Pipe

The total length of floating pipe shall be reported with the tag "length\_floating".

#### 3.1.1.3.4.2 Submerged Pipe

The total length of submerged pipe shall be reported with the tag "length\_submerged".

#### 3.1.1.3.4.3 Shore Pipe

The total length of shore pipe shall be reported with the tag "length\_land".

#### 3.1.1.3.5 Booster Pump Event

Information concerning the booster pumps being used shall be included under the header tag "booster\_pump\_event". A message shall be sent to indicate any change in the status of the booster pumps being used.

#### 3.1.1.3.5.1 Number of Booster Pumps

Upon the addition or removal of a booster pump, the total number of booster pumps being used shall be reported with the tag "booster\_total".

3.1.1.3.6 Dredge Advance

The dredge advance, the total forward progress of the dredge relative to the centerline of the cut, shall be measured to the nearest whole foot and cumulatively calculated over a 24-hour period from midnight to midnight local time. It shall be identified by the tag "advance\_daily". The msg\_time associated with this tag shall be reported as the first timestamp of the following 24-hour period (based on the local time) rather than as midnight of the day for which the value was calculated, and it shall be reported in Greenwich Mean Time (GMT).

3.1.1.3.7 Outfall Information

The X and Y position of the terminal end of the outfall pipe shall be monitored and sent at the start of the contract and thereafter according to the following table. Discharge Heading and Pipe Elevation may be omitted if the dredge is not discharging into an upland disposal site. For beach nourishment, the horizontal X and Y position of the outfall shall be sent at the start of the contract and at the completion of each 24-hour period ending at midnight local time.

Discharge Location	Horizontal Position	Discharge Pipe Elevation	Discharge Outfall Heading
Open Water	Continuous Work Event	N/A	N/A
Scow	Upon Change	N/A	N/A
Beach	Every 24 Hours	N/A	N/A
Upland	Upon Change	Upon Change	Upon Change

3.1.1.3.7.1 Discharge Location

Information on where the slurry is being discharged shall be reported with the tag "outfall\_location". Acceptable values include "upland", "open water", "beach", and "scow".

3.1.1.3.7.2 Discharge Horizontal Position

The horizontal position of the outfall end of the discharge pipe shall be obtained using a positioning system operating with a minimum accuracy level of 3-10 feet horizontal Circular Error Probable (CEP). It shall be reported as Latitude/Longitude WGS 84 in decimal degrees with West Longitude and South Latitude values being reported as negative. Position values shall be identified by the tags "outfall\_latitude" and "outfall\_longitude".

3.1.1.3.7.3 Discharge Outfall Heading

The discharge outfall heading is the angle relative to true north measured from the centerline of the pipe in the direction of discharge. All headings shall be provided using industry-standard equipment. They shall be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention. The discharge heading shall be identified by the tag "outfall\_heading".

#### 3.1.1.3.7.4 Discharge Pipe Elevation

The discharge pipe elevation is the height of the outfall measured in feet and tenths of a foot relative to the project datum. The required accuracy is contingent upon contract requirements. The tag "outfall\_elevation" shall be used to identify this elevation.

#### 3.1.1.3.8 Non-effective Work Event

Delays and dredge downtime shall be reported at the conclusion of the event. The reason for the non-effective work time shall be submitted under the header tag "non\_eff\_event" within 24 hours of the event.

##### 3.1.1.3.8.1 Non-effective Work Interval

The start and end times for the non-effective work event shall be reported using the tags "msg\_start\_time" and "msg\_end\_time".

##### 3.1.1.3.8.2 Dredge Function Code

The dredge operator indication of production delays, as listed on Form 4267, shall be transmitted at the end of the non-effective interval. Dredge function event messages shall be identified by the tag "function\_code" and shall consist of one of the following standardized entries to indicate the operation:

AGV	Assisting Grounded Vessels
CCH	Change Cutterhead
CCSH	Clear Cutter Suction
CLPJ	Change Location Bar
COLL	Collision
CPPL	Clear Pump Pipeline
CPR	Change Impeller
DR	Dike Repair
FBD	Fire Boat Drills
HPL	Handling Pipe Line
HSL	Handling Swing Line
HSP	Handling Shore Pipe
LDNE	Loss Due to Natural Elements
LDPV	Loss Due to Passing Vessel
LNL	Transfer to New Location
MISC	Miscellaneous
MOB	Mobilization & Demobilization
MSC	Miscellaneous/Non-pay
OC	Out of Commission
OR	Operating Repairs
P	Preparation
PREP	Preparation & Making Up Tow
RPL	Repair Pipeline
SB	Sounding & Buoying
SBT	Stand-By Time as Directed
SH	Sundays-Holidays
TFS	Taking on Fuel & Supplies
TOW	Time on Tow
WAP	Waiting Attendant Plant

##### 3.1.1.3.8.3 Additional Comments

The "comment" tag shall be used to provide additional explanation for the

noted delays or downtimes. For example, when the code "LDPV" (Loss Due to Passing Vessel) is indicated, the name of the vessel and the number of tows shall be listed with the "comment" tag.

### 3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system shall be capable of collecting and transmitting information to the DQM onboard computer. The applicable parameters from Paragraph 3.1, "Requirements for Reported Data," shall be recorded as events locally and continuously transmitted to the DQM database anytime an Internet connection is available. The dredge shall be equipped with a DQM computer system consisting of a computer, monitor, keyboard, mouse, data modem, Universal Power Supply (UPS), and network hub. The computer system shall be a standalone system, exclusive to the DQM monitoring system, and shall have USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within two business days of the determination of the condition or submitting a plan and timeline for repair if the repair will take more than two business days.

#### 3.2.1 Computer Requirements

The Contractor shall provide a dedicated onboard computer for use by the Dredging Quality Management system. This computer shall run the USACE DQM software and receive data from the Contractor's data-reporting interface. This computer must meet or exceed the following performance specifications:

CPU	Intel or AMD processor with a (non-overclocked) clock speed of at least 1.6 gigahertz (GHz)
Hard drive	250 gigabytes (GB); internal
RAM	4 gigabytes (GB)
Ethernet adapter	Internal network card with an RJ 45 connector
Ports	1 free serial port with standard 9-pin connectors; 1 free USB port
Other hardware	Keyboard, mouse, monitor

The Contractor shall install a fully licensed copy of Windows 7 Professional Operating System or later on the computer specified above. The Contractor shall also install any necessary manufacturer-provided drivers for the installed hardware.

This computer shall be located and oriented to allow data entry and data viewing as well as to provide access to data ports for connection of external hardware.

#### 3.2.2 Software

The DQM computer's primary function is to transmit data to the DQM shoreside database. No other software which conflicts with this function shall be installed on it. The DQM computer shall also have the USACE-provided Dredging Quality Management Onboard Software (DQMOBS) installed on it by DQM personnel.

#### 3.2.3 UPS

The Contractor shall supply an Uninterruptible Power Supply (UPS) for the

computer and networking equipment. It shall interface with the DQM computer to communicate UPS status, and it shall provide backup power at 1 kVA for a minimum of 10 minutes. The Contractor shall ensure that sufficient power outlets are available to run all specified equipment.

#### 3.2.4 Internet Access

The Contractor shall maintain an Internet connection capable of transmitting real-time data to the DQM server as well as enough additional bandwidth to clear historically queued data when a connection is re-established. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

The Contractor shall acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the DQM web service. The hardware and software shall be configured to allow the DQM Support Center remote access to this computer, and the telemetry system shall be capable of meeting these minimum reporting requirements in all operating conditions.

In areas with poor cellular service and at the local District's discretion, it may be required to manually download the data on a daily basis using the protocol for retrieving and submitting backup files provided by the DQM Support Center. This method of data transmission should be used only if Internet connectivity is unavailable at the dredging site, and it should be considered a temporary measure.

#### 3.2.5 Data Routing Requirements

Onboard sensors continually monitor dredge conditions, operations, and efficiency and route this information to the shipboard dredge-specific system (DSS) computer to assist in guiding dredge operations. Portions of this Contractor-collected information, as described in this specification, shall be routed to the DQM computer on a real-time basis. Standard sensor data shall be sent to the DQM computer via an RS-232 serial interface with a baud rate of 9600 or 19200 bps. The serial interface shall be configured as 8 bits, no parity, and no flow control

Information regarding changes in the state of the dredge shall be digitally logged and transmitted as close to the time of the occurrence as possible. These events can either be included in a separate message bundle going to the DQM onboard computer, or they can be entered on the "State" tab in the DQM Pipeline Software

### 3.3 DREDGE MONITORING DATA

#### 3.3.1 General

Onboard sensors continuously collect dredging data in support of the dredge Contractor's operations. Portions of this Contractor-collected information, as described in this specification, and calculations based on them shall be stored and transmitted to the DQM database on a near real-time basis. Additionally, information regarding the state of the dredge shall be digitally logged and transmitted.



### 3.3.2 Data Measurement Frequency

The frequency of data transmission is dependent on the type of message being sent. Work Event messages contain data that are instantaneously collected or calculated from sensors and are logged as a series of events. State event messages are activated by a change in the dredge state.

#### 3.3.2.1 Work Event Messages

Data shall be logged as a series of events. Each event shall consist of a dataset containing dredge information (as defined in Paragraph 3.1, "Requirements for Reported Data"). Each set of measurements (for example, time and position) shall be considered an event, and there shall be a 6-12 second interval between work events. This interval shall remain consistent across event types for the dredge plant.

A standard data string shall be recorded within one second of an event trigger with the time stamp and all parameters reflecting when the event happened.

#### 3.3.2.2 State Event Messages

A set of descriptive information (event name, time, description, comment) shall be considered a state event. These events shall be recorded within 24 hours of a change in state with the time stamp reflecting when the event happened.

#### 3.3.3 Parameter Transmission to the Web Service

The data shall be formatted as JSON (JavaScript Object Notation, as defined at <http://www.json.org>) strings of arbitrary length. These JSON strings represent a hierarchical data structure consisting of a message bundle which may contain 0-3 automatic data messages and any number of manual data messages.

A tag/parameter is reported only when it contains a value. No "Null" value strings shall be included in a message bundle.

```
*****  
Message bundle  
*****  
  
{  
  "DQM_Data": {  
    "messages": [  
      {  
        "work_event": {  
          "msg_time": <24-hour UTC time YYYY-MM-DD HH:MM:SS>,  
          "vert_correction": <floating point 100th decimal place>,  
          "ch_latitude": <decimal to 6 decimal places>,  
          "ch_longitude": <decimal to 6 decimal places>,  
          "ch_depth": <floating point 100th decimal  
place>,  
          "ch_heading": <integer value 000-359>,  
          "slurry_velocity": <floating point 100th decimal place>,  
          "slurry_density": <floating point 100th decimal place>,  
          "pump_rpm": <integer>,  
          "vacuum": <floating point 100th decimal place>,  
          "outlet_psi": <floating point 100th decimal place>,  
        }  
      }  
    ]  
  }  
}
```

```
    "comment":          <string>},
  },
  {
    "contract_event": {
      "msg_time":        <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "contract_number": <string>,
      "event_type":      <string - "start" or "end">,
      "comment":         <string>
    }
  },
  {
    "station_event": {
      "msg_time":        <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "station_name":    <string>,
      "comment":         <string>
    }
  },
  {
    "pipe_length_event": {
      "msg_time":        <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "length_floating": <integer>,
      "length_submerged": <integer>,
      "length_land":     <integer>,
      "comment":         <string>
    }
  },
  {
    "booster_pump_event": {
      "msg_time":        <24-hour UTC time YYYY-MM-DDHH:MM:SS>,
      "booster_total":   <integer>,
      "comment":         <string>
    }
  },
  {
    "advance_Event": {
      "msg_time":        <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "advance_daily":   <integer>,
      "comment":         <string>
    }
  },
  {
    "outfall_position": {
      "msg_time":        <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "outfall_location": <string-"upland", "beach", "scow",
"open water">
      "outfall_latitude": <decimal to 6 decimal places>,
      "outfall_longitude": <decimal to 6 decimal places>,
      "outfall_heading": <integer value 000-359>,
      "outfall_elevation": <floating point 10th decimal place>,
      "comment":         <string>
    }
  },
  {
    "non_eff_event": {
      "msg_start_time": <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "msg_end_time":   <24-hour UTC time YYYY-MM-DD HH:MM:SS>,
      "function_code": <string - 1 to 4 characters>,
      "comment":         <string>
    }
  }
}
```

```
    }  
  }  
] }  
}
```

### 3.3.4 Contractor Data Backup

The Contractor shall maintain an archive of all data sent to the DQM computer during the dredging contract. The COR may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the same JSON format as would have been transmitted to the DQM computer. There shall be no line breaks between the parameters, and each record string shall be on separate line. The naming convention for the files shall be < dredgename>\_<StartYYYYMMddhhmmss>\_<EndYYYYMMddhhmmss>.txt. Data submission shall be via a storage medium acceptable to the COR.

At the end of the dredging contact, the Contractor shall call the National DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. The Contractor shall then record the following information in a separate section at the end of the dredge's onboard copy of the DPIP:

- Person who called the National DQM Support Center
- Date of the call
- DQM representative who gave permission to discard the data

### 3.4 PERFORMANCE REQUIREMENTS

The Contractor's National Dredging Quality Management Program's data transmission shall be fully operational at the start of dredging operations. To meet contract requirements for operability, the Contractor's system shall provide an accurate data string return and be compliant with hardware requirements. Data string return is defined as the number of quality records within an event or state tag sent by the contractor's system to the DQM database. Quality data strings are considered to be those providing accurate values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within two business days, or a plan and timeline for repair shall be submitted if the repair will take more than two business days. Failure by the Contractor to report quality data within the specified time window for dredge measurements as stated in the specifications (see Paragraph 3.2.4, "Internet Access"; Paragraph 3.3.2, "Data Measurement Frequency"; and Paragraph 3.3.3, "Parameter Transmission to the Web Service"), will result in withholding of up to 10% of the contract progress payment per clause 52.232-5.

### 3.5 LIST OF ITEMS PROVIDED BY THE CONTRACTOR

- DPIP <https://dqm.usace.army.mil>
- DQM System Paragraph 3.2, "National Dredging Quality Management Program System Requirements," including all subparagraphs
- Dredge Data Paragraph 3.3, "Dredging Monitoring Data"



-- End of Section --

APPENDIX A  
GEOTECHNICAL BORING LOGS  
AND  
LAB DATA

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-35-19		<b>LOCATION COORDINATES</b> X = 1,805,479 Y = 175,501		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-09-20 <b>COMPLETED</b> 01-09-20
<b>8. TOTAL DEPTH OF BORING</b> 15.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -49.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> M. Shekouh, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-49.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
-51.0	2.0	//	(CH) CLAY, fat, high plasticity, soft consistency, few fine gravel-sized shell, wet, gray inorganic			1	Vibrocure

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,805,479 Y = 175,501			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,805,479 Y = 175,501			-49.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-62.0	13.0					1	Vibracore
-64.0	15.0		(PT) PEAT, few wood debris, wet, dark brown				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

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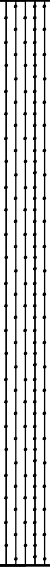
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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-36-19		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<b>VERT.</b> MLLW
<b>4. NAME OF DRILLER</b> CSI		<b>12. TOTAL SAMPLES</b>		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>CONTRACTOR FILE NO.</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0	<b>DISTURBED</b> 1
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater	<b>UNDISTURBED (UD)</b> 0	
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>	<b>STARTED</b> 01-09-20	<b>COMPLETED</b> 01-09-20
<b>8. TOTAL DEPTH OF BORING</b> 18.0 Feet		<b>16. ELEVATION TOP OF BORING</b> -47.0 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> J. McConnell, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.0	0.0		(MH) SILT, inorganic-H, high plasticity, soft consistency, wet, gray				
-51.5	4.5		(CL) CLAY, lean, medium plasticity, medium consistency, little sand, wet, gray, sandy, sand size fraction increases with depth, inorganic			1	Vibrocure
-55.0	8.0		(SC) SAND, clayey				

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,805,008 Y = 179,878			ELEVATION TOP OF BORING -47.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-60.0	13.0						
-65.0	18.0		(SM) SAND, silty, few silt, few clay, wet, light gray			1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-37-19		<b>LOCATION COORDINATES</b> X = 1,804,921 Y = 181,834		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 18.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-10-20 <b>COMPLETED</b> 01-10-20
			<b>16. ELEVATION TOP OF BORING</b> -51.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> M. Shekouh, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-51.0	0.0		(SM) SAND, silty, low plasticity, some clay, wet, dark gray				
-54.0	3.0		(SP-SM) SAND, poorly-graded with silt, low plasticity, some organic matter, wet, dark brown and gray				
-55.0	4.0		(SW-SM) SAND, well-graded with silt, wet, light gray and brown			1	Vibrocore

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,804,921 Y = 181,834			ELEVATION TOP OF BORING -51.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-62.0	11.0		At El. -61.0 Ft. blue and gray clay seams				
-69.0	18.0		(SP) SAND, poorly-graded, wet, light brown, fine to medium sand			1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-38-19		<b>LOCATION COORDINATES</b> X = 1,804,474 Y = 185,872		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-10-20 <b>COMPLETED</b> 01-10-20
<b>8. TOTAL DEPTH OF BORING</b> 14.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -44.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> M. Shekouh, Geotechnical Engineer					

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-44.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
						1	Vibrocure

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,804,474 Y = 185,872			ELEVATION TOP OF BORING -44.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-56.0	12.0		(SP-SM) SAND, poorly-graded with silt, mostly fine to coarse-grained sand-sized sand, trace gravel, wet, gray to light gray			1	Vibracore
-58.0	14.0						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. The tripod tilted when placed on the channel bottom due to the strong current. Vibracore sample was possible taken at an angle from the vertical direction.				


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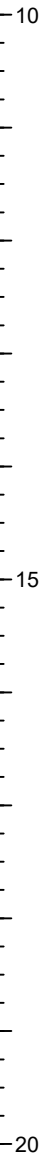
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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-39-19		<b>LOCATION COORDINATES</b> X = 1,804,377 Y = 187,814		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-10-20 <b>COMPLETED</b> 01-10-20
<b>8. TOTAL DEPTH OF BORING</b> 20.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -49.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-49.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
						1	Vibrocure
-56.0	7.0	//	(CH) CLAY, fat, high plasticity, soft consistency, wet, tan and gray, inorganic				

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,804,377 Y = 187,814			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,804,377 Y = 187,814			-49.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-69.0	20.0		At El. -64.0 Ft. 4 inch thick organic seam At El. -65.5 Ft. 3 inch thick sand seam			1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

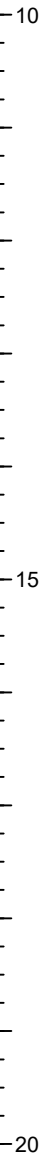




<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-40-19		<b>LOCATION COORDINATES</b> X = 1,804,133 Y = 189,765		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-12-20 <b>COMPLETED</b> 01-12-20
<b>8. TOTAL DEPTH OF BORING</b> 19.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -47.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
						1	Vibrocure
-56.0	9.0	/ / / / /	(CL) CLAY, lean, medium plasticity, soft consistency, wet, gray and tan, with fine to coarse grained sand, inorganic				

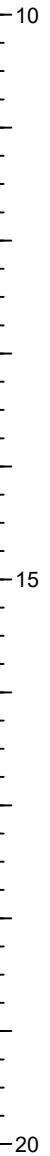
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,804,133 Y = 189,765			ELEVATION TOP OF BORING -47.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-60.5	13.5		(OH) CLAY, organic-H, high plasticity, soft consistency, mostly organic matter, wet, brown and brown and gray, with pieces of wood			1	Vibracore
-66.0	19.0						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-41-19		<b>LOCATION COORDINATES</b> X = 1,804,016 Y = 191,315		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore <input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b> <b>STARTED</b> 01-12-20 <b>COMPLETED</b> 01-12-20		
<b>8. TOTAL DEPTH OF BORING</b> 19.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -48.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		


ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-48.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
			At El. -51.5 Ft., soft consistency			1	Vibrocure

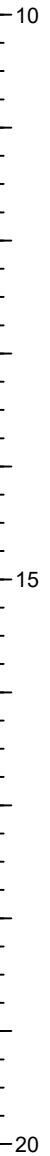
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,804,016 Y = 191,315			ELEVATION TOP OF BORING -48.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-61.0	13.0						
-65.5	17.5		(CL) CLAY, lean, high plasticity, medium consistency, wet, tan and gray, inorganic			1	Vibracore
-67.0	19.0		(OH) CLAY, organic-H, high plasticity, stiff consistency, wet, brown, with pieces of wood				Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b>  2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-42-19		<b>LOCATION COORDINATES</b> X = 1,803,746 Y = 193,641		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-12-20 <b>COMPLETED</b> 01-12-20
<b>8. TOTAL DEPTH OF BORING</b> 20.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -50.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-50.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
-52.5	2.5		(SM) SAND, silty, wet, dark tan, fine to medium grained sand				
-58.0	8.0		(SP-SM) SAND, poorly-graded with silt, wet, tan, fome to medium grained sand			1	Vibrocure

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,803,746 Y = 193,641			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,803,746 Y = 193,641			-50.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-70.0	20.0		At El. -65.0 Ft. fine to coarse grained sand  At El. -69.0 Ft., trace organic matter			1	Vibracore
NOTES:			1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. First push contained all sand. Voids were in sample. Pushed a second sample.				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b>  2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-43-19		<b>LOCATION COORDINATES</b> X = 1,803,631 Y = 195,729		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 16.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-12-20 <b>COMPLETED</b> 01-12-20
			<b>16. ELEVATION TOP OF BORING</b> -47.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, brown				
			At El. -49.0 Ft., dark gray				
			At El. -51.0 Ft., medium consistency			1	Vibrocure

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,631 Y = 195,729			ELEVATION TOP OF BORING -47.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-58.0	11.0						
-59.5	12.5		(CL) CLAY, lean, low plasticity, wet, dark gray, inorganic				
-63.0	16.0		(SP-SM) SAND, poorly-graded with silt, wet, tan fine to medium grained sand			1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-44-19		<b>LOCATION COORDINATES</b> X = 1,803,222 Y = 199,406		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>14. ELEVATION GROUND WATER</b> Underwater
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-21-20 <b>COMPLETED</b> 01-21-20
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>16. ELEVATION TOP OF BORING</b> -47.0 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %
<b>8. TOTAL DEPTH OF BORING</b> 18.5 Feet			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> M. Shekouh, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
			At El. -50.0 Ft., high plasticity, soft consistency				
-53.0	6.0		(SM) SAND, silty, loose, wet, gray			1	Vibrocure
-54.0	7.0		(SP-SM) SAND, poorly-graded with silt, loose, wet, gray fine to medium grained				
			At El. -56.0 Ft., wet, gray fine to medium grained, with shell				


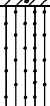

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,222 Y = 199,406			ELEVATION TOP OF BORING -47.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-65.5	18.5					1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				


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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-45-19		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<b>VERT.</b> MLLW
<b>4. NAME OF DRILLER</b> CSI		<b>12. TOTAL SAMPLES</b>		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>CONTRACTOR FILE NO.</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0	<b>DISTURBED</b> 1
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater	<b>UNDISTURBED (UD)</b> 0	
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>	<b>STARTED</b> 01-21-20	<b>COMPLETED</b> 01-21-20
<b>8. TOTAL DEPTH OF BORING</b> 19.0 Feet		<b>16. ELEVATION TOP OF BORING</b> -47.0 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> M. Shekouh, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.0	0.0		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
-49.0	2.0		(SC) SAND, clayey, wet, gray				
-50.0	3.0		(SM) SAND, silty, wet, gray, fine to medium grained				
-54.5	7.5		(SP) SAND, poorly-graded, wet, gray, fine to medium grained, inorganic			1	Vibrocore

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,094 Y = 201,478			ELEVATION TOP OF BORING -47.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-66.0	19.0	 <p>At El. -59.0 Ft. very dense</p> <p>At El. -62.0 Ft. with shell</p>				1	Vibracore
		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.					


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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-46-19		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> CSI		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>		<b>STARTED</b> 01-21-20 <b>COMPLETED</b> 01-21-20
<b>8. TOTAL DEPTH OF BORING</b> 18.5 Feet		<b>16. ELEVATION TOP OF BORING</b> -45.0 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> M. Shekouh, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-45.0	0.0		(SP) SAND, poorly-graded, wet, light brown, fine to coarse grained				
		●●●●●				1	Vibrocure
			At El. -53.0 Ft. gravel lense				

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,802,378 Y = 208,546			ELEVATION TOP OF BORING -45.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-59.0	14.0		(SP) SAND, poorly-graded, light brown				
-63.5	18.5					1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				


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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-47-19		<b>LOCATION COORDINATES</b> X = 1,802,226 Y = 211,030		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>		<b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 14.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-27-20 <b>COMPLETED</b> 01-27-20
			<b>16. ELEVATION TOP OF BORING</b> -46.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-46.0	0.0		(CL) CLAY, lean, high plasticity, very soft consistency, wet, dark gray, sandy, fine to coarse grained sand				
-48.0	2.0		(SP) SAND, poorly-graded, wet, light gray, fine to coarse grained				
			At El. -52.5 Ft. medium to coarse grained, trace gravel			1	Vibrocure
			At El. -54.0 Ft., light brown				

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,802,226 Y = 211,030			ELEVATION TOP OF BORING -46.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-60.5	14.5					1	Vibracore
			At El. -59.5 Ft., light gray, medium grained				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

10

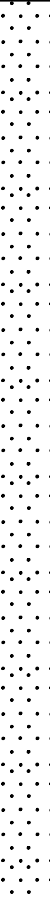
15

20



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-48-19		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> CSI		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>		<b>STARTED</b> 01-27-20 <b>COMPLETED</b> 01-27-20
<b>8. TOTAL DEPTH OF BORING</b> 18.0 Feet		<b>16. ELEVATION TOP OF BORING</b> -48.0 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-48.0	0.0						
-48.5	0.5		(MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray				
			(SP) SAND, poorly-graded, wet, light brown, fine to coarse grained				
			At El. -51.0 Ft. fine to medium grained				
-52.5	4.5		(ML) SILT, inorganic-L ML lense 1' thick				
-53.5	5.5		(SP) SAND, poorly-graded, wet, light brown, fine to coarse grained			1	Vibrocore

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,801,895 Y = 213,585			ELEVATION TOP OF BORING -48.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-66.0	18.0		At El. -59.0 Ft. medium to coarse grained, trace gravel			1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				


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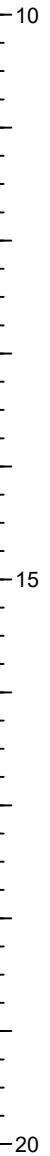
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20

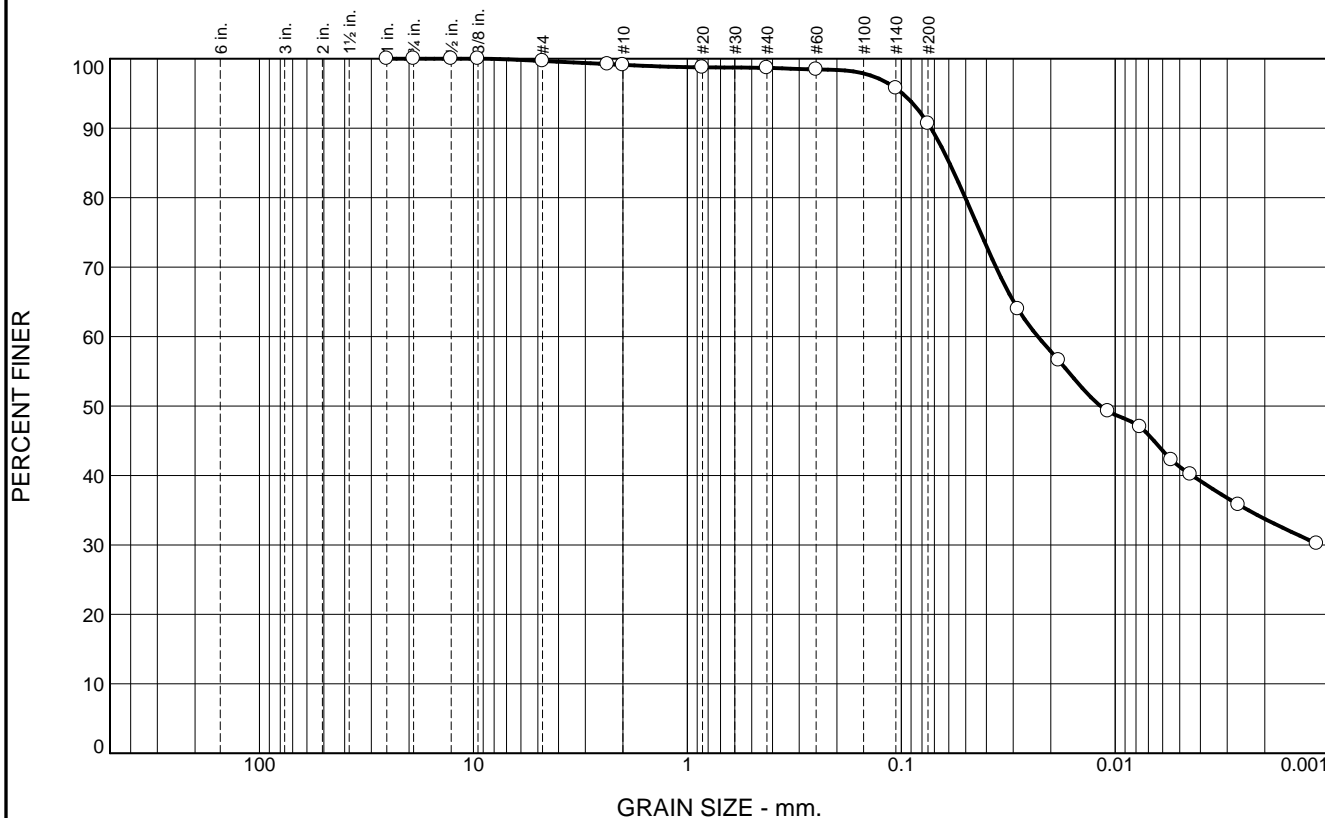
<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 2020 Geotechnical Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> MHVBC-49-19		<b>LOCATION COORDINATES</b> X = 1,801,695 Y = 216,418		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> CSI			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-27-20 <b>COMPLETED</b> 01-27-20
<b>8. TOTAL DEPTH OF BORING</b> 20.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -48.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> C. Long, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-48.0	0.0		(SP) SAND, poorly-graded, wet, light gray, fine to medium grained				
		•••••	At El. -52.0 Ft. CH lense			1	Vibrocure
		•••••	At El. -54.5 Ft. CH lense				
		•••••	At El. -56.0 Ft. CH lense				

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,801,695 Y = 216,418			ELEVATION TOP OF BORING -48.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							
			At El. -59.0 Ft. CH lense				
			At El. -63.0 Ft. medium to coarse grained, trace gravel			1	Vibracore
-68.0	20.0						
NOTES:			1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.6	0.4	8.0	49.5	41.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.7		
#8	99.2		
#10	99.1		
#20	98.8		
#40	98.7		
#60	98.5		
#140	95.7		
#200	90.7		

**Material Description**  
GRAY CLAY W/ SAND

**Atterberg Limits**  
 PL= 18      LL= 56      PI= 38

**Coefficients**  
 D<sub>90</sub>= 0.0727      D<sub>85</sub>= 0.0596      D<sub>60</sub>= 0.0230  
 D<sub>50</sub>= 0.0117      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= CH      AASHTO= A-7-6(37)

**Remarks**  
 MOISTURE CONTENT: 52.6%  
 SPECIFIC GRAVITY: 3.09

\* (no specification provided)

Source of Sample: MHVBC-35-19

Depth: 6'-8'

Date: 3/4/2020

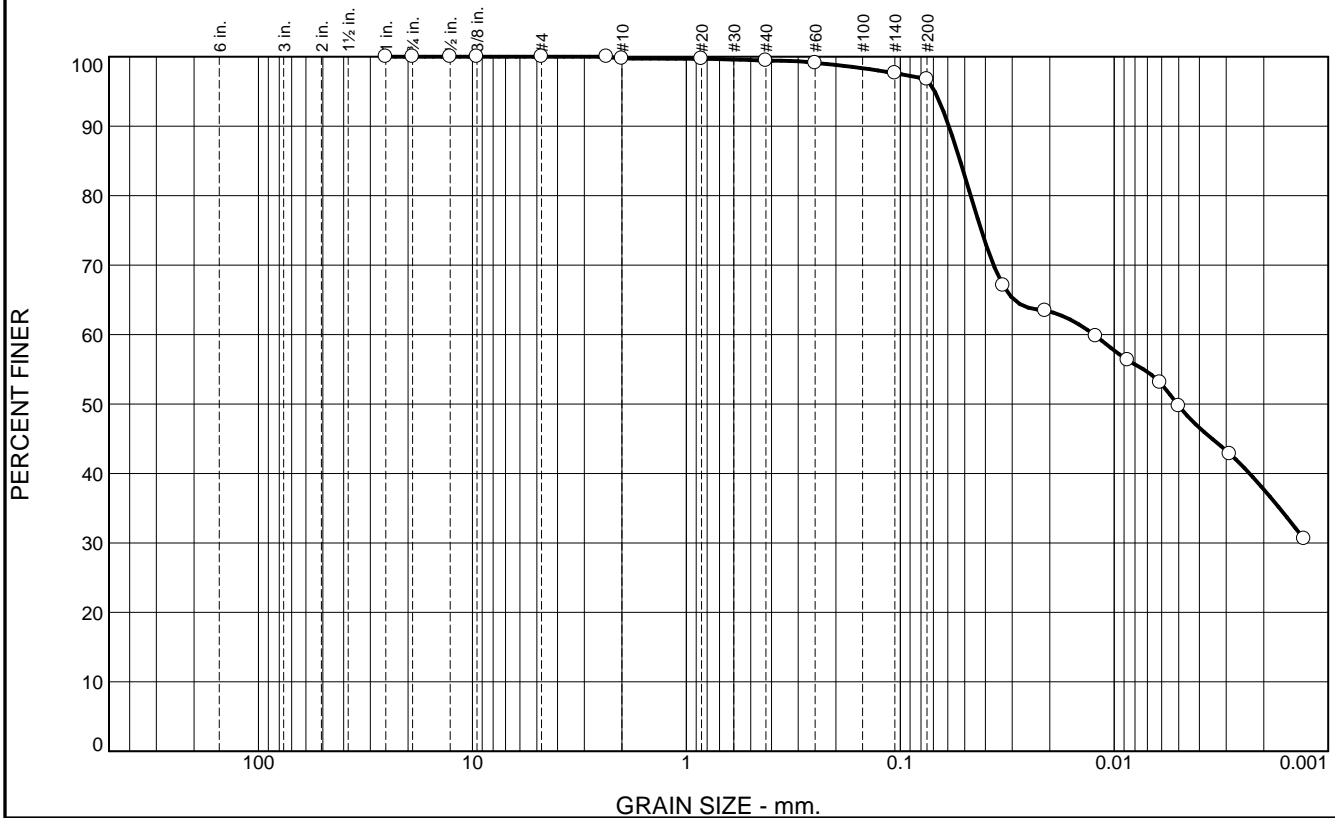
**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	0.3	2.6	47.1	49.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	99.7		
#20	99.7		
#40	99.4		
#60	99.1		
#140	97.6		
#200	96.8		

**Material Description**

BROWN SILT

**Atterberg Limits**

PL= 40      LL= 65      PI= 25

**Coefficients**

D<sub>90</sub>= 0.0593      D<sub>85</sub>= 0.0525      D<sub>60</sub>= 0.0125  
D<sub>50</sub>= 0.0051      D<sub>30</sub>=                      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= MH      AASHTO= A-7-5(32)

**Remarks**

MOISTURE CONTENT: 152.0%  
SPECIFIC GRAVITY: 2.88

\* (no specification provided)

Source of Sample: MHVBC-36-19

Depth: 2'-4'

Date: 3/4/2020

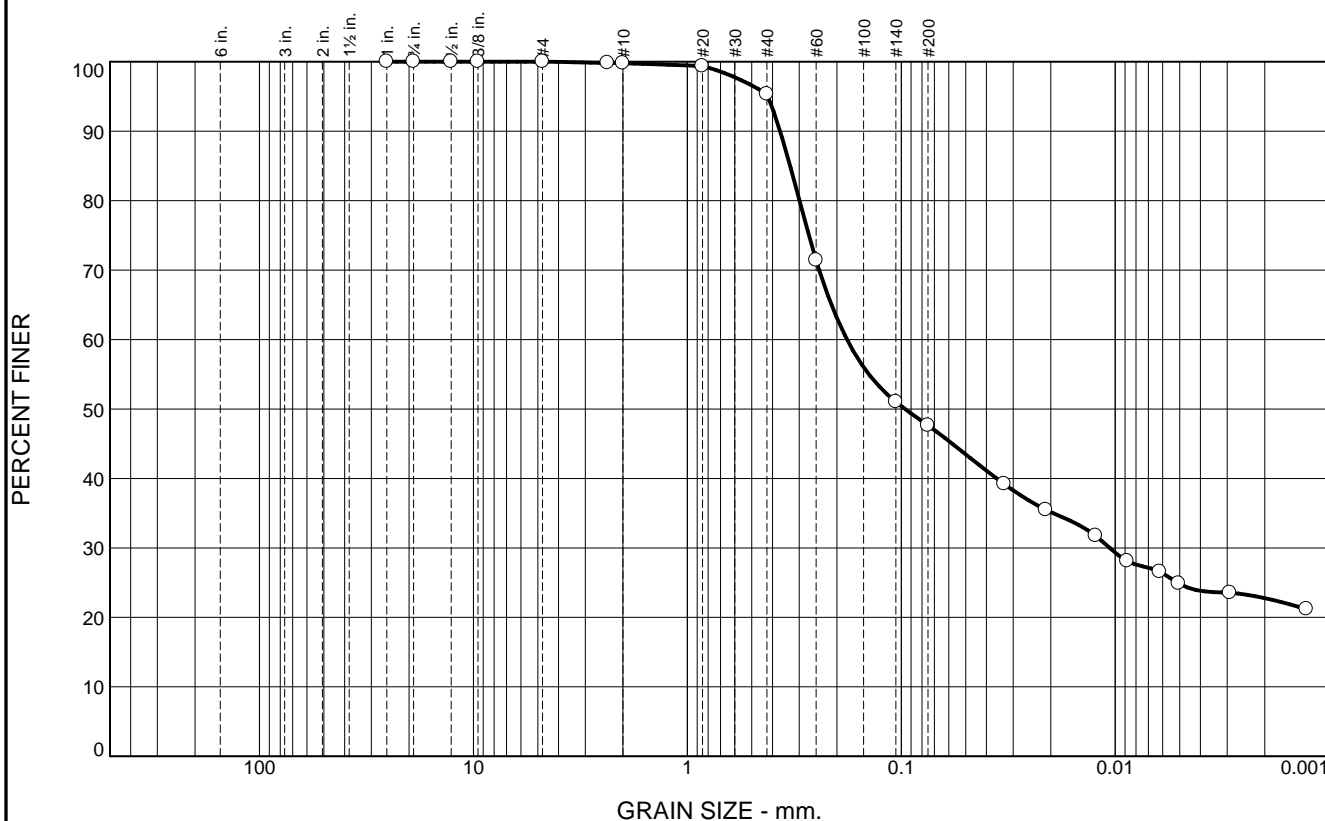
**SOUTHERN EARTH  
SCIENCES**  
Mobile, Alabama

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	4.5	47.7	22.8	24.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.8		
#10	99.8		
#20	99.4		
#40	95.3		
#60	71.4		
#140	51.0		
#200	47.6		

**Material Description**

GRAY CLAYEY SAND

**Atterberg Limits**

PL= 16      LL= 28      PI= 12

**Coefficients**

D<sub>90</sub>= 0.3686      D<sub>85</sub>= 0.3309      D<sub>60</sub>= 0.1794  
D<sub>50</sub>= 0.0961      D<sub>30</sub>= 0.0106      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= SC                      AASHTO= A-6(2)

**Remarks**

MOISTURE CONTENT: 32.4%  
ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-36-19

Depth: 8'-10'

Date: 3/4/2020

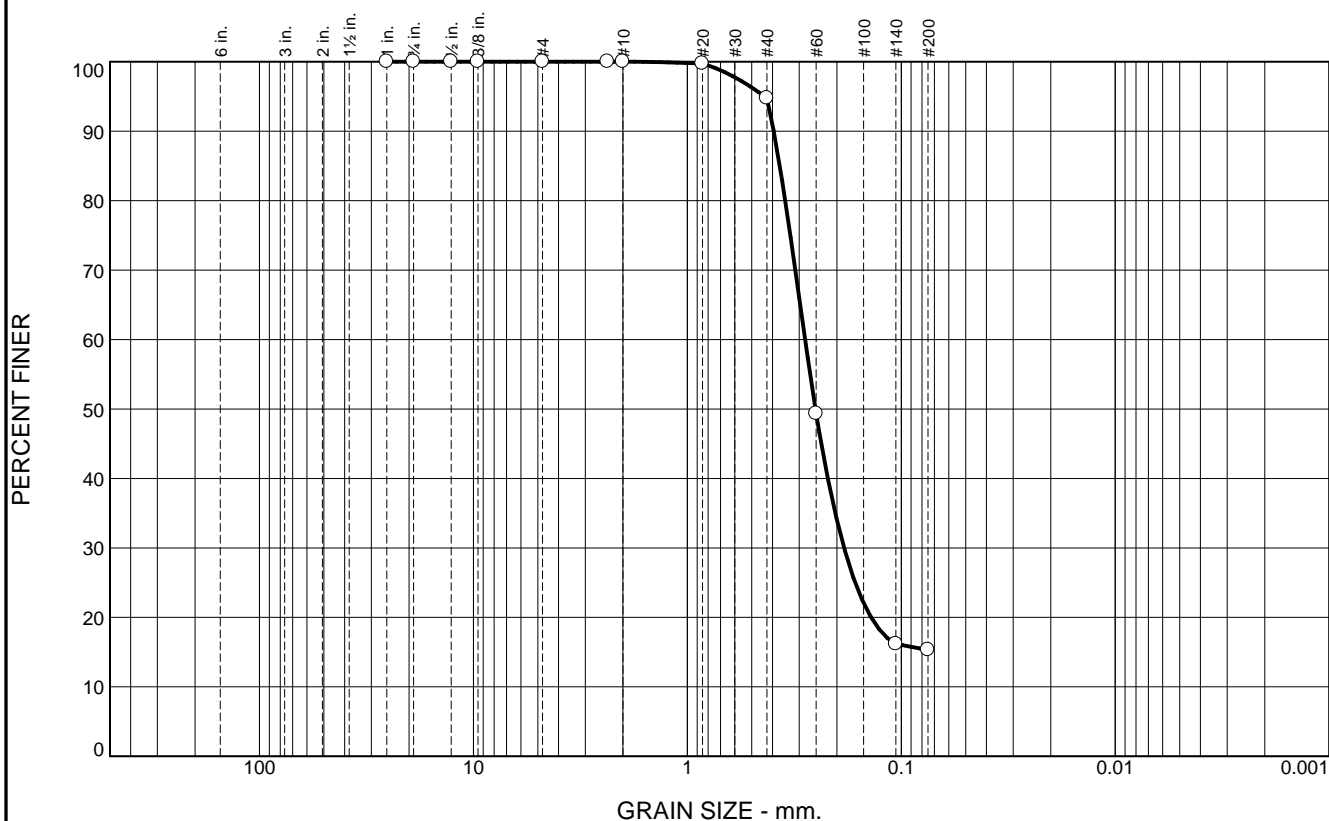
**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	5.3	79.4	15.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.7		
#40	94.7		
#60	49.4		
#140	16.2		
#200	15.3		

**Material Description**

GRAY SAND

**Atterberg Limits**  
 PL=                      LL=                      PI=

**Coefficients**  
 D<sub>90</sub>= 0.3947      D<sub>85</sub>= 0.3698      D<sub>60</sub>= 0.2818  
 D<sub>50</sub>= 0.2519      D<sub>30</sub>= 0.1851      D<sub>15</sub>=  
 D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**  
 USCS= SM                      AASHTO=

**Remarks**  
 MOISTURE CONTENT: 31.1%

\* (no specification provided)

Source of Sample: MHVBC-36-19

Depth: 14'-16'

Date: 3/4/2020

**SOUTHERN EARTH  
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Mobile, Alabama**

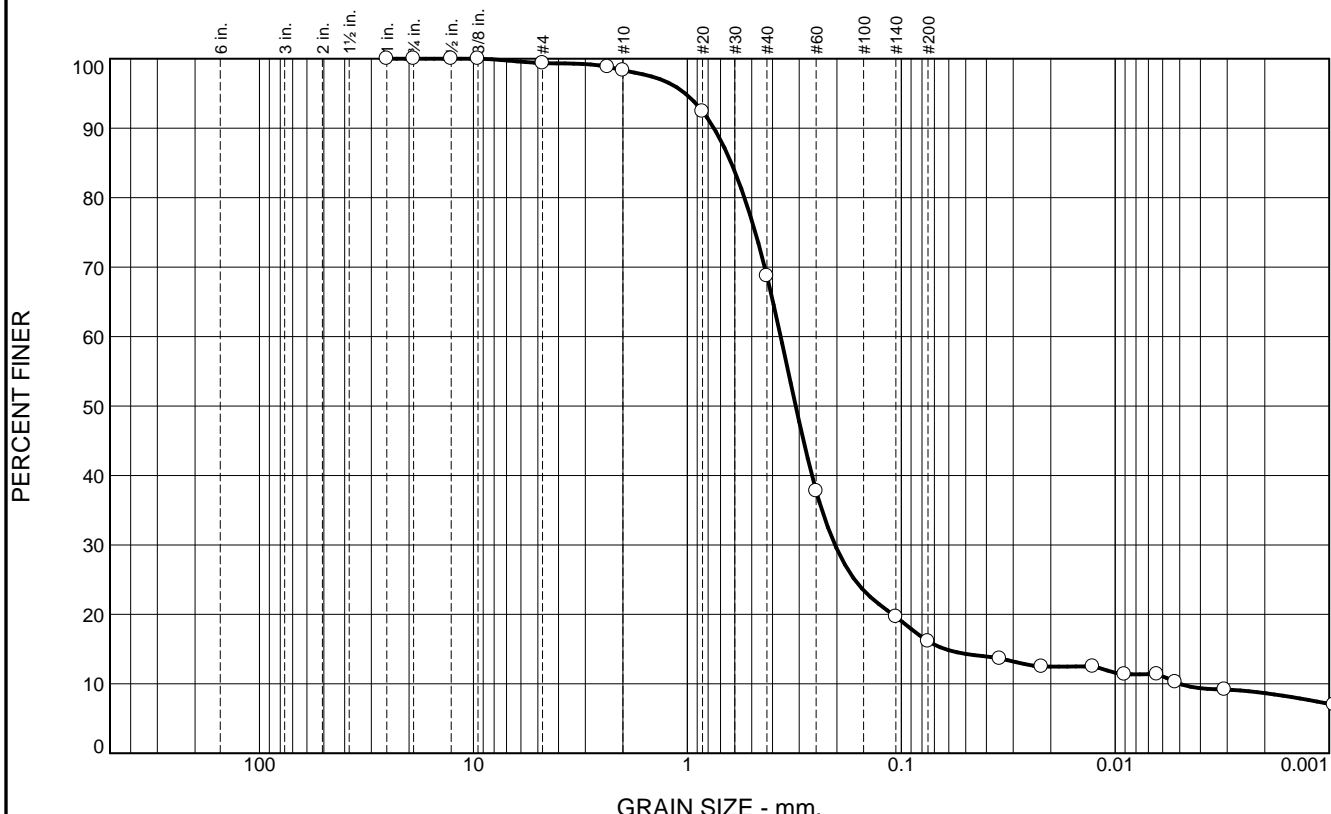
Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure



# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	1.1	29.6	52.6	6.1	10.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.4		
#8	98.8		
#10	98.3		
#20	92.4		
#40	68.7		
#60	37.8		
#140	19.7		
#200	16.1		

**Material Description**

GRAY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.7519              D<sub>85</sub>= 0.6235              D<sub>60</sub>= 0.3663  
D<sub>50</sub>= 0.3117              D<sub>30</sub>= 0.2042              D<sub>15</sub>= 0.0624  
D<sub>10</sub>= 0.0050              C<sub>u</sub>= 73.33                  C<sub>c</sub>= 22.79

**Classification**

USCS= SP-SM                      AASHTO=

**Remarks**

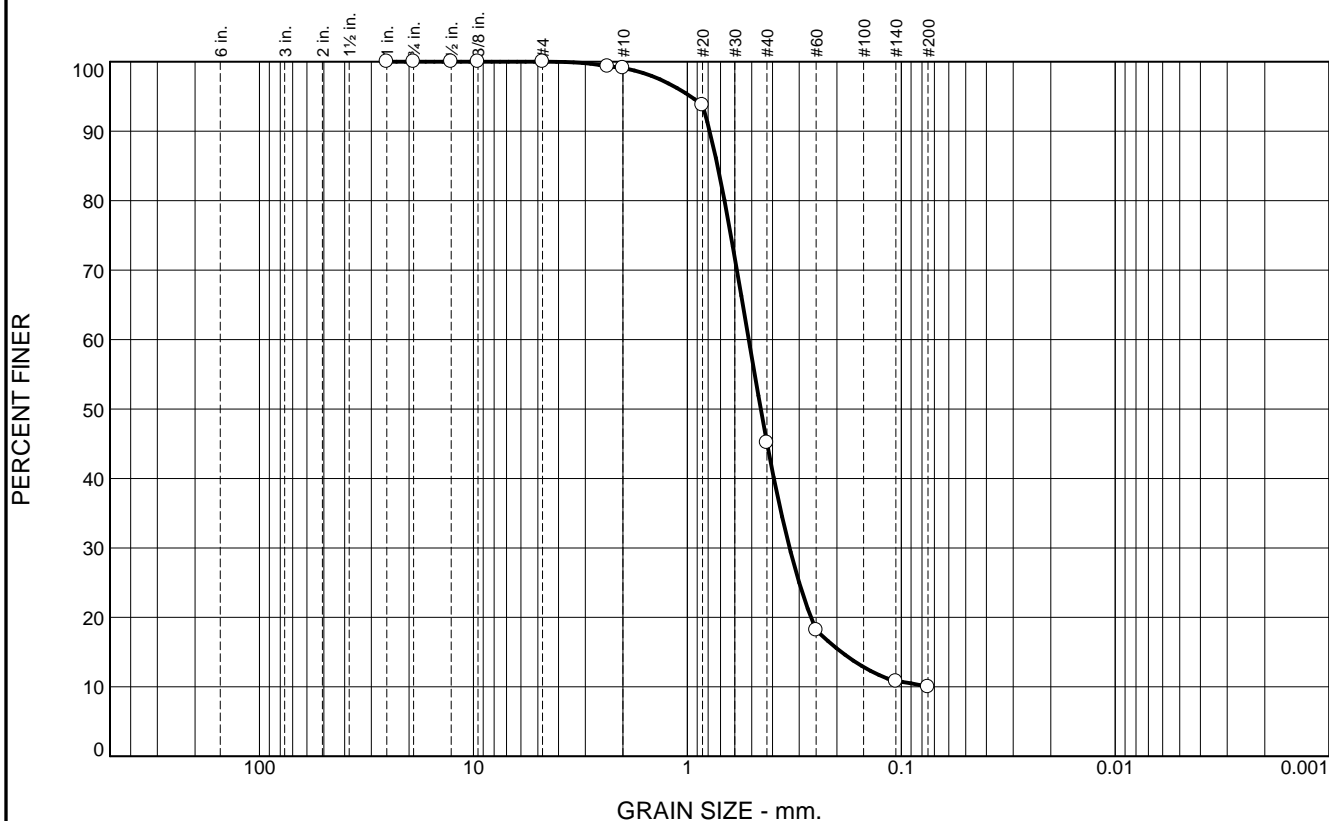
MOISTURE CONTENT: 24.7%  
SPECIFIC GRAVITY: 2.73

\* (no specification provided)

Source of Sample: MHVBC-37-19              Depth: 2'-3'                                      Date: 2/19/2020

<b>SOUTHERN EARTH SCIENCES</b> <b>Mobile, Alabama</b>	<b>Client:</b> ARCHWAY SOLUTIONS <b>Project:</b> USACOE - MOBILE HARBOR W91278-19-D-0045 <b>Project No:</b> M20-069 <b>Figure</b>
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# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	53.9	35.2	10.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.3		
#10	99.1		
#20	93.8		
#40	45.2		
#60	18.2		
#140	10.8		
#200	10.0		

**Material Description**

GRAY & TAN SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.7865      D<sub>85</sub>= 0.7226      D<sub>60</sub>= 0.5165  
D<sub>50</sub>= 0.4541      D<sub>30</sub>= 0.3327      D<sub>15</sub>= 0.1905  
D<sub>10</sub>= 0.0754      C<sub>u</sub>= 6.85              C<sub>c</sub>= 2.84

**Classification**

USCS= SW-SM                      AASHTO=

**Remarks**

MOISTURE CONTENT: 19.9%  
SPECIFIC GRAVITY: 2.75

\* (no specification provided)

Source of Sample: MHVBC-37-19

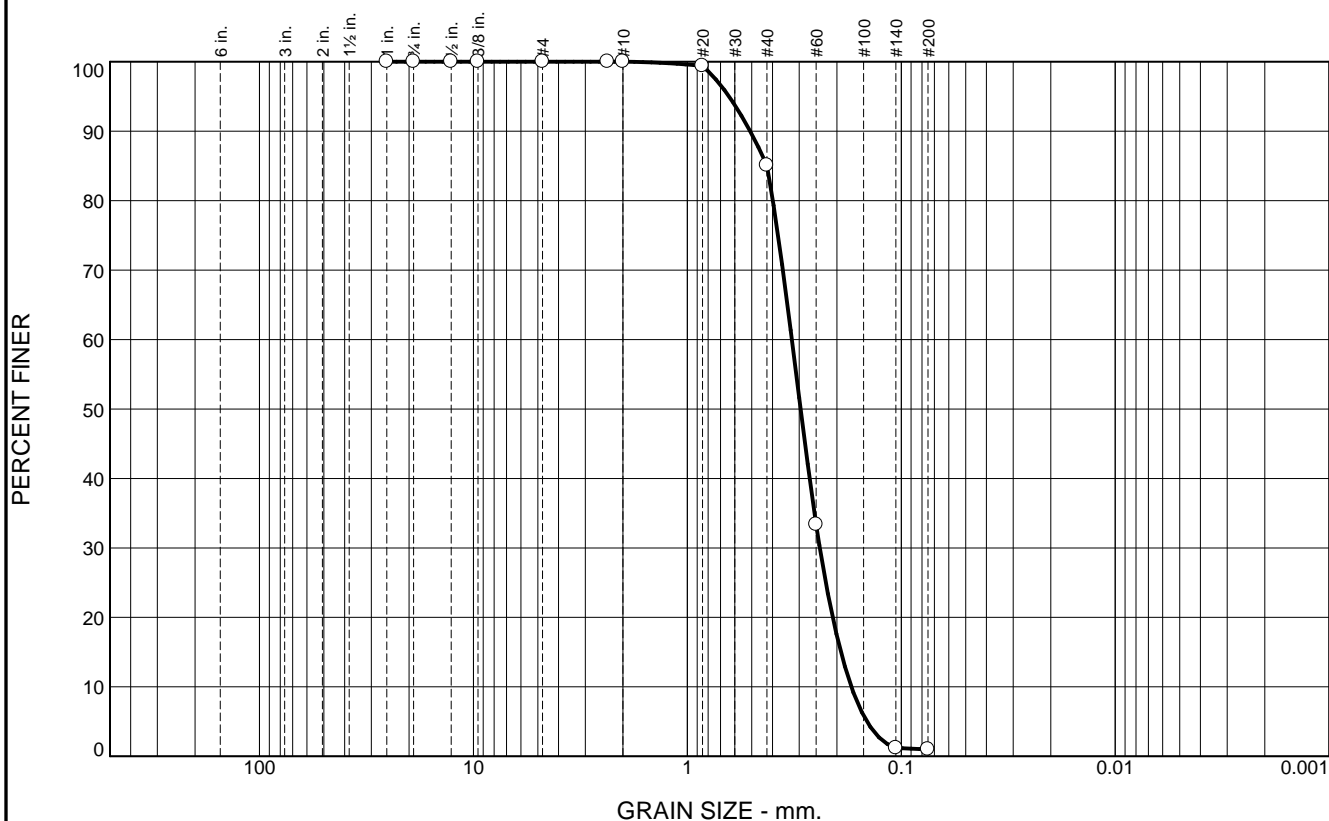
Depth: 5'-6'

Date: 2/19/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	14.9	84.1	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.4		
#40	85.1		
#60	33.4		
#140	1.2		
#200	1.0		

**Material Description**

TAN SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.5090              D<sub>85</sub>= 0.4245              D<sub>60</sub>= 0.3248  
D<sub>50</sub>= 0.2957              D<sub>30</sub>= 0.2404              D<sub>15</sub>= 0.1916  
D<sub>10</sub>= 0.1712              C<sub>u</sub>= 1.90                      C<sub>c</sub>= 1.04

**Classification**

USCS= SP                      AASHTO=

**Remarks**

MOISTURE CONTENT: 26.4%

\* (no specification provided)

Source of Sample: MHVBC-37-19

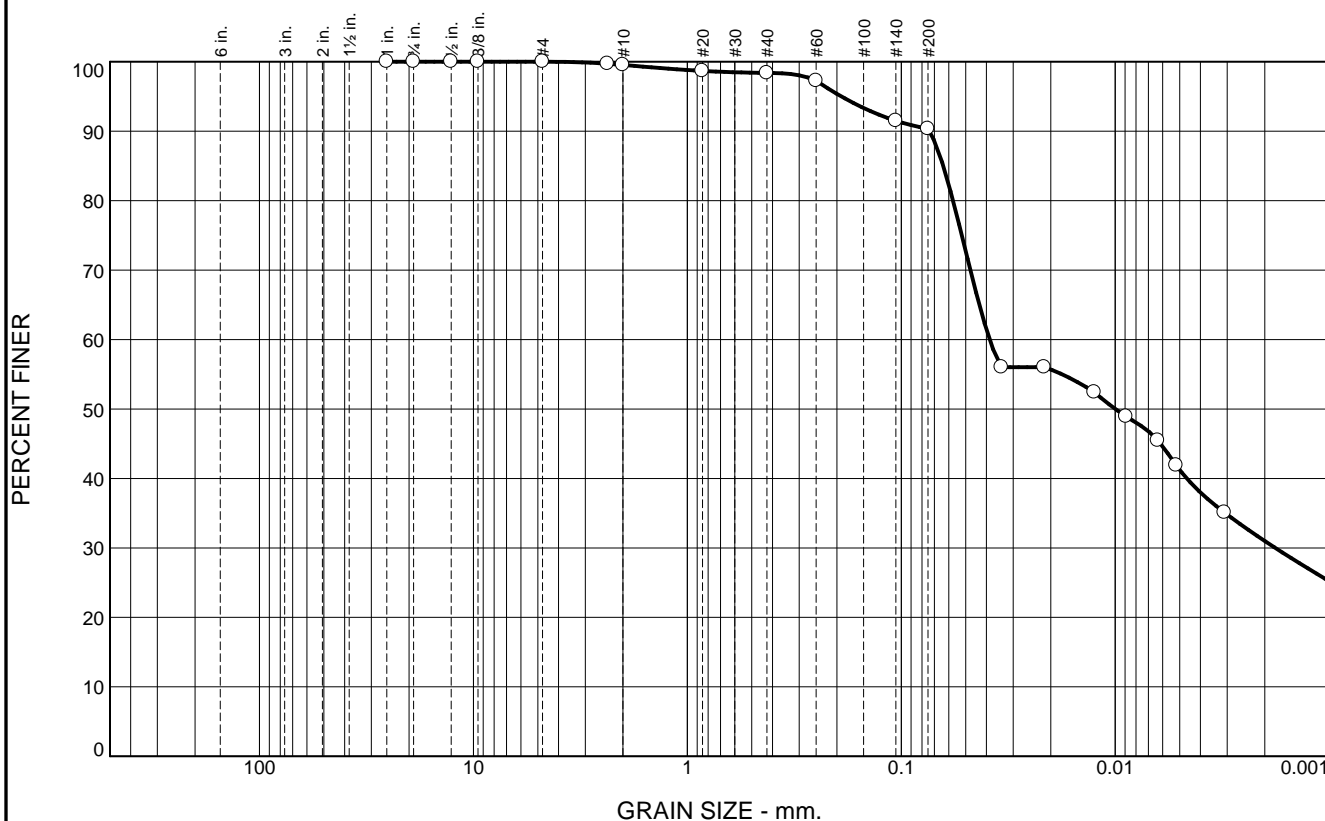
Depth: 12'-13'

Date: 2/19/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	1.1	8.1	49.1	41.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.7		
#10	99.5		
#20	98.7		
#40	98.4		
#60	97.3		
#140	91.5		
#200	90.3		

**Material Description**

BROWN SILT

**Atterberg Limits**  
 PL= 37      LL= 53      PI= 16

**Coefficients**  
 D<sub>90</sub>= 0.0738      D<sub>85</sub>= 0.0637      D<sub>60</sub>= 0.0386  
 D<sub>50</sub>= 0.0100      D<sub>30</sub>= 0.0018      D<sub>15</sub>=  
 D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**  
 USCS= MH                      AASHTO= A-7-5(19)

**Remarks**  
 MOISTURE CONTENT: 164.1%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-38-19

Depth: 3'-4'

Date: 2/19/2020

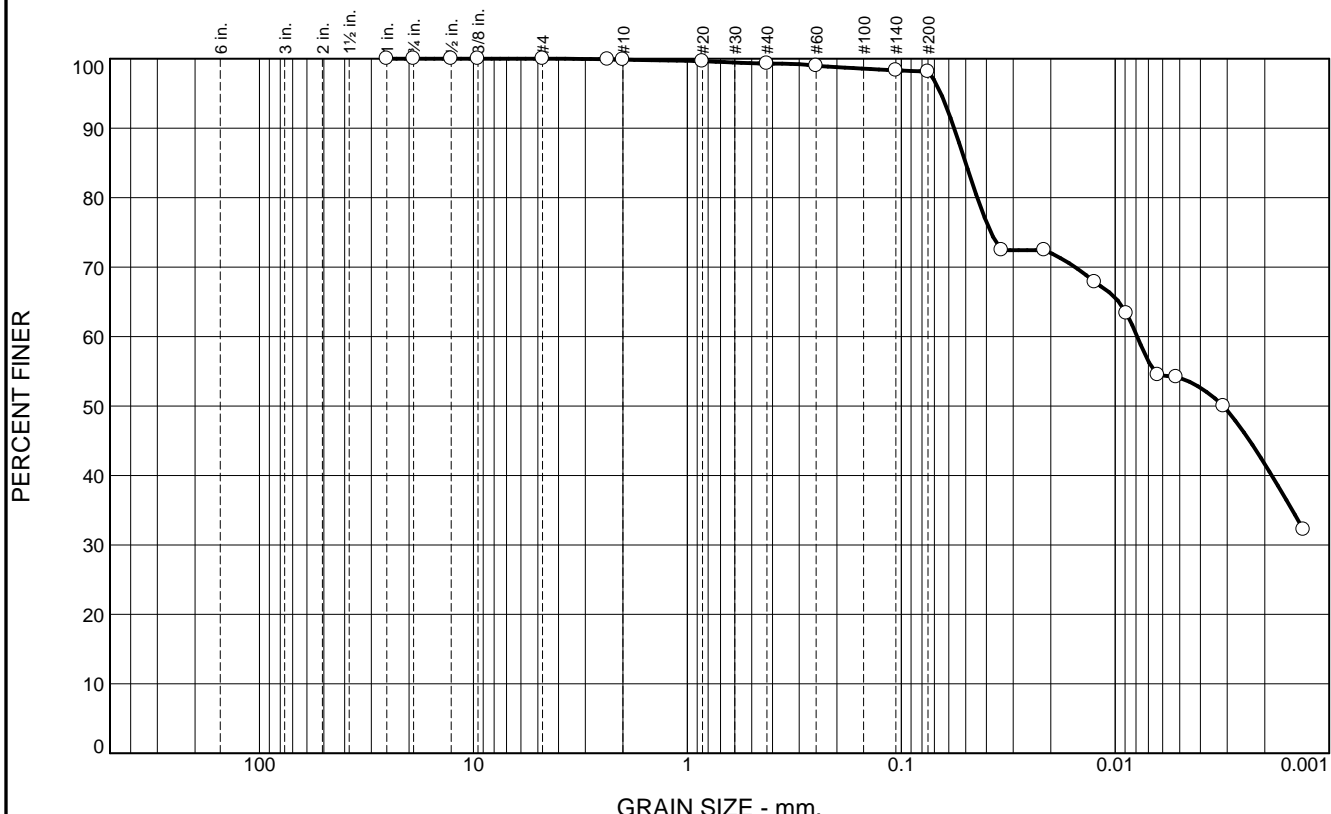
**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.6	1.2	44.1	54.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.9		
#20	99.6		
#40	99.3		
#60	99.0		
#140	98.3		
#200	98.1		

**Material Description**

GRAY SILT

**Atterberg Limits**  
 PL= 38      LL= 62      PI= 24

**Coefficients**  
 D<sub>90</sub>= 0.0566      D<sub>85</sub>= 0.0500      D<sub>60</sub>= 0.0079  
 D<sub>50</sub>= 0.0031      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= MH      AASHTO= A-7-5(31)

**Remarks**  
 MOISTURE CONTENT: 154.5%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-38-19

Depth: 8'-9'

Date: 2/19/2020

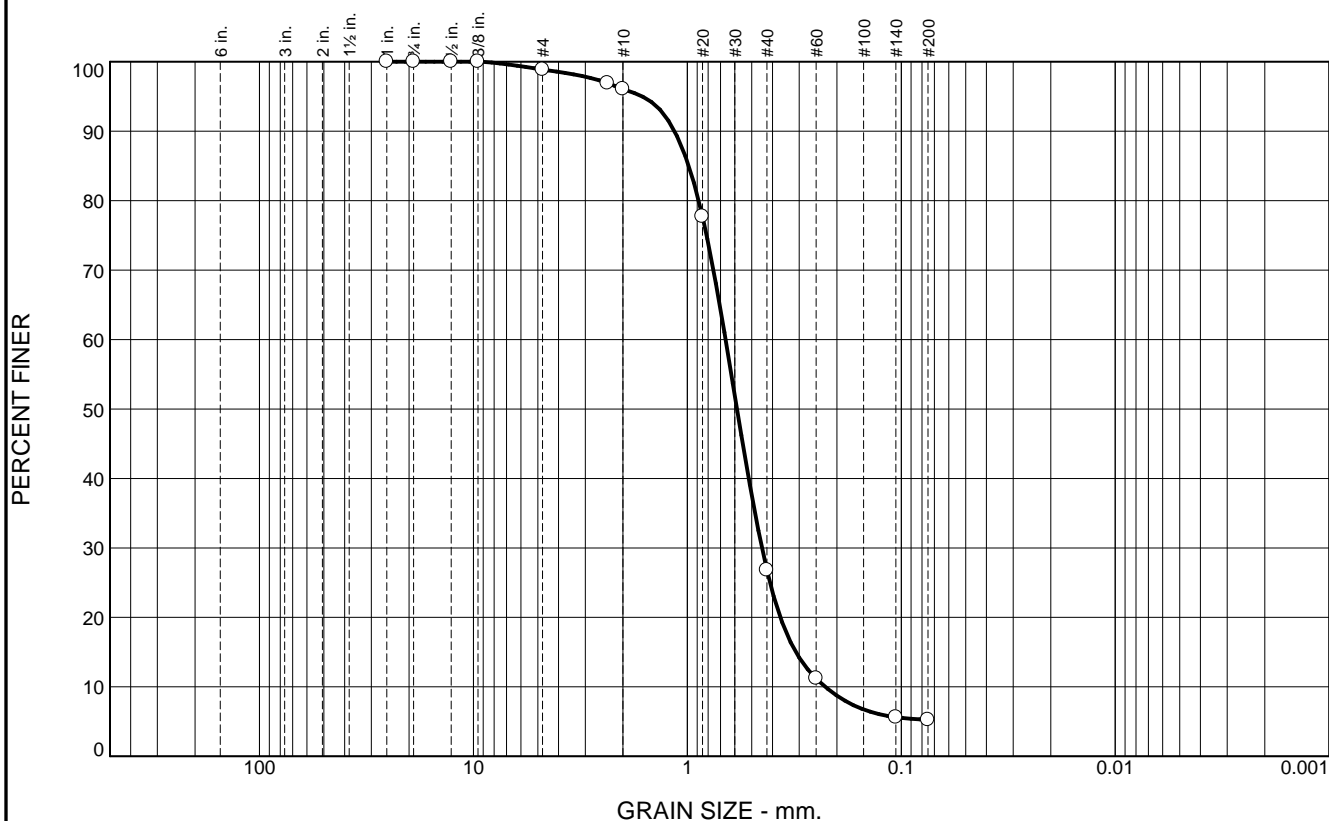
**SOUTHERN EARTH  
SCIENCES**  
Mobile, Alabama

