AMENDMENT OF SOLICITATION/M	TRACT 1. CONTRACT ID CODE			PAGE OF PAGES	
				1 2	
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITIO	ON/PURCHASE	5. PROJECT	NO. (If applicable)
W9127824B0001-0001 6. ISSUED BY CODE	8 MARCH 2024	7. ADMINIST	ERED BY(If other that	CHC2	2012
0.100022.21		CODE			
Corps of Engineers 109 St. Joseph St. Mobile, AL 36602					
8. NAME AND ADDRESS OF CONTRACTOR	(No., street, county, Sta	ate and ZIP code)		9A. AMEN	IDMENT OF SOLICITATION
	,		NO. W912782 9B. DATEI 16 FEABI 10A. MOD CONTRAC	24B0001 D (SEE ITEM 11) RUARY 2024 IFFICATION OF CT/ORDER NO.	
				10B. DATE	ED (SEE ITEM 13)
CODE	FACILITY CODE				``````````````````````````````````````
In this trick of the submitted of the submitted as set forth in item 14. The hour and date specified for receipt of Offers is extended. If is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA	12. ACCOUNTING AND APPROPRIATION DATA (if required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS,					
A. THIS CHANGE ORDER IS ISSUED PU CONTRACT ORDER NO. IN ITEM 10A	S THE CONTRACT/O	ority) THE C	HANGES SET FORT	HIN ITEM 14	ARE MADE IN THE
B. THE ABOVE NUMBERED CONTRAC appropriation date, etc.)	T/ORDER IS MODIFIED TO ITEM 14, PURSUANT TO A	REFLECT ADM UTHORITY OF 1	IINISTRATIVE CHAI FAR 43.103(b)	NGES (such as	changes in paying office,
C. THIS SUPPLEMENTAL AGREEMENT	IS ENTERED INTO PURSU	ANT TO AUTHO	ORITY OF:		
D. OTHER (Specify type	of modification and authority)			
E. IMPORTANT: Contractor is not,	is required to sign this docu	ment and return	copies to the issui	ng office.	
14. DESCRIPTION OF AMENDMENT/MODIFICAT	TION (Organized	by UCF section h	eadings, including sol	icitation/contra	act subject matter where feasible)
The subject solicitation for: MOBILE HARBOR, ALABAMA, DEEPENING AND WIDENING – PHASE 6					
Is modified in the following: REFER TO THE ENCLOSED REVISED SPECIFICATIONS FOR AMENDMENT NO. 0001					
NOTE: THE RECEIPT OF PROPOSAL DATE IS HEREBY REVISED BY THIS AMENDMENT. REFER TO BLOCK 13.A OF THE ENCLOSED SF1442.					
Except as provided herein, all terms and conditions of the document reference in item 9A or 10A, as Heretofore changed, remains unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER(Type or print)16A. NAME AND TITLE OF CONTRACTING OFFICE(Type or print)					
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNEI	D 16B. UNI BY	TED STATES OF AM	IERICA 1	6C. DATE SIGNED
(Signature of person authorized to sign)		(Sign	ature of contracting of	ficer)	
NSN 7540-01-152-8070 PREVIOUS EDITION UNUSABLE		30-105		STANDA Prescribe	ARD FORM 30 (REV. 10-83) d by GSA

PART I - REVISIONS MADE BY ADDED AND/OR REPLACEMENT PARAGRAPHS/PAGES/SECTIONS

The items listed below are to be replaced by the corresponding added and/or revised paragraphs/pages or sections. Added and/or revised paragraphs/pages or sections are indicated by a note in bottom right hand corner of each paragraph or page. Added sections are hereby made a part of the contract and are to be inserted in the specification in the proper numerical/alphabetical sequence.

Within the specifications, deletions from the specifications are indicated by strikethrough, e.g.: deletions are marked with strikethrough and additions to the specifications including revisions/substitutions are indicated in bold, italic and underlined, e.g.: additions are indicated thus.

	Corresponding Added or Revised Paragraph
SECTION	Page, and/or Section
SF1442	Revised Block 13.A as indicated herein.
01 00 00	Revised Paragraphs 1.3, 1.11.1, and 1.11.2.1 as indicated herein.
01 00 01	Revised Paragraph 1.3 as indicated herein.
01 57 19	Revised Paragraph 3.3 as indicated herein.
35 20 23	Revised Paragraphs 3.3.6.2 - 3.3.6.5 as indicated herein.
Appendix A	Replaced in its entirety.

Encl as stated Replaced pages of the specifications as indicated in Part I.

		1. SOLICITATION NUMBER	2. TYPE OF SOLI	CITATION	3. DATE ISSUED	PAGE	OF	PAGES
SULICITATION, OF	FER		SEALED BID	(IFB)				
AND AWARD			INVITATION F	or Bid				
(Construction, Alteration, o	or Repair)	W9127824B0001	NEGOTIATED	(RFP) R PROPOSAL	16 FEB 2024	1		2
IMPORTANT - The "offer" sec	ction on the	reverse must be fully comp	pleted by offeror.					
4. CONTRACT NO.		5. REQUISITION/PURCHASE	REQUEST NO.	6. PROJECT CHC2201	NUMBER 2			
7. ISSUED BY	CODE	СТ	8. ADDRESS C	FFER TO				
U.S. ARMY ENGINEER DISTRICT, MOBILE CONTRACTING DIVISION (CESAM-CT) 109 SAINT JOSEPH STREET MOBILE, AL 36628-0001			SAME AS BLOCK 7					
	9. FOR Chanda Strenth / Kristi Sutherland			D. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) (251) AA1_5505 / (251) AA1_6515				
	INFORMATION CALL : F Chanda Stientry Rist Stutienand (231) 441-53957 (231) 441-5315							
SOLICITATION								
NUIE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".								
10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (<i>Title, identifying no., date</i>):								

MOBILE HARBOR, ALABAMA, DEEPENING AND WIDENING – PHASE 6, 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 29 in Section 01 00 01.

11.	The contractor shall begin performance within* calendar days and complete it within	calendar days after receiving
	\square award, \boxtimes notice to proceed. This performance period is \square mandatory, \square negotiable. (S	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
		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 <u>19 MARCH 2 APRIL 2024</u> (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 \square is, \square 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
re	ference.

d. Offers providing less than <u>120</u> calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

OFFER (Must be fully completed by offeror)										
14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)			15. TELEPHONE NO. (Include area code)							
			16. 1	16. REMITTANCE ADDRESS (Include only if different than Item 14.)			ltem 14.)			
17. The offeror agrees to perform the work req	JDE juired at t	he pric	es specified	d below	in strict acc	ordance with	the terms of	this solicitation	, if this offer is	accepted by
the Government in writing within requirement stated in Item 13d. Failure to	caler o insert ar	ndar da ny num	lys after the ber means	e date o <i>the offe</i>	offers are du eror accepts	e. (Insert an <u>)</u> the minimun	y number equ n in Item 13d.)	al to or greater	r than the minin	num
AMOUNTS										
18. The offeror agrees to furnish any required	performa	nce an	d payment	bonds.						
(The offeror ack	1 nowledge	9. AC	KNOWLE	DGME ndments	ENT OF AN s to the solid	IENDMENT	S number and o	date of each)		
AMENDMENT NUMBER										
DATE										
20a. NAME AND TITLE OF PERSON AUTHO (<i>Type or print</i>)	DRIZED T	O SIGI	N OFFER		20b. SIGNA	TURE		1	20c. OFFER	DATE
	AV	VARD) (To be	сотр	leted by	Governm	ent)			
21. ITEMS ACCEPTED:			(10.00				,			
22. AMOUNT			23. ACCC	DUNTIN	ig and app	PROPRIATIC	N DATA			
24. SUBMIT INVOICES TO ADDRESS SHOW			ГЕМ	25. C	OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO					
(4 copies unless otherwise specified)				[□ 10 U.S.C. 3204(a) () □ 41 U.S.C. 3304(a) ()					
26. ADMINISTERED BY					27. PAYMENT WILL BE MADE BY					
	<u>I</u>									
CONTRACT	ING OF	FICE	RWILL	COMF	PLETE ITI	EM 28 OR	29 AS APP	PLICABLE		
28. NEGOTIATED AGREEMENT (Contra document and return copies to iss to furnish and deliver all items or perform a	ctor is rec suing offic II work, re	quired t ce.) Co	o sign this ontractor ag	rees d	29. AWA on th cons	ARD (Contra is solicitation ummates the	actor is not red is hereby acc contract, whi	<i>quired to sign t</i> cepted as to th ch consists of	<i>his document.</i>) e items listed. (a) the Govern	Your offer This award ment
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.			n shall d by	solic conti	itation and yc actual docun	our offer, and (nent is necess	(b) this contrac sary.	t award. No fu	rther	
30a. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (<i>Type or print</i>)			D	31a. NAME OF CONTRACTING OFFICER (Type or print)						
30b. SIGNATURE		30c. D	ATE		31b. UNIT	ED STATES	OF AMERICA	ł	31c. AWARE)
					BY				DATE	

STANDARD FORM 1442 (REV12/2022) BACK

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 in the northern most reach of the Mobile Bay, Alabama at the mouth of the Mobile River within and along the Mobile Harbor Federal Navigation Channel and turning basin from Stations 226+16 to 337+00.

The in bay Relic Shell placement sites A and B for the project are located in the Mobile Bay, southeast of the channel work, approximately 4 miles to the closest point, and approximately 8.5 miles from the furthest point.

The benefical use Deer River and Dauphin Island Causeway North and South placement sites are located in the middle and lower portions of Mobile Bay southwest of the channel work, roughly 13.5 miles and 25 miles from the Mobile Harbor Turning Basin.

(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 heights of various structures to including, but not limited to submarine cables, pipes, highlines, docks, piers, bulkheads, and bridges etc. (as applicable), are not known. It will be necessary for the Contractor to ascertain interference problems and notify the respective owners in advance of dredging and placement operations. The Contractor shall make all arrangements with the respective owners of the structure to assure satisfactory completion of dredging and dredge material placement 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 weather conditions which may cause suspension of the work for short unknown periods of time. During tropical storms and hurricanes which may occur from June to November, the project channels do not afford a safe refuge for floating plants. 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 themself 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 Federal Navigation 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 container ships, bulk carriers, 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.

(h) The Dauphin Island Causeway construction schedule estimates the end of May for substantial completion. The Dauphin Island Causeway contractor is to maintain the approach channel until final acceptance of channels based on as-built surveys, which may be conducted up to 30 days prior to the end of the contract. Dates are subject to change.

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 their 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 (156.65 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 the appropriate US Coast Guard regulation for a vessel of its size); 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 Sub Title

Text

1.8 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.

1.9 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. All project signs shall be removed after construction is physically complete.

1.10 DATUM AND BENCHMARKS

The plane of references of Mean Lower Low Water (MLLW) and North American Vertical Datumn of 1988 (NAVD88) as used in these specifications is that determined by National Oceanic and Atmosperic Administration (NOAA) and 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.

1.11 FINAL EXAMINATION AND ACCEPTANCE

The Contractor or their authorized representative will be notified when soundings and/or sweepings are to be made for final examination and acceptance, 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.

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.

1.11.1 Mobile Harbor Federal Navigation Channel and Turning Basin

(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 Contractor and COR agreed upon 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 the contract specified 1V:5H slope. Acceptance of the Mobile Harbor Federal Navigation Channel 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.

For the purpose of acceptance for the Mobile Harbor Federal Navigation Channel, the work to be done will be divided into one 1,384, <u>nine <u>eight</u></u> 1,000-foot sections, and one 1,700 foot section, as defined below, unless otherwise specified in the approved workplan. The contractor shall submit their own dredge cuts in the workplan, similar to Table 1 in section 35 20 23, which may be used for acceptance purposes in lieu of acceptance sections by channel stationing, if approved by the Contracting Officer or their representative. The quantity of material dredged for payment shall be calculated as the difference between the before- and after-dredging surveys of the cut areas within the dredge prism. Partial payments can be made on individual cuts prior to final acceptance. Final acceptance will be made when the individual dredge cuts are constructed to the lines and grades shown on the contract drawings:

Dredging Reach No.	From Station	To Station
1	226+16	240+00
2- 11 9	240+00	320+00
$\frac{12}{10}$	320+00	337+00

(b) 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).

(c) 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.

1.11.2 Dredge Material Placement Sites

Acceptance of the dredged material placement areas will be based on placement to the lines, grades and elevations within the specified placement tolerances.

No dredged material shall be deposited at locations or elevations other than those shown on the contract plans and designated. Misplacement violates environmental compliance and/or Regulatory permit(s). Should any misplacement occur, the Contractor shall remove and/or redeposit material at his expense. Misplaced material will be quantified by volumes calculated from Lidar and/or hydrograph surveys and/or DQM measurements. Required removal and redeposit of the misplaced material and any necessary dredged material placement sites restoration work shall not be the basis for a time extension or additional compensation under this contract.

AMENDMENT	0001
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1.11.2.1 Deer River Dredge Material Placement Site

As soon as practicable (within 14 calendar days or less if agreed to by the Contracting Officer) after completion of the entire work of the Deer River Placement Site 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 placement template) will be thoroughly examined at the cost and expense of the GovernmentContractor by sounding, as determined by the Contracting Officer, for determination of ACCEPTABILITY of PERFORMANCE by the Contractor. Acceptance of the Deer River Placement Site will be based on dredged material placement to the lines, grades and elevations within the specified placement tolerances. Final acceptance will be based on at least 90% (by percentage of point elevations) within the Contractor and Contracting Officer agreed upon accpetance sections meeting the specified tolerance. The Contracting Officer or their representative may require the contractor to fill deficit or remove excesss dredge material placement areas that fall outside of the specified minimum and maximum tolerances.

1.11.2.2 Dauphin Island Causeway North and South Segement Placement Sites

As soon as practicable (within 14 calendar days or less if agreed to by the Contracting Officer) after completion of the entire work of the Dauphin Island Causeway North and South Segement Placement Sites 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 placement template) will be thoroughly examined at the cost and expense of the Contractor by sounding, as determined by the Contracting Officer, for determination of ACCEPTABILITY of PERFORMANCE by the Contractor. Acceptance of the Dauphin Island Causeway North and South Segement Placement Sites will be based on dredged material placement to the lines, grades and elevations within the specified placement tolerances.

Final acceptance of the marsh creation areas will be based on at least 90% (by percentage of point elevations) within the Contractor and COR agreed upon acceptance sections meeting the specified tolerance. The COR may require the contractor to fill deficit or remove excesss dredge material placement areas that fall outside of the specified minimum and maximum tolerances.

1.11.2.3 Relic Shell Mine Placement Sites A and B

As soon as practicable (within 14 calendar days or less if agreed to by the Contracting Officer) after completion of the placement within Relic Shell Mine Placement Sites A and B 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 placement template) will be thoroughly examined at the cost and expense of the Contractor by sounding, as determined by the Contracting Officer, for determination of ACCEPTABILITY of PERFORMANCE by the Contractor. Acceptance will be based on dredged material placement within the specified placement tolerances.

1.12 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 --

SECTION 01 00 01 GENERAL CONTRACT REQUIREMENTS

1.	BOARD OF CONTRACT APPEALS
2.	REQUESTS FOR INFORMATION
3.	DESCRIPTION OF WORK
4.	PREAWARD INFORMATION
5.	CONTRACT PRICES - BIDDING SCHEDULE
6.	REQUIRED INSURANCE
7.	EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE
8.	U.S. ARMY CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385- 1-1.5
9.	AFFILIATED BIDDERS
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29.	PROCEDURES FOR SUBMISSION OF BIDS AND VIRTUAL BID OPENING

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 <u>4 18 MARCH 2024</u> 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: W9127824B0001 The Bidder Inquiry Key is: F7XNRG-28TZK8

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.

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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.

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

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 6 of the Mobile Harbor, Alabama Project shall consist of deepening and widening portions of the Upper Bay Channel and the Upper Bay Turning Basin (Choctaw Pass Turning Basin).

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.

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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

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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.

(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 <u>http://www.usace.army.mil/Safety-and-Occupational-Health/EM-385-1-1-2008-Being-Revised/</u>. 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. 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

11. 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

12. 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

13. 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

14. 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

15. 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

16. 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

17. 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

18. 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.

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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

19. 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

20. 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

21. 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

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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

22. 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

23. 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

24. 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

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25. 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

26. 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

27. 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

28. 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

29. 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 2:00 pm CST on **19 March 2024** 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. Bidders that are interested in submitting bids will use the U.S. Army Corps of Engineers via Procurement Integrated Enterprise Environment (PIEE) website (<u>https://piee.eb.mil/xhtml/unauth/home/login.xhtml</u> OR- <u>https://wawf.eb.mil</u> -OR- <u>https://piee.eb.mil</u>). Emailed submissions of bids are not permitted and will not be accepted under any circumstances. The Government must receive your bid no later than the time and date specified in Block 13 of SF 1442. The PIEE system notification must show the bid submission prior to the specified time. Any and all amendments to the solicitation shall be acknowledged by signing on each amendment (SF30) and by completing Block 19 of the SF 1442. Offerors shall confirm bid receipt by emailing the Points of Contact listed on the SF1442.

The public bid opening will be held virtually on **19 March 2024** at 2:45 pm CST. Interested parties are welcome to participate by joining the teleconference call via WebEx. The details of the teleconference are provided below:

Phone Number: 844-800-2712 Access Code: 1990707194 Security Code: 1111

End of Paragraph

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TEMPORARY ENVIRONMENTAL CONTROLS 08/22

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.

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

40	CFR	64	Compliance Assurance Monitoring
40	CFR	241	Guidelines for Disposal of Solid Waste
40	CFR	243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40	CFR	258	Subtitle D Landfill Requirements
40	CFR	261	Identification and Listing of Hazardous Waste
40	CFR	262	Standards Applicable to Generators of Hazardous Waste
40	CFR	263	Standards Applicable to Transporters of Hazardous Waste
40	CFR	264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40	CFR	265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40	CFR	266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40	CFR	268	Land Disposal Restrictions
49	CFR	173	Shippers - General Requirements for Shipments and Packagings
49	CFR	178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical,

or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.4 Solid Waste

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.

1.2.5 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification 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

Preconstruction Survey

Environmental Protection Plan; G

SD-06 Test Reports

Manatee Sighting Reports; G, PD

SD-11 Closeout Submittals

Waste Determination Documentation; G

Hazardous Waste/Debris Management; G

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution. This includes compliance 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. The Contractor must perform all work within compliance specifications issued by the Alabama Department of Environmental Management (ADEM) which is included in the Environmental Compliance Appendix. In addition for placement at beneficial use sites - Dauphin Island Causeway (SAM-2019-1004-DCH) and Deer River (SAM-2019-1005-DCH), the Contractor shall comply with the Regulatory Permits included in the Environmental Compliance Appendix.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey and Protection of Features

Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.5.2 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be used; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer Representative to discuss the proposed Environmental Protection Plan (EPP) or equipment local requirement. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, environmental compliance requirements (such as mitigation measures), Regulatory permits for Dauphin Island Causeway (SAM-2019-1004-DCH) and Deer River (SAM-2019-1005-DCH), and other measures to be taken.

1.5.3 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, and other elements of the Contractor's EPP. The Contractor shall record on daily reports any problems in complying with laws, regulations and ordinances and corrective action taken. 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. FAR 52.242-14 Suspension of Work provides that a suspension, delay, or interruption of work due to the fault or negligence of the Contractor allows for no adjustments to the contract for time extensions or equitable adjustments. In addition to a suspension of work, the Contracting Officer may use additional authorities under the contract or law.

1.6 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Ensure construction related efforts comply with the ADEM water quality certification, USFWS and NMFS requirements, laws, and regulations in addition to Dauphin Island Causeway (SAM-2019-1004DCH) and Deer River (SAM-2019-1005-DCH) Regulatory permits. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP not less than 7 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.6.1 General Overview and Purpose

1.6.1.1 Descriptions

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. 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.

1.6.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.6.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.6.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.6.1.5 Contact Information

Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

1.6.2 General Site Information

1.6.2.1 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

Show where any fuels, hazardous substances, solvents, or lubricants will be stored. Provide a spill plan to address any releases of those materials.

1.6.3 Prevention of Releases to the Environment

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. The statement shall discuss procedures to prevent releases to the environment and notifications in the event of a release to the environment. 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.

- 1.6.4 Clean Air Act Compliance
- 1.6.4.1 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on the impacts of the project. Ensure required permits are obtained prior to installing and operating applicable equipment/processes.

1.7 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7 Permits and Responsibilities. Notify the Government of all equipment that may require permits or special approvals that the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7 Permits and Responsibilities.

- a. The following environmental compliance documents have been obtained by the Government:
 - (1) Alabama Department of Environmental Management (ADEM) Water Quality Certification
- (2) U.S. Fish and Wildlife Service Section 7 of the Endangered Species Act
 - (3) National Marine Fisheries Service, Habitat Conservation Division Essential FIsh Habitat
 - b. The following Regulatory permits have been obtained by applicants:
 - (1) Dauphin Island Causeway SAM-2019-1004-DCH
 - (2) Deer River SAM-2019-1005-DCH
- PART 2 PRODUCTS

Not Used

- PART 3 EXECUTION
- 3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility. 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 The following species are known and could be affected within the construction area: manatees, sea turtles, Giant manta ray, and the Gulf sturgeon..

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Fish and Wildlife

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, Giant manta ray, and the 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, Giant manta ray, Gulf sturgeon, dolphins or whales 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) The Contractor shall coordinate all activities associated with these resources with the Coastal Environment Team, Mobile District (Attn: Ms. Jennifer Jacobson, PD-E at (251)690-2724 or cell (251)472-7589 or Mr. Don Mroczko, PD-EC at 251-690-3185.

(2) 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

(3) 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). The Contractor shall also notify the Contracting Officer or Contracting Officer Representative within 24 hours. Also provide a copy to Mobile District Coastal Environment Office, Ms. Jennifer Jacobson, PD-E at (251)690-2724 or cell (251)472-7589

(4) 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. Also notify the USACE, Mobile District, Chief of Coastal Environmental, PD-EC, Ms. Jennifer Jacobson, PD-E at (251)690-2724 or cell (251)472-7589, Jennifer.L.Jacobson@usace.army.mil and Mr. Don Mroczko, 251-690-3185, donald.e.mroczko@usace.army.mil.

3.1.1.1 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 and disposal activities authorized by this contract, the Contractor utilize the State and/or USFWS Standard Manatee Construction Conditions.

The manatee is a designated Threatened 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:

(1) 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.

(2) 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.

(3) 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.

Manatee Signs: Prior to commencement of construction, each (4) 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 SPPED IS REQUIRED IF OPERATIING 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.

(5) 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.

(6) 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.

3.1.1.2 Use of Cutterhead Dredge

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 cutterheads are suspended in the water column including but not limited to the following:

(1) When initiating dredging, suction through the cutterhead shall be allowed just long enough to prime the pumps. Then the cutterheads must be placed firmly on the bottom.

(2) When lifting the cutterhead from the bottom, suction through the cutterheads shall be allowed just long enough to clear the lines, then must cease.

(3) Pumping water through the cutterhead shall cease while maneuvering or during travel to/from the placement area.