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.1	2.8	69.3	21.6	5.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	98.9		
#8	96.9		
#10	96.1		
#20	77.7		
#40	26.8		
#60	11.2		
#140	5.6		
#200	5.2		

**Material Description**

TAN SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 1.1481              D<sub>85</sub>= 0.9855              D<sub>60</sub>= 0.6630  
D<sub>50</sub>= 0.5860              D<sub>30</sub>= 0.4483              D<sub>15</sub>= 0.3112  
D<sub>10</sub>= 0.2266              C<sub>u</sub>= 2.93                      C<sub>c</sub>= 1.34

**Classification**

USCS= SP-SM                      AASHTO=

**Remarks**

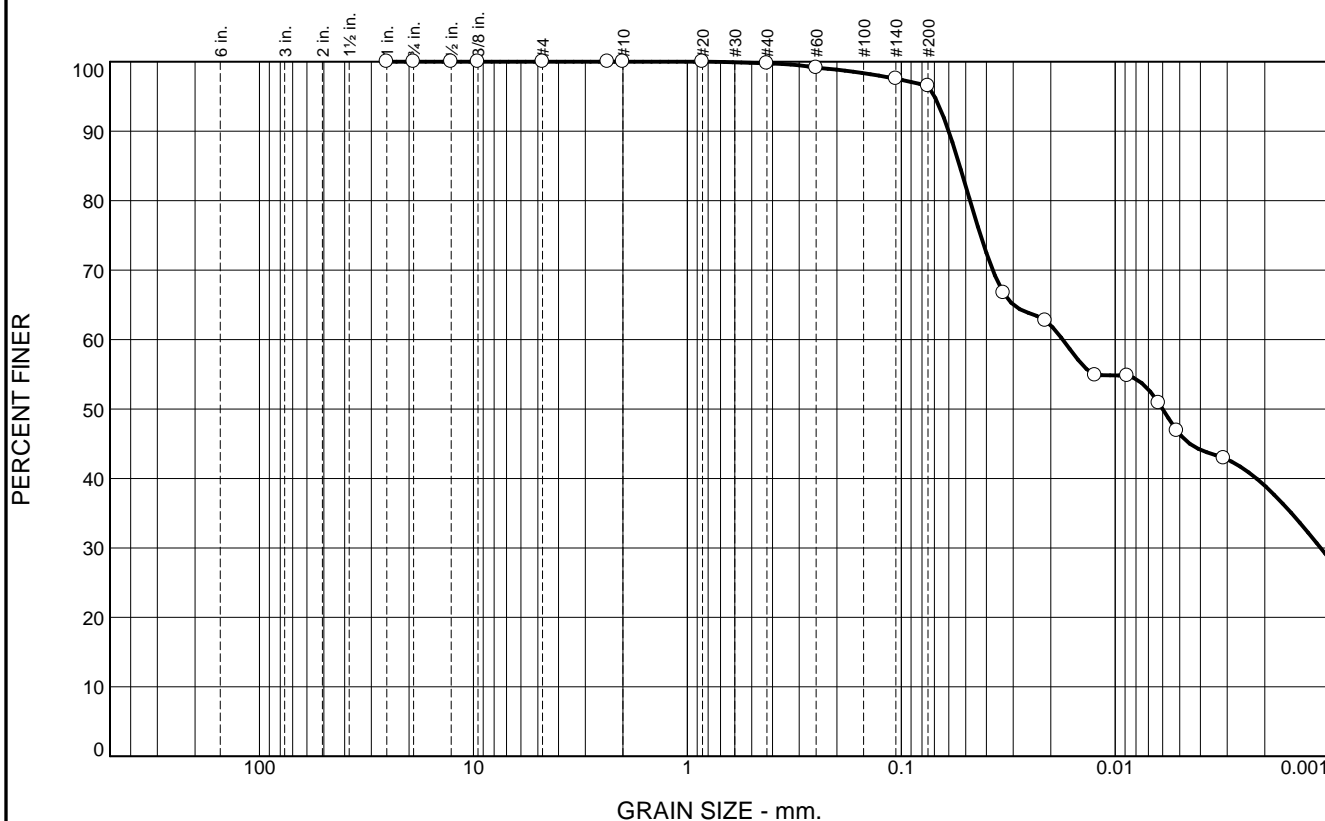
MOISTURE CONTENT: 20.1%

\* (no specification provided)

Source of Sample: MHVBC-38-19              Depth: 13'-14'                                      Date: 2/19/2020

<b>SOUTHERN EARTH SCIENCES</b> <b>Mobile, Alabama</b>	<b>Client:</b> ARCHWAY SOLUTIONS <b>Project:</b> USACOE - MOBILE HARBOR W91278-19-D-0045 <b>Project No:</b> M20-069 <b>Figure</b>
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# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	3.3	50.1	46.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.1		
#140	97.5		
#200	96.5		

**Material Description**

BROWN SILT

**Atterberg Limits**

PL= 39      LL= 64      PI= 25

**Coefficients**

D<sub>90</sub>= 0.0601      D<sub>85</sub>= 0.0533      D<sub>60</sub>= 0.0176  
D<sub>50</sub>= 0.0060      D<sub>30</sub>= 0.0011      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= MH                      AASHTO= A-7-5(32)

**Remarks**

MOISTURE CONTENT: 137.6%  
ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-39-19

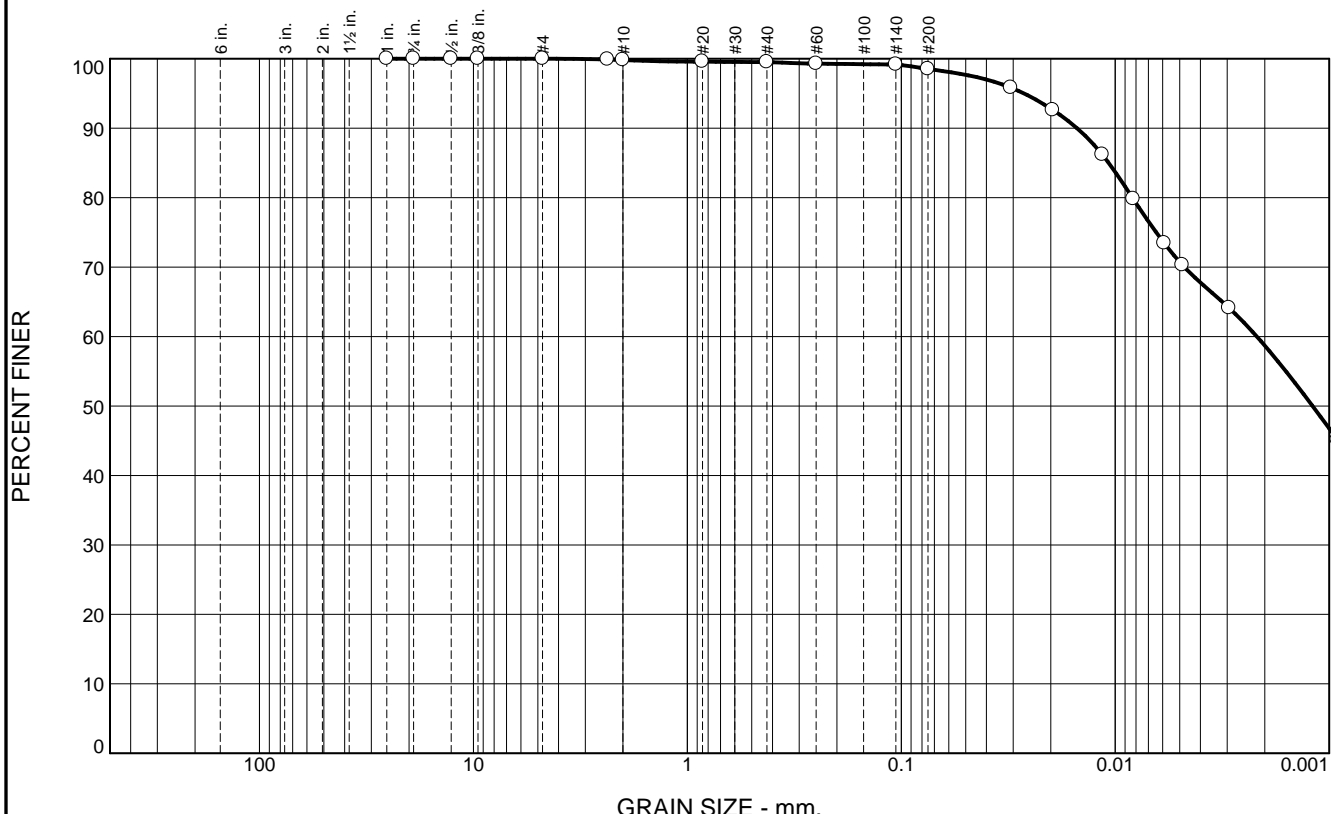
Depth: 3'-4'

Date: 2/19/2020

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SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	0.3	1.0	27.8	70.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.8		
#20	99.6		
#40	99.5		
#60	99.3		
#140	99.2		
#200	98.5		

**Material Description**

GRAY CLAY

**Atterberg Limits**  
 PL= 26      LL= 51      PI= 25

**Coefficients**  
 D<sub>90</sub>= 0.0151      D<sub>85</sub>= 0.0107      D<sub>60</sub>= 0.0022  
 D<sub>50</sub>= 0.0012      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= CH      AASHTO= A-7-6(29)

**Remarks**  
 MOISTURE CONTENT: 69.9%  
 ASSUMED SPEC. GRAVITY: 2.7

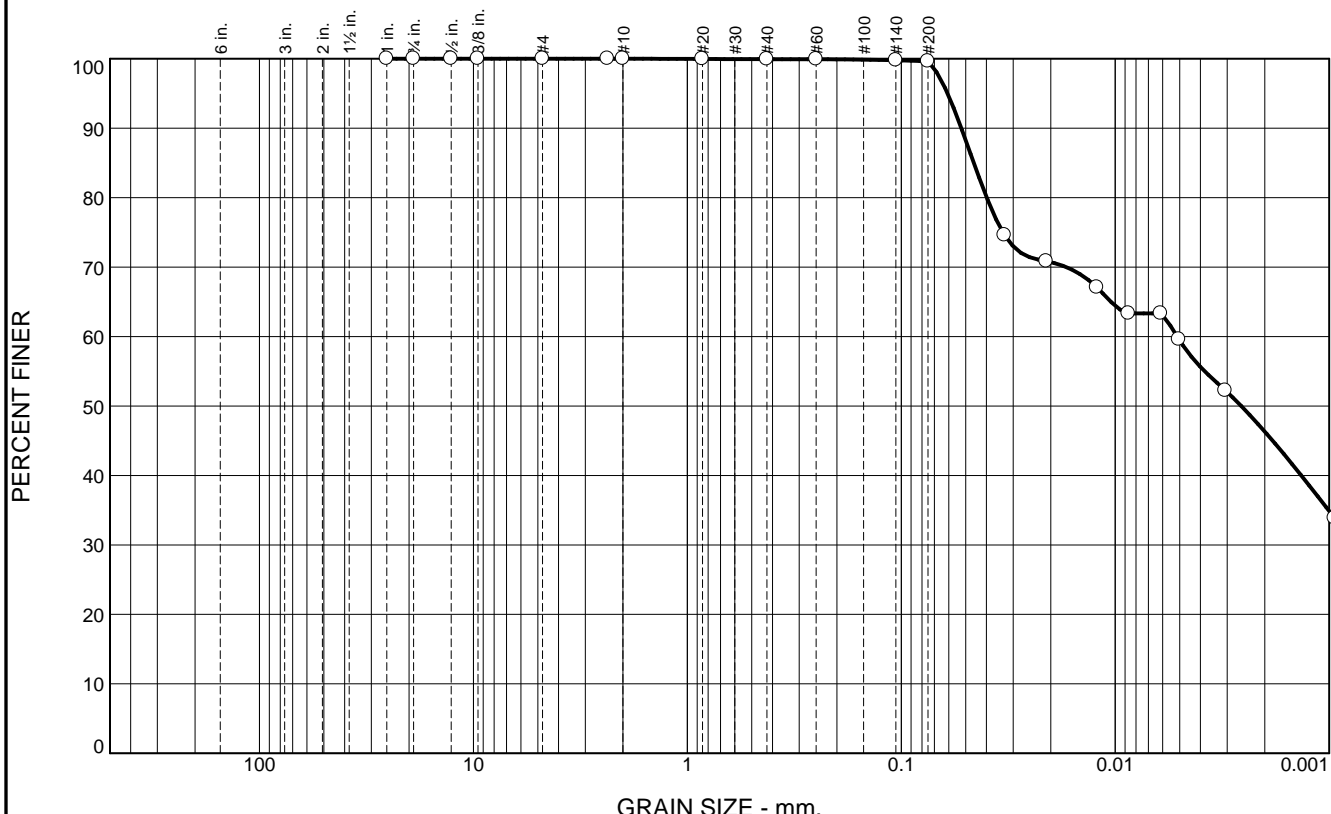
\* (no specification provided)

Source of Sample: MHVBC-39-19      Depth: 10'-11'      Date: 2/19/2020

<b>SOUTHERN EARTH SCIENCES</b> Mobile, Alabama	Client: ARCHWAY SOLUTIONS Project: USACOE - MOBILE HARBOR W91278-19-D-0045 Project No: M20-069      Figure
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# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.3	40.2	59.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	100.0		
#40	99.9		
#60	99.9		
#140	99.8		
#200	99.6		

**Material Description**

BROWN SILT

**Atterberg Limits**  
 PL= 39      LL= 65      PI= 26

**Coefficients**  
 D<sub>90</sub>= 0.0524      D<sub>85</sub>= 0.0458      D<sub>60</sub>= 0.0051  
 D<sub>50</sub>= 0.0026      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= MH      AASHTO= A-7-5(35)

**Remarks**  
 MOISTURE CONTENT: 149.1%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-40-19

Depth: 6'-7'

Date: 2/19/2020

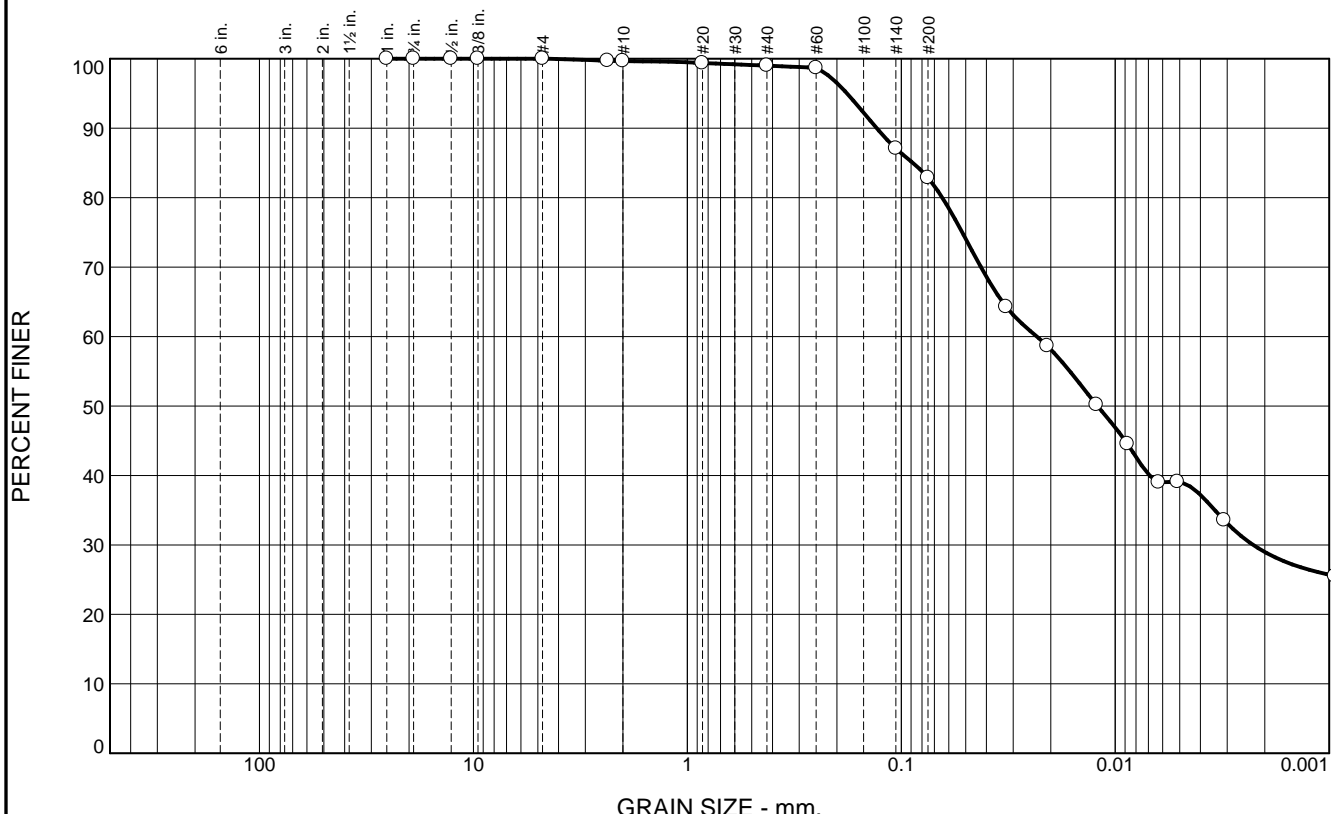
**SOUTHERN EARTH  
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Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	0.7	16.1	43.9	39.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.7		
#10	99.7		
#20	99.4		
#40	99.0		
#60	98.7		
#140	87.1		
#200	82.9		

**Material Description**

GRAY CLAY

**Atterberg Limits**  
 PL= 22      LL= 33      PI= 11

**Coefficients**  
 D<sub>90</sub>= 0.1304      D<sub>85</sub>= 0.0883      D<sub>60</sub>= 0.0232  
 D<sub>50</sub>= 0.0121      D<sub>30</sub>= 0.0023      D<sub>15</sub>=  
 D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**  
 USCS= CL                      AASHTO= A-6(9)

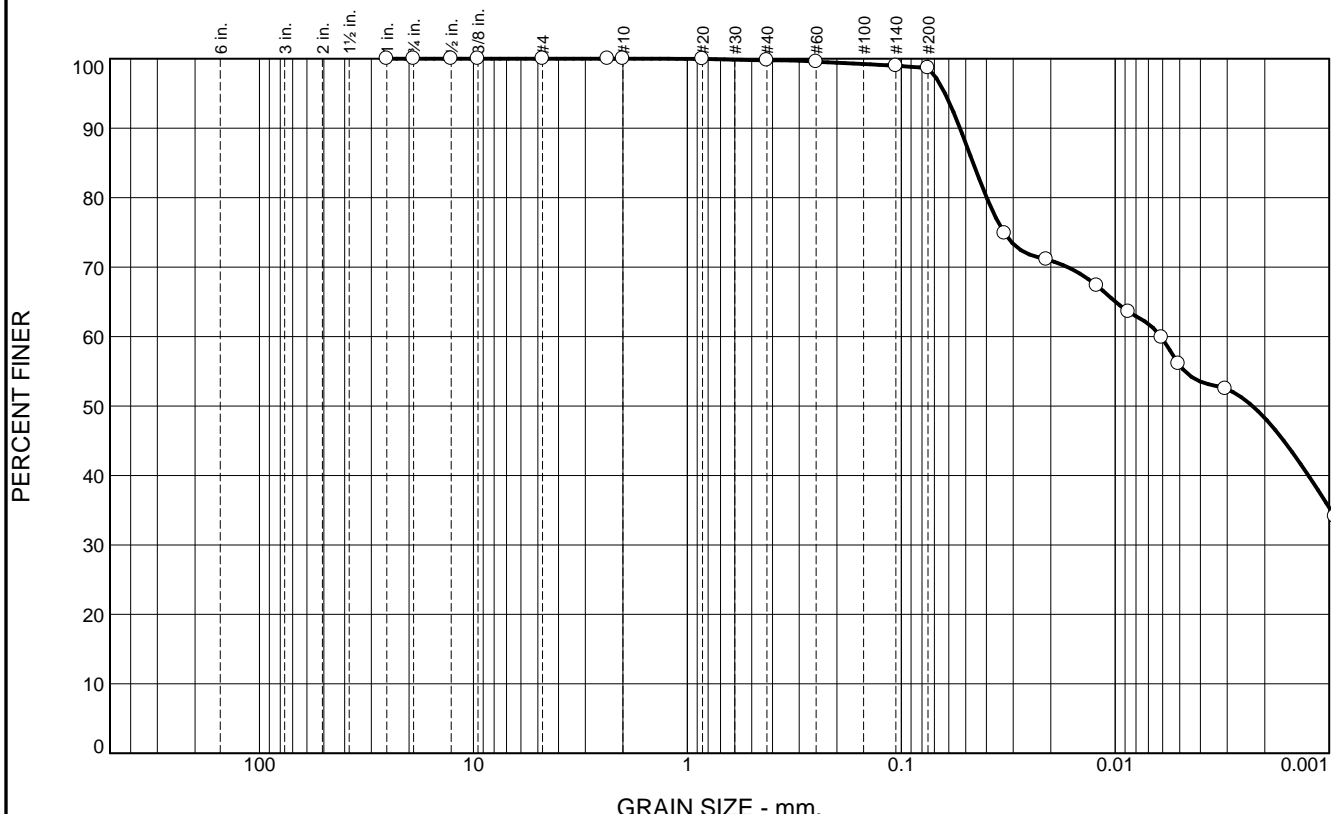
**Remarks**  
 MOISTURE CONTENT: 46.7%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-40-19      Depth: 10'-11'      Date: 2/19/2020

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---	--

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	1.1	42.9	55.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.5		
#140	99.0		
#200	98.7		

**Material Description**

BROWN SILT

**Atterberg Limits**  
 PL= 34      LL= 61      PI= 27

**Coefficients**  
 D<sub>90</sub>= 0.0532      D<sub>85</sub>= 0.0462      D<sub>60</sub>= 0.0061  
 D<sub>50</sub>= 0.0023      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= MH      AASHTO= A-7-5(34)

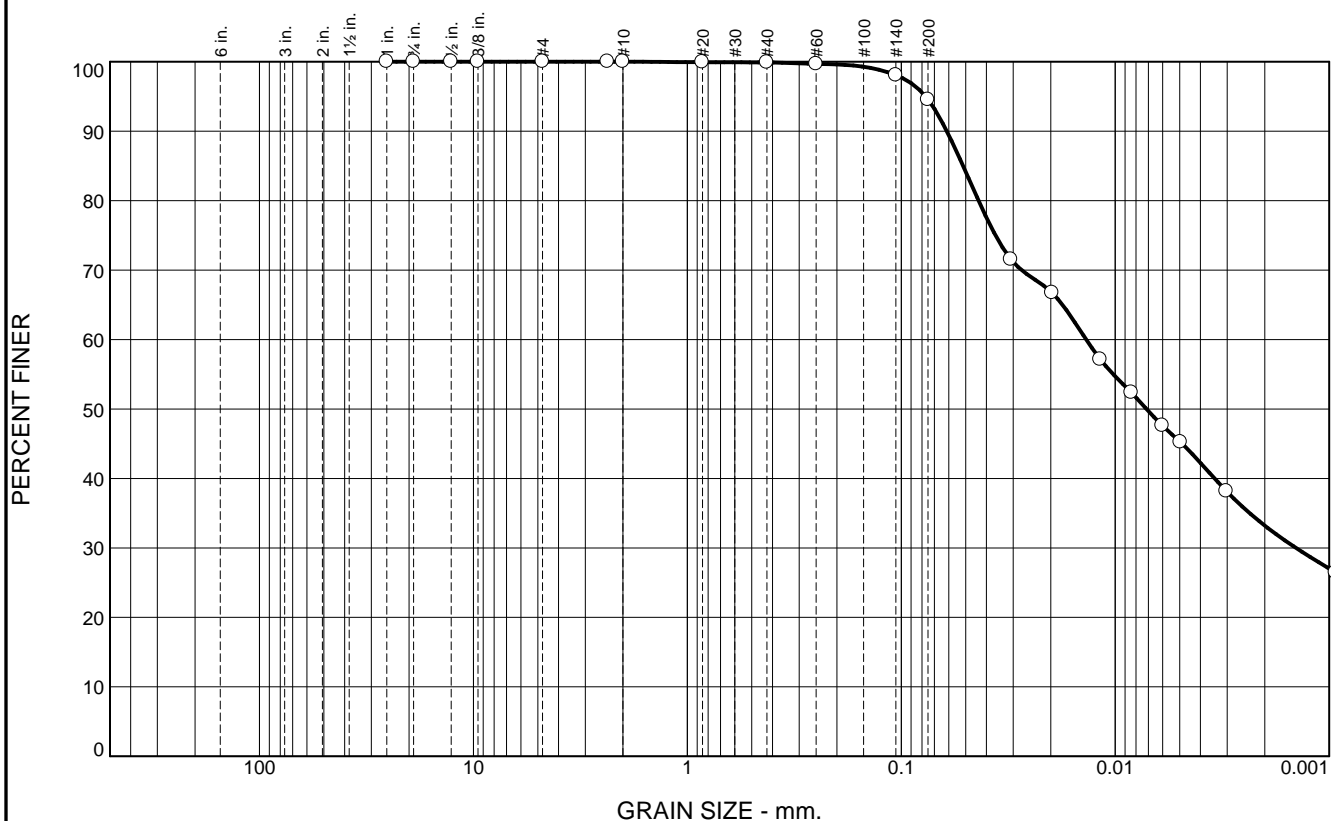
**Remarks**  
 MOISTURE CONTENT: 118.2%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-41-19      Depth: 7'-8'      Date: 2/24/2020

<b>SOUTHERN EARTH SCIENCES</b> Mobile, Alabama	Client: ARCHWAY SOLUTIONS Project: USACOE - MOBILE HARBOR W91278-19-D-0045 Project No: M20-069      Figure
---	--

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	5.4	49.2	45.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.9		
#40	99.9		
#60	99.7		
#140	98.1		
#200	94.5		

**Material Description**

GRAY CLAY

**Atterberg Limits**  
 PL= 25      LL= 47      PI= 22

**Coefficients**  
 D<sub>90</sub>= 0.0613      D<sub>85</sub>= 0.0515      D<sub>60</sub>= 0.0137  
 D<sub>50</sub>= 0.0071      D<sub>30</sub>= 0.0014      D<sub>15</sub>=  
 D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**  
 USCS= CL                      AASHTO= A-7-6(23)

**Remarks**  
 MOISTURE CONTENT: 51.2%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-41-19

Depth: 13'-14'

Date: 2/24/2020

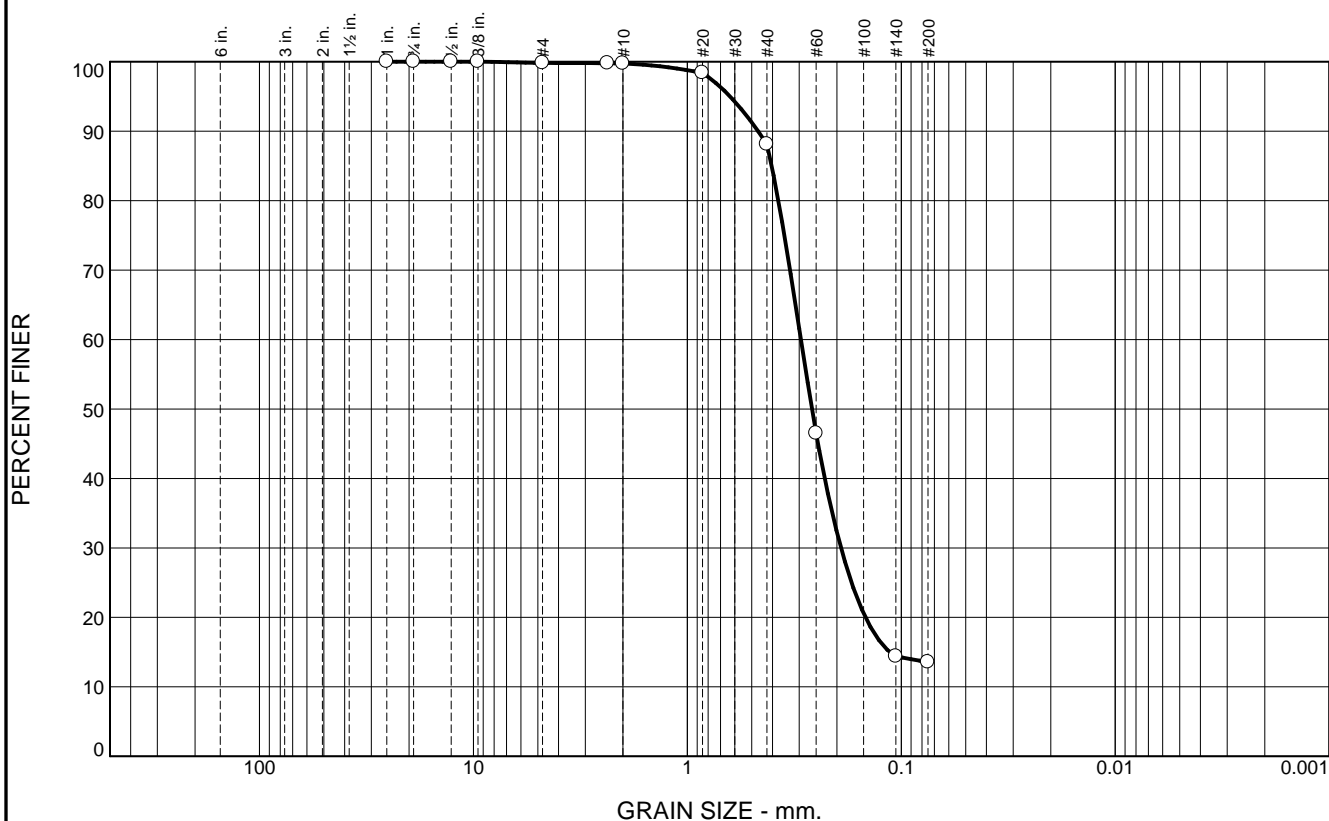
**SOUTHERN EARTH  
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Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.1	11.6	74.6	13.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#8	99.8		
#10	99.7		
#20	98.4		
#40	88.1		
#60	46.5		
#140	14.4		
#200	13.5		

**Material Description**

GRAY SILTY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.4674              D<sub>85</sub>= 0.4035              D<sub>60</sub>= 0.2948  
D<sub>50</sub>= 0.2615              D<sub>30</sub>= 0.1914              D<sub>15</sub>= 0.1130  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= SM                      AASHTO=

**Remarks**

MOISTURE CONTENT: 24.5%  
SPECIFIC GRAVITY: 2.79

\* (no specification provided)

Source of Sample: MHVBC-42-19

Depth: 4'-5'

Date: 2/19/2020

**SOUTHERN EARTH  
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Mobile, Alabama**

**Client:** ARCHWAY SOLUTIONS  
**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045  
**Project No:** M20-069                      **Figure**

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	18.3	76.4	5.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.8		
#20	97.5		
#40	81.5		
#60	31.3		
#140	5.6		
#200	5.1		

**Material Description**

GRAY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.4936      D<sub>85</sub>= 0.4481      D<sub>60</sub>= 0.3353  
D<sub>50</sub>= 0.3043      D<sub>30</sub>= 0.2459      D<sub>15</sub>= 0.1909  
D<sub>10</sub>= 0.1638      C<sub>u</sub>= 2.05              C<sub>c</sub>= 1.10

**Classification**

USCS= SP-SM                      AASHTO=

**Remarks**

MOISTURE CONTENT: 25.3%  
SPECIFIC GRAVITY: 2.76

\* (no specification provided)

Source of Sample: MHVBC-42-19

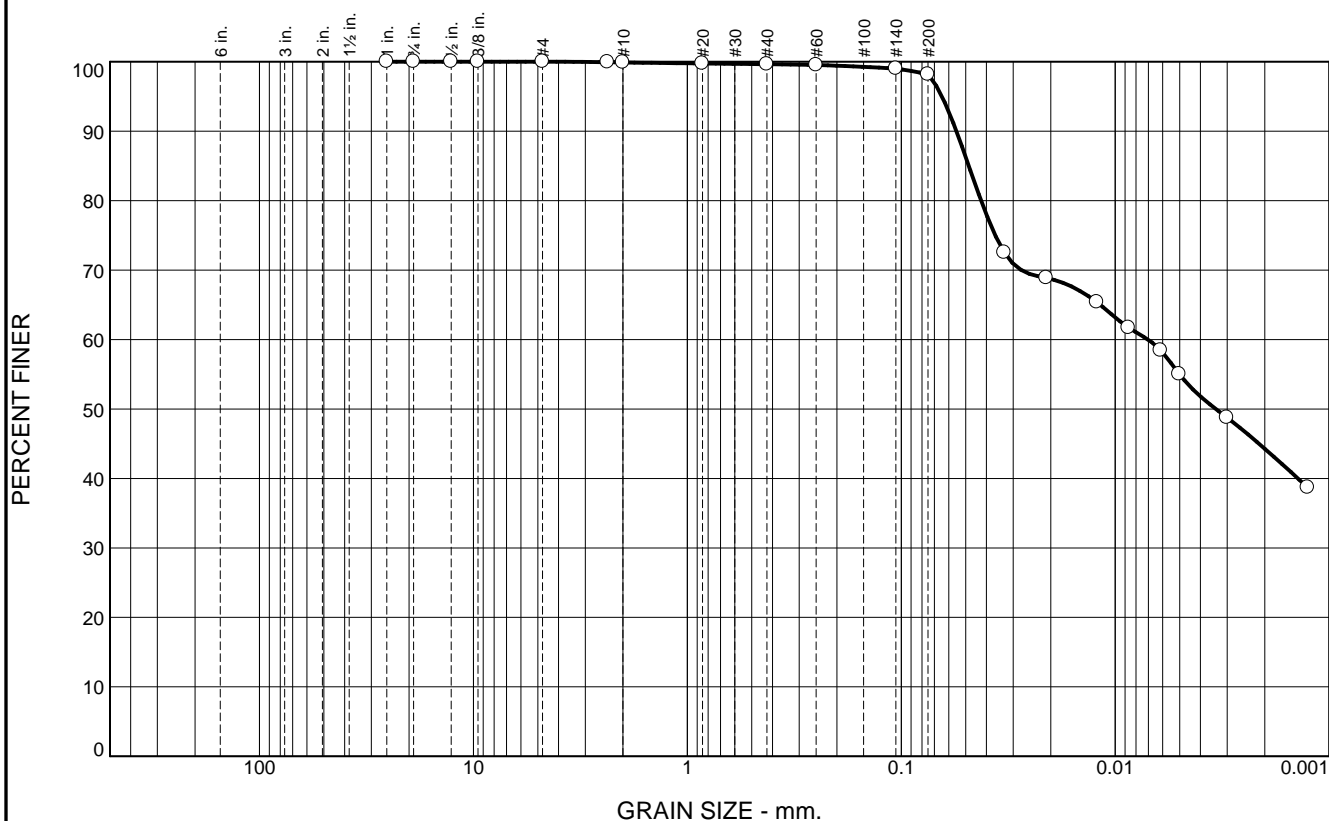
Depth: 9'-10'

Date: 2/19/2020

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Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.3	1.4	43.3	54.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.9		
#20	99.7		
#40	99.6		
#60	99.5		
#140	99.0		
#200	98.2		

**Material Description**

GRAY SILT

**Atterberg Limits**  
 PL= 37      LL= 58      PI= 21

**Coefficients**  
 D<sub>90</sub>= 0.0553      D<sub>85</sub>= 0.0484      D<sub>60</sub>= 0.0070  
 D<sub>50</sub>= 0.0034      D<sub>30</sub>=              D<sub>15</sub>=  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= MH      AASHTO= A-7-5(27)

**Remarks**  
 MOISTURE CONTENT: 150.6%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-43-19

Depth: 5'-6'

Date: 3/5/2020

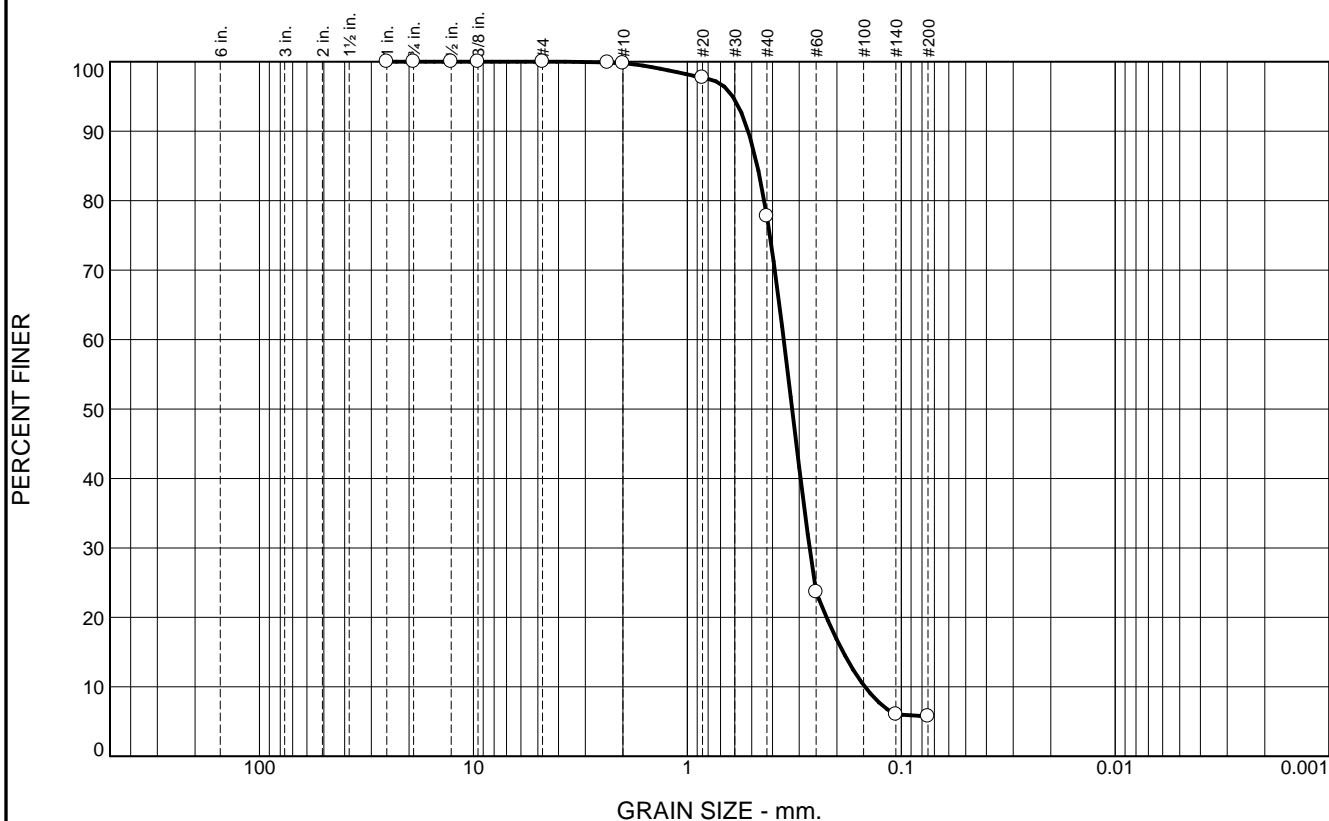
**SOUTHERN EARTH  
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Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	22.0	72.0	5.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.8		
#20	97.7		
#40	77.8		
#60	23.7		
#140	6.0		
#200	5.8		

**Material Description**

GRAY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.5198              D<sub>85</sub>= 0.4710              D<sub>60</sub>= 0.3544  
D<sub>50</sub>= 0.3239              D<sub>30</sub>= 0.2684              D<sub>15</sub>= 0.1870  
D<sub>10</sub>= 0.1478              C<sub>u</sub>= 2.40                      C<sub>c</sub>= 1.38

**Classification**

USCS=                      AASHTO=

**Remarks**

MOISTURE CONTENT: 27.7%

\* (no specification provided)

Source of Sample: MHVBC-43-19

Depth: 15'-16'

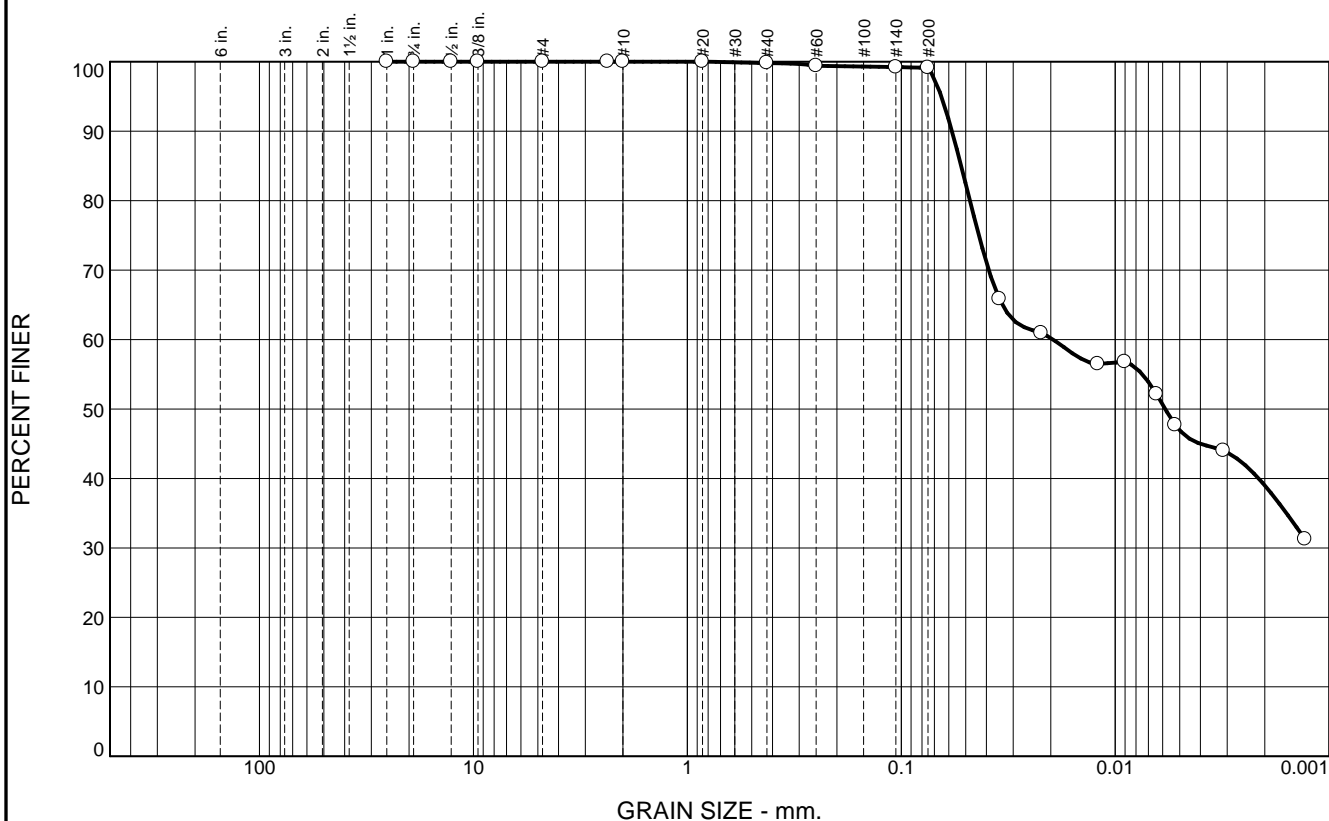
Date: 3/5/2020

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Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure



# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	0.7	52.2	46.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.4		
#140	99.2		
#200	99.1		

**Material Description**

BROWN SILT

**Atterberg Limits**

PL= 32      LL= 56      PI= 24

**Coefficients**

D<sub>90</sub>= 0.0579      D<sub>85</sub>= 0.0525      D<sub>60</sub>= 0.0196  
D<sub>50</sub>= 0.0058      D<sub>30</sub>=              D<sub>15</sub>=  
D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**

USCS= MH      AASHTO= A-7-5(30)

**Remarks**

MOISTURE CONTENT: 146.4%  
ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-44-19

Depth: 4'-5'

Date: 3/2/2020

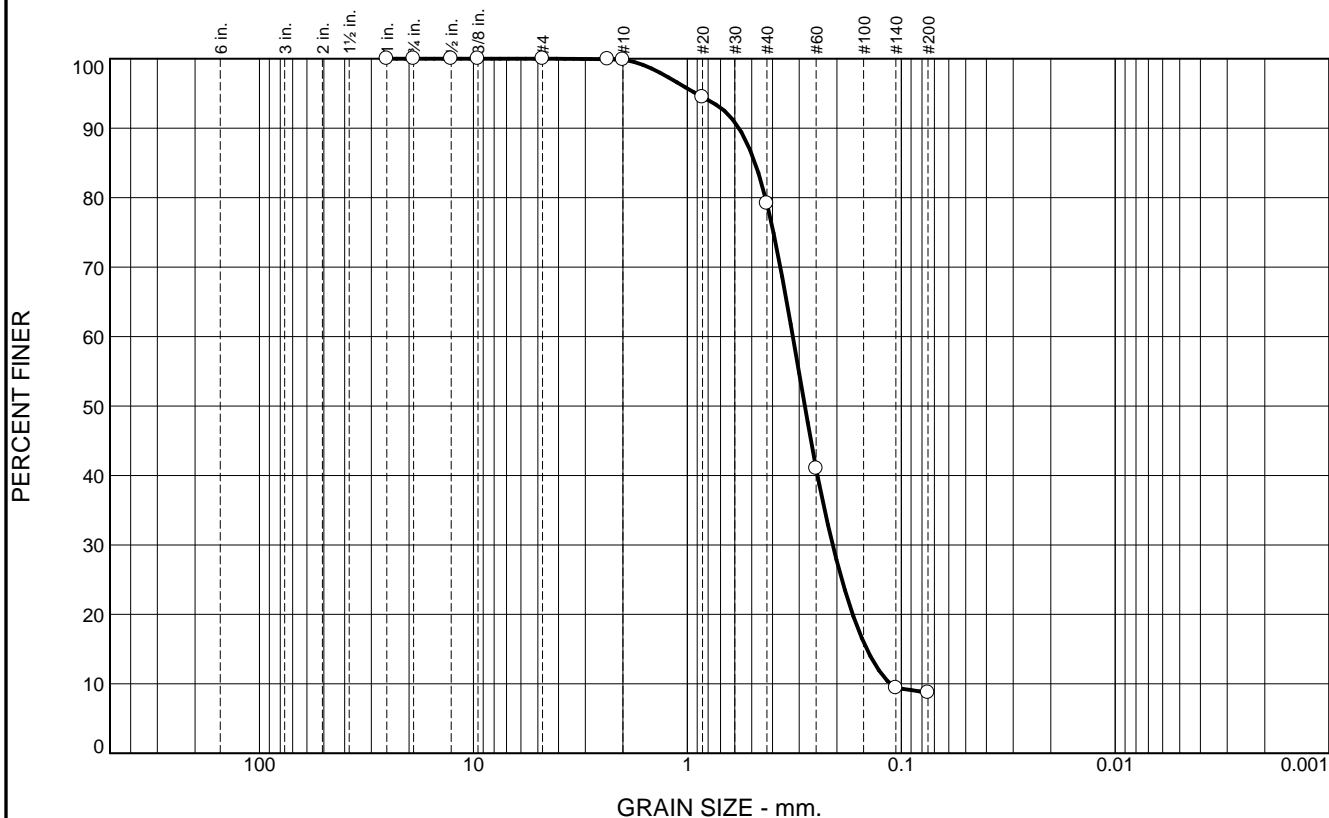
**SOUTHERN EARTH  
SCIENCES**  
Mobile, Alabama

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	20.7	70.5	8.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.9		
#20	94.5		
#40	79.2		
#60	41.0		
#140	9.4		
#200	8.7		

**Material Description**

GRAY SAND

**Atterberg Limits**

PL= NP      LL= NV      PI= NP

**Coefficients**

D<sub>90</sub>= 0.5739      D<sub>85</sub>= 0.4828      D<sub>60</sub>= 0.3214  
D<sub>50</sub>= 0.2826      D<sub>30</sub>= 0.2093      D<sub>15</sub>= 0.1450  
D<sub>10</sub>= 0.1122      C<sub>u</sub>= 2.86      C<sub>c</sub>= 1.21

**Classification**

USCS= SP-SM      AASHTO= A-3

**Remarks**

MOISTURE CONTENT: 23.4%

\* (no specification provided)

Source of Sample: MHVBC-44-19

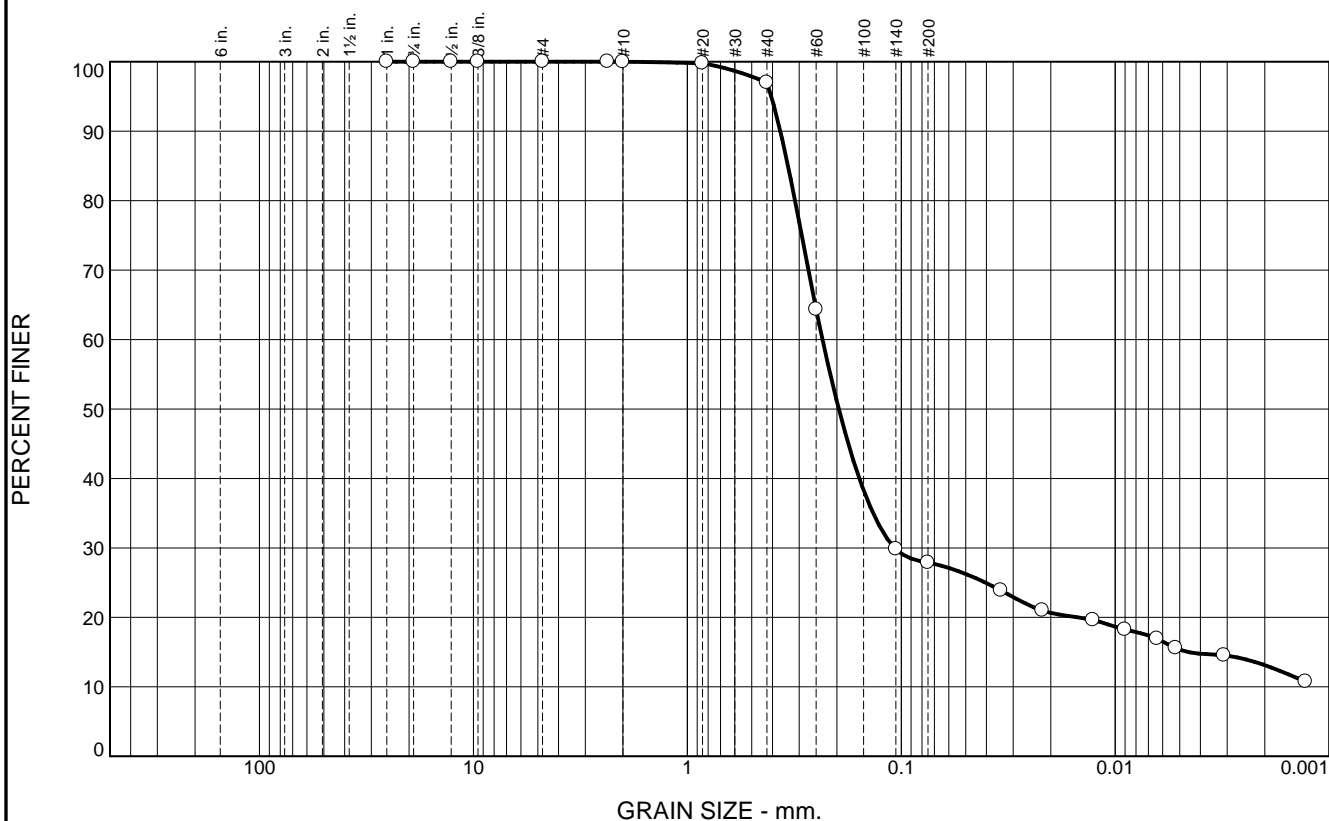
Depth: 8'-9'

Date: 3/2/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.0	69.1	12.5	15.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.8		
#40	97.0		
#60	64.3		
#140	29.8		
#200	27.9		

**Material Description**

GRAY SILTY SAND

**Atterberg Limits**  
 PL= NP      LL= 14      PI= NP

**Coefficients**  
 D<sub>90</sub>= 0.3675      D<sub>85</sub>= 0.3385      D<sub>60</sub>= 0.2337  
 D<sub>50</sub>= 0.1961      D<sub>30</sub>= 0.1073      D<sub>15</sub>= 0.0045  
 D<sub>10</sub>=              C<sub>u</sub>=              C<sub>c</sub>=

**Classification**  
 USCS= SM      AASHTO= A-2-4(0)

**Remarks**  
 MOISTURE CONTENT: 25.8%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-45-19

Depth: 3'-4'

Date: 3/2/2020

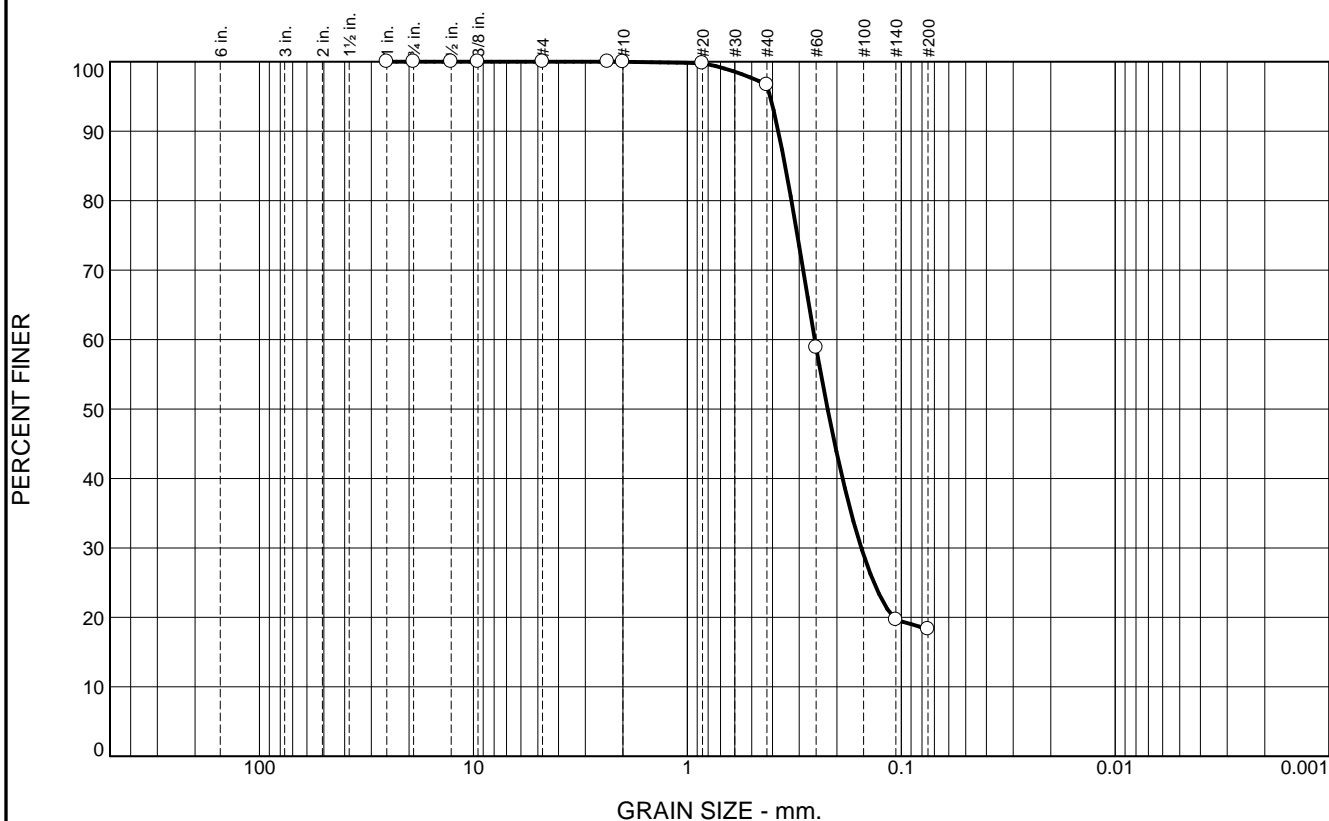
**SOUTHERN EARTH  
SCIENCES**  
Mobile, Alabama

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.3	78.4	18.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.8		
#40	96.7		
#60	58.9		
#140	19.7		
#200	18.3		

**Material Description**

GRAY SILTY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.3757      D<sub>85</sub>= 0.3489      D<sub>60</sub>= 0.2537  
D<sub>50</sub>= 0.2211      D<sub>30</sub>= 0.1538      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS=                      AASHTO=

**Remarks**

MOISTURE CONTENT: 25.2%

\* (no specification provided)

Source of Sample: MHVBC-45-19

Depth: 5'-6'

Date: 3/2/2020

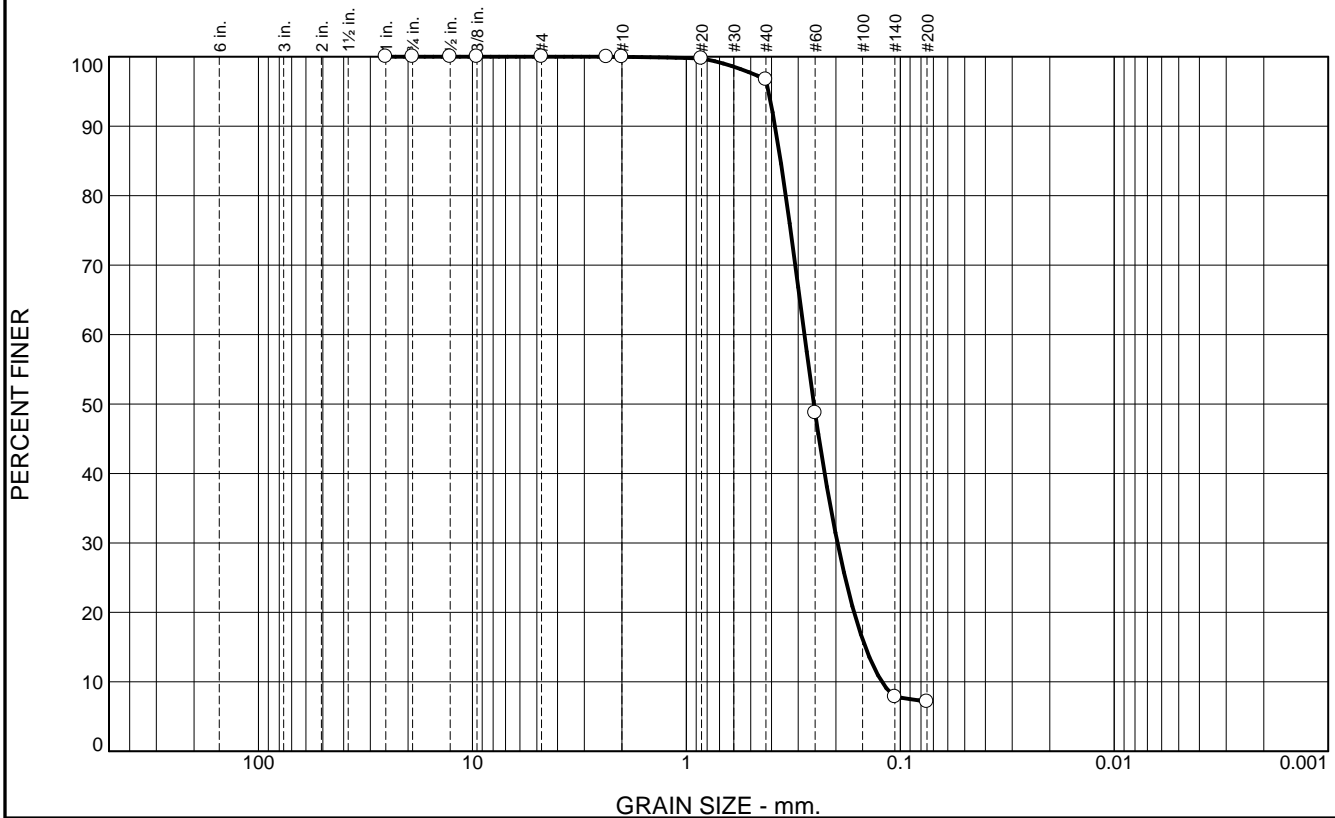
**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.3	89.5	7.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.8		
#40	96.7		
#60	48.7		
#140	7.8		
#200	7.2		

**Material Description**

GRAY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.3848              D<sub>85</sub>= 0.3623              D<sub>60</sub>= 0.2808  
D<sub>50</sub>= 0.2535              D<sub>30</sub>= 0.1967              D<sub>15</sub>= 0.1457  
D<sub>10</sub>= 0.1219              C<sub>u</sub>= 2.30                      C<sub>c</sub>= 1.13

**Classification**

USCS=                      AASHTO=

**Remarks**

MOISTURE CONTENT: 32.9%

\* (no specification provided)

Source of Sample: MHVBC-45-19

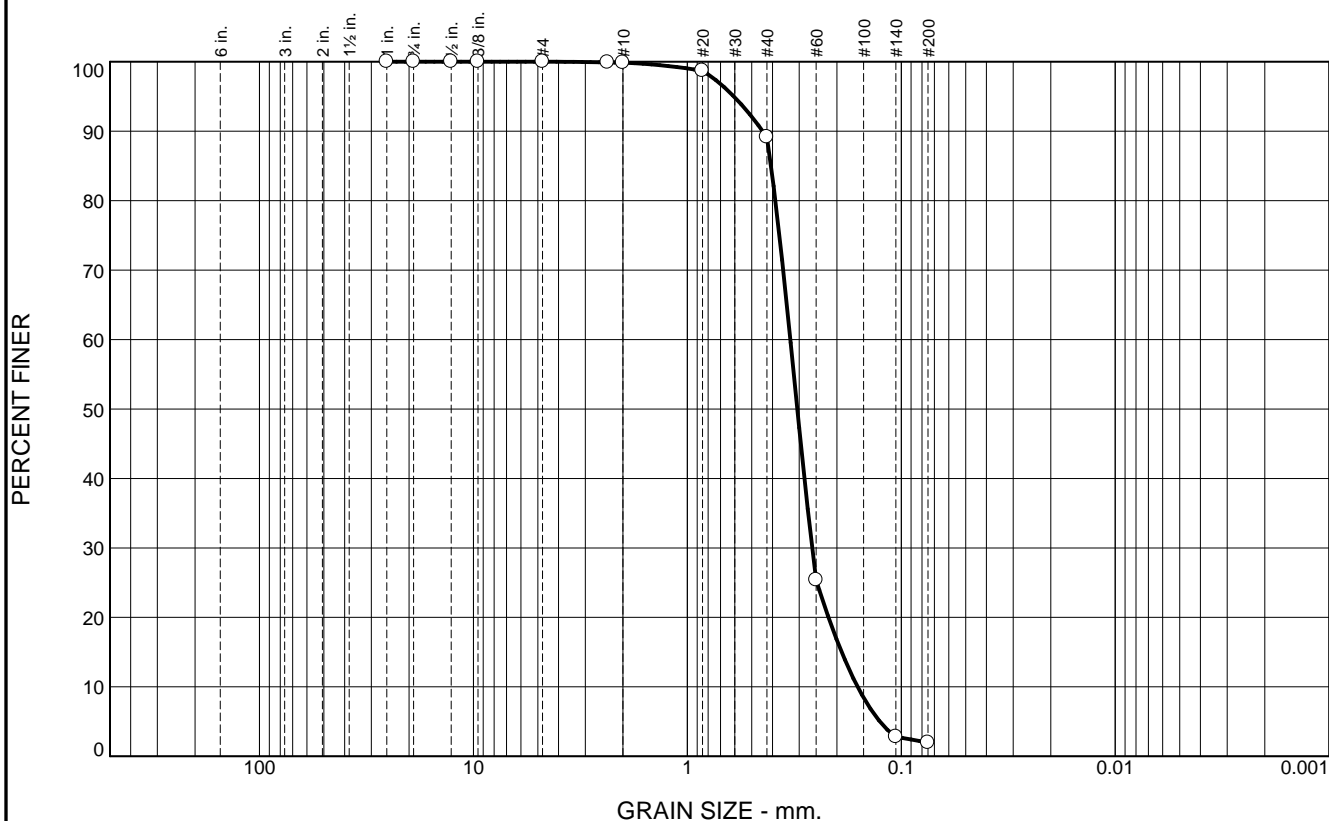
Depth: 9'-10'

Date: 3/2/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	10.8	87.1	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.9		
#20	98.7		
#40	89.1		
#60	25.4		
#140	2.8		
#200	2.0		

**Material Description**

TAN SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.4448      D<sub>85</sub>= 0.4064      D<sub>60</sub>= 0.3302

D<sub>50</sub>= 0.3064      D<sub>30</sub>= 0.2611      D<sub>15</sub>= 0.1901

D<sub>10</sub>= 0.1600      C<sub>u</sub>= 2.06              C<sub>c</sub>= 1.29

**Classification**

USCS= SP                      AASHTO=

**Remarks**

MOISTURE CONTENT: 22.0%      SPECIFIC GRAVITY: 2.78

\* (no specification provided)

Source of Sample: MHVBC-46-19

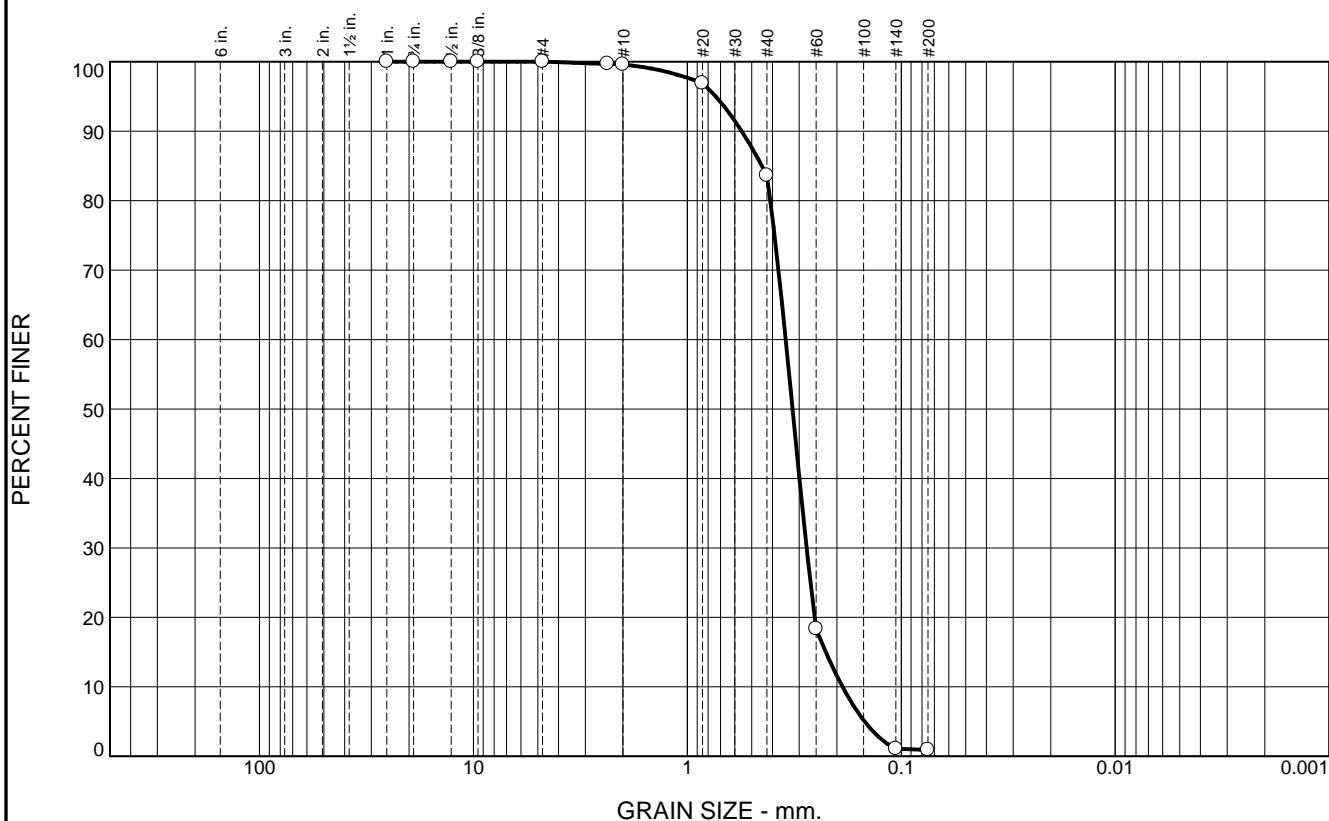
Depth: 4'-5'