(4) Raising the 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.

3.1.1.3 Use of Hopper Dredge

When using a hopper dredge, the Contracor shall implement the following:

3.1.1.3.1 Laws and Regulations

(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).

3.1.1.3.2 Shutdown Procedures

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:

(1) Two or more turtle incidents occur within 24 hours

(2) Two turtles incidents, of the same species, occur during dredging

(3) Four turtle incidents, regardless of species, occur during dredging

(4) One gulf sturgeon incident during dredging

3.1.1.3.3 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.

3.1.1.3.4 Operations and Dreging Endangered Species System (ODESS) Reporting

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 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.

3.1.1.3.4.1 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://dqm.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:

(1) 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, Jennifer.L.Jacobson@usace.army.mil , and Donald.e.mroczko@usace.army.mil.

(2) 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.

(3) 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.

(4) 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 consistent with the endangered species compliance section of the contract specification.

3.1.1.3.5 Camera

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.

3.1.1.3.6 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.

3.1.1.3.6.1 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 Contractor Officer Representative shall request permission before doing so by contacting Mobile District Coastal Environmental Team (Ms. Jennifer Jacobson, PD-E at (251)690-2724 or cell (251)472-7589) prior to the reductions in screening. The Contractor shall provide an explanation for such reduction in the dredging report.

3.1.1.3.7 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.

3.1.1.3.8 Sea Turtle Deflector Requirements

3.1.1.3.8.1 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.

3.1.1.3.8.2 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.

3.1.1.3.8.3 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".

3.1.1.3.9 Training for Hopper Dredge Personnel

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.

3.1.1.3.10 Sea Turtle and Gulf Sturgeon Trawling and Relocation

Trawling and relocation shall be conducted only during Hopper Dredging within Mobile Bay 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 requirements Trawling and Relocation:

3.1.1.3.10.1 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. Jennifer Jacobson, Jennifer.L.Jacobson@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/EngineerManuals.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/.

3.1.1.3.10.2 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.

3.1.1.3.10.3 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.

3.1.1.3.10.4 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 insure 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.

3.1.1.3.10.5 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.

3.1.1.3.10.6 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.

3.1.1.3.10.7 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.

3.1.1.3.10.8 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).

3.1.1.3.10.9 Captured Turlte 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.

3.1.1.3.10.9.1 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. Jennifer Jacobson, PD-E at (251)690-2724 or cell (251)472-7589, or by email at Jennifer.L.Jacobson@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

3.1.1.3.10.9.2 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.

3.1.1.3.10.10 Scientific Measures

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.

3.1.1.3.10.11 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.

3.1.1.3.10.12 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):

(1) 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.

(2) Gulf sturgeon PIT tagging must then be performed in accordance with the protocol detailed at the NMFS SERO PRD Web site.

(3) 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.

3.1.1.3.10.13 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.

3.1.1.3.10.14 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. Jennifer Jacobson, Jennifer.L.Jacobson@usace.army.mil and Mr. Don Mroczko, 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. Jennifer Jacobson, Jennifer.L.Jacobson@usace.army.mil and the CO within 10 working days of dredging completion.

3.1.1.3.11 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) 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.

3.1.1.3.12 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.

3.1.1.3.13 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. 3.1.1.3.14 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.

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 Belskis, 75 Virginia Beach Drive, Miami, Florida 33149.

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.

3.1.1.3.15 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.

3.1.2 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.3 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.1.4 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with all required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

The Contracting Officer's approval and appropriate permits are required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.2 EROSION AND SEDIMENT CONTROL MEASURES

Provide erosion and sediment control measures at the placement site and along the pipeline routein accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

<u>AMENDMENT 0001</u>

3.3 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. The following requirements shall be followed:

1) The Contractor shall ensure dredging and the placement of material is in accordance with the plans and specifications as well as the Regulatory Permits SAM-2019-1004-DCH (Dauphin Island Causeway) and SAM-2019-1005-DCH (Deer River) included herein and shall be performed with minimum damage to the environment. No other areas are approved for the placement or excavation of material.

2) The Contract designates areas for placement of all dredged material. No other areas are approved for dredged material placement.

3) The Contractor must comply with all turbidity and monitoring standards and other specific conditions set forth in the water quality certification and Regulatory Permits SAM-2019-1004-DCH (Dauphin Island Causeway) and SAM-2019-1005-DCH (Deer River). 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. Jennifer Jacobson, PD-E at (251)690-2724 or cell (251)472-7589)]. Turbidity Monitoring Reports shall be emailed on a weekly basis to Ms. Jennifer Jacobson at Jennifer.L.Jacobson@usace.army.mil and Mr. Don Mroczko at Donald.e.mroczko@usace.army.mil.

4) 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.

5) 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.

6) 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.

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

8) Only pump out activities such as spud, anchoring, and/or staging of floating equipment is to take place within the designated "pump out area" per permit SAM-2019-01004-DCH (found in Appendix B Environmental Compliance).

AMENDMENT 0001

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Archaeological Resources

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 and Mobile District Archeological Staff (attn: Mr. Mike Malsom PD-EI, (251) 442-8853 and Dr. Patrick M. O'Day, PD-EI Cell(251)604-2159. 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 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.

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).

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards. 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.

3.5.1 Dust Control

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.

- 3.6 WASTE MANAGEMENT AND DISPOSAL
- 3.6.1 Solid Waste Management

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.

3.6.1.1 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste.Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

3.6.2 Control and Management of Hazardous Waste

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

3.6.2.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as

being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Installation Environmental Office. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.6.3 Wastewater

3.6.3.1 Disposal of Wastewater

Disposal of wastewater must be as specified below.

3.6.3.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, to enter water ways or to be discharged prior to being treated to remove pollutants. Wastewater shall be processed, filtered, ponded, or otherwise treated, if applicable, prior to release from project area into waterways. If applicable, the removed material placement operation return water shall not impact any areas of seagrasses, shellfish beds, or wetland areas. Dispose of the wastewater in accordance with 40 CFR 403, state, regional, and local laws and regulations.

3.7 SOUND INTRUSION

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.

3.8 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 35 20 23

DREDGING 08/20

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

This Section covers furnishing all suitable labor, materials, plant, equipment, tools, skills, services, incidentals and performing all work required to excavate the specified materials from within the prescribed Mobile Harbor Federal Navigation Channel Improvements deepening and wideningdredge area limits. In addition, this section covers the transport and placement of the dredge material as indicated in the Contract drawings to attain the surface area and fill height for the respective benefical use at the Deer River, Dauphin Island Causeway and Relic Shell Areas A and B dredge material placement areas. The dredge material will be placed to create tidal marsh habitat and restore sediment to open water bay bottoms.

1.2 REFERENCES

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1

(2014) Safety and Health Requirements Manual

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. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance with Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Unless otherwise indicated below, Preconstruction Submittals shall be submitted no later than 20 calendar days after Notice of Award or 5 calendar days after Notice to Proceed, whichever is later.

> Notice Of Intent to Dredge; G, OP Order Of Work Plan; G, OP Quality Control Plan; G, OP Deposition Plan; G, OP Survey Plan; G, OP Accident Prevention Plan (App); G, OP

SD-05 Design Data

Pre-Construction Surveys; G, OP

Post-Construction Surveys; G, OP

Construcion Surveys; G, OP

SD-06 Test Reports

Dredge Progress Report; G, OP

Daily Reports; G, OP

SD-11 Closeout Submittals

Project Completion Report; G, OP

1.4 DEFINITIONS

1.4.1 Maintenance Material

Maintenance material is defined as that comprising shoaling which has occurred since the channel areas were last dredged.

1.4.2 New Work Material

New work material is defined as previously undredged material.

1.4.3 Mobile Harbor Upper Bay Deepening

Is the dredging to achieve a 5 foot deepening of the existing maintained Upper Mobile Harbor Channel between Stations 226+16 and 267+72.58

1.4.4 Mobile Harbor Turning Basin Deepening and Expansion

Is the dredging to achieve a 5 foot deepening and 250 foot southward expansion of the existing maintained Mobile Harbor turning basin located between stations 245+00 and 271+26.85.

1.4.5 Mobile Harbor Upper Bay Widening

Is the dredging to achieve a 100 foot widening of the existing maintained Upper Mobile Harbor Channel between Stations 267+72.58 to Station 337+00.

1.4.6 Deer River Marsh Creation Fill

Is marsh platform constructed by placement of sandy dredged fill material mixed with silts and clay from the specified Mobile Harbor Federal Navigation Channel behind the existing Deer River Containment Berm within the lines, grades, and elevations shown in the Plans.

1.4.7 Relic Shell Mine Site A and B

Is the open water placement of finer silts and clay dredged material from the specified Mobile Harbor Federal Navigation Channel within the specified limits of the bay shown on the contract Plans to restore sediment to the system.

1.4.8 Dauphin Island Causeway North Sand Berm

Is the placement of coarser sandy fill material from the specified Mobile Federal Navigation Channel behind the existing segmented breakwaters at the Dauphin Island Causeway North dredge placement area located north of Heron Bay Cutoff within the lines, grades, and elevations shown in the contract Plans.

1.4.9 Dauphin Island Causeway North Marsh Creation Fill

Is marsh platform constructed by placement of sandy dredged fill material mixed with silts and clays from the specified Mobile Harbor Federal Navigation Channel behind the Dauphin Island Causeway North Sand Berm located north of Heron Bay Cutoff within the lines, grades, and elevations shown in the contract Plans.

1.4.10 Dauphin Island Causeway South Sand Berm

Is the placement of coarser sandy dredged fill material from the specified Mobile Federal Navigation Channel behind the existing segmented breakwaters at the Dauphin Island Causeway South dredge placement area located south of Heron Bay Cutoff within the lines, grades, and elevations shown in the contract Plans.

1.4.11 Dauphin Island Causeway South Marsh Creation Fill

Is marsh platform constructed by placement of sandy dredged fill material mixed with finer silts and clays from the specified Mobile Harbor Federal Navigation Channel behind the Dauphin Island Causeway South Sand Berm located south of Heron Bay Cutoff within the lines, grades, and elevations shown in the contract Plans.

1.5 METHOD OF COMMUNICATION

Project coordination with the Contracting Officer/Representative (KO/COR) and Quality Assurance Representative (QAR) is to occur during all phases of construction. The area adjacent and West of the channel deepening and widening between stations 267+72.53 and 337+00 will be dredged under a separate Phase 5 Contract. The Contractor shall ensure close coordination regarding their order of work with the Contracting Officer to ensure clear coordination between contractors. Provide a system of communication between the dredge crew and the crew at the placement area. A portable two-way radio is acceptable. Coordination also includes but is not limited to publication of the notice of intent to dredge and coordination with local officials including police, public, US Coast Guard, and others as agreed during coordination meetings. The Contractor shall submit a bi-weekly Dredge Progress Report in Adobe PDF format to the Contracting Officer. The Dredge progress reports shall include but not be limited to the following:

a. Summary table of excavated sediments, dredge positions and cut depths for the reporting time period obtained from applicable production reports 4267 or 27

b. Overview of the project showing the cumulative dredge positions for the reporting time period

c. Excavation graphs showing depth versus time for each dredge for the reporting time period

d. A color-coded plot, in the project reference datum, of the draghead, cutterhead, or other hydraulic or mechanical dredging device depicting the vertical and horizontal limits of the material dredged each day. Any horizontal or vertical dredge violations shall be clearly defined

e. Hopper dredges shall submit dredge track lines with draghead depths that shall indicate dredge status: dredging, transiting, unloading, and loading

f. Daily reports for the reporting time period

g. Update of the construction progress, including estimated volumetric production rates from dredge areas (both cumulative and for the reporting period)

h. Hopper Dredge Turtle Observer Reports (if applicable) for the reporting time period

i. Incidental Take Observer Reports (if applicable) for the reporting time period

- 1.6 NOTICES
- 1.6.1 Start of Work

The Contractor shall give the Contracting Officer's Representative five (5) days written advance notice of the date they 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 Notice of Intent to Dredge

Prior to commencement of work on this contract, the Contractor will be required to notify the Commander, Eighth Coast Guard District of their intent to dredge and request that it be published in the Local Notice to Mariners. This notification must be given in sufficient time so that it appears in the Notice to Mariners at least 30 calendar days prior to project commencement. A copy of the notification shall be provided to the Contracting Officer.

1.6.3 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 Conrtactor, 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.

1.6.4 Order or Work Changes

The Contractor shall give the Contracting Officer's Representative ten (10)days written advance notice of the date of any plans to modify the 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.

1.7 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

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, is required. An Accident Prevention Plan (APP) describing the Contractor's accident prevention program shall be provided. In addition to these features, the safety requirements outlined in the following paragraphs shall be incorporated into the Contractor's accident prevention program.

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 fleeting area plan shall be contained within the Order of Work Plan. 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 bouys, 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, bouys, 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'S 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 investigation 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 1.d. of the ENG Form 3394 attesting to his or her 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 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.

1.10 OTHER OPERATIONS

The Contractor should anticipate the possibility of concurrent marine construction and aquaculture operations, adjacent to or nearby the dredge and placement areas in this contract. Locations of known aquaculture subtidal reefs in the vicinity of the work areas are shown on the Contract drawings. Delays should be anticipated in transiting to, and through, the dredging and placement areas during dredging and placement operations. Coordination with other operations in the vicinity of the dredge and placement areas is required.

The Contractor shall so conduct their operations such that they shall not close any thoroughfare nor interfere in any way with traffic on railway, highways, or on water, without the written consent of the Contracting Officer. The regulations the Contractor shall adhere to are those established by, but not necessarily limited to, the Department of the Navy, U.S. Coast Guard, Department of the Army, American Bureau of Shipping, Department of Interior, Alabamaa Department of Transportation, Alabamaa Law Enforcement Agencies, county and municipal.

1.11 PROTECTION OF EXISTING STRUCTURES

The Contractor shall be responsible for determining and documenting the pre-construction condition of existing structures within the project area including staging site(s) and work access. The Contractor shall take appropriate measures to prevent damage to any structures during construction, and for performing a post-construction verification inspection of those structures previously inspected.

1.12 DAMAGES TO ADJACENT PROPERTY AND STRUCTURES

Any damage to private or public property within the project boundaries, including staging site(s) and work access areas/roads, shall be repaired promptly by the Contractor. Any damage as a result of the Contractor's operations shall be repaired at no cost to the Government.

1.13 PROJECT FINAL CLEANUP

Final cleanup, as stated in the paragraph COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK of Section 00700 CONTRACT CLAUSES, shall include the removal of all of the Contractor's plant and equipment either for disposal or reuse. Plant and/or equipment to be disposed of shall ONLY be disposed of in a manner and at locations approved by the COR. Unless otherwise approved in writing by the COR, the Contractor will not be permitted to abandon pipelines, pipeline supports, pontoons, or other equipment in the work area, pipeline access areas, water areas, or other areas adjacent to the work site. Pilings and any other debris removed or created as a result of the execution of this contract shall be disposed of in a manner and at locations approved by the COR.

1.14 ENVIRONMENTAL COMPLIANCE AND PROTECTION

Comply with conditions and requirements of State and Federal permits. See Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for additional details. During the life of the contract, provide and maintain environmental protective measures. Also, environmental protective measures required to correct conditions, such as oil spills or debris, that occur during the dredging operations, must be provided. Comply with Federal, State, and local regulations pertaining to water, air, and noise pollution.

1.14.1 Pumping of Bilges

Contractors are warned that pumping oil or bilge water containing oil into navigable waters, or into areas which would permit the oil to flow into such waters, is prohibited by Section 13 of the River and Harbor Act of 1899, approved 3 March 1899 (30 Stat. 1152; 33 U.S.C. 407). Violation of this prohibition is subject to penalties provided under the referenced Act.

1.14.2 Fuel Oil Transfer Operations

In accordance with U.S. Coast Guard regulations (33 CFR 156.120), couplings used in fuel oil transfer operations on any vessel with a capacity of 250 or more barrels of oil shall be either a bolted or full-threaded connection; or a quick-connect coupling approved by the Commandant; or an automatic back-pressure shutoff nozzle used to fuel the vessel. An executed fuel oil transfer (Declaration) form signed by the tanker operator shall be submitted to the Contracting Officer for each refueling operation. The U.S. Coast Guard shall also be notified prior to any refueling. Submittal of the Declaration of Inspection is described in SD-03 Product Data

1.14.3 Turbidity

Excavation, transport, and filling operations shall be performed in a manner that will minimize turbidity. The Contractor shall meet the requirements to maintain the quality of the State's waters as contained in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. The Contractor will be required to make inspections, measurements and observations required by those regulations in the vicinity of the dredge, and the dredge material placement areas(s). During dredging and placement operations the Daily Report shall clearly shall clearly note the daily turbidity measurements, including: brand and model of the turbidity meter, Easting and Northing of the Compliance and Background points, the water depth of the collection location, the water temperature, the date and time of the measurements, the dredge status, the name of the collector, the wind velocity and direction, the current velocity and direction, and other appropriate weather conditions.

1.14.4 Cultural Resources Protection

No known cultural resources exist with in the project area. However, if any shipwreck, artifact, or other objects of antiquity that have scientific or historical value, or are of interest to the public, are discovered, located, and/or recovered, the Contractor acknowledges that:

a. The site(s), articles, or other materials are the property of the State or Federal Government.

b. Shall immediately notify the QAR, the archaeological monitor, and the Project Archaeologist.

1.15 BASIS FOR BIDS

See the EXPLANATION OF BID ITEMS.

PART 2 PRODUCTS

- 2.1 CHARACTER OF MATERIAL
- 2.1.1 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 their own interpretation(s) of this information in determining the character of materials to be dredged and understand how the character of the materials may affect the placement. All classifications of soils, both visual and laboratory, are in accordance with the Unified Soil Classification System, sompatible with ASTM D 2487.

2.1.2 Materials to Be Removed

Material to be removed under this contract (within the required dredging prisms) includes mainteance 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, snags, 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.

PART 3 EXECUTION

3.1 INSPECTION

Inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. Provide, at the request of the Contracting Officer, boats, boatmen, laborers, and materials necessary for inspecting, supervising, and surveying the work. When required, provide transportation for the Contracting Officer and inspectors to and from the placement area and between the dredging plant and adjacent points on shore.

3.1.1 Plant Inspection

The dredge plant will be inspected by the Contractor and Contracting Officer, or their representative, prior to beginning work to ensure total dredging plant is in safe working condition. Before any machinery or mechanized equipment is placed in service, it must be inspected and tested by the Contractor and certified to be in safe operating condition.

3.1.1.1 Contractor's Obligation to Inspect

Mechanized equipment 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. 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.

3.1.1.2 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 their responsibility to perform their own inspections of plant to assure a safe working environment at all times in accordance with contract specifications, EM 385-1-1 and the Accident Prevention Plan. Checklists are provided in Appendix D.

3.1.1.3 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.

3.1.1.4 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.

3.1.1.5 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.

3.2 DREDGING

3.2.1 Order of Work

The Contractor shall submit a Order of Work Plan describing all methods, materials, equipment, and personnel to be utilized during dredge and placement operations including submerged pipelines and pipeline routes and staging and access areas. The order of dredging will be dependent on the placement features to be created with the dredge material. Dredging of the Mobile Harbor Federal Navigation Channel Improvements for this contract has generally been divided into 7 separate horizontal (A-G) and 13 vertical cuts based on material types for best matching with the placement. The associated placement location of each cut is provided in table 1 below. The contractor shall make their own determination of the existing conditions and propose the dredge cuts and placement feature order of construction within the work plan to be approved by the Contract Officer. The Government reserves the right to change the order of work at any time.

Dredge Cut	Dredge Material Placement Area	
		Material
Turning Basin Cut A above -33 ft MLLW	Deer River and/or Dauphin Island Causeway Sand Berm	Coarser Sandier Materials
Turning Basin Cut A below -33 and above -50 ft MLLW	Dauphin Island Causeway Marsh Creation	Finer Clay Materials
Turning Basin Cut A below -50 and above -56 ft MLLW	Dauphin Island Causeway Sand Berm and/or Dauphin Island Causeway Marsh Creation	Coarser Sandier Materials
Turning Basin Cut B above -28 ft MLLW	Dauphin Island Causeway Sand Berm	Coarser Sandier Materials
Turning Basin Cut B below -28 and above -42 ft MLLW	Dauphin Island Causeway Marsh Creation	Finer Silts and Clay Materials
Turning Basin Cut B below -42 and above -56 ft MLLW	Dauphin Island Causeway Sand Berm and/or Dauphin Island Causeway Marsh Creation	Coarser Sandier Materials
Turning Basin Cut C above -52 ft MLLW	Relic Shell A and/or B	Finer Silts and Clays Materials
Turning Basin Cut C below -52 ft and above -56 ft MLLW	Deer River Marsh and Dauphin Island Causeway Sand Berm	Sands and Finer Silts and Clay Materials
Turning Basin Cut D above -56 ft MLLW	Dauphin Island Causeway Marsh Creation	Finer Clay Materials
Upper Bay Channel Deepening Cut Fabove -50 ft MLLW Station (226+16 to 260+00)	Relic Shell A and/or B	Finer Silts and Clay Materials

Table	1:	Dredge	Cuts	and	Dredge	Materia	a⊥	Pla	ceme	nt	Areas

Dredge Cut	Dredge Material Placement Area	Material
Upper Bay Channel Deepening Cut Fbelow -50 and above -54 ft MLLW Station (226+16 to 260+00)	Deer River and/or Dauphin Island Causeway Berm	Coarser Sandier Materials
Upper Bay Channel Deepening Cut E above -54 ft MLLW Station (260+00to 267+72.58)	Dauphin Island Causeway Marsh	Finer Silts and Clay Materials
Upper Bay Channel Widener Cut G above -54 ft MLLW Station (267+72 to 335+00)	Relic Shell A and/or B	Finer Silts and Clay Materials

The preferred dredged material placement order of work is to fill the Deer River and Dauphin Island Causeway North dredge material placement sites to the specified lines, grades and elevations prior to placement in Dauphin Island Causeway South dredge material placement site.

Dredged material placement in the Dauphin Island Causeway North and South dredge material placement sites shall be performed in a continuous and consecutive manner. Placement of material will generally proceed where the coarser sandier material is used to construct sand berm features first to help contain the finer silts and clay material placed behind in the marsh creation areas. For the Dauphin Island Causeway North and South Sand Berm the preferred placement is from south to north. The Contractor may elect to construct the sand berms beginning at the approach channels/pipeline corridor landing areas and advancing towards the south and north; however, the portion from the landing area to the southern end must be completed before advancing northward from the landing area. If the Contractor elects to begin material placement at the landing area proceeding southward at the Dauphin Island Causeway South Sand Berm, then the sand berm must tie-in to the existing shoreline with an internal containment berm between station 64+00 and 74+00 to create a partially filled area behind the completed berm sections to receive fill for the marsh creation.

3.2.1.1 Work Plan

A Work Plan is to be submitted by the Contractor for review and approval by the Contracting Officer. The work plan is to cover all aspects of dredging, transport, and placement operations and shall include, but not be limited to, the following:

a. Deposition Plan: A Deposition Plan is to be sumbitted by the Contractor to the Contracting Officer for approval prior to placement of any dredged material under this contract. The Contractor's Deposition Plan is to be completely explanatory and include all assumptions, statements of fact, computations and a narrative to fully explain the procedures that the Contractor will follow during the contract. The Contractor's Deposition Plan will address each different placement situation, including but not limited to, contingencies to correct any excess displacement of in-situ water bottoms, non-compliant turbidity, placement of varying material types, and/or slope failures that may occur during placement of material. The Deposition Plan is also to address weir structures (if needed) and the means and methods for surveying and monitoring the placement of fill to meet required slopes and grades, i.e. grade stakes, settlement plates, topographic surveys, etc.

b. Survey Plan: The Survey Plan shall present 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.

c. Progress Schedule Map: Provide a progress schedule map of the contractor's work. The progress schedule map shall be a plan view drawing depicting the dredge limits, dredge material placement and access areas to be used on the project. The map shall show all acceptance sections (AS), access/staging areas, and pipeline landings anticipated to be used on the project. For each acceptance section, the information shall list the following: Anticipated quantity of material per acceptance section, projected dates for satisfactory channel dredging and fill to be placed and

completed. The map will be color coordinated with the following color scheme: Red depicting an area not ready for construction; Orange depicting an area currently being worked, and Green meaning an area accepted by the Contracting Officer. The map shall be updated at least weekly and whenever significant changes occur to the projected dates. Since the map will be used by the Government for coordination with the sposnor(s) to track progress, the update shall be provided prior to the weekly project progress meeting.

d. Buoy Log: The Contractor shall develop a method of inventory for all anchors, buoys, and buoy cables used in the construction of the project. This record shall be used by the Contractor to recover all buoys and anchoring equipment at the completion of the project.

e. Grade Stake Log and Recovery Plan: If the Contractor intends to use grade stakes in the project work area, they shall submit a Construction and Grade Stakes Recovery Plan. The plan will outline the steps that the Contractor will implement to recover all the stakes used on the project. A sample Grade Stake Log is to be provided indicating how the log will be prepared and maintained to inventory the grade stakes used on the project. The log is to include information concerning the location, installation, and recovery of all grade stakes. This log is to be available for review by the appropriate Government personnel upon request.

f. Staging and Access Areas: The Contractor shall indicate how they plan on accessing each site for their construction operations. The Contractor shall submit proposed drawings depicting the areas, photo-documentation of the condition of the access location prior to disrupting the site, dimensions of access channels, location of placement for excavated access channel material, and any support facilities for Contracting Officer approval.

g. Public Protection: Provide a Contractor's plan for ensuring public and worker safety. Submit means and methods for public protection during fill operations for review and approval by the Contracting Officer. Submit product information and methods of installation for orange safety fencing for safety measures. Submit methods of staking in place and maintenance of system for duration of construction. If required submit an off-road trucking operation safety plan.

3.2.2 Interference with Navigation

Minimize interference with the use of channels and passages. The Contractor is responsible for shifting or moving of dredges or the interruption of dredging operations to accommodate the movement of vessels and floating equipment, if necessary. Adhere to Coast Guard Regulations for passing vessels.

3.2.3 Lights

Each night, between sunset and sunrise and during periods of restricted visibility, provide lights for floating plants, pipelines, ranges, and markers. Also, provide lights for buoys that could endanger or obstruct navigation. When night work is in progress, maintain lights from sunset to sunrise for the observation of dredging operations. Lighting must conform to United States Coast Guard requirements for visibility and color.

3.2.4 Navigation Warnings

Furnish and maintain navigation warning signs along the pipeline. Provide notice to increase public awareness of potential hazards presented by dredge plant equipment by stating the location, date of construction, equipment mooring, marshaling areas, using local newspapers, radios, television, waterway users associations, or other appropriate area specific communication networks. Ensure that an announcement is made through the same networks at the beginning of the dredging operation. Make periodic updates/status announcements at intervals of not more than a month throughout the contract life.

Display a sturdy and prominent warning sign at all public boat marinas within 10 miles of dredging operations or moored equipment. 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. The Contractor is responsible for keeping this sign current with respect to the dredging operations or equipment.

3.2.5 Ranges, Gages, and Lines

Provide, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend dredging when the gages or ranges cannot be seen or followed. The Contracting Officer will furnish, upon request by the Contractor, survey lines, points, and elevations necessary for the setting of ranges, gages, and buoys.

3.2.6 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.

- 3.2.7 Dredge Plant and Equipment
 - a. The Contractor has an option to use clamshell, hydralic cutter head, and/or trailing suction hopper dredge to perform all dredging work under this contract.
 - b. The Contractor may elect to operate more then one dredge or dredge type under this Contract at a time. Should the Contractor employ more than one dredge unit on the project, concurrent work locations shall be approved by the Contracting Officer's Representative.
 - c. Maintain all dredge plant and associated equipment such as, but not limited to, scows, coamings, barges, and pipelines, to meet the requirements of the work. Promptly repair leaks or breaks along pipelines.
- 3.2.8 Staging and Fabracation Areas

The Contractor shall determine the requirements for staging and fabrication areas for dredging equipment based on his their 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.

3.2.9 Dredging Requirements

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
3.2.9.1 Upper Bay Channel Deepening

Dredging of the Upper Bay Channel Deepening consist of the removal of both maintenance and new work material within the horizontal and vertical limits displayed on the contract drawings. Dredging of the Upper Bay Channel Deepening has generally been divided into 2 separate horizontal and 3 vertical cuts based on general material types and placement locations described in section 3.2.1 Order of Work. Dredging for acceptance will be satifactory removal of material down to -52 feet MLLW including paid overdepth, unless otherwise stated in the layout drawing

3.2.9.2 Turning Basin Deepening and Expansion

Dredging of the turning basin consist of the removal of both maintenance and new work material within the horizontal and vertical limits displayed on the contract drawings. Dredging of the turning basin has been divided into 4 separate horizontal and 9 vertical cuts based on general material types and placement locations described in section 3.2.1 Order of Work. Dredging for acceptance will be satifactory removal of material down to -54 feet MLLW including paid overdepth, unless otherwise stated in the layout drawing.

3.2.9.3 Upper Bay Channel Widening

Dredging of the Upper Bay Channel Widening consist of the removal of new work material within the horizontal and vertical limits displayed on the contract drawings between Stations 271+00 to Station 335+00. Dredging for acceptance will be satifactory removal of material down to -52 feet MLLW including paid overdepth, unless otherwise stated in the layout drawing.

3.2.10 Required Dredging

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 2226+16 to Station 337+00, and -54 feet MLLW within the Mobile Harbor Turning Basin at the widths shown on the contract drawings.

3.2.10.1 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

3.2.10.2 Side Slopes

Side slopes in the dredge areas within this contract will be measured and paid based on a 5 feet horizontal to 1 feet vertical ratio. 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.

3.2.10.3 Dredge Overflow

Overflow will be limited to forty-five minutes, per load, for hopper dredges only, unless otherwise approved by the COR. Overflow will only be allowed for material that is predominantly sand. 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 dredge material placement area. Mechanical dredge bucket dripping occurring between the excavation point and deposition into dump scows will not be considered overflow

3.2.10.4 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".

3.2.11 Obstructions and Debris

The Government has no knowledge of cables, pipes, or other artificial obstructions or of any wrecks, wreckage, or other material that would necessitate the use of explosives or the employment of additional equipment for economical removal. Contractors should however exercise due diligence in determining the existence of any obstructions within proposed work areas during bid preparation.

The Government has knowledge of debris such as, but not limited to, metal bands, pallets, pieces of broken cable, rope, fire hose, and broken piles. The Contractor is responsible for the disposal of the removed debris. This disposal must occur outside the limits of government property, and done so in accordance with all federal, state, and municipal regulations.

The Government has no knowledge of existing wrecks, wreckage, or other material of such size or character as to require the use of explosives or special or additional plant for its economical removal.

3.2.12 Quality Control

Establish and maintain quality control for operations to assure compliance with contractual requirements and maintain records of this quality control for dredging operations.

While performing all dredging work control the horizontal positioning of the dredge with electronic positioning.

3.2.13 Skimming of Hoppers

Skimming of hoppers must be performed in compliance with environmental requirements and ABS/USCG load line marks.

3.2.14 Salvaged Material

Anchors, chains, firearms, and other articles of value, which are brought to the surface during dredging operations, must remain or become the property of the Government and will be placed on shore at a convenient location near the site of the work, as directed.

3.2.15 Safety of Structures

The prosecution of work must ensure the stability of piers, bulkheads, and other structures lying on or adjacent to the site of the work, insofar as structures may be jeopardized by dredging and/or placement operations. Repair damage resulting from dredging operations is the responsibility of the Contractor, insofar as such damage may be caused by variation in locations or depth of dredging, or both, from that indicated or permitted under the contract. The Contractor is responsible for coordinating with the owner of the structure for any necessary repairs.

3.3 PLACEMENT OPERATONS

3.3.1 Placement of Excavated Materials

Provide for safe transportation and placement of dredged materials. Transport and placement of dredged material in the Deer River, Dauphin Island Causeway North and South and the Relic Shell Areas A and B dredge material placement areas. The Contractor shall provide equipment and operators satisfactory to manipulate dredge material and move the outflow pipe to ensure the placement of material does not cause the excessive displacement of in-situ water bottoms. The contractor shall also ensure adjacent areas outside of the fill template are not adversely impacted by the contractor's placement operations. This includes but is not limited to adversely affecting adjacent oyster beds, marshes, roadways, etc. The Contractor will be responsible for any damage resulting from their dredge material placement operations, inside or outside of the dredge material placement area. The contractor shall furnish sufficient crew at the dredge material placement areas to ensure the correct placement of material is maintained throughout the contract.

3.3.2 Method of Placement

For dredged material pumped through a pipeline, the Contractor is responsible to select a pipeline route within the boundaries outlined in the contract drawings to the placement sites and methodology of construction (type of pipeline and installation) and/or plant equipment layout that will not cause a hazard to existing navigation nor undue restriction to marine traffic, particularly in the marked navigation channels and the adjacent private docking/mooring/sailing fairways. Particular attention should be given to the pipeline route or other plant layout as related to the existing accesses of the businesses along the project banks. These accesses should not be blocked or restricted to those businesses. If the Contractor's pipeline or equipment is found to be blocking or restricting any business's access or use area, it will be the Contractor's responsibility to coordinate with the business to bring a solution to that restriction problem, even if the Contractor's pipeline or equipment has to be moved or relocated (all at no increase to contract price). Care shall be taken to avoid damaging private structures.

3.3.3 Natural Drainage

The Contractor will be required to maintain the natural drainage within the placement areas. Dredging operations shall be suspended should the Contractor fail to immediately restore to its normal condition any drainage system, either natural or artificial, which was damaged as a result of dredging operations.

3.3.4 Weir Box Maintenance

Dredged material shall be placed in the dredge material placement sites site within containment areas sufficient in volume to effectively settle solids. At no time shall any material be allowed to enter the weir boxes of any of the placement sites. Any material escaping the dredge material placement areas will be considered misplaced material and cleanup provisions as stated in paragraph entitled OBSTRUCTION OF NAVIGABLE WATERWAYS, of SECTION 00700 will be enacted. Adequate settling time shall be maintained by raising the elevation of the weirs crest at the drainage structure as necessary. Sufficient size overflow boards shall be furnished by the Contractor to fill the slotted columns on all open sides

of the weir box. Overflow boards shall not exceed six (6) inches in height. The Contractor shall be responsible for the maintenance of all weirs and drainage structures until completion and acceptance of work. Prior to dredging operations, discharge pipes through containment dikes should be inspected for obvious displacement due to settlement, and joints in the discharge pipes shall be sealed to prevent seepage through joints. Polyethylene may be used and supplied by the Contractor around the weir box as an additional safeguard against seepage. The polyethylene will be supplied and installed at no additional cost to the Government.

3.3.5 Access Channels and Staging Areas

Access channels are shown on the Contract Drawings. Dredging of the channels are to be done under seperate contracts. Given the dynamic nature of the project area, the final limits of access shall be field-verified by the Contractor and approved by the Contracting Officer, prior to commencement of construction. Should any access channel need to be dredged as part of this contract for access for placement the excuvation shall be restricted to the limits shown on the Constract Drawings. No other areas are cleared for distrubance. Dredged material from the excavation of access channels maybe sidecast to the east of the access channels with final limits of placement to be approved by the COR. Contractor will not be required to back fill the access channels following construction.

The Contractor is responsible for locating a staging areas for equipment. The Contractor shall include the proposed location of the staging area(s) in the Work Plan. The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in an area approved by the COR. The COR shall approve all temporary movement or relocation of Contractor facilities.

Optional Temporary Laydown Area is located at Cedar Point east of the Dauphin Island Parkway Right of Way that the Contractor may use for a material laydown area, equipment staging, field office, etc. during construction.

Should the Contractor require additional staging or laydown areas, these additional areas are the responsibility of the Contractor. Contractor is responsible for all permitting and costs associated with additional staging and laydown areas.

For access and staging the contractor shall ensure the following:

a. The staging areas are be kept neat, orderly and in a safe manner.

b. Staging areas are cordoned off and/or fenced to secure all staging areas from the public.

c. Access and staging areas are restored to the pre-construction condition upon project completion, at cost to the Contractor, unless otherwise directed by this contract or the COR.

d. Water and land access routes are provided and maintained as necessary for their equipment and plant to and from the work sites.

e. Environmental conditions, which can affect water and land access, such as climate, terrain, winds, current, waves, swells, depths, shoaling, and

scouring tendencies are assertained.

3.3.6 Placement in Indicated Site(s)

In placing excavated material for fill, uniformly grade and allow for shrinkage.

Provide and maintain necessary bulkheads, dikes, ditches, weirs, spillways, and other construction necessary to confine and retain the fill in the dredge placement areas.

In order to most efficiently use the available fill material, the COR may make alterations in the plan dimensions or slopes of the sand berm fill or marsh creation area fill area elevations in order to increase or decrease the volume of fill placed.

3.3.6.1 Deer River Marsh Creation Area

An estimated 164,000 cubic yards of inplaced predominately sandy material, dredged from the COR approved dredge cuts, shall be used to fill the Deer River Marsh Creation site to the lines, grades and elevations shown on the Contract drawings. Approximately 82,360 square yards of material shall be placed within this placement site.

Discharge of dredge material slurry will only be allowed within the existing containment berm shown on the contract drawings.

The target fill elevation range is +2.5' to +3.5' NAVD 88.

Should the estimated 164,000 cubic yards of inplaced dredge material exceed the site capacity as determined by the maximum target fill elevation, Contractor may delinate a stockpile area furtherest from the weir locations for COR approval.

3.3.6.2 Dauphin Island Causeway North Sand Berm

An estimated 109,000 cy of inplaced predominately sandy coarser material from the COR approved dredge cuts shall be used to fill the sand berm fill to the lines, grades, and elevations indicated in the Contract documents. Approximately 5,947 linear feet of sand berm shall be placed within this placement site. Discharge of dredge material slurry will only be allowed within sand berm fill area shown on the contract drawings. Additonally the dredge discharge **point** must always be located at least 25 feet away from the existing shoreline. To the extent practical, the fill placement must be uniform with minimal ridges, humps and depressions. The Contractor may construct interal training dikes, at their own discretion, at locations within the sand berm fill area. Spreader and pocket pipe or other measures may be used as necessary to prevent gullying and erosion.

The target constructed sand berm elevation is +3.5' NAVD 88. The vertical fill tolerance is $\pm 0.5'$. The sand berm target fill elevation range is therefore +3.0' to +4.0' NAVD 88. The sand berm crest shall have a maximum width of 15' and a minimum width of 5'. The sand berm landward slope shall have a grade no shallower than 30:1 (H:V) with no limits on the maximum grade (i.e. maximum steepness) of the slope. The Contractor is encouraged to minimize the volume of sand material placed in the sand berm
section within the defined template to maximize the length of sand berm that can be constructed with available sandy fill material and to ensure that sufficient length of sand berm is constructed prior to the placement of the marsh creation fill areas.

On portions of the sand berm landward slope below Mean Low Water (MLW), the Contractor may place material to the natural angle of repose if different from the design slope of the placement section. The Contractor shall ensure that there are no undrained areas or abrupt mounds within the completed segments. The Contractor is not required to perform grading on portions of the sand berm landward slope below MLW.

Should the estimated 109,000 cys of inplaced dredge material exceed the sand berm capacity as determined by the target fill crest width and elevation the Contractor with COR approval may place excess material within the north marsh creation fill area.

3.3.6.3 Dauphin Island Causeway North Marsh Creation Fill

An estimated 167,000 cy of inplaced predominately finer sands, silts and clay materials from the COR approved dredge cuts shall be used to fill the marsh creation fill to the lines, grades, and elevations indicated in the Contract documents. Approximately 288,282 square yards of material shall be placed within this placement site. Discharge of dredge material slurry will only be allowed within marsh creation fill area shown on the contract drawings.

Additonally the dredge discharge **point** must always be located at least 25 feet away from the existing shoreline. To the extent practical, the fill placement must be uniform with minimal ridges, humbs and depressions. The Contractor may construct interal training dikes, at their own discretion, at locations within the sand berm fill area. Spreader and pocket pipe or other measures may be used as necessary to prevent gullying and erosion.

At no point shall fill be placed on the existing wetlands or within the Dauphin Island Parkway Right of Way. Fill shall be placed in such a way so as to not erode or damage the existing shoreline including any natural or armored shorelines.

The target constructed Dauphin Island Causeway marsh creation elevation is +2' NAVD88. The vertical fill tolerance is +/- 0.5'. The marsh creation fill elevation range is therefore +1.5' to +2.5' NAVD88.

Should the estimated 167,000 cys of inplaced dredge material exceed the marsh fill capacity as determined by the maximum fill tolerance elevation the COR may make adjustments to the marsh creation fill elevation or direct the contractor to place excess within the Dauphin Island Causeway South Marsh.

3.3.6.4 Dauphin Island Causeway South Sand Berm

An estimated 77,569 cy of inplaced predominately sandy coarser material from the COR approved dredge cuts shall be used to fill the sand berm fill to the lines, grades, and elevations indicated in the Contract documents. Approximately 3,363 linear feet of sand berm shall be placed within this placement site. Discharge of dredge material slurry will only be allowed within sand berm fill area shown on the contract drawings. Additonally the dredge discharge <u>point</u> must always be located at least 25 feet away from the existing shoreline. To the extent practical, the fill placement must be uniform with minimal ridges, humbs and depressions. The Contractor may

construct interal training dikes, at their own discretion, at locations within the sand berm fill area. Spreader and pocket pipe or other measures may be used as necessary to prevent gullying and erosion.

The target constructed sand berm elevation is +3.5' NAVD 88. The vertical fill tolerance is $\pm0.5'$. The sand berm target fill elevation range is therefore +3.0' to +4.0' NAVD 88. The sand berm crest shall have a maximum width of 15' and a minimum width of 5'. The sand berm landward slope shall have a grade no shallower than 30:1 (H:V) with no limits on the maximum grade (i.e. maximum steepness) of the slope. The Contractor is encouraged to minimize the volume of sand material placed in the sand berm section within the defined template to maximize the length of sand berm that can be constructed with available sandy fill material and to ensure that sufficient length of sand berm is constructed prior to the placement of the marsh creation fill areas.

On portions of the sand berm landward slope below Mean Low Water (MLW), the Contractor may place material to the natural angle of repose if different from the design slope of the placement section. The Contractor shall ensure that there are no undrained areas or abrupt mounds within the completed segments. The Contractor is not required to perform grading on portions of the sand berm landward slope below MLW.

Should the estimated 77,569 cy of dredge material exceed the sand berm capacity as determined by the target fill crest width and elevation between station 64+00 and 97+62.82 the Contractor may elect with COR approval to place excess material within the South marsh creation fill area and/or within additional South Sand berm to the north of station 64+00.

3.3.6.5 Dauphin Island Causeway South Marsh Creation Fill

An estimated 43,000 cy of inplaced predominately finer sands, silts and clay materials from the COR approved dredge cuts shall be used to fill the marsh creation fill to the lines, grades, and elevations indicated in the Contract documents. Approximately 57,588 square yards of material shall be placed within this placement site. Discharge of dredge material slurry will only be allowed within marsh creation fill area shown on the contract drawings. Additonally the dredge discharge **point** must always be located at least 25 feet away from the existing shoreline. To the extent practical, the fill placement must be uniform with minimal ridges, humbs and depressions. The Contractor may construct interal training dikes, at their own discretion, at locations within the sand berm fill area. Spreader and pocket pipe or other measures may be used as necessary to prevent gullying and erosion.

The target constructed Dauphin Island Causeway marsh creation elevation is +2.5' NAVD88. The vertical fill tolerance is +/- 0.5'. The marsh creation fill elevation range is therefore +2' to +3' NAVD88.

Should the estimated 43,000 cys of inplaced dredge material exceed the marsh fill capacity as determined by the maximum fill tolerance elevation the COR may make adjustments to the marsh creation fill elevation or direct the contractor to place excess within additional South Sand berm to the north.

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3.3.6.6 Relic Shell Mine A and B Dredge Material Placement Areas

The Contractor shall delineate limits of the Relic Shell Mine Areas A and B as shown on the Contract drawing that will be used for placement of dredged material from this work that is not specified to go to the Deer River or Dauphin Island Causeway North or South sites. The Contractor shall ensure deposition is within the limits of the COR approved Contractor delineated dredge material placement boundary.

Dredge material placed within the Relic Shell Mine sites A and B shall be on an average no greater than 1.5 feet in thickness over each placement site and in no instance shall the placement exceed a +3 foot tolerance.

The Constractor should note the water depths between the dredge channel limits and the relic shell mine placement areas are known to be shallower than the elevations shown on the contract plans. Some areas may be shallower than -5 feet MLLW. The Contractor should also note areas alongside the Mobile Harbor channel are subject to change as they are authorized open water dredged material placement sites for maintenance material. The Contractor is responsible for ensuring routes provide adequate depths for all necessary equipment needed to complete this work and is advised to perform surveys to verify.

3.3.7 Misplaced Dredged Material

Any dredged material deposited at locations other than in dredge material placement sites shown in the drawings will be considered misplaced material and will not be paid for until the Contractor, at their own expense, removes and redeposits the misplaced material. Any material deposited in excess of tolerances described in the plans and specifications shall be removed by the Contractor at their own expense with no increase in contract price or time. This required removal and redeposit of the misplaced material and any necessary placement site restoration work is not the basis for a time extension or additional compensation under this contract.

3.3.8 Submerged Pipelines

If a leak occurs in the discharge pipeline, immediately discontinue using the line until leaks are repaired. Following a leak, the Contractor should conduct, or request the Government to conduct, a hydrosurvey to ensure that any dredged material discharged through the leak did not accumulate or cause mounding. If accumulation did occur, the Contractor must coordinate with the Government to remove the accumulated material, if deemed necessary. The Contractor is responsible for any resulting costs of repair and restoration.

3.4 DREDGE AND PLACEMENT AREA SURVEYING

3.4.1 General

The Government will furnish survey and dredging layout data for each dredging tangent and placement areas prior to any dredging. The data will be discussed at the pre-construction conference. The Contractor shall perform all necessary pre-construction, acceptance, and post-construction surveys of channel and dredge material placement sites. Additionally, the Contractor shall provide all construction progress surveys performed prior to acceptance to the Government for the record.