Date: 3/2/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
 Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	16.0	82.7	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.7		
#10	99.6		
#20	96.9		
#40	83.6		
#60	18.4		
#140	1.1		
#200	0.9		

**Material Description**

TAN SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.5572              D<sub>85</sub>= 0.4484              D<sub>60</sub>= 0.3470  
D<sub>50</sub>= 0.3224              D<sub>30</sub>= 0.2773              D<sub>15</sub>= 0.2254  
D<sub>10</sub>= 0.1883              C<sub>u</sub>= 1.84                      C<sub>c</sub>= 1.18

**Classification**

USCS= SP                      AASHTO=

**Remarks**

MOISTURE CONTENT: 23.2% SPECIFIC GRAVITY: 2.79

\* (no specification provided)

Source of Sample: MHVBC-46-19

Depth: 10'-11'

Date: 3/2/2020

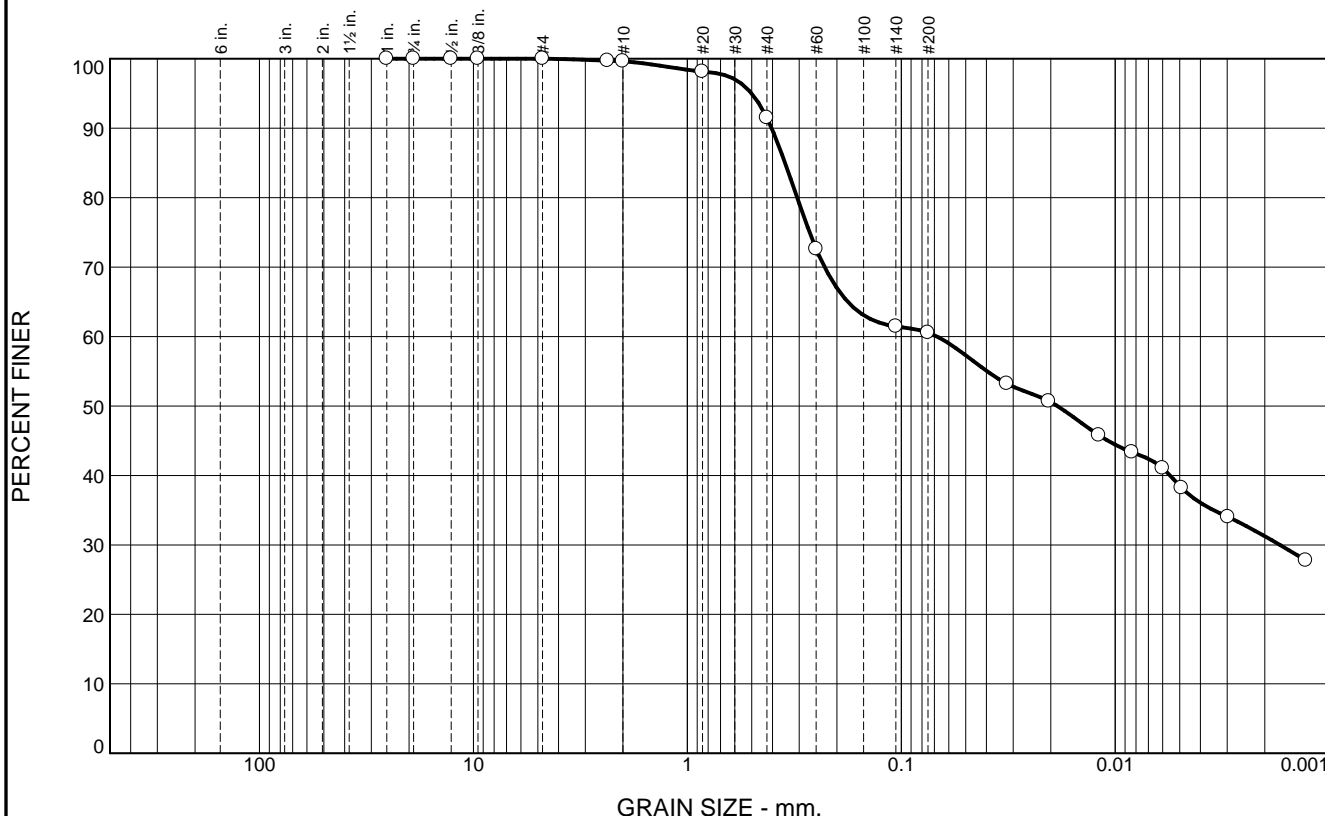
**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	8.1	30.9	22.1	38.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.7		
#10	99.6		
#20	98.1		
#40	91.5		
#60	72.6		
#140	61.5		
#200	60.6		

**Material Description**

BROWN CLAY

**Atterberg Limits**  
 PL= 23      LL= 37      PI= 14

**Coefficients**  
 D<sub>90</sub>= 0.4038      D<sub>85</sub>= 0.3495      D<sub>60</sub>= 0.0681  
 D<sub>50</sub>= 0.0187      D<sub>30</sub>= 0.0017      D<sub>15</sub>=  
 D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**  
 USCS= CL                      AASHTO= A-6(7)

**Remarks**  
 MOISTURE CONTENT: 100.4%  
 ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-47-19

Depth: 1'-2'

Date: 3/4/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

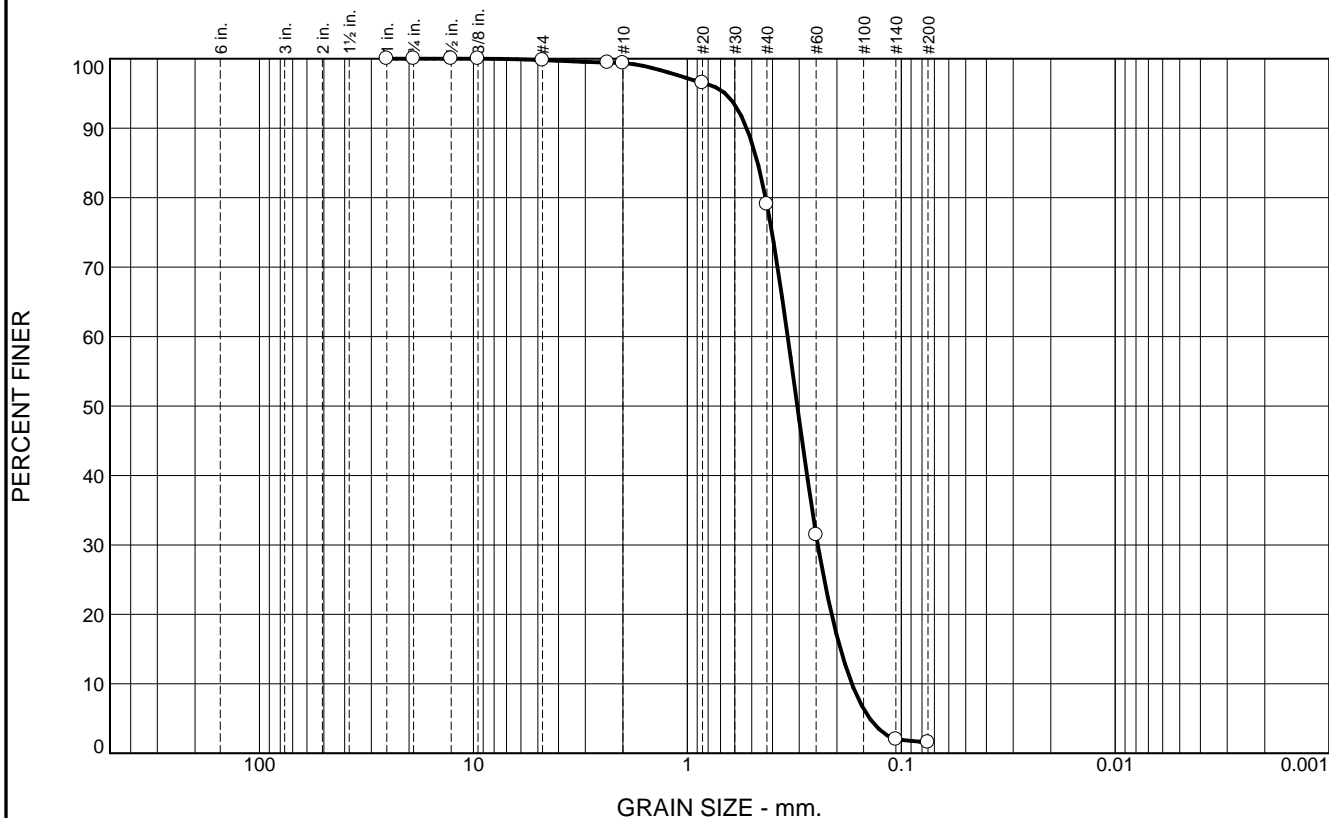
Client: ARCHWAY SOLUTIONS  
 Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure



# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	20.3	77.5	1.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.8		
#8	99.5		
#10	99.4		
#20	96.5		
#40	79.1		
#60	31.4		
#140	2.0		
#200	1.6		

**Material Description**

TAN SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.5279              D<sub>85</sub>= 0.4692              D<sub>60</sub>= 0.3396  
D<sub>50</sub>= 0.3064              D<sub>30</sub>= 0.2455              D<sub>15</sub>= 0.1926  
D<sub>10</sub>= 0.1702              C<sub>u</sub>= 2.00                      C<sub>c</sub>= 1.04

**Classification**

USCS= SP                      AASHTO=

**Remarks**

MOISTURE CONTENT: 23.3%  
SPECIFIC GRAVITY: 2.75

\* (no specification provided)

Source of Sample: MHVBC-47-19

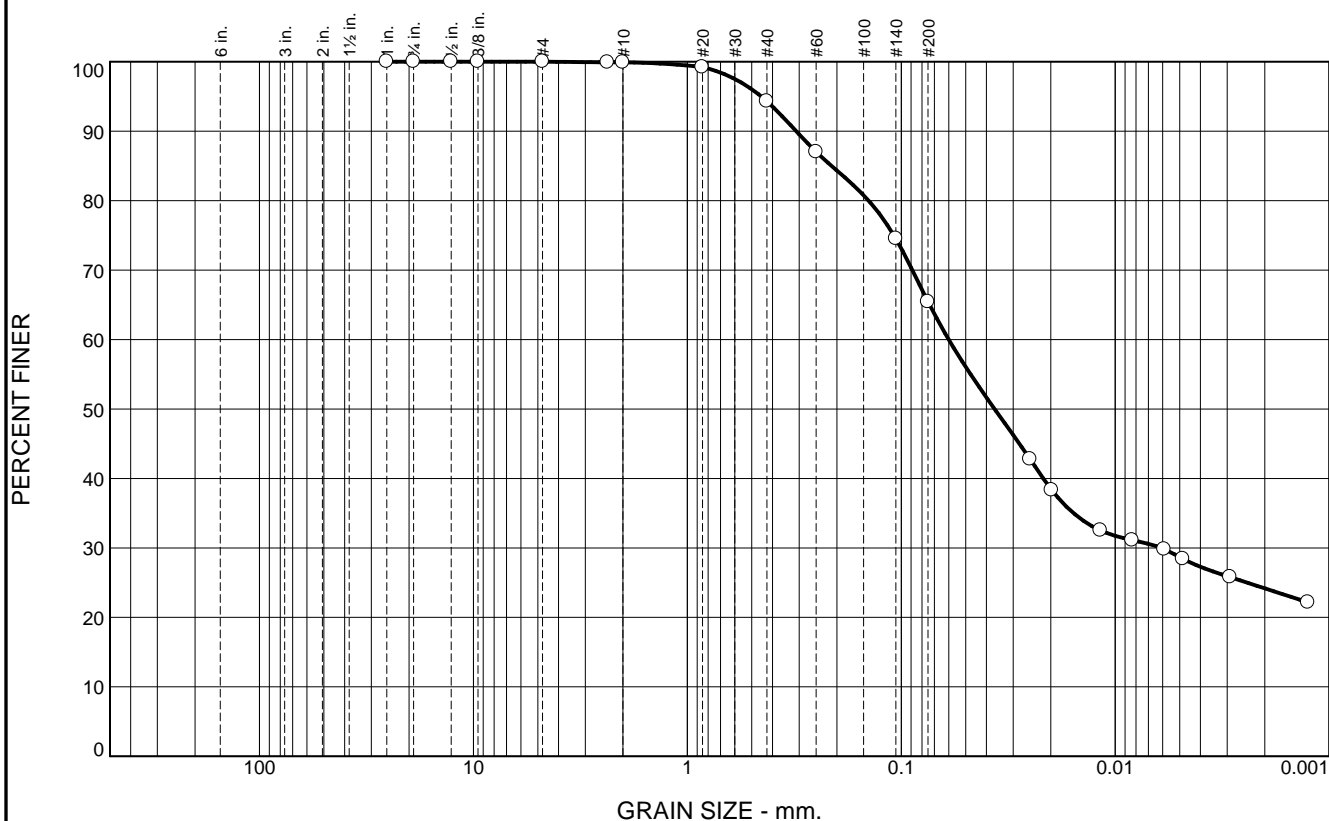
Depth: 10'-11'

Date: 3/4/2020

**SOUTHERN EARTH  
SCIENCES  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045  
Project No: M20-069                      Figure

# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	5.6	28.9	36.7	28.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	99.9		
#10	99.9		
#20	99.2		
#40	94.3		
#60	87.0		
#140	74.5		
#200	65.4		

**Material Description**

ORANGE SILT

**Atterberg Limits**

PL= 19      LL= 18      PI= NP

**Coefficients**

D<sub>90</sub>= 0.3101      D<sub>85</sub>= 0.2120      D<sub>60</sub>= 0.0601  
D<sub>50</sub>= 0.0366      D<sub>30</sub>= 0.0061      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= ML                      AASHTO= A-4(0)

**Remarks**

MOISTURE CONTENT: 29.6%  
ASSUMED SPEC. GRAVITY: 2.7

\* (no specification provided)

Source of Sample: MHVBC-48-19

Depth: 5'-6'

Date: 3/4/2020

**SOUTHERN EARTH  
SCIENCES**  
Mobile, Alabama

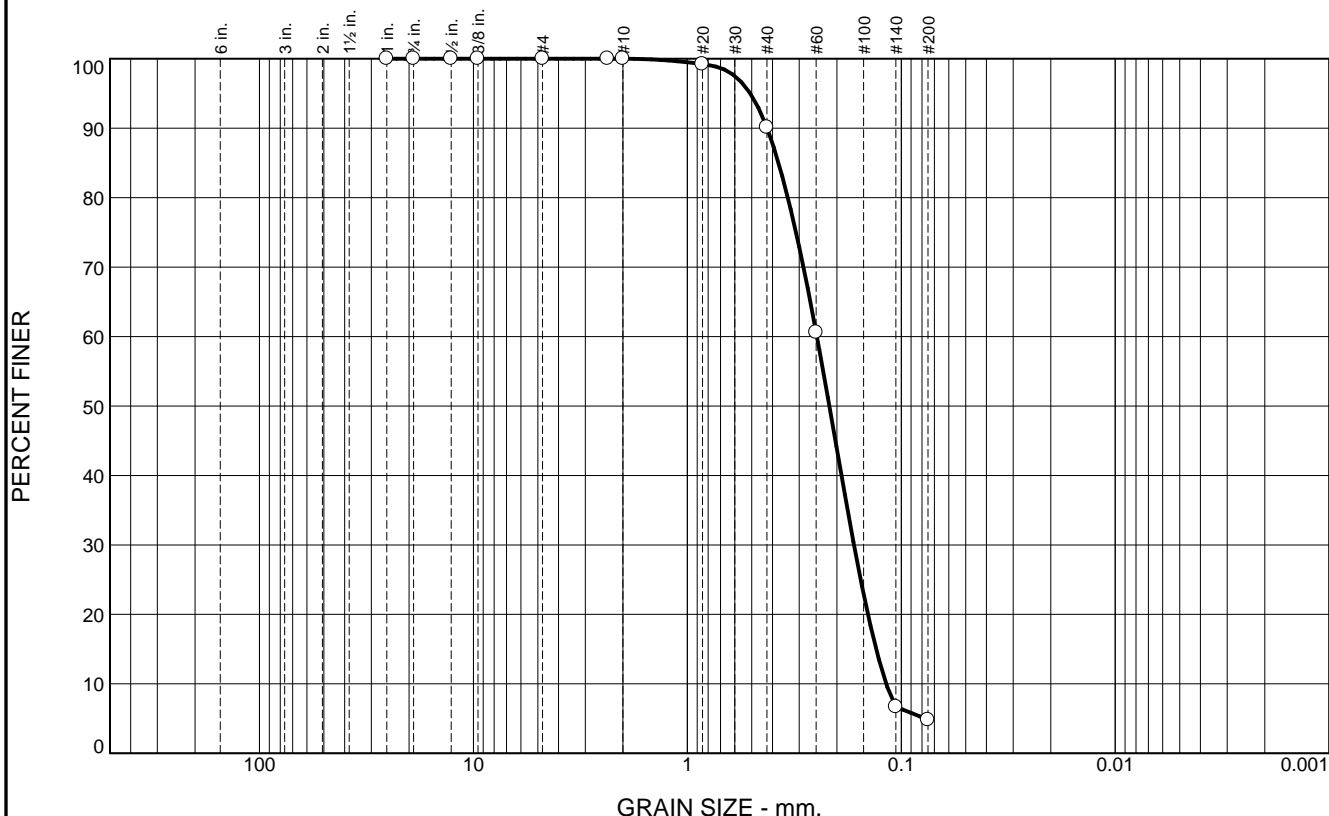
Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069

Figure



# Particle Size Distribution Report



% Cobbles	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	9.9	85.3	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	100.0		
#20	99.2		
#40	90.1		
#60	60.6		
#140	6.7		
#200	4.8		

**Material Description**

GRAY SAND

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.4238              D<sub>85</sub>= 0.3749              D<sub>60</sub>= 0.2480  
D<sub>50</sub>= 0.2170              D<sub>30</sub>= 0.1664              D<sub>15</sub>= 0.1311  
D<sub>10</sub>= 0.1176              C<sub>u</sub>= 2.11                      C<sub>c</sub>= 0.95

**Classification**

USCS= SP                      AASHTO=

**Remarks**

MOISTURE CONTENT: 25.4%  
SPECIFIC GRAVITY: 2.76

\* (no specification provided)

Source of Sample: MHVBC-49-19

Depth: 8'-9'

Date: 3/4/2020

**SOUTHERN EARTH  
SCIENCE  
Mobile, Alabama**

Client: ARCHWAY SOLUTIONS  
Project: USACOE - MOBILE HARBOR W91278-19-D-0045


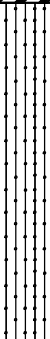
Project No: M20-069

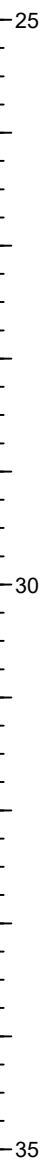
Figure

<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-49		<b>LOCATION COORDINATES</b> X = 1,801,783 Y = 218,417		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 27.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -23.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-23.8	0.0		(OH) CLAY, organic-H, high plasticity, very soft consistency, wet, gray, marine type				Advanced Boring
				0			SPT Sampler
				0	0		Advanced Boring
				0			SPT Sampler
				0	0		Advanced Boring

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,801,783 Y = 218,417			ELEVATION TOP OF BORING -23.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-38.8	15.0						Advanced Boring
			(CH) CLAY, fat, high plasticity, medium consistency, wet, gray and tan	2	6		SPT Sampler
				3			
			At El. -40.3 Ft., stiff consistency	3			
				3	12		SPT Sampler
				4			
				8			
				3	11		SPT Sampler
				4			
			At El. -43.3 Ft., very stiff consistency	7			
				8	22		SPT Sampler
				10			
				12			
				5	17		SPT Sampler
				8			
			At El. -46.3 Ft., hard consistency	9			
				10	37		SPT Sampler
				16			

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,801,783 Y = 218,417			ELEVATION TOP OF BORING -23.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.8	24.0			21			SPT Sampler
			(SM) SAND, silty, medium, wet, gray	8			SPT Sampler
				10	23		
				13			
				10			SPT Sampler
				13	28		
				15			
-50.8	27.0						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 4 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-51		<b>LOCATION COORDINATES</b> X = 1,801,419 Y = 216,375		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 39.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -9.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-9.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray				Advanced Boring
				0			SPT Sampler
				0		0	
				0			Advanced Boring
				0			SPT Sampler
				0			
				0			Advanced Boring
				0			SPT Sampler
				0			
				0			Advanced Boring




<b>DRILLING LOG (Cont. Sheet)</b>	<b>INSTALLATION</b> Mobile District	<b>SHEET 2</b> <b>OF 4 SHEETS</b>
<b>PROJECT</b>	<b>COORDINATE SYSTEM/DATUM</b> NAD83	<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,801,419 Y = 216,375	<b>ELEVATION TOP OF BORING</b> -9.8 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		SPT Sampler
				0			SPT Sampler
							Advanced Boring

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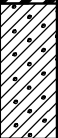
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DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 4 SHEETS		
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL		
			NAD83		MLLW			
LOCATION COORDINATES X = 1,801,419 Y = 216,375			ELEVATION TOP OF BORING -9.8 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
							Advanced Boring	
					0			SPT Sampler
					0	0		
					0			
								Advanced Boring
				At El. -39.8 Ft., very stiff consistency	4			SPT Sampler
					6	16		
					10			
					5			SPT Sampler
				At El. -42.8 Ft., stiff consistency	8	20		
					12			
					4			SPT Sampler
				At El. -44.3 Ft., very stiff consistency	6	13		
					7			
					8			SPT Sampler
				10	23			
				13				
				8			SPT Sampler	
				10	25			
				15				

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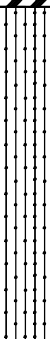
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 4 OF 4 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,801,419 Y = 216,375			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,801,419 Y = 216,375			-9.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.6	37.8		(SC) SAND, clayey, very dense, wet, gray	15			SPT Sampler
-48.8	39.0		(SC) SAND, clayey, very dense, wet, gray	50			SPT Sampler
				50	100		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-53		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<b>VERT.</b> MLLW
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>CONTRACTOR FILE NO.</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0	<b>DISTURBED</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater	<b>UNDISTURBED (UD)</b> 0	
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>	<b>STARTED</b>	<b>COMPLETED</b>
<b>8. TOTAL DEPTH OF BORING</b> 9.0 Feet		<b>16. ELEVATION TOP OF BORING</b> -41.3 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-41.3	0.0		(CH) CLAY, fat, high plasticity, stiff consistency, wet, gray and brown, with organic material  At El. -42.8 Ft., very stiff consistency	4	11		SPT Sampler
				5			
				6			
				8	21		SPT Sampler
				10			
				11			
				7	19		SPT Sampler
				8			
				11			
				5	20		SPT Sampler
				9			
		11					
-47.3	6.0		(SM) SAND, silty, dense, wet, brown,  At El. -48.8 Ft., medium	10	37		SPT Sampler
				15			
				22			
				9	18		SPT Sampler
				9			
				9			
-50.3	9.0						

**NOTES:**

1. Soils are field visually classified in accordance with the Unified Soils

140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

<b>DRILLING LOG (Cont. Sheet)</b>	<b>INSTALLATION</b> Mobile District	<b>SHEET 2</b> <b>OF 2 SHEETS</b>
<b>PROJECT</b>	<b>COORDINATE SYSTEM/DATUM</b> NAD83	<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,801,877 Y = 214,408	<b>ELEVATION TOP OF BORING</b> -41.3 Ft.	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
			Classification System.				

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-55		<b>LOCATION COORDINATES</b> X = 1,802,335 Y = 212,442		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
<b>8. TOTAL DEPTH OF BORING</b> 19.5 Feet			<b>16. ELEVATION TOP OF BORING</b> -30.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		


ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-30.8	0.0			0			
				0			SPT Sampler
				0	0		Advanced Boring
				0			
				0			SPT Sampler
				0	0		Advanced Boring
				0			
				0			SPT Sampler
				0			

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS			
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL			
			NAD83		MLLW				
LOCATION COORDINATES X = 1,802,335 Y = 212,442			ELEVATION TOP OF BORING -30.8 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
-41.3	10.5			0	0		SPT Sampler		
			(CH) CLAY, fat, high plasticity, stiff consistency, wet, gray, marine type  At El. -42.8 Ft., very stiff consistency  At El. -47.3 Ft., stiff consistency  At El. -48.8 Ft., hard consistency	3			SPT Sampler		
				4		9			
				5					
						8			SPT Sampler
						10		21	
						11			
						5			SPT Sampler
						7		15	
						8			
						8			SPT Sampler
						10		23	
						13			
						3			SPT Sampler
						4		10	
						6			
				15			SPT Sampler		
				22		49			
				27					
-50.3	19.5								
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).		

<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. BORING DESIGNATION</b> SS-57		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b>
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		<b>STARTED</b>
<b>8. TOTAL DEPTH OF BORING</b> 17.5 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		<b>COMPLETED</b>
<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0			0			
				0	0		SPT Sampler
				0			Advanced Boring
				0	0		SPT Sampler
				0			Advanced Boring
-42.3	8.5		(CH) CLAY, fat, high plasticity, stiff consistency, wet, brown and gray	3			
				4	12		SPT Sampler
				8			



DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS			
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL			
					NAD83	MLLW			
LOCATION COORDINATES X = 1,801,971 Y = 210,400			ELEVATION TOP OF BORING -33.8 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
			At El. -43.8 Ft., very stiff consistency	5	18		SPT Sampler		
				9					
				9					
						5	15		SPT Sampler
						7			
						8			
						8	21		SPT Sampler
						10			
						11			
						8	19		SPT Sampler
						9			
						10			
						10	20		SPT Sampler
						10			
				10					
-51.3	17.5								
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).		

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-59		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
<b>8. TOTAL DEPTH OF BORING</b> 28.0 Feet		<b>16. ELEVATION TOP OF BORING</b> -20.8 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-20.8	0.0		(OH) CLAY, organic-H, high plasticity, very soft consistency, wet, gray				Advanced Boring
				0			SPT Sampler
				0	0		
				0			
							Advanced Boring
-29.3	8.5		(SC) SAND, clayey, dense, wet, gray	10			SPT Sampler
				15	34		
				19			

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2 OF 3 SHEETS		
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,802,702 Y = 208,459			ELEVATION TOP OF BORING -20.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-32.3	11.5		At El. -30.8 Ft., medium	4 5 6	11		SPT Sampler
-33.8	13.0			4 5 6	11		SPT Sampler
			(SC) SAND, clayey, loose, wet, gray	2 3 3	6		SPT Sampler
				2 2 3	5		SPT Sampler
			At El. -36.8 Ft., very loose	2 2 2	4		SPT Sampler
-39.8	19.0			2 2 2	4		SPT Sampler
			(CL) CLAY, lean, soft consistency, wet, gray	1 1 2	3		SPT Sampler
-41.3	20.5		(CH) CLAY, fat, very soft consistency, wet, gray	1 1 1	2		SPT Sampler
				2 2	4		SPT Sampler

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS			
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL			
					NAD83	MLLW			
LOCATION COORDINATES X = 1,802,702 Y = 208,459			ELEVATION TOP OF BORING -20.8 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
			-At El. -44.3 Ft., medium consistency	2	8		SPT Sampler		
				2					
					3			SPT Sampler	
					5				
				-At El. -45.8 Ft., very stiff consistency	5				
					7			SPT Sampler	
-47.3	26.5			8	15				
			(OH) CLAY, organic-H, very stiff consistency, wet, gray	6	17				
				8					SPT Sampler
-48.8	28.0						9		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).		

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-61		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
<b>8. TOTAL DEPTH OF BORING</b> 14.5 Feet		<b>16. ELEVATION TOP OF BORING</b> -36.8 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-36.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray	0			SPT Sampler
				0	0		
				0			
							Advanced Boring
				0			SPT Sampler
				0	0		
				0			
							Advanced Boring

<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 2</b> <b>OF 2 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>VERTICAL</b> MLLW
<b>LOCATION COORDINATES</b> X = 1,802,612 Y = 206,442			<b>ELEVATION TOP OF BORING</b> -36.8 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
							Advanced Boring	
				0			SPT Sampler	
				0	0		SPT Sampler	
				0			Advanced Boring	
-51.3	14.5							
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).	

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-63		<b>LOCATION COORDINATES</b> X = 1,802,522 Y = 204,426		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 14.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray				Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler

<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District			<b>SHEET 2</b> <b>OF 2 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83	
<b>LOCATION COORDINATES</b> X = 1,802,522 Y = 204,426			<b>ELEVATION TOP OF BORING</b> -33.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
-48.3	14.5			0	0		SPT Sampler
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				Advanced Boring 140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-65		<b>LOCATION COORDINATES</b> X = 1,803,254 Y = 202,485		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 18.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -32.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-32.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with sand lenses	0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,254 Y = 202,485			ELEVATION TOP OF BORING -32.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		
				0			
							Advanced Boring
-51.3	18.5						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-67		<b>LOCATION COORDINATES</b> X = 1,802,890 Y = 200,443		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 17.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -31.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-31.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with silty sand layers	0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,802,890 Y = 200,443			ELEVATION TOP OF BORING -31.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
				0			SPT Sampler
				0	0		
				0			
							Advanced Boring
-48.8	17.0						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-69		<b>LOCATION COORDINATES</b> X = 1,803,348 Y = 198,476		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 16.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -34.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-34.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with sand lenses				Advanced Boring
				0			SPT Sampler
				0	0		
				0			Advanced Boring
				0			SPT Sampler
				0	0		
				0			SPT Sampler
				0			Advanced Boring
				0			SPT Sampler
				0			Advanced Boring

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,803,348 Y = 198,476			ELEVATION TOP OF BORING -34.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		Advanced Boring
-51.3	16.5						140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-71		<b>LOCATION COORDINATES</b> X = 1,803,806 Y = 196,510		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 15.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with clayey sand				Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,806 Y = 196,510			ELEVATION TOP OF BORING -33.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		Advanced Boring
-48.8	15.0						140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. BORING DESIGNATION</b> SS-73		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b>
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -35.8 Feet		<b>STARTED</b>
<b>8. TOTAL DEPTH OF BORING</b> 15.5 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		<b>COMPLETED</b>
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-35.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with sand lenses				Advanced Boring
				0			SPT Sampler
				0		0	
				0			Advanced Boring
				0			SPT Sampler
				0		0	
				0			Advanced Boring
				0			SPT Sampler
				0			Advanced Boring
				0			SPT Sampler

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,803,442 Y = 194,468			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,803,442 Y = 194,468			-35.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		
							Advanced Boring
-51.3	15.5						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-75		<b>LOCATION COORDINATES</b> X = 1,804,173 Y = 192,527		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 16.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray				Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,804,173 Y = 192,527			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,804,173 Y = 192,527			-33.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		Advanced Boring
-49.8	16.0						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT 1963-1964 Subsurface Investigation		9. SIZE AND TYPE OF BIT See Remarks		
2. BORING DESIGNATION SS-77		10. COORDINATE SYSTEM/DATUM/UNITS State Plane - Alabama West - U.S. Survey Ft.		HORIZ. VERT. NAD83 MLLW
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL N/A		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER N/A		12. TOTAL SAMPLES		DISTURBED 0 UNDISTURBED (UD) 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES 0		14. ELEVATION GROUND WATER Underwater
6. THICKNESS OF OVERBURDEN N/A		15. DATE BORING		STARTED COMPLETED
7. DEPTH TO TOP OF ROCK N/A		16. ELEVATION TOP OF BORING -36.8 Feet		17. TOTAL RECOVERY FOR BORING Not Recorded
8. TOTAL DEPTH OF BORING 14.5 Feet		18. SIGNATURE AND TITLE OF INSPECTOR N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
-36.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray	0	0		SPT Sampler		
				0					
				0					
									Advanced Boring

<b>DRILLING LOG (Cont. Sheet)</b>				<b>INSTALLATION</b> Mobile District			<b>SHEET 2</b> <b>OF 2 SHEETS</b>	
				<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83	
<b>LOCATION COORDINATES</b> X = 1,804,084 Y = 190,510				<b>ELEVATION TOP OF BORING</b> -36.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
				0			SPT Sampler	10
				0	0			
				0				
-51.3	14.5						Advanced Boring	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).	15
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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. BORING DESIGNATION</b> SS-79		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b>
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		<b>STARTED</b>
<b>8. TOTAL DEPTH OF BORING</b> 17.5 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		<b>COMPLETED</b>
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with organic traces				Advanced Boring
				0			SPT Sampler
				0		0	
				0			Advanced Boring
				0			SPT Sampler
				0			
				0			Advanced Boring
				0			SPT Sampler
				0			
				0			Advanced Boring

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,994 Y = 188,493			ELEVATION TOP OF BORING -33.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		
				0			
							Advanced Boring
-51.3	17.5						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.	140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).			

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-81		<b>LOCATION COORDINATES</b> X = 1,804,725 Y = 186,552		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 16.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -34.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
-34.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray	0	0		Advanced Boring		
				0		SPT Sampler			
				0					
									Advanced Boring
						0	0		SPT Sampler
						0			
						0			
									Advanced Boring

<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 2</b> <b>OF 2 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,804,725 Y = 186,552			<b>ELEVATION TOP OF BORING</b> -34.8 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-51.3	16.5						Advanced Boring	
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>				<p>140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).</p>	

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-83		<b>LOCATION COORDINATES</b> X = 1,804,361 Y = 184,510		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 15.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -35.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-35.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray	0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,804,361 Y = 184,510			ELEVATION TOP OF BORING -35.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		
				0			Advanced Boring
-51.3	15.5						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).


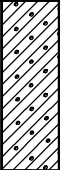
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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-85		<b>LOCATION COORDINATES</b> X = 1,804,819 Y = 182,544		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 14.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -34.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-34.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray				Advanced Boring	
				0				SPT Sampler
				0		0		
				0				
								Advanced Boring
						0		
						0		
						0		
							Advanced Boring	

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,804,819 Y = 182,544			ELEVATION TOP OF BORING -34.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-47.3	12.5						Advanced Boring
-48.8	14.0		(SC) SAND, clayey, medium, wet, gray, with fat clay layers	7 12 16	28		SPT Sampler
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. BORING DESIGNATION</b> SS-87		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b>
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		<b>STARTED</b>
<b>8. TOTAL DEPTH OF BORING</b> 17.5 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		<b>COMPLETED</b>
<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with sand layers	0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,805,277 Y = 180,578			ELEVATION TOP OF BORING -33.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		Advanced Boring
-51.3	17.5						
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. BORING DESIGNATION</b> SS-89		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> N/A		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> N/A		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b>
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -23.8 Feet		<b>STARTED</b>
<b>8. TOTAL DEPTH OF BORING</b> 27.5 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		<b>COMPLETED</b>
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		


ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-23.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with sand	0			Advanced Boring	
				0		0		SPT Sampler
				0				
						0		

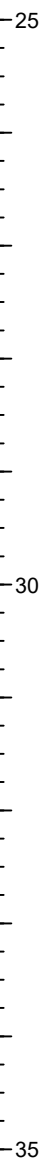
<b>DRILLING LOG (Cont. Sheet)</b>			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,804,913 Y = 178,536			-23.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
							Advanced Boring
				0			SPT Sampler
				0	0		
				0			SPT Sampler
				0			Advanced Boring
				0			SPT Sampler
				0			Advanced Boring
				0			SPT Sampler

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DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,804,913 Y = 178,536			ELEVATION TOP OF BORING -23.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-51.3	27.5			0	0		SPT Sampler
							Advanced Boring
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-91		<b>LOCATION COORDINATES</b> X = 1,805,645 Y = 176,595		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 17.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -33.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-33.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray				Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler
				0	0		Advanced Boring
				0	0		SPT Sampler

<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 2</b> <b>OF 2 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,805,645 Y = 176,595			<b>ELEVATION TOP OF BORING</b> -33.8 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
							Advanced Boring	
				0			SPT Sampler	
				0	0		SPT Sampler	
				0			Advanced Boring	
-51.3	17.5							
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).	


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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> SS-93		<b>LOCATION COORDINATES</b> X = 1,805,555 Y = 174,578		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> N/A <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> N/A			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 0 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 11.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> <b>COMPLETED</b>
			<b>16. ELEVATION TOP OF BORING</b> -39.8 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> Not Recorded		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> N/A, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
-39.8	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray	0	0		0		
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0
				0		0	0	0	0


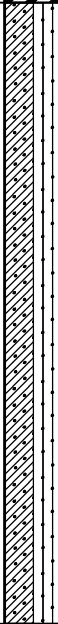
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,805,555 Y = 174,578			ELEVATION TOP OF BORING -39.8 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 0.5 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-51.3	11.5						Advanced Boring
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-10-84		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> C. Fuller		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b> <b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %
<b>8. TOTAL DEPTH OF BORING</b> 22.7 Feet		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(CH) CLAY, fat, high plasticity, wet, dark gray, with organic material				
-45.5	2.5		(SC-SM) SAND, silty, clayey, wet, light gray, with sandy lean clay			1	Vibrocure
-51.0	8.0		(SM) SAND, silty, wet, light gray, with fine gravel				



DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,801,777 Y = 214,854			ELEVATION TOP OF BORING -43.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-57.5	14.5		(SP) SAND, poorly-graded, wet, white				
-65.7	22.7		At El. -60.5 Ft., white and gray, with silt			1	Vibracore
NOTES:			1. Soils are field visually classified in				

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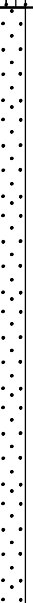
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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 2 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-11-84		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> C. Fuller		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 19.3 Feet		<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(CH) CLAY, fat, high plasticity, medium consistency, wet, orange, gray, and beige, mottled				
-49.0	6.0		(SC) SAND, clayey, wet, organe, gray, and beige, medium grained sand			1	Vibrocure
-53.0	10.0						

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 2 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,802,068 Y = 212,328			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,802,068 Y = 212,328			-43.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-57.0	14.0		(SM) SAND, silty, wet, beige  At El. -54.0 Ft., orange, gray, and beige, mottled				
-62.3	19.3		(SP-SM) SAND, poorly-graded with silt, wet, orange, gray, and beige, medium grained sand			1	Vibracore
			NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

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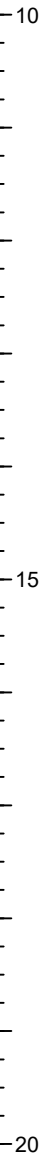
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<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-12-84		<b>LOCATION COORDINATES</b> X = 1,802,317 Y = 209,667		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 26.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
			<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

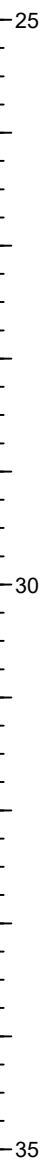
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(CH) CLAY, fat, high plasticity, soft consistency, wet, dark gary				
-44.0	1.0		(SP) SAND, poorly-graded, wet, gray, yellow, and white medium to coarse grained sand with silt and with occasional pockets of fat clay				
						1	Vibrocure

<b>DRILLING LOG (Cont. Sheet)</b>		<b>INSTALLATION</b> Mobile District		<b>SHEET 2</b>
				<b>OF 3 SHEETS</b>
<b>PROJECT</b>		<b>COORDINATE SYSTEM/DATUM</b>	<b>HORIZONTAL</b> NAD83	<b>VERTICAL</b> MLLW
<b>LOCATION COORDINATES</b> X = 1,802,317 Y = 209,667		<b>ELEVATION TOP OF BORING</b> -43.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
		•••••				1	Vibracore




DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,802,317 Y = 209,667			ELEVATION TOP OF BORING -43.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-69.0	26.0					1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-13-84		<b>LOCATION COORDINATES</b> X = 1,802,548 Y = 207,419		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 22.7 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
			<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, gray				
			At El. -44.0 Ft., soft consistency			1	Vibrocure



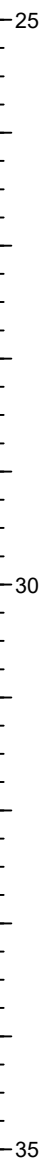
<b>DRILLING LOG (Cont. Sheet)</b>			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,802,548 Y = 207,419			-43.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-65.7	22.7		At El. -55.6 Ft., high plasticity, medium consistency, wet with organic materials consisting of sticks and roots			1	Vibracore
			NOTES: 1. Soils are field visually classified in				

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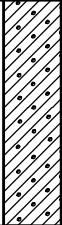
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<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b>		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,802,548 Y = 207,419			<b>ELEVATION TOP OF BORING</b> -43.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
			accordance with the Unified Soils Classification System.					



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-14-84		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> C. Fuller		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b> <b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -42.0 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %
<b>8. TOTAL DEPTH OF BORING</b> 26.5 Feet		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		



ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-42.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, black to dark gray, with organic material				
-44.3	2.3		(SC) SAND, clayey, soft consistency, wet, dark gray			1	Vibrocure

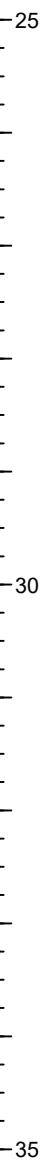
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,803,073 Y = 204,716			ELEVATION TOP OF BORING -42.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-54.0	12.0		(CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, with organic material consisting of leaves and wood			1	Vibracore

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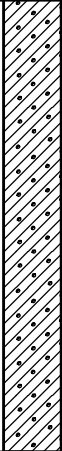

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DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,073 Y = 204,716			ELEVATION TOP OF BORING -42.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-68.0	26.0		At El. -66.4 Ft., light gray			1	Vibracore
-68.5	26.5		(SM) SAND, silty, wet, light gray, fine grained sand				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>							



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-15-84		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<b>VERT.</b> MLLW
<b>4. NAME OF DRILLER</b> C. Fuller		<b>12. TOTAL SAMPLES</b>		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>CONTRACTOR FILE NO.</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0	<b>DISTURBED</b> 1
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>DEG. FROM VERTICAL</b>	<b>14. ELEVATION GROUND WATER</b> Underwater	<b>UNDISTURBED (UD)</b> 0
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>BEARING</b>	<b>15. DATE BORING</b>	<b>STARTED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 30.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet	<b>COMPLETED</b> 01-08-84
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %	
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist	


ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(SC) SAND, clayey, soft consistency, wet, gray, with fat clay				
						1	Vibrocore

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,802,932 Y = 202,677			ELEVATION TOP OF BORING -43.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-57.0	14.0		(CH) CLAY, fat, wet, gray				
			At El. -58.0 Ft., soft consistency, wet, dark gray to gray, with organic material consisting of wood, roots, and leaves			1	Vibracore

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<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>		
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83	
<b>LOCATION COORDINATES</b> X = 1,802,932 Y = 202,677			<b>ELEVATION TOP OF BORING</b> -43.0 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
-73.0	30.0					1	Vibracore		25
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>						30
									35

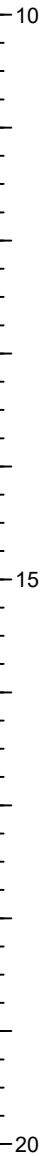


<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-16-84		<b>LOCATION COORDINATES</b> X = 1,803,348 Y = 200,185		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore <input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 28.0 Feet			<b>15. DATE BORING</b> <b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84		
			<b>16. ELEVATION TOP OF BORING</b> -37.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

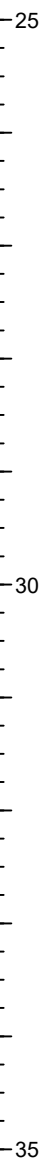
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-37.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, black, with organic material				
		▨				1	Vibrocure
-43.5	6.5	▧	(SC) SAND, clayey, wet, dark gray				
-45.0	8.0	▩	(SP-SM) SAND, poorly-graded with silt, wet, gray				

<b>DRILLING LOG (Cont. Sheet)</b>		<b>INSTALLATION</b> Mobile District		<b>SHEET 2</b> <b>OF 3 SHEETS</b>	
<b>PROJECT</b>		<b>COORDINATE SYSTEM/DATUM</b>	<b>HORIZONTAL</b> NAD83	<b>VERTICAL</b> MLLW	
<b>LOCATION COORDINATES</b> X = 1,803,348 Y = 200,185		<b>ELEVATION TOP OF BORING</b> -37.0 Ft.			



ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
						1	Vibracore



<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>VERTICAL</b> MLLW
<b>LOCATION COORDINATES</b> X = 1,803,348 Y = 200,185			<b>ELEVATION TOP OF BORING</b> -37.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-65.0	28.0					1	Vibracore	
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>					

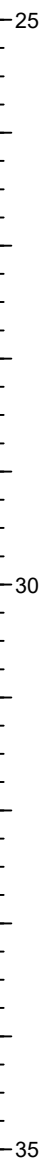


<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-17-84		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> C. Fuller		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 26.7 Feet		<b>16. ELEVATION TOP OF BORING</b> -42.0 Feet		
		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		



ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-42.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, dark gray				
-46.8	4.8		(SC) SAND, clayey, wet, light gray			1	Vibrocore
-51.0	9.0		(SP-SM) SAND, poorly-graded with silt, wet, light gray				



<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,803,402 Y = 198,503			<b>ELEVATION TOP OF BORING</b> -42.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-68.7	26.7	[Dotted Pattern]				1	Vibracore	
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>					

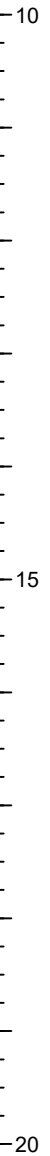


<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-1-84		<b>LOCATION COORDINATES</b> X = 1,801,386 Y = 237,379		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 26.0 Feet			<b>15. DATE BORING</b> <b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84		
			<b>16. ELEVATION TOP OF BORING</b> -42.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-42.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, black with organic material				
			At El. -47.5 Ft., light gray			1	Vibrocure
-48.6	6.6		(CL) CLAY, lean, soft consistency, wet, light gray with clay				

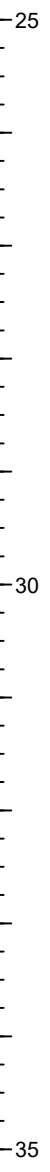
<b>DRILLING LOG (Cont. Sheet)</b>		<b>INSTALLATION</b> Mobile District		<b>SHEET 2</b>
				<b>OF 3 SHEETS</b>
<b>PROJECT</b>		<b>COORDINATE SYSTEM/DATUM</b>	<b>HORIZONTAL</b> NAD83	<b>VERTICAL</b> MLLW
<b>LOCATION COORDINATES</b> X = 1,801,386 Y = 237,379		<b>ELEVATION TOP OF BORING</b> -42.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
		At El. -52.0 Ft., white					
		At El. -52.5 Ft., wet, yellow coarse grained				1	Vibracore





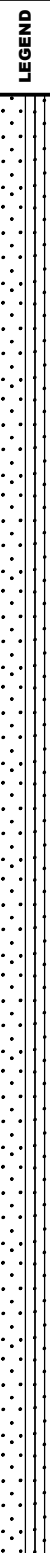

<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,801,386 Y = 237,379			<b>ELEVATION TOP OF BORING</b> -42.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-68.0	26.0	[Hatched Box]				1	Vibracore	
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>					

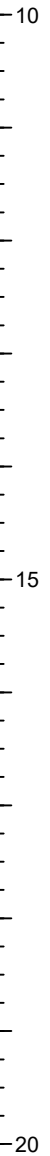



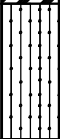
<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District	<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation		<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-18-84		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft.		<b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore		<input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>
<b>4. NAME OF DRILLER</b> C. Fuller		<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>		<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	<b>13. TOTAL NUMBER CORE BOXES</b> 0
<b>6. THICKNESS OF OVERBURDEN</b> N/A		<b>14. ELEVATION GROUND WATER</b> Underwater		<b>15. DATE BORING</b> <b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>7. DEPTH TO TOP OF ROCK</b> N/A		<b>16. ELEVATION TOP OF BORING</b> -44.0 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %
<b>8. TOTAL DEPTH OF BORING</b> 28.2 Feet		<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

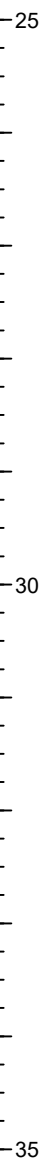
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-44.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, yellow, with clayey sand				
-46.0	2.0		(SC) SAND, clayey, wet, gray and yellow, with sandy lean clay			1	Vibrocure
-53.0	9.0		(SM) SAND, silty, wet, gray and yellow				
-54.0	10.0						

<b>DRILLING LOG (Cont. Sheet)</b>	<b>INSTALLATION</b> Mobile District		<b>SHEET 2</b>
			<b>OF 3 SHEETS</b>
<b>PROJECT</b>	<b>COORDINATE SYSTEM/DATUM</b>	<b>HORIZONTAL</b> NAD83	<b>VERTICAL</b> MLLW
<b>LOCATION COORDINATES</b> X = 1,803,444 Y = 196,773	<b>ELEVATION TOP OF BORING</b> -44.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
			(SP-SM) SAND, poorly-graded with silt, wet, light gray				
			(CH) CLAY, fat, high plasticity, wet, gray			1	Vibracore






DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,444 Y = 196,773			ELEVATION TOP OF BORING -44.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-71.0	27.0					1	Vibracore
-72.2	28.2		(SM) SAND, silty, wet, gray				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-19-84		<b>LOCATION COORDINATES</b> X = 1,803,771 Y = 194,553		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 25.2 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
			<b>16. ELEVATION TOP OF BORING</b> -42.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		


ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-42.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, dark gray, with organic material				
		▨	At El. -45.0 Ft., soft consistency, light gray, with sand			1	Vibrocure
-48.5	6.5	▧	(SC) SAND, clayey, wet, light gray, with silt				

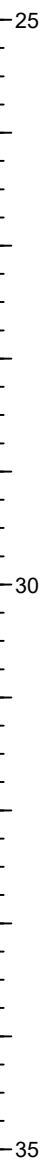
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,803,771 Y = 194,553			ELEVATION TOP OF BORING -42.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-53.0	11.0		(SM) SAND, silty, wet, light gray, with clay				
-54.5	12.5		(SP) SAND, poorly-graded, wet, light gray, with silt				
						1	Vibracore

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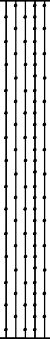

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,803,771 Y = 194,553			ELEVATION TOP OF BORING -42.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-67.2	25.2					1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-1A-84		<b>LOCATION COORDINATES</b> X = 1,801,568 Y = 240,909		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 26.8 Feet			<b>16. ELEVATION TOP OF BORING</b> -41.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-41.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, dark gray,				
-46.0	5.0		(SM) SAND, silty, wet, light gray, alternating pockets of clayey sand and silty sand			1	Vibrocure




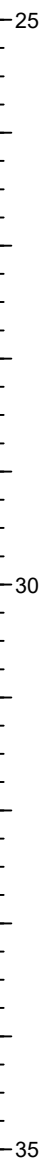
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,801,568 Y = 240,909			ELEVATION TOP OF BORING -41.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-54.0	13.0						
			(SP) SAND, poorly-graded, wet, gray and yellow,			1	Vibracore

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DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,801,568 Y = 240,909			ELEVATION TOP OF BORING -41.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-67.8	26.8					1	Vibracore
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>				



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-20-84		<b>LOCATION COORDINATES</b> X = 1,803,909 Y = 192,677		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 27.5 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
			<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(CH) CLAY, fat, high plasticity, soft consistency, wet, gray, with shell and wood fragments				
						1	Vibrocure

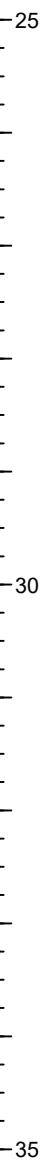
<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 2</b> <b>OF 3 SHEETS</b>		
			PROJECT			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83	
<b>LOCATION COORDINATES</b> X = 1,803,909 Y = 192,677			<b>ELEVATION TOP OF BORING</b> -43.0 Ft.						
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS		
						1	Vibracore		

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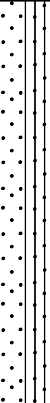


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<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,803,909 Y = 192,677			<b>ELEVATION TOP OF BORING</b> -43.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-70.5	27.5					1	Vibracore	
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p>					



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1963-1964 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-21-84		<b>LOCATION COORDINATES</b> X = 1,804,755 Y = 183,977		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 30.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -42.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		


ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-42.0	0.0		(CH) CLAY, fat, high plasticity, wet, black and dark gray, with organic material				
-45.0	3.0		(SP-SM) SAND, poorly-graded with silt, wet, gray and white, medium grained sand			1	Vibrocore

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
X = 1,804,755 Y = 183,977			NAD83		MLLW		
LOCATION COORDINATES			ELEVATION TOP OF BORING				
X = 1,804,755 Y = 183,977			-42.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-55.6	13.6						
-56.2	14.2		(CH) CLAY, fat, wet, gray, with sand				
			(SP) SAND, poorly-graded, wet, white, medium grained sand			1	Vibracore

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DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS		
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL		
					NAD83	MLLW		
LOCATION COORDINATES X = 1,804,755 Y = 183,977			ELEVATION TOP OF BORING -42.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-72.0	30.0					1	Vibracore	25
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.					30
								35



<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-22-84		<b>LOCATION COORDINATES</b> X = 1,805,305 Y = 177,977		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 30.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -43.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		



ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-43.0	0.0		(CH) CLAY, fat, high plasticity, wet, black, with organic matter				
			At El. -47.6 Ft., soft consistency, gray			1	Vibrocure

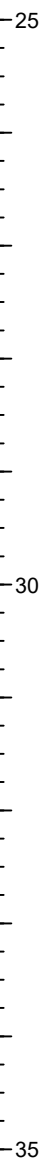
<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 2</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b> NAD83		<b>HORIZONTAL</b>
<b>LOCATION COORDINATES</b> X = 1,805,305 Y = 177,977			<b>ELEVATION TOP OF BORING</b> -43.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
						1	Vibracore	

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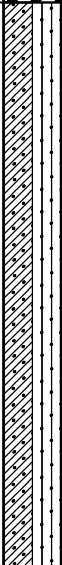
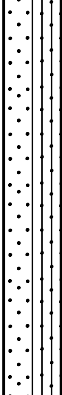
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,805,305 Y = 177,977			ELEVATION TOP OF BORING -43.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-70.0	27.0		(OL) CLAY, organic-L, wet, brown and gray			1	Vibracore
-73.0	30.0						
NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.							

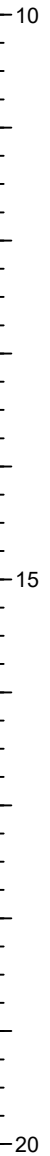


<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-23-84		<b>LOCATION COORDINATES</b> X = 1,805,705 Y = 173,577		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> Vibrocore <input type="checkbox"/> <b>AUTO HAMMER</b> <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>DEG. FROM VERTICAL</b>	<b>BEARING</b>	
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>13. TOTAL NUMBER CORE BOXES</b> 0		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>8. TOTAL DEPTH OF BORING</b> 30.0 Feet			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
			<b>16. ELEVATION TOP OF BORING</b> -38.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-38.0	0.0		(CH) CLAY, fat, high plasticity, soft consistency, wet, gray				
						1	Vibrocure

<b>DRILLING LOG (Cont. Sheet)</b>	<b>INSTALLATION</b> Mobile District		<b>SHEET 2</b>
			<b>OF 3 SHEETS</b>
<b>PROJECT</b>	<b>COORDINATE SYSTEM/DATUM</b>	<b>HORIZONTAL</b> NAD83	<b>VERTICAL</b> MLLW
<b>LOCATION COORDINATES</b> X = 1,805,705 Y = 173,577		<b>ELEVATION TOP OF BORING</b> -38.0 Ft.	




ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-53.0	15.0						
-58.0	20.0		(SC-SM) SAND, silty, clayey, wet, gray and white, poorly graded			1	Vibracore
			(SP-SM) SAND, poorly-graded with silt, wet, gray and white				



DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS		
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL		
					NAD83	MLLW		
LOCATION COORDINATES X = 1,805,705 Y = 173,577			ELEVATION TOP OF BORING -38.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-68.0	30.0					1	Vibracore	25
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.					30
								35

<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET 1</b> <b>OF 3 SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-24-84		<b>LOCATION COORDINATES</b> X = 1,806,105 Y = 169,277		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>DEG. FROM VERTICAL</b> <b>BEARING</b>
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>14. ELEVATION GROUND WATER</b> Underwater		
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>8. TOTAL DEPTH OF BORING</b> 27.0 Feet			<b>16. ELEVATION TOP OF BORING</b> -44.0 Feet		
			<b>17. TOTAL RECOVERY FOR BORING</b> 100 %		
			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-44.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, black and dark gray, with organic material				
		▨	At El. -46.4 Ft., soft consistency, light gray			1	Vibrocure

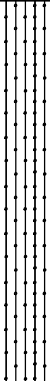
DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
			NAD83		MLLW		
LOCATION COORDINATES X = 1,806,105 Y = 169,277			ELEVATION TOP OF BORING -44.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-61.0	17.0		(OL) CLAY, organic-L, wet, black and brown			1	Vibracore
-64.7	20.7		(CH) CLAY, fat, high plasticity, soft consistency, wet, light gray				
-67.0	23.0		(SM) SAND, silty, wet, white, poorly graded				

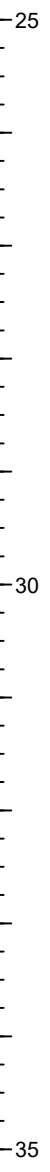
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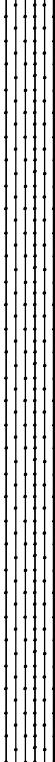
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DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 3 OF 3 SHEETS	
PROJECT			COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL	
					NAD83	MLLW	
LOCATION COORDINATES X = 1,806,105 Y = 169,277			ELEVATION TOP OF BORING -44.0 Ft.				
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-71.0	27.0					1	Vibracore
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.				

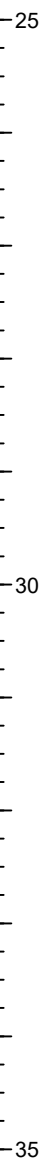


<b>DRILLING LOG</b>		<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Mobile District		<b>SHEET</b> 1 <b>OF</b> 3 <b>SHEETS</b>
<b>1. PROJECT</b> 1982-1984 Subsurface Investigation			<b>9. SIZE AND TYPE OF BIT</b> See Remarks		
<b>2. BORING DESIGNATION</b> VC-9-84		<b>LOCATION COORDINATES</b> X = 1,801,604 Y = 217,999		<b>10. COORDINATE SYSTEM/DATUM/UNITS</b> State Plane - Alabama West - U.S. Survey Ft. <b>HORIZ.</b> NAD83 <b>VERT.</b> MLLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers - CESAM		<b>CONTRACTOR FILE NO.</b>		<b>11. MANUFACTURER'S DESIGNATION OF DRILL</b> <input type="checkbox"/> <b>AUTO HAMMER</b> Vibrocore <input type="checkbox"/> <b>MANUAL HAMMER</b>	
<b>4. NAME OF DRILLER</b> C. Fuller			<b>12. TOTAL SAMPLES</b>		<b>DISTURBED</b> 1 <b>UNDISTURBED (UD)</b> 0
<b>5. DIRECTION OF BORING</b> <input checked="" type="checkbox"/> <b>VERTICAL</b> <input type="checkbox"/> <b>INCLINED</b>			<b>13. TOTAL NUMBER CORE BOXES</b> 0		<b>14. ELEVATION GROUND WATER</b> Underwater
<b>6. THICKNESS OF OVERBURDEN</b> N/A			<b>15. DATE BORING</b>		<b>STARTED</b> 01-08-84 <b>COMPLETED</b> 01-08-84
<b>7. DEPTH TO TOP OF ROCK</b> N/A			<b>16. ELEVATION TOP OF BORING</b> -42.0 Feet		<b>17. TOTAL RECOVERY FOR BORING</b> 100 %
<b>8. TOTAL DEPTH OF BORING</b> 24.0 Feet			<b>18. SIGNATURE AND TITLE OF INSPECTOR</b> H. Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS
-42.0	0.0		(CH) CLAY, fat, high plasticity, very soft consistency, wet, dark to light gray, with organic material				
-44.0	2.0		(SM) SAND, silty, wet, light gray, poorly graded				
-50.8	8.8		(SP) SAND, poorly-graded, wet, yellow			1	Vibrocure



<b>DRILLING LOG (Cont. Sheet)</b>			<b>INSTALLATION</b> Mobile District				<b>SHEET 3</b> <b>OF 3 SHEETS</b>	
			<b>PROJECT</b>			<b>COORDINATE SYSTEM/DATUM</b>		<b>HORIZONTAL</b> NAD83
<b>LOCATION COORDINATES</b> X = 1,801,604 Y = 217,999			<b>ELEVATION TOP OF BORING</b> -42.0 Ft.					
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	BLOWS/ 1 FT.	N-VALUE	BOX OR SAMPLE	REMARKS	
-66.0	24.0	•••••				1	Vibracore	
			NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.					