The survey work to be performed includes: Preconstruction surveys, construction surveys and post Construction surveys.

Preconstruction surveys are required to be conducted prior to the commencement of Work.

Construction surveys are required for progress surveys, payment applications and also for the layout and staking of the work to be completed where appliciable.

Post-Construction surveys include as-built surveys of the completed Work.

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. 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 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/u43544q/687964726F67726170686963/

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) The Contractor shall maintain complete and accurate field notes, sketches, recordings, and computations required in establishing the necessary horizontal and vertical control. All survey data shall be recorded in accordance with accepted standards and as approved by the Contracting Officer or his/her designated representative. All the above data shall be available at all times during the progress of the work forready examination and use by the Contracting Officer or his/her designated representative. Upon request of the Contracting Officer or his/her designated representative, the Contractor shall furnish a copy of above survey data.

(c) Survey personnel. All quantity surveys required by the Contractor shall be made by personnel of a professional engineer and/or land surveyor experienced in the practice of such work including Global Positioning Systems (GPS) surveys. The survey personnel shall have the following minimum qualifications.

(1) Each party chief shall be a Professional Land Surveyor and shall be proficient in the operation of precise and semi-precise instruments. They shall be capable of running horizontal and vertical control of 2nd order accuracy. In the event it is considered advantageous to employ a party chief who is not a Professional Land Surveyor, detailed qualifications of the individual shall be submitted to the Contracting Officer for review and approval.

(2) Instrument personnel shall be proficient in the operation of precise and semi-precise instruments and shall prepare all survey notes in a firm and legible manner.

(3) Surveying technicians shall be familiar with all phases of surveys and the Alabama plane coordinate system. They shall also be well versed in the computation and adjustment of horizontal and vertical control of 2nd and 3rd order survey.

(d) 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).

(e) 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.

(f) All survey work shall be subject to periodic inspection and/or

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.

(g)For lidar data the constractor shall ensure overlapping lines and datasets shall be compared to each other and to cross lines. All systematic errors shall be identified and eliminated, and remaining errors should have a normal distribution. Differences between a DEM and bare earth ground truth data will be unbiased and within 5 cm (RMSE) in flat terrain. A binned surface of standard deviation (within each bin) generated from topographic lidar data will not exceed 5 cm in flat areas for > 5% of the grid cells.

- 3.4.5 Equipment and Data
- 3.4.5.1 Real Time Kinematic (RTK) Global Positioning System (GPS)

Survey data for the Deer River and the Dauphin Island Causeway North and South beneficial use sites shall be collected using RTK GPS technology.

3.4.5.2 Sounding Equipment

Sounding equipment shall consist of an electronic sounding machine/device capable of providing updated soundings on not more than 1/20 second intervals and have accuracy rating of not more than +/-0.5 feet. Sounding device shall have analog charting (real time) within the device and shall have all the capabilities of calibrating to a bar check utilizing the Norfolk Method of bar checking. The sounding device will be similar and equal to the Odom MKIII Echo Sounder. All depths acquired will consist of dual frequency soundings utilizing a high operating 208 Khz frequency transducer and a low operating 41 Khz or 28 Khz frequency transducer. All digitally acquired sounding data for the borrow area surveys shall be those acquired with the high frequency survey (any frequencies other than those listed must be approved by the Government prior to use). Both the high and low frequency soundings shall be shown on the analog chart of the sounding device. All soundings shall be acquired on a continuous basis with plotting of data based on the scale and size of the plot.

3.4.5.3 Spacing, Coverage, and Datum

Surveyed points, including easting, northing, and elevation for each point, shall be collected along cross section lines with spacing not to exceed 200 feet. Spacing between points along the cross section lines shall not exceed 3 feet nor be less than 0.3 feet for hydrographic surveys. Spacing between points along the cross section lines for topographic surveys shall

SECTION 35 20 23 Page 29 Revised by Amendment No. W9127824B0001-0001 not exceed 10 feet and shall include points at each sharp change in slope. The easting and northing values shall be relative to the State Plane Coordinate System, Alabama West zone, NAD 1983 in U.S. survey feet. Elevations shall be relative to Mean Lower Low Water for the Navigation channel and relic shell A and B placement area and NAVD88 for the Deer River and Dauphin Island Causeway placement areas . Each survey line shall extend a minimum of 200 feet beyond the limits shown on the contract drawings.

3.4.5.4 Lidar Requirements

If surveys are collected using Lidar, the collection and mapping shall be in compliance with USACE EM- 1110-1-1000 for Photogrammetric and Lidar Mapping. Collection methods shall comply with the American Society for Photogrammetry and Remote Sensing (ASPRS) Vertical Accuracy for Lidar Data Guidelines. UAS operations shall be conducted in compliance with APL 95-1-1.

3.4.5.5 Survey Data Submittal Requirements

The Contractor shall submit all pre- and post-construction plan view and cross-section plots of the channel and dredge materil placement acceptance sections, along with a breakdown of quantities removed from and placed at the respective locations. 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 data, line files, tide files, etc. associated with each survey. Otherwise, the Contractor shall utilize a system capable of acquiring or converting all, unedited raw data (horizontal and vertical) to an ASCII compatible format prior to submittal to the Government. Sounding files shall contain single line records. Each record shall contain the easting, northing, elevation, date, and time for one sounding. Each item in the record shall be separated by a space character, and the record 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 shown below.

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Data acquired by the Contractor for each survey shall be furnished to the Government on computer disks in the form of CADD drawing files in Microstation format and additionally in ASCII XYZ format digital files. Each digital XYZ file shall be accompanied with information stating the surveyor's name, collection date, horizontal datum and units, and vertical datum and units of the survey, and all other field notes. The contractor shall provide a metadata file compliant with the latest version of the Federal Geographic Data Committee (FGDC) Standards/ ISO 19115. The metadata file shall contain methods, procedures, control information, datum, and other data necessary to properly describe the origin of the data.

LiDAR data shall be provided inClassified Point Data (LAS) and Digital Terrain Model and Digital Surface Model (GeoTiff) formats , unless otherwise approved by COR.Complete metadata shall be provided for each of these data products. The metadata will be provided in xml format and will adhere to an FDGC-endorsed metadata standard (i.e. ISO 19115-2). At a minimum, the core elements of the FGDC-endorsed metadata standard will be completed. In addition to the core metadata elements, process steps, including software packages and version numbers, will be provided with sufficient detail to allow reproduction of the product file

3.4.6 Channel Surveys

The Contractor shall perform Pre-Construction surveys and Post-Construction surveys in accordance with Section 01 00 00, pargaph 1.10 FINAL EXAMINATION AND ACCEPTANCE, of the project excavation limits.

The contractor shall peform Construction Surveys for quality checks on the dredging depth and width behind the dredge as work progresses. The Contractor will take progress soundings or sweepings.

3.4.7 Dredge Material Placement Areas Surveys

The Contractor shall perform Pre-Construction surveys and Post-Construction surveys along repeatable ranges covering the portion of the placement area to be used for this contract and adjacent bottom within the limits specified herein. The required pre construction surveys shall be referenced to NAVD88 for the Deer River and Dauphin Island Causeway Sites and MLLW for the Relic Shell Mine Areas. Pre- surveys shall be performed within 14 days prior to commencement placement operations. The surveys shall generally be oriented with ranges (cross sections) spaced no greater than five hunderd (500) feet apart and extending one hundred (100) feet beyond the approved placement area limits for this contract.

The contractor shall peform Construction Surveys for progress, quality checks on placement lines, grades, and elevation and pay applications.

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.

The Contractor will perform final acceptance surveys of the Deer River and Dauphin Island Causeway North and South Placement sites in accordance with Section 01 00 00, pargaph 1.10 FINAL EXAMINATION AND ACCEPTANCE, of the project placement limits.

3.5 PLANT REMOVAL

Upon completion of the work, remove all dredging plant and placement equipment, including ranges, buoys, piles, and other markers or obstructions within 10 days. Plant and/or equipment to be disposed of shall ONLY be disposed of in a manner and at locations approved by the Contracting Officer. Unless otherwise approved in writing by the Contracting Officer, the Contractor will not be permitted to abandon pipelines, pipeline supports, pontoons, or other equipment in the work area, pipeline access areas, water areas, or other areas adjacent to the work site. Pilings and any other debris removed or created as a result of the execution of this contract shall be disposed of in a manner and at locations approved by the Contracting Officer.

3.6 PROJECT COMPLETION REPORT

The Contractor shall submit a project completion report in Adobe PDF format to the Contracting Officer within 30 days following project completion. The Project Completion Report shall include but not be limited to the following:

(a) Names and titles of the project managers overseeing the effort, including contact information (telephone numbers, mailing addresses, and email addresses)

(b) Location and description of the project, including the final total volume of material extracted from the Mobile Harbor Channel the volume of material actually placed into each placement site (including a description of the volume calculation method used to determine these volumes)

(c) Files containing the x, y, z and time stamp of the dredge locations (if applicable)

(d) Narrative describing the final, as-built features, boundaries

(e) A table, showing the various items of work construction, final quantities, and monetary amounts

(f) A listing of construction and construction oversight information, including the prime and subcontractor(s), contract costs, etc;

(g) A list of all major equipment used to construct the project

(h) A narrative discussing the construction sequences and activities, and, if applicable, any problems encountered and solutions

(i) A list and description of any construction change orders issued (if applicable)

(j) A list and description of any safety-related issues or accidents reported during the life of the project

(k) A narrative and any appropriate tables describing any environmental or compliance surveys or efforts associated with the project and costs associated with these surveys or efforts

(1) A table listing significant construction dates beginning with bid opening and ending with final acceptance of the project

APPENDIX A

GEOTECHNICAL BORING LOGS AND LAB DATA

(PROVIDED ELECTRONICALLY ONLY)

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•	Į		•						2.12, Cc= (MC= 19%).99, Gs=			Ē
-	ł		1						2.75	00			┝
	t		1										È
	Į		-										F
-	ł		1										┝
•	İ.		1										Ē
	ł												ŀ
-	ŧ		At El58.0 Ft., red and tan		100	1		Vibracore					F
	Į		•										F
	ł		1										ŀ
-	ţ.		At El59.0 Ft. medium gravel 15' to	16'									F
	ł												-
	t		1										Ē
	F												F
	ł		•										ŀ
-	Į.		1										L
	ł												ŀ
	t												È
-62.0	18.0	••••							-				L
	ł		NOTES:										ŀ
	Į		1 Soils are field visually classified in										Ē
-	╞		accordance with the Unified Soils										╞
	İ.		Classification System.										Ē
	ł												-
-	t												F
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	ł												ŀ
	t												F
-	Į												F
	ł												ŀ
		1826			I	L	I		a taur - 4			<u> </u>	1

Project I.D.										Вс	oring Desig	nation	М	HVB	C-57	'-19
DRILLIN	IG LO	DG	DIVI	SION	Sou	th Atlantic	IN	ISTA	LL	ΤΙΟΙ	Mobile	Distric	t	SHEET OF 2	T 1 She	ETS
PROJECT							LAT	LONG	COORI	DINATE	b LAT = 30.6	71202	LONG	= -88	.0334	20
2020 Ge	otechr	nical Inv	/estigat	ion			STA	TE PLA	NE CO	ORDINA	XTES X = 1,8	00,801	Y = 2	44,50	3	
DATE OF BO	RING			<i>START</i> 01-23-	ED 20	<i>COMPLETED</i> 01-23-20	coo State	RDINA Plane	te sy e - Ala	STEM/D bama V	ATUM/UNITS Vest - U.S. Su	rvev Ft.	HOR NAD	IZ. 83	VER MLL	2 7. .W
DRILLING A	GENC	Y	Corps	of Engine	ers - C	ESAM	E	LEVA		IS	TOP OF BO	RING	GR	OUND	WATE	R
NAME & TITLE	OF FIE	ELD INSPE	ECTOR		NAM	E OF DRILLER	MAN	UFAC	TURER	'S DESI	-40.0 Fe SNATION OF DF	RILL [O HAN	Mater	
C. Long,	Geote	chnical E	Enginee	r		CSI	Vi	brocor	e			Ī		IUAL H	АММ	ER
		IG] INCLIN	ED	VERTIC	AL	BEARING	SIZE	AND	ГҮРЕ О	FBIT	See Re	emarks				
THICKNESS O	FOVER	BURDEN	I	N/A			тот	AL NU	MBER	CORE B	OXES 0					
DEPTH TO TO	P OF RC	оск		N/A			тот	AL SAI	NPLES	D	ISTURBED 1	UN	DISTURI	BED (U	D)	0
TOTAL DEPTH	OF BO	RING		20.0 Fee	t		тот	AL REG	COVER	Y FOR E	ORING 100) %				
ELEV. DEPTH	LEGEND		CLASSI	FICATION	OF MA [.]	TERIALS	RÉC.	BOX OR SAMPLE	RQD OR UD	ADV	ANCEMENT METHOD	DF RE	RILLING		BLOWS/ 1 FT.	N-VALUE
<u>-40.0</u> 0.0		(MH) soft cc	SILT, in onsisten	., soft co	H, high dark gra	plasticity, very ay, trace wood	100	1		V	'ibracore	At El. -200= 39, LL 20, M	-46 Ft. 95%, F _= 59, F C= 136	PL= 21= %		
- <u>-50.0</u> 10.0	1836	AF	FTER		ING [Z (C	ontinue	d)			Borina De	signatio	on	NHVI	BC-F	57-1

		<u> </u>	C (Cont Shaat)	INSTAL	LATIO	N	В	oring Designation	on M		-5/-1 T 2	9	
DK		G L(JG (Cont. Sheet)	Mob	ile Dis	trict				OF 2	SHE	ETS	
PROJEC	т			COORD		SYSTE Alaba	M/DAT	UM			RTICAL	-	
LOCATI			TES			Alaba	BORIN	si - U.S. Survey FI. G	ΙΝΑΟδΟ				
X =	1,800,80	<u>1</u> Y	′ = 244,503	-40.0	0 Ft.								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	3	RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI	ig Ks	BLOWS/ 1 FT.	N-VALUE	
-57.0 57.0	17.0 - - - - - - - - - - - - -	836-	(SP-SM) SAND, poorly-graded with wet, light gray, fine to coarse grained (SP, SAND, poorly-graded, wet, light fine to coarse grained (SP) SAND, poorly-graded, wet, light fine to coarse grained NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. A AFTER DRILLING ▼ DURING ▼	silt, d t gray,	100	1		Vibracore Boring De	At El51 F -200= 7%, 3.52, Cc= MC= 27%, 2.70 At El57 F -200= 0%, 1.92, Cc= MC= 22%, 2.72	⁻ t. Cu= 1.27, Gs= 1.04, Gs=		7-19	-1 -1 -1 -1 -1 -1 -1 -1

















X-D301-06 Borings



DRILLING	LOG	(Cont Sh	eet)	ELEVATION TOP	OF HOLE	EL.	-25.5'	F	lole No.	1.	-D301-0)6	
PROJECT		MOBILE H	LE HA ARBOR	RBOR TURNING BAS] N	INSTALLAT	TION MOB	ILE DIST	RICT		SHEE OF 2	T 2 SHEETS	
ELEVATION	DEPT	H LEGEND		CLASSIFICATIO	ON OF MATERI	IALS	% CORE	BOX OR	(D.:''' 1'	REMARKS	<u> </u>	*	
° -46.5	ь 21.0	c		Uesc	d			NO. f	weather	ing, etc., if sig g	s, depth o nificant) sp i	T BLOWS/FT	
A7 E	22.0		C B	LAYEY FINE GRA ROWN	IN SAND (SO	C), LT.		IAR-8				11	F
-41.3			P	OORLY GRADED F	INE GRAIN	SAND	-				_		_
				ODRIY GRADED F	INF GRAIN	SAND		JAR-9	JAR-9 (FINES=2	1.22.5 - 24 2.9%, D50=0	1.0.).38mm	12	F
-49.5	24.0	_		SP), LT. BROWN	& LT. YELI	LOW			MA Sand (S	SP). GRAY	_	16	E
		=\ /						\land /					F
	_	<u> </u>						$ \rangle /$					E
		ΞX	N	O SAMPLE				X					F
	27.0	/ E											E
-57 5	28.0	\exists/ \setminus						$/ \setminus$					F
ل • ل <i>ل</i>	- 20.0				INE CRAIN	SAND					-		E
-55.0	29.5		'i	SP), LT. YELLO	W	JANU		JAR-10				28	F
	30.0							∇			-		E
		$\exists \setminus /$						$ \rangle /$					F
	_	XE	N	O SAMPLE				X					E
		= /											F
-58.5	33.0	$=/$ \		_							-		F
			P	OORLY GRADED F	INE GRAIN	SAND		JAR-11				12	F
-60.0	34.5	<u> </u>		SPJ. LI. GRAT			_		в.О.н.				E
		-											F
	_	_											E
													E
	_	_											E
													E
	_	_											E
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													E
		_								101 E 110			F
				TRUJECT		URLIN TIID	NINC RA	N I N		HULL NU.			



Proj. No	.: ALW00204	Alt. Proj. No.: CHO5	D301		н	ole No.	<u>13-D301</u>	-06	_
DRILL		DIVISION	INSTALLA		LE DIST	RICT	SHE OF 2	ET 1 SHEETS	
1. PROJECT	MOBILE HA	ARBOR TURNING BASIN	10. SIZE	ND TYPE (DF BIT	STD SPT	/ 140 LB HAM	MER	1
	MC	DBILE HARBOR	11. ELEVA	TION DATU	M	ML	LW. FEET		
Z. LOCATION (N 242405	<u>б Е 1801858'</u>	12. MANUF	ACTORER'S	DESIGNATIO	W STATE T	PLANE NAU83 F	LEI	-
3. DRILLING AC	GENCY MOBILE DISTRIC	T / EA ENGINEERING			F /	AILING 3	14		
4. HOLE_NO. (As shown on drawing	title 13-D301-06	13. TOTAL BURDE	NO.OF ON N SAMPLES	/ER- TAKEN	· Distu	1 I		
5 NAME OF D	mber) RILLER		14. TOTAL	NUMBER C	ORE BOXES	S	0		1
	E	WOODS	15. ELEVA	TION GROUI	NDWATER		N/A		
6. DIRECTION			16. DATE	HOLE	, j	STARTED	' сомғ 006 - 25 SFI	PLETED P 2006	
		DEG. FROM VERTICAL	17. ELEVA	TION TOP	OF HOLE		EL22.5'		1
7. THICKNESS	OF OVERBURDEN	-	18. TOTAL	CORE REC	OVERY FO	R BORING			1
8. DEPTH DRIL	TH OF HOLE		19. SIGNAT	URE OF IN	SPECTOR	NPFR			:D
SI EVATION		CLASSIFICATION OF	MATERIALS	% CORE	BOX OR		REMARKS	.M · 3VI	-
-22.5	b c 0.0	(Description) d		RECOVERY OR W.C. e	SAMPLE NO. f	(Drilling tin weatherin	ne, water loss, depth ng, etc., if significant g	of) SPT Blows/FT	
									E
					JAR-1	MARINE	SUK I NG	WK	F
						BOH: WATER DI	37.5' EPTH: 23.6'		╉
		SOFT SILTY MATERIAL (FINE GRAIN SAND, GRAY	(ML) W/ LITTLE		$ \setminus / $	TIDE:	+1.1	WR	F
	3.0				V I	FINISH	TIME: 1645		╞
						COORDIN	ATES BY GPS	wD	F
-27.0					/			MIL	F
				-		JAR-2 d FINES=2	.4.5 - 6.0. 9.5%		╞
					JAR-2	D50=0.0	B3mm	WR	F
	6.0	SOFT CLAYEY FINE GRAI	IN SAND (SC).			SILTY S	AND (SM). GRAY		-
								WR	F
-30.0	7.5				\nearrow				F
						JAR-3 d	.7.5 - 9.0.		
		FINE GRAIN SANDY CLAY	((CL). GRAY		JAR-3	D50=0.0	86mm	4	E
-31.5	9.0			-		+/-200	9.0 - 10.5.		┫
	│				JAR-4	FINES=7	.4%.	4	
						150=0.00 +/-200	88mm		
	│				\backslash	SILTY SA	AND (SP-SM).		E
								4	E
					$ \longrightarrow $				
	│	SILTY FINE GRAIN SAND) (SM) W/		JAR-5			8	F
	│ <u> </u>								╞
	╡╡┇							70	F
								20	F
									╞
	│				JAR-6			34	F
						JAR-7 d	.16.5 - 18.0.		╞
	│	SILTY FINE GRAIN SAND) (SM) W/		JAR-7		-SM.	5	F
-40.5	_{18•0}	LITTLE CLAY. LT. GRAY	ſ		Veni I	D50=0.0	88mm	3	F
				1	$\overline{}$	+/-200			╞
	/				$ \setminus / $				F
	_] X	NO SAMPLE			X	NOTE: BI SAMPLIN	GAN ALTERNATE		F
	<u> </u>				$ / \setminus $				
-43.5	21.0 7/								-
		NOBIL	E HARBOR TUR	NING BAS	SIN	1	HOLE NO. 13_0301	-06	
LING FURN	I IOJO (FOCSIMILE)	•	MUDILE HAR	DUR			13-0301	00	

DRULLING LOG (Cont Sheet) LEVATION TOP OF HOLE EL22.5' Hole No. 13-0301-06 PROJECT MOBILE HARDOR PROTALATION PROTALATION MOBILE DISTRICT or 2 area -43.5 21.0 CLASSFRATION OF LOG INVERTIGATION PROTALATION State of the st		06]							
PROJECT	MOBILE HA	LE HARBOR ARBOR TURNING BASIN	INSTALLAT	ION MOBI	LE DIST	RICT		SHEE OF 2	T 2 SHEETS	1
ELEVATION 0 - 43.5	DEPTH LEGEND b c 21.0	CLASSIFICATION OF MATERIA (Description) d	LS	% CORE RECOVERY OR W.C. e	BOX OR SAMPLE NO. f	(Drilling ti weatheri	REMARKS me, water loss ng, etc., if sigr g	, depth o iificant) SP	f T BLOWS/FT	
-45.0	22.5	POORLY GRADE FINE GRAIN SA W/ TRACE OF CLAY, LT. GRAY	ND (SP)		JAR-8	JAR-8 C Silty S	I.21.0 - 22 AND (SM), (•5 CRAY	8	E
-48 5	24.0	NO SAMPLE			$\left \right $					
-50.0		POORLY GRADE FINE GRAIN SAULT. BROWN & WHITE	ND (SP),		JAR-9			-	19	
-53.5	30.0	NO SAMPLE			$\left \right $					
-55.0		POORLY GRADE FINE GRAIN SAU LT. BROWN & WHITE	ND (SP),		JAR-10				29	
-58 5	33.0	NO SAMPLE			$\left \right $					
-60.0		POORLY GRADE FINE-MED. GRA (SP), LT. BROWN & WHITE	IN SAND		JAR-11	в.О.н.			22	
	I 1836-A (Focsimi	PROJECT MOBILE HAR ile) MOBILE	BOR TURI HARBOR	NING BAS	IN .		hole no. 13 [.]	-D301-	06	