DRILLING LOG		DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING			10. SIZE AND TYPE OF BIT 4" VIBROCORE	
2. LOCATION (Coordinates or Station) N 217,922 E 333,099			11. DATUM FOR ELEVATION 5, DOWN (DOWN or AMSL) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO			12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file marked) VC-9-84			13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	13. DISTURBED 4
5. NAME OF DRILLER C. FULLER			14. TOTAL NUMBER CORE BOXES 0	13. UNDISTURBED 0
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED AUG. 1984	
8. DEPTH DRILLED INTO ROCK			16. DATE HOLE COMPLETED AUG. 1984	
9. TOTAL DEPTH OF HOLE 24.0' (EL. -66.0')			17. ELEVATION TOP OF HOLE -42.0	
			18. TOTAL CORE RECOVERY FOR BORING N/A	
			19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-42.0	0		(CH) DARK TO LIGHT GRAY FAT CLAY, VERY SOFT, WITH ORGANIC MATERIAL			
-44.0	2					
	4		(SM) LIGHT GRAY POORLY GRADED SILTY SAND		1	DEPTH 4.5'-5.0'
	6					
	8					
-50.0	10		(SP) YELLOW POORLY GRADED SAND		2	DEPTH 9.5'-10.0'
	12		WHITE			
	14					
	16				3	DEPTH 14.5'-15.0'
	18		WHITE WITH GRAVEL, (1" MAX.)			
-62.0	20					

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE - 42.0 Hole No. VC-9-84

PROJECT MOBILE HARBOR CHANNEL DEEPENING INSTALLATION MCO SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	SA. PLUS NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if pertinent) K																									
-62.0	20	•••••	(SP) WHITE POORLY GRADED SAND WITH GRAVEL, (1" MAX.)																												
	22	•••••																													
-66.0	24	•••••	BOTTOM OF HOLE	4		DEPTH 23.5'-24.0'																									
						<b>LAB DATA :</b> <table border="1"> <thead> <tr> <th>SAM #</th> <th>CLASS</th> <th>LL</th> <th>PL</th> <th>PI</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SM</td> <td>NP</td> <td>NP</td> <td>NP</td> </tr> <tr> <td>2</td> <td>SP</td> <td>NP</td> <td>NP</td> <td>NP</td> </tr> <tr> <td>3</td> <td>SP</td> <td>NP</td> <td>NP</td> <td>NP</td> </tr> <tr> <td>4</td> <td>SP</td> <td>NP</td> <td>NP</td> <td>NP</td> </tr> </tbody> </table>	SAM #	CLASS	LL	PL	PI	1	SM	NP	NP	NP	2	SP	NP	NP	NP	3	SP	NP	NP	NP	4	SP	NP	NP	NP
SAM #	CLASS	LL	PL	PI																											
1	SM	NP	NP	NP																											
2	SP	NP	NP	NP																											
3	SP	NP	NP	NP																											
4	SP	NP	NP	NP																											

DRILLING LOG		DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING			10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (Coordinates or Station) N 214,776 E 333,272			11. DATUM FOR ELEVATION SHOWN (THIN OR MSL) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO			12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC - 10 - 84			13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN DISTURBED 4 UNDISTURBED 0	
5. NAME OF DRILLER C. FULLER			14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED AUG. 1984	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE - 43.0	
9. TOTAL DEPTH OF HOLE 22.7' (EL. - 65.7)			18. TOTAL CORE RECOVERY FOR BORING N/A	
			19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000 <th>REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g</th>	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
-43.0	0		(CH) DARK GRAY FAT CLAY WITH ORGANIC MATERIAL			
-46.5	2					
	4		(SC) LIGHT GRAY CLAYEY SAND WITH POCKETS OF SANDY LEAN CLAY	19	1	DEPTH 4.5'-6.0'
	6					
-51.0	8					
	10		(SM) LIGHT GRAY SILTY SAND WITH FINE GRAVEL		2	DEPTH 9.5'-10.0'
	12					
-57.5	14					
	16		(SP) WHITE POORLY GRADED SAND		3	DEPTH 14.5'-15.0'
	18					
-60.5						
	20		(SM) WHITE & GRAY POORLY GRADED SILTY SAND			

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE -48.0		Hole No. VC-10-84		
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. e	OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-69.0	20		(SM) WHITE & GRAY POORLY GRADED SILTY SAND			
-65.7	22				4	DEPTH 22.2'-22.7'
	24		BOTTOM OF HOLE			LAB DATA : SAMPLER CLASS LL PL PI # 1 CL-ML 18 13 5 2 SM - - - 3 SP NP NP NP 4 SP NP NP NP SAMPLER LOI (%) -200(%) # 1 1.6 42.2 SAMPLER SPG # 1 2.67



DRILLING LOG		DIVISION SAD		INSTALLATION MDO		SHEET 1 OF 1 SHEETS	
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING				10. SIZE AND TYPE OF BIT 4" VIBRACORE			
2. LOCATION (Coordinates or Station) N 212,250 E 383,563				11. DATUM FOR ELEVATION SHOWN (T.M. or M.S.L.) MLLW ± 3 FT.			
3. DRILLING AGENCY MDO				12. MANUFACTURER'S DESIGNATION OF DRILL BARGE			
4. HOLE NO. (As shown on drawing title and file number) VC-11-84				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 3	UNDISTURBED 0
5. NAME OF DRILLER C. FULLER				14. TOTAL NUMBER CORE BOXES 0		15. ELEVATION GROUND WATER	
6. DIRECTION OF HOLE VERTICAL <input checked="" type="checkbox"/> INCLINED _____ DEG. FROM VERT.				16. DATE HOLE STARTED AUG. 1984		COMPLETED AUG. 1984	
7. THICKNESS OF OVERBURDEN				17. ELEVATION TOP OF HOLE -49.0			
8. DEPTH DRILLED INTO ROCK				18. TOTAL CORE RECOVERY FOR BORING N/A			
9. TOTAL DEPTH OF HOLE 19.3' (EL. -62.3)				19. SIGNATURE OF INSPECTOR H. GATES <span style="float: right;">DU</span>			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	4-CORE RECOVERY % e	MIN-OR SAMPLE NO. f	REMARKS (Drilling loss, water loss, depth of weathering, etc., if significant) g
-49.0	0		(CH) ORANGE, GRAY & BEIGE MOTTLED FAT CLAY, MEDIUM STIFFNESS			
	2					
	4					
				24	1	DEPTH 4.5'-5.0'
-49.0	6		(SC) ORANGE, GRAY & BEIGE CLAYEY SAND, MEDIUM GRAINED			
	8					
	10			19	2	DEPTH 9.5'-10.0'
-59.0	12		(SM) BEIGE SILTY SAND			
	14		ORANGE, GRAY & BEIGE, MOTTLED, SILTY			
	16					
	18		ORANGE, GRAY & BEIGE, SILTY, MEDIUM GRAINED			
				3		DEPTH 14.5'-15.0'
	16					LAB DATA :
						SAM CLASS LL PL PI
						# 3 SP-SM NP NP NP
						SAM LOI (%) -200(%)
						# 1 - 71.0
						# 2 - 13.5
-62.3	20		BOTTOM OF HOLE			

DRILLING LOG		DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING			10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (Coordinates or Station) N 209,509 E 333,812			11. DATUM FOR ELEVATION (SHOW FULL NAME) MLLW ± 9 FT.	
3. DRILLING AGENCY MDO			12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and its number) VC-12-84			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 5
5. NAME OF DRILLER C. FULLER			14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE VERTICAL <input checked="" type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE	STARTED AUG. 1984
8. DEPTH DRILLED INTO ROCK			COMPLETED AUG. 1984	
9. TOTAL DEPTH OF HOLE 20.0' (EL. - 69.07)			17. ELEVATION TOP OF HOLE -43.0	18. TOTAL CORE RECOVERY FOR BORING N/A
			19. SIGNATURE OF INSPECTOR H. GATES <span style="float: right;">DH</span>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-43.0	0		(CH) DARK GRAY FAT CLAY, SOFT			
-44.0						
	2					
	4					
	6		(SM) GRAY, YELLOW & WHITE POORLY GRADED SILTY SAND, MEDIUM TO COARSE GRAINED, WITH OCCASIONAL POCKETS OF FAT CLAY		1	DEPTH 4.5'-5.0'
	8					
	10				2	DEPTH 9.5'-10.0'
	12					
	14					
	16					
	18				3	DEPTH 14.5'-15.0'
-63.0	20				4	DEPTH 19.5'-20.0'

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE  
-49.0

Hole No. VC-12-84

PROJECT  
MOBILE HARBOR CHANNEL DEEPENING

INSTALLATION  
MDO












SHEET 2  
OF 2 SHEETS



ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C	SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-68.0	20		(SM) GRAY, YELLOW & WHITE POORLY GRADED SILTY SAND, MEDIUM TO COARSE GRAINED, WITH OCCASIONAL POCKETS OF FAT CLAY			
	22					
	24					
				5		DEPTH 24.5'-25.0'
-69.0	26		BOTTOM OF HOLE			



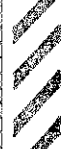

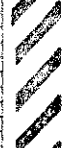


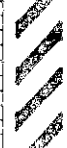



LAB DATA :

SAM #	CLASS	LL	PL	PI
1	SP	NP	NP	NP
2	SP	NP	NP	NP
3	SP	NP	NP	NP
4	SP	NP	NP	NP
5	SP	NP	NP	NP

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (Coordinates or Station) N 807, 241 E 394, 043		11. DATUM FOR ELEVATION (SHOW TITLE or MSL) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC-13-84		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 2 UNDISTURBED 0	
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE 54 VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED COMPLETED AUG. 1984 AUG. 1984	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE = 43.0	
9. TOTAL DEPTH OF HOLE 22.7' (EL. = 65.7)		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES <span style="float: right;">DH</span>	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W-C	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-43.0	0		(CH) GRAY FAT CLAY, VERY SOFT			
	2					
	4					
	6		GRAY, SOFT	67	1	DEPTH 4.5'-5.0'
	8					
	10					
	12					
	14					
	16		GRAY, SOFT TO STIFF, WITH ORGANIC MATERIAL OF STICKS & ROOTS	171	2	DEPTH 14.5'-15.0'
	18					
-63.0	20					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE -49.0		Hole No. VC-13-84		
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C	BOX-CAN SAMPLE NO. 1	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) R
-63.0	20		(CH) GRAY FAT CLAY, SOFT TO STIFF, WITH ORGANIC MATERIAL OF STICKS & ROOTS			
-65.7	22					
	24		BOTTOM OF HOLE			LAB DATA : SAM LOI (%) - 200 (%) # 1 - 96.4 2 24.8 86.5

DRILLING LOG		DIVISION SAD		INSTALLATION MDO		SHEET 1 OF 2 SHEETS	
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING				10. SIZE AND TYPE OF BIT 4" VIBRACORE			
2. LOCATION (Coordinates or Station) N 204,638 E 774,508				11. DATUM FOR ELEVATION SHOWN (TYP. OF HSE) MLLW ± 3 FT.			
3. DRILLING AGENCY MDO				12. MANUFACTURER'S DESIGNATION OF DRILL BARGE			
4. HOLE NO. (As shown on drawing title and file number) VC-14-84		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		DISTURBED 4		UNDISTURBED 0	
5. NAME OF DRILLER C. FULLER				14. TOTAL NUMBER CORE BOXES 0			
6. DIRECTION OF HOLE Vertical <input checked="" type="checkbox"/> Inclined <input type="checkbox"/> DEG. FROM VERT.				15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN				16. DATE HOLE STARTED AUG. 1984		COMPLETED AUG. 1984	
8. DEPTH DRILLED INTO ROCK				17. ELEVATION TOP OF HOLE -42.0			
9. TOTAL DEPTH OF HOLE 26.5' (EL. - 68.5')				18. TOTAL CORE RECOVERY FOR BORING N/A			
				19. SIGNATURE OF INSPECTOR H. GATES <i>HG</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Descriptor) d	W-C W+C	BOX-OFF SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
-42.0	0		(CH) BLACK TO DARK GRAY FAT CLAY WITH ORGANIC MATERIAL, VERY SOFT				
	2						
	4						
	6		DARK GRAY, SOFT				
	8						
	10						
	12						
	14						
	16		DARK GRAY, SOFT, WITH ORGANIC MATERIAL OF LEAVES AND WOOD				
	18						
-62.0	20						
				37	1	DEPTH 4.5'-5.0'	
				90	2	DEPTH 11.5'-12.0'	
				102	3	DEPTH 19.5'-20.0'	

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HULL - 42.0		Hole No. VC-14-84	
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) R
-62.0	20		(CH) DARK GRAY FAT CLAY, SOFT, WITH ORGANIC MATERIAL OF WOOD & LEAVES		
	22				
	24				
			LIGHT GRAY, SOFT	5	DEPTH 24.5'-25.0'
-68.0	26		(SM) LIGHT GRAY SILTY SAND, FINE GRAINED		
-68.5			BOTTOM OF HOLE		

SAM #	CLASS	LL	PL	PI
1	CL	36	16	20
4	CH	-	-	-







  

SAM #	LOI (%)	-200(%)
1	-	47.3
2	-	95.2
3	16.2	94.1

DRILLING LOG		DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING.			10. SIZE AND TYPE OF BIT 4" VEIACORE	
2. LOCATION (Coordinates as shown) N 202,600 E 334,427			11. DATUM OF ELEVATION (SHOW TYPE or BSL) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO			12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC - 15 - 84			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 4 UNDISTURBED 0
5. NAME OF DRILLER C. FULLER			14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE VERTICAL <input checked="" type="checkbox"/> INCLINED <input type="checkbox"/> DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			15. DATE HOLE	STARTED AUG. 1984 COMPLETED AUG. 1984
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE - 43.0	
9. TOTAL DEPTH OF HOLE 30.0' (EL. - 73.0)			18. TOTAL CORE RECOVERY FOR BORING N/A	
			19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of washing, etc., if significant)
-43.0	0					
	2					
	4					
	6		(CH) GRAY FAT CLAY, SOFT, WITH SOME SAND	29	1	DEPTH 2.5' - 3.0'
	8					
	10					
	12					
	14					
	16					
	18		DARK GRAY TO GRAY, SOFT, WITH ORGANIC MATERIAL OF WOOD, ROOTS & LEAVES	41	3	DEPTH 14.5' - 15.0'
-63.0	20					
				67	4	DEPTH 19.5' - 20.0'



DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE -43.0		Hole No. VC-15-84	
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) e
-63.0	20		(CH) DARK GRAY TO GRAY FAT CLAY, SOFT, WITH ORGANIC MATERIAL OF WOOD, ROOTS & LEAVES		
	22				
	24				
	26		GRAY, SOFT, WITH ORGANIC MATERIAL		
	28				
-73.0	30		BOTTOM OF HOLE		

LAB DATA :		
SAM #	LOI (%)	-200 (%)
1	-	30.2
2	-	48.7
3	-	82.8
4	-	93.5

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (Coordinates or Station) N 200, 108 E 994, 843		11. BATHYMETRIC ELEVATION (TO BOTTOM OF HOLE) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC - 16 - 84		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 5	UNDISTURBED 0
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE VERTICAL		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE AUG 1984	COMPLETED AUG 1984
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE - 37.0	
9. TOTAL DEPTH OF HOLE 28.0' (EL. = 65.0')		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-37.0	0		(CH) BLACK FAT CLAY, VERY SOFT, WITH ORGANIC MATERIAL			
	2					
	4					
	6			156	1	DEPTH 4.5' - 5.0'
-43.5			(SC) DARK GRAY CLAYEY SAND			
-45.0	8					
	10				2	DEPTH 9.5' - 10.0'
	12					
	14		(SM) GRAY POORLY GRADED SILTY SAND			
	16					
	18				3	DEPTH 14.5' - 15.0'
	20					
	22					
	24					
	26					
	28				4	DEPTH 19.5' - 20.0'

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. VC-16-84			
PROJECT		INSTALLATION		SHEET 2 OF 2 SHEETS			
MOBILE HARBOR CHANNEL DEEPENING		MDO					
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d		f	e	
-57.0	20		(SM) GRAY SILTY SAND				
	22						
	24						
	26						
-65.0	28			BOTTOM OF HOLE		5	DEPTH 27.5'-28.0'
			LAB DATA : SAM CLASS LL PL PI # _____ 2 SP-SM NP NP NP 3 SP-SM NP NP NP 4 SP-SM NP NP NP 5 SP-SM NP NP NP  SAM LOI (%) -200(%) # _____ 1 12.2 99.3				

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (If coordinates or Station) N 198.426 E 394.897		11. DATUM FOR ELEVATION (MSL or MLLW) MLLW ± 0 FT	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL EARGE	
4. HOLE NO. (As shown on drawing title and file number) VC-17-84		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN	DISTURBED 4
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE VERTICAL <input checked="" type="checkbox"/> INCLINED <input type="checkbox"/> DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED AUG. 1984
8. DEPTH DRILLED INTO ROCK		COMPLETED AUG. 1984	
9. TOTAL DEPTH OF HOLE 26.7' (EL. -68.7)		17. ELEVATION TOP OF HOLE -42.0	
		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	LOGGING SYMBOLS W.C.	NO. OF SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-42.0	0		(CH) DARK GRAY FAT CLAY, VERY SOFT			
	2					
	4					
-46.8			(SC) LIGHT GRAY POORLY GRADED SILTY CLAYEY SAND		1	DEPTH 4.5'-5.0'
	6					
	8					
	10		LIGHT GRAY, CLAYEY		2	DEPTH 9.5'-10.0'
	12					
	14					
	16					
	18		LIGHT GRAY, POORLY GRADED, SILTY, CLAYEY		3	DEPTH 14.5'-15.0'
-62.0	20					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF BOLT		Hole No. VC-17-84	
PROJECT			INSTALLATION		SHEET 2
MOBILE HARBOR CHANNEL DEEPENING			MDO		OF 2 SHEETS
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-62.0	20	///	(SC) LIGHT GRAY POORLY GRADED SILTY CLAYEY SAND		
-63.0		///			
-64.2	22		(SM) LIGHT GRAY SILTY SAND WITH ORGANIC MATERIAL		
	24		(SM) LIGHT GRAY POORLY GRADED SILTY SAND		
				4	DEPTH 24.5' - 25.0'
	26				
-68.7					
	28		BOTTOM OF HOLE		

LAB DATA :

SAM #	CLASS	LL	PL	PI
1	SC	NP	NP	NP
2	SP-SM	NP	NP	NP
3	SP-SM	NP	NP	NP
4	SP	NP	NP	NP

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VISSACORE	
2. LOCATION (Coordinates or Station) N 196,696 E 334,939		11. DATE AND TIME ELEVATION (HOW TO MEASURE) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC - 18 - 04		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN 5	DISTURBED 0
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE DEVERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED AUG. 1984	COMPLETED AUG. 1984
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE - 44.0	
9. TOTAL DEPTH OF HOLE 28.2' (BL. - 72.2')		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	NUMBER OF CORE SAMPLES TAKEN W.C.	DEPTH OF CORE SAMPLE NO. 1	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-44.0	0		(CH) YELLOW FAT CLAY, VERY SOFT, WITH CLAYEY SAND			
-46.0	2					
	4		(SC) GRAY & YELLOW CLAYEY SAND W/ SANDY LEAN CLAY	3	1	DEPTH 4.5'-5.0'
	6					
	8					
-54.0	10				2	DEPTH 9.5'-10.0'
	12					
	14		(SM) LIGHT GRAY POORLY GRADED SILTY SAND		3	DEPTH 14.5'-15.0'
	16					
	18					
-64.0	20				4	DEPTH 19.5'-20.0'

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE -44.0		Hole No. VC-18-84		
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-64.0	20		(SM) LIGHT GRAY POORLY GRADED SILTY SAND			
	22		LIGHT GRAY, SILTY, WITH ORGANIC SILT			
-67.0						
	24		(CH) GRAY FAT CLAY		5	DEPTH 24.5'-25.0'
	26					
-71.0						
-72.2	28		(SM) GRAY POORLY GRADED SILTY SAND			
			BOTTOM OF HOLE			

LAB DATA :

SAM #	CLASS	LL	PL	PI
1	SC	26	17	9
2	SM	NP	NP	NP
3	SP-SM	NP	NP	NP
4	SP-SM	NP	NP	NP

SAM #	LOI (%)
4	1.0

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (Coordinates or Station) N 194,476 E 395,266		11. BAYON FOR ELEVATION SHOWN (TBM or MSL) MLLW ± 9 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC - 19 - 84		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 4 UNDISTURBED 0
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED AUG. 1984 COMPLETED AUG. 1984
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE = 42.0	
9. TOTAL DEPTH OF HOLE 25.2' (EL. - 67.2')		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES DJ	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-42.0	0		(CH) DARK GRAY FAT CLAY, VERY SOFT, WITH ORGANIC MATERIAL			
	2			150	1	DEPTH 2.5'-3.0'
	4		LIGHT GRAY, SOFT, WITH SAND			
-48.5	6				2	DEPTH 6.5'-7.0'
	8		(SC) LIGHT GRAY SILTY CLAYEY SAND			
	10				3	DEPTH 11.5'-12.0'
-55.5	14					
	16		(SM) LIGHT GRAY POORLY GRADED SILTY SAND		4	DEPTH 16.5'-17.0'
-62.0	20					



DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. VC-19-84			
PROJECT			INSTALLATION		SHEET 2 OF 2 SHEETS		
MOBILE HARBOR CHANNEL DEEPENING			MDO				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W-C	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d		f	e	
-62.0	20		(SM) LIGHT GRAY POORLY GRADED SILTY SAND				
	22						
	24						
-67.2	26		BOTTOM OF HOLE				

LAB DATA :			
SAM #	CLASS	LL	PL PI
1	CH	-	- -
2	SC	-	- -
3	SM	-	- -
4	SP	-	- -

SAM #	LOI (%)
1	12.5

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 of 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIORACORE	
2. LOCATION (Coordinates of Station) N 192,600 E 595,404		11. DAYUM FOR ELEVATION SHOWN FROM (M.S.L.) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC-20-84		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 4 UNDISTURBED 0
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		18. DATE HOLE STARTED AUG. 1984	COMPLETED AUG. 1984
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE -43.0	
9. TOTAL DEPTH OF HOLE 27.5' (EL. = 70.5')		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W-C	SP-SM SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-43.0	0					
	2					
	4					
	6		(CH) GRAY FAT CLAY, SOFT TO MEDIUM STIFFNESS, WITH SHELL & WOOD FRAGMENTS	40	1	DEPTH 4.5'-5.0'
	8					
	10			55	2	DEPTH 9.5'-10.0'
	12					
	14					
	16					
	18			109	3	DEPTH 14.5'-15.0'
-63.0	20					

DRILLING LOG (Cont Sheet)

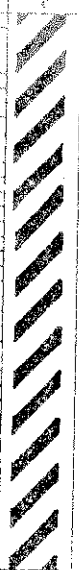
ELEVATION TOP OF HOLE  
at 49.0

Hole No. VC-20-84

PROJECT  
MOBILE HARBOR CHANNEL DEEPENING

INSTALLATION  
MDO

SHEET 2  
OF 2 SHEETS


ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C.	SAMPLE NO. e	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) f
-69.0	20					
	22					
	24					
	26					
-70.5						
	28		BOTTOM OF HOLE			LAB DATA :
						SAM CLASS LL PL PI
						#
						2 CH 55 22 33



DRILLING LOG		DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS	
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING			10. SIZE AND TYPE OF BIT 4" VLD-2ACORE		
2. LOCATION (If in minutes or distance) BETWEEN BN 57 & BN 58			11. BAYWATER ELEVATION (SHOW TPD or MSL) MLLW ± 3 FT.		
3. DRILLING AGENCY MDO			12. MANUAL TURNER'S DESIGNATION OF DRILL BARGE		
4. HOLE NO. (As shown on drawing title and file number) VC-21-84			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 3
			UNDISTURBED 0		
5. NAME OF DRILLER C. FULLER			14. TOTAL NUMBER CORE BOXES 0		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED DEG. FROM VERT.			15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED AUG. 1984		
8. DEPTH DRILLED INTO ROCK			COMPLETED AUG. 1984		
9. TOTAL DEPTH OF HOLE 30.0' (EL. - 72.0')			17. ELEVATION TOP OF HOLE - 42.0		
			18. TOTAL CORE RECOVERY FOR BORING N/A		
			19. SIGNATURE OF INSPECTOR H. GATES		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	LOGS NO. OR DATE W-C	NO. OR DATE SAMPLE NO. 1	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) 3
-42.0	0		(CH) BLACK & DARK GRAY FAT CLAY WITH ORGANIC MATERIAL			
	2					
-45.0			(SP) GRAY & WHITE POORLY GRADED SAND, MEDIUM GRAINED		1	DEPTH 4.5'-5.0'
	4					
	6					
	8					
	10					
	12					
-55.6			(CH) GRAY FAT CLAY WITH SAND			
-56.2	14				2	DEPTH 14.5'-15.0'
	16		(SP) WHITE POORLY GRADED SAND, MEDIUM GRAINED			
	18					
-62.0	20					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE = 42.0		Hole No. VC-21 - 84				
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W.C. e	REMARKS (Drilling time, water loss, depth of penetration, etc. if significant) f			
-62.0	20	•••••	(SP) WHITE POORLY GRADED SAND, MEDIUM GRAINED					
	22	•••••						
	24	•••••						
	26	•••••						
	28	•••••						
	30	•••••						
							3	DEPTH 24.5'-25.0'
-72.0			BOTTOM OF HOLE		LAB DATA :			
					SAM CLASS LI PL FI			
					#			
					1 SP-SM NP NP NP			
					2 SP NP NP NP			
					3 SP NP NP NP			

DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIBRACORE	
2. LOCATION (Coordinates or Station) DUE WEST ON 56, C/L CHANNEL		11. DATUM FOR ELEVATION (SHOW TYPE or USE) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title) and file number VC-22-84		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED AUG. 1984	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE -43.0	
9. TOTAL DEPTH OF HOLE 30.0' (EL. = 73.0')		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-43.0	0		(CH) BLACK FAT CLAY WITH ORGANIC MATERIAL			
	2			173	1	DEPTH 2.5'-3.0'
	4					
	6					
	8					
	10		GRAY, SOFT	67	2	DEPTH 8.5'-9.0'
	12					
	14					
	16					
	18					
	20			49	3	DEPTH 14.5'-15.0'
-63.0	30			90	4	DEPTH 19.5'-21.0'

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF SEAL		Hole No. VC-22-34		
PROJECT			REGISTRATION		SHEET 2	
MOBILE HARBOR CHANNEL DEEPENING			MDO		OF 2 SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W-C	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant)
a	b	c	d		f	k
-63.0	20		(CH) GRAY FAT CLAY, SOFT			
	22					
	24					
	26					
-70.0			(OL) BROWN & GRAY ORGANIC SILT	202	5	DEPTH 27.0' - 27.5'
	28					
-73.0	30		BOTTOM OF HOLE			
						LAB DATA :
						SAM CLASS LL PL PI
						#
						2 CH 56 23 33
						SAM LOI (%) - 200 (%)
						#
						1 11.1 98.8
						3 - 84.7
						5 40.3 81.4


DRILLING LOG	DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING		10. SIZE AND TYPE OF BIT 4" VIBROCORE	
2. LOCATION (Coordinates or Station) 4,000 FT. SO. OF BA 56, C/L CHANNEL		11. DEPTH FOR ELEVATION SHOWN (LHM or MSL) MLLW ± 3 FT.	
3. DRILLING AGENCY MDO		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC - 23 - 84		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER C. FULLER		14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE VERTICAL <input checked="" type="checkbox"/> INCLINED <input type="checkbox"/> DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED AUG. 1984 COMPLETED AUG. 1984	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE - 38.0	
9. TOTAL DEPTH OF HOLE 30.0' (EL. - 68.0')		18. TOTAL CORE RECOVERY FOR BORING N/A	
		19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-38.0	0		(CH) GRAY FAT CLAY, SOFT	32	1	DEPTH 4.5' - 5.0'
	2					
	4					
	6					
	8					
	10					
	12			44	2	DEPTH 11.5' - 12.0'
	14					
-53.0			(SM) GRAY & WHITE POORLY GRADED SILTY SAND			
	16					
	18					
-58.0	20				3	DEPTH 19.5' - 20.0'



DRILLING LOG (Cont Sheet)		ELEVATION W.P. OF HOLE -38.0		Hole No. VC-23-84																												
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDC		SHEET 2 OF 2 SHEETS																											
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	W.C.	SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)																										
-58.0	20				1																											
	22																															
	24		(SM) GRAY & WHITE POORLY GRADED SILTY SAND		4	DEPTH 24.5'-25.0'																										
	26																															
	28																															
-68.0	30		BOTTOM OF HOLE		5	DEPTH 29.5'-30.0'																										
						<b>LAB DATA :</b> <table border="1"> <thead> <tr> <th>SAM #</th> <th>CLASS</th> <th>LL</th> <th>PL</th> <th>PI</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>SM-SC</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>4</td> <td>SP-SM</td> <td>NP</td> <td>NP</td> <td>NP</td> </tr> <tr> <td>5</td> <td>SP-SM</td> <td>NP</td> <td>NP</td> <td>NP</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>SAM #</th> <th>LOI (%)</th> <th>-200 (%)</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>-</td> <td>62.8</td> </tr> </tbody> </table>	SAM #	CLASS	LL	PL	PI	3	SM-SC	-	-	-	4	SP-SM	NP	NP	NP	5	SP-SM	NP	NP	NP	SAM #	LOI (%)	-200 (%)	2	-	62.8
SAM #	CLASS	LL	PL	PI																												
3	SM-SC	-	-	-																												
4	SP-SM	NP	NP	NP																												
5	SP-SM	NP	NP	NP																												
SAM #	LOI (%)	-200 (%)																														
2	-	62.8																														

DRILLING LOG		DIVISION SAD	INSTALLATION MDO	SHEET 1 OF 2 SHEETS
1. PROJECT MOBILE HARBOR CHANNEL DEEPENING			10. SIZE AND TYPE OF BIT 4" VIBROCORE	
2. LOCATION (Coordinates or Station) BETWEEN 51 (S2, C/L CHANNEL			11. DATUM FOR ELEVATION SHOWN (TUM or MSL) MLLW ± 0 FT.	
3. DRILLING AGENCY MDO			12. MANUFACTURER'S DESIGNATION OF DRILL BARGE	
4. HOLE NO. (As shown on drawing title and file number) VC-24-84			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED: 5 UNDISTURBED: 0	
5. NAME OF DRILLER C. FULLER			14. TOTAL NUMBER CORE BOXES 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED: AUG. 1984 COMPLETED: AUG. 1984	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE + 44.0	
9. TOTAL DEPTH OF HOLE 27.0' (EL. - 71.0')			18. TOTAL CORE RECOVERY FOR BORING N/A	
			19. SIGNATURE OF INSPECTOR H. GATES	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	CORE NO. W-C	SAMPLE NO. I	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-44.0	0		(CH) BLACK & DARK GRAY FAT CLAY, VERY SOFT, WITH ORGANIC MATERIAL			
	2					
	4					
	6		LIGHT GRAY, SOFT	93	1	DEPTH 4.5'-5.0'
	8					
	10					
	12					
	14					
	16			66	2	DEPTH 14.5'-15.0'
-61.0						
	18		(OL) BLACK & BROWN ORGANIC SILT		3	DEPTH 17.5'-18.0'
-64.0	20					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE - 44.0		Hole No. VC-24-84		
PROJECT MOBILE HARBOR CHANNEL DEEPENING			INSTALLATION MDO		SHEET 2 OF 2 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	W-C	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-64.0 -64.7	20		(OL) BLACK & BROWN ORGANIC SILT			
				64	4	DEPTH 20.5' - 21.0'
	22		(OH) LIGHT GRAY FAT CLAY, SOFT			
-67.0						
	24		(SM) WHITE POORLY GRADED SILTY SAND			
					5	DEPTH 24.5' - 26.0'
	26					
-71.0						
	28		BOTTOM OF HOLE			

LAB DATA :

SAM #	CLASS	LL	PL	PI
5	SM	NP	NP	NP

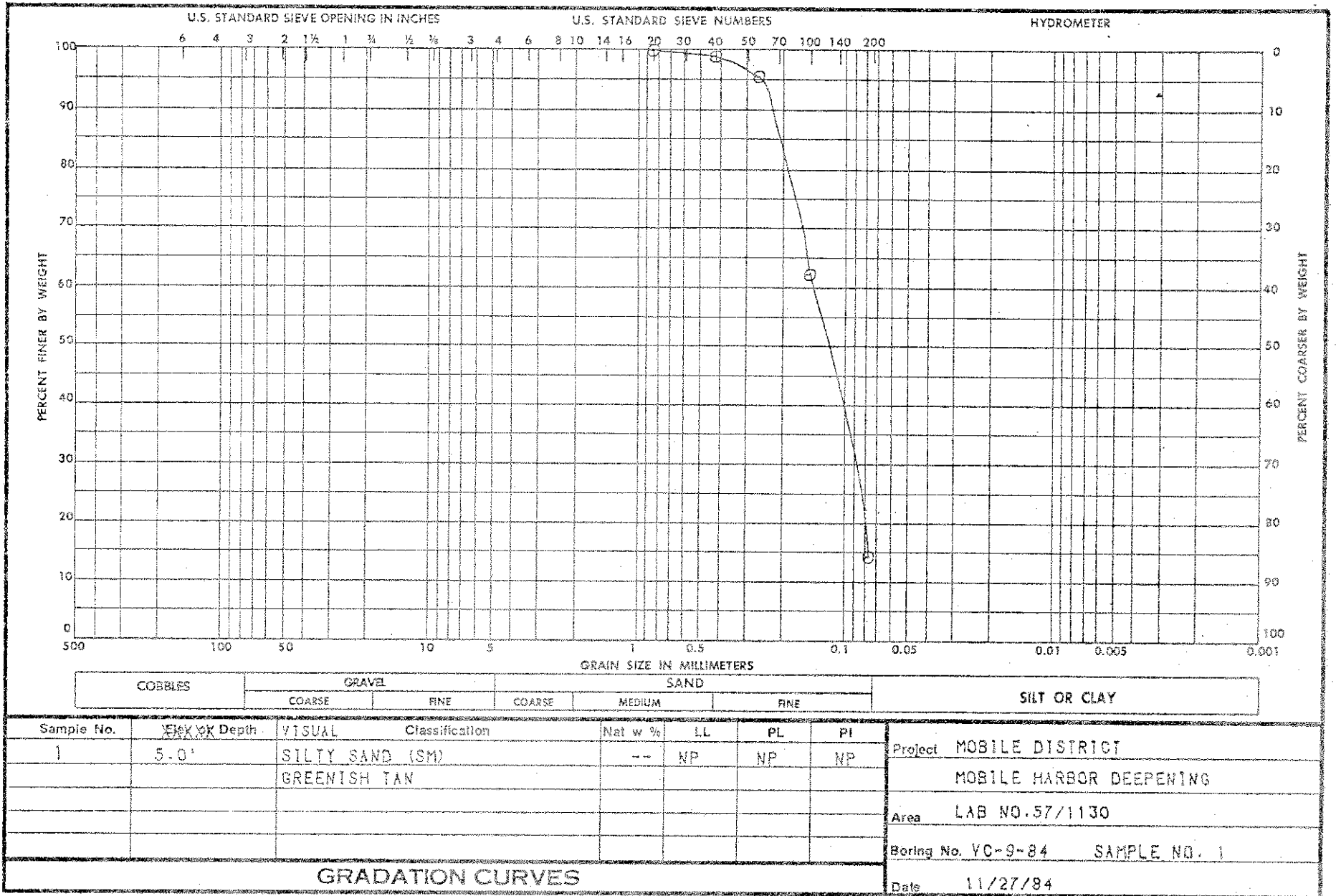
  

SAM #	LOI (%)	-200 (%)
1	-	97.6
2	-	97.6
4	-	96.3

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

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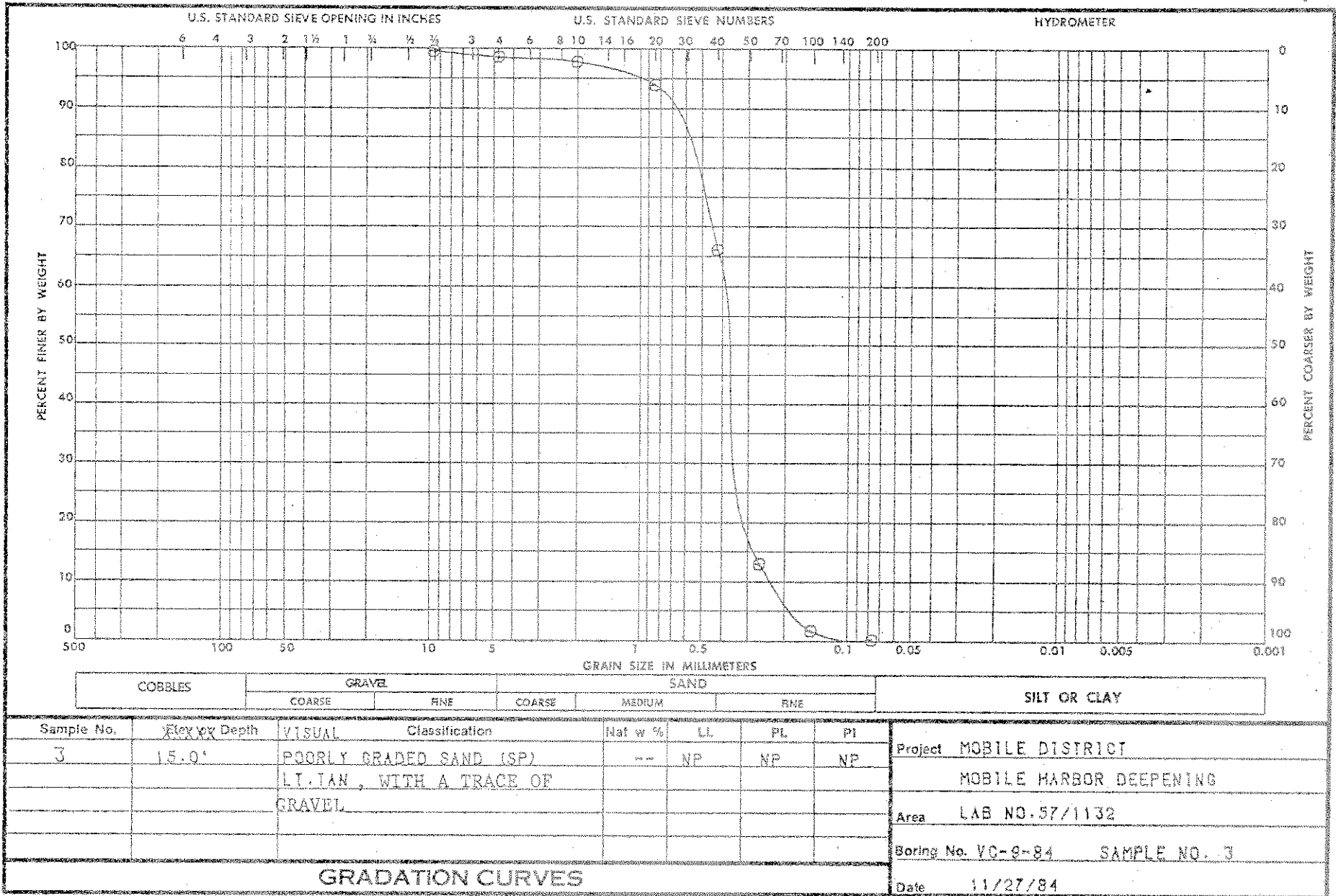
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
1	5.0'		SILTY SAND (SM) GREENISH TAN	--	NP	NP	NP	MOBILE DISTRICT MOBILE HARBOR DEEPENING
								Area LAB NO.57/1130
								Boring No. VC-9-84 SAMPLE NO. 1
								Date 11/27/84

CHART NO. 537

GRADATION CURVES



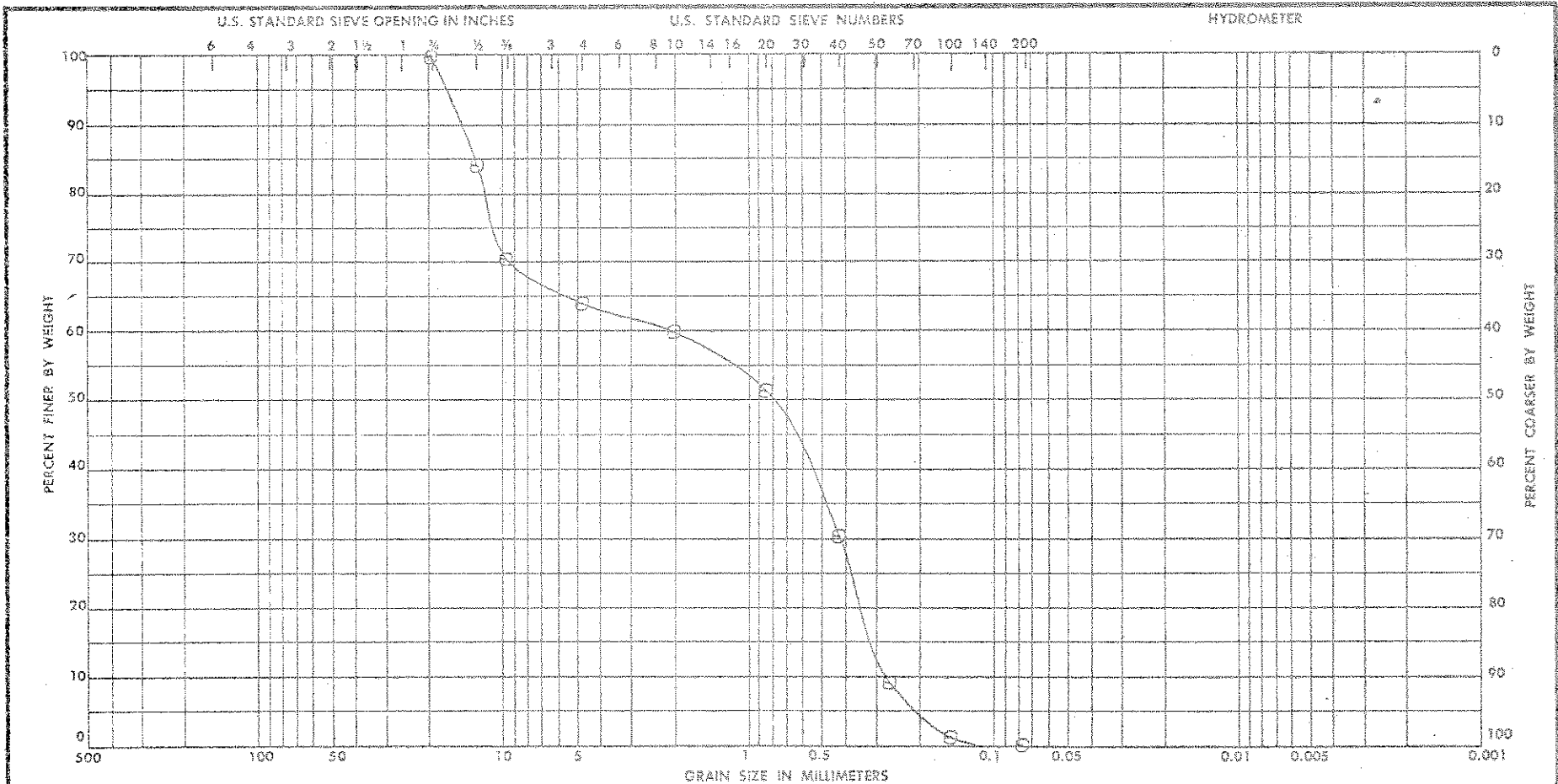


Sample No.	Depth	VISUAL Classification	Nat w %	LL	PL	PI	SOIL CLASSIFICATION	
							COARSE SAND	FINE SAND
3	15.0'	POORLY GRADED SAND (SP) LT. TAN, WITH A TRACE OF GRAVEL	---	NP	NP	NP		

Project	MOBILE DISTRICT
	MOBILE HARBOR DEEPENING
Area	LAB NO. 57/1132
Boring No.	VC-9-84
SAMPLE NO.	3
Date	11/27/84

CHART NO. 539

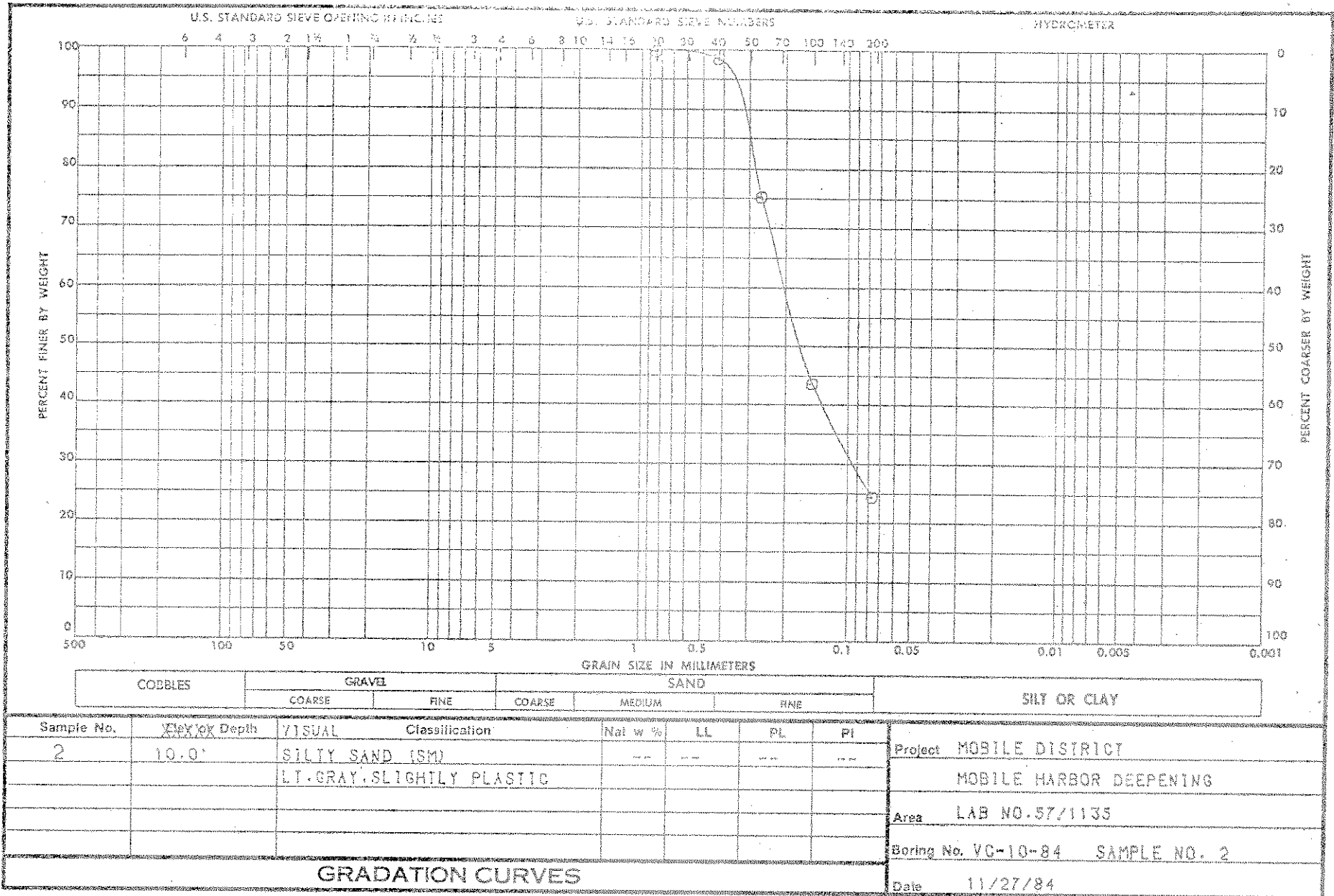


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Field No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
4		24.0'		POORLY GRADED SAND (SP) LT. TAN. GRAVELLY	--	NP	NP	NP	MOBILE DISTRICT
									MOBILE HARBOR DEEPENING
									Area LAB NO. 57/1133
									Boring No. VC-9-84 SAMPLE NO. 4
									Date 11/27/84

GRADATION CURVES

CHART NO. 540



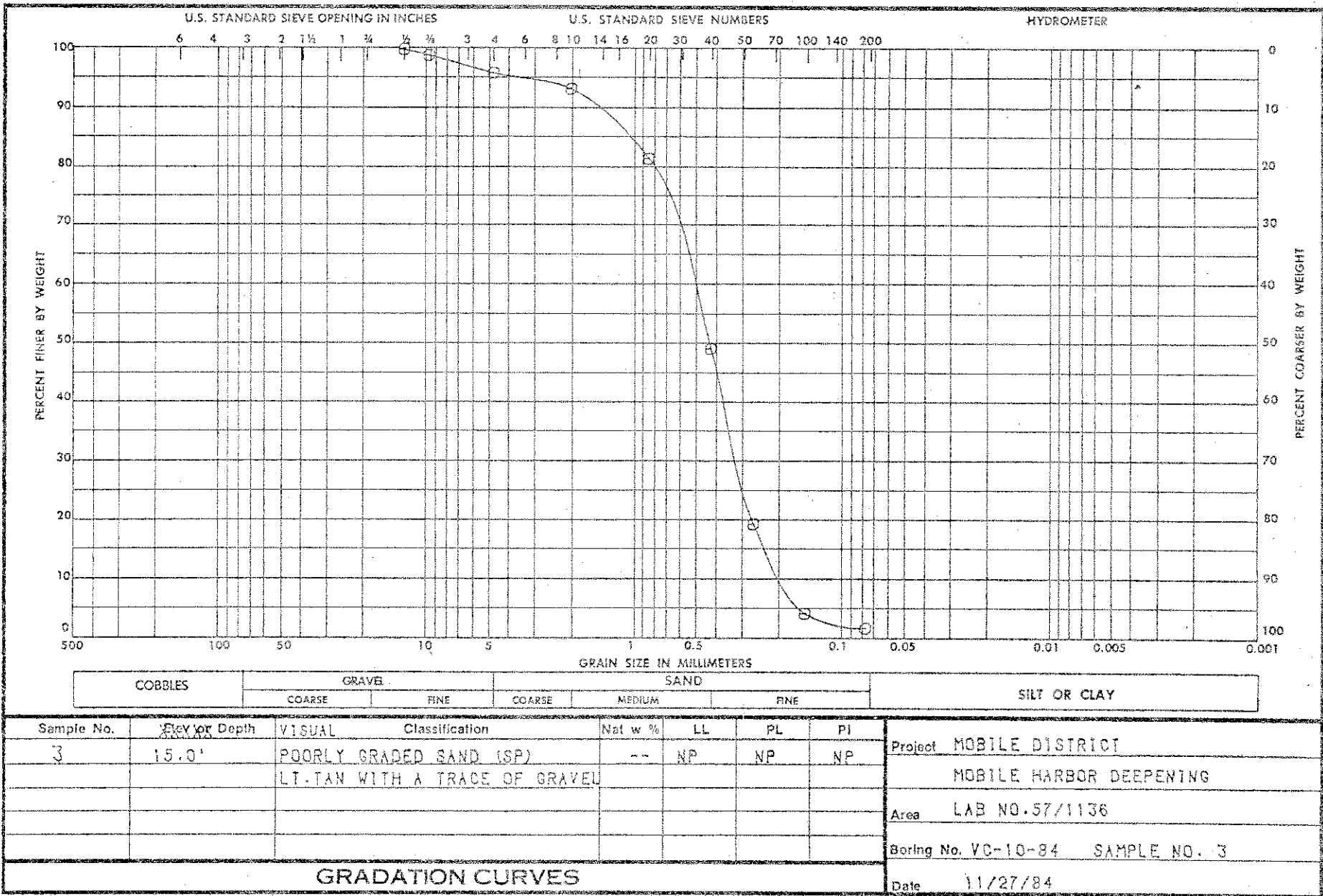
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Max Depth	VISUAL Classification	Nat w %	LL	PL	PI	Project
2	10.0'	SILTY SAND (SM) LT. GRAY, SLIGHTLY PLASTIC	---	---	---	---	MOBILE DISTRICT MOBILE HARBOR DEEPENING
							Area LAB NO. 57/1135
							Boring No. VC-10-84 SAMPLE NO. 2
							Date 11/27/84

GRADATION CURVES

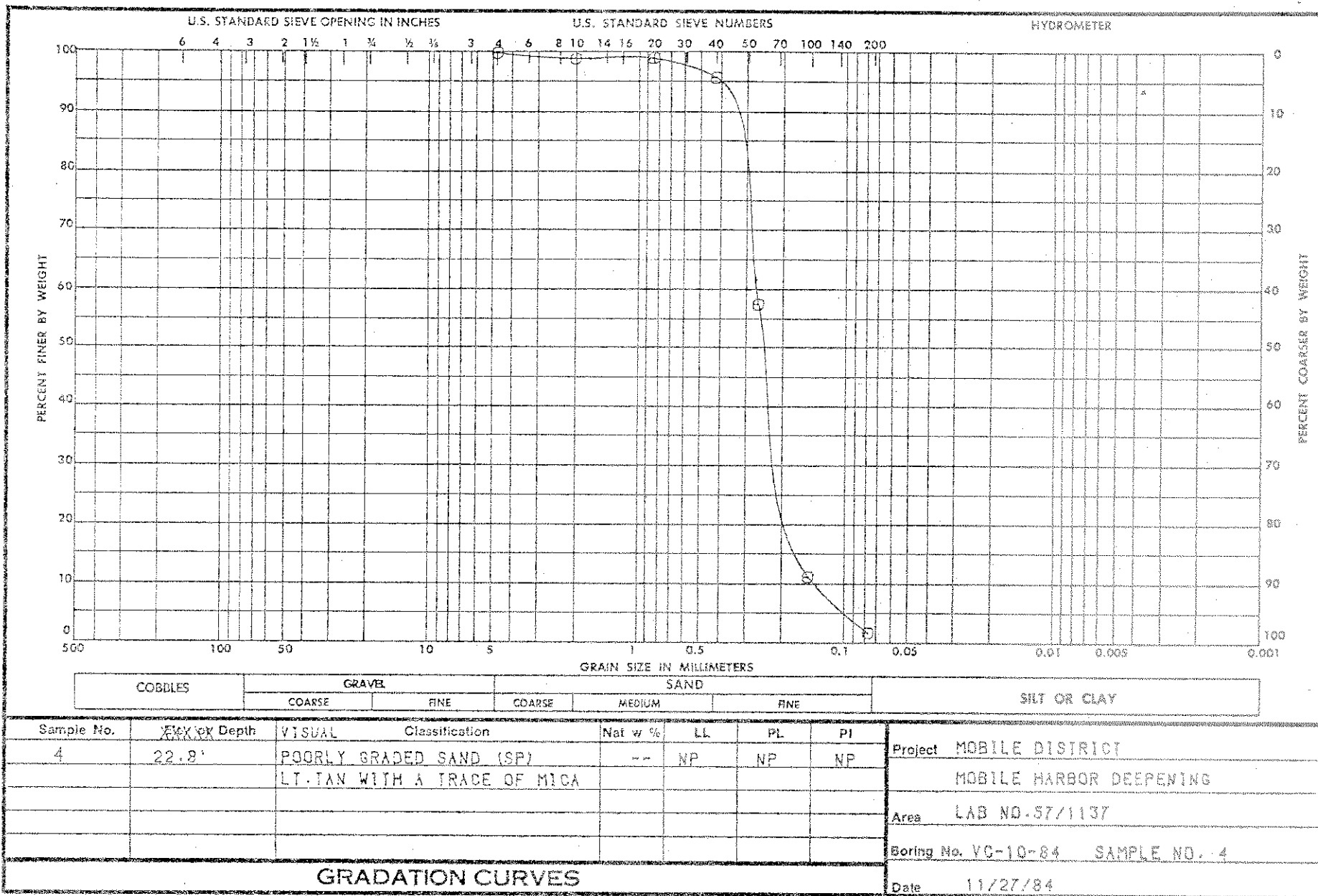
CHART NO. 541





GRADATION CURVES

CHART NO. 542

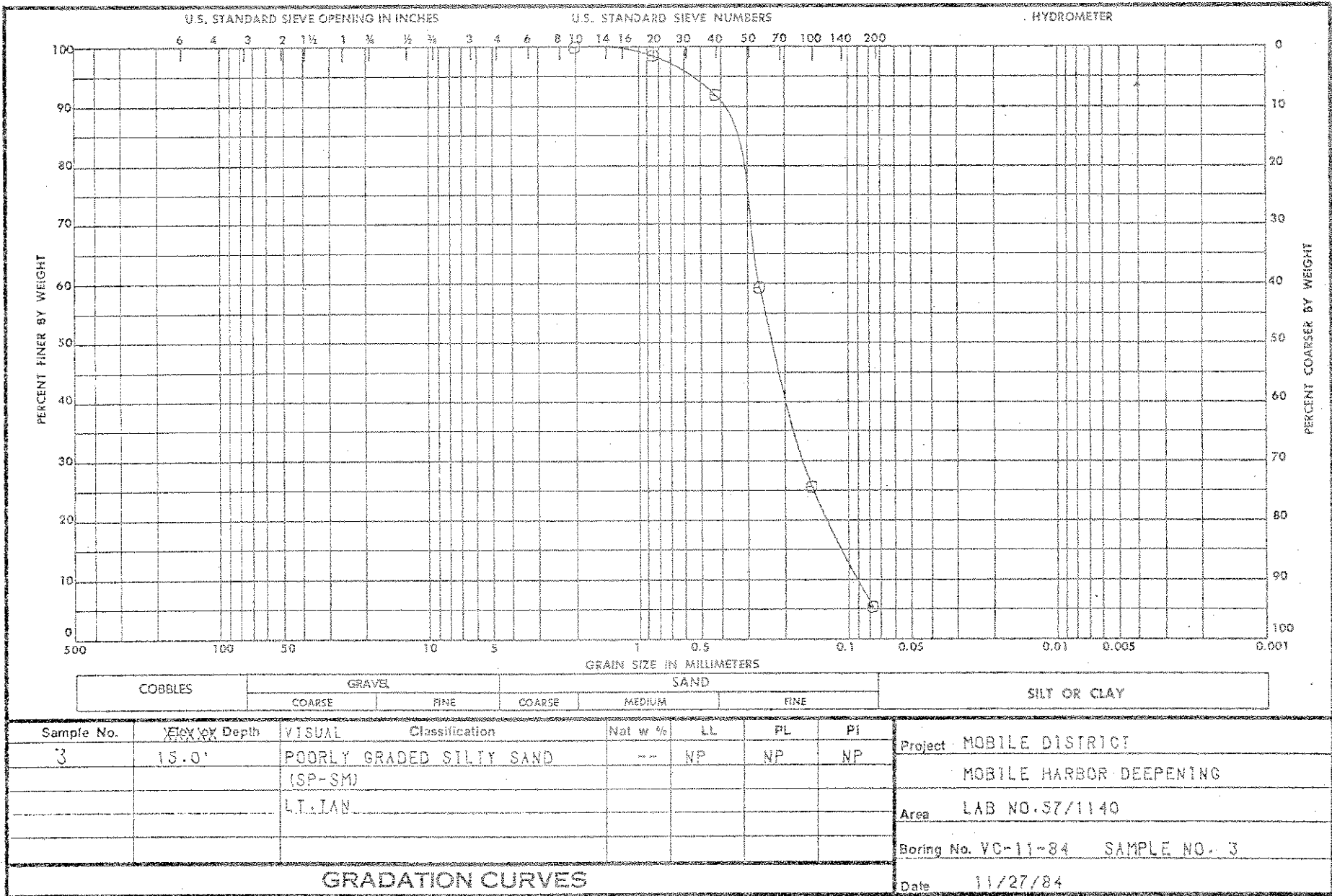


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
4	22.8'		POORLY GRADED SAND (SP) LT. TAN WITH A TRACE OF MICA	--	NP	NP	NP	MOBILE DISTRICT MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1137
								Boring No. VC-10-84 SAMPLE NO. 4
								Date 11/27/84

CHART NO. 543

GRADATION CURVES



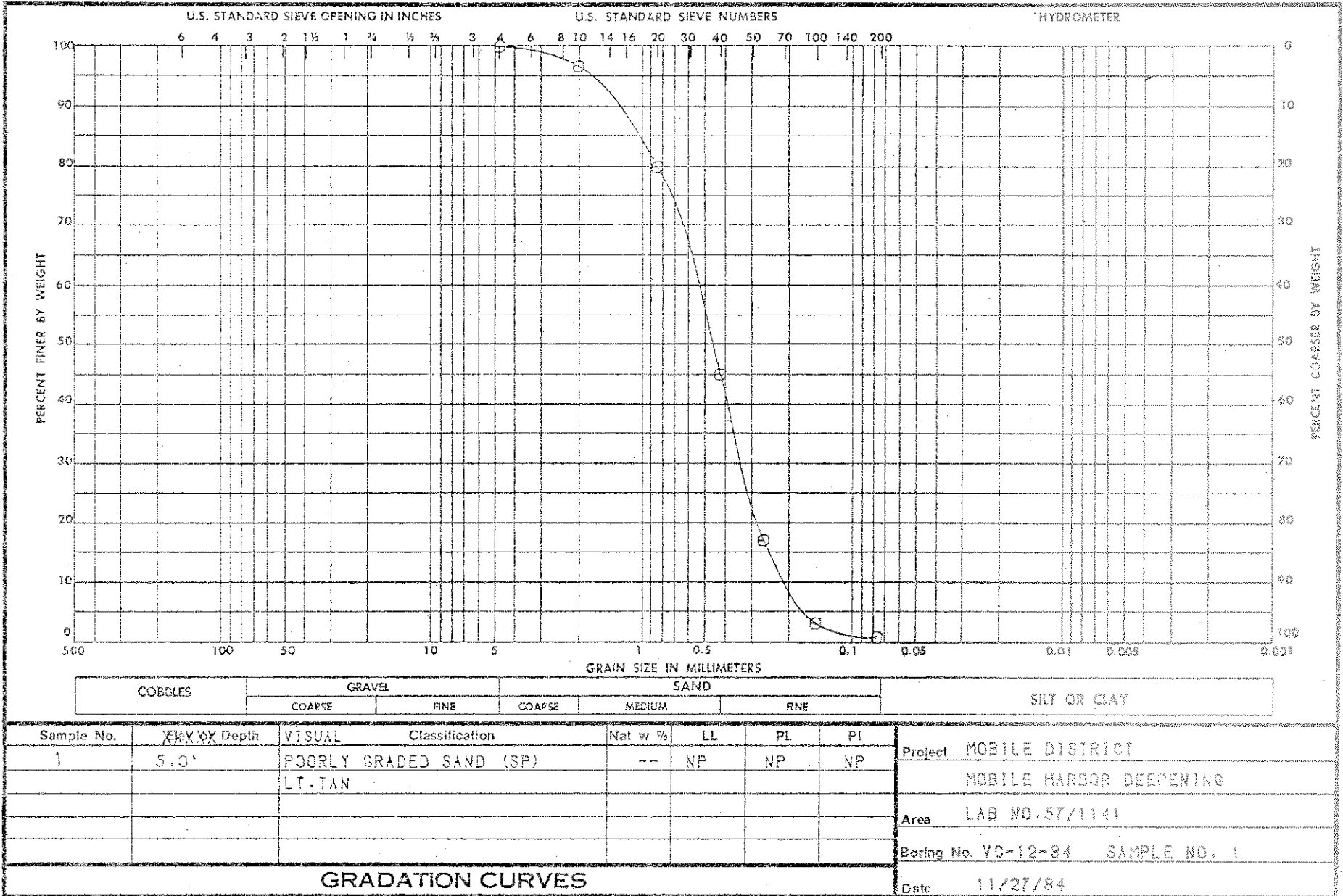
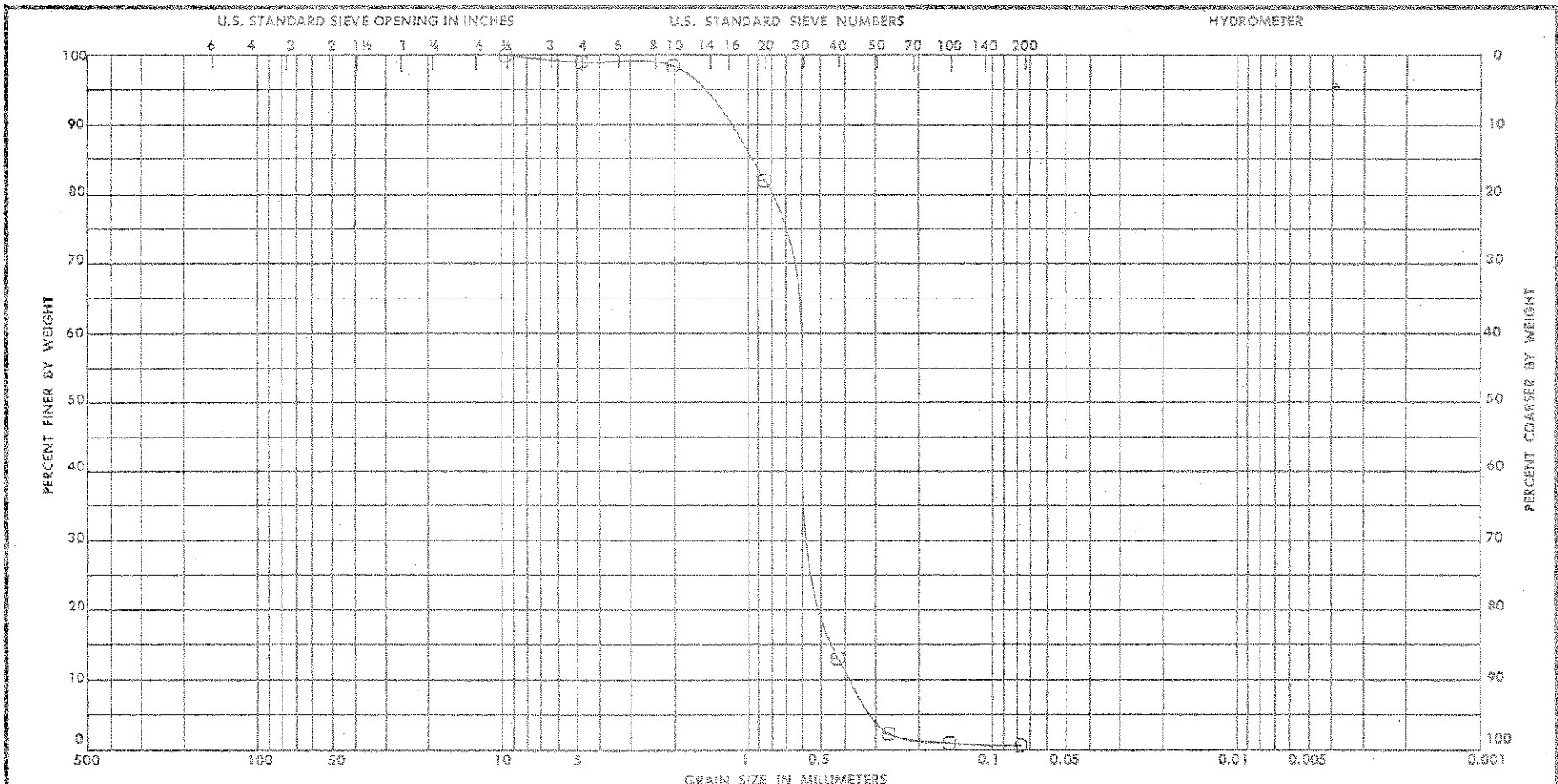


CHART NO. 545



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Box Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
2	10.0'		POORLY GRADED SAND (SP) LT. TAN, WITH A TRACE OF GRAVEL	--	NP	NP	NP	MOBILE DISTRICT MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1142
								Boring No. VC-12-84 SAMPLE NO. 2
								Date 11/27/84

GRADATION CURVES

CHART NO. 546

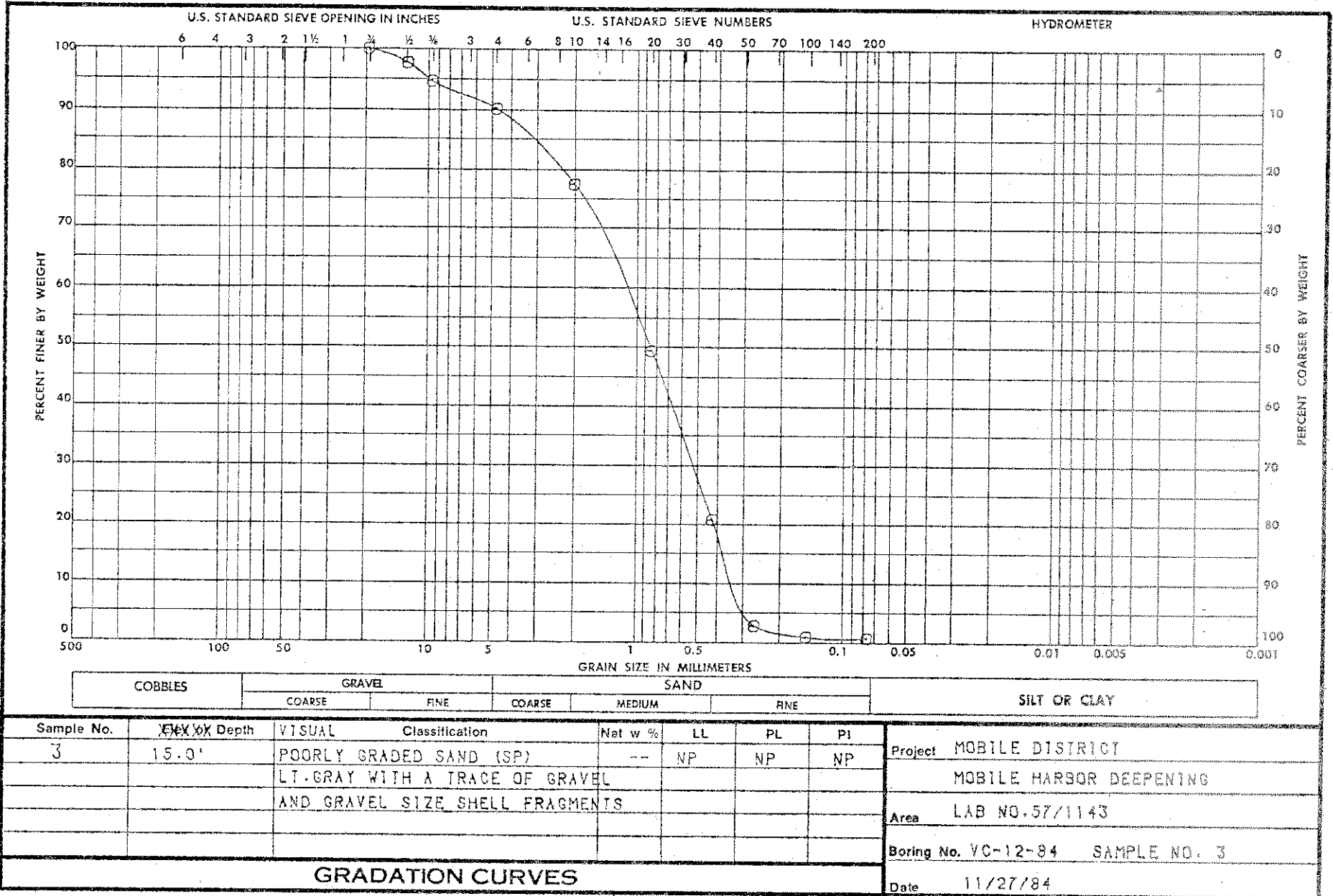
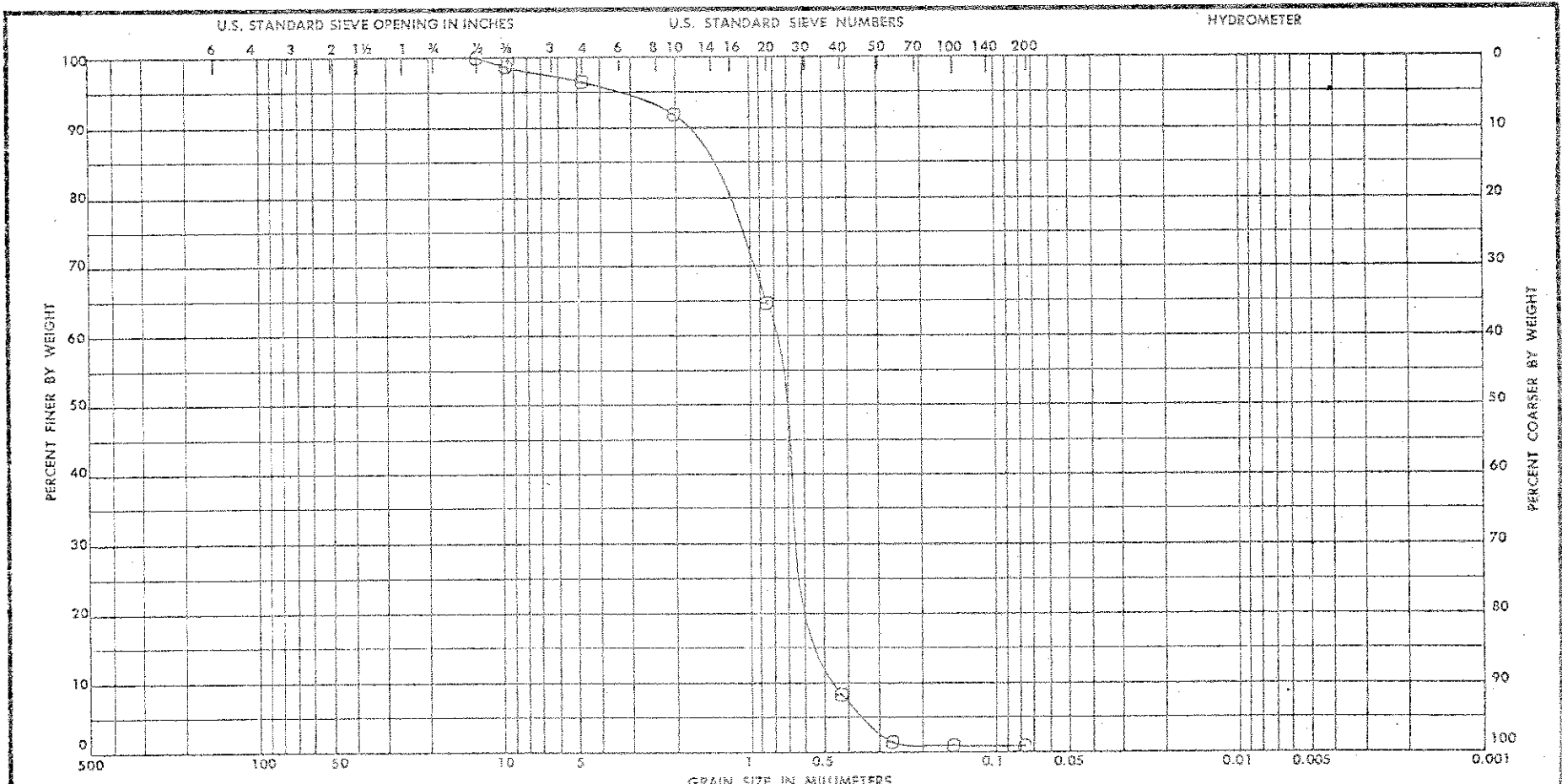


CHART NO. 547

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
4	20.0'		POORLY GRADED SAND (SP) LT. TAN WITH A TRACE OF GRAVEL	--	NP	NP	NP	MOBILE DISTRICT MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1144
								Boring No. VC-12-84 SAMPLE NO. 4
<b>GRADATION CURVES</b>								Date 11/27/84

CHART NO. 548

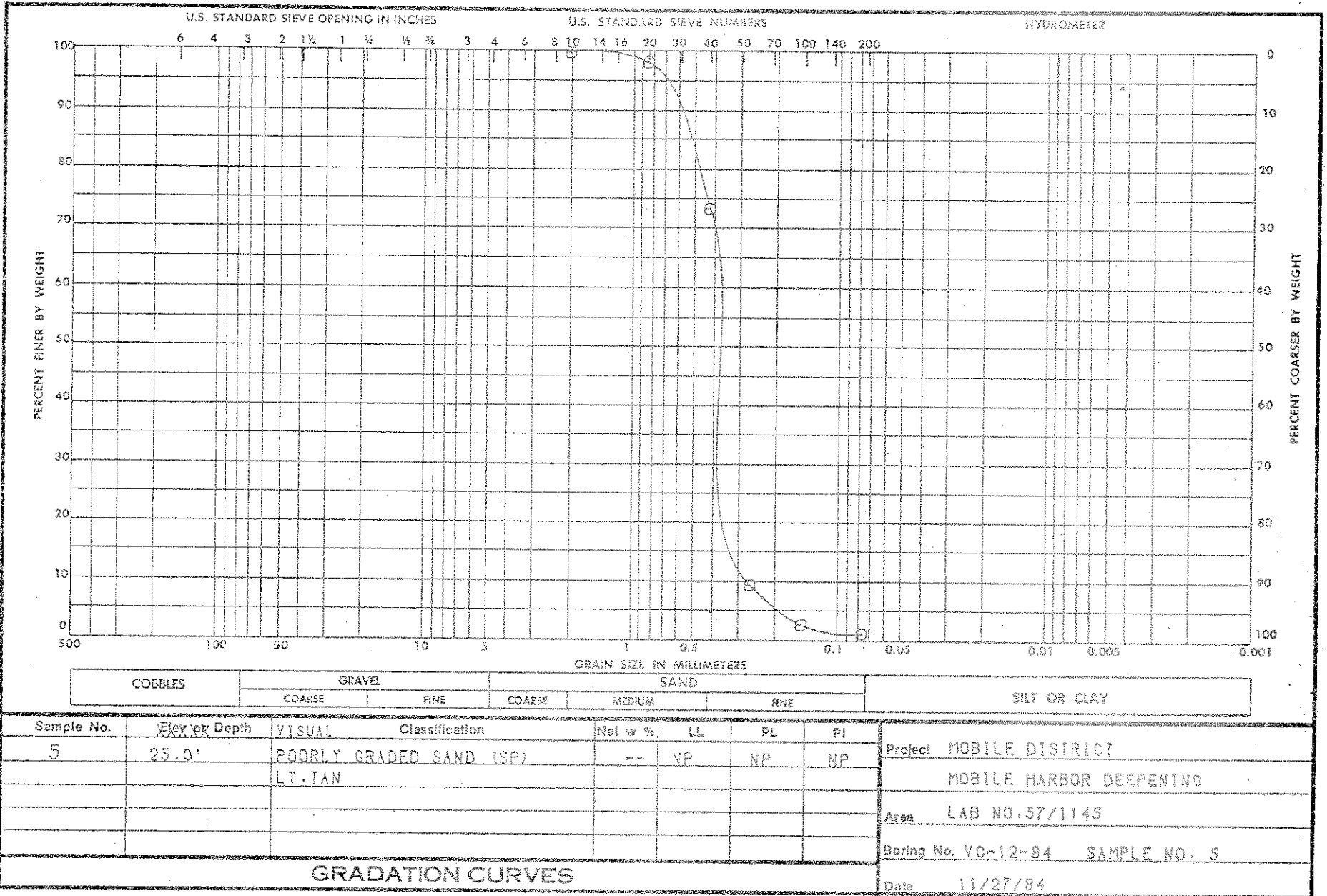
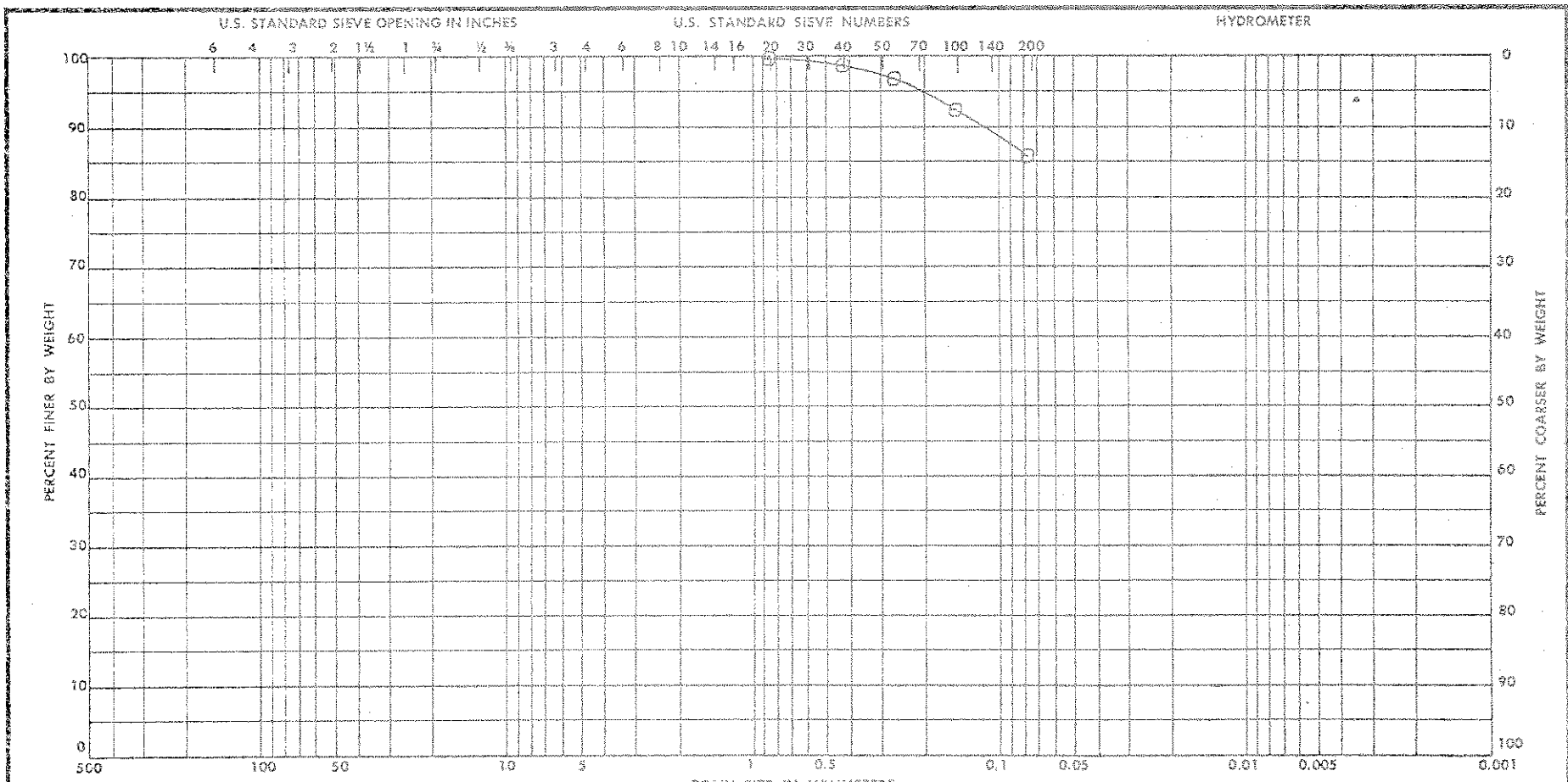


CHART NO. 549





COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL Classification	Nat w %	LL	PL	PI	Project
4	25.0'	FAT CLAY (CH) LI-GRAY WITH A LITTLE SAND AND A TRACE OF ORGANIC FINES AND MICA	--	--	--	--	MOBILE DISTRICT MOBILE HARBOR DEEPENING
							Area LAB NO. 57/1151
							Boring No. VC-14-84 SAMPLE NO. 4
							Date 11/27/84

GRADATION CURVES

CHART NO. 550

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

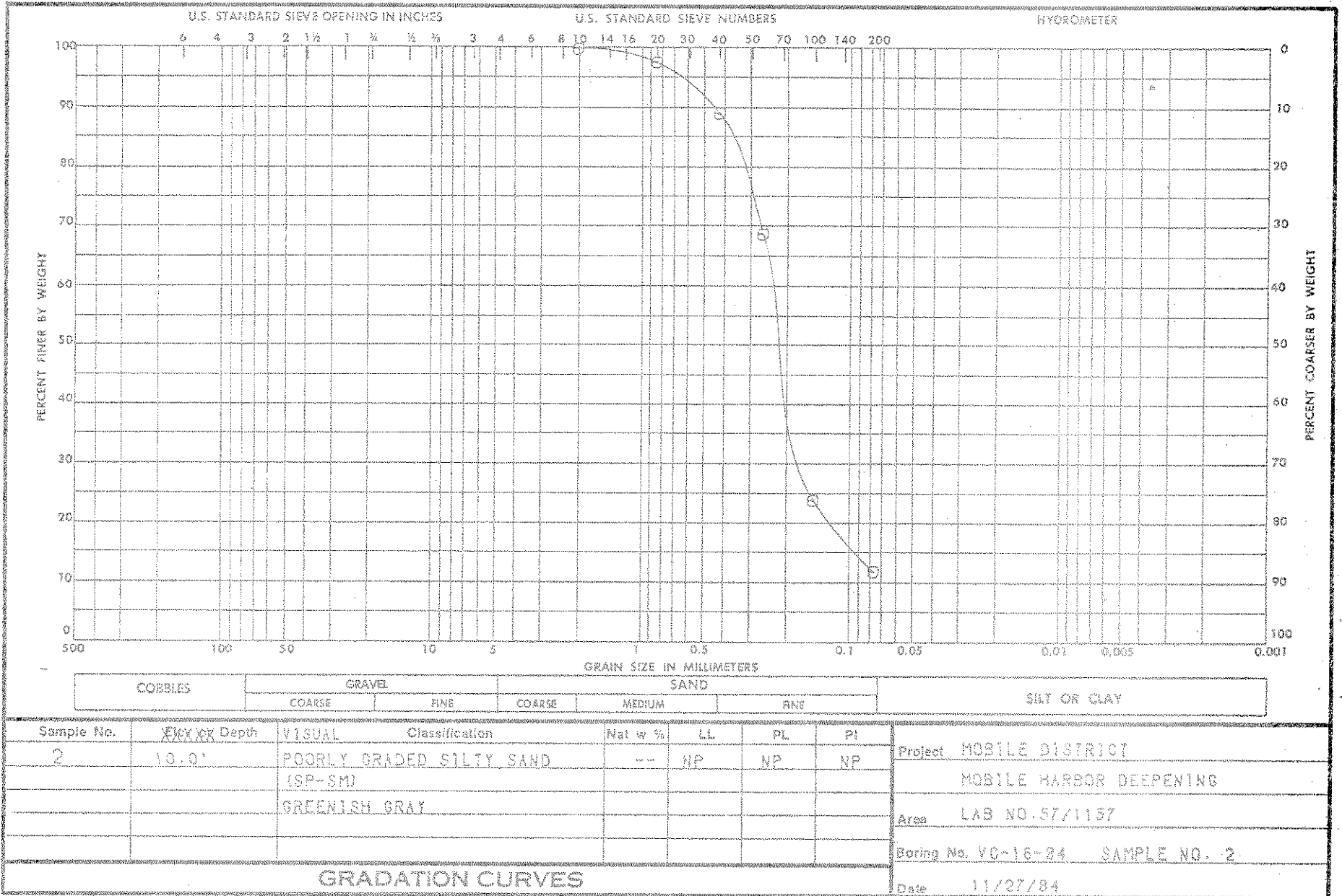
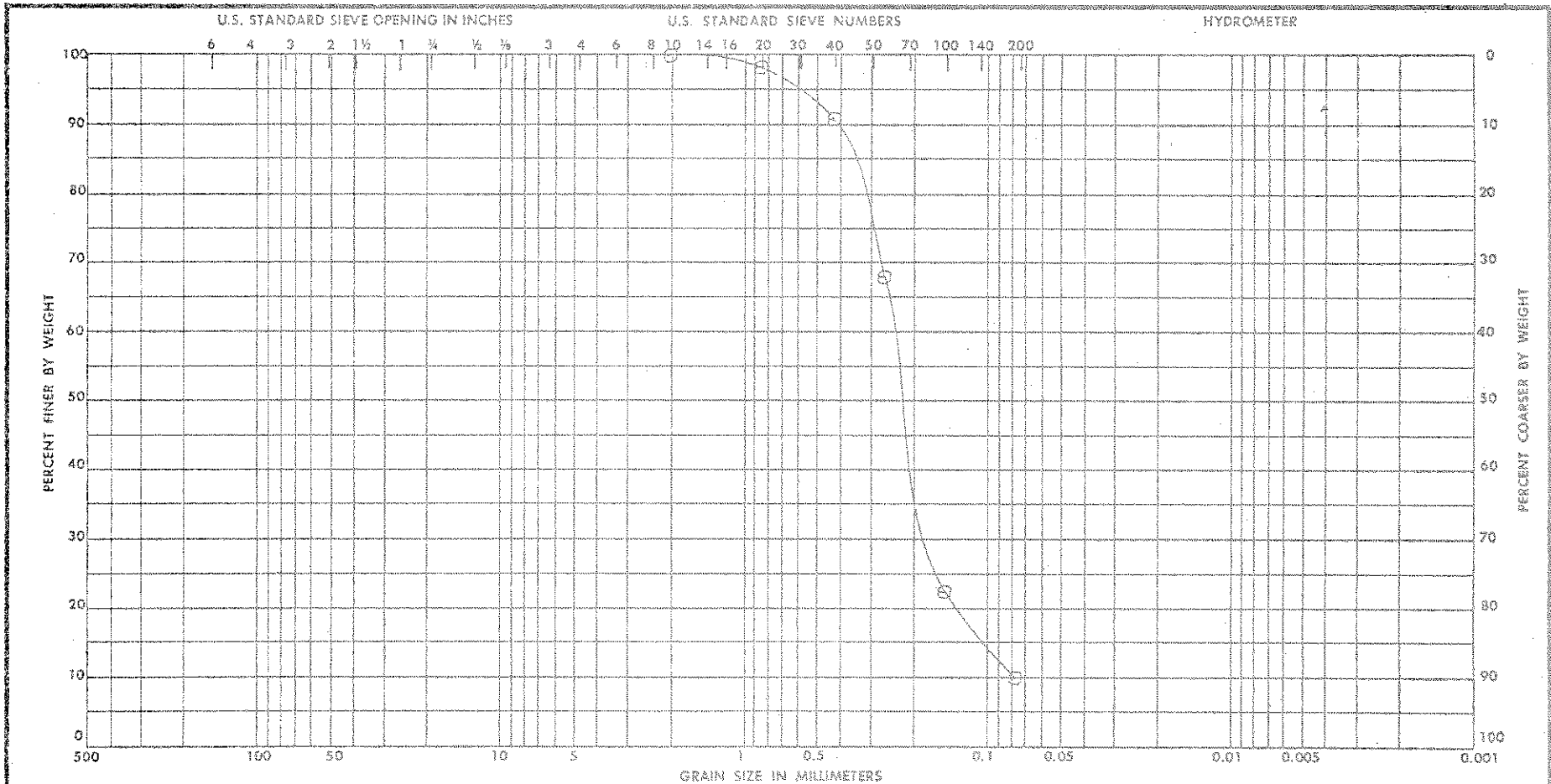


CHART NO. 551



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
3	15.0'	POORLY GRADED SILTY SAND (SP-SM)		--	NP	NP	NP	MOBILE DISTRICT
		GREENISH GRAY WITH A TRACE OF ROOTS AND MICA						MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1158
								Boring No. VC-16-84 SAMPLE NO. 3
								Date 11/27/84

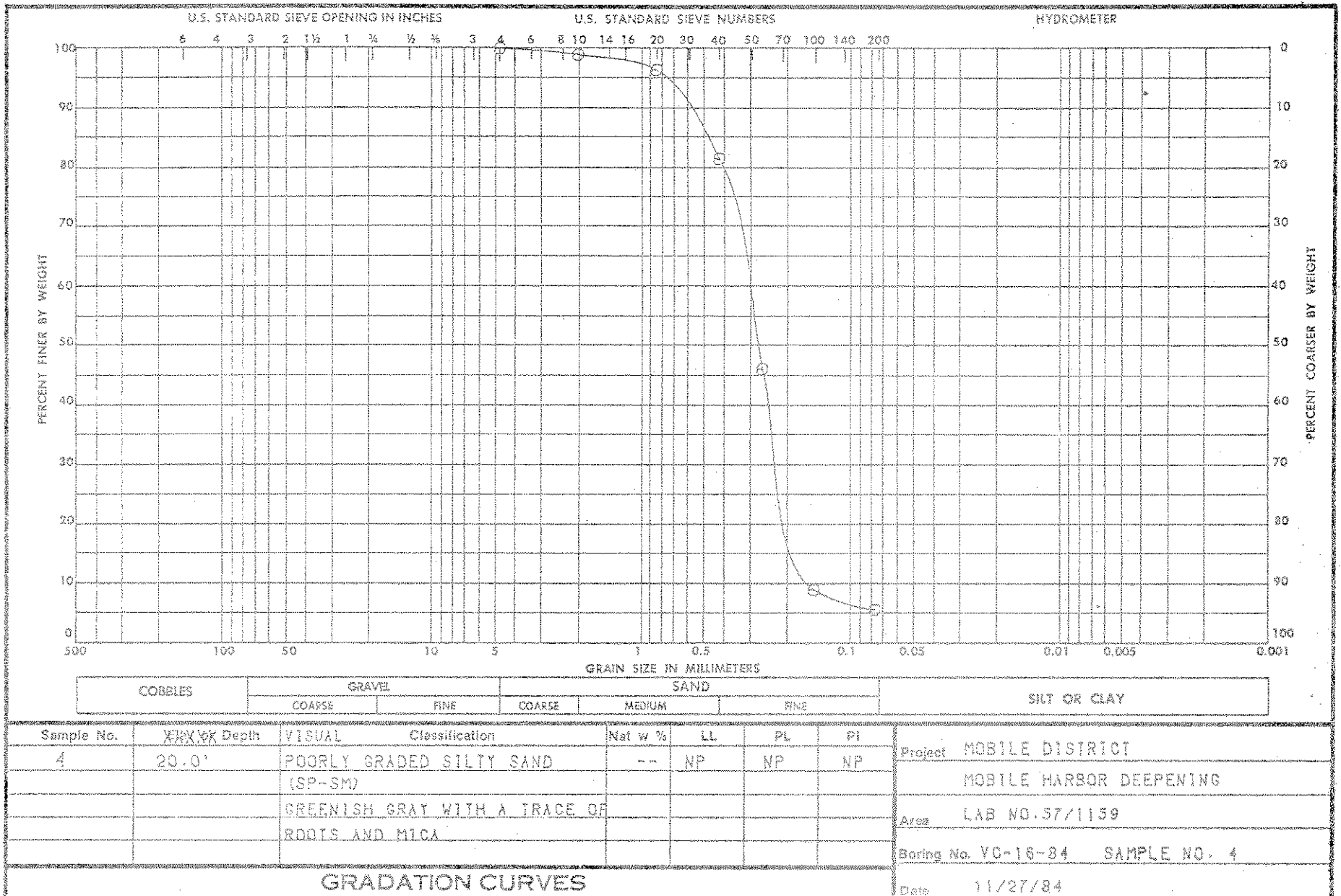
GRADATION CURVES

CHART NO. 552

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

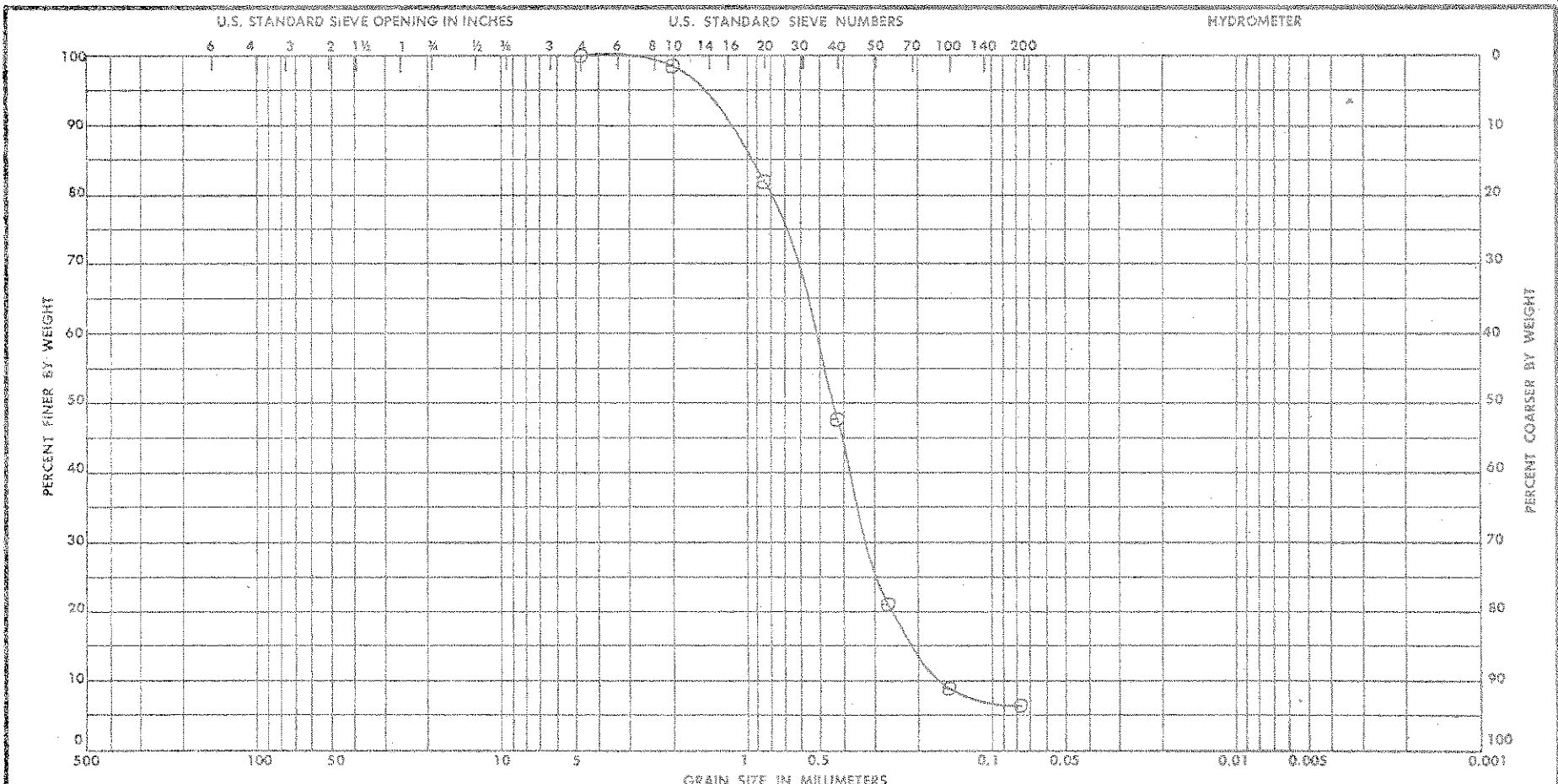


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
4	20.0'	POORLY GRADED SILTY SAND (SP-SM)		---	NP	NP	NP	MOBILE DISTRICT
		GREENISH GRAY WITH A TRACE OF ROOTS AND MICA						MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1159
								Boring No. VC-16-84 SAMPLE NO. 4
								Date 11/27/84

GRADATION CURVES

CHART NO. 553



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
5	28.0'		POORLY GRADED SILTY SAND (SP-SM)	--	NP	NP	NP	MOBILE DISTRICT
			GRAY WITH A TRACE OF ROOTS AND MICA					MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1160
								Boring No. VC-16-84 SAMPLE NO. 5

GRADATION CURVES

Date 11/27/84

CHART NO. 554

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

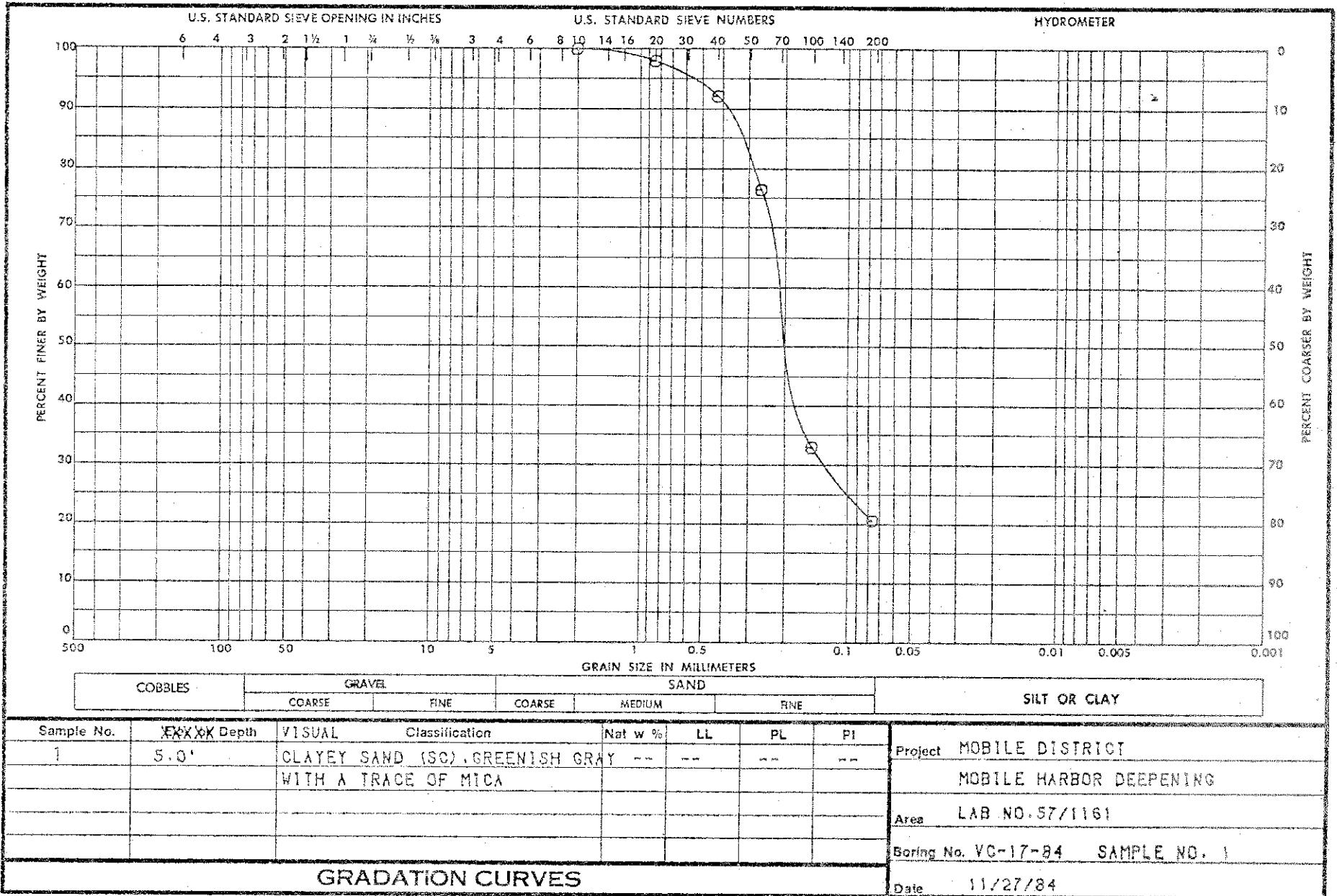
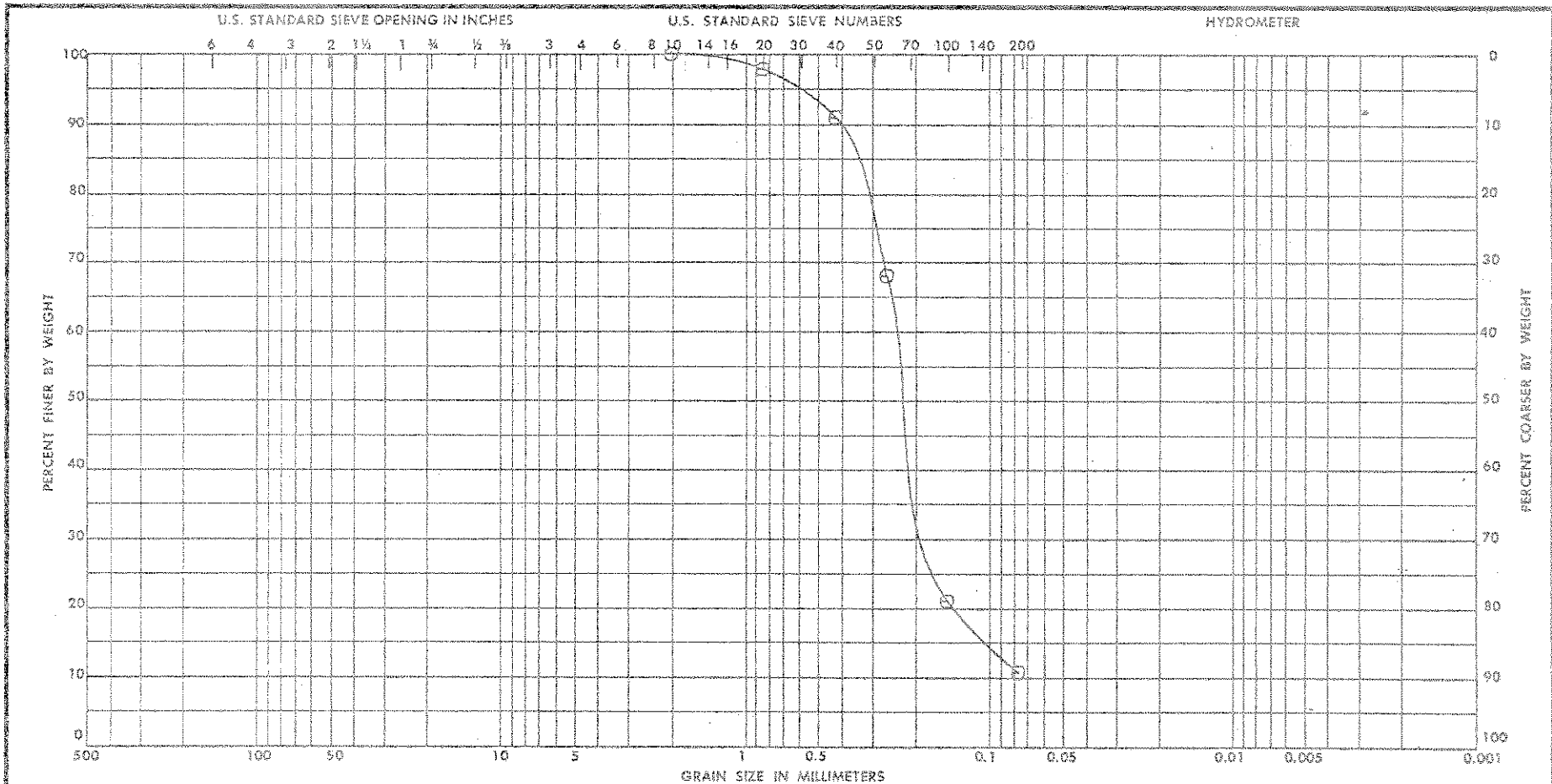


CHART NO. 5551



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
2	10.0'	POORLY GRADED SILTY SAND (SP-SM)		--	NP	NP	NP	MOBILE DISTRICT
		GREENISH GRAY WITH A TRACE OF MICA						MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1162
								Boring No. VC-17-84 SAMPLE NO. 2
								Date 11/27/84

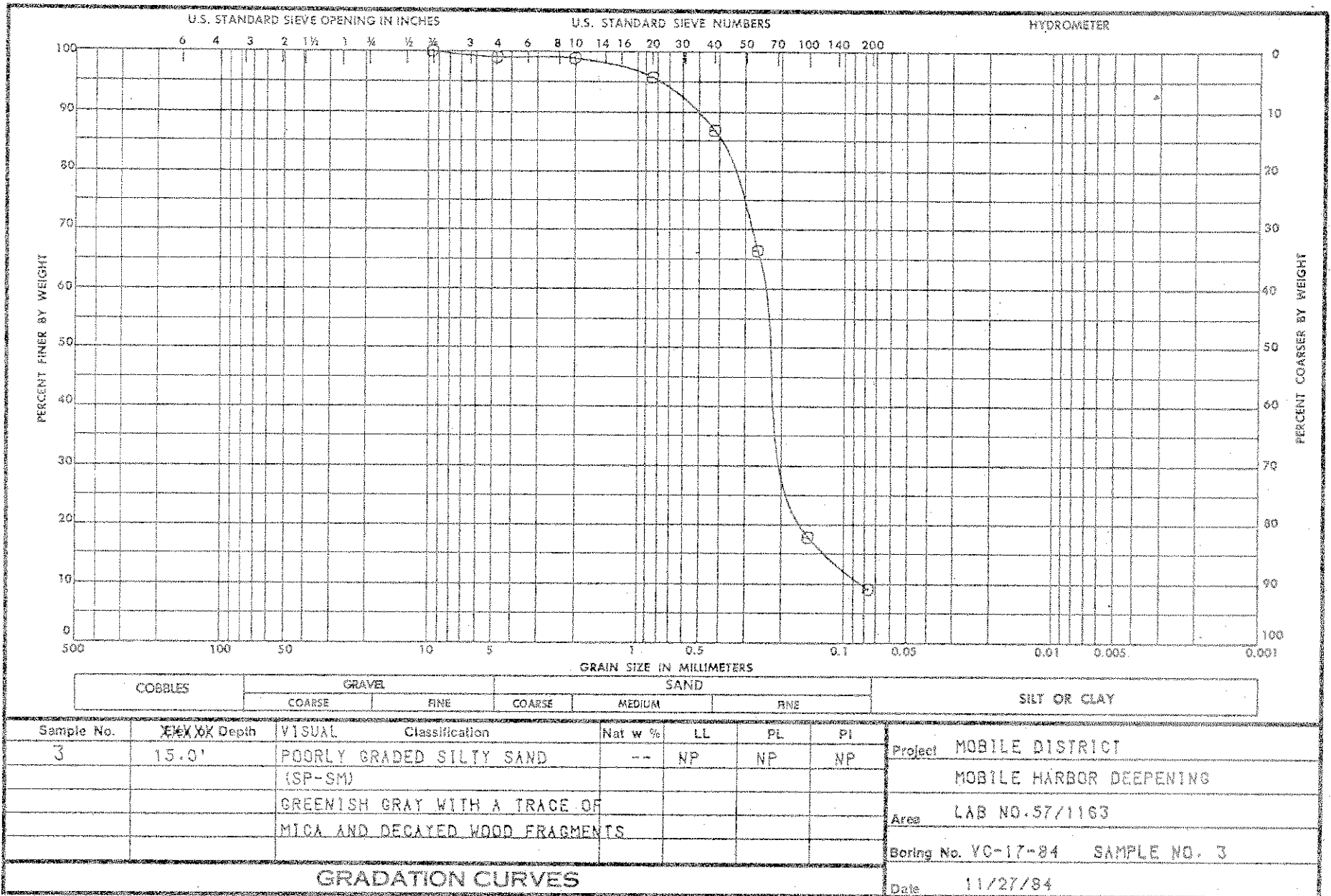
**GRADATION CURVES**

CHART NO. 556

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M



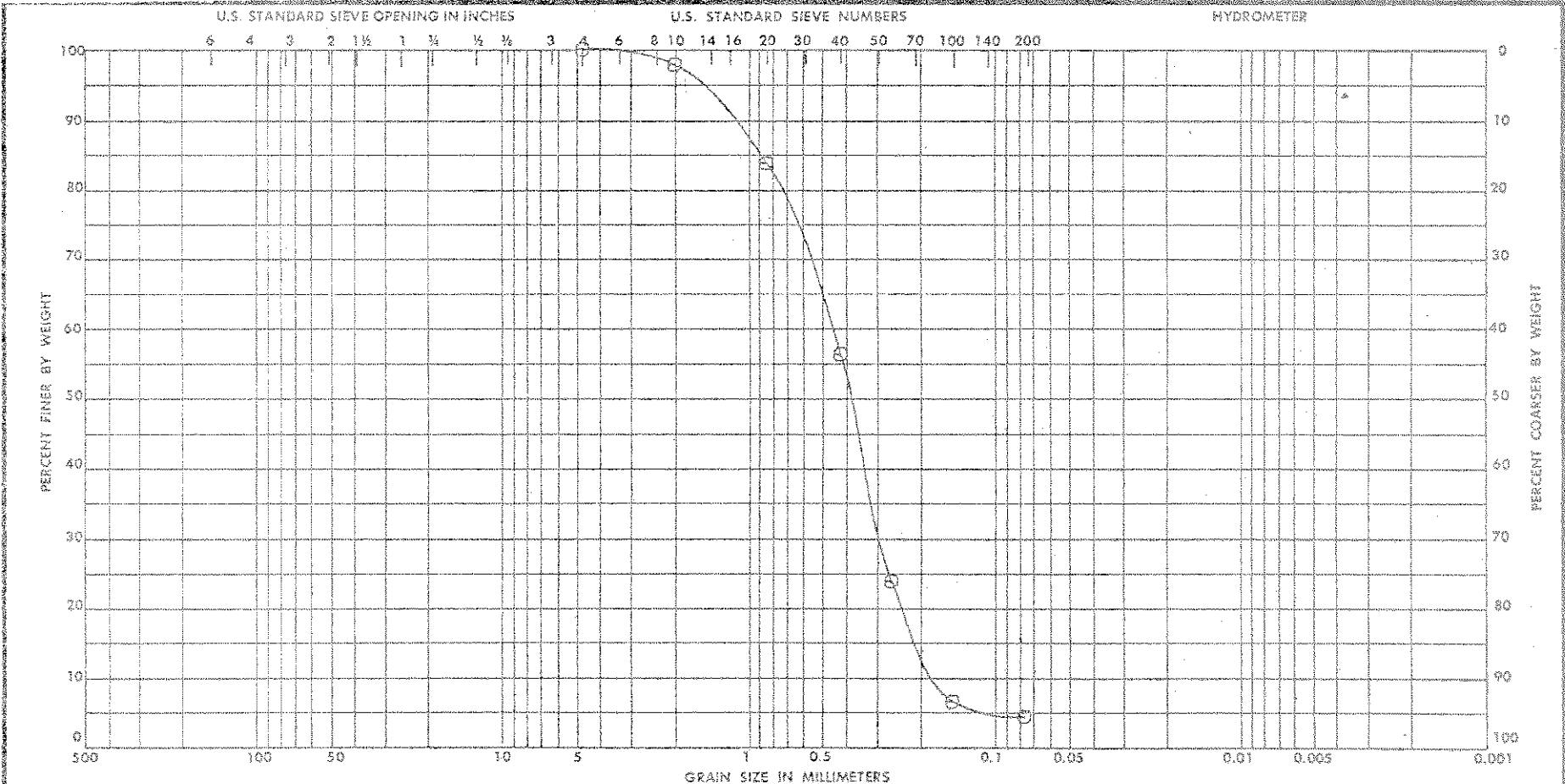
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL Classification	Nat w %	LL	PL	PI	Project
3	15.0'	POORLY GRADED SILTY SAND (SP-SM)	--	NP	NP	NP	MOBILE DISTRICT
		GREENISH GRAY WITH A TRACE OF MICA AND DECAYED WOOD FRAGMENTS					MOBILE HARBOR DEEPENING
							Area LAB NO. 57/1163
							Boring No. YC-17-84 SAMPLE NO. 3
							Date 11/27/84

GRADATION CURVES

CHART NO. 557





COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
4	25.0'		POORLY GRADED SAND (SP)	--	NP	NP	NP	MOBILE DISTRICT
			TAN AND GRAY WITH A TRACE OF MICA AND DECAYED WOOD FRAG.					MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1164
								Boring No. VC-17-84 SAMPLE NO. 4
								Date 11/27/84

GRADATION CURVES

CHART NO. 558

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

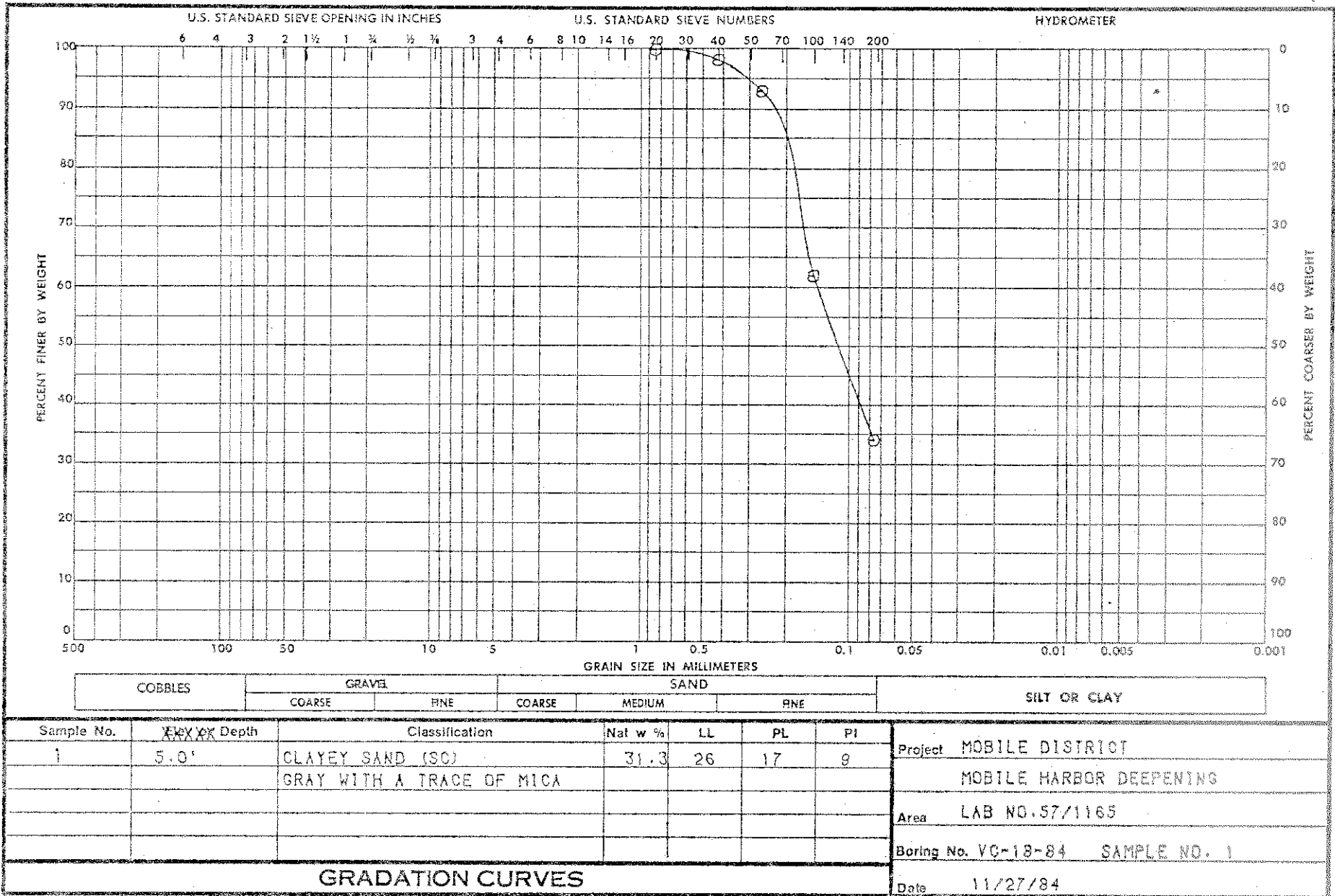
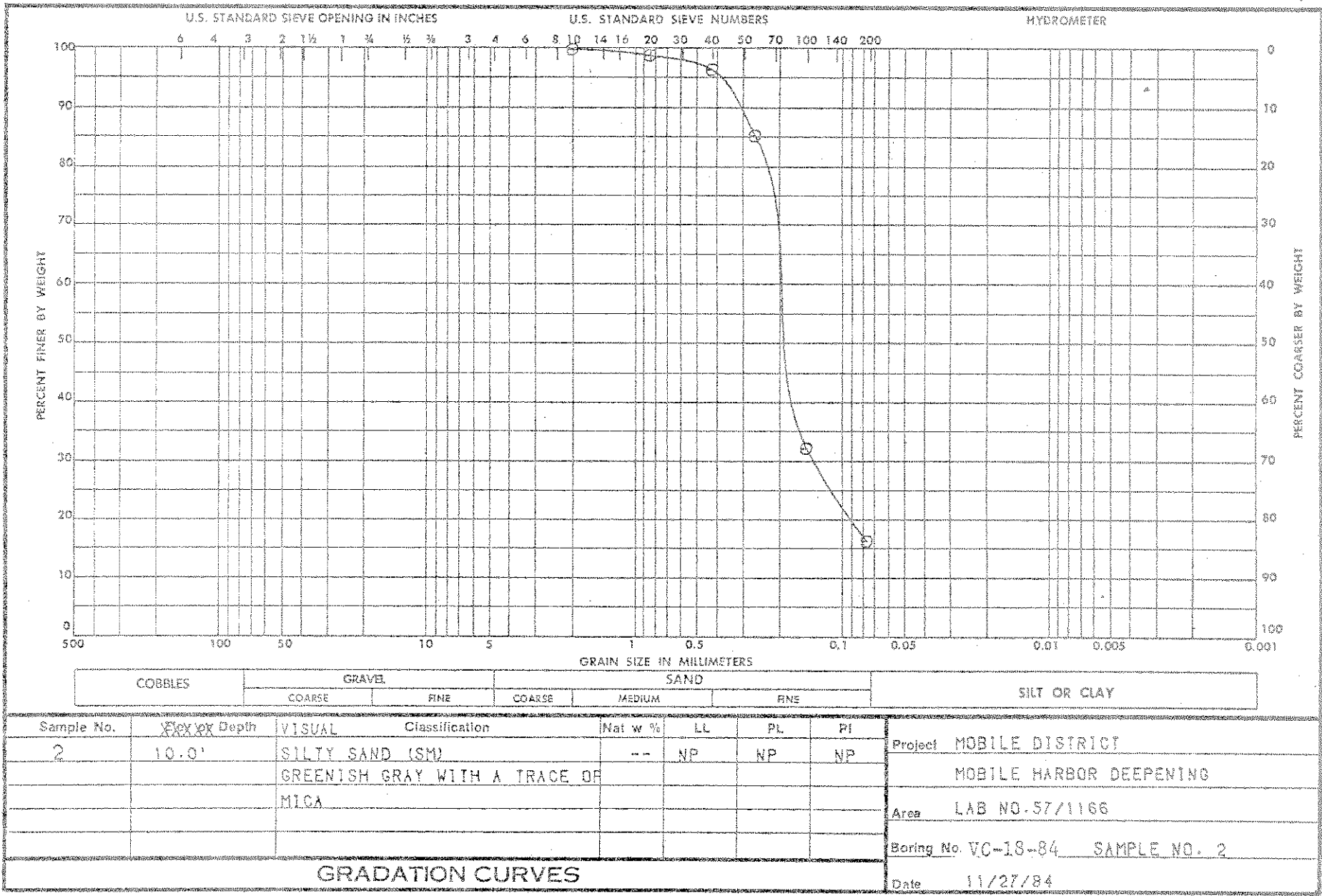


CHART NO. 559



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
2	10.0'		SILTY SAND (SM)	--	NP	NP	NP	MOBILE DISTRICT
			GREENISH GRAY WITH A TRACE OF					MOBILE HARBOR DEEPENING
			MICA					LAB NO. 57/1166
								Boring No. VC-18-84 SAMPLE NO. 2
								Date 11/27/84

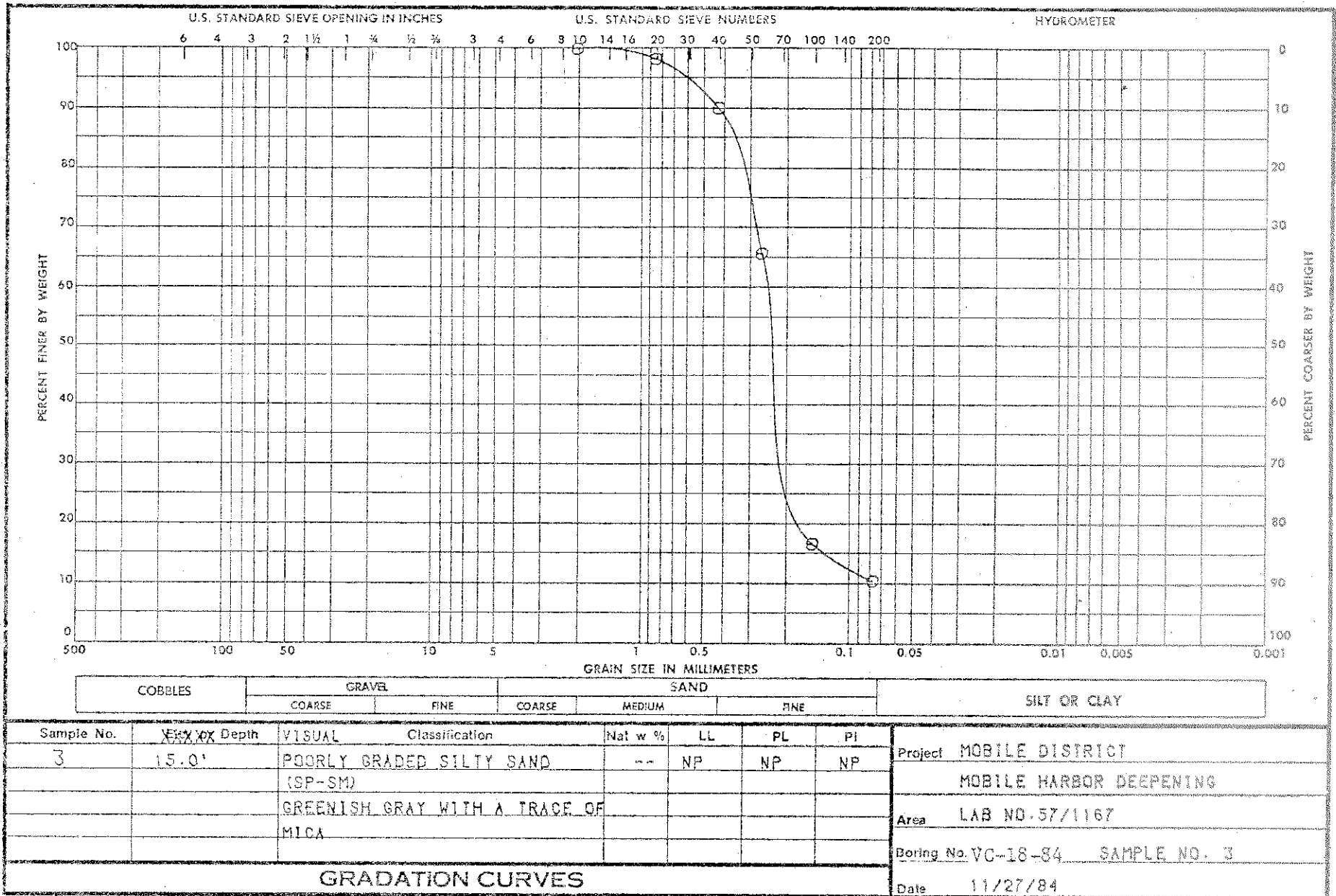
GRADATION CURVES

CHART NO. 560

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

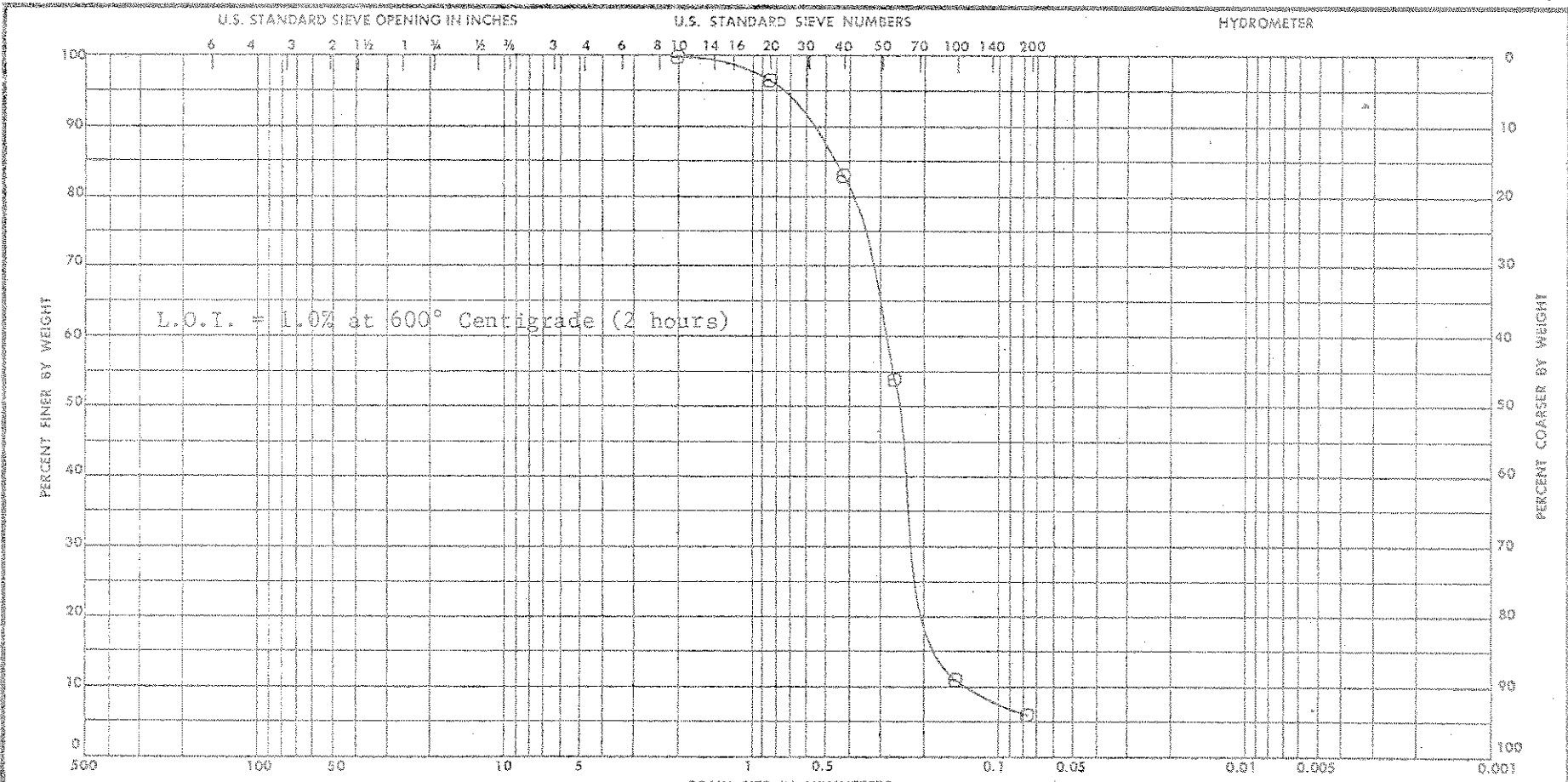


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	<del>15.0'</del> Depth	VISUAL Classification	Nat w %	LL	PL	PI	Project	MOBILE DISTRICT
3	15.0'	POORLY GRADED SILTY SAND (SP-SM)	--	NP	NP	NP		MOBILE HARBOR DEEPENING
		GREENISH GRAY WITH A TRACE OF MICA					Area	LAB NO. 57/1167
							Boring No.	VC-18-84 SAMPLE NO. 3
							Date	11/27/84

GRADATION CURVES

CHART NO. 561



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
4	20.0'		POORLY GRADED SILTY SAND (SP-SM)	--	NP	NP	NP	MOBILE DISTRICT
			GRAY WITH A TRACE OF MICA & ORGANIC FINES					MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1168
								Boring No. VC-18-84 SAMPLE NO. 4
								Date 11/27/84

GRADATION CURVES

CHART NO. 562

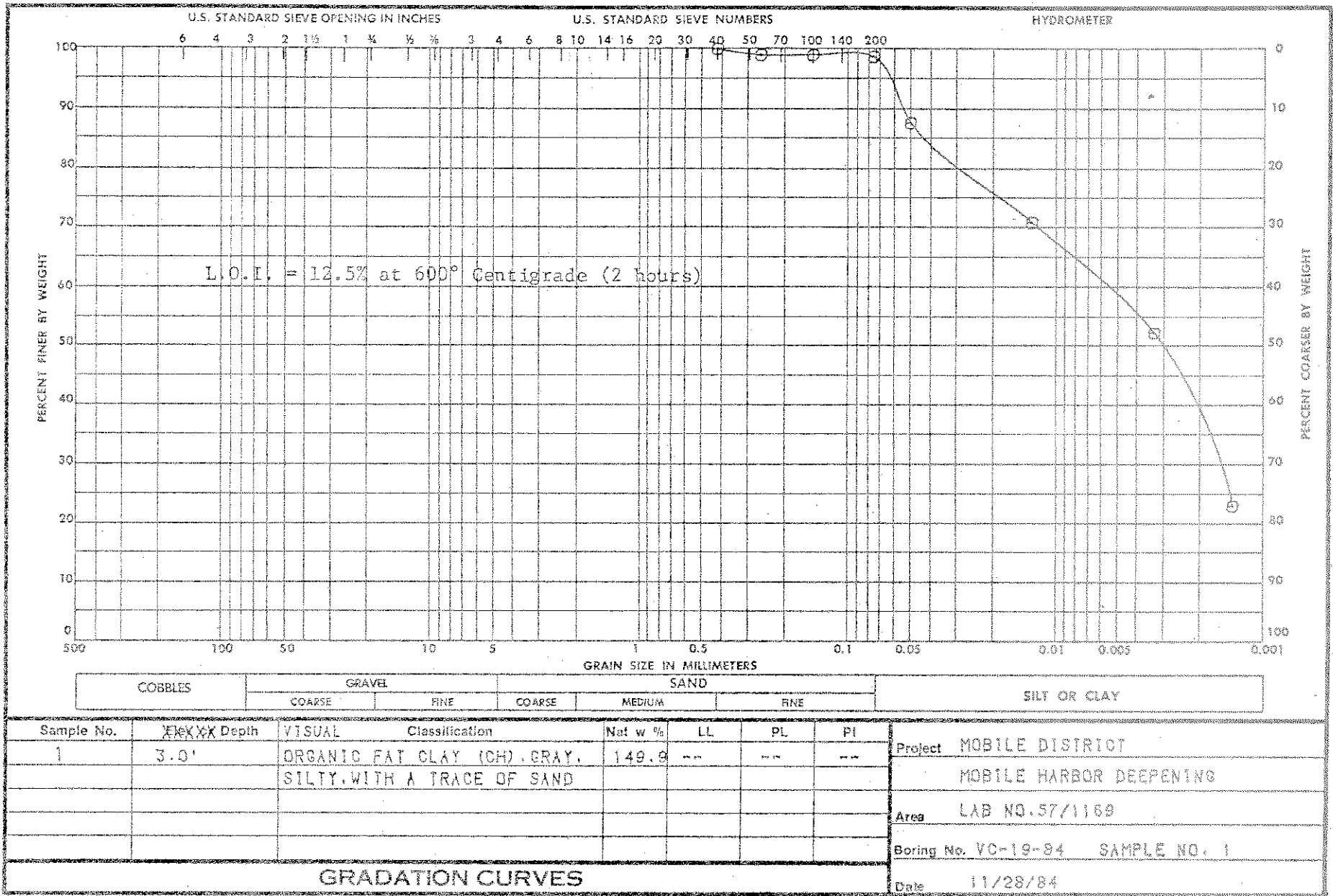
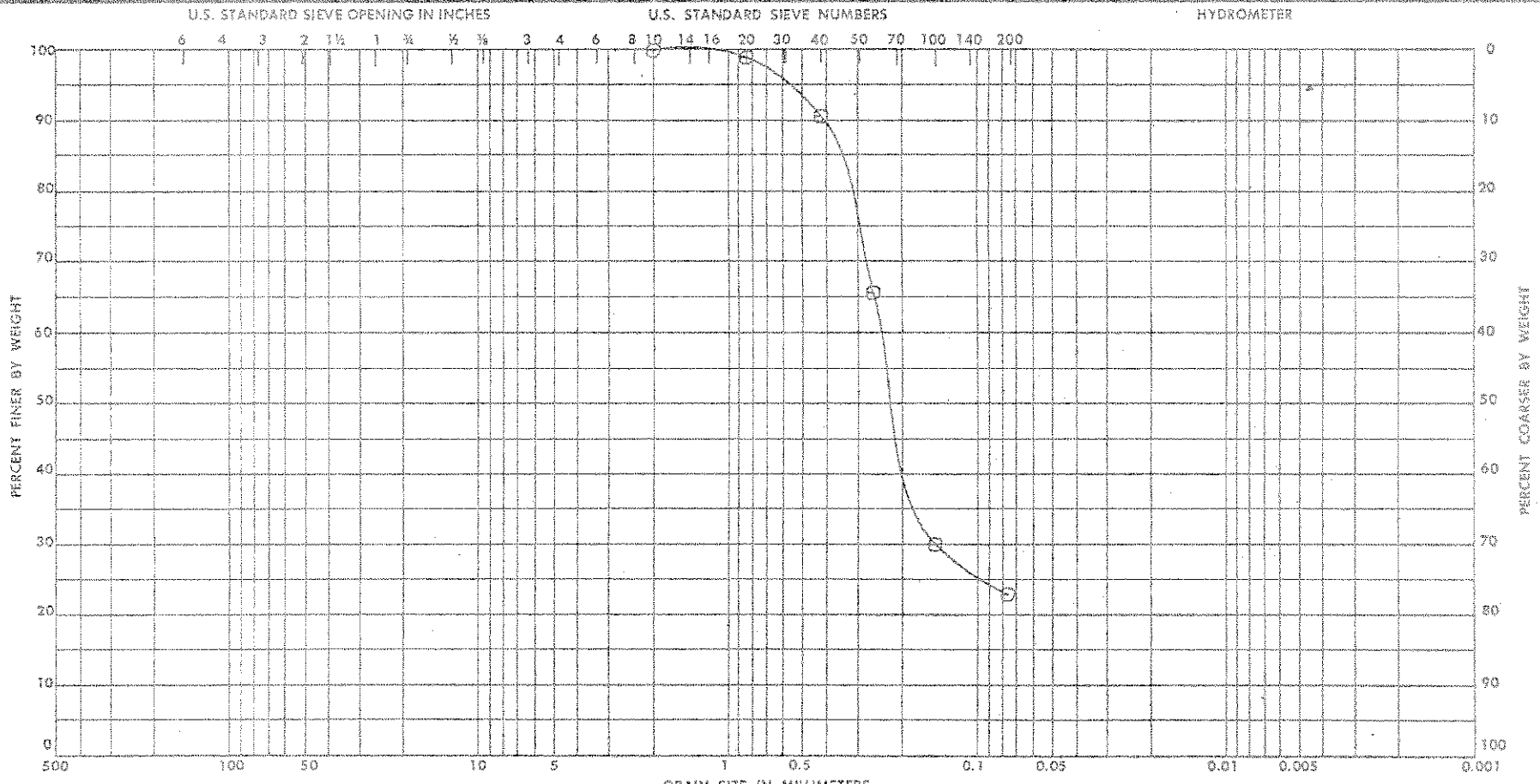


CHART NO. 563



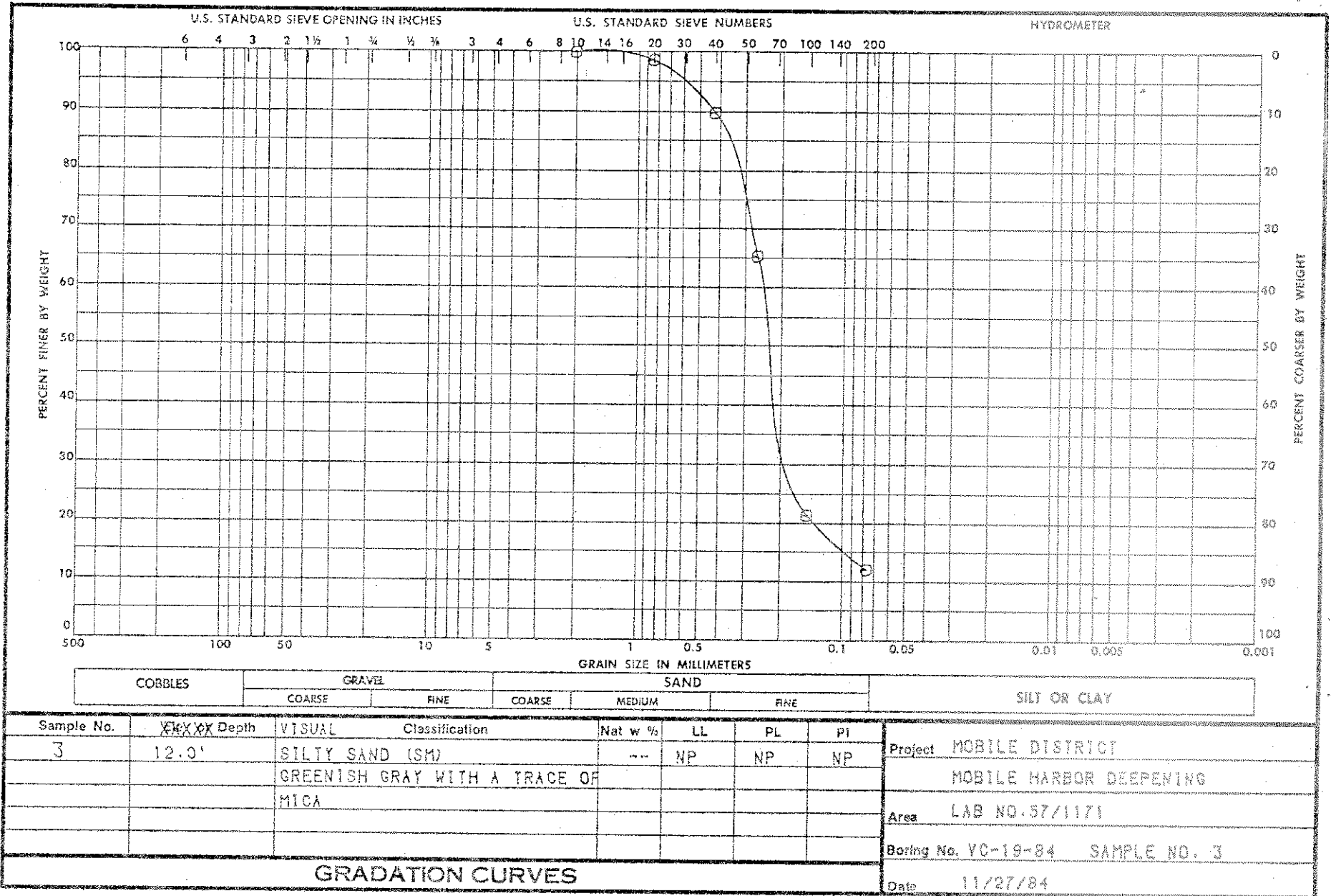
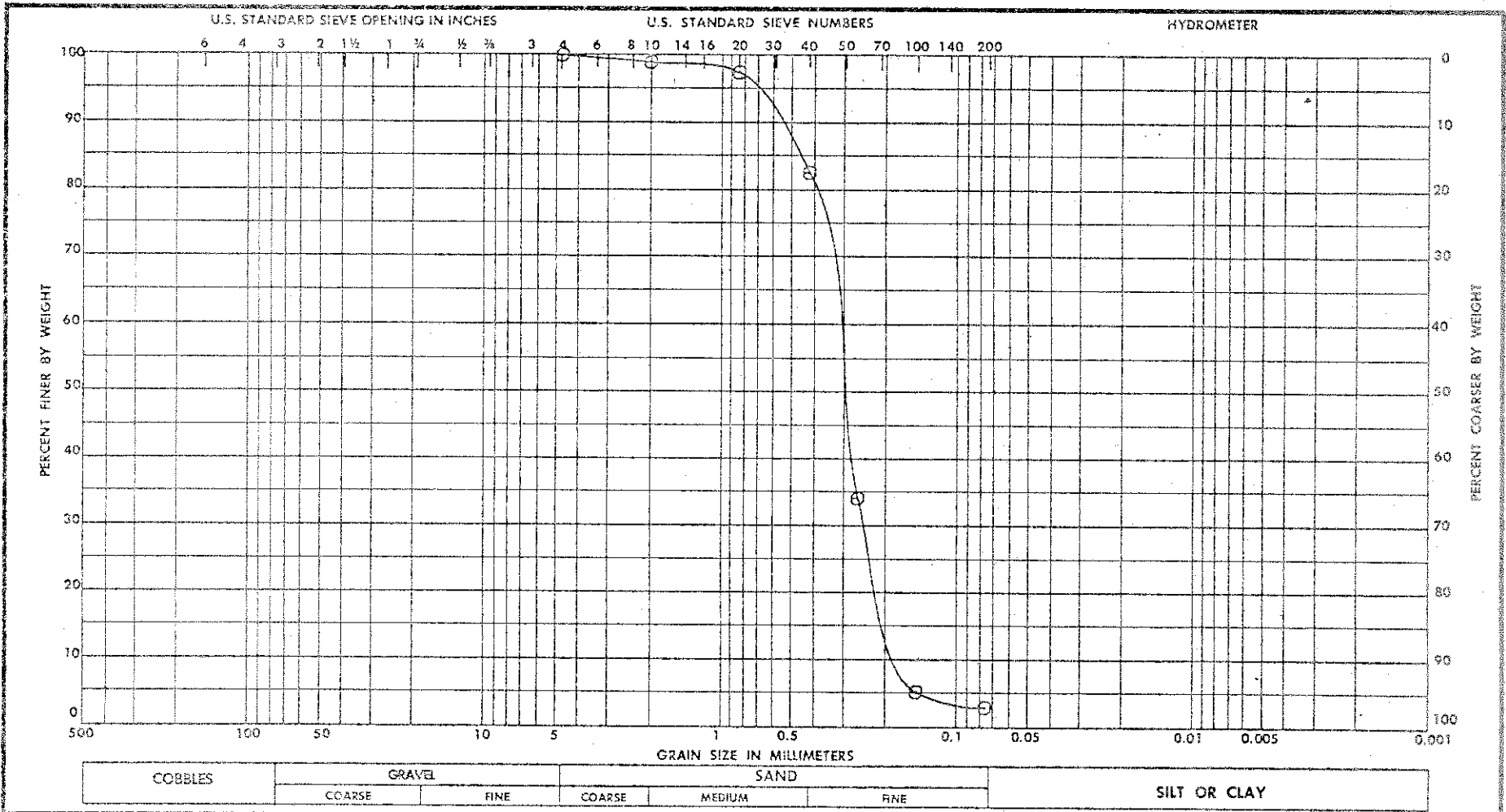