Proj. No.: ALW00204	Alt. Proj. No.: CH05D301			ŀ	Hole No. 28-D3	01-06		
DRILLING LOG	DIVISION MOBILE DISTRICT				TRICT OF	SHEET 1 OF 2 SHEFTS		
1. PROJECT MOBIL	E HARBOR TURNING BASIN	10. SIZE A	ND TYPE C	DF BIT	STD SPT / 140 LB H	AMMER		
2 LOCATION (Coordinates	11. ELEVA	TION DATU	A • -	MLLW, FEET				
N 241	12. MANUF	ACTORER'S	DESIGNAT	IN OF DRILL	TELI			
3. DRILLING AGENCY MOBILE DIST			F	AILING 314				
4. HOLE NO. (As shown on dra	13. TOTAL BURDEN	NO. OF OV	TAKEN	1 14				
5. NAME OF DRILLER		14. TOTAL	NUMBER C	ORE BOXE	cs 0			
	E WOODS	15. ELEVA	TION GROUP	NDWATER	N/A			
6. DIRECTION OF HOLE		16. DATE	HOLE		STARTED ' CO	OMPLETED SEP 2006		
	-17. ELEVATION TOP OF HOLE EL28.3'							
7. THICKNESS OF OVERBURDEN		18. TOTAL	CORE REC	OVERY FO	DR BORING			
9. TOTAL DEPTH OF HOLE	33.0'	19. SIGNAT	URE OF IN	SPECTOR	00PFR '0	RAFTED' CHECKED		
	CLASSIFICATION OF MATERIAL	LS	% CORE	BOX OR	REMARKS			
	(Description) d		OR W.C.	SAMPLE NO.	Urilling time, water loss, dep weathering, etc., if significa	oth of ont)		
	+)		e		g	SPI BLUES/FI		
	111			J-1	MARINE BORING	WR		
					BOH: 33.0'			
	LOOSE FINE GRAIN SAND(SM)	N/ SOME		1-2	WATER DEPTH: 29.1'	wD		
	SILT. GRAY			J-2	START TIME: 0850	WA		
	+				COORDINATES BY GPS			
	↓ T I			J-3	J-3 d.3.0 - 4.5	WR		
			-		SILTI SAND (SM/4 OKA			
	SILTY CLAY (CL) W/ SOME DEC WOODY MATERIAL, LITTLE FINE	CAYED F GRAIN		.1-4	J-4 d.4.5 - 6.0			
-34.3 6.0	SAND. GRAY & DK. GRAY			•	SILTY SAND (SM), GRA	Y -		
					1-5 4 6 0 - 7 5			
	SILT. LT. GRAY			J-5	SILTY SAND (SM), GRA	Y 4		
	STIFF FAT CLAY (CH) W/ LITT & FINE GRAIN SAND, LT, GRAY	ILE SILT		J-6		9		
-37.3 9.0	MED. PLASTIC SUTY CLAY (CL),], \						
-37.8 9.5	GRAY			_				
	POORLY GRADED FINE GRAIN SA	AND (SP)		J-7		19		
		•						
	POORLY GRADED FINE GRAIN SA W/ TRACE OF CLAY, LT CRAY	AND (SP)		J-8		15		
-40.3 12.0	· W/ TRACE OF CLATS LT. ORAT							
				\smallsetminus				
	NU SAMPLE			\land				
	·]							
	POORLY GRADED FINE GRAIN SA (SP), IT, GRAY	AND		J-9	NOTE: BEGAN 3' CENTE	RS 42		
-43.3 15.0 - •	•							
				\searrow				
				\wedge				
.	• PODRLY GRADED FINE GRAIN SA • (SP), LT. GRAY	AND		J-10		33		
-46.3 18.0 - •					7			
				\setminus /				
-47.8 19.5				$\backslash/$				
				Ň				
	PODRLY GRADED FINE GRAIN SA (SP), LT. GRAY	AND		/		29		
-49.3 21.0 ···		000 700		<u>/ \</u>				
ENG FORM 1836 (Focs	imile) MOBILE HAR	BUR IUR	NING BAS	SIN	28-D3	01-06		

DRILLING	LOG	(Cont	Shee	et)	EL.	-28.3'	F	lole No.	28-D301-	-06	
PROJECT		M MOBIL	OBILE F HARI	HARBOR BOR TURNING BASIN	INSTALLAT	ION MOB	ILE DIS	TRICT	SHEE OF 2	ET 2 SHEETS	
ELEVATION	DEPT	H LEGI		CLASSIFICATION OF MATER	RIALS	% CORE	BOX OR	RE			
a -49.3	ь 21.0	c	:	(Description) d		RECOVERY OR W.C.	SAMPLE NO. f	(Drilling time, wat weathering, etc.	er loss, depth (., if significant) a s	of PTRIMUS/CT	
45.5	21.0						\mathbf{X}		<u>y</u> 3		F
50.9	22 5	$\exists >$	\leq	NO SAMPLE			X				
-20.8	22.5	<u> </u>	$\overline{\cdot}$								-
		<u> </u>		SAND (SP) LT. GRAY	GRAIN		J-11			19	E
-52.3	24.0		<u> </u>				$\overline{}$				
		$\exists >$	$\langle $	NO SAMPLE			X				F
-53.8	25.5	<u>-</u> /.	<u>-</u> -					•			
				POORLY GRADED FINE - MED. SAND (SP), LT, GRAY	GRAIN		J-12			11	F
-55.3	27.0	<u></u>	· · /					•			F
		$\exists \rangle$	$\langle $	NO SAMPLE							
-56.8	28.5	-/_	<u> </u>				$\angle $				-
		<u> </u>		POORLY GRADED FINE - MED. SAND (SP) W/ TRACE OF CO/	GRAIN ARSE GRAIN		J-13			15	_
-58.3	30.0	<u> </u>		SAND, LT. BROWN							F
				NO SAMPLE			\searrow				
-59.8	31.5		\searrow				\bigtriangleup				
		_		POORLY GRADED FINE - MED.			1-14			10	F
-61.3	33.0	╡	••	SAND, LT. BROWN	ANSE UNAIN		5-14	В.О.Н.		10	F
		_									
											F
	-	_									
		_									E
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											F
											E
							SIN	HOLE N	0.		

Proj. No	.: ALW00204	Alt. Proj. No.: CHO5D301	T		F	lole No.	29-D301	-06	_
DRILL	ING LOG	DIVISION MOBILE DISTRICT	INSTALLA		LE DIST	RICT	SHE OF 2	ET 1 SHEETS	
1. PROJECT	MOBILE H	ARBOR TURNING BASIN	10. SIZE A	ND TYPE C	DF BIT	STD SP	T / 140 LB HAM	MER	-
	M(Coordinates or Statio	OBILE HARBOR	11. ELEVA	TION DATUR	M				
N 241275' E 1801878'			12. MANUF	ACTORER'S	DESIGNATI	ON OF DRIL	LANE NAUSJ +		-
3. DRILLING A	MOBILE DISTRIC	T / EA ENGINEERING			F .			NSTURBED	
4. HOLE NO. (As shown on drawing	title 29-D301-06	BURDEN	NO. OF OV	TAKEN	<u> </u>	7 1	0	
5. NAME OF D	RILLER		14. TOTAL	NUMBER C	ORE BOXE	s	0		
	E	WOODS	15. ELEVA	TION GROUN	NDWATER		N/A		
			16. DATE	HOLE		STARTED	2006 · 8 SEI	2006	
			17. ELEVA	TION TOP (OF HOLE		EL25.2'		
8. DEPTH DRI			18. TOTAL	CORE REC	OVERY FO	R BORING			
9. TOTAL DEP	TH OF HOLE	36.0'	19. SIGNAT	URE OF INS	SPECTOR DY	OUNG	· JRAF	B · SVF	.0
ELEVATION	DEPTH LEGEND	CLASSIFICATION OF MATERIAL	.S	% CORE	BOX OR	(Drilling ti	REMARKS	of	1
-25.2		d		OR W.C.	NO.	weather	ing, etc., if significant:	OI) SPTRUMWS/FT	
23.2		SILTY SAND, MOST FINE SAND	& SILT	, , , , , , , , , , , , , , , , , , ,			y		╞
		(SM). TRACE DRGANICS. VERY	LOOSE		JAR-1	MARINE	BORING	WH	F
-26.7		POORLY CRAIN STI-STI	אם נכםי	-		BOH:	36.0'		╇
		W/ LITTLE SILT, TRACE ORGAN			JAR-2	TIDE:	+0.3	WR	F
	3.0_7	SHELL FRAG., VERY LOOSE, VE GRAY	RT DARK			START 1 FINISH	IME: 1035		F
		POORLY GRADED FINE GRAIN SA	ND (SP)			COORDIN	NATES BY GPS		┣
	- • •	W/ LITTLE SILT, TRACE ORGAN	1105.		JAR-3			7	F
									┥
					JAR-4			4	
	6.0	POORLY GRADED FINE GRAIN SA	ND (SP)						
		VERY LOOSE. VERY DARK GRAY	11034			.IAR-5 (1.6.0 - 7.5	_	F
70.7					JAR-5	CLAY (CH). GRAY	3	
-32.1				-		JAR-6 (FINES=4	1.7.5 - 9.0. 10.9%		╉
		FINE SAND, MOIST, VERY DARK	GRAY &		JAR-6	D50=0.0)79mm	6	
-34.2	9.0 -	BLAUK - 5/1-2-5/1		-		CLAYEY	SAND (SC) W/		╞
		PEAT (PT) W/ WOOD FRAG. & S	JLT.		JAR-7	TRACE OF WOOD& ORAT	3	F	
-35,7	10.5	MOIST, VERY DARK GRAY & BLA	CK		VAN			5	
									╞
					JAR-8			2	F
	12.0								-
				AL				2	
						140 10	4 17 5 15 0	_	
						FINES=	0.13.5 - 15.0. 98.8%		
		HIGH PLASTICITY (MH) W/ TRA	CF		JAR-10	+/-200 CLAY ((CH). GRAY	5	
	15.0	ORGANICS, MOIST, DARK GRAY				L01=1.8	3%		┥
		571-471			JAR-11	NOTE: S	SAMPLE FALLS IN WATER.	5	
							_		
									E
					JAK-12			4	F
									╉
	▏▁▋▋▋▋				X			3	F
-44.7	19.5 -			4	$\angle $				╞
		SILTY FINE GRAIN SAND (SM)	W/		IAD_1 2	JAR-13	d.19.5 - 21.0	۲	F
-46.2		TRACE ORGANICS, WET, LOOSE,	GRAY		JAR-13	CLAYEY	SAND (SC). GRAY	D	
70.2		PROJECT MOBILE HAR	BOR TUR	NING BAS	SIN		HOLE NO.	-	
ENG FORM	V 1836 (Focsimile)	> MOB	ILF HAR	BOR	-		29-D301	-06	

DRILLING	LOG (Cor	nt Sheet)	ELEVATION TOP OF HOLE	EL.	-25.2'	F	lole No.	2	9-D301-	06	
PROJECT	MĤB	MOBILE H	ARBOR R TURNING BASIN	INSTALLAT	ION MOB	ILE DIST	RICT		SHEE OF 2	T 2 SHEETS	
ELE VATION o			CLASSIFICATION OF MATERI/ (Description) d	ALS	% CORE RECOVERY OR W.C.	BOX OR SAMPLE NO.	(Drilling ti weatheri	REMARK me, water los ng, etc., if si	(S ss, depth o ignificant)	f	
-46.2	21.0	•••	POORLY GRADED FINE GRAIN S W/ TRACE SILT, MOIST, MED. GRAY, 5/Y-6/1	AND (SP) DENSE•	e	f JAR-14		g	<u> </u>	<u>19</u>	
	24.0 - ·	·				JAR-15				21	
		•••	POORLY GRADED FINE GRAIN S W/ TRACE ORGANICS, WET, ME	AIN SAND (SP) (* MED. 5/Y-6/1						27	
	27.0	•••	DENSE, OLIVE YELLOW, 5/Y-6/							26	
	· ·	· · ·								27	
	30.0	•••				JAR-16				19	
			POORLY GRADED COARSE GRAIN	SAND	\setminus					18	
	33.0	•••	(SP), WET, MED, DENSE, OLIVE YELLOW, 5/Y-6/4			$\left \bigwedge \right $			17		
		•••							10		
-61.2	<u>36.0</u> -	•••			-	JAR-17	в.О.н.			15	
ENG FORM	1836-A (I	Facsimile)	PROJECT MOBILE HAS	RBOR TUR	NING BAS	SIN		HOLE NO. 2	9-D301-	06	
Proj. No	.: ALWOO2	04	Alt. Proj. No.: CH05D301			F	lole No.	<u>30-D30</u>)1-06	_	
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DRILL	ING LOG			INSTALLATION SHEET 1 MOBILE DISTRICT OF 2 SHEETS							
1. PROJECT	MOB	ILE H	ARBOR TURNING BASIN	10. SIZE A	ND TYPE C	F BIT	STD SP	T / 140 LB HA	MMER	-	
		M	OBILE HARBOR	11. ELEVA	TION DATUM	1	М	LLW. FEET			
2. LOCATION (Coordinates (N	or Statio 240113	ⁿ² E 1801756'	COORDIN 12. MANUE	ACTORER'S	DESIGNATI	LW STATE	PLANE • NAD83 •	FEET	_	
3. DRILLING AC	GENCY	ISTRIC	T / FA ENGINEERING			F	AILING 3	514			
4. HOLE NO. (As shown on	drawing	title 30-D301-06	13. TOTAL BURDEN	NO.OF OV SAMPLES	'ER- TAKEN	' DIST	URBED U			
and file nur	mber)		1 30-0301-08	14. TOTAL	NUMBER C	ORE BOXE	s	0			
		Ε	WOODS	15. ELEVA	TION GROUN	DWATER		N/A			
6. DIRECTION	OF HOLE			16. DATE	HOLE	1	STARTED		MPLETED		
		INED	DEG. FROM VERTICAL	17. ELEVA	TION TOP C	OF HOLE	5 001 2	EL25.3'	0. 2000	-	
7. THICKNESS	OF OVERBUR		-	18. TOTAL	CORE REC	OVERY FO	R BORING			-	
9 TOTAL DEP		JCK	36.0'	19. SIGNAT	URE OF INS	SPECTOR	NUDEB	DR		D	
		FOEND	CLASSIFICATION OF MATERIAL	S	% CORE	BOX OR		REMARKS		-	
		C C	(Description) d		RECOVERY OR W.C.	SAMPLE NO.	(Drilling ti weather	me, water loss, dept ing, etc., if significar	th of ht)		
-25.3	0.0	• •			e	$\overline{}$		9	SPT BLOWS/FT	\pm	
						\times	MARINE	BORING	WR		
	_					$\angle $	BOH:	36.5'		╞	
	_	† †					WATER (EPTH: 25.3'	wD	F	
	,, =]]	┥╽┥╽				JAK-I	START	IME: 0803	WK		
		+				$\overline{}$	F INTSH COORD IN	TIME: 1045 NATES BY GPS		╈	
						\times			WR		
						$\angle \$	JAR-2 d	1.4.5 - 6.0.			
		┇╽┇╽					FINES=	3.7% D50=0.27m	m 		
		+				JAR-2	SILTY S	SAND (SP-SM).	WR		
	6.0		GRAY	(SM)+			GRAY			┥	
	_ •					\mathbf{X}	NOTE: F	POLY SAL @ 6.0'	• WH		
		Ĩ				$/ \setminus$					
										_	
		+				JAR-3			WH		
	9.0									-	
	_ +					$\mathbf{\mathbf{X}}$			WR	_	
						$/ \setminus$					
		+ +								_	
		\downarrow				JAR-4			WR	-	
-37.3	12.0 - +									_	
						\mathbf{N}			WH		
						$/ \setminus$					
				TDACE						-	
			OF FINE GRAIN SAND, DK. GRA	Y		JAR-5			WH		
	15.0										
						\searrow			WD		
						\wedge			WA		
							JAR-6 d	1.16.5 - 18.0.			
			SOFT SILTY MATERIAL (MH) W/ LENSES. DK. GRAY	SAND		JAR-6	F [NES=] +/-200	17.3%	5		
	18.0						SANDY	CLAY (CL). GRAY		╞	
						\searrow			wP		
	SOFT SILTY MATERIAL (MH), D					\wedge			WK		
						$ \longrightarrow $				╈	
			SOFT SILTY MATERIAL (MH) W/	SAND		JAR-7			1		
-46.3	21.0 -										
ENG FORM	M 1836 (F)	ocsimile		SOR TUR	NING BAS BOR	5 I N)1-06		

DRILLING	LOG	(Cont S	heet)	ELEVATION	TOP OF HOLE	EL.	-25.3'	H	-lole No.	30)-D301-(06	
PROJECT		MOB MOBILE	ILE HA HARBOR	RBOR TURNING	BASIN	INSTALLAT	ION MOB	ILE DIS	TRICT		SHEE1 OF 2	т 2 SHEETS	
ELEVATION	DEPTH		,	CLASSIF	ICATION OF MATE (Description)	RIALS	% CORE	BOX OR	(Drilling ti	REMARKS	S s. depth of	f	
-46.3	21.0				d		OR W.C. e	NO. f	weather	ing, etc., if sig g	nificant) SPT	BLOWS/FT	
			S O	OFT SILTY I F SAND • DK	MATERIAL (MH) GRAY	W/ TRACE		\ge			_	WR	
	24.0		S	OFT SILTY I ENSES, DK.	MATERIAL (MH) GRAY	W/ SAND		JAR-8				WR	
								\mathbf{X}			_	WR	
	27.0_		s	OFT SILTY I	MATERIAL (MH)	• DK. GRAY		JAR-9			_	WR	
	_							\ge			_	WR	
<u>-54.3</u> -55.3	29.0 30.0		ss	ILTY FINE (GRAIN SAND (S	M). GRAY		JAR-10			_	3	
	_		• Р	OORLY GRAD	D MED. GRAIN	SAND		JAR-11			_	4	
-58.3	33.0		•	SP), LT. Y	ELLOW			\bigvee			_	2	
-59.8	34.5		N	IO SAMPLE				\square					
-61.3	36.0		• Р (OORLY GRADE	ED FINE-MED. ELLOW	GRAIN SAND		JAR-12	В.О.Н.			30	
	_												
	_	_											
		_											
		_											
		_											
													_
		_											
	-	_											_
													F
	-												E
													E
	_												E
		_											F
ENG FORM	I 1836-	·A (Focsir	nile)	PROJECT	MOBILE H	IARBOR TUR	NING BA	SIN		HOLE NO.)-D301-(06	-





CHEM-X-06 Borings

	.: ALW00204	Alt. Proj. No.: CH05D301	0301 Hole No. CHEM-1-06					6
DRILL			INSTALLA		LE DISI		SHEET OF 2	1 SHEETS
PROJECT	MOBILE HA	RBOR TURNING BASIN BILE HARBOR	10. SIZE A	ND TYPE C	DF BIT	3" SPLITSPOON /	140 LB I	
. LOCATION (Coordinates or Station N 242805	, É E 18018591		ACTOPER'S		LW STATE PLANE, N	AD83. FEE	T
. DRILLING AG	MOBILE DISTRIC	T / FA FNGINFFRING	IZ. MANUF	ACTORER 3	F.	AILING 314	1	
HOLE NO. (4	As shown on drawing t	title CHEM-1-06	13. TOTAL BURDEN	NO. OF OV SAMPLES	/ER- TAKEN	DISTURBED		URBED
NAME OF Df	nber) RILLER		14. TOTAL	NUMBER C	ORE BOXE	S	0	
		WOODS	15. ELEVA	TION GROUN	NDWATER		COMPLET	
		DEG. FROM VERTICAL	16. DATE	HOLE		16 SEP 2006 -	16 SEP	2006
. THICKNESS	OF OVERBURDEN	-		CORE REC	OVERY FO	R BORING		
DEPTH DRILI	LED INTO ROCK	- 29.0'	19. SIGNAT	DRAFTE				
		CLASSIFICATION OF MATERIA	LS	% CORE	BOX OR	REMAR	- JCD RKS	· 3¥F
-25.6	b c 0.0	(Description) d		RECOVERY OR W.C. e	SAMPLE NO. f	(Drilling time, water lo weathering, etc., if g	oss, depth of significant) SP 1	BLOWS/FT
		SOFT SILTY MATERIAL (ML-SM) W/		1	MARINE BORING BOH: 28 WATER DEPTH: 26 TIDE: +0	3.0' 5.3' 1.7'	WR
-29.6	3.0	SILTY SAND, GRAY			2	START TIME: 08 FINISH TIME: 12 3.0" SPLITSPOON 2.0' DRIVES COORDINATES BY	610 - 230 1 GPS	WR
	6.0		00.14		3		-	WR
-33.6		SUFI SILIY MAIERIAL (ML).	GRAY		4		-	WR
	9.0	SOFT SILTY MATERIAL (MH).	GRAY		5		-	WR
-36.6		POORLY GRADED SAND (SP), G	RAY	-	6			10
		POORLY GRADED SAND (SP), L & YELLOWISH BROWN	T. BROWN		7		-	82
	15.0				8		-	79
POORLY GRADED SAND (SP), Y	ELLOW		9		-	46		
							-	
					10			30
-46.6					10		-	30 30

DRILLING	LOG (Cont Sh	eet)	EL.	-25.6'	F	lole No. CH	IEM-1-0	6	
PROJECT	MOBIL		INSTALLAT			TRICT	SHEET	2	1
								SHEEIS	1
a	b c	(Description)	425	RECOVERY	SAMPLE NO.	(Drilling time, water loss weathering, etc., if sign	, depth of hificant)		
-46.6	21.0			e	f	g	spi	BLOWS/FT	L
					11			30	
		POORLY GRADED SAND (SP), Y	ELLOW						
					12			51	
	24.0								
							_		
					13			53	
		POORLY GRADED SAND (SP), Y	ELLOWISH				_		
		WHITE							
	27.0				14			29	
-53.6	28.0					В.О.Н.			L
									F
									F
									E
									E
									F
									F
					-				

Proj. No.	.: ALWOO204	Alt. Proj. No.: CH05D301		I	Hole No.	<u>CHEM-2-(</u>	06	-		
DRILL	ING LOG			NIF DIS	TRICT	SHEET	T 1 SHEETS	l		
1. PROJECT	MOBILE H	HARBOR TURNING BASIN	10. SIZE AND TYPE	OF BIT	3" SPT W/ 14	40LB HAMME	R			
2. LOCATION (Coordinates or Stat N 24189	ion) 16' E 1801921'			MLLW. F	NAD83. FEE	T			
3. DRILLING AC	GENCY MOBILE DISTRI	CT / EA ENGINEERING		F	ALLING 314					
4. HOLE NO. ()	As shown on drawing	g title CHEM-2-06	- 13. TOTAL NO. OF C BURDEN SAMPLES	OVER- S TAKEN	15	1	0			
5. NAME OF D	RILLER		14. TOTAL NUMBER CORE BOXES 0							
6. DIRECTION	OF HOLE	: WUUDS	15. ELEVATION GROUNDWATER N/A							
X VERTICA		DEG. FROM VERTICAL	- 17. ELEVATION TOP	OF HOLE	19 SEP 2006	<u>19 SEP</u>	2006	-		
7. THICKNESS	OF OVERBURDEN	-	18. TOTAL CORE RE	COVERY FO	OR BORING	2311		1		
8. DEPTH DRIL	LED INTO ROCK	- 30.0'	19. SIGNATURE OF I		OOPER			į		
ELEVATION		CLASSIFICATION OF MATERIA	LS % CORE	BOX OR			, ,	1		
-23.7		(Description) d	RECOVER OR W.C e	NO.	(Drilling time, wate weathering, etc.,	r loss, depth o if significant) g y	of PT BLOWS/FT			
					MARINE BORING	;		F		
				1	BOH:	30'	WH			
					WATER DEPTH:	24.1' +0.45'		ŀ		
	│				START TIME:	0811		t		
	3.0	SILTY SAND (SM), GRAY		2	3.0" SPLITSPO	iON	5	þ		
	╡┥┤┥┟				COORDINATES B	Y GPS		þ		
	│				-			t		
				3			10			
	▏									
-29.7		· 			-			ł		
		SILT, SAND W/ DECAYING WOD	DY				<i>,</i>			
		MATERIAL (MH-OL). GRAY		4			5	L		
-31.7	8.0 -				_			ł		
		STIFF FAT SANDY CLAY (CH).	GRAY	5			9	F		
-33.7	10.0				-	,		ļ		
				6			41			
	12.0	CLAVEY SAND (SC), CDAY						-		
		CEATET SAND (SC/L UNAT						L		
				7			39	L		
-37.7										
					1	•		ŀ		
	15.0			8			56	þ		
	│							F		
	│ ┤				-	•		f		
				9			63			
	│ ┤.`` .	POORLY GRADED SAND (SP), Y	ELLOWISH				05	F		
	18.0				-			f		
	_ · ·					40	E			
				10			47	F		
	│ ┤				-			ł		
-44.7	$ _{21.0} = \cdot \cdot \cdot$,		11			91	þ		
		PROJECT MOBILE HAR	BOR TURNING BA	ASIN	HOLE NO.		<u> </u>	-		
ENG FORM	A 1836 (Focsimil	e) MOB	ILE HARBOR			CHEM-2-(06			

DRILLING	LOG (Cont Sh	eet)	OP OF HOLE	EL.	-23.7'	F	lole No. Cl	1EM-2-0)6	
PROJECT	MOBII MOBILE H	LE HARBOR	ASIN	INSTALLAT	ION MOB	ILE DIST	RICT	SHEET	T 2	
ELEVATION	DEPTH LEGEND	CLASSIFIC	CATION OF MATER	RIALS	% CORE	BOX OR	REMARKS	<u> </u>	0.122.10	1
a -44.7	ь с 21.0	(Description) d		RECOVERY OR W.C. e	SAMPLE NO. f	(Drilling time, water loss weathering, etc., if sig a	, depth of nificant) SPI	f I Blows/Ft	
						11			91	E
								-		┢
						12			88	
								-		F
						13			101	
		POORLY GRADE	D SAND (SP).	YELLOWISH				_		
						14			154	_
								-		-
						15			70	
						13			13	
-53.1	30.0 -						B•U•H•			╘
										_
										_
										-
										E
		PROJECT					HOLE NO.			