CHART NO. 565

GRADATION CURVES



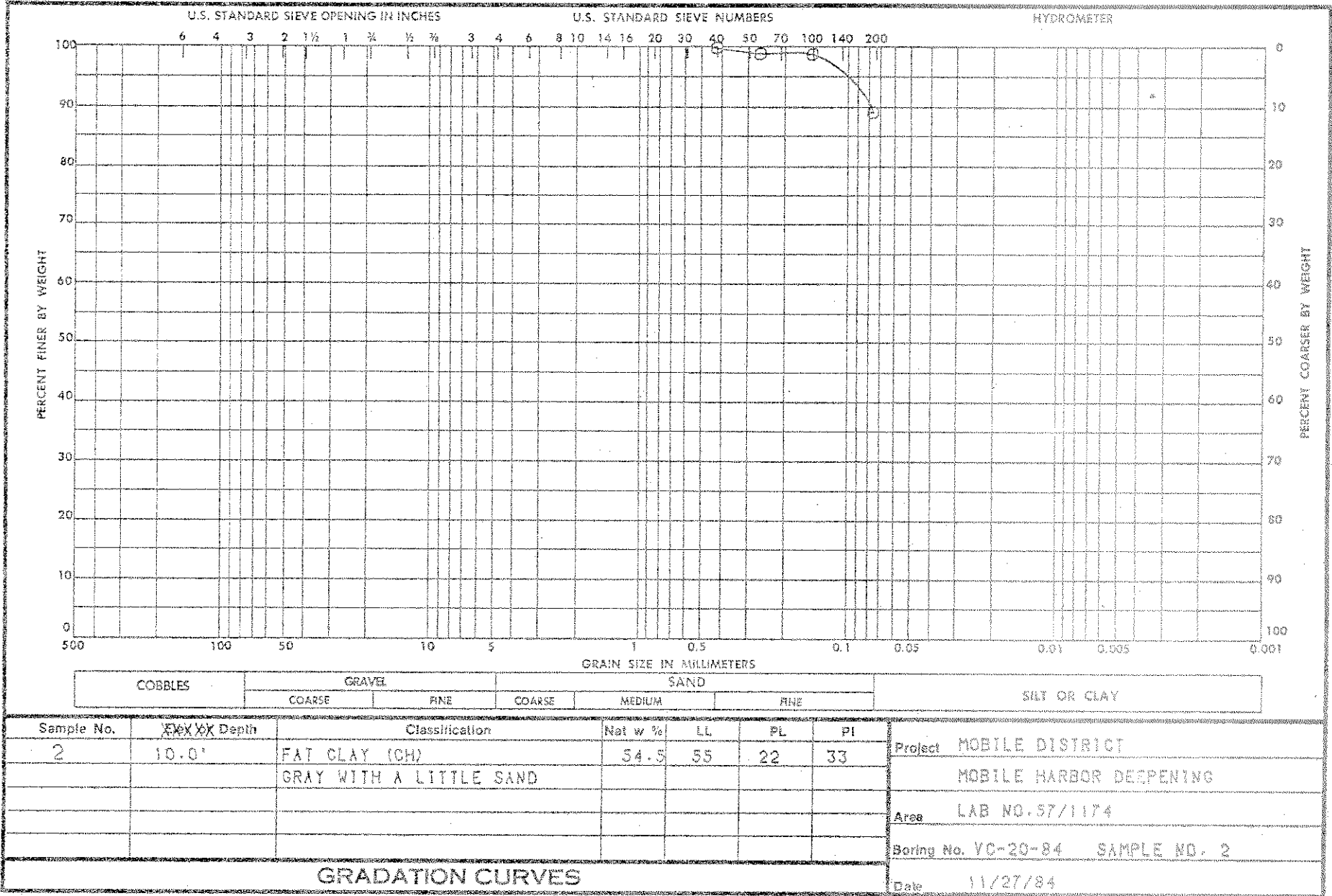


Sample No.	Depth	VISUAL Classification	Nat w %	LL	PL	PI	GRAIN SIZE IN MILLIMETERS	
							COARSE	FINE
4	17.0'	POORLY GRADED SAND (SP) LT. TAN AND GRAY WITH A TRACE MICA AND DECAYED WOOD FRAG.	---	NP	NP	NP	COARSE	FINE

Project	MOBILE DISTRICT
	MOBILE HARBOR DEEPENING
Area	LAB NO. 57/1172
Boring No.	VC-19-84
SAMPLE NO.	4
Date	11/27/84

CHART NO. 566

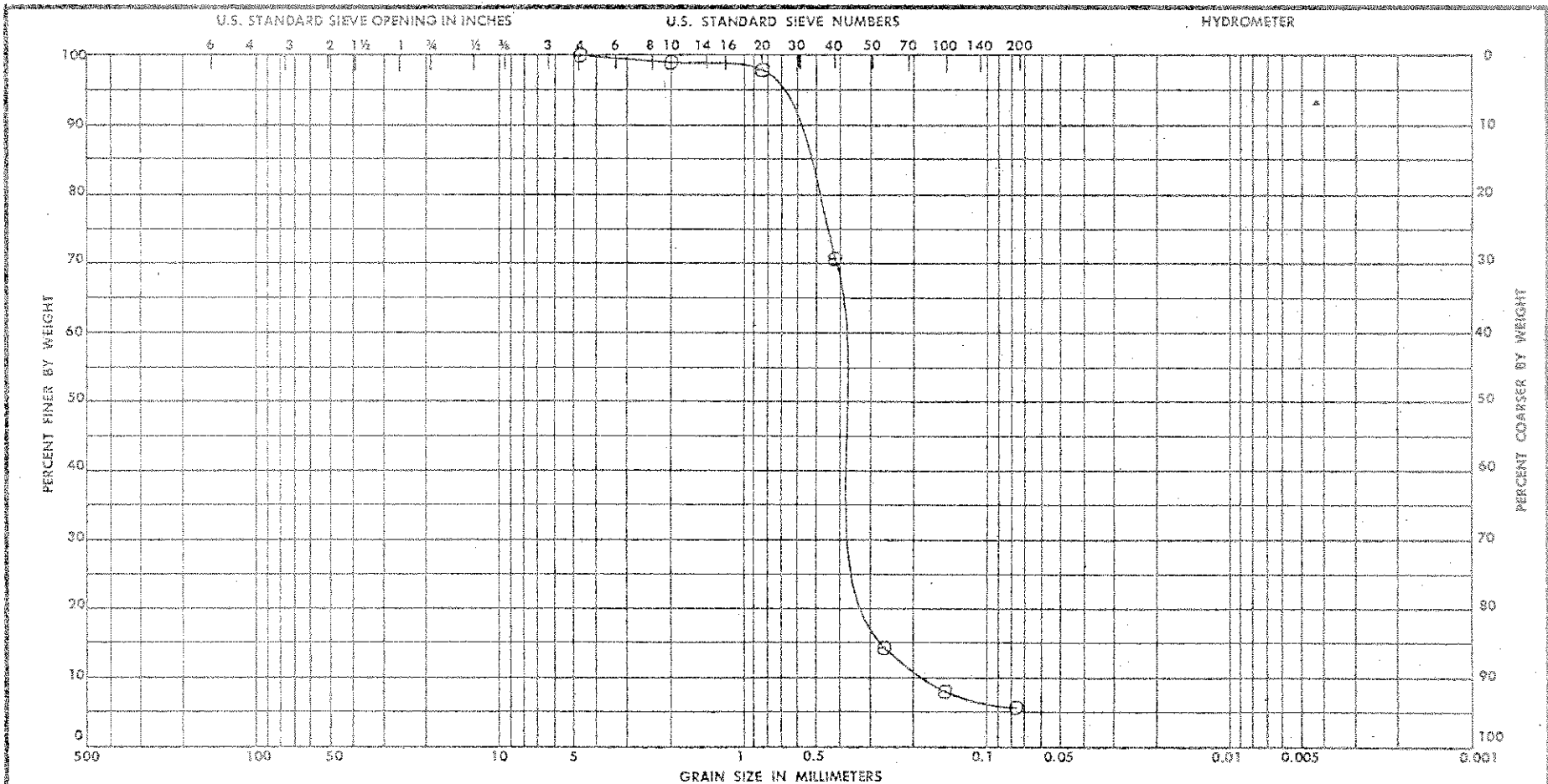
GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	Classification	Nat w %	LL	PL	PI	Project
2	10.0'	FAT CLAY (CH) GRAY WITH A LITTLE SAND	54.5	55	22	33	MOBILE DISTRICT MOBILE HARBOR DEEPENING
							Area LAB NO. 57/1174
							Boring No. VC-20-84 SAMPLE NO. 2
<b>GRADATION CURVES</b>							Date 11/27/84

CHART NO. 567

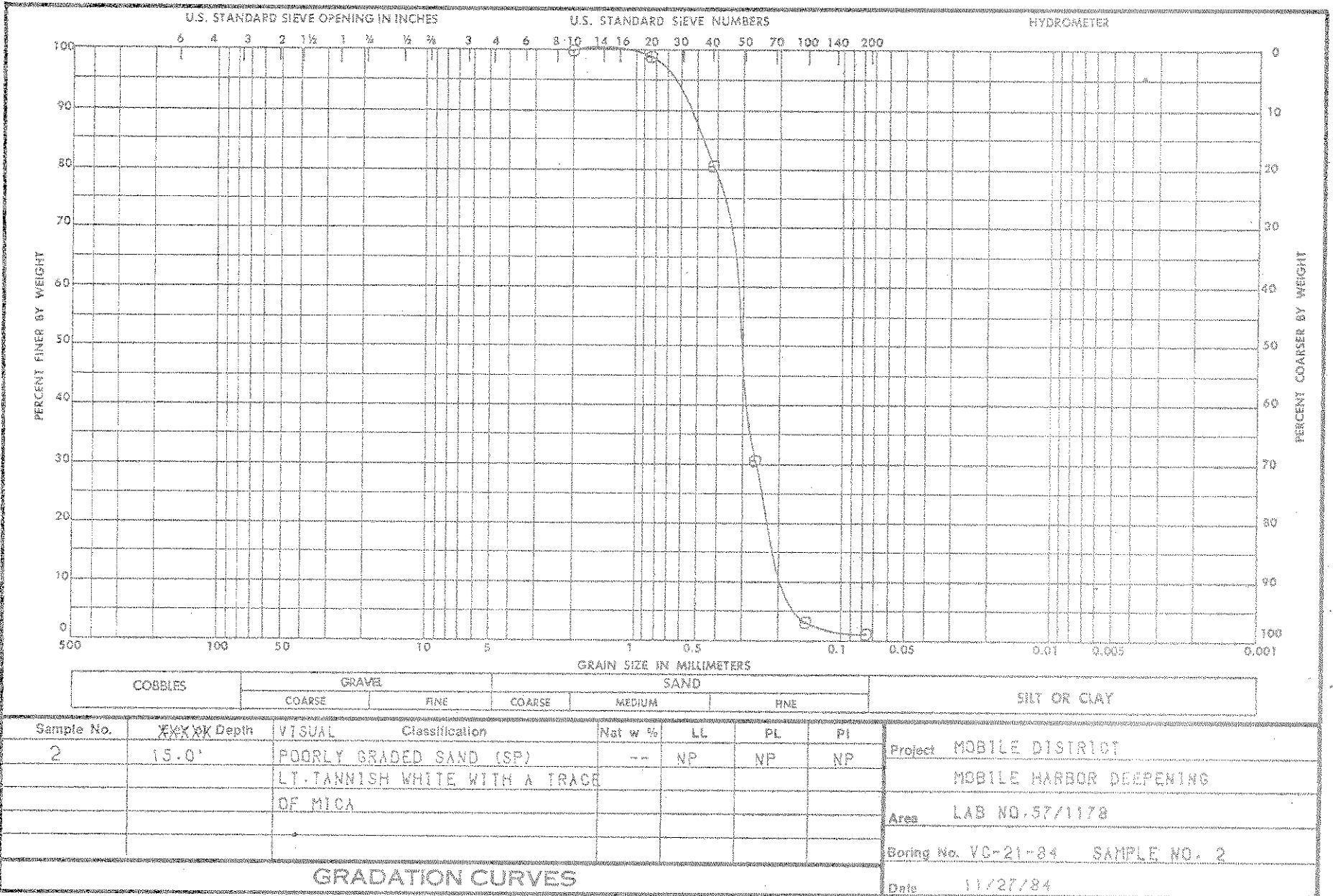


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL Classification	Nat w %	LL	PL	PI	Project
1	5.0'	POORLY GRADED SILTY SAND (SP-SM) LT. TAN	--	NP	NP	NP	MOBILE DISTRICT MOBILE HARBOR DEEPENING
							Area LAB NO. 57/1177
							Boring No. VC-21-84 SAMPLE NO. 1
							Date 11/27/84

**GRADATION CURVES**

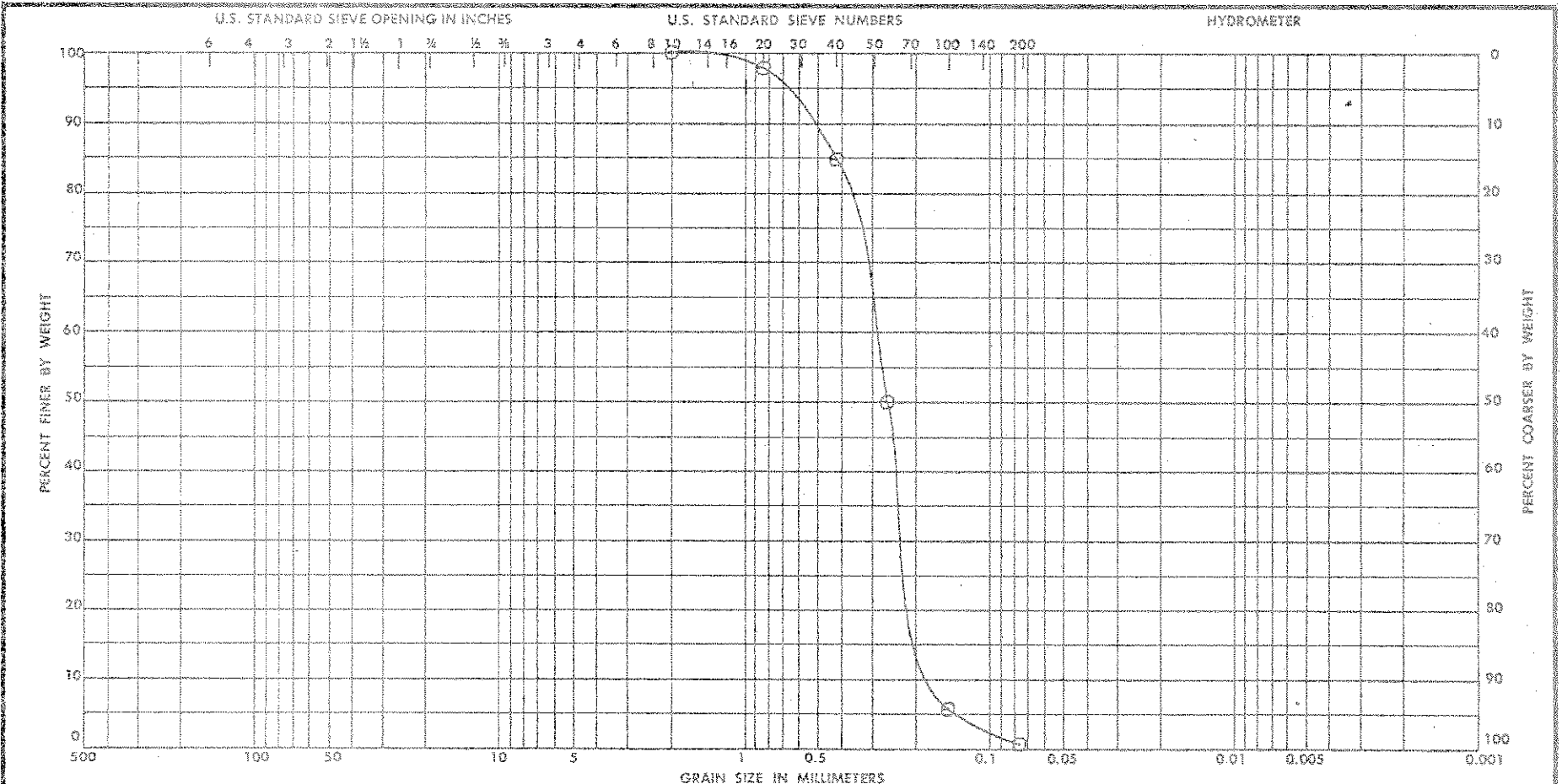
CHART NO. 568



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
2	15.0'		POORLY GRADED SAND (SP)	--	NP	NP	NP	MOBILE DISTRICT
			LT-TANNISH WHITE WITH A TRACE OF MICA					MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1178
								Boring No. VC-21-84 SAMPLE NO. 2
<b>GRADATION CURVES</b>								Date 11/27/84

CHART NO. 569



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	VISUAL	Classification	Nat w %	LL	PL	PI	Project
3	25.0'		POORLY GRADED SAND (SP)	--	NP	NP	NP	MOBILE DISTRICT
			LT. TAN					MOBILE HARBOR DEEPENING
								Area LAB NO. 57/1179
								Boring No. VC-21-84 SAMPLE NO. 3
								Date 11/27/84

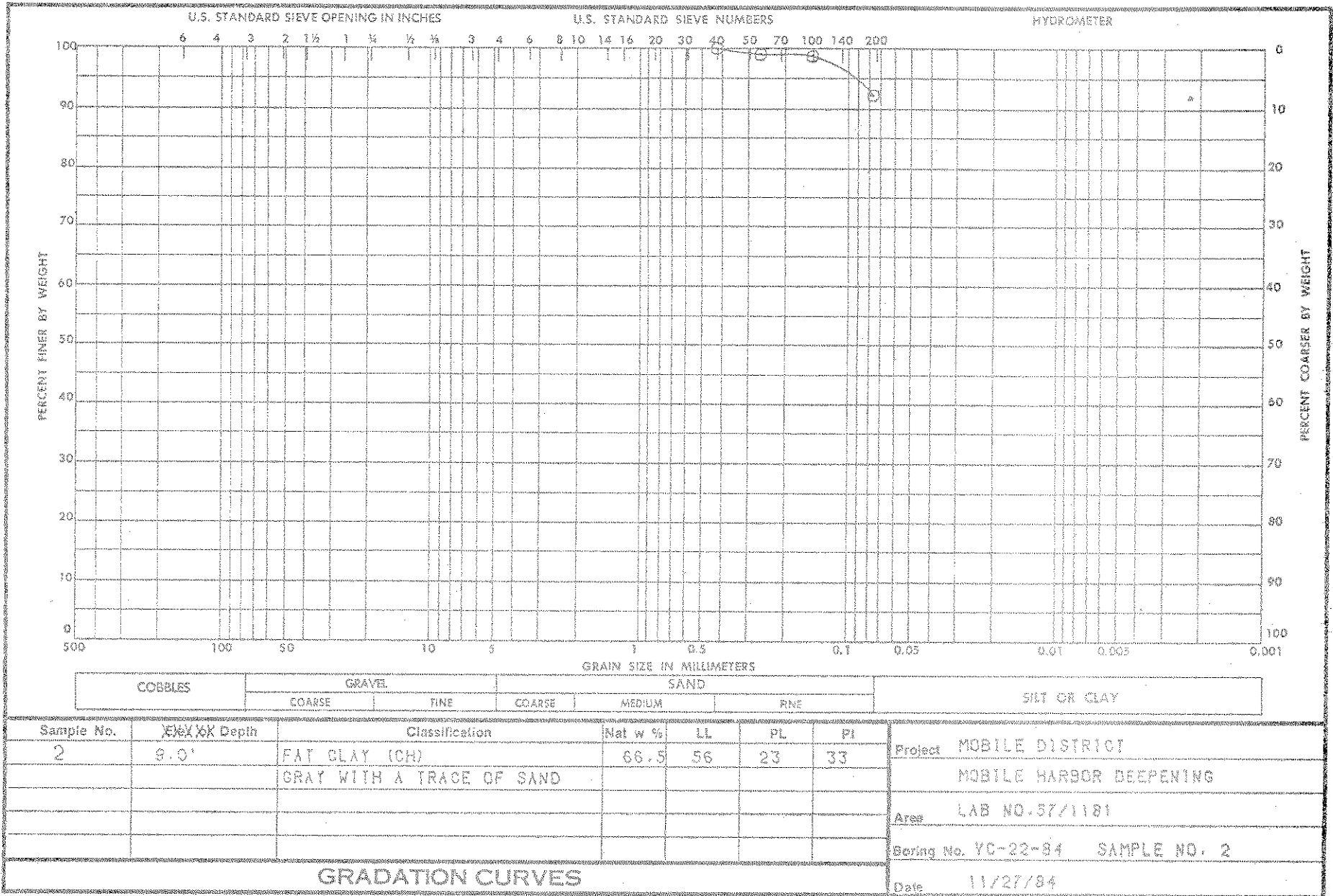
GRADATION CURVES

CHART NO. 570

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

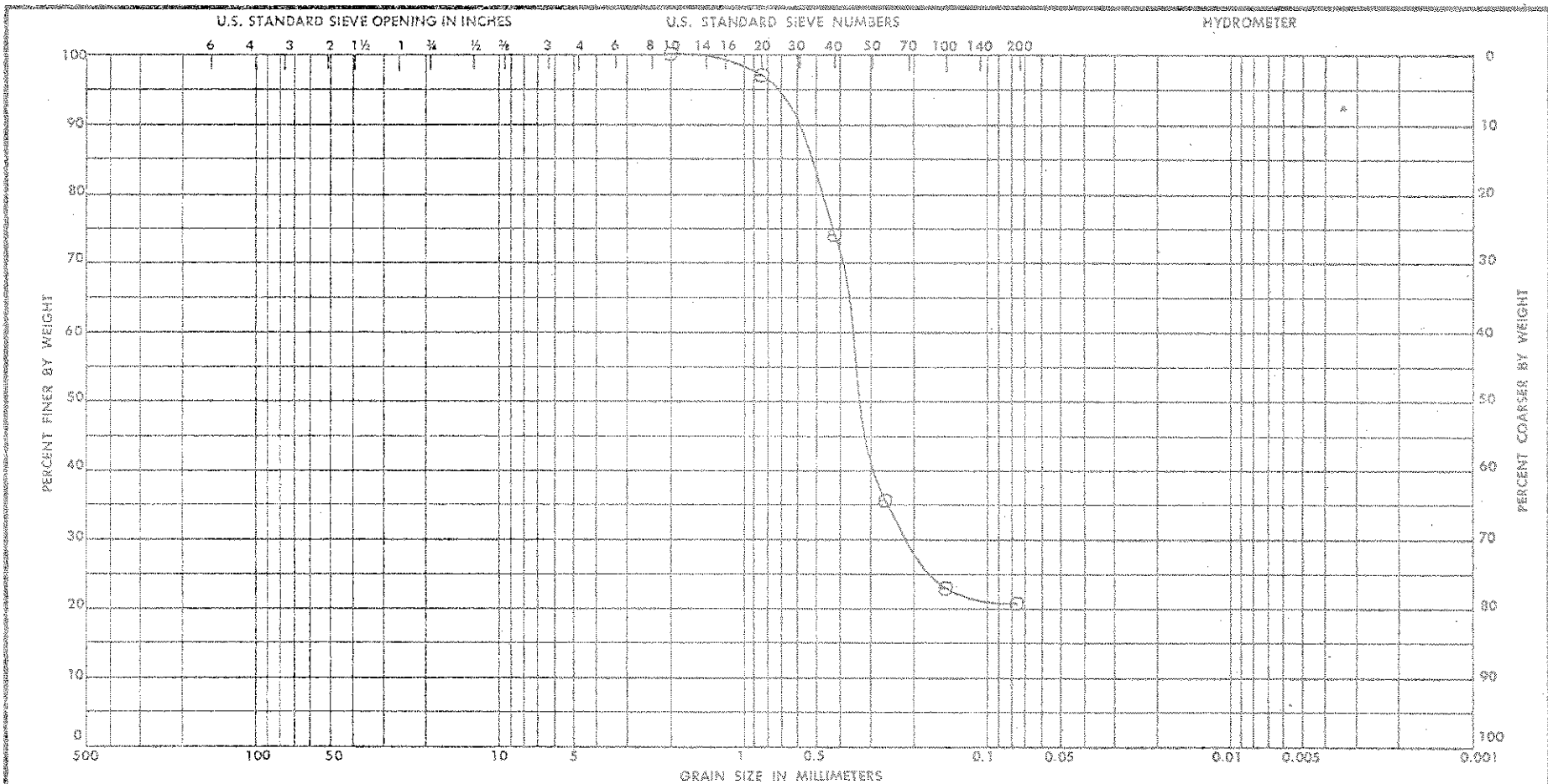


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Depth	Classification	Nat w %	LL	PL	PI	Project
2	9.0'	FAT CLAY (CH) GRAY WITH A TRACE OF SAND	66.5	56	23	33	
							Area LAB NO. 57/1181
							Boring No. YC-22-84    SAMPLE NO. 2
							Date 11/27/84

GRADATION CURVES

CHART NO. 571



Sample No.	Depth	VISUAL Classification	GRAVEL			SAND			SILT OR CLAY
			COARSE	FINE	COARSE	MEDIUM	FINE		
3	20.0'	SILTY, CLAYEY SAND (SM-SC) GRAY WITH A TRACE OF MICA							

Project	MOBILE DISTRICT
	MOBILE HARBOR DEEPENING
Area	LAB NO. 57/1187
Boring No.	VC-23-84
	SAMPLE NO. 3
Date	11/27/84

**GRADATION CURVES**

CHART NO. 572

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
 CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

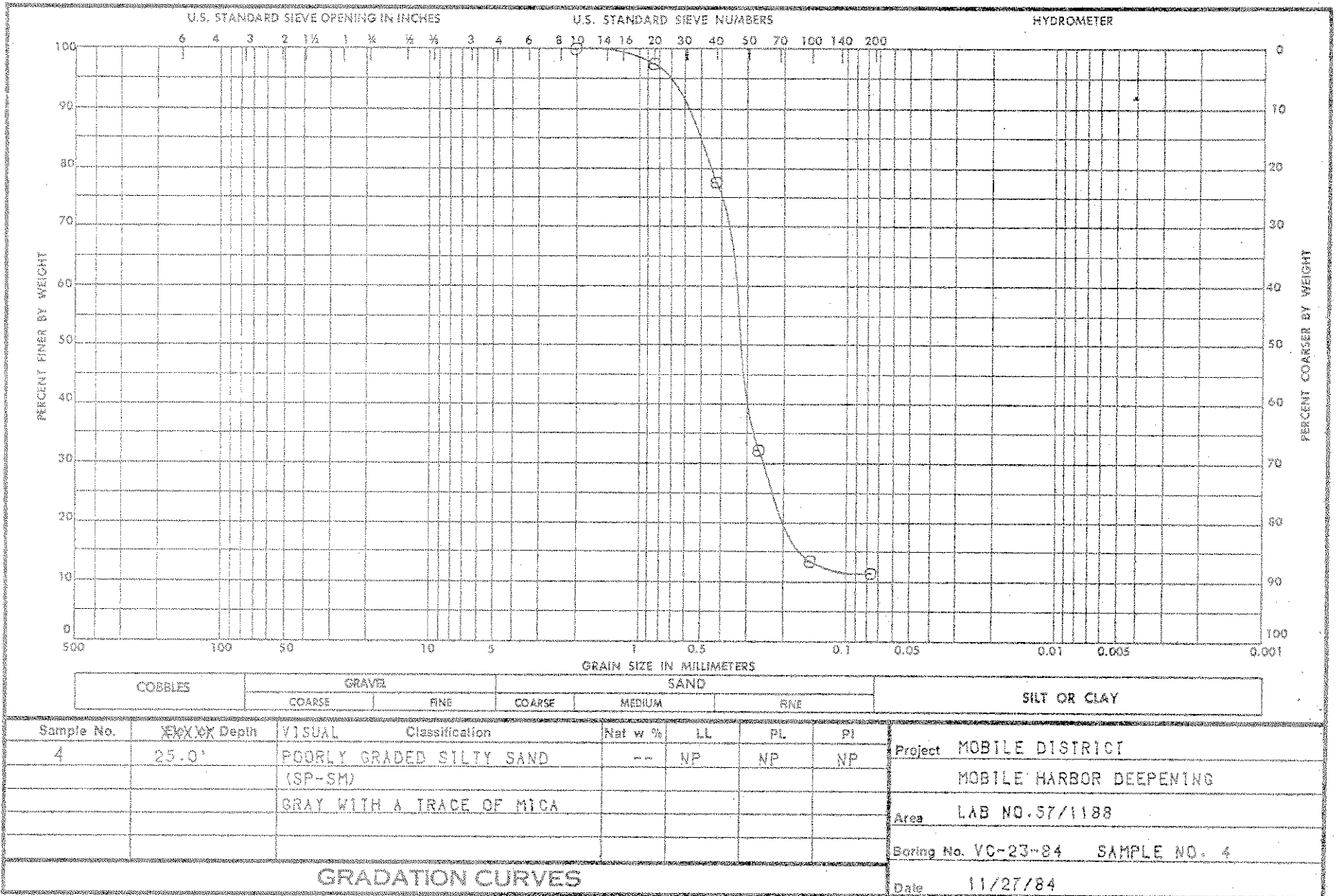


CHART NO. 573





DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY  
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Req. No. 1-85-F&M

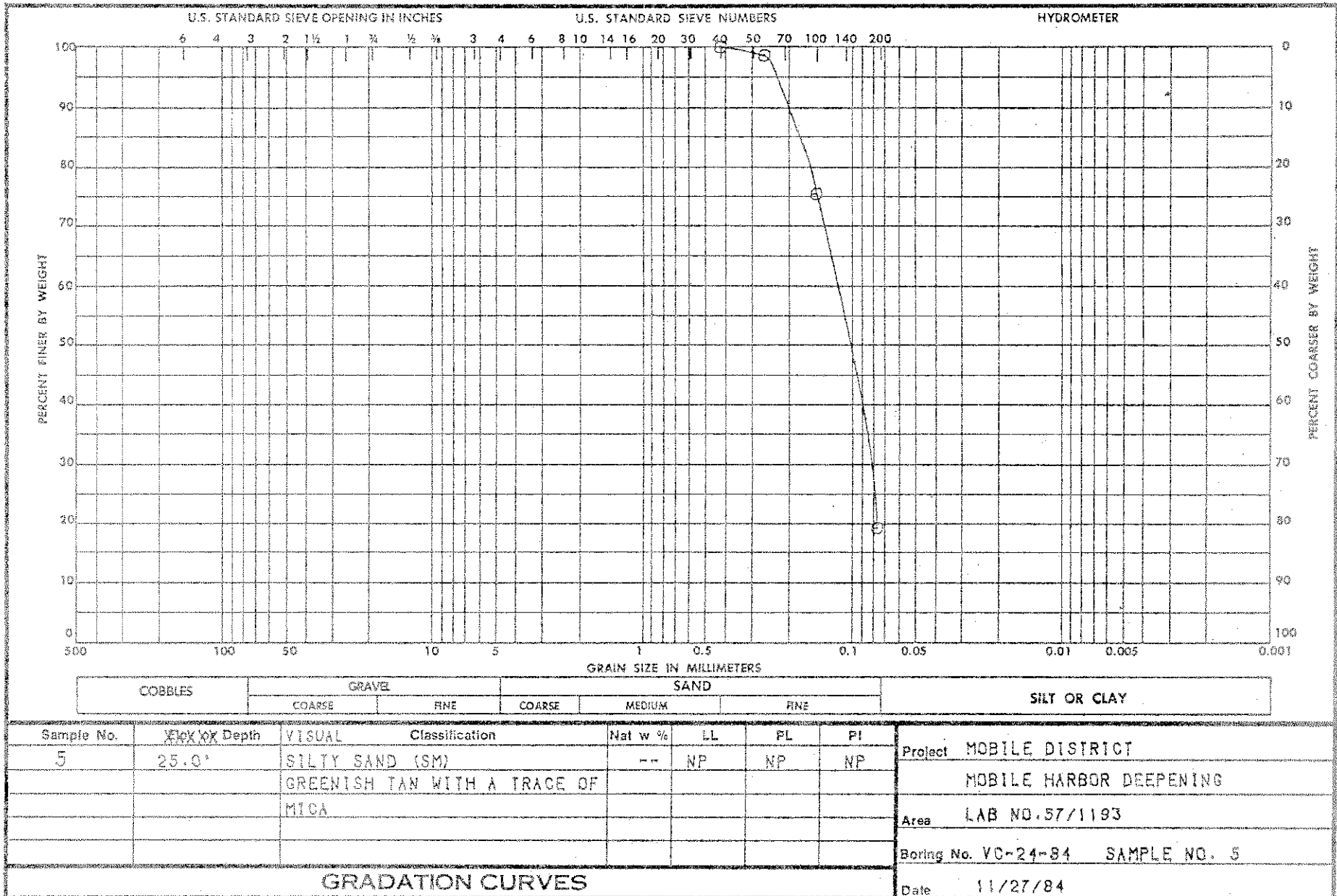


CHART NO. 575

APPENDIX B  
ENVIRONMENTAL COMPLIANCE

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# **Turtle Trawl Net Specifications**

## Turtle Trawl Net Specifications

DESIGN: 4 Seam, 4 Legged, 2 Bridal Trawl Net

WEBBING: 4 inch bar, 8 inch stretch

Top - 36 Gauge Twisted Nylon Dipped

Side - 36 Gauge Twisted Nylon Dipped

Bottom - 84 Gauge Braided Nylon Dipped

NET LENGTH: 60 ft from cork line to cod end

BODY TAPER: 2 to 1

WING END HEIGHT: 6 feet

CENTER HEIGHT: Dependent on depth of trawl - 14 to 18 feet

COD END: Length 50 meshes x 4 inches equals 16.7 feet

Webbing 2 inch bar, 4 inch stretch, 84 gauge braid nylon

Dipped, 80 meshes around, 40 rigged meshes with  $\frac{1}{4}$  x 2

inch choker rings, 1 each  $\frac{1}{2}$  x 4 inch at end

Cod End Cover - none

Chaffing Gear - none

HEAD ROPE: 60 ft  $\frac{1}{2}$  inch combination rope (braid nylon with stainless cable center)

FOOT ROPE: 65 ft  $\frac{1}{2}$  inch combination rope

LEG LINE: Top - 6 ft, Bottom - 6 ft

FLOATS: Size - Tuna Floats (football style), Diameter - 7

Inches; Length - 9 inches; number 12 each;

Spacing - center of top net 2 inches apart

MUD ROLLERS: Size - 5 inch Diameter, 5.5 inch length

Number - 22 each; spacing - 3 ft attached with  $\frac{3}{8}$  inch

Polypropylene rope (replaced with snap on roller when broken)

TICKLER CHAINS: NONE (Discontinued - but previously used  $\frac{1}{4}$  inch x 74 ft galvanized chain)

WEIGHT: 20 ft of  $\frac{1}{4}$  inch galvanized chain on each wing, 40 ft per net looped and tied

DOOR SIZE: 7 ft x 40 inches (or 8 ft x 40 inches); Shoe - 1 inch

X 6 inch: bridles -  $\frac{3}{8}$  inch high test chain

CABLE LENGTH: (Bridle Length, Total) :  $\frac{7}{16}$  inch x 240-300 ft varies with bottom conditions

FLOAT BALL: NONE

LAZY LINES: 1 inch nylon

PICKUP LINES:  $\frac{3}{8}$  inch polypropylene

WHIP LINES: 1 inch nylon

# **ODESS System Requirements and Forms**

## HARDWARE REQUIREMENTS FOR THE ODESS SYSTEM

The dredge shall be equipped and the contractor is responsible for an ODESS hardware system consisting of a tablet computer, wireless keyboard, wireless mouse and data modem (or equivalent onboard internet connection) along with a proper tote bag and setup location for the afore mentioned hardware components. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor shall be responsible for repairing it within 48 hours of determination of the condition. The contractor shall also keep ODESS personnel updated on the status of the onboard ODESS system and the progress of any repairs.

### Computer

The Contractor shall provide a dedicated onboard tablet computer for use by the observers and shall have ODESS software installed on it prior to project initiation. This computer shall be located and oriented to allow data entry and data viewing. It must meet or exceed the following specifications:

<b>Tablet Hardware Component</b>	<b>Specification</b>
CPU	Intel or AMD processor with a (non-overclocked) clock speed of at least 2.4 gigahertz (GHz)
Hard Disk	128 gigabytes (GB); solid state internal storage
RAM	4 gigabytes (GB)
Network Adapter	Internal wired or wireless network hardware to match internet connection
Video Adapter	Support for 1024x768 resolution at 16-bit color depth
Display	>= 10.8 in.
Integrated Camera	2MP HD webcam (front); 8MP (back)
Ports	1 free USB port

### Internet Access

The Contractor shall maintain an Internet connection capable of transmitting data to the ODESS database. The telemetry system shall always be available and have connectivity in the contract area. If connectivity is lost, unsent data shall be stored locally within the FC tool and transmitted upon restoration of connectivity. The Contractor shall acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the ODESS database. The hardware and software must be configured to allow remote access to the computer by USACE ODESS personnel. Coordination between the dredging company's IT and ODESS Support may be required in order to configure remote access through any



security, firewall, router, and telemetry systems. Telemetry systems must be capable of meeting these minimum reporting requirements in all operating conditions.

## SOFTWARE REQUIREMENTS

ODESS personnel shall be responsible for installing and testing all ODESS software tools on the dedicated onboard ODESS tablet computer. No other software which conflicts with the ODESS function of recording and transmitting data shall be installed on the tablet computer. The Contractor shall be responsible for installing and/or maintaining any necessary manufacturer-provided software for the installed hardware. If any software problem occurs, the Contractor shall contact ODESS Support at [ODESS@usace.army.mil](mailto:ODESS@usace.army.mil) or 1-877-840-8024.

The ODESS tablet computer shall have the following minimum software installed in support of the ODESS system:

<b>Software</b>	<b>Specification</b>
Operating System	Windows 10, Contractor-installed
Browser**	Chrome, Internet Explorer, Contractor-installed
ODESS Software	Field Collector (FC) tool, USACE ODESS Support Installed
Remote Access Software	Team Viewer, USACE ODESS Support-installed

\*\*Latest version recommended, Chrome is preferred



## **Operations and Dredging Endangered Species System (ODESS) USACE Sea Turtle Deflector Checklist for Hopper Dredges for USACE and USACE/Army-Permitted Projects**

---

1. Read the contract plans and specs and/or all applicable permits (Dept. of the Army Permit, State Permits) to determine the contract or permit requirements for the protection of endangered sea turtles. (Each District spec or permit may be different.)
2. Read the Biological Opinion and any USACE Protocol, if available.
3. Develop a list of inspection requirements:
  - a. Deflector leading edge angle (90° or less).
  - b. Approach angle or leading edge plowing depth (6" or more).
  - c. Aft rigid attachment of the deflector to the draghead (hinged or trunnion).
  - d. Forward deflector attachment point (adjustable pinned or cable/chain with stop).
  - e. Opening between draghead and deflector (4" x 4" max).
  - f. Dredged material screening requirement (yes/no).
  - g. Screen type requirement (inflow, overflow, or both).
  - h. Inflow basket screen openings (4" x 4" max) and dredged material screening (100%).
  - i. Lighting of the inflow and overflow screens and proper access for cleaning (must meet EM 385-1-1).
  - j. UXO (Unexploded Ordnance) screening in use (yes/no).
  - k. Structural design of the deflector (per the approved deflector submittal).
  - l. Dredge operational requirements (starting/stopping the dredge pump, draghead plugging, raising the draghead, turning the dredge).

- m. Dredging Quality Management (DQM) dredging data recording requirement. Is dredging data recording (drag elevation, slurry density, and velocity) required by specs or permit? If so, is it being collected, is DQM turned on, and is data being submitted?
  - n. Turtle trawling requirement. Is turtle trawling required by specs or permit? If so, is it being performed?
  - o. Turtle observer requirements (12 or 24 hours).
  - p. A copy of the approved turtle deflector submittal is on board the vessel.
  - q. Copies of the contract plans and specs or the Dept. of the Army permit are on board the vessel.
4. Review the turtle deflector submittal. (Do not allow dredging to start until the submittal is approved.)
- a. Structural soundness.
  - b. Deflector leading edge angle (90° or less).
  - c. Approach angles submitted for the project's dredging depths.
  - d. 4" x 4" opening between the deflector and the draghead.
  - e. Aft rigid deflector attachment to draghead (hinged or trunnion).
  - f. Forward deflector attachment point (adjustable pinned or cable/chain with stop).
5. Ensure that the Contractor Quality Control (CQC) performs a pre-dredging inspection. The CQC is required to review and inspect all items in section 3.
6. Ensure that the CQC performs a startup-dredging inspection:
- a. The CQC is required to check the turtle deflector to see if the deflector is installed and adjusted for the required dredge depth of the project in accordance with the approved deflector submittal.
  - b. The CQC is required to ensure that the drag tenders are operating the dredge pump and draghead in accordance with the specs/permit.
  - c. The CQC should perform a paint test to ensure that the deflector is plowing at least 6" into the dredge material while the dragtender is consistently maintaining the submitted and approved approach angle to a tolerance of +0 to -4°.
  - d. The CQC should note the inspection results in the Quality Control (QC) Daily Report.
7. Quality Assurance (QA) should perform a dredging operation inspection soon after the dredge starts dredging:
- a. Review and inspect all items in section 3.

- b. Inspect the turtle deflector to ensure that the deflector is installed and adjusted for the required dredge depth of the project in accordance with the approved deflector submittal.
- c. Require the contractor to perform a paint test to ensure that the deflector is plowing at least 6" into the dredge material while the dragtender is consistently maintaining the submitted and approved approach angle to a tolerance of +0 to -4°. (While over-penetration of the deflector may reduce production and increase fuel consumption of the dredge, it is allowed.)
- d. Ride the dredge through at least one dredging cycle (from dredging to the dump and then back to the dredge site).
- e. Watch the dragtender to ensure that he/she is operating the dredging equipment in accordance with the plans and specs:
  - i Starting the dredge pump only when the draghead is firmly on the bottom by watching the slurry specific gravity and swell compensator.
  - ii Reducing the slurry velocity to the dredge pump idle speed velocity before raising the draghead off the bottom.
  - iii Consistently maintaining the approach angle to a tolerance of +0 to -4° whenever the draghead is on the bottom and the dredge pump is operating
  - iv Raising the draghead off the bottom due to draghead plugging or ship crabbing.
- f. Ensure that the lockout tagout procedure for cleaning the inflow and overflow screens meets EM 385-1-1.
- g. Talk to the turtle observers to ensure that they are aware of contract and permit requirements and that they are inspecting the screens and deflectors and reporting any required maintenance to the dredge personnel. Also ensure that correct turtle observer forms are being used and filled out properly.
- h. Talk to the dredge Captain about maintaining the screens and deflectors.
- i. Ensure that DQM data is being sent to the National Dredging Quality Management Program.
- j. Note all pre-dredge/post-dredge and followup inspections in the QA and the QC Daily Reports.





# Operations & Dredging Endangered Species System (ODESS)



US Army Corps  
of Engineers®

## Dredge Load

District	Project	Contract	Dredge	Dredging Company
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Load Number (Required)/Date	Start Date (Required)	Start Time (24 hours) (Required)	Stop Date (Required)	Stop Time (24 hours) (Required)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Port Screen Condition**

Excellent  
 Good  
 Fair  
 Bad

**Starboard Screen Condition**

Excellent  
 Good  
 Fair  
 Bad

**Overflow Screen Condition**

Excellent  
 Good  
 Fair  
 Bad

**Inflow Screen Percent**

25%  
 50%  
 75%  
 100%

**Overflow Screen Percent**

25%  
 50%  
 75%  
 100%

**Other Screen Percent**

25%  
 50%  
 75%  
 100%

**# Dragheads Used**

**Draghead Length (ft)**

**Draghead Width (ft)**

**Draghead Type**

California Style  
 IHC  
 IHC + Water Injection  
 Wild Dragon  
 Other (Specify)

**Deflector Condition**

Good  
 Fair  
 Poor  
 None

**UXO Screening in Use?**

Yes  
 No

**Material Type**

Clay  
 Consolidated Material  
 Mud  
 Other  
 Rock  
 Sand - Course  
 Sand - Fine  
 Sand - Medium  
 Sand - Mixed  
 Shell  
 Silt  
 Unknown

**Weather Conditions**

Sunny  
 Cloudy  
 Partly Cloudy

**Beaufort Sea Scale**

0 (0-1 kn, 0-0 ft)  
 1 (1-3 kn, 0-1 ft)  
 2 (4-6 kn, 1-2 ft)  
 3 (6-10 kn, 2-3.5 ft)  
 4 (10-16 kn, 3.5-6 ft)  
 5 (16-21 kn, 6-9 ft)  
 6 (21-27 kn, 9-13 ft)  
 7 (27-33 kn, 13-19 ft)  
 8 (33-40 kn, 19-25 ft)  
 9 (40-47 kn, 25-32 ft)  
 10 (47-55 kn, 32-41 ft)  
 11 (55-63 kn, 41-52 ft)  
 12 (>63 kn, >52 ft)

**Wave Height (ft)**

**Wind Speed (k)**

**Wind Direction (°)**

**Tide**

High  
 Low  
 Slack  
 Rising  
 Falling  
 Unknown

**Air Temp (°C)**

**Surface Water Temp (°C)**

**Mid-Depth Water Temp (°C)**

**Bottom Water Temp (°C)**

**Trawling Being Conducted?**

Yes  
 No

**Any Incidents Involving Endangered or Protected Species?**

Yes  
 No

**If Yes, Which Species? (Complete a Turtle or Sturgeon incident form)**

Marine Mammal  
 Sea Turtle  
 Sturgeon  
 Other  
 Unknown

**Whale Sighting Notification Received?**

Yes  
 No

**Alert Sent to District?**

Yes  
 No

**Screen Contents**

1 Port Screen  
 Contents (incl. # of each item)

2 Starboard Screen  
 Contents (incl. # of each item)

3 Overflow Screens  
 Contents (incl. # of each item)

4 Other Screen or Location (Specify)

Contents (incl. # of each item)

5 Port Draghead  
 Contents (incl. # of each item)

6 Starboard Draghead  
 Contents (incl. # of each item)

**Comments**

<b># Observers Used/24 Hours</b>	<b>% Monitoring/Project</b>	<b>Observer(s) Name(s) (Req; Print)</b>	<b>Observer(s) Signature(s)</b>	<b>Observer(s) Company</b>
<input type="text"/>	<input type="checkbox"/> None <input type="checkbox"/> 75% <input type="checkbox"/> 25% <input type="checkbox"/> 100% <input type="checkbox"/> 50%	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Notes:**

- **Screen Contents**—Examples include sea turtle (sp.), sturgeon (sp.), shark (sp.), ray (sp.), other fish of note (sp.), horseshoe crab, blue crab, other crab species, coral, jellyballs, other species of note, environmental debris, and trash.



# Operations & Dredging Endangered Species System (ODESS) Marine Mammal Observation



US Army Corps  
of Engineers®

District	Project	Contract
<input type="text"/>	<input type="text"/>	<input type="text"/>

Dredge	Dredging Company	Load Number (Required)/Date
<input type="text"/>	<input type="text"/>	<input type="text"/>

Start Date (Required)	Start Time (24 hours) (Required)	End Date (Required)	End Time (24 hours) (Required)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Beaufort Sea State**

- 0 (0-1 kn, 0-0 ft)
- 1 (1-3 kn, 0-1 ft)
- 2 (4-6 kn, 1-2 ft)
- 3 (6-10 kn, 2-3.5 ft)
- 4 (10-16 kn, 3.5-6 ft)
- 5 (16-21 kn, 6-9 ft)
- 6 (21-27 kn, 9-13 ft)

- 7 (27-33 kn, 13-19 ft)
- 8 (33-40 kn, 19-25 ft)
- 9 (40-47 kn, 25-32 ft)
- 10 (47-55 kn, 32-41 ft)
- 11 (55-63 kn, 41-52 ft)
- 12 (>63 kn, >52 ft)

**Species Observed (Required)**

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Bryde's/Sei Whale<br># ___ Est. Length (ft.) ___ | <input type="checkbox"/> Manatee<br># ___ Est. Length (ft.) ___     | <input type="checkbox"/> Right Whale<br># ___ Est. Length (ft.) ___ |
| <input type="checkbox"/> Fin Whale<br># ___ Est. Length (ft.) ___         | <input type="checkbox"/> Minke Whale<br># ___ Est. Length (ft.) ___ | <input type="checkbox"/> Unknown<br># ___ Est. Length (ft.) ___     |
| <input type="checkbox"/> Humpback Whale<br># ___ Est. Length (ft.) ___    | <input type="checkbox"/> Pilot Whale<br># ___ Est. Length (ft.) ___ |   |

Air Temp (°C)	Water Temp (°C)	Winds (k)	Seas (ft)	Cloud Cover (%)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Magnetic Bearing to Sighting	Estimated Distance	Vessel's Heading	Heading of Animal(s)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Coloration	Fins or Flippers Observed
<input type="text"/>	<input type="text"/>

Behaviors Observed	Surfacing Intervals Time
	Surfacing Intervals Distance
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Comments (Was the behavior of the animal(s) affected by the vessel? How far did the animal(s) move? Who was notified?)

Observer(s) Name(s) (Required; Print)	Observer(s) Signature(s)	Observer(s) Company
<input type="text"/>	<input type="text"/>	<input type="text"/>







# Operations & Dredging Endangered Species System (ODESS) Turtle Incident



**US Army Corps  
of Engineers**

District  Project  Contract

Dredge  Dredging Company  Species (Required)  
 Green  
 Hawksbill  
 Kemp's Ridley  
 Leatherback  
 Loggerhead  
 Unknown

Load Number (Required)/Date  Is this a Take? (Required)  
 Yes  
 No  
 Project Incident # (Required)

Recovery Date (Required)  Recovery Time (24 hours) (Required)  Incident/Take Description

Air Temp (°C)  Surface Water Temperature (°C)

Mid-Depth Water Temperature (°C)  Bottom Water Temperature (°C)

Location Specimen Recovered  
 Deck  
 Draghead  
 Inflow Cage (Circle one)  
     Starboard/Port/Other  
 Hopper  
 Overflow Screen (Circle one)  
     Starboard/Port/Other  
 Pipe

Age Class  
 Juvenile (10.1-80 cm)  
 Sub-Adult (80.1-87 cm)  
 Adult (>87 cm)  
 Unknown

Gender  
 Female  
 Male  
 Unknown

Specimen Condition  
 Alive  
 Dead  
 Fresh Dead  
 Moderately Decomposed  
 Severely Decomposed  
 Skeleton  
 Skeleton Old Bone  
 Undetermined

Location Comment

Tag Type  
 Flipper  
 Pit  
 Other (Specify)

Head Width (cm/in)

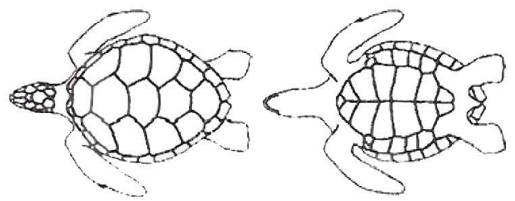
Tag Number  Plastron Length (cm/in)  Carapace Straight Length (cm/in)  Carapace Curved Length (cm/in)

Tag Date  Plastron Width (cm/in)  Carapace Straight Width (cm/in)  Carapace Curved Width (cm/in)

Genetic Samples Taken?  
 Yes  
 No

Final Disposition of Specimen

Use these diagrams to illustrate the specimen/part that was recovered.



Comments

Observer(s) Name(s) (Required; Print)

Observer(s) Signature(s)

Observer(s) Company





**Cooperative Marine Turtle Tagging Program  
(CMTTP) Tagging Data Form**

**COOPERATIVE MARINE TURTLE TAGGING PROGRAM (CMTTP)  
TAGGING DATA FORM**

SPECIES: _____	DATE CAPTURED: DAY__ MO__ YR__	DATE RELEASED: DAY__ MO__ YR__
<b>TAG NUMBERS</b> (LIST ALL NUMBERS AND LETTER PREFIXES; CIRCLE TAG NUMBERS ALREADY ON THE TURTLE [= "OLD TAGS"]):		
LEFT FRONT: _____	RIGHT FRONT: _____	LEFT REAR: _____
PIT TAG#: _____		LOCATION OF PIT TAG: _____
WAS TURTLE CARRYING TAGS WHEN ENCOUNTERED?:	YES	NO
IF YES, THEN CIRCLE CORRECT STATEMENT:		
1. RECAPTURE OF SAME PROJECT TURTLE (EITHER WITHIN SEASON OR BETWEEN SEASONS)		
2. RECAPTURE OF DIFFERENT PROJECT TURTLE (NOT A TAG YOUR GROUP APPLIED)		
TAG RETURN ADDRESS:		
ORGANIZATION TAGGING AND/OR RELEASING TURTLE (INCLUDE AREA CODE/PHONE NUMBER; AND EMAIL):		
PROJECT TYPE (CIRCLE ONE):		
[NESTING BEACH]	[TANGLE NET]	[POUND NET]
[HAND CATCH]	[STRANDING]	[OTHER, DESCRIBE]
IF NESTING BEACH: DID TURTLE NEST?	YES	NO
UNDETERMINED		
FACILITY WHERE TURTLE WAS BEING HELD:		
DESCRIBE CAPTURE LOCATION. BE SPECIFIC, INCLUDE COUNTY AND LAT/LONG IF AVAILABLE		
DESCRIBE RELEASE LOCATION. BE SPECIFIC, INCLUDE COUNTY AND LAT/LONG IF AVAILABLE.		
<b>TURTLE MEASUREMENTS:</b>		
STRAIGHT CARAPACE LENGTH (SCLMINIMUM):	_____ CM	_____ INCHES
STRAIGHT CARAPACE LENGTH (SCLNOTCH-TIP):	_____ CM	_____ INCHES
STRAIGHT CARAPACE WIDTH (SCW):	_____ CM	_____ INCHES
CURVED CARAPACE LENGTH (CCLMINIMUM):	_____ CM	_____ INCHES
CURVED CARAPACE LENGTH (CCLNOTCH-TIP):	_____ CM	_____ INCHES
CURVED CARAPACE WIDTH (CCW):	_____ CM	_____ INCHES
WEIGHT:	_____ KG	_____ LBS
<b>TURTLE WAS INSPECTED AND/OR SCANNED FOR:</b>		
TAG SCARS:	YES	NO
WHERE LOCATED?		
PIT TAGS:	YES	NO
WHAT FREQUENCY?		
MAGNETIC WIRES:	YES	NO
WHERE LOCATED?		
LIVING TAGS:	YES	NO
WHERE LOCATED?		
ADDITIONAL REMARKS OR DATA ON BACK OF FORM:	YES	NO
<p align="center"><b>MAIL COMPLETED FORM TO:</b>          ARCHIE CARR CENTER FOR SEA TURTLE RESEARCH, DEPARTMENT OF ZOOLOGY, PO Box 118525          UNIVERSITY OF FLORIDA, GAINESVILLE, FL 32611 USA          and          SCDNR Marine Turtle Program, PO Box 12559, Charleston, SC 29422</p>		

# **Protocol for Collecting Tissue from Live and Dead Turtles for Genetic Analysis**

**Appendix II:**

**PROTOCOL FOR COLLECTING TISSUE FROM DEAD TURTLES FOR GENETIC ANALYSIS**

**Method for Dead Turtles**

<<<IT IS CRITICAL TO USE A NEW SCALPEL BLADE AND GLOVES FOR EACH TURTLE TO AVOID CROSS-CONTAMINATION OF SAMPLES>>>

1. Put on a new pair of latex gloves.
2. Use a new disposable scalpel to cut out an approx. 1 cm (½ in) cube (bigger is NOT better) piece of muscle. Easy access to muscle tissue is in the neck region or on the ventral side where the front flippers “insert” near the plastron. It does not matter what stage of decomposition the carcass is in.
3. Place the muscle sample on a hard uncontaminated surface (plastron will do) and make slices through the sample so the buffer solution will penetrate the tissue.
4. Put the sample into the plastic vial containing saturated NaCl with 20% DMSO \*(SEE BELOW)
5. Use the pencil to write the stranding ID number (observer initials, year, month, day, turtle number by day), species, state and carapace length on the waterproof paper label and place it in the vial with the sample.  
EXAMPLE: For a 35.8 cm curved carapace length green turtle documented by Jane M. Doe on July 15, 2001 in Georgia, the label should read “JMD20010715-01, C. mydas, Georgia, CCL=35.8 cm”. If this had been the third turtle Jane Doe responded to on July 15, 2001, it would be JMD20010715-03.
6. Label the outside of the vial with the same information (stranding ID number, species, state and carapace length) using the permanent marker.
7. Place clear scotch tape over the writing on the vial to protect it from being smeared or erased.
8. Wrap parafilm around the cap of the vial by stretching it as you wrap.
9. Place vial within whirlpak and close.
10. Dispose of the scalpel.
11. Note on the stranding form that a part was salvaged, indicating that a genetic sample was taken and specify the location on the turtle where the sample was obtained.
12. Submit the vial with the stranding report to your state coordinator. State coordinators will forward the reports and vials to NMFS for processing and archiving.

\*The 20% DMSO buffer in the plastic vials is nontoxic and nonflammable. Handling the buffer without gloves may result in exposure to DMSO. This substance soaks into skin very rapidly and is commonly used to alleviate muscle aches. DMSO will produce a garlic/oyster taste in the mouth along with breath odor. The protocol requires that you WEAR gloves each time you collect a sample and handle the buffer vials.

The vials (both before and after samples are taken) should be stored at room temperature or cooler. If you don't mind the vials in the refrigerator, this will prolong the life of the sample. DO NOT store the vials where they will experience extreme heat (like in your car!) as this could cause the buffer to break down and not preserve the sample properly.

Questions:

Sca Turtle Program  
NOAA/NMFS/SEFSC  
75 Virginia Beach Drive  
Miami, FL 33149  
305-361-4207

**THANK YOU FOR COLLECTING SAMPLES FOR SEA TURTLE GENETIC RESEARCH!!**

**Genetic Sample Kit Materials – DEAD turtles**

latex gloves

single-use scalpel blades (Fisher Scientific 1-800-766-7000, cat. # 08-927-5A)

plastic screw-cap vial containing saturated NaCl with 20% DMSO, wrapped in parafilm

waterproof paper label, 1/4" x 4"

pencil to write on waterproof paper label

permanent marker to label the plastic vials

scotch tape to protect writing on the vials

piece of parafilm to wrap the cap of the vial

- whirl-pak to return/store sample vial



Appendix III:

**PROTOCOL FOR COLLECTING TISSUE FROM LIVE TURTLES FOR GENETIC ANALYSIS**

**Method for Live Turtles**

<<<IT IS CRITICAL TO USE A NEW BIOPSY PUNCH AND GLOVES FOR EACH TURTLE TO AVOID CROSS-CONTAMINATION OF SAMPLES>>>

1. Turn the turtle over on its back.
2. Put on a new pair of latex gloves.
3. Swab the entire cap of the sample vial with alcohol.
4. Wipe the ventral and dorsal surfaces of the rear flipper 5-10 cm from the posterior edge with the Betadine/iodine swab.
5. Place the vial under the flipper edge to use the cleaned cap as a hard surface for the punch.
6. Press a new biopsy punch firmly into the flesh as close to the posterior edge as possible and rotate one complete turn. Cut all the way through the flipper to the cap of the vial.
7. Wipe the punched area with Betadine/iodine swab; rarely you may need to apply pressure to stop bleeding.
8. Use a wooden skewer to transfer the sample from the biopsy punch into the plastic vial containing saturated NaCl with 20% DMSO \*(SEE BELOW)
9. Use the pencil to write the stranding ID number (observer initials, year, month, day, turtle number by day), species, state and carapace length on the waterproof paper label and place it in the vial with the sample.  
EXAMPLE: For a 35.8 cm curved carapace length green turtle documented by Jane M. Doe on July 15, 2001 in Georgia, the label should read "JMD20010715-01, *C. mydas*, Georgia, CCL=35.8 cm". If this had been the third turtle Jane Doe responded to on July 15, 2001, it would be JMD20010715-03.
10. Label the outside of the vial with the same information (stranding ID number, species, state and carapace length) using the permanent marker.
11. Place clear scotch tape over the writing on the vial to protect it from being smeared or erased.
12. Wrap parafilm around the cap of the vial by stretching it as you wrap.
13. Place vial within whirlpak and close.
14. Dispose of the biopsy punch.
15. Note on the stranding form that a part was salvaged, indicating that a genetic sample was taken and specify the location on the turtle where the sample was obtained.
16. Submit the vial with the stranding report to your state coordinator. State coordinators will forward the reports and vials to NMFS for processing and archiving.

\*The 20% DMSO buffer in the plastic vials is nontoxic and nonflammable. Handling the buffer without gloves may result in exposure to DMSO. This substance soaks into skin very rapidly and is commonly used to alleviate muscle aches. DMSO will produce a garlic/oyster taste in the mouth along with breath odor. The protocol requires that you WEAR gloves each time you collect a sample and handle the buffer vials.

The vials (both before and after samples are taken) should be stored at room temperature or cooler. If you don't mind the vials in the refrigerator, this will prolong the life of the sample. DO NOT store the vials where they will experience extreme heat (like in your car!) as this could cause the buffer to break down and not preserve the sample properly.

Questions:

Sea Turtle Program  
NOAA/NMFS/SEFSC  
75 Virginia Beach Drive  
Miami, FL 33149  
305-361-4207

**THANK YOU FOR COLLECTING SAMPLES FOR SEA TURTLE GENETIC RESEARCH!!**

**Genetic Sample Kit Materials – LIVE turtles**

- latex gloves
- alcohol swabs
- Betadine/iodine swabs
- 4-6 mm biopsy punch – sterile, disposable (Moore Medical Supply 1-800-678-8678, part #0052442)
- plastic screw-cap vial containing saturated NaCl with 20% DMSO, wrapped in parafilm
- wooden skewer
- waterproof paper label, 1/4" x 4"
- pencil to write on waterproof paper label
- permanent marker to label the plastic vials
- scotch tape to protect writing on the vials
- piece of parafilm to wrap the cap of the vial
- whirl-pak to return/store sample vial





# **Sea Turtle Handling and Resuscitation Guidelines**

#### Appendix IV: SEA TURTLE HANDLING AND RESUSCITATION GUIDELINES

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Any sea turtles taken incidentally during the course of fishing or scientific research activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to the following procedures:

A) Sea turtles that are actively moving or determined to be dead (as described in paragraph (B)(4) below) must be released over the stern of the boat. In addition, they must be released only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.

B) Resuscitation must be attempted on sea turtles that are comatose or inactive by:

1. Placing the turtle on its bottom shell (plastron) so that the turtle is right side up and elevating its hindquarters at least 6 inches (15.2 cm) for a period of 4 to 24 hours. The amount of elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (7.6 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.
2. Sea turtles being resuscitated must be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water-soaked towel placed over the head, carapace, and flippers is the most effective method in keeping a turtle moist.
3. Sea turtles that revive and become active must be released over the stern of the boat only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) must be returned to the water in the same manner as that for actively moving turtles.
4. A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh has begun to rot; otherwise, the turtle is determined to be comatose or inactive and resuscitation attempts are necessary.

Any sea turtle so taken must not be consumed, sold, landed, offloaded, transshipped, or kept below deck.

*These guidelines are adapted from 50 CFR § 223.206(d)(1). Failure to follow these procedures is therefore a punishable offense under the Endangered Species Act.*

## **Online Resources**

REFERENCE THE GRBO AND REVISIONS ONLINE AT:

<https://www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast>



# **ADEM Water Quality and Coastal Zone Consistency Certifications**

**LANCE R. LEFLEUR**  
DIRECTOR



**KAY IVEY**  
GOVERNOR

Alabama Department of Environmental Management  
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463  
Montgomery, Alabama 36130-1463  
(334) 271-7700 ■ FAX (334) 271-7950

May20, 2020

Department of the Army  
Mobile District, U.S. Army Corps of Engineers  
Mr. Todd A. Nettles, Acting Chief  
Planning and Environmental Division  
Post Office Box 2288  
Mobile, Alabama 36628-0001

RE: State of Alabama Water Quality Certification (WQC) Pursuant to Clean Water Act (CWA) §401(a)  
Mobile Harbor Federal Navigation  
U.S. Army Corps of Engineers (USACE) Joint Public Notice (JPN): FP15-MH01-10  
Alabama Department of Environmental Management (ADEM) Tracking Code: ADEM-2018-345-WQC-COEP

Dear Mr. Nettles:

On April 13, 2020, the ADEM received the USACE's request for WQC for the above referenced federal activity.

In this proposed federal activity, the U.S. Army Corps of Engineers would widen the Mobile Harbor Navigation Channel utilizing mechanical and hydraulic dredging methods. The area would be dredged to a total depth of -56 - 54 feet within a previously dredged area of Mobile Bay. Minor bend easings would occur at the double bends in the Bar Channel approach to the Bay Channel. The Bay Channel would be widened from 400 to 500 feet to a total depth of 54 feet from the mouth of Mobile Bay northward for three nautical miles to provide two-way traffic area for passing. In addition, the Choctaw Pass Turning Basin will be expanded 250 feet to the south to a total depth of 56 feet for safe turning. The purpose is to provide sufficient water depth and lateral clearance for larger vessels experiencing transportation delays and inefficiencies due to limited channel width and depth of the existing channel dimensions. Dredged material will be disposed of in established, protected, and previously approved disposal areas which include the Relic Shell Mined Area, Sand Island Beneficial Use Area, and the Ocean Dredged Material Site.

Action pertinent to WQC is required by CWA §401(a)(1), 33 U.S.C. §1251, *et. seq.* If conducted in accordance with the conditions prescribed herein, there is reasonable assurance that the discharge resulting from the proposed activities will not violate applicable water quality standards established under §303 of the CWA and §22-22-9(g), Code of Alabama (1975). By this letter, the ADEM hereby notifies the USACE that CWA §401 WQC is **granted**. This WQC terminates with the expiration of FP15-MH01-10. This WQC only addresses potential discharges to state waters resulting from the activities. ADEM certifies that there are no applicable effluent limitations under §301 and §302 nor applicable standards under §306 and §307 of the CWA in regard to the activities specified.

In recognition that projects are site specific in nature and conditions can change during project implementation, the ADEM reserves the right to request additional information or request additional management measures to be implemented, as necessary on a case-by-case basis, in order to ensure the protection of water quality and coastal resources. Deviation from the approved project design may necessitate additional coordination.

This WQC does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, trespass, or any infringement of Federal, State, or local laws or regulations and in no way purports to vest in the USACE title to lands now owned by the State of Alabama nor shall it be construed as acquiescence by the State of Alabama of lands owned by the State that may be in the USACE's possession. This certification is not transferable without prior written notice and approval of the ADEM. Upon such notice, the Director ~~may~~ require submission of additional information.

**Birmingham Branch**  
110 Vulcan Road  
Birmingham, AL 35209-4702  
(205) 942-6168  
(205) 941-1603 (FAX)

**Decatur Branch**  
2715 Sandlin Road, S.W.  
Decatur, AL 35603-1333  
(256) 353-1713  
(256) 340-9359 (FAX)



**Mobile Branch**  
2204 Perimeter Road  
Mobile, AL 36615-1131  
(251) 450-3400  
(251) 479-2593 (FAX)

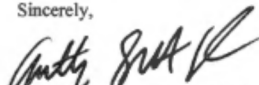
**Mobile-Coastal**  
3664 Dauphin Street, Suite B  
Mobile, AL 36608  
(251) 304-1176  
(251) 304-1189 (FAX)

Adherence to the following conditions is required in order to ensure protection of water quality.