Proj. No.: ALW00204	Alt. Proj. No.: CH05D301		ŀ	lole No.	CHEM-3-06	
DRILLING LOG			BILFDIS	TRICT	SHEET 1	TS
1. PROJECT MOBILE		10. SIZE AND TYP	E OF BIT	3" SPT W/ 140	DLB HAMMER	
2. LOCATION (Coordinates or Sta	tion)	11. ELEVATION DA	тим тим А	MLLW. FE	LI NAD83. FEET	
3. DRILLING AGENCY		12. MANUFACTORE	R'S DESIGNAT F	ION OF DRILL		
MUBILE DISIK		13. TOTAL NO. OF BURDEN SAMPL	OVER- ES TAKEN			, T
and file number)	CHEM-3-06	14. TOTAL NUMBER	R CORE BOXE	S	0	\neg
	E WOODS	15. ELEVATION GR	OUNDWATER	N/A	1	
		16. DATE HOLE	, ,	STARTED '	COMPLETED	6
		17. ELEVATION TO	P OF HOLE	EL'	11.5'	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE F	RECOVERY FO	OR BORING		
9. TOTAL DEPTH OF HOLE	42.0'	13. SIGNATORE OF	T C	OOPER	BEM S	VF
ELEVATION DEPTH LEGEND	CLASSIFICATION OF MATERIAL (Description)	S % COR RECOVE	E BOX OR RY SAMPLE	REMAN (Drilling time, water I	RKS loss, depth of	
-11.5 0.0 °	d	OR W. e	C. NO. f	weathering, etc., if	significant) SPT BLOWS	5/FT
				MARINE BORING		-
			1		2' WR 19'	F
					0.4'	
				FINISH TIME: 12	231	ŀ
			2	2.0' DRIVES	N WR	F
	SOFT SILTY MATERIAL (ML), G	RAY		COURDINATES BY	GPS	_
			_		_	E
			3		WR	þ
6.0				-		_
						F
			4		WR	E
-19.5 8.0 -	<u> </u>			-		_
			_		_	ŀ
	SILTY SAND (SM), GRAY		5		5	F
	<u> </u>			-		_
						ŀ
			Ь		WR	þ
12.0				-		_
			-		-0	
			ſ		WR	F
				-		
15.0					шO	F
	SOFT SILTY MATERIAL (MH-ML)	GRAY	8		WK	E
		_		-		
			•		шŌ	ŀ
			3		WR	ŀ
18.0				4		[
			10		<u>س</u>	E
					WK	þ
				-		
-32.5 21.0			11		WR	
	PROJECT MOBILE HAR	BOR TURNING E	BASIN	HOLE NO.	CHEN-3-04	
	MUR	ILE HAKBUK			VIILM_J_∩0	

DRILLING	LOG (C	Cont Sh	neet)	ELEVATION	TOP OF HO	DLE	EL.	-11.5'	F	lole No.	Cł	HEM-3-()6]
PROJECT		MOBI	LE HAI	RBOR			INSTALLAT			TRICT		SHEE	т 2	1
	M	ORILF H	IARBUR	TURNING	BASIN			MUB				OF 2	SHEETS	-
ELEVATION 0	DEPTH b	LEGEND c		CLASS	FICATION OF (Description	n)	ALS	% CORE RECOVERY	BOX OR SAMPLE	(Drilling ti	REMARKS me, water loss	s, depth o	f	
-32.5	21.0				a			e e	f	wedther	g g	SP	t Blows/Ft	
									11				WR	F
						/ Maj _ Ma						-		F
			3				A UNAT		12				WR	E
_35_5	34 0 -													E
-10.0	24.0	┆╏╴╏╵╽						-				-		┢
			S	OFT SILTY	MATERIAL	(MH).	GRAY		13				WR	F
77 6	25 0						•							F
-31.3	20.0							-				-		E
	27.0			DFT SILTY RADED SAN	MATERIAL D (MH-SP)	& POOR GRAY	LY &		14				57	E
30.5			Ŷ	ELLOWISH		•	-						•	
-33.2	28.0 _											-		ŧ
									15				58	—
		•••												E
	30.0	•••										-		╘
	_								16				71	E
													••	E
	_											-		F
	33.0	•••							17				70	E
	_												10	
		•••								-		•		Ł
		•••				(CD) V			10				76	
		• • •		UURLT GRA	DED SAND	(58)• 1	ELLUWISH		18				(0)	F
	36.0											-		╡
]											••	E
		•••							19				82	E
	_	••												Ł
	39.0												•	F
									20				81	F
		•••										-		E
		•••											••	
									21				92	F
-53.5	42.0	••	<u> </u>							В.О.Н.				╞
														E
		-												E
	_	-												E
	_	-												F
	_	-												F
														E
														Ē
		-												F
		-		PROJECT										F
ENG FORM	1836-A	(Focsim	ile)	PROJECT	MOB	ILE HAF MOBILE	RBOR TURI HARBOR	NING BAS	SIN		HULE NO. Ch	HEM-3-()6	

Proj. No.: ALW00204	Alt. Proj. No.: CH05D301		Hole	No.	CHEM-4	1-06	_
DRILLING LOG			LE DISTRIC	т	SHE OF	EET 1 2 SHEFTS	
1. PROJECT MOBILE H	IARBOR TURNING BASIN	10. SIZE AND TYPE (DF BIT 3	'SPTW/	140LB HAM	MER	-
2. LOCATION (Coordinates or Stati N 24011	on) 0'E 1801680'	COORDINATE DATUM		TATE PLANE	E. NAD83. F	FEET	
3. DRILLING AGENCY MOBILE DISTRI	CT / EA ENGINEERING	IZ. MANOFACTORER S	FAIL	NG 314			
4. HOLE NO. (As shown on drawing and file number)	CHEM-4-06	BURDEN SAMPLES	/ER- TAKEN ı	14	1	0	_
5. NAME OF DRILLER	WOODS	- 14. TOTAL NUMBER C	ORE BOXES		0 N/A		-
6. DIRECTION OF HOLE		16. DATE HOLE	' ST/	RTED			-
	DEG. FROM VERTICAL	17. ELEVATION TOP	IN STATE	EL.	<u> </u>	.P 2006	-
7. THICKNESS OF OVERBURDEN	-	- 18. TOTAL CORE REC	OVERY FOR BO	RING			
9. TOTAL DEPTH OF HOLE	28.0'	19. SIGNATURE OF IN	SPECTOR T COOPE	R	'DRA • B	EM ' SVF	٩
ELEVATION DEPTH LEGEND	CLASSIFICATION OF MATERIA (Description)	LS % CORE RECOVERY OR W C	BOX OR SAMPLE (Dr NO. w	R illing time, wa	EMARKS iter loss, depth	h of	1
		e	f			SPT BLOWS/FT	+
			MA	RINE BORIN	NG	4	E
				H: TER DEPTH:	28.0' 25.4'	4	F
│			T ST	DE: ART TIME:	+1.0' 1005		╡
3.0			F 2 3.	NISH TIME: O‴SPLITSF	: 1320 POON	10	E
			2.	O' DRIVES	BY GPS	10	F
				0.010	01 01 5		╉
			3			40	F
						40	F
							┫
						12	F
			-			12	F
							╡
9.0			5			10	E
			5			10	F
	SILTY SAND (SM), GRAY						╉
			c			2	þ
			D			2	F
							┫
			7			0	F
						3	F
							╡
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DRILLING	LOG (Cont St	heet)	EL	-24.4'	F	lole No.	CHEM-4-C)6	
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2. LOCATION (Coordinates or N 23	Static 8418	8' E 1801621'	COORDIN	ACTORER'S		MLLW+ FE LW STATE PLANE+ N ON OF DRILL	NAD83. FEE	T
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7. THICKNESS OF OVERBURDE	.N	-	17. ELEVA	TION TOP (OF HOLE	EL:	31.0'	
8. DEPTH DRILLED INTO ROCH	<	-	19. SIGNAT	URE OF IN	SPECTOR		DRAFTE	D CHECKED
9. TOTAL DEPTH OF HOLE		22.0'			T CC	DOPER	' JCB	' SVF
ELEVATION DEPTH LEC	GEND c	CLASSIFICATION OF MATERIAL (Description) d	S	% CORE RECOVERY OR W.C.	BOX OR SAMPLE NO.	REMAI Drilling time, water I) weathering, etc., if	RKS oss, depth of significant)	i
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VC-X-84 Borings



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----- ENG , MAY 63 2087

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DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

CHART

NO.

517



Reg. No. 1-85-F&M





ENG FORM 2087

CHART NO. 518

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. No. 4222

Reg. No. 1-85-F&M



CHART NO.



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ENG , MAY 63 2087

NO. 520

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DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

W.O. NO. 4222

Reg. No. 1-85-F&M



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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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CHART NO. 523

----- ENG , MAY 63 2087

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HOLE NO. 55 - 3- 70

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May 13, 2022

Mr. James McConnell, P.E. Levee Safety Program Manager USACE, Mobile District 109 Saint Joseph Street Mobile, AL 36602

### RE: Vibracore Collection Field Report Dauphin Island Causeway Beneficial Use Project Mobile County, Alabama

Dear Mr. McConnell,

Athena Technologies, Inc. is pleased to submit this Vibracore Collection Field Report for the abovementioned project. Should you have any questions or concerns regarding the attached report, please do not hesitate to contact me via the information below.

Respectfully,

lan Inee

J. Adam Freeze Vice President / Geologist



## **VIBRACORE COLLECTION FIELD REPORT**

### DAUPHIN ISLAND CAUSEWAY BENEFICIAL USE PROJECT MOBILE COUNTY, ALABAMA

May 2022

Prepared for:

USACE, Mobile District 109 Saint Joseph Street Mobile, AL 36602

#### Prepared by:

Athena Technologies, Inc. 1293 Graham Farm Road McClellanville, SC 29458



1293 Graham Farm Road, PO Box 68 McClellanville, South Carolina 29458 (843) 887-3800 www.athenatechnologies.com



## **VIBRACORE COLLECTION FIELD REPORT**

### DAUPHIN ISLAND CAUSEWAY BENEFICIAL USE PROJECT MOBILE COUNTY, ALABAMA

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#### **Section 1: Introduction**

In 2021, Athena Technologies, Inc. (Athena) was tasked by the U.S. Army Corps of Engineers, Mobile District (USACE) to conduct geotechnical vibracore sampling in support of the following project: *Dauphin Island Causeway Project*. The scope of the project included the collection of 15 geotechnical vibracores from the Mobile River and Choctaw Pass (near Little Sand Island) in Mobile County, Alabama (**Figure 1**). The scope of services also included the development of photo-mosaic images of each core, geotechnical core logging, and preparation of digital core logs using gINT software. The vibracores were collected over the course of 2 mobilizations: one in February and the second in April 2022. Figures depicting the vibracore sample locations have been included as **Figure 2A** and **Figure 2B**. A summary of the vibracore collection methodology and a description of site conditions is presented below.

#### Section 2: Methodology and Site Conditions

Athena utilized the 35-foot research vessel, *Artemis*, as the sampling platform for this project. *Artemis* was equipped with all required United States Coast Guard (USCG) safety gear and was operated by a USCG-certified 100 Ton Master Captain with over 20 years of vessel operation experience. The Captain was accompanied by 3 additional crewmembers. A Trimble Differential Global Positioning System (capable of sub-meter accuracy) interfaced with HYPACK was utilized for primary navigation. Horizontal coordinates were recorded in North American Datum of 1983, State Plane Coordinate System, Alabama West (Zone 0102), U.S. Survey Feet. Real-time tide elevation data were also obtained in the field using a Spectra Precision SP80 Global Navigation Satellite System receiver interfaced with the Alabama Continuously Operating Reference Station network.

During field operations, *Artemis* was immobilized over the desired sample sites using a triple point anchor system. Once on station, the coordinates at the vessel location were compared with the coordinates for the desired sample location to ensure accurate vessel positioning. Upon satisfactory positioning, a water depth was collected via lead line or fathometer, final horizontal coordinates were recorded, and tide elevation data were recorded. The tide elevation data, which was referenced to North American Vertical Datum of 1988 (NAVD 88), was then utilized to determine the sediment surface elevation at each sample location.



A custom-designed and fabricated vibracore system was utilized to collect the geotechnical vibracores. The system consists of a generator with a mechanical vibrator attached via cable to a 3-inch diameter, galvanized sample barrel. The sample barrel was lowered until the bottom of the barrel was directly above the sediment surface. The vibracore machine was turned on and the sample barrel was allowed to penetrate until the bottom of the sample barrel reached a project depth of 20 feet below sediment surface. Once the sample barrel reached the project depth, the machine was turned off and the sample barrel was retrieved using an electric winch. The recovered core length was measured following core retrieval, and percent recovery was verified. The cores were then capped, labeled, and cut into 5-foot sections. A vibracore summary table containing final vibracore location coordinates, elevation data, and penetration and recovery data has been included as **Table 1**.

During the initial sampling event, surficial sediments in the study area were found to be comprised of hyper-saturated clays with very low density. In certain locations, this hyper-saturated, fine-grained sediment prevented the anchors from setting properly. Similarly, on certain occasions the hyper-saturated sediment would wash out of the sample barrel during retrieval. Such was the case at location DIC-BU-01; despite multiple coring attempts at DIC-BU-01, we were unable to retain a core due to the exceptionally unconsolidated nature of the sediments at that location. The unconsolidated, watersaturated surficial sediments likely represent operation and maintenance material within and adjacent to the Upper Bay navigation channel.

The completed cores were opened longitudinally at Athena's core processing facility in McClellanville, South Carolina. The cores were photographed after opening and were logged by Athena's geologists in accordance with protocol outlined in ASTM D 2488 and ASTM D 2487. Core logs and photo-mosaic images of the cores were provided to USACE and the cores were then delivered to the USACE's core storage facility in Selma, AL. Photo-mosaic images and logs for each core have been included as **Appendix A**.



## FIGURE 1: Study Area Location Map Dauphin Island Causeway Beneficial Use Project Mobile County, Alabama





FIGURE 2A: Vibracore Location Map Upper Bay Turning Basin Subarea Dauphin Island Causeway Beneficial Use Project Mobile County, Alabama





FIGURE 2B: Vibracore Location Map Upper Bay Channel Subarea Dauphin Island Causeway Beneficial Use Project Mobile County, Alabama





# TABLES



#### TABLE 1 - Geotechnical Vibracore Summary Dauphin Island Causeway Beneficial Use Project USACE Mobile District

Boring ID	Collection Date	Time	East (x)	North (y)	Water Depth (ft)	Tide Elevation [1] (ft NAVD 88)	Sediment Surface Elevation (ft NAVD 88)	Bottom of Core Elevation (ft NAVD 88)	Penetration (ft)	Recovery (ft)	Notes	
DIC-BU-01	2/23/2022	11:14	1801460.44	243265.16	48.3	0.9	-47.4	-47.4	20.0	0.0	Made 3 coring attempts; sediment comprised of water-saturated clay with very low consistency; sediment washed out of sample barrel during each coring attempt and no core was recovered; location abandoned.	
DIC-BU-02	2/23/2022	12:34	1802413.40	242986.88	37.4	1.0	-36.4	-53.1	20.0	16.7		
DIC-BU-03	2/23/2022	12:00	1802856.86	242170.30	41.7	1.0	-40.7	-61.7	21.0	21.0		
DIC-BU-04	4/6/2022	8:58	1802590.32	241751.00	28.7	-0.4	-29.1	-45.2	20.0	16.1		
DIC-BU-05	4/6/2022	10:59	1802186.18	242229.62	42.6	0.0	-42.6	-59.8	23.0	17.2		
DIC-BU-06	4/6/2022	9:53	1802361.09	241496.04	15.1	-0.3	-15.4	-32.7	20.0	17.3		
DIC-BU-07	4/6/2022	11:58	1802531.60	242396.19	39.6	0.1	-39.5	-59.6	23.0	20.1		
DIC-BU-08	4/6/2022	9:27	1802546.51	242062.74	40.4	-0.4	-40.9	-59.9	22.5	19.0		
DIC-BU-09	2/24/2022	12:14	1801884.96	239449.40	18.9	0.8	-18.1	-35.1	20.0	17.0		
DIC-BU-10	2/24/2022	11:38	1801851.96	238386.07	20.8	0.6	-20.2	-43.9	26.0	23.7		
DIC-BU-11	2/23/2022	16:59	1801854.71	237355.84	14.2	1.9	-12.3	-34.0	24.0	21.7		
DIC-BU-12	4/6/2022	10:31	1802255.19	241885.30	40.6	-0.2	-40.8	-59.9	23.0	19.1		
DIC-BU-13	2/23/2022	16:30	1801753.60	235834.36	13.1	1.7	-11.4	-34.4	26.0	23.0		
DIC-BU-14	2/23/2022	14:17	1801079.90	235144.95	46.1	1.6	-44.6	-58.1	26.0	13.5	Made 5 coring attempts; sediment comprised of water-saturated clay with very low consistency overlying a coarse-grained sand at the base; the measured recovery during the 5 coring attempts varied from 7.8' to 14.2'; last core retained for processing.	
DIC-BU-15	4/6/2022	11:33	1802240.79	242603.66	41.3	-0.1	-41.4	-61.4	23.0	20.0		
	ft = feet											
Notes	Coordinates wer	e recorded in North	n American Datum o	f 1983, State Plane	Coordinate System	n, Alabama West (Z	one 0102), US Sur	vey Feet.				
	NAVD 88 = Nort	h American Vertica	I Datum of 1988									
	= Elevation d	ata were collected i	in the field using a S	Spectra SP80 Globa	al Navigation Satelli	te System receiver	interfaced with the	ALCORS network, a	and were referenced	d to North Americar	Vertical Datum of 1988.	