1. Appropriate and Effective Best Management Practices (BMPs) shall be implemented to minimize turbidity impacts to the maximum extent practicable. Turbidity generated by the activity must not cause substantial visible contrast nor result in an increase of more than fifty (50) Nephelometric turbidity units above background in state waters. If turbidity generated from project exceeds acceptable levels, operations must cease until turbidity is restored to acceptable levels. The ADEM Mobile Coastal office (251) 304-1176 must be notified of resultant work stoppage.
2. Upon the loss or failure of any treatment facility, BMP, or other management control measure as identified by responsible on-site staff during day-to-day operations or as identified by ADEM technical staff during inspections, work/activity and all discharges shall, where necessary to maintain compliance with this WQC, be suspended, halted, reduced, or otherwise controlled until effective treatment is restored.
3. The USACE and/or its assigns are responsible for the condition of land-based dredge spoil disposal areas for the life of the placement activity and until the disposal areas are reclaimed or adequately stabilized, and for pumping and discharge rates to ensure settling of suspended solids within the confines of the spoil disposal areas sufficient to ensure that turbidity in the return water will not cause substantial visible contrast within the receiving waters, or result in an increase of 50 NTUs above background turbidity levels in the receiving waters. The salinity of return waters shall be similar to that of the receiving waters.
4. Spoil material utilized beneficially through strategic placement onto state water bottoms shall be free of toxic pollutants in toxic amounts.

Contact the Mobile-Coastal office anytime with questions. Always include the ADEM tracking code above when corresponding on this matter. Allen Phelps is the Mobile-Coastal office contact for this project; he may be reached by phone at 251.304.1176 or by e-mail at [cap@adem.alabama.gov](mailto:cap@adem.alabama.gov).

Sincerely,



Anthony Scott Hughes, Chief  
Field Operations Division

cc: EPA, Molly Martin  
DCNR.Coastal@dcnr.alabama.gov  
USACE, Donald Mroczko

ASH/jsb/cap

File: 401WQC/12532

**LANCE R. LEFLEUR**  
DIRECTOR



**KAY IVEY**  
GOVERNOR

Alabama Department of Environmental Management  
adem.alabama.gov  
1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463  
Montgomery, Alabama 36130-1463  
(334) 271-7700 ■ FAX (334) 271-7950

May 20, 2020

Department of the Army  
Mobile District, U.S. Army Corps of Engineers  
Mr. Todd A. Nettles, Acting Chief  
Planning and Environmental Division  
Post Office Box 2288  
Mobile, Alabama 36628-0001

RE: State of Alabama Concurrence with the U.S. Army Corps of Engineers' Coastal Consistency Determination  
Modifications to the Mobile Harbor Federal Navigation Channel  
U.S. Army Corps of Engineers (USACE) Joint Public Notice (JPN): FP15-MH01-10  
Alabama Department of Environmental Management (ADEM) Tracking Code: ACAMP-2018-345-FC-FAA-COEP

Dear Mr. Nettles:

On April 13, 2020 the ADEM received the USACE's Consistency Determination (CD) that the proposed federal activity, referenced above, is consistent with the Alabama Coastal Area Management Program.

In this proposed federal activity, the U.S. Army Corps of Engineers would widen the Mobile Harbor Navigation Channel utilizing mechanical and hydraulic dredging methods. The area would be dredged to a total depth of -56 -54 feet within a previously dredged area of Mobile Bay. Minor bend easings would occur at the double bends in the Bar Channel approach to the Bay Channel. The Bay Channel would be widened from 400 to 500 feet to a total depth of 54 feet from the mouth of Mobile Bay northward for three nautical miles to provide two-way traffic area for passing. In addition, the Choctaw Pass Turning Basin will be expanded 250 feet to the south to a total depth of 56 feet for safe turning. The purpose is to provide sufficient water depth and lateral clearance for larger vessels experiencing transportation delays and inefficiencies due to limited channel width and depth of the existing channel dimensions. Dredged material will be disposed of in established, protected, and previously approved disposal areas which include the Relic Shell Mined Area, Sand Island Beneficial Use Area, and the Ocean Dredged Material Site.

Pursuant to Title 15 C.F.R. §930.41(a) and based upon review of the information submitted by the USACE, by this letter the ADEM hereby notifies the USACE of its **concurrence** with the USACE's CD.

Should it become necessary to modify the activities described in the JPN after this concurrence has been issued, a revised CD may be necessary pursuant to Title 15 C.F.R. §930.46. Contact the Mobile-Coastal office anytime with questions. Always include the ADEM tracking code above when corresponding on this matter. Allen Phelps is the Mobile-Coastal office contact for this project; he may be reached by phone at 251.304.1176 or by e-mail at [cap@adem.alabama.gov](mailto:cap@adem.alabama.gov).

**Birmingham Branch**  
110 Vulcan Road  
Birmingham, AL 35209-4702  
(205) 942-6168  
(205) 941-1603 (FAX)

**Decatur Branch**  
2715 Sandlin Road, S.W.  
Decatur, AL 35603-1333  
(256) 353-1713  
(256) 340-9359 (FAX)



**Mobile Branch**  
2204 Perimeter Road  
Mobile, AL 36615-1131  
(251) 450-3400  
(251) 479-2593 (FAX)

**Mobile-Coastal**  
3664 Dauphin Street, Suite B  
Mobile, AL 36608  
(251) 304-1176  
(251) 304-1189 (FAX)

USACE Joint Public Notice (JPN): FP15-MH01-10  
ADEM Tracking Code: ACAMP-2018-345-FC-FAA-COEP  
Page 2 of 2

Sincerely,



Anthony Scott Hughes, Chief  
Field Operations Division

cc: EPA, Molly Martin  
DCNR.Coastal@dcnr.alabama.gov  
USACE, Donald Mroczko

ASH/jsb/cap

File: CZCERT/12532

# **Letter from U.S. Fish and Wildlife Service**



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
1208-B Main Street  
Daphne, Alabama 36526

IN REPLY REFER TO:  
2016-CPA-0130

DEC 21 2018

Lekesha W. Reynolds  
Chief, Coastal Environment Team  
Department of the Army  
Mobile District, Corps of Engineers  
P.O. Box 2288  
Mobile, AL 36628

Dear Ms. Reynolds:

Thank you for your letter received by our office on November 20, 2018, requesting Endangered Species Act (ESA) Section 7 concurrence on the Army Corps of Engineers (USACE) effects determination for the Mobile Harbor Federal Navigation Project Draft Integrated General Reevaluation Report with Supplemental Environmental Impact Statement. The project is located in Mobile County, Alabama. Our comments are provided in accordance with provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

We understand that you determined this project may affect, but is not likely to adversely affect the following federally listed species:

West Indian manatee (*Trichechus manatus*) – Threatened  
Wood stork (*Mycteria americana*) - Threatened  
Piping plover (*Charadrius melodus*) – Threatened  
Red knot (*Calidris canutus rufa*) – Threatened  
Southern clubshell (*Pleurobema decisum*) - Endangered  
Inflated heelsplitter (*Potamilus inflatus*) – Threatened  
Gopher tortoise (*Gopherus polyphemus*) – Threatened  
Eastern indigo snake (*Drymarchon corais couperi*) – Endangered  
Black pine snake (*Pituophis melanoleucus lodingi*) – Threatened  
Alabama red-bellied turtle (*Pseudemys alabamensis*) - Endangered

We are concerned about the potential indirect or direct physical impact on manatees that may be migrating through the project area during the proposed dredging operation. Direct impacts could occur from either boat, barge, cutterhead, or hydraulic pipeline strikes. Because manatees are known to seasonally occur in the Mobile channel, and could be affected by this activity, we believe that a “may affect” situation exists for the manatee.

PHONE: 251-441-5181

FAX: 251-441-6222

You have proposed to implement our "Standard Manatee Construction Conditions" for this project. We believe that if these conditions can be implemented, then there will be no adverse impact to this species and further consultation will not be required for the manatee. If these steps cannot be exercised, or there is an occurrence of collision with and/or injury to a manatee, because of the proposed project, then further consultation may be required.

Based upon a review of our records and the information provided in your letter, we concur with your determination that the project actions may affect, but are not likely to adversely affect the species listed above.

We also understand that, for this project, Gulf sturgeon and sea turtles fall under the jurisdiction of the National Marine Fisheries Service (NMFS). USACE will utilize the NMFS issued Gulf Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287).

Thank you for the opportunity to provide ESA Section 7 concurrence for your project. For further discussion, please contact Mr. Josh Rowell of my staff at (251) 441-5836. Please refer to the reference number located at the top of this letter in future phone calls or written correspondence.

Sincerely,



William J. Pearson  
Field Supervisor  
Alabama Ecological Services Field Office



**Letter from NOAA National Marine Fisheries  
Service**



**UNITED STATES DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
283 13th Avenue South  
St. Petersburg, Florida 33701-5505  
<http://sero.nmfs.noaa.gov>

September 7, 2018 F/SER46/BH:jk  
225/389-0508

Ms. Jennifer L. Jacobson  
Planning and Environment Division  
Mobile District Environmental Branch  
U.S. Army Corps of Engineers  
Post Office Box 2288  
Mobile, Alabama 86628-0001

Dear Ms. Jacobson:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Draft Integrated General Reevaluation Report with Supplemental Environmental Impact Statement (SEIS), dated July 24, 2018, on the "Mobile Harbor Navigation Project." The U.S. Army Corps of Engineers (USACE) proposes to conduct maintenance dredging and placement activities. The maintenance dredging includes a navigation channel from the Gulf of Mexico to turning basins near the Cochrane Bridge, Alabama State Docks, and McDuffie Island. The following is provided in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and 600.920 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; P.L. 104-297).

The NMFS provided comments to the public notice for the project by letter dated January 25, 2017, recommending the beneficial use of dredge material. The USACE responded by letter dated February 21, 2017, acknowledging the comments. The maintenance dredging will generate approximately 5.5 million cubic yards of sediment annually. As proposed in the Public Notice, the sediment would be disposed at the Mobile Offshore Dredged Material Disposal Site (ODMDS), open bay thin-layer disposal areas, the Sand Island Beneficial Use Area (SIBUA), Blakely Island, and Gilliard Island.

Section 2.5.4 of the SEIS confirms little change to water quality parameters such as turbidity, salinity, and dissolved oxygen will result from the project. Due to NMFS' early involvement as a cooperating agency and close coordination with USACE, the project has been designed in such a way as to not have a substantial adverse effect on EFH or federally managed fishery species in Mobile Bay and surrounding waters. The NMFS Habitat Conservation Division does not object to the project as proposed and agrees with USACE's determination the project will not adversely affect EFH.

We appreciate your consideration of our comments. If you wish to discuss this project further or have questions concerning our recommendations, please contact Brandon Howard at (225) 389-0508, extension 203.

Sincerely,

Virginia M. Fay  
Assistant Regional Administrator  
Habitat Conservation Division



c:  
FWS, Paul\_Necaise@fws.gov  
F/SER46, Swafford  
F/SER4, Dale, Fay, Silverman  
Files

**Letter from Alabama State Historic Preservation  
Officer**



## ALABAMA HISTORICAL COMMISSION

468 South Perry Street  
P.O. Box 300900  
Montgomery, Alabama 36130-0900  
334-242-3184 / Fax: 334-240-3477

Lisa D. Jones  
Executive Director  
State Historic Preservation Officer

July 6, 2020

Patrick O'Day  
Corps of Engineers  
P.O. Box 2288  
Mobile, AL 36628-0001

Re: AHC 20-1051  
CRA  
Mobile Harbor Phase II Diver Verification Survey Report  
Mobile County

Dear Mr. O'Day:

Upon review of the cultural resource assessment conducted for the above referenced project, we have determined that project activities will have no effect on cultural resources eligible for or listed on the National Register of Historic Places. Therefore, we concur with the proposed project activities.

Consultation with the State Historic Preservation Office does not constitute consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public. If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal, and glass objects. The federal agency or the applicant receiving federal assistance should contact our office immediately. If human remains are encountered, the provisions of the Alabama Burial Act (*Code of Alabama* 1975, §13A-7-23.1, as amended; Alabama Historical Commission Administrative Code Chapter 460-X-10 Burials) should be followed. This stipulation shall be placed on the construction plans to insure contractors are aware of it.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Amanda McBride at 334.230.2692 or [Amanda.McBride@ahc.alabama.gov](mailto:Amanda.McBride@ahc.alabama.gov). Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

A handwritten signature in blue ink that reads "Lee Anne Wofford".

Lee Anne Wofford  
Deputy State Historic Preservation Officer

LAW/amh

## **Section 103 Concurrence from EPA**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW  
ATLANTA, GEORGIA 30303-3104

July 14, 2020

Mr. Todd A. Nettles  
Acting Chief-Planning and Environmental Division  
U.S. Army Corps of Engineers-Mobile District  
P.O. Box 2288  
Mobile, Alabama 36628

Dear Mr. Nettles:

This letter is in response to your request for concurrence on the proposed disposal of new work dredged material from the Mobile Harbor GRR Project into the Mobile Ocean Dredged Material Disposal Site (ODMDS). We received your concurrence request and evaluation of dredged material suitability on June 16, 2020 with additional information provided on July 6, 2020.

Pursuant to Section 103(c) of the Marine Protection, Research, and Sanctuaries Act (Act), as amended, concurrence from the U.S. Environmental Protection Agency is based upon compliance with the criteria, conditions and restrictions established pursuant to Sections 102(a) [environmental criteria], and Section 102(c) [disposal site designation and management] of the Act. Based upon our review of the information you provided, we concur that the proposed new work dredged material from the Mobile Harbor GRR Project meets the criteria for ocean disposal as proposed and with the conditions described below.

The proposed project includes new work dredging parts of the navigation channel segments of the Mobile Harbor Federal Navigation Project including the River Channel, the Bay Channel, and Bar Channel. The Choctaw Pass Turning Basin is also included. Dredged material volumes are estimated to be approximately 17 million cubic yards.

Our concurrence on the disposal of this material is contingent upon compliance with all specifications and conditions of the Mobile ODMDS Site Management and Monitoring Plan (SMMP). Specifically, disposal shall occur no less than 330 feet (100 meters) inside the site boundaries of the ODMDS. In accordance with the SMMP, the USACE or site user is required to conduct post-disposal bathymetric surveys within 30 days and submit a final disposal summary report to the EPA within 90 days of project completion. Disposal will be completed prior to leaving the ODMDS boundaries as indicated by hull status showing that the hopper doors are closed. All reporting should be consistent with the SMMP. Notification of initiation must be provided 15 days in advance of the start date to EPA. Disposal monitoring data

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shall be provided to the EPA electronically on a weekly basis. The operator shall notify the USACE and the EPA within 24 hours if a violation of the contract and/or concurrence conditions occur during disposal operations. At no time may any debris be placed in the ODMDS. In addition, the SMMP also requires that monitoring and precautions be taken to protect sea turtles and Gulf sturgeon when using hopper dredges in accordance with the National Marine Fisheries Service *Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by Corps Galveston, New Orleans, Mobile, and Jacksonville Districts*, or any version current as of the time of dredging and disposal. This concurrence is based on dredging by hydraulic methods and load volumes not to exceed 15,000 cubic yards. Furthermore, this concurrence is conditioned on the EPA's review and approval of any relevant sections of dredging contract specifications addressing ocean disposal.

A copy of the current SMMP (amended version of March 2019) must be provided to the contractor (or prospective contractors) and EPA must be notified that the document has been provided to them. If possible, it may be worthwhile to share the upcoming SMMP revision to avoid potential issues once that SMMP becomes effective.

The EPA reserves the right to provide an amended concurrence if changes are required to manage the ODMDS. Revisions to the SMMP may also require the EPA to provide an amended concurrence.

The EPA's concurrence is effective for a three-year period as of the date of this letter. If you have any questions concerning this letter, please contact Dr. Wade Lehmann at (404) 562-8082.

Sincerely,

**JEANEANNE  
GETTLE** Digitally signed by  
JEANEANNE GETTLE  
Date: 2020.07.14  
08:45:24 -04'00'  
Jeaneanne M. Gettle, Director  
Water Division





**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW  
ATLANTA, GEORGIA 30303-3104

July 17, 2020

Mr. Todd A. Nettles  
Acting Chief  
Planning and Environmental Division  
U.S. Army Corps of Engineers  
Mobile District  
P.O. Box 2288  
Mobile, Alabama 36628

Dear Mr. Nettles:

The purpose of this letter is to correct an error that was included in the letter from the U.S. Environmental Protection Agency dated July 14, 2020 in response to your request for concurrence on the proposed disposal of new work dredged material from the Mobile Harbor GRR Project into the Mobile Ocean Dredged Material Disposal Site. Specifically, the EPA's letter dated July 14, 2020 which is attached for your reference, stated that the EPA's concurrence is based on dredging by hydraulic methods and load volumes not to exceed 15,000 cubic yards. The correct restrictions for load volumes are included in the table below and supersede the restrictions for load volumes included in the EPA's letter dated July 14, 2020. All other conditions identified in the prior letter remain effective.

<b>Dredging Unit</b>	<b>Load restriction</b>
DU3	15,000 cy
DU4A	15,000 cy
DU4B	15,000 cy
DU5A	15,000 cy
DU5B	13,500 cy
DU6A	13,000 cy
DU7A	15,000 cy
DU08	Excluded
DU09	Excluded
DU10	Excluded
DU11	Excluded
DU12	15,000 cy

The EPA's concurrence is effective for a three-year period as of July 14, 2020. If you have any questions concerning this letter, please contact Dr. Wade Lehmann at (404) 562-8082.

Sincerely,

Jeaneanne M. Gettle, Director  
Water Division

Enclosure

# **Mobile Harbor ODMDS Site Management and Monitoring Plan (SMMP)**



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
CORPS OF ENGINEERS, MOBILE DISTRICT  
P.O. BOX 2288  
MOBILE, AL 36628-0001

CESAM-PD-E

22 February 2019

MEMORANDUM FOR THE DISTRICT COMMANDER

SUBJECT: Mobile 4.75-square nautical mile (nm<sup>2</sup>) Ocean Dredged Material Management Site (ODMDS) Site Management and Monitoring Plan (SMMP)

1. PROBLEM. It is the responsibility of the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) pursuant to Section 102 of the Marine, Protection, Research and Sanctuaries Act (MPRSA) of 1972 to manage and monitor each designated ODMDS. All ODMDSs must have a current SMMP in order to actively utilize the site for dredged material placement. The SMMP for the Mobile 4.75-nm<sup>2</sup> ODMDS must be extended for 2 years to ensure continue maintenance operations can occur for the Federal Mobile Harbor navigation project.

2. RECOMMENDATION. It is recommended that the District Commander initial the enclosed Memorandum.

APPROVED 24 SEE ME \_\_\_\_\_ OTHER \_\_\_\_\_

3. BACKGROUND AND DISCUSSION.

a. The existing Mobile 4.75 nm<sup>2</sup> ODMDS was previously designated by the EPA in accordance with Section 102 of the MPRSA of 1972. Continued use of this 4.75 nm<sup>2</sup> site is necessary until EPA finalizes its rule-making effort to designate the 24-nm<sup>2</sup> ODMDS, which overlays and expands the existing smaller site.

b. EPA in conjunction with the USACE published the SMMP for the Mobile 4.75 nm<sup>2</sup> ODMDS on 30 April 2015. In anticipation of completing an expansion of the Mobile ODMDS prior to 2019, the 2015 SMMP was developed for use on a short-term basis and included an expiration date of 29 April 2019. However, the process to complete the expansion of the Mobile ODMDS has taken longer than initially anticipated, thereby warranting an extension of the effective period of the 2015 SMMP not to exceed an additional two years. During this time, it is expected that the expansion of the ODMDS, and development of a new SMMP for the expanded site, will be complete. The Memorandum will serve as an addendum to the 2015 SMMP to extend the expiration of the current SMMP from 29 April 2019, until such time as the final rulemaking for the proposed expansion of the Mobile ODMDS is completed and goes into effect, or to 29 April 2021, whichever occurs sooner.

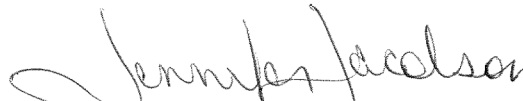
CESAM-PD-E

22 February 2019

SUBJECT: Mobile 4.75-square nautical mile (nm<sup>2</sup>) Ocean Dredged Material  
Management Site (ODMDS) Site Management and Monitoring Plan (SMMP)

4. IMPACTS. Without the District Commander's signature, use of the ODMDS would be discontinued and navigation utilizing the Federal Mobile Harbor channel would be impeded.

5. MOBILE DISTRICT POC. Please contact the undersign at (251) 690-2724.



JENNIFER L. JACOBSON  
Chief, Environment and Resources  
Branch

Encls

**MEMORANDUM**

**SUBJECT:** Extension to the current expiration date of the Site Management and Monitoring Plan for the Mobile Ocean Dredged Material Disposal Site

**FROM:** Mary S. Walker, Acting Regional Administrator  
U.S. Environmental Protection Agency, Region 4

*MSW* 2/15/2019

Sebastian P. Joly, Colonel, Corps of Engineers  
District Commander, Mobile District

*SJP* 2/4/19

**TO:** File

Pursuant to the Water Resources Development Act Amendments of 1992 (WRDA 92) to the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), the Environmental Protection Agency, Region 4 (EPA), in conjunction with the U.S. Army Corps of Engineers, Mobile District (USACE), published the Site Management and Monitoring Plan (SMMP) for the Mobile Ocean Dredged Material Disposal Site (Mobile ODMDS) on April 30, 2015. In anticipation of completing an expansion of the Mobile ODMDS prior to 2019, the 2015 SMMP was developed for use on a short-term basis and included an expiration date of April 29, 2019. However, the process to complete the expansion of the Mobile ODMDS has taken longer than initially anticipated, thereby warranting an extension of the effective period of the 2015 SMMP not to exceed an additional two years. During this time, it is expected that the expansion of the ODMDS, and development of a new Site Management and Monitoring Plan for the expanded site, will be complete. Through this memorandum, which will serve as an addendum to the 2015 SMMP, the EPA and the USACE are extending the expiration of the current SMMP from April 29, 2019, until such time as the final rulemaking for the proposed expansion of the Mobile ODMDS is completed and goes into effect, or to April 29, 2021, whichever occurs sooner.

The MPRSA Section 102(c)(3), as amended by WRDA 92, sets forth several requirements regarding the content and development of site management plans, as follows:

*(a) A baseline assessment of conditions at the site;*

The initial baseline assessment of the Mobile ODMDS was conducted in 1985, as part of the Environmental Impact Statement process for the establishment of the site. This study included assessment of the physical, chemical, geological, and biological structure of the site, as well as consideration of the impacts of disposal at the ODMDS. More recently, a new baseline study was conducted in 2010 to assess baseline conditions at the proposed expanded Mobile ODMDS. This included further sampling at the existing site.

*(b) A program for monitoring the site;*

Since the initial baseline assessment conducted in 1985, a regular monitoring program examining the physical, chemical, and biological conditions at the site has been in

place. The most recent monitoring of the site was a Status and Trends study conducted in October of 2017. The survey found no significant differences in conditions inside and outside of the Mobile ODMDS, and no significant changes since the previous Status and Trends study conducted in 2009.

- (c) *Special management conditions or practices to be implemented at each site that are necessary for the protection of the environment;*

Based on the results of the most recent monitoring study conducted in 2017, the EPA and USACE found no need to change or alter the management conditions and practices currently in place at the Mobile ODMDS (as described in the current SMMP), as these management conditions and practices are still appropriate.

- (d) *Consideration of the quantity of the material to be disposed of at the site, and the bioavailability of the contaminants in the material;*

Projected volumes and rates of operation and maintenance (O&M) dredged material disposal for existing projects during the next few years, from both Federal and private applicants, are expected to be similar to disposal volumes and rates from previous years. Since 2012, open-water in bay thin-layer disposal of dredged material has been utilized for the disposal of some of the O&M dredged material. This has decreased the average O&M material being disposed of in the Mobile ODMDS from 4,400,000 to 2,900,000 cubic yards annually. However, the Alabama State Port Authority has proposed a project to deepen and widen portions of the Federal Mobile Harbor Navigation project. This proposed project could potentially add an approximate 24,000,000 cubic yards of new work material and an associated increase of 2,000,000 cubic yards in annual O&M material to the amount of sediment being disposed of at the Mobile ODMDS. In the future, further deepening and widening of the Mobile Harbor Navigation project could add a total of approximately 100,000,000 cubic yards of material to the Mobile ODMDS.

All material to be disposed of at the Mobile ODMDS will continue to be tested to the level outlined in Section 103 of the MPRSA, as well as in Title 40 of the Code of Federal Regulations, Parts 220-228. The suitability of the dredged material for ocean disposal must be verified by the USACE and the EPA prior to disposal.

- (e) *Consideration of the anticipated use of the site over the long term, including the anticipated closure date for the site, if applicable, and any need for management of the site after the closure of the site; and*

The current site does not have the capacity to accommodate the projected amount of material that is expected to be disposed at the Mobile ODMDS during the next ten years. As a result of the proposed Mobile Harbor expansion project, as well as regular new work and O&M needs, the EPA has proposed to expand the current Mobile ODMDS from its current 4.75 square nautical mile (nmi<sup>2</sup>) size to an area of approximately 23.8 nmi<sup>2</sup>. The draft Environmental Assessment and draft SMMP for

the expanded site was provided for public notice and comment on September 24, 2018. The expanded site coordinates and new SMMP would supersede the current site and SMMP when finalized.

In the interim period, remaining site capacity at the current Mobile ODMDS will be closely monitored. The SMMP for the existing Mobile ODMDS outlines several monitoring strategies and thresholds for action, including ensuring a safe navigable depth of the site, which will be implemented if necessary.

- (f) *A schedule for review and revision of the plan (which shall not be reviewed and revised less frequently than 10 years after the adoption of the plan, and every 10 years thereafter).*

The current SMMP was signed on April 30, 2015, and has been in place for approximately four years. Typically, SMMPs are in place for a period of ten years before they are revised. The current SMMP was initially established for a shorter period, in anticipation of the completion of an expansion of the site by April 2019. Pursuant to this memorandum, the SMMP will remain effective until April 29, 2021, or the date an expansion of the ODMDS is effective, whichever occurs sooner. If an expansion of the ODMDS does not occur by April 29, 2021, a revised SMMP for the current Mobile ODMDS will be published before then.

Any questions related to the extension of the current SMMP for the Mobile ODMDS may be addressed to the Site Manager, Ms. Lena Weiss (404-562-9228 or weiss.lena@epa.gov).





Mobile Ocean Dredged Material Disposal Site

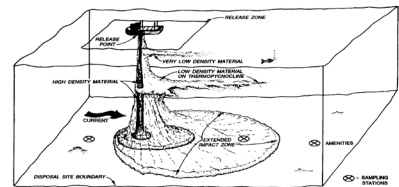
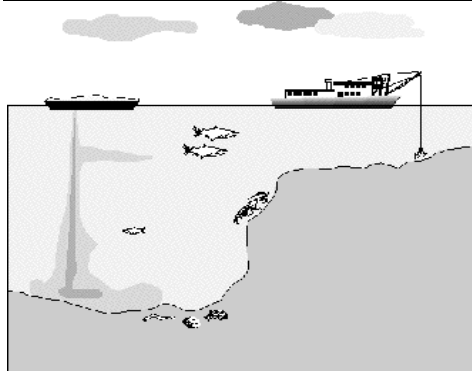
# SITE MANAGEMENT AND MONITORING PLAN

July 2020

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U.S. Army Corps  
of Engineers  
Mobile District





**MOBILE OCEAN DREDGED MATERIAL DISPOSAL SITE  
SITE MANAGEMENT AND MONITORING PLAN**

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# Mobile Ocean Dredged Material Disposal Site Site Management and Monitoring Plan (SMMP)

## 1.0 INTRODUCTION

Under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, it is the responsibility of U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) to monitor and manage Ocean Dredged Material Disposal Sites (ODMDS). The goal of this plan is to ensure that ocean dredged material disposal activities will not unreasonably degrade the marine environment or endanger human health or economic potential. MPRSA, as amended by the Water Resources Development Act (WRDA) of 1992, requires the development of a Site Management and Monitoring Plan (SMMP); a Memorandum of Understanding (MOU) of 2017 between the EPA and USACE specifically addresses the development of the SMMP for transportation and disposal of dredged material at ODMDS. The SMMP provisions are an integral part of all disposal activities at the site. EPA concurrence decisions under MPRSA section 103 regarding transportation and ocean disposal of dredged material will assure consistency with the SMMP.

Preparation of this SMMP has been informed by the Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites (EPA and USACE, 1996). This SMMP provides a framework for site monitoring and management as required by MPRSA. The SMMP may be revised if EPA in conjunction with USACE determine that changes are warranted, including as a result of information obtained during the monitoring process or other factors. The SMMP will be reviewed and revised as needed, or every ten years.

The Mobile ODMDS was designated in 1988 and modified in 2020. This SMMP will replace prior versions of the SMMP for the Mobile ODMDS.

### **1.1 Site Management and Monitoring Plan Team**

An interagency SMMP team has been established to assist EPA and the USACE in developing and revising this SMMP. The team consists of the following governmental agencies and their respective representatives:

USACE, Mobile District  
Mr. Matthew Lang

Alabama State Port Authority (ASPA)  
Mr. James K. Lyons

EPA, Region 4  
Dr. Wade Lehmann

Alabama Department of  
Environmental Management

Mr. Scott Brown

U.S. Coast Guard  
Sector Mobile Commander  
CAPT Ladonn Allen

National Oceanic and  
Atmospheric Administration  
Dr. Roy Crabtree

Other agencies, such as the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the Bureau of Ocean Energy Management (BOEM) are invited to participate where appropriate. EPA and the USACE evaluated existing monitoring data, the type of disposal (i.e., operations and maintenance (O&M) vs. new work), the type of material (i.e., sand vs. silts/clays), location of dredged material placement within the ODMS, and quantity of material. The team assists EPA and the USACE on deciding on appropriate monitoring techniques, level of monitoring, significance of results, and potential management options.

Specific responsibilities of EPA and the USACE are:

EPA: EPA is responsible for designating/de-designating MPRSA Section 102 ODMSs, regulating site use, developing and implementing disposal monitoring programs, evaluating environmental effects of disposal of dredged material at these sites, and for reviewing and concurring on dredged material suitability determinations.

USACE: The USACE is responsible for evaluating dredged material suitability, issuing MPRSA Section 103 permits, and cooperating with EPA in regulating site use and developing and implementing disposal monitoring programs.

The SMMP provisions apply for all dredged material disposal activities at the site, including monitoring and management activities by the federal agencies, but also include template provisions for USACE to include in subsequently issued permits (see Appendix B) or in the transportation and disposal requirements for a Federal project (see Appendix C). References in this document to matters that “will be required” refers to implementation in a subsequent proceeding to authorize disposal of dredged material, whether in a permit, in contract or other Federal project specifications for the transportation and disposal of dredged material, or by the Corps directly. This SMMP does not itself impose binding requirements or obligations, though the SMMP does identify binding rights and obligations established by other final agency actions. The site designation regulation at 40 CFR 228.15(H)14 requires compliance with section 2.8 of this SMMP. Other than section 2.8, matters that “will be required” will be implemented through application of the template language included in the Appendices or the language may vary from the terms of the Appendices. The issuance of this SMMP does not determine the rights or obligations of any third party. EPA can ensure

implementation of the template provisions as necessary through EPA's concurrence actions. All MPRSA Section 103 ocean disposal permits or contract specifications will assure implementation of the SMMP.

## 2.0 SITE MANAGEMENT

Section 228.3 of the Ocean Dumping Regulations (40 Code of Federal Regulation (CFR) 220-229) states: "Management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation." The SMMP may be modified if it is determined that such changes are warranted as a result of information obtained during the monitoring process. MPRSA, as amended by WRDA 92, provides that the SMMP shall include but not be limited to:

- A baseline assessment of conditions at the site;
- A program for monitoring the site;
- Special management conditions or practices to be implemented at each site that are necessary for the protection of the environment;
- Consideration of the quantity and biological/physical/chemical characteristics of dredged materials to be disposed of at the site;
- Consideration of the anticipated use of the site over the long-term; and
- A schedule for review and revision of the plan.

### 2.1 Disposal Site Characteristics

The designation of the Mobile ODMDS is published at 40 CFR 228.15(h)(14). Coordinates in the regulation are provided in NAD 83 (Table 1). The Mobile ODMDS is a 23.8 square nautical mile (nmi<sup>2</sup>) area.

Table 1. Site Coordinates

Geographic (NAD 83)	
30°13.0'N	88°08.8'W
30°09.6'N	88°04.8'W
30°08.5'N	88°05.8'W
30°08.5'N	88°12.8'W

30°12.4'N	88°12.8'W
-----------	-----------

The site lies on the shallow continental shelf, 4 nmi offshore of Mobile Point, Alabama, with an average depth of approximately 42 feet (Figure 1). Physical and biological conditions at the ODMDS are described in, "Environmental Assessment for Modification of the Mobile ODMDS, Mobile, Alabama." (EPA, 2020).

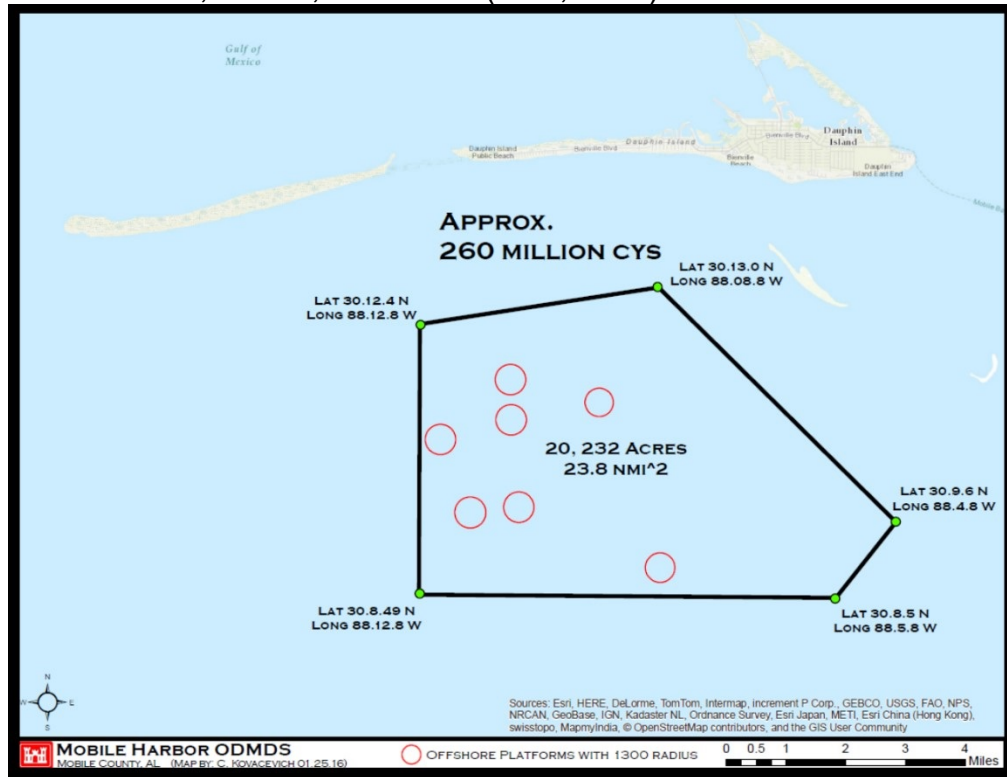


Figure 1. Mobile ODMDS Location Map

### 2.2 Management Objective

Appropriate management of an ODMDS is aimed at assuring that disposal activities do not unreasonably degrade or endanger human health, welfare, the marine environment or economic potentialities (MPRSA §103(a)). The primary objectives in the management of these ODMDSs are:

- Protection of the marine environment;
- Documentation of disposal activities and compliance; and
- Maintenance of a long-term disposal alternative for dredged material, while encouraging beneficial use of dredged material where practicable.



### **2.3 Disposal History and Dredged Material Volumes**

Disposal history can be found at the Ocean Disposal Database maintained by the USACE (<https://odd.el.erdc.dren.mil>). The Mobile ODMDS has been used for disposal of approximately 125 million cubic yards (cys) since 1987 (Table 2). Currently, the average annual disposal volume for the Mobile Harbor navigation maintenance is approximately 4.4 million cys. The composition of the dredged material is primarily silts and clays. Additionally, the Mobile Harbor Turning Basin (MHTB) constructed in 2010 requires annual maintenance dredging of approximately 400,000 cys, which may go to the ODMDS. Future volumes and rates of disposal, from both Federal and private applicants, are expected to be similar to previous years. However, this estimate may increase if it is determined feasible to improve the Mobile Harbor Federal Navigation Project (FNP) to its congressionally authorized dimensions. Additionally, approximately 300,000 cys of sandy material is removed from the Bar channel annually and placed in the Sand Island Beneficial Use Area (SIBUA), rather than the Mobile ODMDS to which this SMMP applies.

<b><u>Date</u></b>	<b><u>Quantity in Cubic Yards</u></b>
1987	101,400
1989	16,000,000
1990	6,755,400
1991	6,888,500
1992	4,939,400
1993	1,945,300
1994	2,400,000
1995	2,636,600
1996	3,028,400
1997	5,503,100
1998	7,425,100
1999	2,617,000
2000	5,911,300
2001	4,593,800
2002	4,101,400
2003	6,785,700
2004	7,848,900
2005	3,223,900
2006	2,546,600
2007	1,952,800
2008	2,235,993
2009	5,979,800
2010	4,361,670
2011	3,500,844
2012	1,592,204

2013	1,901,591
2014	2,037,900
2015	652,338
2016	2,200,000
2017	1,027,500
2018	2,319,480
<b>Total 125,013,920 disposed</b>	

Table 2. Mobile ODMDS disposed material volume

A change in dredging operations occurred in July 2014 with the permanent reinstatement of in-bay open-water disposal practices associated with operation and maintenance (O&M) dredged material (Public Notice FP14-MH01-10). The USACE, Mobile District anticipates approximately 1.5 million cys of material dredged from within Mobile Bay could potentially be placed, annually, at in-bay disposal areas adjacent to the Federal Mobile Harbor navigation project where it will be regulated under Section 404 of the Clean Water Act. Thus, of the anticipated volumes to be dredged annually from the Mobile Harbor Bay channel in order to maintain the existing Federal Mobile Harbor navigation project, only approximately 2.9 million cys of sediment are anticipated to be transported to and disposed of at the Mobile ODMDS.

The Mobile ODMDS has been determined to be a dispersive site, meaning disposed materials are expected to move outside the site boundaries over time, particularly during hurricane season (Byrnes *et al.*, 2010). However, the degree of dispersiveness of the site, and consequently the ultimate capacity of the Mobile ODMDS, is subject to unpredictable variability.

## **2.4 Dredged Material Characteristics**

### 2.4.1 Mobile Harbor FNP

Grain size characteristics of the shoal material dredged from the Mobile Harbor FNP varies with location within the system. Shoal material from the Mobile River portions of the project is typically 46.3% sand and 52.3% silts/clays. Upper Mobile Bay sediments range from 8.7 -61.2% sand and 38.8-91.3% silts/clays. Sands within the Lower Mobile Bay range from less than 1% to 87.4%, whereas the silt/clay fraction accounts for 12.6 to 99% of the shoal material. Sediments from the Turning Basin are typically 66.3% sands and 34.1% silts/clays.

### 2.4.2 Associated Beach Quality Materials

USACE Beneficial Use of Dredged Material Engineer Manual (EM) 1110-2-5026 requires dredged material be maximized within the coastal system. Dredged materials that qualify for beach or near-shore placement per the applicable State standards shall

be beneficially placed in such locations, to the maximum extent practicable. It is expected that the applicable State will exercise its authority and responsibility, regarding beach nourishment, to the full extent during any future permitting activities. Beneficial use of beach compatible dredged material for beach nourishment is strongly encouraged and supported by EPA. Most sandy material is placed in the SIBUA located due east of the ODMDS, rather than at the ODMDS, to which this SMMP applies.

#### 2.4.3 Dredged Material Quality Verification

The suitability of dredged material for ocean disposal must be verified by the USACE and agreed to via written concurrence from EPA prior to transportation and disposal. EPA prepares its concurrences on sediment disposal at the ODMDS to be valid for up to three years, on a project specific basis, consistent with the three-year duration of USACE authorizations per 33 CFR 325.6.

Sediment quality verification process:

- 1) Case-specific evaluation against the exclusion criteria (40 CFR 227.13(b))
- 2) Determination of testing requirements for non-excluded material based on the potential of sediment contamination since last verification.
- 3) When applicable, conduct testing and confirm the suitability of non-excluded material for ocean disposal.

The permittee, project sponsor, or USACE completes documentation for suitability prior to use of the ODMDS in the form of a MPRSA Section 103 Evaluation.” Potential testing and the evaluation follow the procedures outlined in the 1991 EPA/USACE Dredged Material Testing Manual and 2008 Southeast Regional Implementation Manual (SERIM), or the appropriate updated version. Necessary testing and evaluation include descriptions of how dredging projects will be subdivided into project segments for sampling and analysis. Appendix C of the SERIM outlines the form used for the MPRSA Section 103 Evaluation. Water Quality Compliance determinations will be made using the STFATE (ADDAMS) model. Only material determined to be suitable and in compliance with the Ocean Dumping Criteria (40 CFR Part 227) through the verification process by the USACE and EPA Region 4 is appropriate for transportation and disposal in the ODMDS.

#### **2.5 Time of Disposal**

At present no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biotic activity at the Mobile ODMDS.

#### **2.6 Disposal Technique**

No specific disposal technique is required for these sites. In order to protect sea turtles and Gulf sturgeon, however, the National Marine Fisheries Service (NMFS), Protected Resources Division (PRD) requires monitoring according to the *Regional Biological*

*Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining (“Borrow”) Areas Using Hopper Dredges by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts* (NMFS, 2003 and amended 2005 & 2007). Site users transiting and disposing at the ODMDS will be required to employ standard surveillance and evasive measures to protect sea turtles and marine mammals.

### **2.7 Disposal Location**

The regulation at 40 CFR §227.28 requires that all disposals occur at least 330 feet (100 meters) inside ODMDS boundaries to prevent material from leaving the site. Release zones will be established by the EPA and the USACE at the time of site use to maintain compliance with the Ocean Dumping Criteria set forth in 40 CFR Part 227. Disposal will be initiated within the applicable release zone boundary and completed (i.e. doors closed) prior to leaving the ODMDS. Placement methods, which prevent mounding of dredged materials from becoming an unacceptable navigation hazard, must be used. Dredged material shall be disposed so that at no point will depths less than -25 feet Mean Lower Low Water (MLLW) occur (i.e., a clearance of 25 feet of water depth will be maintained). Disposal shall not occur closer than 1,300 feet to any oil and gas rigs that are present within the site boundaries. Disposal shall not occur closer than 500 feet to any historic properties that are present within the site boundaries. Those portions of the site that have been in continuous use are eligible for disposal. Updated maps of disposal locations at the Mobile ODMDS are available from EPA Region 4 or USACE Mobile District.

If necessary, the Corps may propose to use the previously unutilized (no disposal has been performed) portions of the ODMDS (the western portion) that were previously evaluated in a 1983 geotechnical survey. If the Corps proposes to use any portion of the previously unused area, the Corps will delineate the intended area and implement procedures as outlined in “Programmatic Agreement for the Mobile Harbor General Reevaluation Study (Project)” dated June 28, 2019, between USACE South Atlantic Mobile District and Alabama Historic Commission in order to protect potential historic properties. During the EPA’s MPRSA Section 103 evaluations for proposed disposal of dredged material in the ODMDS, the EPA will include any necessary limitations regarding the location of dredged material disposal as a condition of concurrence decisions in order to prevent impacts to potential historic properties. The USACE Mobile District and the EPA Region 4 will provide a map denoting area to be avoided, upon request.

### **2.8 Summary of Transit and Disposal Requirements in the SMMP**

The site designation regulation at 40 C.F.R. 228.15(H)14, requires that transit and disposal at the Mobile ODMDS comply with the provisions of the SMMP that are identified in Table 3. Further, the disposal monitoring and post-disposal monitoring

requirements described under Section 3.0. Site Monitoring will be included with the management requirements described in this section as permit conditions on all MPRSA Section 103 permits and will be incorporated in the contract language for all federal projects. Draft language provided by USACE is available for this purpose to be included by USACE in permits (Appendix B) and contracts (Appendix C). EPA's concurrence review will confirm implementation.

Table 3. Summary of Disposal Requirements.

Requirement	Reference
Dredged Material Quality Verification	Mobile ODMDS SMMP 2.4.3
Disposal Technique	Mobile ODMDS SMMP 2.6
Disposal Location	Mobile ODMDS SMMP 2.7
Leakage	Mobile ODMDS SMMP 3.2
Marine Mammal Avoidance	Mobile ODMDS SMMP 2.6
Bathymetric surveys	Mobile ODMDS SMMP 3.1 and 3.3
Disposal Monitoring	Mobile ODMDS SMMP 3.2
Reporting Requirements	Mobile ODMDS SMMP 3.5

### **2.9 Ocean Dumping Criteria (ODC) Compliance Process**

All disposal of dredged material in the ocean must comply with the ODC and EPA reviews the demonstrations of compliance when reviewing permits and projects for concurrence. Projects that are not Federal Civil Works, or other federal projects involving ocean disposal of dredged material, require an ocean dumping permit issued by the USACE pursuant to Section 103 of the MPRSA. Federal Civil Works projects, though not required to have a permit, must adhere to the same criteria, factors to be evaluated, procedures, and requirements that apply that apply to permits, including the process for evaluation of the project, and must receive EPA's concurrence prior to awarding any contract for transportation and disposal of dredged material at an ODMDS. A summary of the permitting process can be found at:

<https://www.epa.gov/ocean-dumping/ocean-disposal-dredged-material>.

### **2.10 Information Management of Dredged Material Disposal Activities**

As part of site management, EPA and the USACE will continue to investigate alternatives for appropriate data management. The USACE has an Ocean Disposal Database (<https://odd.el.erdc.dren.mil/>) maintained by the Engineering Research and Development Center (ERDC). This database provides the quantities disposed of at the ODMDS and whether the project is from a civil works project or private entity. EPA Region 4 and USACE South Atlantic Division (SAD) have agreed on using an extensible Markup Language (XML) standard for sharing of disposal monitoring data (see also Section 3.5).

## 3.0 SITE MONITORING

Under the SMMP, site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site, as well as to verify compliance with the site designation criteria, any special management conditions, and permit requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs. The intent of the program is to provide the following:

- (1) Information indicating whether the disposal activities are occurring in compliance with the permit and site restrictions;
- (2) Information indicating the short-term and long-term fate of materials disposed of in the marine environment.
- (3) Information concerning the short-term and long-term environmental impacts of the disposal;

The main purpose of a disposal site monitoring program is to determine whether dredged material site management practices, including disposal operations, at the site need to be changed to avoid significant adverse impacts.

### **3.1 Baseline Monitoring**

The results of investigations presented in the designation EIS (EPA, 1987) and subsequent surveys listed in Table 4 serve as the main body of data for the monitoring of impacts associated with use of the Mobile ODMDS and serve, in part, as baseline data for future use of the ODMDS. Previous monitoring studies included the ODMDS as well as the surrounding environs, therefore EPA has a database which can serve as baseline data for future monitoring. The most recent survey of the benthic communities within and surrounding the Mobile ODMDS was conducted in October 2017. Because the expansion plans had already been finalized, this survey covered all areas needed to secure an adequate baseline that could be used for future impacts assessment. The results of the most recent survey are summarized below. A bathymetric survey will be conducted by the USACE or site user within three (3) months prior to project disposal for projects expected to exceed 50,000 cys in the area to be utilized within the ODMDS. Bathymetric surveys will be used to monitor the dredged material to ensure a navigation hazard is not produced, to assist in verification of material disposal and containment in the site, to monitor bathymetry changes and trends and to ensure that the site capacity is not exceeded (i.e., the dredged sediments do not exceed the site boundaries at depths expected to have impacts to the benthos) nor are too shallow. Surveys will conform to the minimum performance standards for Corps of Engineers Hydrographic

Surveys for “Other General Surveys & Studies” as described in the USACE Engineering Manual, EM1110-2-1003, *Hydrographic Surveying* dated November 30, 2013 [[http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM\\_1110-2-1003.pdf?ver=2014-01-06-155809-307](http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2-1003.pdf?ver=2014-01-06-155809-307)]. The number and length of transects required will be sufficient to encompass the zone of use and a 500-foot wide area around the release zone. The surveys will be taken along lines spaced at 500-foot intervals or less. The minimum performance standards from Table 3-1 of EM 1110-2-1003, *Hydrographic Surveying*, will be followed. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing a differential global positioning system. The vertical datum will be referenced to prescribed National Oceanic and Atmospheric Administration (NOAA) MLLW datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for that area or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83). No additional pre-disposal monitoring is required.

Table 4. Surveys and Studies Conducted in the vicinity of the Mobile ODMDS

Survey/Study Title	Conducted By:	Date	Purpose	Results
Analysis & Synthesis of Oceanic Conditions in the Mississippi Sound Offshore Region	USACE	March 1984	Determine the direction and amount of sediment transport from a dredged material disposal site.	Circulation patterns within the site are controlled by astronomical tides, winds, and freshwater discharges.
Sediment Mapping	UGA Center for Applied Isotopes for EPA	2002	Characterization of bottom sediments using gamma spectrometry.	Baseline Survey
Mobile ODMDS Expansion Survey	USACE/EPA	October 2009	Collect physical, chemical and biological data on sediments and water.	Collected and analyzed 30 sediment and 10 water samples covering entire ODMDS.
Mobile ODMDS Post Oil Spill Sediment Sampling	USACE	December 2010	Determine if any oil from the Deep-Water Horizon Oil Spill has contaminated the sediments.	Test results published February 2011 indicate there were no discernible changes in the sediment quality attributed to the Deepwater Horizon Oil Spill.
Bathymetric Survey	USACE	Before and After Event	Monitor bathymetry changes.	Safe navigation depths have been maintained.

Trends assessment survey	EPA	October 2017	Examine potential changes to chemical, biological, and physical characteristic within the used portion of the ODMDS and to establish background data on the same for the unused portion.	Fine sediments are present on the northern boundary of the site and become larger (sand) to the south. Arsenic is naturally present at all sites. Dioxins were detectable at all sites, but not above levels of concern. Macroinvertebrate statistics were the same inside the previously utilized portions of the site as those not utilized. Overall, data present that no significant changes have occurred at the site due to disposal of dredged material.
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In 2017, the macroinfauna taxa dominating the assemblages at stations both inside and outside the ODMDS were very similar and typical of those found in nearshore shallow water benthic habitats (Felder and Kemp 2009). In 2017, taxa richness, densities, and diversity at stations inside the active ODMDS site were not significantly different when compared to 2009. There was no significant difference in taxa richness, density, and diversity between stations inside and outside the ODMDS in 2017 (US EPA, 2017). These data indicate that the abundance and diversity of the macroinfaunal assemblages in the active ODMDS site have reached background levels.

**3.2 Disposal Monitoring**

For all disposal activities, permits and projects will require use of an electronic tracking system (ETS). Appendices B and C provide template language. An ETS provides surveillance of the transportation and disposal of dredged material. An ETS is maintained and operated to continuously track the horizontal location and draft condition (accuracy± 0.1 foot) of the disposal vessel (i.e. hopper dredge or disposal scow) from the point of dredging to the disposal site and return to the point of dredging. Data shall be collected at least every 0.25 nautical mile or every four minutes during travel to and from the ODMDS and every 12 seconds or every 30 feet of travel within the ODMDS and while hull status is open. In addition to the continuous tracking data, the following trip information shall be electronically recorded for each disposal cycle:

- a. Load Number
- b. Disposal Vessel Name and Type (e.g. scow)
- c. Estimated volume of Load
- d. Description of Material Disposed
- e. Source of Dredged Material



f. Date, Time and Location at Initiation and Completion of Disposal Event

It is expected that disposal monitoring will be conducted utilizing the Dredge Quality Management (DQM) system [see <http://dqm.usace.army.mil/Specifications/Index.aspx>], or equivalent acceptable system. Disposal monitoring and ETS data will be reported to EPA Region 4 on a weekly basis (within one week of disposal) utilizing the eXtensible Markup Language (XML) specification and protocol per Section 3.5. EPA Region 4 and the USACE District require notification within 24 hours if disposal occurs outside of the ODMDS or specified disposal zone, if excessive leakage occurs, if hull open status occurs outside the ODMDS, or other violation of the conditions in this SMMP occur. Correspondence will be required to explain how the issue was addressed, pertinent dates, and corrective actions to be implemented to prevent repetition in the future.

### **3.3 Post Discharge Requirements**

The USACE, or other site user, will be required to conduct a bathymetric survey consistent with the pre-disposal survey requirements within 30 days after disposal project completion. Surveys will not be required for projects less than 50,000 cys. If a release zone is utilized and adhered to, the number and length of transects required will be sufficient to encompass the release zone and a 500-foot wide area around it. Bathymetric surveys will be required to monitor the disposal mound to ensure a navigation hazard is not produced, to assist in verification of material disposal, to monitor bathymetry changes and trends, and to ensure that the site capacity is not exceeded, i.e., the dredged sediment does not exceed the site boundaries on disposal.

### **3.4 Disposal Effects Monitoring**

Based on the type and volume of material disposed, various monitoring techniques can be used to examine if the disposed dredged material is moving and in what direction. There are also techniques to assess potential environmental effects that the material is having on the site and adjacent areas. At the current time, no nearby biological resources (hard-bottom habitat) have been identified that are likely to be impacted by disposal operations at the ODMDS. The Mobile ODMDS is at least one nautical mile from all known fish havens, artificial reefs, and fishing areas. The site has been characterized as dispersive, meaning material is likely to move outside the site boundaries over time due to ocean currents and that disposed dredged material does not move in distinct mounds, but instead blends with the surrounding environment causing a progressive transition to sediments containing a higher percentage of silt and clay consistent with the composition of the material found on the north side of the ODMDS. Changes in sediment composition will likely alter the benthic community structure. However, based on previous benthic studies, it is unlikely that permanent or long-term adverse impacts will result due to changes in sediment composition. At a minimum, a Trend Assessment Survey (40 CFR 228.13) will be conducted approximately every ten years. The Trend Assessment surveys focus on overall health

and viability of the benthic communities and compare areas where disposal has occurred to areas where it has not. Such a survey will be used to detail temporal changes that may be occurring across benthic communities in the northern Gulf of Mexico relative to the ODMDS.

Based on the type and volume of material disposed and impacts of concern, various monitoring surveys can be used to examine whether the disposed dredged material is moving, where it moves, and the environmental effect the material on the site and adjacent areas. A tiered approach will be utilized to determine the level of monitoring effort required following each disposal event. At a minimum, bathymetry will be required to be conducted after all disposal events in excess of 50,000 cubic yards, along with requirements for detailed summary project reports certifying either total compliance with all disposal requirements, or explanations of when and where any deviations occur accompanied by a description of actions taken to remedy the cause for such deviations. Template language for contracting for use of the ODMDS is contained in Appendix C.

A tiered strategy for a monitoring program is desirable. With a tiered approach, an unacceptable result may trigger further and often more complex monitoring. Continuous monitoring of all physical, chemical, and biological parameters and resources in and around the ocean dredged material disposal site is not necessary. A monitoring program should be structured to address specific questions (hypotheses) and measure key indicators and endpoints, particularly those defined during site designation or specific project issues that arise. For the Mobile ODMDS, the site expansion environmental assessment did not identify any hard bottoms in nearby waters as resources of concern. These resources were not present within, nor adjacent to, the site. Therefore, the benthic community will serve as the major indicator for identifying adverse impact from dumping. At a minimum, the Trend Assessment Study will be conducted approximately once every ten years. These surveys will be performed in accordance with 40 CFR 228.13. Results from these surveys will be used to assess the need for further, more detailed and complex studies. Table 5 shows how a progression from simple Trends study to Impact assessment studies may occur.

The SMMP Team will continue to use the phased approach to suggest appropriate monitoring techniques and level of monitoring required for a specific action. Team suggestions are based on type of disposal activity (i.e., O&M vs. construction), quality of material, location of placement activity within ODMDS, or quantity of material. EPA and USACE will ultimately determine the actual monitoring activities to be required.

Future surveys as outlined in Table 5 will focus on determining the rate and direction of disposed dredged material dispersal and the capacity of the ODMDS. Should future disposal at the Mobile ODMDS result in unacceptable adverse impacts, further studies may be required to determine the persistence of these impacts, the extent of the

impacts within the marine system, and/or possible means of mitigation. In addition, this SMMP may be revised based on the outcome of the monitoring program.

### ***3.5 Post-Disposal Monitoring***

The Corps or other site users will conduct a bathymetric survey for all projects which exceed 50,000 cubic yards within 30 days after disposal project completion.

Table 5. Site Monitoring Strategies and Thresholds for Action

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Monitor Bathymetric Trends	Bathymetry	Site User	Determine the extent of the disposal mound and major bathymetric changes.	Post- Disposal for projects greater than 50,000 cy.	Disposal mound occurs outside ODMDS boundaries.	Continue monitoring.	-Modify disposal method/disposal. -Restrict disposal volumes.
Model Bathymetric Capacity	Bathymetry and capacity modeling	Site User or USACE	Determine that large project volumes can be accommodated based on most recent bathymetry.	For any projects occurring after 2024 that are 5 million cy or larger.	Verify that disposal will remain in the ODMDS at proposed (maximal) volume.	No action.	-Modify disposal. -Restrict disposal volumes. -Expand or modify the site.
Benthic Effects Monitoring & Trend Assessment (40 CFR §228.13)	Sediment Mapping (Gamma/ CS <sup>3</sup> )	EPA	Determine aerial influence of dredged material.	Approximately every 10 years.	-Absence of pollution sensitive biota from the site.	Continue monitoring on prescribed schedule.	-Conduct Environmental Effects Monitoring or Advanced Environmental Effects Monitoring. -Review dredged material evaluation procedures and amend, if necessary. Discontinue site use. De-designate site.
	Water and Sediment Quality, Benthic Community Analysis (40CFR §228.13)	EPA	Periodically evaluate the impact of disposal on the marine environment (40CFR §228.9).	Approximately every 10 years.	-Progressive non-seasonal changes in water or sediment quality.		
Environmental Effects Monitoring	Chemical Monitoring	EPA/ USACE	Determine if sediment chemical contaminants are	Implement if disposal footprint	Contaminants are found to be elevated in dredged sediments. <sup>1</sup>	Discontinue specific event monitoring.	-Conduct directed, specific contaminant monitoring to define extent of management

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
	Benthic Monitoring		significantly elevated <sup>1</sup> within, and outside of, site boundaries. Determine whether there are adverse changes in the benthic populations outside of the site and evaluate recovery rates.	extends beyond the site boundaries or if Trend Assessment results warrant.	Adverse changes observed outside of the site that may endanger the marine environment.		action required. -Perform biological testing on ODMDS samples. -Review and potentially alter dredged material evaluation procedures.
Advanced Environmental Effects Monitoring	Tissue Chemical Analysis	EPA/USACE	Determine if the site is a source of adverse bioaccumulation which may endanger the marine environment.	Implement if Environmental Effects Monitoring warrants.	Benthic body burdens and risk assessment models indicate potential for food chain impacts.	Discontinue monitoring.	- Implement case-specific management options (i.e. Remediation, limits on quantities or types of material). - Discontinue site use.
	Benthic Monitoring		Determine if the site is a source of adverse sub-lethal <sup>2</sup> changes in benthic organisms which may endanger the marine environment.		Sub-lethal effects are unacceptable.		
Ensure Safe Navigation Depth & Monitor	Bathymetry	Site User	Determine height of mound and any excessive mounding.	Pre & Post disposal for projects	Mound height > -30 feet mean lower low water (MLLW).	Continue Monitoring.	-Modify future disposal method/disposal. -Restrict disposal volumes.

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Bathymetric Trends				greater than 50,000 cy.	Mound height > -25 feet MLLW.	Continue Monitoring.	- Physically level material.
Compliance	Disposal Site Use Records & DQM data	Site User	-Ensure management requirements are being met.	Continuously during the project with weekly reports to project manager/EPA.	Disposal records required by SMMP are not submitted or are incomplete.	Continue monitoring.	-Restrict site use until requirements are met.
					Review of records indicates a dump occurred outside ODMDS boundary, excessive leakage en route to disposal.	Continue constant monitoring and reporting.	-Notify EPA Region 4 & USACE and investigate why non-compliance occurred. -Verify corrective actions to be enacted; or -Take appropriate enforcement action.

<sup>1</sup> Significantly elevated: Concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Engineer found to be suitable for disposal at the ODMDS.

<sup>2</sup> Examples of sub-lethal effects include without limitation the development of lesions, tumors, development abnormality, and/or decreased fecundity.

### **3.5 Reporting and Data Formatting**

#### 3.5.1 Project Initiation and Violation Reporting Requirements

The USACE will notify (or other site user will be required to notify) EPA 15 days prior to the beginning of a dredging cycle or disposal project. The user also will be required to notify the USACE and EPA within 24 hours if a violation of the permit and/or contract conditions related to required terms of the permit or project authorization occur during disposal operations.

#### 3.5.2 Disposal Monitoring Data

Disposal monitoring will be conducted ideally utilizing the Dredge Quality Management (DQM) system [see <http://dqm.usace.army.mil/Specifications/Index.aspx>], although other systems are acceptable. The Corps will provide (or require another user to provide) disposal monitoring data to EPA Region 4 electronically on a weekly basis (within one week of disposal event), per EPA Region 4 XML format and delivered as an attachment to an email to [DisposalData.R4@epa.gov](mailto:DisposalData.R4@epa.gov). The XML format is available from EPA Region 4.

#### 3.5.3 Post Disposal Summary Reports

A site user will be required to provide a Post-Disposal Summary Report to EPA within 90 days after project completion. Post-Disposal reports will be required to include: vessel name, disposal start and end dates and times; dredging project; volume disposed, number of loads completed, type of material disposed; name of contractor conducting the work, permit and/or contract number; identification of any misplaced material; and dates of bathymetric surveys of the ODMDS. The disposal summary reports must be submitted with the bathymetry survey results (contour plot and X, Y, Z ASCII data file) and can be accessed by USACE personnel at the DQM Website: <http://dqm-portal.usace.army.mil>.

#### 3.5.4 Environmental Monitoring

EPA and/or the USACE will coordinate material tracking, disposal effects monitoring and any other data collected and provided to SMMP team members and federal and state agencies as appropriate. Data will be available to other interested parties upon request to the extent possible. The report should indicate how the survey relates to the SMMP and previous surveys at the Mobile ODMDS and should provide data interpretations, conclusions, and recommendations, and should project the next phase of the SMMP. Monitoring results will be summarized in subsequent modifications to the SMMP posted to EPA's website (<https://www.epa.gov/ocean-dumping>.)

## 4.0 MODIFICATION OF THE MOBILE ODMDS SMMP

If the results of monitoring surveys, reports from other sources, or modeling results indicate that continued use of the ODMDS would lead to unacceptable effects, then the management of the ODMDS will be modified to mitigate the effects or, if necessary, the site use may be terminated. For example, significant changes to the quantity or type of dredged material disposed on site may trigger SMMP review and revision. The plan should be updated in conjunction with activities authorizing use of the site.

## 5.0 IMPLEMENTATION OF THE MOBILE ODMDS SMMP

This plan is effective and available for implementation from the date of signature for a period not to exceed ten years. EPA, in conjunction with the USACE, will review and revise more frequently if site use and conditions at the site indicate a need for revision. EPA and USACE share responsibility for implementation of the SMMP. Site users may be required to undertake monitoring activities as a condition of their permit. The USACE and any USACE contractor will remain responsible for implementation of the SMMP for Federal new work and maintenance projects.

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# **Mobile SMMP Appendix A**

## **WATER COLUMN EVALUATIONS NUMERICAL MODEL (STFATE) INPUT PARAMETERS MOBILE ODMDS**

## Appendix A: Water Column Evaluations Numerical Model (STFATE) Input Parameters Mobile ODMDS

### SITE DESCRIPTION

Parameter	Value	Units
Number of Grid Points (left to right)	96	
Number of Grid Points (top to bottom)	96	
Spacing Between Grid Points (left to right)	500	Ft
Spacing Between Grid Points (top to bottom)	500	Ft
Constant Water Depth	46	Ft
Roughness Height at Bottom of Disposal Site	.005 <sup>1</sup>	Ft
Slope of Bottom in X-Direction	0	Deg.
Slope of Bottom in Z-Direction	0	Deg.
Number of Points in Ambient Density Profile Point <sup>1</sup>	3	
Ambient Density at Depth = 3 ft	1.0206	g/cc
Ambient Density at Depth = 26 ft	1.0206	g/cc
Ambient Density at Depth = 46 ft	1.0207	g/cc

<sup>1</sup> from EPA Mobile ODMDS Designation Survey Report (2009) for Zone A

### AMBIENT VELOCITY DATA

Parameter	Value	Units
Profile <sup>2</sup>	2-Point at constant depth	
X-Direction Velocity = 11 feet	0.12	ft/sec
Z-Direction Velocity = 11 feet	-0.41	ft/sec
X-Direction Velocity = 33 feet	0.22	ft/sec

---

<b>Parameter</b>	<b>Value</b>	<b>Units</b>
Z-Direction Velocity = 33 feet	-0.37	ft/sec

---

<sup>2</sup> from EPA Mobile ODMDS Designation Survey Report (2009)

**DISPOSAL OPERATION DATA**

---

<b>Parameter</b>	<b>Value</b>	<b>Units</b>
Location of Disposal Point from Top of Grid	16,400	Ft
Location of Disposal Point from Left Edge of Grid	28,800	Ft
Dumping Over Depression	0	

---

**INPUT, EXECUTION AND OUTPUT**

<b>Parameter</b>	<b>Value</b>	<b>Units</b>
Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge	4,500	Ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	9,000	Ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	28,000	Ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	46,000	Ft
Duration of Simulation	14,400	sec
Long Term Time Step	600	sec

**COEFFICIENTS**

<b>Parameter</b>	<b>Keyword</b>	<b>Value</b>
Settling Coefficient	BETA	0.000 <sup>1</sup>
Apparent Mass Coefficient	CM	1.000 <sup>1</sup>
Drag Coefficient	CD	0.500 <sup>1</sup>
Form Drag for Collapsing Cloud	CDRAG	1.000 <sup>1</sup>
Skin Friction for Collapsing Cloud	CFRIC	0.010 <sup>1</sup>
Drag for an Ellipsoidal Wedge	CD3	0.100 <sup>1</sup>
Drag for a Plate	CD4	1.000 <sup>1</sup>
Friction Between Cloud and Bottom	FRICTN	0.010 <sup>1</sup>
4/3 Law Horizontal Diffusion Dissipation Factor	ALAMDA	0.001 <sup>1</sup>
Unstratified Water Vertical Diffusion Coefficient	AKYO	Pritchard Expression
Cloud/Ambient Density Gradient Ratio	GAMA	0.250 <sup>1</sup>
Turbulent Thermal Entrainment	ALPHAO	0.235 <sup>1</sup>
Entrainment in Collapse	ALPHAC	0.100 <sup>1</sup>
Stripping Factor	CSTRIP	0.003 <sup>1</sup>

<sup>1</sup> Model Default Coefficient

<b>Mobile ODMDS Background Water Concentration.</b>	
<b>Chemicals of Concern</b>	<b>Background Concentration Levels (µg/l)</b>
Arsenic	1.66 <sup>1</sup>
Cadmium	0.01 <sup>1</sup>
Chromium (VI)	0.75 <sup>1</sup>
Copper	1.11 <sup>1</sup>
Lead	0.75 <sup>1</sup>
Mercury	0.10 <sup>1,3</sup>
Nickel	0.75 <sup>1</sup>
Selenium	0.23 <sup>1</sup>
Silver	0.005 <sup>1</sup>
Zinc	3.78 <sup>1</sup>
Cyanide	
Tributyltin (TBT)	0.025 <sup>2,3</sup>
Aldrin	0.005 <sup>1,3</sup>
Chlordane	0.10 <sup>1,3</sup>
DDT	0.05 <sup>1,3</sup>
Dieldrin	0.005 <sup>1,3</sup>
alpha - Endosulfan	0.005 <sup>1,3</sup>
beta - Endosulfan	0.005 <sup>1,3</sup>
Endrin	0.005 <sup>1,3</sup>
gamma-BHC (Lindane)	0.005 <sup>1,3</sup>
Heptachlor	0.005 <sup>1,3</sup>
Heptachlor Epoxide	0.005 <sup>1,3</sup>
Toxaphene	.25 <sup>1,3</sup>
Pentachlorophenol	5.0 <sup>2,3</sup>

<sup>1</sup> Mobile ODMDS Site Designation Study (2010)

<sup>2</sup> Pensacola ODMDS Trend Assessment Study (2013)

<sup>3</sup> Analyte not detected. Value based on one half the reporting limit.