# APPENDIX A Core Photographs and Logs





					Borir	ng Des	signation DIC-BU-02				
DRI	LLING	LOG	South Atlantic Division			strict	SHEET 1 OF 2 SHEETS				
1. PROJE	ст nin Islar	nd Cau	seway Beneficial Use	9. CO Sta	ordinat ate Plar	e syste ne - AL	M HORIZONTAL VERTICAL West NAD83 NAVD 88				
Mobile	e Count	ty, Alab	bama	10. SI	ZE AND T	YPE OF	BIT2.5" Sample Barrel				
2. HOLE N DIC-B	UMBER		LOCATION COORDINATES N 242986.88 E 1802413.4	11. MANUFACTURER'S DESIGNATION OF DRILL Athena Technologies Vibracore System							
3. DRILLIN	NG AGEN	CY		12. TOTAL SAMPLES DISTURBED UNDISTURBED							
4. NAME C		ER	5								
Palme	er McCl	ellan		14. EL	EVATION	GROUN	ND WATER See Remarks				
	TION OF E RTICAL ELINED	BORING	DEG FROM BEARING VERTICAL	15. DA OF BC	ATE TIME DRING	GROUP	STARTED COMPLETED 2/23/22 @ 1234 hrs.: 2/23/22 @ 1150 hrs				
6. THICKN	IESS OF	OVERBU	RDEN	16. EL	EVATION	I TOP OF	BORING -36.4' NAVD 88				
7. DEPTH	DRILLED	INTO RO	DCK	17. TC	TAL COF	RE RECO	OVERY FOR BORING 84%				
8. TOTAL	DEPTH C	F BORIN	G 20.0'	18. SI	GNATURI Adam		e. Geologist				
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS		% CORE	BOX OR	REMARKS				
(NAVD 88) a	(feet) b	с	(Description) d		REC e	SAMPLE # f	<ul> <li>Urilling time, water loss, depth of weathering, etc., if significant)</li> <li>g</li> </ul>				
			0.0' TO -36.4' WATER				NOTE 1: Ocean Bottom elevation is referenced to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation = +1.03 feet NAVD 88.				
-36.4	0.0		OCEAN BOTTOM AT -36.4' NAVD & CH: Olive gray, fat clay, trace wood/plant material, low grading to medium plasticity, ver grading to soft.	38 y soft		-	VIBRACORE BORING From: 0.0' to 20.0' Ran: 20.0' Rec: 16.7'				
					Core Run						
	2.0-				20.0'						
					83.5%						
							LAB CLASSIFICATION				
	4.0						NOTE: Soils are Visually Lab Classified in				
							Accordance with ASTM-D2487. Percent Passing #200 Sieve and Percent Shell are Determined in				
							Accordance with ASTM-D6913.				
	60-										
-42.9											
			<b>SC</b> : Olive gray and light olive brown, clayey sa	and,							
			clean sand in burrows & layers, loose/soft,								
11 5			bioturbated.								
-44.5	8.0	//////	<b><u>SP</u></b> : Light brownish gray, poorly graded sand,	fine							
			to medium -grained, trace inorganic clay in bu to 8.5', loose, subangular.	rrows							
40.0		· · · ·									
-46.0			SP: Light olive brown grades to yellowish brow	vn,	-						
	10.0		poorly graded sand, medium -grained, trace c	oarse							
			clay in occasional laminations, slight iron-oxid	ation,							
		• • •	ioose, subangular.								
	12.0										
		• • • •									
	3	Duraft					Periowed Pre Neil Misker				
	l	Dratte	и ву. Adam Freeze Drafted: 3/7/2022				Date Checked: 3/10/2022				
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SAW FORM 1836-A (VIBRACORE BORING) JUNE 2016

				Boriı	ng Des	signatio	DIC-BU	-02
DRILL	ING LOG (	Cont Sheet)	INSTA Mo		strict		SHEET 2 OF 2 SHEETS	
PROJECT			COOF	DINATE	SYSTEM		HORIZONTAL	VERTICAL
Daupl	hin Island Ca	useway Beneficial Use	Sta	NAVD 88				
LOCATIO	N COORDINATE	8	ELEVA	ATION TO	OP OF BO	RING		
N 242	986.88 E 1	802413.4	-36	5.4'	1			
ELEV (NAVD 88) a	DEPTH (feet) b c	D FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f		REMARKS (Drilling time, water lo weathering, etc., if s g	S ss, depth of significant)
-53.1		BOTTOM OF BOREHOLE AT 20.0 ft Soils ARE FIELD VISUALLY CLASSIFIE ACCORDANCE WITH THE UNIFIED SC CLASSIFICATION SYSTEM	D IN DIN					



						Borir	ng Des	signation	DIC-BU-	-03			
DRI	LLING L	OG	South Atlantic Di	vision		LATION	strict			SHEET OF 2	1 SHEETS		
Dauphin Island Causeway Beneficial Use						RDINAT	E SYSTE	M West	HORIZONTAL NAD83		- D 88		
					10. SIZ	10. SIZE AND TYPE OF BIT2.5" Sample Barrel							
DIC-BU-03 N 242170.3 E 1802856.86							Athena Technologies Vibracore System						
Athen	a Technol	logies			12.10	IAL SAIV	IPLES	- 015	1		SED		
4. NAME (	OF DRILLER	0			13. TO	TAL NUN	BER CO	RE BOXES		i			
		an		BEARING	14. ELE	VATION	I GROUN	D WATER	See Remark	٢S			
	RTICAL		VERTICAL		15. DATE TIME GROUP, STARTED COMPLETED						040 h		
					2/23/22 @ 1200 hrs.: 2/23/22 @ 1210 hrs								
6. THICK			IN		17. TO	TOTAL CORE RECOVERY FOR BORING 100%							
7. DEPTH					18. SIG	IGNATURE AND TITLE OF INSPECTOR							
8. TOTAL		BORING 2				Adam Freeze, Geologist							
ELEV (NAVD 88) a	DEPTH LEC (feet) b	GEND c	(Descr	iption)		% CORE REC e	BOX OR SAMPLE # f	(D	villing time, water lo weathering, etc., if s	ss, depth of ignificant)			
-40.7	0.0		0.0' TO -40. OCEAN BOTTOM / : Olive gray, fat clay, lo sticity, very soft grading	7' WATER AT -40.7' NAVD 8 w grading to mediur	38 n			NOTE 1: Oct to NAVD 88 Spectra Preconboard the +1.05 feet N/ VIBRACORE From: 0.0' to Ran: 21.0' R	ean Bottom ele using verified ti ision SP80 GN sampling vesse AVD 88. EBORING 21.0' ec: 21.0'	vation is refe idal data fron ISS system el. Tide Elev	erenced n a ration =		
50.0			sucity, very son grading	j to soit.	1	Core Run 21.0' Recovery 100.0%		NOTE: Soils a Accordance w #200 Sieve ar Accordance w	AB CLASSIFI Are Visually Lat <i>i</i> th ASTM-D24 Ind Percent She <u>i</u> th ASTM-D69	CATION O Classified in 87. Percent I II are Detern 13.	n Passing nined in		
	12.0	SP to r occ qua sub	: Light brownish gray, p nedium -grained, trace casional burrows, fine tr artz in matrix at top & a bangular.	oorly graded sand, inorganic clay in o coarse gravel-size t 10.8', loose,	fine d								
Mobile Distr	Drafted By: Adam Freeze Date Drafted: 3/7/2022							Reviewed By: Date Checked VERSION:	Neil Wicker I: 3/10/2022 Final				
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JUNE 2016	JIKINI 1836 S	-A (VIB	RACORE BURING	1		Borir	ng Des	signation [	DIC-RD-03	SHEI	EI1 of 2		

					Borir	ng Des	signatio	n DIC-BU	-03
DRILLING LOG (Cont Sheet)					LLATION	strict		SHEET 2	
PROJECT	-			COORDINATE SYSTEM HORIZON					VERTICAL
Daupł	hin Islaı	nd Cau	seway Beneficial Use	State Plane - AL West NAD83					NAVD 88
LOCATIO	N COORE	INATES		ELEVA	TION TO	OP OF BO	RING		
N 242170.3 E 1802856.86					.7'				
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f		REMARK: (Drilling time, water lo weathering, etc., if : g	S sss, depth of significant)
-54.2	=	• • •							
55.0	14.0	· · · ·	<b><u>SP</u></b> : Light brownish gray grades to yellowish brown, poorly graded sand, medium to coarse -grained, trace fine gravel-sized quartz, loose, subangular.						
-55.6 -56.0 -56.3		<b>////</b> //	<b>SW</b> : Dark yellowish brown, well graded sand, to coarse -grained, some fine to coarse gravel-sized quartz, trace inorganic clay in ma lloose. subrotund/subangular.	ine trix,					
	10.0		SC: Yellowish brown, clayey sand, fine to med grained, little inorganic clay, iron-oxidized. SP: Yellowish brown, poorly graded sand, fine medium-grained, trace coarse sand to fine	ium to					
-58.7	18.0		gravel-sized quartz in layer at 16.9-17.2', sligh iron-oxidation, loose, subangular. <u>SP</u> : Yellowish brown, poorly graded sand,	t					
-59.7			medium to coarse -grained, trace fine to coars gravel-sized quartz, loose, subangular.	е					
-60.6	20.0-		<b>SP-SC</b> : Stong brown, poorly graded sand with clay, fine to medium -grained, few inorganic cl iron-oxidized, loose, subangular.	ay,					
-61.7			-grained, some inorganic clay, clean sand in burrows, loose/soft, bioturbated.						
			BOTTOM OF BOREHOLE AT 21.0 ft SOILS ARE FIELD VISUALLY CLASSIFIED	IN					
			ACCORDANCE WITH THE UNIFIED SOI CLASSIFICATION SYSTEM	L					
						<u> </u>			

Mobile District Geotechnical Section SAW FORM 1836-A (VIBRACORE BORING) JUNE 2016



					Borir	ng Des	signation	DIC-BU-0	94
DRI	LLING L	OG	DIVISION South Atlantic Division		bile Dis	ı strict			SHEET 1 OF 2 SHEETS
1. PROJECT Dauphin Island Causeway Beneficial Use					9. COORDINATE SYSTEM HORIZONTAL VERTICAL State Plane - AL West NAD83 NAVD 88				
Mobile	e County,	Alaba	ama	10. SIZE AND TYPE OF BIT3 Sample Barrel					
2. HOLE N DIC-B	1	LOCATION COORDINATES N 241751 E 1802590.32	11. MANUFACTURER'S DESIGNATION OF DRILL Athena Technologies Vibracore System						
3. DRILLIN Athen	Ionies	2	12. TC	OTAL SAN	<b>IPLES</b>	DISTU	RBED 1		
4. NAME C	logice	<u> </u>	13. TC	TAL NUN	MBER CO	RE BOXES	· ·	0	
5. DIRECT	an Ring	DEG FROM BEARING	14. EL	EVATION		D WATER S	ee Remarks	3	
		VERTICAL	15. DA OF BC	ORING	GROUP	STARTED 4/6/22 @ 0858	COM 8 hrs. 4/6/	PLETED /22 @ 0902 hrs.	
6. THICKN	IESS OF OVE	ERBUR	RDEN	16. EL	EVATION		BORING -2	29.1' NAVD	88
7. DEPTH		TO RO		18. SI	GNATURI			DR	
8. TOTAL					J. WIC	ker, Ge	Signation DIC-BU-04           SHEET         1           OF         2           West         HORIZONTAL           West         NAD83           INAD83         NAVD 88           BIT3 Sample Barrel         DESIGNATION OF DRILL           Degies Vibracore System         0           DRE BOXES         UNDISTURBED           ND WATER         See Remarks           STARTED         COMPLETED           4/6/22 @ 0858 hrs.         4/6/22 @ 0902 hrs.           F BORING         29.1' NAVD 88           WERY FOR BORING         81%           TILE OF INSPECTOR         eologist           *         (Driling time, water loss, depth of weathering, etc., if significant)           9         NOTE 1: Ocean Bottom elevation is referenced to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation = -0.4 feet NAVD 88. <b>LAE CLASSIFICATION</b> NOTE: Soils are Visually Lab Classified in Accordance with ASTM-D2487. Percent Passing #200 Sieve and Percent Shell are Determined in Accordance with ASTM-D6913.		
ELEV (NAVD 88) a	(feet) b	c	(Description)		% CORE REC e	BOX OR SAMPLE # f	(Drillin wea	ng time, water loss athering, etc., if sigi q	, depth of nificant)
		$\leq$	0.0' TO -29.1' WATER				NOTE 1: Ocear	n Bottom eleva	ation is referenced
		$\leq$					Spectra Precisi	on SP80 GNS	S system
		$\leq$					-0.4 feet NAVD	88.	
20.1	0.0		OCEAN BOTTOM AT -29.1' NAVD 8	38		-	VIBRACORE B	ORING	
-29.1			<u>SM</u> : Dark gray, sity sand, medium -grained, loose.				Ran: 20.0' Rec:	: 16.1'	
-30.6		•	<b>SP</b> : Dark grayish brown, poorly graded sand,		Core Run				
	2.0	. • 1	medium -grained, loose.		Recovery				
-31.9					80.5%		LAI	B CLASSIFIC	ATION
-32.9			<u>CH</u> : Dark grayish brown, fat clay, soft, trace medium sand in burrows, color is initially blacł oxidizes quickly to brown.	c and					
-33.2 -33.4	4.0		<b>SP</b> : Light gray, poorly graded sand, medium	l			NOTE: Soils are Accordance with	Visually Lab ( ASTM-D2487	Classified in 7. Percent Passing
<u>-33.6</u> -34.0			<b>Wd</b> : Dark brown, sandy organic soil, loose, un	it	-		#200 Sieve and Accordance with	Percent Shell ASTM-D6913	are Determined in 3.
-34.2 -34.6			SP: Gray, poorly graded sand, fine -grained,						
			loose. <b>Wd</b> : Dark brown, sandy organic soil, loose, un	it					
-35.5			consists of wood fragments. CH: Dark gravish brown, fat clay, soft, few		-				
			medium sand in matrix and burrows.						
			-grained, loose, trace clay in burrows.						
	8.0		<u>CH</u> : Dark gray, sandy fat clay, soft, trace medi sand in burrows, color is initially dark and oxid	um izes					
			quicкiy to brown. <u>SC</u> : Dark olive gray, clayey sand, medium						
-38.6			-grained, loose, little clay in burrows and lense	es.					
-00.0			SP: Light olive gray, poorly graded sand, med	ium					
			enses.	anu					
	12.0—								
-41.7			(Continued on next sheet)						
	D	rafted	By: J. Wicker		1	I	Reviewed Bv: A	. Freeze	
		ate Dr	rafted: 4/15/2022				Date Checked: 4	/19/2022	
Geotechnica	al Section	A () //					VERSION: F		

SAW FORM 1836-A (VIBRACORE BORING) JUNE 2016

				Borir	ng Des	ignatic	n DIC-BU-	-04
DRILL	ING LOG (C	Cont Sheet)	INSTAL Mob	LATION	strict		SHEET 2 OF 2 SHEETS	
PROJECT	L'in Lebend Cou	David Salah Has	COORD	INATE	HORIZONTAL	VERTICAL		
Daupi		Iseway Beneficial Use	State Plane - AL West NAD83 NAV					
LOCATIO	NCOORDINATES		ELEVAI	FION TO	OP OF BU	RING		
N 241	751 E 18025	590.32	-29.	1'	1			
ELEV (NAVD 88) a	DEPTH (feet) b c	FIELD CLASSIFICATION OF MATERIALS (Description) d	9	% CORE REC e	BOX OR SAMPLE # f	L	REMARKS (Drilling time, water lo weathering, etc., if s	S iss, depth of ignificant)
-45.2	14.0	SP: Light yellowish brown, poorly graded sar medium -grained, medium dense, trace silt in burrows and lenses. BOTTOM OF BOREHOLE AT 20.0 ft SOILS ARE FIELD VISUALLY CLASSIFIE ACCORDANCE WITH THE UNIFIED SO CLASSIFICATION SYSTEM	ED IN DIL					
		I	I					


		Bori	ng Des	Signation DIC-BU-05
DRILLING LOG	South Atlantic Division	Mobile Di	strict	SHEET 1 OF 2 SHEETS
1. PROJECT Dauphin Island Cau Mobile County Alal	useway Beneficial Use	9. COORDINA State Plai	TE SYSTE ne - AL	M HORIZONTAL VERTICAL West NAD83 NAVD 88
		10. SIZE AND	TYPE OF	BIT3 Sample Barrel
2. HOLE NUMBER DIC-BU-05	N 242229.62 E 1802186.18	11. MANUFAC	ECHNOIC	DESIGNATION OF DRILL ogies Vibracore System
3. DRILLING AGENCY	29	12. TOTAL SAI	MPLES	
4. NAME OF DRILLER Palmer McClellan		13. TOTAL NU	MBER CC	RE BOXES
5 DIRECTION OF BORING		4. ELEVATIO	N GROUN	D WATER See Remarks
	VERTICAL	15. DATE TIME OF BORING	GROUP	STARTED         COMPLETED           4/6/22 @ 1059 hrs.         4/6/22 @ 1103 hrs.
6. THICKNESS OF OVERBL	JRDEN	16. ELEVATIO	N TOP OF	BORING -42.6' NAVD 88
7. DEPTH DRILLED INTO R	оск	17. TOTAL CO	RE RECO	VERY FOR BORING 75%
8. TOTAL DEPTH OF BORIN	NG 23.0'	- 18. SIGNATUR	cker. G	eologist
ELEV DEPTH LEGEND	FIELD CLASSIFICATION OF MATERIALS	% CORE	BOX OR	REMARKS
(NAVD 88) (feet) c	(Description) d	REC	SAMPLE #	(Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0' TO -42.6' WATER			NOTE 1: Ocean Bottom elevation is referenced to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation = 0.0 feet NAVD 88.
-42.6 0.0	OCEAN BOTTOM AT -42.6' NAVD & <u>CH</u> : Grayish brown, fat clay, soft, water satura firms slightly downcore (still soft), color is initia black/dark gray and rapidly oxidizes to brown, saturated.	88 ated, ally	-	VIBRACORE BORING From: 0.0' to 23.0' Ran: 23.0' Rec: 17.2'
		Core Run	1	
2.0		23.0		
		74.8%	2	
				LAB CLASSIFICATION
				NOTE: Soils are Visually Lab Classified in
				Accordance with ASTM-D2487. Percent Passing #200 Sieve and Percent Shell are Determined in
				Accordance with ASTM-D6913.
6.0				
80				
10.0				
Drafte	ed By: J. Wicker			Reviewed By: A. Freeze
Date I	Drafted: 4/15/2022			Date Checked: 4/19/2022
Geotechnical Section				

					<u>Borii</u>	ng Des	<u>signatio</u>	<u>n DIC-B</u>	<u>U-05</u>	5
DRILL	ING L	OG (C	Cont Sheet)			l etrict				SHEET 2
PROJECT			·	COOR	DINATE	SYSTEM		HORIZONTA	L	VERTICAL
Daupł	nin Islar	nd Cau	iseway Beneficial Use	Sta	ite Plar	ne - AL	West	NAD83		NAVD 88
LOCATIO	N COORE	INATES		ELEVA	ATION TO	DP OF BO	RING		<u> </u> :	
N 242	22 <u>9.62</u>	E 18	02186.18	-42	.6'					
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f		REMAI (Drilling time, wate weathering, etc. g	RKS er loss, d , if signifi	lepth of icant)
-56.2 -56.6 -56.8 -57.2 -57.4 -58.7 -58.9 -59.8			SP: Very light brown, poorly graded sand, fine medium -grained, loose, trace clay in burrows lenses. SC: Reddish brown, clayey sand, medium grained, loose, little clay in matrix, iron-oxidize OH: Dark brown, organic clay, firm, wood & ro fragments in matrix. CH: Reddish brown, organic clay, firm, wood & ro fragments in matrix. CH: Reddish brown, fat clay, firm, iron-oxidize SW: Light yellowish brown, well graded sand, medium to coarse -grained, loose, little fine gr gravel. BOTTOM OF BOREHOLE AT 23.0 ft SOILS ARE FIELD VISUALLY CLASSIFIEE ACCORDANCE WITH THE UNIFIED SOI CLASSIFICATION SYSTEM	to and ed. ot d. ained						
Mobile Dist	L									ſ



			Bori	ng Des	signation	DIC-BU-0	06
DRILLING LOG	South Atlantic Div	vision	Mobile D	N istrict			SHEET 1 OF 2 SHEETS
1. PROJECT Dauphin Island Cause Mobile County, Alaba	eway Beneficial Use		9. COORDINA State Pla	TE SYSTE ne - AL	West	RIZONTAL NAD83	VERTICAL NAVD 88
			10. SIZE AND	TYPE OF	BIT3 Sample Bar	rel	
2. HOLE NUMBER LO	N 241496.04 E 1802	2361.09	Athena T	echnolo	gies Vibracore	system	
3. DRILLING AGENCY Athena Technologies			12. TOTAL SA	MPLES	DISTUR	RBED 1	
4. NAME OF DRILLER			13 TOTAL NU	MBER CC	RE BOXES		. 0
Palmer McClellan		•	14. ELEVATIO	N GROUN	ID WATER Se	ee Remark	\$
5. DIRECTION OF BORING	DEG FROM VERTICAL	BEARING	15. DATE TIM OF BORING	E GROUP	STARTED		IPLETED
6. THICKNESS OF OVERBURD	EN EN EN EN EN EN EN EN EN EN EN EN EN E	;	16. ELEVATIO	N TOP OF	+/0/22 @ 0900	5.4' NAVD	88
7. DEPTH DRILLED INTO ROC	К		17. TOTAL CC	RE RECC	VERY FOR BORING	G 87%	
8. TOTAL DEPTH OF BORING	20.0'		18. SIGNATUF J. Wi	RE AND TI cker. G	TLE OF INSPECTO e <b>oloaist</b>	R	
ELEV DEPTH LEGEND	FIELD CLASSIFICATIO	ON OF MATERIALS	% CORE	BOX OR		REMARKS	
(NAVD 88) (feet) a b c	(Descrip d	otion)	REC	SAMPLE #	e (Drillin wea	ng time, water loss thering, etc., if sig g	s, depth of gnificant)
	0.0' TO -15.4	4' WATER			NOTE 1: Ocear to NAVD 88 usi Spectra Precisio onboard the sar -0.3 feet NAVD	n Bottom elev ng verified tic on SP80 GNS mpling vesse 88.	ration is referenced lal data from a SS system I. Tide Elevation =
-15.4 0.0 <b>S</b>	OCEAN BOTTOM A <u>P</u> : Olive brown, poorly gra ledium -grained, loose, tra	<u>T -15.4' NAVD 8</u> aded sand, fine to ace clay in matrix ar	38 nd		VIBRACORE B From: 0.0' to 20 Ran: 20.0' Rec:	<b>ORING</b> 0.0' 17.3'	
	urrow.						
			Core Ru	1			
2.0			20.0				
			86.5%	2			
					LAE	<u> 3 CLASSIFIC</u>	ATION
	C: Dark gravish brown, cl	avev sand, fine					
4.0	grained, loose, little clay in	burrows and matri	X,		NOTE: Soils are	Visually Lab	Classified in
	2.4'.	ase in nequency an			#200 Sieve and	ASTM-D248 Percent Shell	are Determined in
						<u>AGTNI-2001</u>	0.
8.0							
12.0							
Drafted I	By: J. Wicker				Reviewed Bv: A	. Freeze	
Date Dra	fted: 4/15/2022				Date Checked: 4	/19/2022	
Geotechnical Section							

					Borir	ng Des	ignatio	n DIC-BL	J-06
DRILL	ING L	OG (C	ont Sheet)	INSTA		l atriat			SHEET 2
PROJECT	-		•	COOR		SYSTEM		HORIZONTAL	VERTICAL
Daupł	hin Islar	nd Cau	seway Beneficial Use	Sta	to Diar		Most		
LOCATIO	N COORD	INATES		ELEVA	TION TO		RING	: NAD03	
N 241	106 01	E 18	02361.00	_15	<i>/</i> '				
FLEV			FIELD CLASSIFICATION OF MATERIALS	-13	% CORE	BOX OR		REMAR	KS
(NAVD 88) a	(feet) b	c	(Description) d		REC	SAMPLE #		(Drilling time, water weathering, etc., it g	loss, depth of f significant)
-30.0 -30.3 -32.0 -32.7	14.0 14.0 14.0 16.0 18.0 18.0 18.0		SC: Dark grayish brown, clayey sand, fine -grained, loose, little clay in burrows and matri sand-infilled burrows increase in frequency aff 12.4. CH: Dark gray, fat clay, stiff, little fine quartz s in matrix and burrows. CH: Reddish brown, fat clay, stiff, little fine quarts sand in matrix and burrows, slight iron-oxidation present. SP-SC: Light reddish brown, poorly graded sa with clay, fine to medium -grained, loose, few in matrix. BOTTOM OF BOREHOLE AT 20.0 ft SOILS ARE FIELD VISUALLY CLASSIFIED ACCORDANCE WITH THE UNIFIED SOI CLASSIFICATION SYSTEM	x, er and fartz on nd clay f	e CORE e	SAMPLE #		(Drilling time, water weathering, etc., if g	Tops, depth of f significant)
						<u> </u>			