**Mobile SMMP  
Appendix B**

**TEMPLATE**

**For**

**Generic Special Conditions**

**For**

**MPRSA Section 103 Permits**

**Mobile ODMDS**



## Appendix B: TEMPLATE OF GENERIC SPECIAL CONDITIONS FOR MPRSA SECTION 103 PERMITS FOR THE MOBILE ODMDS

MPRSA section 102(c)(3) directs EPA in conjunction with the USACE to develop site management and monitoring plans for dredged material disposal sites and such plans are implemented through MPRSA permits issued by USACE or through Federal projects subject to the same criteria, evaluation factors, procedures and requirements as permits. EPA in conjunction with USACE developed the template language below for inclusion in permits, though the template language is intended to be include on a case-by-case basis. Neither the SMMP nor this Appendix impose requirements on a permittee. Instead, the terms of any particular permit would impose (or not) requirements specific to the permitted activity. The USACE is not obligated to impose any particular permit term based on the template language; the language is provided to facilitate USACE permit development and to provide notice to third parties. For any future permit, EPA’s concurrence review would confirm that appropriate terms are included to assure adequate implementation of the SMMP.

### I. DISPOSAL OPERATIONS

A. For this permit, the term disposal operations shall mean: navigation of any vessel used in disposal of operations, transportation of dredged material from the dredging site to the Mobile ODMDS, proper disposal of dredged material at the disposal area within the Mobile ODMDS, and transportation of the hopper dredge or disposal barge or scow back to the dredging site.

B. The Mobile ODMDS is defined as the trapezoid with corner coordinates as follows:

<b>Mobile ODMDS Corner Coordinates (North American Datum (NAD) 83)</b>	
Latitude 30° 13.0'N	Longitude 88° 08.8'W
Latitude 30° 09.6'N	Longitude 88° 04.8'W
Latitude 30° 08.5'N	Longitude 88° 05.8'W
Latitude 30° 08.5'N	Longitude 88° 12.8'W
Latitude 30° 12.4'N	Longitude 88° 12.8'W

C. No more than [NUMBER] cubic yards of dredged material excavated at the location defined in [REFERENCE LOCATION IN PERMIT] are authorized for disposal at the Mobile ODMDS.

D. The permittee shall use an electronic positioning system to navigate to and from the Mobile ODMDS. For this section of the permit, the electronic positioning system will be

as per the DQM specifications. If the electronic positioning system fails or navigation problems are detected, all disposal operations shall cease until the failure or navigation problems are corrected.

E. The permittee shall certify the accuracy of the electronic positioning system proposed for use during disposal operations at the Mobile ODMDS. The certification shall be accomplished by providing current certification documentation from the National DQM Program for scow and hopper dredge instrumentation systems. The National DQM certification is valid for one year from the date of certification.

F. This permit does not authorize leakage or spillage out of barges, dump scows, or hopper dredges of water and/or excavated material while en route to the ODMDS disposal release zone(s). Failure to repair leaks or change the method of operation which is resulting in the leakage or spillage will result in the suspension of dredging operation and require prompt repair or change of operation as prerequisite to the resumption of dredging. Transit to the ODMDS begins as soon as dredged material loading into the disposal vessel is completed and the vessel begins moving to the ODMDS. All appropriate measures to avoid spillage during transit must be taken. Appropriate measures may include but are not limited to: up-to-date U.S. Coast Guard and/or American Bureau of Shipping certification of all disposal-related vessels; maintenance (inspection and/or replacement) of gaskets on barge doors, minimization of excess free liquids in barge loads, pre-transit testing of barge door hydraulics, and pre-transport verification of appropriate weather and sea state conditions. EPA Region 4 and the USACE Mobile District shall be notified within 24 hours (or the next business day) if any apparent leaking or spilling of dredged material occurs as indicated by an average loss of draft during transit from the dredging area to the disposal release zone(s) (forward draft loss plus aft draft loss divided by 2) in excess of x.x. feet. In addition, the permittee understands that no debris is to be placed in the Mobile ODMDS.

G. A disposal operations inspector and/or captain of any tugboat, hopper dredge or other vessel used to transport dredged material to the Mobile ODMDS shall insure compliance with disposal operation conditions defined in this permit.

1. If the disposal operations inspector or the captain detects a violation, he shall report the violation to the permittee immediately.
2. The permittee shall contact the U.S. Army Corps of Engineers, Mobile District's Regulatory Branch (251) 690-2658 and EPA Region 4 at OceanDumpingR4@epa.gov or (404) 562-9300 to report the violation within twenty-four (24) hours after the violation occurs. A complete written explanation of any permit violation shall be included in the post-dredging report.

H. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Mobile ODMDS as defined in Special Condition B. Additionally, disposal shall occur within a specified disposal zone defined as [DEFINE COORDINATES AND SIZE OF DISPOSAL ZONE]. Disposal shall not occur closer than 1,300 feet to any oil or gas rig that may be present within the site boundaries.

I. The permittee shall use an automated disposal verification system that is certified by the National DQM program to continuously track the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) to and from the Mobile ODMDS. This real-time information is available on-line to the Mobile District and will be provided to EPA Region 4 on a weekly basis via email using the eXtensible Markup Language (XML) specification and protocol. Data shall be provided per the EPA Region 4 XML format and delivered as an attachment to an email to R4\_DisposalData@epa.gov. The XML format is available from EPA Region 4.

J. The permittee shall conduct a bathymetric survey of the Mobile ODMDS within 30 days of a disposal event following project completion.

1. The number and length of the survey transects shall be sufficient to encompass the defined disposal zone within the Mobile ODMDS and a 500-foot-wide area around the disposal zone. Transects shall be spaced at 500-foot intervals or less with a depth recording density of 20 to 70 feet.

2. Vertical accuracy of the survey shall be  $\pm 0.1$  feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either microwave line of site system or differential global positioning system. The vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum. MLLW is 1.8 feet below NGVD 1929. The horizontal datum will be Alabama State Plane (zone 0102 Alabama West) or Geographic (NAD 1983). State Plane coordinates shall be reported to the nearest 0.10 foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.

K. The permittee has read and agrees to assure its actions are consistent with any revisions to the Mobile ODMDS Site Management and Monitoring Plan (SMMP) in effect at the time of permit issuance.

The permittee shall not transport dredged material to the Mobile ODMDS until it confirms that EPA has concurred that the proposed dredge material meets the Ocean Disposal Criteria as given in 40 CFR Part 227.

L. Enclosed is the Gulf Regional Biological Opinion (GRBO) dated [INSERT DATE], for

swimming sea turtles, whales, and sturgeon. The GRBO contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the GRBO. Authorization for transportation and ocean disposal of dredged material at the Mobile ODMDS under the U.S. Army Corps of Engineers (USACE) permit is conditional upon compliance with all of the mandatory terms and conditions associated with the incidental take of the attached GRBO, which terms and conditions are incorporated by reference in the permit. Failure to comply with the terms and conditions associated with the incidental take of the GRBO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your USACE permit. Depending on the affected species, National Marine Fisheries Service (NMFS) is the appropriate authority to determine compliance with the terms and conditions of its GRBO and with the Endangered Species Act. For further clarification of this point, contact the project managers at USACE and the NMFS. Should a determination be made that the conditions of the GRBO have been violated, the violation may be enforced administratively by EPA, or referred to the Department of Justice for further investigation and appropriate enforcement.

## II. REPORTING REQUIREMENTS

A. The permittee shall send the U.S. Army Corps of Engineers, Mobile District's Regulatory Branch and EPA Region 4's Ocean, Wetlands, and Streams Protection Branch (61 Forsyth Street SW, Atlanta, GA 30303) a notification of commencement of work at least 15 days before initiation of any dredging operations authorized by this permit.

B. The permittee shall submit to the U.S. Army Corps of Engineers and EPA Region 4 weekly disposal monitoring reports. These reports shall contain the information described in Special Condition I.

C. The permittee shall develop and send one copy of the disposal summary report to the Mobile District's Regulatory Branch and one copy of the disposal summary report to EPA Region 4 documenting compliance with all general and special conditions defined in this permit. The disposal summary report shall be sent within 90 days after completion of the disposal operations authorized by this permit. The disposal summary report shall include the following information:

1. The report shall indicate whether all general and special permit conditions were met. Any violations of the permit shall be explained in detail.

2. The disposal summary report shall include the following information: USACE permit number, actual start date and completion date of dredging and disposal operations, total cubic yards disposed at the Mobile ODMDS, locations of disposal events, and post

disposal bathymetric survey results (in hard and electronic formats).

### III. PERMIT LIABILITY

A. The permittee and all contractors or other third parties who perform an activity authorized by this permit on behalf of the permittee shall be separately liable for a civil penalty for each violation of any term of this permit committed alone or in concert with the permittee or other parties. Liability shall be individual, rather than joint and several, and shall not be reduced in any fashion to reflect the liability assigned to and civil penalty assessed against the permittee or any other third party as defined in 33 U.S.C. Section 1415(a).

B. If the permittee or any contractor or other third party knowingly violates any term of this permit (either alone or in concert), the permittee, contractor or other party shall be individually liable for the criminal penalties set forth in 33 U.S.C. Section 1415(b).

# **Mobile SMMP Appendix C**

## **Generic Contract Specification Language for Use of the Mobile ODMDS**

## Appendix C: Generic Contract Specification Language for Use of the Mobile ODMDS

MPRSA section 102(c)(3) directs EPA in conjunction with the USACE to develop site management and monitoring plans for dredged material disposal sites and such plans are implemented through MPRSA permits issued by USACE or through Federal projects subject to the same criteria, evaluation factors, procedures and requirements as permits. EPA in conjunction with USACE developed the template language below for inclusion in USACE contracts or other project specifications for the transportation and disposal at the Mobile ODMDS, though the template language is intended to be include on a case-by-case basis. Neither the SMMP nor this Appendix impose the model requirements directly. Instead, the terms of any particular contract or other project specification document for the transportation and disposal of dredged material at the Mobile ODMDS would impose (or not) requirements specific to the project activity. The USACE is not obligated to impose any particular contract term based on the template language; the language is provided to facilitate USACE contract development and to provide notice to third parties. For any future Federal project, EPA's concurrence review would confirm that appropriate terms are included to assure adequate implementation of the SMMP.

### SECTION 35 20 23.23

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM  
HOPPER DREDGE  
X/X/20XX

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the dredge's status at all times during the contract and manage data history.

This performance-based specification section identifies the minimum required output and precision and instrumentation requirements. The requirements may be satisfied

using equipment and technical procedures selected by the Contractor.

## 1.2 SUBMITTALS

Government approval is required for submittals with a “G” designation; submittals not having a “G” designation are for information only. When used, a designation following the “G” designation identifies the office responsible for review of the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00, “SUBMITTAL PROCEDURES”:

SD-01, Preconstruction Submittals

Dredge Plant Instrumentation Plan Revisions or Addendum; G, SAM-OP-J

SD-06, Test Reports

Data Appropriately Archived e-mail, section 3.2.10; G, *XXX-XX-X (enter local district)*

SD-07, Certificates

Letter of National Dredging Quality Management Program Certification; G,  
*XXX-XX-X (enter local district)*

## 1.3 PAYMENT

No separate payment shall be made for installation, operation and maintenance of the DQM certified system as specified herein for the duration of the dredging operations; all costs in connection therewith shall be considered a subsidiary obligation of the Contractor and covered under the contract unit prices for dredging in the bidding schedule.

## 1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from the DQM for the hopper dredge instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (<http://dqm.usace.army.mil/Specifications/Index.aspx>). Compliance with these criteria shall be verified by annual on-site quality assurance (QA) checks conducted by DQM Support Center Data Acquisition and Analysis Team, and by periodic review of the transmitted data. DQM Certification is valid for one year from the date of the annual QA checks. Certification is contingent upon the system’s ability to continuously meet



the performance requirements as outlined in sections 3.3 and 3.5. If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the Data Acquisition Team may be necessary.

Annual DQM Certification shall be based on:

- A series of QA checks as described in Section 3.4 "Compliance Quality Assurance Checks"
- Verification of data acquisition and transfer (Section 3.3)
- Review of the Dredge Plant Instrumentation Plan (DPIP) as described in Section 1.5

The dredging contractor shall have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The dredging contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. As a general rule, Data Acquisition and Analysis Team personnel will come with PPE consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed, such as eye protection, safety harnesses, work gloves or personal location beacons, these items shall be provided to the team while on site. It is the dredging contractor's obligation to inform the QA team if the location designated for the QA checks has any site-specific safety concerns prior to their arrival on site.

The owner or operator of the dredge shall contact the DQM at [DQM-AnnualQA@rpsgroup.com](mailto:DQM-AnnualQA@rpsgroup.com) on an annual basis, or at least three weeks prior to certification expiration, to schedule QA checks for renewal. This notification is meant to make the Data Acquisition Team aware of a target date for the annual QA checks for the dredge. At least one week prior to the target date, the dredging contractor shall contact the Data Acquisition team and verbally coordinate a specific date and location. The contractor shall then follow-up this conversation with a written e-mail confirmation. The owner/operator shall coordinate the QA checks with all local authorities, including but not limited to, the local USACE contracting officer.

Re-certification is required for any yard work which produces modification to displacement (i.e. change in dredge lines, repositioning or repainting hull marks), modification to bin volume (change in bin dimensions or addition or subtraction of structure) or changes in sensor type or location; these changes shall be reported in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs, however in order to retain its certification during this period, the system sensors or hardware should not be disconnected or removed from the dredge. If the system is powered down, calibration coefficients shall be retained.

## 1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the DPIP on file with the National DQM Support Center. The Contractor shall also maintain a copy of the DPIP on the dredge while working on site which is always easily accessible to government personnel. This document shall describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed dredge specific data and how the sensor data will be transmitted to the DQM Database will also be included. The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to start of work.

The DPIP shall include the following as a minimum:

*(DPIP must have table of contents in the following order and tabs separating sections)*

Cover Page    Dredge Name  
                   Date  
                   Photo of plant

### Table of Contents

New page    Dredge Contacts  
                   Dredging Company  
                   • Dredge Point of Contact on-site  
                   • Phone Number  
                   • e-mail address

                  Dredge Monitoring System Provider  
                   • Dredge Monitoring System Point of Contact  
                   • Telephone Number  
                   • e-mail address

New page    Table of dredge characteristics  
                   • Dimensions of dredge  
                   • Dimensions of hopper  
                   • Method of disposal  
                   • Capacity  
                   • Minimum and maximum digging depth  
                   • Minimum and maximum drafts and displacements  
                   • RPM and velocity range  
                   • ID of suction and discharge pipes

## New page

## Sensor data collection method

- Any averaging
- Route from sensors to DQM computer
- Internet connection type and provider

## Sensor descriptions, locations and calibration methods

- Positioning system
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions
- Dredge heading instrumentation
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
- Hull status
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions
  - o Calibration procedure
- Draft
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions
  - o Calibration procedure
- Ullage
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions
  - o Calibration procedure
- DragarmDrag arm depths
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions
  - o Calibration procedure
- Density
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions including pipe diameter
  - o Calibration procedure
- Velocity
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions including pipe

- diameter
  - o Calibration procedure
- Pump RPM
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions
  - o Calibration procedure
- Pump out (if instrumented)
  - o Brand name, model and accuracy
  - o Any calculation done external to the instrumentation
  - o Sensor location with referenced dimensions

#### Calibration procedure

##### Calculated Parameters

- Displacement:

Method used by Contractor to calculate displacement  
 Tables listing (fresh and saltwater) displacement as a  
 tenths of feet

function of draft in feet and

- Hopper Volume:

Method used by Contractor to calculate hopper volume  
 Table listing the hopper volume as a function of hopper  
 feet

ullage in feet and tenths of

Description of datum for ullage sounding measurements

- Drag Head Position
  - o Method used by Contractor to calculate drag head position
- Load number
  - o Method used to increment load number

##### Quality Control

Description of Contractors quality control process  
 Log of sensor calibrations, repairs and modifications

##### Appendices

Hydrostatic curves

Certified Displacement and Volume Tables

Legible Dimensioned Drawings of the Dredge with units in feet

A typical plan of the dredge showing:

Overall dredge and hopper dimensions

Locations of required sensors referenced to uniform longitudinal and transverse reference  
 points

Distance between the draft sensors

Distance between the ullage sensors

Dimensions of drag arm

A profile view of the dredge showing:  
Overall dredge and hopper dimensions  
Distance between draft sensors and draft marks  
Locations of required sensors referenced to uniform vertical and longitudinal reference points  
Typical vessel cross section through the hopper  
Sensor manuals and certificates of calibration

Any changes to the computation methods shall be approved by the National Dredging Quality Management Program Support Center prior to their implementation.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

#### REQUIREMENTS FOR REPORTED DATA

The Contractor shall provide, operate and maintain all hardware and software to meet these specifications. The Contractor shall be responsible for replacement, repair and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.

Repairs shall be completed within 48 hours of any sensor failure. Upon completion of a repair, replacement, installation, modification or calibration the Contractor shall notify the Contracting Office's Representative (COR). The COR may request re-calibration of sensors or other hardware components at any time during the contract as deemed necessary.

The Contractor shall keep a log of sensor repair, replacement, installation, modification and calibration in the dredge's onboard copy of the DPIP. The log shall contain a three-year history of sensor maintenance to include: the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems are initiated to provide required data. It shall also contain the name of the person responsible for the sensor work.

Sensors installed shall be capable of collecting parameters within specified accuracies and resolutions indicated in the following subsections.

Reported sensor values for ullage, draft and drag head depth should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. This information should be documented in the DPIP sections that say, "Calculations done external to the instrumentation".

### 3.1.1 Date and Time

The date and time shall be reported to the nearest second and referenced to UTC time based on a 24-hour format; mm/dd/yyyy hh:mm:ss. The reported time shall be the time reported by the GPS in the NMEA string.

### 3.1.2 Load Number

A load number shall document the end of a disposal event. Load numbering will begin at number 1 at the start of the contract and will be incremented by 1 at the completion of each disposal event or emptying of the hopper. Whenever possible, the load number shall be calculated off the sensors aboard the dredge and shall be a mathematically repeatable routine. Efforts shall be made to include logic that avoids false load number increments while also not allowing the routine to miss any disposal event. If manual incrementing of the load number is in place, extra attention shall be paid to this value in the contractor's quality control process (section 3.5).

### 3.1.3 Horizontal Positioning

All locations shall be obtained using a Positioning System operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

#### 3.1.3.1 Vessel Horizontal Positioning

Geographic coordinates of the vessel as indicated by the location of the GPS antenna.

#### 3.1.3.2 Draghead Horizontal Positioning

Geographic coordinates of the heel on centerline of the draghead(s). Any offset calculations from the GPS antenna should be described in the DPIP.

### 3.1.4 Hull status

Open/closed status of the hopper dredge, corresponding to the split/non-split condition of a split hull hopper dredge shall be monitored. For dredges with hopper doors, the status of a single door that is the first opened during normal disposal operations may be monitored. An "OPEN" value shall indicate the hopper door is open, or in the case of split hull dredges, the hull is split. A "CLOSED" value indicates the hopper doors are closed, or in the case of split hull dredges, the hull is not split. *For this contract, hull*

*status shall register closed prior to leaving the disposal area.*

### 3.1.5 Dredge Course

Dredge course-over-ground (COG) shall be provided using industry standard equipment. The Contractor shall provide dredge course over ground to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

### 3.1.6 Dredge Speed

Dredge speed-over-ground shall be provided in knots using industry standard equipment with a minimum accuracy of 1 knot and resolution to the nearest 0.1 knot.

### 3.1.7 Dredge Heading

Dredge heading shall be provided using industry standard equipment. The dredge heading shall be accurate to within 5 degrees and reported to the nearest whole degree, with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

### 3.1.8 Tide

Tide data shall be obtained using appropriate equipment to give the water level with an accuracy of  $\pm 0.1$  feet and a resolution of 0.01 feet. Tide values above project datum described in the dredging specification shall be entered with a positive sign, those below with a negative sign.

### 3.1.9 Draft

All reported draft measurements shall be in feet, tenths and hundredths with an accuracy of  $\pm 0.1$  foot relative to observed physical draft readings. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). Reported forward draft value shall be equal to the sum of the visual forward port and starboard draft mark readings divided by 2. Reported aft draft value shall be equal to the sum of the visual aft port and starboard draft mark readings divided by 2. Forward draft, aft draft and average draft will be reported. Sensors shall be placed at an optimum location on the vessel to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The sensor value reported shall be an average of at least 10 samples per event, remove at least one maximum value and one minimum value, and average the minimum 8 remaining values. When average draft is calculated for the purpose of determining displacement, significant

digits for average draft shall be maintained such that if forward draft was 0.15 and aft draft was 0.1 then the average draft would be 0.125.

### 3.1.10 Hopper Ullage Sounding

All reported ullage soundings shall be in feet, tenths and hundredths with an accuracy of  $\pm 0.1$  foot with respect to the combing and be representative of the forward and aft extents of the hopper as close to centerline as is possible. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). Forward ullage and aft ullage soundings will be reported. Sensors should be mounted so as to avoid discharge flume turbulence, foam and any structure that could produce sidelobe errors. If sensors must be offset from centerline of the hopper they should be offset to opposite sides of the vessel. If more than one fore or one aft sensor is used, they shall be placed near the corners of the hopper and the average value of the fore sensors and the average value of the aft sensors shall be reported. The sensor value reported shall be an average of at least 10 samples per event, remove at least one maximum value and one minimum value, and average the minimum 8 remaining values. When average ullage is calculated for the purpose of determining hopper volume, significant digits for average ullage shall be maintained such that if forward ullage was 0.15 and aft ullage was 0.1 then the average ullage would be 0.125.

### 3.1.11 Hopper Volume

Hopper volume shall be reported in cubic yards, based on the most accurate method available for the dredge. The minimum standard of accuracy for hopper volume is interpolation from the certified hopper volume table, based on the average fore and aft ullage soundings.

#### Displacement

Dredge displacement shall be reported in long tons, based on the most accurate method available for the dredge. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement shall be \_\_\_\_\_ kg/cubic meter and shall be used for an additional interpolation between the fresh and salt water tables. *The water density used is project/location specific. 1000 kg/m<sup>3</sup> (1g/cm<sup>3</sup>)- fresh water 1027 kg/m<sup>3</sup> - 1030 kg/m<sup>3</sup> (1.027g/cm<sup>3</sup> - 1.03g/cm<sup>3</sup>)- salt water*



## Empty Displacement

Empty displacement shall be reported in long tons, and shall be the lightship value of the dredge, or the weight of the dredge with no material in the hopper, adjusted for fuel and water consumption.

### 3.1.14 Draghead depths

Draghead depths shall be reported with an accuracy of  $\pm 0.5$  feet and a resolution to the nearest 0.1 feet as measured from the surface of the water with no tidal adjustments. Minimum accuracies are conditional to relatively calm water. The sensor value reported shall be an average of at least 10 samples per event, remove at least one maximum value and one minimum value, and average the minimum 8 remaining values.

### 3.1.15 Slurry Densities of Dragarms

A density metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry density of each dragarm to the nearest 0.0001 g/cc with an accuracy of  $\pm 0.001$ g/cc. If the manufacture does not specify a frequency of re-calibration, calibration shall be conducted prior to commencement of work.

### 3.1.16 Slurry Velocities of Dragarms

A flow metering device, calibrated according to the manufacturer's specifications, shall be used to record the slurry velocity of each dragarm to the nearest 0.0001 fps with an accuracy of  $\pm 0.001$  fps. If the manufacture does not specify a frequency of re-calibration, calibration shall be conducted prior to commencement of work. The slurry velocity shall be measured in the same pipeline inside diameter as that used for the slurry density measurement.

### 3.1.17 Pump RPM

Pump RPM shall be measured with the highest level of accuracy that is standard on the vessel operational displays, either at the bridge, at the drag tenders' controls, or in the engine room. Dredges with multiple pumps per side shall report RPM for the pump that best describes the dredging process (typically the outboard pump). If requirements of section 3.1.19 are determined based on pump RPM, then that value shall be reported.

### 3.1.18 Sea Suction Valve for Dragarm

If sea suction can be taken to bypass suction through the draghead, the sea suction

location and valve status will be reported. The status of the valve will change from “closed” to “open” when the valve starts to open and will register “closed” when the valve is fully closed. When applicable, the state of the latch will be reported as “true” or “false”. The sea suction location shall be reported in a standard non-changing name string of no more than 20 characters. These field values will always occur in the XML string as a set. The DQM system can only accommodate up to 4 unique sea suction locations. Suggested options for the naming convention can be found in the Example dataset in section 3.2.9, “Data Format”.

### 3.1.19 Pumpout

When the hopper dredge is being pumped out, a “True” value shall be reported; when it is not, a “False” value shall be reported. The only permissible values are “TRUE” and “FALSE”.

## NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

Contractors DQM system shall be capable of collecting, displaying, and transmitting information to the DQM Database. The applicable parameters from section 3.1 shall be recorded as events locally and continually transmitted to the DQM Database anytime an internet connection is available. The Dredge shall be equipped with a DQM computer system consisting of a computer, monitor, keyboard, mouse, data modem, UPS, and network hub. The computer system shall be a standalone system, exclusive to the DQM monitoring system, and will have USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within 48 hours of determination of the condition.

### 3.2.1 Computer Requirements

The Contractor shall provide a dedicated on-board computer for use by the Dredging Quality Management system. This computer shall run the USACE’s software and receive data from the Contractor’s data reporting interface. This computer must meet or exceed the following performance specifications:

CPU:	Intel or AMD processor with a (non-overclocked) clock speed of at least 3 gigahertz (GHz)
Hard drive:	250 gigabytes (GB); internal
RAM:	2 gigabytes

Ethernet adapter:	10 or 100 megabit (Mbit) internal network card with an RJ-45 connector
Video adapter:	Must support resolution of 1024x768 at 16-bit color depth
Keyboard:	Standard 101-key
Mouse:	Standard 2-button mouse
Monitor:	17-inch viewable display; must support 1024x768 resolution at 16-bit color depth
CD-ROM drive:	16X read speed/8X write speed
Ports:	2 free Serial ports with standard 9-pin connectors; 1 free USB port
Other hardware:	Category 5 (Cat-5) cable with standard RJ-45 plugs connecting the network adapter to the network hub; one spare cable

Contractor shall install a fully licensed copy of Windows 7 Professional Operating System on the computer specified above. Contractor shall also install any necessary manufacturer-provided drivers for the installed hardware.

This computer shall be located and oriented to allow data entry and data viewing, as well as to provide access to data ports for connection of external hardware. Location and orientation shall be subject to Contracting Officer's Representative's approval.

### 3.2.2 Software

The DQM computer's primary function is to transmit data to the DQM shore side database. No other software which conflicts with this function shall be installed on this computer. The DQM computer will have the USACE provided DQMOBS (Dredge Quality Management Onboard Software) installed on it by DQM personnel along with USACE selected software for remote support and management.

### 3.2.3 Network Hub

The DQM computer shall communicate via IEEE 802.3 Ethernet and the TCP/IP networking protocol. The Contractor shall provide a network hub to allow the temporary addition of the Contracting Officer's representative's portable computer to the computer

network. The hub shall provide a minimum of four RJ-45 ports that support Category 5 (Cat-5) cable with standard RJ-45 plugs connecting the network adapter to the network hub; one spare cable shall be available on site to plug into the network hub.

### 3.2.4 UPS

The Contractor shall supply an Uninterruptible Power Supply (UPS) for the computer and networking equipment. The UPS shall provide backup power at 1kVA for a minimum of 10 minutes. The UPS shall interface to the DQM computer to communicate UPS status. The Contractor shall ensure that sufficient power outlets are available to run all specified equipment.

### 3.2.5 Internet Access

The Contractor shall maintain an internet connection capable of transmitting real time data to the DQM Server and supporting remote access, as well as enough additional band width to clear historically queued data when a connection is re-obtained. The telemetry system shall be always available and have connectivity in contract area. If connectivity is lost, unsent data shall be queued and transmitted upon restoration of connectivity. The Contractor shall acquire and install all necessary hardware and software to make the internet connection available for data transmission to the DQM web service. The hardware and software must be configured to allow the USACE DQM center remote access to this computer. Coordination between the dredging company's IT and DQM support may be required in order to configure remote access though any security, firewall, router, and telemetry systems. Telemetry systems must be capable of meeting these minimum reporting requirements in all operating conditions.

### 3.2.6 Data Routing Requirements

Onboard sensors shall continually monitor dredge conditions, operations and efficiency and route this information into the shipboard dredge-specific system computer (DSS) to assist in guiding dredge operations. Portions of this Contractor-collected information shall be routed to the DQM computer on a real-time basis. Standard sensor data shall be sent to the DQM computer via an RS-232 9600- or 19200-baud serial interface. The serial interface shall be configured as 8 bits no parity and no flow control.

### 3.2.7 Data Reporting Frequency

Data shall be logged as a series of events. Each event will consist of a data set containing dredge information as per section 3.1. Each set of measurements (i.e. time, position, etc...) will be considered an event. All required information in section 3.1 that

are not an averaged variable (i.e. draft and ullage) shall be collected within one second of the reported time. A data string for an event shall be sent to the DQM computer every 6 to 12 seconds and this interval shall remain constant throughout the contract; data strings shall never be transmitted more frequently than once per every 5 seconds. Any averaged variable must be collected and computed within this sampling interval.

### 3.2.8 Data Format

Data shall be reported as an eXtensible Markup Language (W3C standard XML 1.0) document as indicated below. Line breaks and spaces are added for readability, but the carriage return, line feed character combination is only added to delineate records (HOPPER\_DREDGING\_DATA tag) for actual data transmission.

```
<?xml version="1.0"?>
<HOPPER_DREDGING_DATA version = "2.0">
  <DREDGE_NAME> string32 </DREDGE_NAME>
  <HOPPER_DATA_RECORD>
    <DATE_TIME> time date string </DATE_TIME>
    <CONTRACT_NUMBER> string32</CONTRACT_NUMBER>
    <LOAD_NUMBER> integer string </LOAD_NUMBER>
    <VESSEL_X coord_type = "LL"> floating point string </VESSEL_X>
    <VESSEL_Y coord_type = "LL"> floating point string </VESSEL_Y>
    <PORT_DRAG_X coord_type = "LL"> floating point string</PORT_DRAG_X>
    <PORT_DRAG_Y coord_type = "LL"> floating point string</PORT_DRAG_Y>
    <STBD_DRAG_X coord_type = "LL"> floating point string</STBD_DRAG_X>
    <STBD_DRAG_Y coord_type = "LL"> floating point string</STBD_DRAG_Y>
    <HULL_STATUS> OPEN/CLOSED string </HULL_STATUS>
    <VESSEL_COURSE> floating point string </VESSEL_COURSE >
    <VESSEL_SPEED> floating point string </VESSEL_SPEED>
    <VESSEL_HEADING> floating point string </VESSEL_HEADING>
    <TIDE> floating point string </TIDE>
    <DRAFT_FORE> floating point string </DRAFT_FORE>
    <DRAFT_AFT> floating point string </DRAFT_AFT>
    <ULLAGE_FORE> floating point string </ULLAGE_FORE>
    <ULLAGE_AFT> floating point string </ULLAGE_AFT>
    <HOPPER_VOLUME> floating point string </HOPPER_VOLUME>
    <DISPLACEMENT> floating point string </DISPLACEMENT>
    <EMPTY_DISPLACEMENT> floating point string </EMPTY_DISPLACEMENT>
    <DRAGHEAD_DEPTH_PORT> floating point string </DRAGHEAD_DEPTH_PORT>
    <DRAGHEAD_DEPTH_STBD> floating point string </DRAGHEAD_DEPTH_STBD>
    <PORT_DENSITY> floating point string </PORT_DENSITY>
    <STBD_DENSITY> floating point string </STBD_DENSITY>
    <PORT_VELOCITY> floating point string </PORT_VELOCITY>
    <STBD_VELOCITY> floating point string </STBD_VELOCITY>
    <PUMP_RPM_PORT> floating point string </PUMP_RPM_PORT>
    <PUMP_RPM_STBD> floating point string </PUMP_RPM_STBD>
  <VALVE_1_LOCATION> string32</VALVE_1_LOCATION>
  <VALVE_1_STATUS>open/closed</VALVE_1_STATUS>
```

```

<VALVE_1_LATCHED>true/false</VALVE_1_LATCHED>
<VALVE_2_LOCATION> string32</VALVE_2_LOCATION>
<VALVE_2_STATUS>open/closed</VALVE_2_STATUS>
<VALVE_2_LATCHED>true/false</VALVE_2_LATCHED>
<VALVE_3_LOCATION> string32</VALVE_3_LOCATION>
<VALVE_3_STATUS>open/closed</VALVE_3_STATUS>
<VALVE_3_LATCHED>true/false</VALVE_3_LATCHED>
<VALVE_4_LOCATION> string32</VALVE_4_LOCATION>
<VALVE_4_STATUS>open/closed</VALVE_4_STATUS>
<VALVE_4_LATCHED>true/false</VALVE_4_LATCHED>
  <PUMP_OUT_ON> true/false/unknown string </PUMP_OUT_ON>
    </HOPPER_DATA_RECORD>

  </HOPPER_DREDGING_DATA>
Carriage return – ASCII value 13
Line Feed – ASCII value 10

```

### Example

```

<?xml version="1.0"?>
<HOPPER_DREDGING_DATA version = "2.0">
  <DREDGE_NAME>Essayons</DREDGE_NAME>
  <HOPPER_DATA_RECORD>
    <DATE_TIME>04/11/2002 13:12:05</DATE_TIME>
    <CONTRACT_NUMBER>GDSNWP-11-G-
0001</CONTRACT_NUMBER>
    <LOAD_NUMBER>102</LOAD_NUMBER>
    <VESSEL_X coord_type = "LL">-80.123333</VESSEL_X>
    <VESSEL_Y coord_type = "LL">10.123345</VESSEL_Y>
    <PORT_DRAG_X coord_type = "LL">-80.1233371</PORT_DRAG_X >
    <PORT_DRAG_Y coord_type = "LL">10.12335</PORT_DRAG_Y >
    <STBD_DRAG_X coord_type = "LL">-80.123339</STBD_DRAG_X >
    <STBD_DRAG_Y coord_type = "LL">10.123347</STBD_DRAG_Y >
    <HULL_STATUS>CLOSED</HULL_STATUS>
    <VESSEL_COURSE>258</VESSEL_COURSE>
    <VESSEL_SPEED>3.4</VESSEL_SPEED>
    <VESSEL_HEADING>302</VESSEL_HEADING>
    <TIDE>-0.1</TIDE>
    <DRAFT_FORE>10.05</DRAFT_FORE>
    <DRAFT_AFT>15.13</DRAFT_AFT>
    <ULLAGE_FORE>10.11</ULLAGE_FORE>
    <ULLAGE_AFT>10.22</ULLAGE_AFT>
    <HOPPER_VOLUME>2555.2</HOPPER_VOLUME>
    <DISPLACEMENT>4444.1</DISPLACEMENT>
    <EMPTY_DISPLACEMENT>2345.0</EMPTY_DISPLACEMENT>

```

```

    <DRAGHEAD_DEPTH_PORT>55.10</DRAGHEAD_DEPTH_PORT>
    <DRAGHEAD_DEPTH_STBD>53.21</DRAGHEAD_DEPTH_STBD>
    <PORT_DENSITY>1.02</PORT_DENSITY>
    <STBD_DENSITY>1.03</STBD_DENSITY>
    <PORT_VELOCITY>22.1</PORT_VELOCITY>
    <STBD_VELOCITY>23.3</STBD_VELOCITY>
<PUMP_RPM_PORT> 55 </PUMP_RPM_PORT>           <PUMP_RPM_STBD>
54 </PUMP_RPM_STBD>
<VALVE_1_LOCATION> Starboard Dragarm </VALVE_1_LOCATION>
<VALVE_1_STATUS>open</VALVE_1_STATUS>
<VALVE_1_LATCHED>>true</VALVE_1_LATCHED>
<VALVE_2_LOCATION> Port Dragarm</VALVE_2_LOCATION>
<VALVE_2_STATUS> closed</VALVE_2_STATUS>
<VALVE_2_LATCHED>>false</VALVE_2_LATCHED>
<VALVE_3_LOCATION>Port Sea Chest</VALVE_3_LOCATION>
<VALVE_3_STATUS> closed</VALVE_3_STATUS>
<VALVE_3_LATCHED>>false</VALVE_3_LATCHED>
<VALVE_4_LOCATION>Starboard Sea Chest</VALVE_4_LOCATION>
<VALVE_4_STATUS>open </VALVE_4_STATUS>
<VALVE_4_LATCHED> false</VALVE_4_LATCHED>
    <PUMP_OUT_ON>>false</PUMP_OUT_ON>
    </HOPPER_DATA_RECORD>
</HOPPER_DREDGING_DATA>
<cr>
<lf>
<DREDGE_NAME>Essayons</DREDGE_NAME>
    <HOPPER_DATA_RECORD>
        <DATE_TIME>04/11/2002 13:12:10</DATE_TIME>
        <CONTRACT_NUMBER>GDSNWP-11-G-
0001</CONTRACT_NUMBER>
        <LOAD_NUMBER>102</LOAD_NUMBER>
        <VESSEL_X coord_type = "LL">-80.123334</VESSEL_X>
        <VESSEL_Y coord_type = "LL">10.123346</VESSEL_Y>
        <PORT_DRAG_X coord_type = "LL">-80.1233372</PORT_DRAG_X >
        <PORT_DRAG_Y coord_type = "LL">10.12336</PORT_DRAG_Y >
        <STBD_DRAG_X coord_type = "LL">-80.123340</STBD_DRAG_X >
        <STBD_DRAG_Y coord_type = "LL">10.123348</STBD_DRAG_Y >
        <HULL_STATUS>CLOSED</HULL_STATUS>
        <VESSEL_COURSE>259</VESSEL_COURSE>
        <VESSEL_SPEED>3.5</VESSEL_SPEED>
        <VESSEL_HEADING>300</VESSEL_HEADING>
        <TIDE>-0.1</TIDE>

```

```

<DRAFT_FORE>10.00</DRAFT_FORE>
<DRAFT_AFT>15.15</DRAFT_AFT>
<ULLAGE_FORE>10.15</ULLAGE_FORE>
<ULLAGE_AFT>10.20</ULLAGE_AFT>
<HOPPER_VOLUME>2555.5</HOPPER_VOLUME>
<DISPLACEMENT>4444.0</DISPLACEMENT>
<EMPTY_DISPLACEMENT>2345.0</EMPTY_DISPLACEMENT>
<DRAGHEAD_DEPTH_PORT>55.15</DRAGHEAD_DEPTH_PORT>
<DRAGHEAD_DEPTH_STBD>53.19</DRAGHEAD_DEPTH_STBD>
<PORT_DENSITY>1.00</PORT_DENSITY>
<STBD_DENSITY>1.01</STBD_DENSITY>
<PORT_VELOCITY>22.5</PORT_VELOCITY>
<STBD_VELOCITY>23.3</STBD_VELOCITY>
<PUMP_RPM_PORT> 55 </PUMP_RPM_PORT>           <PUMP_RPM_STBD>
54 </PUMP_RPM_STBD>
<VALVE_1_LOCATION> Starboard Dragarm </VALVE_1_LOCATION>
<VALVE_1_STATUS>open</VALVE_1_STATUS>
<VALVE_1_LATCHED>>true</VALVE_1_LATCHED>
<VALVE_2_LOCATION> Port Dragarm</VALVE_2_LOCATION>
<VALVE_2_STATUS> closed</VALVE_2_STATUS>
<VALVE_2_LATCHED>>false</VALVE_2_LATCHED>
<VALVE_3_LOCATION>Port Sea Chest</VALVE_3_LOCATION>
<VALVE_3_STATUS> closed</VALVE_3_STATUS>
<VALVE_3_LATCHED>>false</VALVE_3_LATCHED>
<VALVE_4_LOCATION>Starboard Sea Chest</VALVE_4_LOCATION>
<VALVE_4_STATUS>open </VALVE_4_STATUS>
<VALVE_4_LATCHED> false</VALVE_4_LATCHED>
  <PUMP_OUT_ON>>false</PUMP_OUT_ON>
    </HOPPER_DATA_RECORD>
  </HOPPER_DREDGING_DATA>
<cr>
<lf>

```

### 3.2.9 Data Reporting

The system shall transmit correctly formatted event data XML strings to the DQM Database continuously from mobilization until the last USACE post-dredging survey has been accepted. If the internet connection (section 3.2.6) is non-operable, manual backups from the dredge computer of the XML data string which would have been transmitted to the DQM computer over the serial connection shall be performed for each day the device is inoperable and submitted to the DQM center within 48 hours. This



submission does not replace the requirement of correcting the issue affecting automatic transmission of data. In the event of data transfer, transmission, or hardware failure; a manually recorded disposal log shall be maintained. It shall consist of a series of events. These events are: start of dredging, end of dredging, pre-disposal and post-disposal events. Each event shall include time stamp (GMT), position (Latitude and Longitude WGS84), draft, ullage, volume and displacement. Disposal logs shall be submitted daily to the Contracting Officer's Representative during the time when the system is not operational.

### 3.2.10 Contractor Data Backup

The Contractor shall maintain an archive of all data sent to the DQM computer during the dredging contract. The COR may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the XML format which would have been transmitted to the DQM computer. There shall be no line breaks between the parameters; each record string shall be on separate line. Naming convention for the files shall be <dredgename>\_<StartYYYYMMddhhmmss>\_<EndYYYYMMddhhmmss>.txt . Data submission shall be via storage medium acceptable to the COR.

At the end of the dredging contract, the Contractor shall contact the National DQM Support Center prior to discarding the data to ensure it has been appropriately archived. The Contractor shall record in a separate section at the end of the dredge's on-board copy of the DPIP the following information:

- a. Person who made the call
- b. The date of the call
- c. The DQM representative who gave permission to discard

The same day of the phone call and prior to discarding the data, the Contractor shall submit a "Data Appropriately Archived e-mail" to the local districts Contracting Officer's Representative with the above information, and Cc: the DQM Support Center representative providing permission. In addition to the above information, also include in the e-mail:

- d. Project name and contract number
- e. Dredge start and end dates
- f. Name of hopper dredge

### 3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system shall be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see Section 1.4, National Dredging Quality Management Program Certification). To meet contract requirements for operability, in addition to certification, the Contractor's system shall provide a data string with values for all parameters while operating, as described within the specifications. Additionally, all hardware shall be compliant with hardware requirements (Section 3.2). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within 48 hours. If the Contractor fails to report required data within the specified time window for dredge measurements (see Sections 3.2.7 "Data Measurement Frequency" and 3.2.9 "Data Reporting"); the system will be declared not fully operational, and the Contractor will be assessed liquidated damages equivalent to the additional oversight hours that would be required for USACE personnel to be on site from the first full day after the system is deemed not operational through to the time when the system is returned to fully operational status. For this contract, the liquidated damages shall be \$ \_\_\_\_\_ per day. *(A spread sheet of how to calculate this liquidated damage amount is available at the DQM support center; this is NOT just the DQM day rate)*

### 3.4 COMPLIANCE QUALITY ASSURANCE CHECKS

Quality assurance checks are required prior to the commencement of dredging, and at the discretion of a COR periodically throughout the duration of the contract. Detailed instructions for performing these checks and a spreadsheet for recording the results are available at <http://dgm.usace.army.mil/Certifications/Index.aspx>. Incoming data shall be periodically reviewed to assure compliance with performance requirements outlined in section 3.3. In addition to making sure the data received meets the reporting requirements outlined in the sub sections under section 3.1, a more detailed description of some of the quality assurance methods are outlined below.

For annual instrumentation checks and compliance monitoring, the DQM Data Acquisition Team personnel attempt to be as flexible as possible in performing their checks so as not to delay work; however, in order to expedite matters as much as possible, it is necessary that they receive the support and cooperation of the local district and dredging contractor. The dredging contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM certified system in a timely manner. Calibrations to the sensors should already be performed before DQM personnel arrive on site.

### 3.4.1 Draft & Displacement Check

The COR shall periodically verify the accuracy of the fore and aft system reported draft values by comparing the vessel hull draft marks to the corresponding sensor readings indicated on the DQM screen. The vessel's hull draft reading shall be viewed from a contractor supplied auxiliary vessel circling the dredge. The COR shall review the difference between averaged drafts recorded by the instruments and those estimated from the draft marks to ensure that the system is operating within the acceptable accuracy of approximately  $\pm 0.1$  ft. in calm seas conditions. Reported draft values will be verified light, loaded, and at other intervals at the discretion of the COR. If sensors responsible for collecting draft values are not located on centerline, verification may be required under different trim and list conditions. If values are outside the acceptable range, the Contractor shall re-calibrate or repair system components as necessary. This check may be performed separately or as a part of the Water Load Test. For each system provided fore and aft draft, an average draft value will be calculated during the draft check, and the corresponding displacement will be verified longhand using the supplied draft/displacement tables.

### 3.4.2 Draghead Depth Check

The COR may require periodic calibration checks of the reported draghead depth using manual means such as tape measures or sounding lines to directly measure draghead depth. The Contractor shall furnish a steel tape, chain, or wire with clearly visible flags/tags placed at 1-foot increments within the operational range of the dragarm. These devices shall be capable of measuring the depth below the water surface to the lowest fixed point of each draghead (often the heel) with enough length to measure 5 feet more than the maximum project depth. Pressure sensors may be used to verify calibration of the draghead sensors only in areas where current flow past the vessel/dragarm cannot be reduced sufficiently to allow safe handling of manual measuring devices. Pressure sensors used for this purpose shall be vented pressure gages and shall be subjected to an annual manufacturer's calibration. Prior to the dragarm depth check, the sensor shall be checked at a known depth, and may be required to be zeroed at this point according to manufacturer's specifications. Care shall be taken not to kink the cable or restrict the vent during deployment.

The COR shall review the draghead depth data to ensure that the system is operating within acceptable accuracy and may direct the Contractor to re-calibrate or repair system components as necessary. If a bubbler type system is used, weekly calibration of the draghead sensors is recommended, as they are sensitive to environmental conditions.

### 3.4.3 Ullage Sounding & Volume Check

The COR shall periodically check the reported hopper ullage sounding using a tape measure or other distance measuring device. The Contractor shall furnish a clearly readable weighted tape, marked in tenths of a foot, capable of measuring throughout the full range of hopper depth. The weight for this tape shall be a 6-inch diameter disk weighing between 2 and 3 pounds. The COR shall review the hopper dredge ullage sounding data to ensure that the system is operating within acceptable accuracy (0.1 feet). Reported ullage soundings will be verified light, loaded, and at other intervals at the COR's discretion. Measurements can be taken from multiple locations along the combing or from sensor location at the COR's discretion. If values are outside the acceptable range, the Contractor shall re-calibrate or repair system components as necessary. This check may be performed separately or as a part of the Water Load Test. For each sensor provided fore and aft ullage sounding value, an average ullage sounding value will be calculated during the ullage sounding check, and the corresponding volume will be verified longhand using the supplied hopper volume tables.

### 3.4.4 Position Check

During the QA checks the reported position of the dredge shall be verified by comparison with readings from a handheld GPS receiver. Throughout the contract, the COR shall periodically take readings from an independent GPS to verify locations.

### Water Load Test

Water Tests shall consist of pumping the hopper dredge out to its lowest level and then filling it to capacity with water, taking ullage and draft measurements at both levels to determine hopper dredge volume and displacement. The objective of the water test is to validate the dredge's reported displacement and hopper volumes. If the results of the water test indicate that the system is not operating within acceptable accuracy, the Contractor shall correct the deficiencies causing the error, and repeat the water test until the results are acceptable.

The Contractor shall provide a handheld refractometer with automatic temperature compensation to measure the hopper dredge water specific gravity during water tests. The refractometer shall be capable of measuring the hopper dredge water specific gravity with a resolution of 0.001 and minimum accuracy of  $\pm 0.001$ . The Contractor shall also provide a water-sampling device to retrieve a sufficient volume of water from various depths in the hopper dredge to accurately determine specific gravity with the refractometer, and a sufficient volume of deionized water for calibration of the device.

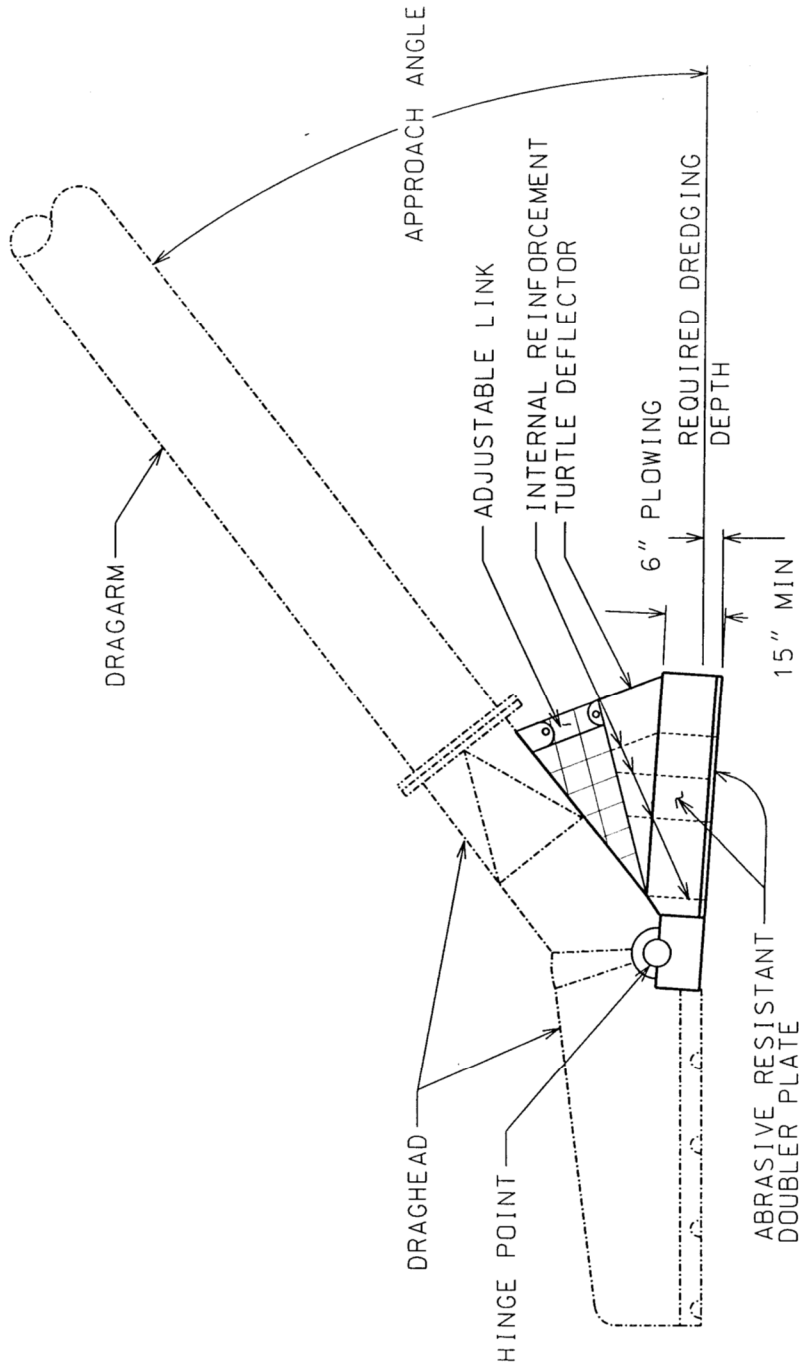
### 3.5 CONTRACTOR QUALITY CONTROL

Dredging contractor shall designate a quality control systems manager (QCSM), who shall develop and maintain daily procedures to ensure the contractor’s quality control (CQC) of the DQM system. These methods shall include a procedure by which data being collected is checked against known values, telemetry is verified to be functioning, and the DQM computer is verified to be on and the DQMOBS is running. The Contractor Quality Control Plan which describes these methods and procedures shall be included in the DPIP as per section 1.5 Table of Contents, item 27. This is the only section which shall be submitted to the local district and is a required submittal prior to the start of the contract. CQC Reports may be required at the discretion of the QAR daily. Annotations shall be made in the CQC Report documenting all actions taken on each day of work including all deficiencies found and corrective actions taken.

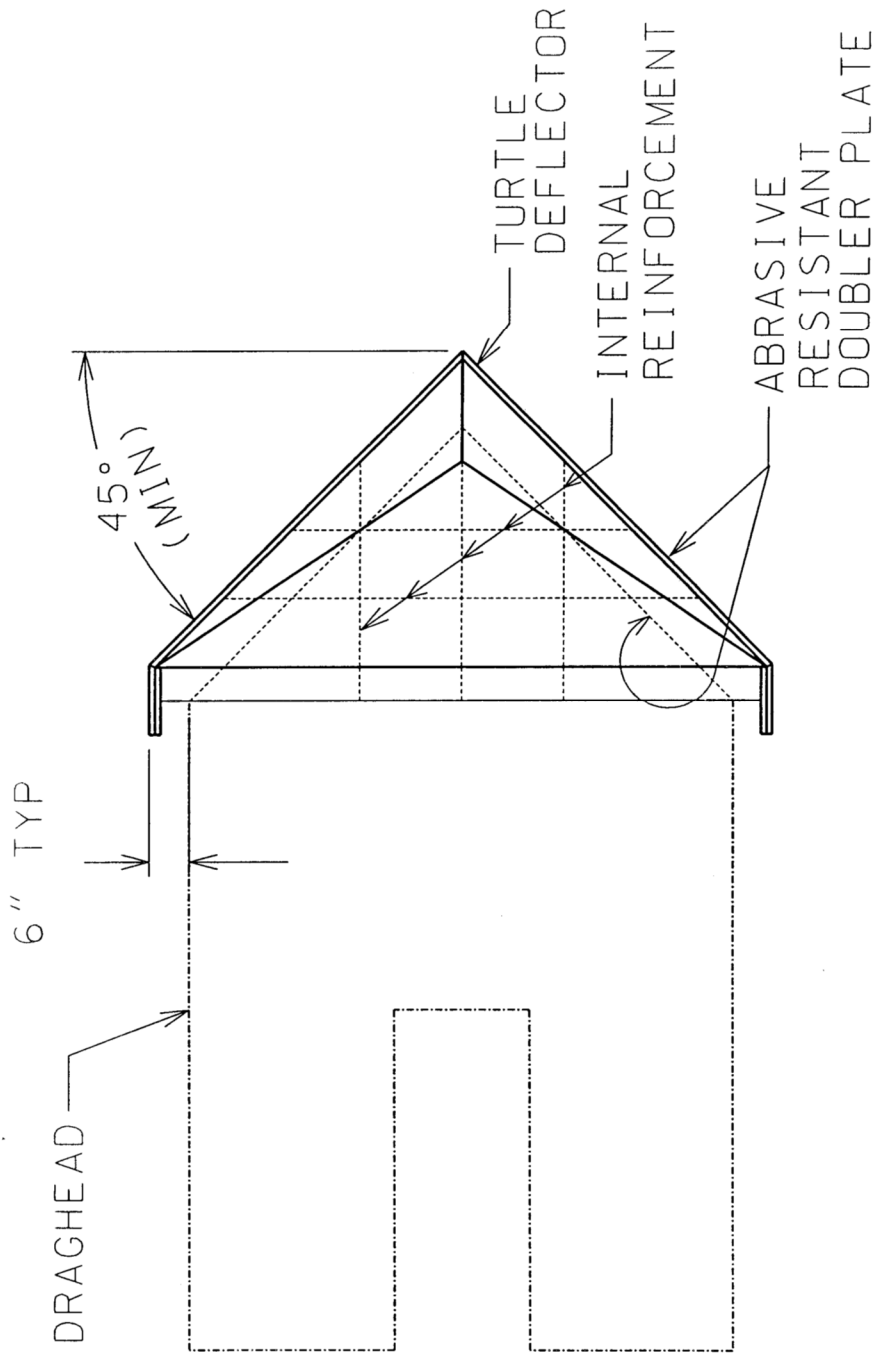
### 3.6 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

Plan	DPIP	Sec 1.5 Dredge Plant Instrumentation
	DQM SYSTEM	
Data	Sensor Instrumentation	Sec. 3.1 Specifications for Reported
Management System Requirements	DQM Computer	Sec. 3.2 National Dredging Quality
	DREDGE DATA	
	Event documentation	Sec. 3.2.9 Data Reporting
Backups	Dredge Data Backups	Sec 3.2.10 Contractor Data
	QA EQUIPMENT ON DREDGE	
Check	Ullage tape	Sec. 3.4.3 Ullage Sounding & Volume
Check	Dragarm depth chain	Sec. 3.4.2 Draghead Depth
	Refractometer –measuring in grams/cubic centimeter with a resolution of 0.001 and a minimum accuracy of $\pm 0.001$ with calibration water	Sec. 3.4.5 Water Load Test
	Water sampling device	Sec. 3.4.5 Water Load Test

# **Sea Turtle Deflector Specification**



ELEVATION  
 RIGID ADJUSTABLE TURTLE DEFLECTOR  
 SCALE: NONE



PLAN VIEW  
 RIGID TURTLE DEFLECTOR  
 SCALE: NONE



# **Turbidity Monitoring Report**

TURBIDITY MONITORING REPORT  
IRVINGTON SITE OFFICE  
CONTRACT NUMBER:

=====

DATE: \_\_\_\_\_ REPORT NO. # \_\_\_\_\_

TIME OF DAY SAMPLE TAKEN: \_\_\_\_\_ hrs

WEATHER CONDITIONS: \_\_\_\_\_

DIRECTION OF WATER FLOW: \_\_\_\_\_ TIDAL STAGE: \_\_\_\_\_

WATER TEMP: \_\_\_\_\_ ° WIND SPEED \_\_\_\_\_ (MPH)

WAVE CONDITIONS (CALM, CHOPPY, ROUGH): \_\_\_\_\_

=====

TURBIDITY MEASUREMENT TAKEN APPROX. \_\_\_\_\_ FT. FROM DREDGE

TURBIDITY MEASUREMENT TAKEN APPROX. \_\_\_\_\_ FT. FROM DISCHARGE

DISCHARGE IS APPROX. \_\_\_\_\_ FT FROM DREDGE WITH AZIMUTH \_\_\_\_\_ °

DEPTH AT DREDGE: \_\_\_\_\_ FT. DEPTH AT DISCHARGE: \_\_\_\_\_ FT.

SURFACE TURBIDITY AT DREDGE: \_\_\_\_\_ NTU

MID-DEPTH TURBIDITY AT DREDGE: \_\_\_\_\_ NTU

SURFACE TURBIDITY AT DISCHARGE: \_\_\_\_\_ NTU D/A #: 11, SECTION 1a

MID-DEPTH TURBIDITY AT DISCHARGE: \_\_\_\_\_ NTU

=====

BACKGROUND TURBIDITY TAKEN APPROX. \_\_\_\_\_ FT FROM DREDGE

AZIMUTH FROM DREDGE: \_\_\_\_\_ °

WATER DEPTH: \_\_\_\_\_ FT

SURFACE TURBIDITY: \_\_\_\_\_ NTU MID-DEPTH TURBIDITY: \_\_\_\_\_ NTU

=====

REMARKS (VISIBLE PLUME, ETC.): Sea too rough for samples \_\_\_\_\_

INSPECTOR: \_\_\_\_\_

# **Standard Manatee Conditions**

STANDARD MANATEE CONSTRUCTION CONDITIONS  
April 2003

- a. The lessee/grantee shall instruct all personnel associated with the project of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatees.
- b. The lessee/grantee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to, or exit from, essential habitat.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- e. If manatees are seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure their protection. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. Operation of any equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.
- f. Any collision with and/or injury to a manatee shall be reported immediately to Mr. Paul Necaize at (228) 493-6631 of the U.S. Fish and Wildlife Service in Jackson, Mississippi.
- g. Temporary signs concerning the manatees shall be posted prior to and during all construction/dredging activities. All signs are to be removed by the lessee/grantee upon completion of the project. A sign measuring at least 3 ft. by 4 ft. which reads *Caution: Manatee Area* will be posted in a location prominently visible to water related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8',6" by 11" which reads *Caution: Manatee Habitat. Idle speed is required if operating a vessel #7 the construction area. All equipment must be shutdown if a manatee comes within 50 feet of operation. Any collision with and/or injury to a manatee shall be reported immediately to the U.S. Fish and Wildlife Service in Jackson, Mississippi (228-493-6631).*

APPENDIX C  
DREDGING QUANTITIES

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**APPENDIX C**  
**PHASE 4 MOBILE HARBOR DEEPENING AND WIDENING**  
**AVERAGE END AREA VOLUME REPORT**

Baseline Station	Phase 4 Dredge Template			Phase 4 O&M Template			Phase 4 New Work Template		
	Cut Area (S.F.)	Cut Volume (C.Y.)	Cumulative Volume (C.Y.)	Cut Area (S.F.)	Cut Volume (C.Y.)	Cumulative Volume (C.Y.)	Cut Area (S.F.)	Cut Volume (C.Y.)	Cumulative Volume (C.Y.)
500+00.00	3746	0	0	744	0	0	3002	0	0
505+00.00	3749	69399	69399	750	13833	13833	2999	55566	55566
510+00.00	3756	69497	138897	774	14116	27950	2982	55381	110947
515+00.00	3734	69354	208250	783	14421	42371	2951	54933	165880
520+00.00	3758	69367	277617	811	14763	57133	2946	54604	220484
525+00.00	3762	69626	347243	779	14730	71863	2982	54896	275380
530+00.00	3747	69525	416768	762	14271	86135	2985	55253	330633
535+00.00	3707	69021	485789	741	13912	100047	2967	55109	385741
540+00.00	3717	68743	554531	768	13967	114014	2949	54775	440517
545+00.00	3710	68767	623298	728	13847	127861	2982	54921	495437
550+00.00	3677	68399	691698	681	13045	140906	2996	55354	550791
555+00.00	3706	68363	760060	607	11927	152834	3099	56435	607227
560+00.00	3977	71141	831201	472	9991	162825	3505	61149	668376
565+00.00	3950	73398	904599	451	8545	171369	3499	64853	733230
570+00.00	4085	74402	979001	657	10256	181626	3428	64145	797375
575+00.00	4095	75742	1054743	391	9705	191331	3704	66037	863412
580+00.00	3961	74587	1129330	410	7421	198751	3550	67166	930579
585+00.00	3979	73514	1202844	530	8710	207461	3448	64804	995383
590+00.00	3975	73651	1276494	440	8983	216444	3536	64668	1060050
595+00.00	3678	70865	1347360	460	8327	224772	3218	62538	1122588
600+00.00	3430	65812	1413172	433	8268	233040	2996	57544	1180133
605+00.00	3352	62792	1475964	465	8323	241362	2886	54469	1234602
610+00.00	3294	61531	1537495	495	8895	250257	2798	52636	1287238
615+00.00	3526	63147	1600643	520	9402	259660	3006	53745	1340983
620+00.00	3330	63481	1664123	489	9343	269002	2841	54138	1395121
625+00.00	3363	61970	1726094	511	9254	278256	2852	52716	1447837
630+00.00	3385	62485	1788578	533	9667	287923	2852	52818	1500655

635+00.00	3362	62475	1851054	468	9270	297193	2894	53205	1553861
640+00.00	3140	60206	1911260	481	8783	305976	2659	51423	1605284
645+00.00	3390	60466	1971726	584	9858	315834	2806	50608	1655892
650+00.00	3244	61432	2033158	559	10583	326417	2685	50849	1706741
655+00.00	3277	60383	2093541	567	10425	336842	2710	49958	1756699
660+00.00	3216	60116	2153657	539	10238	347080	2677	49877	1806577
665+00.00	3153	58966	2212623	502	9637	356717	2651	49329	1855906
670+00.00	3086	57765	2270388	521	9468	366185	2565	48298	1904204
675+00.00	2927	55673	2326062	418	8688	374873	2509	46985	1951189
680+00.00	2865	53632	2379694	398	7549	382422	2468	46083	1997272
685+00.00	3040	54677	2434370	457	7915	390337	2582	46762	2044033
690+00.00	3005	55968	2490338	466	8548	398885	2539	47420	2091453
695+00.00	3059	56150	2546488	503	8973	407858	2556	47177	2138631
700+00.00	3180	57772	2604260	486	9155	417012	2694	48617	2187248
705+00.00	3063	57810	2662070	442	8591	425603	2621	49219	2236467
710+00.00	2916	55370	2717440	416	7945	433548	2501	47425	2283892
715+00.00	2971	54514	2771954	399	7548	441095	2572	46967	2330859
720+00.00	2976	55064	2827018	454	7902	448997	2522	47162	2378021
725+00.00	2816	53625	2880643	324	7201	456198	2492	46424	2424444
730+00.00	2844	52404	2933047	349	6226	462425	2495	46178	2470623
735+00.00	2894	53126	2986173	322	6212	468637	2571	46913	2517536
740+00.00	3016	54716	3040889	396	6649	475286	2620	48067	2565602
745+00.00	2911	54881	3095770	372	7109	482395	2540	47772	2613375
750+00.00	2901	53822	3149592	354	6723	489118	2547	47099	2660474
755+00.00	3080	55384	3204976	392	6911	496030	2688	48473	2708947
760+00.00	3107	57288	3262264	449	7787	503817	2658	49501	2758447
765+00.00	3412	60356	3322620	550	9250	513067	2861	51106	2809553
770+00.00	3231	61507	3384127	498	9700	522767	2734	51807	2861360
775+00.00	3166	59237	3443364	461	8877	531644	2705	50360	2911720
780+00.00	2841	55621	3498985	360	7603	539247	2481	48018	2959738
785+00.00	2802	52243	3551229	345	6527	545774	2457	45716	3005454
790+00.00	2741	51318	3602546	295	5925	551699	2446	45393	3050848
795+00.00	2623	49666	3652212	298	5489	557187	2325	44177	3095025
800+00.00	2523	47651	3699863	247	5040	562228	2277	42610	3137635
805+00.00	2836	49619	3749482	227	4386	566614	2609	45233	3182868



810+00.00	2472	49144	3798626	213	4079	570693	2258	45065	3227933
815+00.00	2621	47156	3845783	267	4446	575139	2354	42711	3270644
820+00.00	2564	48012	3893795	192	4248	579387	2372	43764	3314408
825+00.00	2550	47355	3941150	194	3576	582962	2356	43779	3358187
830+00.00	2683	48450	3989600	238	3997	586960	2445	44453	3402640
835+00.00	2759	50381	4039981	218	4215	591175	2541	46166	3448806
840+00.00	2713	50661	4090642	155	3448	594623	2558	47213	3496019
845+00.00	2461	47906	4138548	162	2933	597556	2299	44973	3540992
850+00.00	2527	46187	4184735	161	2995	600551	2366	43192	3584184
855+00.00	2500	46550	4231285	121	2618	603169	2379	43932	3628116
860+00.00	2342	44838	4276123	90	1954	605123	2253	42885	3671000
865+00.00	2149	41591	4317714	101	1767	606890	2048	39823	3710823
870+00.00	2473	42796	4360510	145	2279	609170	2328	40517	3751340
875+00.00	2548	46490	4407000	149	2722	611891	2399	43769	3795109
880+00.00	2978	51169	4458169	251	3707	615598	2727	47462	3842571
885+00.00	2935	54745	4512914	232	4472	620070	2703	50273	3892844
890+00.00	2710	52264	4565178	198	3979	624049	2512	48285	3941129
895+00.00	2463	47899	4613076	182	3516	627565	2282	44383	3985511
900+00.00	2370	44747	4657823	130	2887	630452	2239	41860	4027371
905+00.00	2390	44070	4701893	120	2315	632767	2270	41755	4069126
910+00.00	2506	45330	4747223	158	2573	635339	2348	42758	4111884
915+00.00	2504	46383	4793606	175	3085	638424	2329	43298	4155181
920+00.00	2666	47862	4841468	225	3708	642133	2440	44154	4199336
925+00.00	2769	50320	4891789	270	4592	646725	2499	45728	4245064
930+00.00	2558	49325	4941114	240	4730	651455	2318	44595	4289659
935+00.00	2226	44295	4985409	217	4237	655691	2009	40059	4329718
940+00.00	2208	41052	5026461	142	3324	659015	2066	37728	4367445
945+00.00	1944	38446	5064907	79	2045	661060	1865	36402	4403847
950+00.00	1514	32024	5096932	13	854	661914	1501	31170	4435017
	<b>Total :</b>			<b>Total</b>			<b>Total New</b>		
		<b>5096932</b>		<b>Maintenance:</b>	<b>661914</b>		<b>Work:</b>	<b>4435017</b>	

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