		1 <b>-</b> · · ·				Borii	ng Des	signatior	n DIC-	BD-(	
DRI			sion outh Atlantic Div	vision		bile Di	strict				SHEET 1
1. PROJEC	ct nin Island Ca	useway E	Beneficial Use		9. CO Sta	ordinat ate Plar	re syste ne - AL	West	HORIZONT	AL 33	VERTICAL NAVD 88
					10. SI	ZE AND 1	TYPE OF I	BIT3 Sample	e Barrel		
2. HOLE N	UMBER 3 <b>U-07</b>	N 242	2396.19 E 180	2531.6	Athena Technologies Vibracore System						
3. DRILLIN	NG AGENCY a Technologi	es			12.10	DTAL SAN	MPLES		ISTURBED		
4. NAME C	OF DRILLER				13. TC	TAL NU	MBER CO	RE BOXES		:	
	ION OF BORING			BEARING	- 14. EL	EVATIO	N GROUN	D WATER	See Re	marks	6
	RTICAL		VERTICAL		15. DA OF BC	ATE TIME DRING	GROUP	started 4/6/22 @	1158 hrs.	сом 4/6	PLETED /22 @ 0002 hrs.
6. THICKN	ESS OF OVERB	JRDEN	F	F	16. EL	EVATION	N TOP OF	BORING	-39.5' N	ÁVD	88
7. DEPTH	DRILLED INTO F	OCK			17. TC	DTAL CO	RE RECO	VERY FOR B	ORING 879	%	
8. TOTAL	DEPTH OF BORI	NG 23.0'			– 18. SI	GNATUR	E AND TI cker. Ge	rle of INSP eoloaist	ECTOR		
ELEV	DEPTH LEGEND		FIELD CLASSIFICATI	ON OF MATERIALS	1	% CORE	BOX OR	U	REM	IARKS	denth of
(NAVD 88) a	(feet) b c		(Descri d	ption)		REC e	SAMPLE # f		weathering, e	ater loss tc., if sig a	nificant)
-39.5	0.0	OCE CH: Grav	0.0' TO -39. AN BOTTOM A yish brown, fat cla	5' WATER <u>T -39.5' NAVD</u> y, soft, water satura	88 ated,			NOTE 1: 0 to NAVD 8 Spectra Pl onboard th 0.1 feet N/ <b>VIBRACO</b> From: 0.0'	Dcean Bottor 88 using verif recision SP8 he sampling v AVD 88. <b>RE BORING</b> to 23.0'	n eleva fied tid 0 GNS vessel	ation is referenced al data from a SS system . Tide Elevation =
	2.0	firms slig black/da	ghtly downcore (sti rk gray and rapidly	II soft), color is initi / oxidizes to brown	ally	<u>Core Run</u> 23.0' <u>Recovery</u> 87.4%		Ran: 23.0'	Rec: 20.1'	SIFIC	<u>ATION</u>
	4.0							NOTE: Soil Accordance #200 Sieve Accordance	s are Visuall e with ASTM and Percen e with ASTM	y Lab -D248 t Shell -D6913	Classified in 7. Percent Passing are Determined in 3.
	6.0										
	8.0										
-51.4											
		<u>SP</u> : Very medium burrows,	/ paie prown, poor -grained, loose, tr , trace shell fragme	iy graded sand, ace silt in occasion ents.	nal						
Mobile Distr Geotechnica	Draft Date	ed By: J. Drafted: 4/	Wicker /15/2022			<u> </u>		Reviewed E Date Check VERSION:	<b>3y:</b> A. Freez ad: <b>4/19/202</b> Final	e 2	
SAW FC JUNE 2016	ORM 1836-A (	VIBRAC	ORE BORING)			Boriı	ng Des	signation	DIC-BU-	07	SHEET 1 of 2

				Boriı	ng Des	ignatio	on DIC-BU	-07
DRILL	ING LOG (	Cont Sheet)		bile Di	strict			SHEET 2 OF 2 SHEETS
PROJECT	「 		COOF	RDINATE	SYSTEM		HORIZONTAL	VERTICAL
Daup	hin Island Ca	useway Beneficial Use	Sta	ate Plar	ne - AL	West	NAD83	NAVD 88
LOCATIO	N COORDINATE	S	ELEV	ATION TO	OP OF BO	RING		
N 242	2396.19 E 1	802531.6	-39	9.5'	1			
ELEV (NAVD 88) a	DEPTH (feet) b c	D FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f		REMARKS (Drilling time, water lo weathering, etc., if s g	S oss, depth of significant)
-59.6		SP: Very pale brown, poorly graded sand, medium -grained, loose, trace silt in occasion burrows, trace shell fragments.	D IN DIL					
	rict							



r				Borir	ng Des	signation DIC-BU-08
DRILLING L	_OG	South Atlantic Division	Mo		strict	SHEET 1 OF 2 SHEETS
1. PROJECT Dauphin Island	Causev	vay Beneficial Use	9. COO Sta	DRDINAT	E SYSTE 1 <b>e - AL</b>	M HORIZONTAL VERTICAL West NAD83 NAVD 88
wobile County,	, Alabam		10. SIZ	ZE AND T	YPE OF	BIT3 Sample Barrel
2. HOLE NUMBER DIC-BU-08	LO:	CATION COORDINATES V 242062.74 E 1802546.51	11. MA Ath	NUFACT	URER'S	DESIGNATION OF DRILL ogies Vibracore System
3. DRILLING AGENCY	/ Nonies		12. TO	TAL SAN	1PLES	DISTURBED UNDISTURBED
4. NAME OF DRILLER	२ २		13. TO	TAL NUM	/BER CO	PRE BOXES
Palmer McClel	lan		14. EL	EVATION	GROUN	ID WATER See Remarks
	RING	VERTICAL	15. DA OF BC	TE TIME RING	GROUP	STARTED COMPLETED 4/6/22 @ 0927 hrs. 4/6/22 @ 0931 hrs.
6. THICKNESS OF OV	/ERBURDE	EN .	16. EL	EVATION	I TOP OF	BORING -40.9' NAVD 88
7. DEPTH DRILLED IN	NTO ROCK		17. TO	TAL COF	RE RECO	OVERY FOR BORING 84%
8. TOTAL DEPTH OF	BORING	22.5'	18. SIC	J. Wic	E AND TI ker. Ge	TLE OF INSPECTOR eoloaist
ELEV DEPTH LE	EGEND	FIELD CLASSIFICATION OF MATERIALS		% CORE	BOX OR	REMARKS
(NAVD 88) (feet) a b	с	(Description) d		REC	SAMPLE # f	(Drilling time, water loss, depth of weathering, etc., if significant) g
		0.0' TO -40.9' WATER				NOTE 1: Ocean Bottom elevation is referenced to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation = -0.4 feet NAVD 88.
-40.9 0.0	CH firn bla	OCEAN BOTTOM AT -40.9' NAVD 8 : Grayish brown, fat clay, soft, water satura ns slightly downcore (still soft), color is initia ck/dark gray and rapidly oxidizes to brown.	38 ted, Illy			VIBRACORE BORING From: 0.0' to 22.5' Ran: 22.5' Rec: 19.0'
				Core Run		
2.0				ZZ.5 Recovery		
				84.4%		
						LAB CLASSIFICATION
4.0						NOTE: Soils are Visually Lab Classified in
						#200 Sieve and Percent Shell are Determined in
						Accordance with ASTM-D6913.
6.0						
8.0						
-53.2		Continued on part shect)				
		onunueu on next Sneet)				
	Drafted B	<b>y:</b> J. Wicker				Reviewed By: A. Freeze
	Date Draft	ted: 4/15/2022				Date Checked: 4/19/2022
Geotechnical Section						

	Boring Designation DIC-BU-08								
DRILL	ING L	OG (C	Cont Sheet)		LLATION	l			SHEET 2
PROJECT		•	,	COOR		SYSTEM		HORIZONTAL	VERTICAL
Daupł	nin Islaı	nd Cau	iseway Beneficial Use	Sta	oto Plar		\N/oct	ΝΔΠ83	
LOCATION	N COORE	INATES		ELEVA	ATION TO		RING		
N 242	062.74	E 18	02546.51	-40	.9'				
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d		ss, depth of ignificant)				
(NAVD 88) a -54.4 -55.2 -59.9			(Description) d SW: Reddish gray, well graded sand, medium coarse -grained, loose, sand fraction coarsens downcore, few fine gravel. SP: Light greenish gray, poorly graded sand, medium oraried, loose. SW: Light brownish gray, well graded sand, medium gravel decreasing in frequency down slight iron-oxidation. BOTTOM OF BOREHOLE AT 22.5 ft SOILS ARE FIELD VISUALLY CLASSIFIEL ACCORDANCE WITH THE UNIFIED SO CLASSIFICATION SYSTEM	to S	REC e	SAMPLE #		(Drilling time, water los weathering, etc., if sig g	s, depth of gnificant)
Mobile Distr	rict								



					Borir	ng Des	signation DIC-BU-09
DRII	LLING	LOG	DIVISION South Atlantic Division	INSTA MO		ı strict	SHEET 1 OF 2 SHEETS
1. PROJEC	ot nin Islai	nd Cau	seway Beneficial Use	9. CO Sta	ordinat ate Plar	e syste 1 <b>e - AL</b>	M HORIZONTAL VERTICAL West NAD83 NAVD 88
	Coun	ty, Alac	bama	10. SI	ZE AND T	YPE OF	BIT2.5" Sample Barrel
2. HOLE N DIC-B	UMBER <b>U-09</b>		LOCATION COORDINATES N 239449.4 E 1801884.96	11. M/ Ath	ANUFACT	URER'S	DESIGNATION OF DRILL ogies Vibracore System
3. DRILLIN Athena	ig agen a Tech	ICY Nologie		12. TC	OTAL SAN	<b>IPLES</b>	DISTURBED UNDISTURBED
4. NAME C	OF DRILL	ER		13. TC	TAL NUM	MBER CC	DRE BOXES
5. DIRECT		BORING	DEG FROM BEARING	— 14. EL	EVATION	I GROUN	ID WATER See Remarks
	RTICAL LINED		VERTICAL	15. DA OF BC	ATE TIME DRING	GROUP	STARTED COMPLETED 2/24/22 @ 1214 hrs. 2/24/22 @ 1225 hrs
6. THICKN	IESS OF	OVERBU	RDEN	16. EL	EVATION		BORING -18.1' NAVD 88
7. DEPTH	DRILLED	INTO RO	оск	17. IC	GNATURI		TLE OF INSPECTOR
8. TOTAL I	DEPTH C	OF BORIN	IG 20.0'		Adam	Freeze	e, Geologist
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description)		% CORE REC e	BOX OR SAMPLE # f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
			0.0' TO -18.1' WATER				g NOTE 1: Ocean Bottom elevation is referenced to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation = +0.82 feet NAVD 88.
-18.1	0.0		OCEAN BOTTOM AT -18.1' NAV SC: Very dark grayish brown mottled with or brown, clayey sand, fine -grained, little ino clay, trace wood/plant material, loose, biot	′ <u>D 88</u> olive rganic urbated.			VIBRACORE BORING From: 0.0' to 20.0' Ran: 20.0' Rec: 17.0'
					Core Run 20.0'		
	2.0-				Recovery		
					85.0%		LAB CLASSIFICATION
	_						
	4.0-						Accordance with ASTM-D2487. Percent Passing
	_						#200 Sieve and Percent Shell are Determined in Accordance with ASTM-D6913.
-23.8		<u>/////</u>	OL: Black, organic silt with sand, little fine	quartz	-		
-24.2	6.0	<u> </u>	sand, notable mica.	/	-		
-24.7	_		SP: Olive gray and dark gray, poorly grade sand, fine -grained, trace inorganic clay in	ed	-		
			laminations, trace organic silt in lamination notable mica, loose, subrounded.	ıs,			
			CH: Dark gray and olive gray, fat clay, few	fine			
	8.0		7.9-8.2', 11.3-12.0', 12.5-12.8', 13.7', & 14	.4-14.8'),			
			trace organic material in matrix, high plast	icity, soft.			
	10.0						
	10.0						
	_						
	12 0						
	ĺ	Drafte	<b>d By:</b> Adam Freeze				Reviewed By: Neil Wicker
Mobile Distri	l. ict	Date I	Drafted: 3/7/2022				Date Checked: 3/10/2022
Geotechnica	al Section	<u> </u>					

Boring Designation DIC-BU-09							-09		
DRILL	ING LO	G (C	ont Sheet)			l			SHEET 2
PROJECT	-		<b>·</b>	COOR		SYSTEM		HORIZONTAL	VERTICAL
Daupl	hin Island	d Cau	seway Beneficial Use	Sta	to Plar	۵۱ ـ ۵۱	West		
LOCATIO	N COORDIN	ATES		ELEV	ATION TO		RING		
N 239	9449.4 E	E 1801	1884.96	-18	5.1'				
ELEV (NAVD 88) a	DEPTH LE (feet) b	EGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d	ł	% CORE REC e	BOX OR SAMPLE # f		REMARK (Drilling time, water lo weathering, etc., if g	S oss, depth of significant)
	14.0		<b><u>CH</u></b> : Dark gray and olive gray, fat clay, few fine quartz sand in laminations & layers (notable a 7.9-8.2', 11.3-12.0', 12.5-12.8', 13.7', & 14.4-1 trace organic material in matrix, high plasticity	e t 4.8'), r, soft.					
-33.1			SP: Gravish brown grades to light olive brown						
	16.0 — .	•	poorly graded sand, fine -grained, trace inorga clay in matrix between 16.4-16.8', fine gravel-s shell at 15.2', loose, subrounded.	, anic sized					
-35.1	<mark></mark> .								
	18.0								
	20.0								
			SOILS ARE FIELD VISUALLY CLASSIFIED ACCORDANCE WITH THE UNIFIED SOI CLASSIFICATION SYSTEM	) IN					



		E	Borir	ng Des	Signation DIC-BU-10	
DRILLING LO	G South Atlantic Division	INSTALL Mobi	ATION	strict	SHEET 1 OF 2 SHEE	ETS
1. PROJECT Dauphin Island Ca	auseway Beneficial Use	9. COOR State	DINAT	E SYSTE 1 <b>e - AL</b>	M HORIZONTAL VERTICAL West NAD83 NAVD 88	
Mobile County, Al	abama	10. SIZE	AND T	YPE OF I	BIT2.5" Sample Barrel	
2. HOLE NUMBER DIC-BU-10	LOCATION COORDINATES N 238386.07 E 1801851.96	11. MANU Ather	ufact na Te	URER'S chnolo	DESIGNATION OF DRILL gies Vibracore System	
3. DRILLING AGENCY	nies	12. TOTA	AL SAN	<b>IPLES</b>	DISTURBED UNDISTURBED	
4. NAME OF DRILLER	JIC5	13. TOTA		/BER CO	RE BOXES	
Palmer McClellan			ATION	I GROUN	D WATER See Remarks	
	VERTICAL	15. DATE OF BORI	e time Ing	GROUP	STARTED COMPLETED 2/24/22 @ 1138 hrs. 2/24/22 @ 1400	hrs
6. THICKNESS OF OVER	BURDEN	16. ELEV	ATION	TOP OF	BORING -20.2' NAVD 88	
7. DEPTH DRILLED INTO	ROCK	17. TOTA 18. SIGN			TLE OF INSPECTOR	
8. TOTAL DEPTH OF BOP	RING 26.0'	A	Adam	Freeze	e, Geologist	
ELEV DEPTH LEGEN (NAVD 88) (feet) a b c	ID FIELD CLASSIFICATION OF MATERIALS (Description)	%	CORE REC e	BOX OR SAMPLE # f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
	0.0' TO -20.2' WATER		-		g NOTE 1: Ocean Bottom elevation is reference	ed
					to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation +0.56 feet NAVD 88.	1 =
	OCEAN BOTTOM AT -20.2' NAVI	0 88			VIBRACORE BORING	
-20.2	<b><u>CH</u>: Very dark grayish brown, sandy fat clay</b> fine quartz sand in matrix, medium plasticity	/, little /, soft.			From: 0.0' to 26.0' Ran: 26.0' Rec: 23.7'	
-21.1	SP: Light olive brown and dark gray, poorly					
	<ul> <li>graded sand, fine -grained, trace inorganic burrows, loose, subrounded.</li> </ul>	clay in	ore Run			
-22.4 2.0		Re	ecovery			
	SC: Dark gray mottled with light olive brown clayey sand, fine -grained, some inorganic trace wood/plant material, loose/soft, biotur	, <u> </u>	91.2%		LAB CLASSIFICATION	
4.0					NOTE: Soils are Visually Lab Classified in Accordance with ASTM-D2487 Percent Passi	ina
					#200 Sieve and Percent Shell are Determined Accordance with ASTM-D6913.	i in
-25.7						
<u>-26.0</u> <u>6.0</u>	<b>SP-SC</b> : Gray and dark gray, poorly graded with clay, fine -grained, few inorganic clay,	sand race				
	CH: Dark gray, fat clay, trace fine quartz sa matrix & in hurrow at 6.2' high plasticity so	a. nd in				
-27.6 -	maurix & in burrow at 0.2, high plasticity, so					
-27.8	SP: Olive gray, poorly graded sand, fine -gr	ained, _[				
8.0		/				
-29.0						
	SC: Olive gray and dark gray, clayey sand, -grained, little inorganic clay in burrows, lay laminations, trace wood/plant material, trac	fine ers & e heavy				
-30.2 10.0	minerals, loose/soft.					
	<b><u>CH</u></b> : Dark gray, fat clay, trace fine quartz sa occasional burrows, laminations & layers, tr wood/plant material (notable at 17.7-18'), h plasticity soft	nd in ace gh				
12.0						
Dra Date	fted By: Adam Freeze e Drafted: 3/7/2022	I			Reviewed By: Neil Wicker Date Checked: 3/10/2022	
Mobile District Geotechnical Section					VERSION: Final	

			Borir	ng Des	ignatic	DIC-B	U-10	
DRILLING LOG (C	Cont Sheet)	INSTAI Mo	LLATION	strict			SHEET OF 2 S	2 HEETS
PROJECT		COOR	DINATE	SYSTEM		HORIZONTAL	VERTICAL	
Dauphin Island Cau	useway Beneficial Use	Sta	te Plar	ne - AL V	West	NAD83	NAVD	88
LOCATION COORDINATES		ELEVA		OP OF BOR	RING	•		
N 238386.07 E 18	01851.96	-20	.2'					
ELEV DEPTH LEGEND (NAVD 88) (feet) b c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f		REMAF (Drilling time, wate weathering, etc., g	₹KS r loss, depth of if significant)	
-41.6 -43.0 -43.9 24.0 -43.9 24.0	<b>SP-SC</b> : Olive gray and dark gray, poorly grad sand with clay, fine -grained, few inorganic clamatrix & laminations, trace wood/plant material (notable at 17.7-18'), high plasticity, soft. <b>SP-SC</b> : Olive gray and dark gray, poorly grad sand with clay, fine -grained, few inorganic clamatrix & laminations, trace wood/plant materi notable mica, loose, subrounded, bioturbated <b>SC</b> : Dark gray mottled with olive gray, clayey sand, fine -grained, little inorganic clay, notat mica, loose/soft, bioturbated.         BOTTOM OF BOREHOLE AT 26.0 ft         SOILS ARE FIELD VISUALLY CLASSIFIEL ACCORDANCE WITH THE UNIFIED SC CLASSIFICATION SYSTEM	ed ay in al, I. DIN DIL						



						1	Borir	ng Des	signation DIC-BU-	.11	
DRI	LLING	LOG	DIVIS So	outh Atlantic Div	/ision			ı strict		SHEET 1 OF 2 SHEETS	
1. PROJE Daupi Mobile	ст hin Islai е Соцп	nd Cau	seway B	Beneficial Use		9. COORDINATE SYSTEM HORIZONTAL VERTICAL State Plane - AL West NAD83 NAVD 88					
2. HOLE N			LOCATIO	N COORDINATES		10. SIZE AND TYPE OF BIT2.5" Sample Barrel 11. MANUFACTURER'S DESIGNATION OF DRILL					
DIC-B	8U-11	2	N 237	355.84 E 180	1854.71	Ath	nena Te	chnolo	gies Vibracore System		
3. DRILLIN Athen	a Tech	nologie	s			12.10	JIAL SAN	<b>NPLES</b>		0	
4. NAME (		ER				13. TC	OTAL NUM	MBER CC	RE BOXES	•	
5. DIRECTION OF BORING DEG FROM BEARING									D WATER See Remar	<s< th=""></s<>	
VERTICAL VERTICAL						OF BC			2/23/22 @ 1659 hrs. 2/	0021120 23/22 @ 1615 hrs	
6. THICKN	NESS OF	OVERBU	RDEN			17. TC	DTAL COF	RE RECO	VERY FOR BORING 90%	000	
7. DEPTH						18. SI	GNATUR				
8. TOTAL			G 24.0	FIELD CLASSIFICATI	ON OF MATERIALS			Freeze		;	
(NAVD 88) a	(feet) b	c		(Descri	ption)		% CORE REC e	SAMPLE #	(Drilling time, water lo weathering, etc., if s g	ss, depth of ignificant)	
				0.0' TO -12.	3' WATER				NOTE 1: Ocean Bottom ele to NAVD 88 using verified ti Spectra Precision SP80 GN onboard the sampling vess +1.88 feet NAVD 88.	vation is referenced dal data from a ISS system əl. Tide Elevation =	
-12.3	0.0		OCE/ SC: Dark sand, find sand to fi wood/pla	AN BOTTOM A gray grades to ve e -grained, some ine gravel-sized s int material, loose	T -12.3' NAVD ery dark gray, claye inorganic clay, trac hells in matrix, trac /soft, bioturbated, f	88 ey e fine e ines			VIBRACORE BORING From: 0.0' to 24.0' Ran: 24.0' Rec: 21.7'		
	=		content i	ncreases with dep	Jui.		Core Run				
	2.0						Recovery				
							90.4%		LAB CLASSIFI	CATION	
									NOTE: Soils are Visually Lat	Classified in	
	4.0								Accordance with ASTM-D24 #200 Sieve and Percent She	87. Percent Passing Il are Determined in	
									Accordance with ASTM-D69	13.	
-17.9			CH: Very	dark gray grades	to very dark greer	nish	-				
	6.0		gray, fat in matrix	clay, little grading & in occasional b	to trace fine quartz urrows to 6.5', trace	z sand e					
			wood/pla	nt material, high p	plasticity, soft.						
	_										
	8.0-										
	10.0										
	12.0										
		Drafte Date E	d By: Ad: Drafted: 3/	am Freeze 7/2022					Reviewed By: Neil Wicker Date Checked: 3/10/2022		
Geotechnic	al Section	00 A 4							VERSION: Final		

SAW FORM 1836-A (VIBRACORE BORING) JUNE 2016

					Borir	ng Des	signation	DIC-BU-1	1	
DRILL	ING L	OG (C	ont Sheet)		LLATION	l etrict			SHEET 2	
PROJECT	-	•		COOF		SYSTEM		HORIZONTAL	VERTICAL	
Daupł	hin Isla	nd Cau	seway Beneficial Use	State Plane - AL West NAD83 NAVD 8						
LOCATIO	N COORE	DINATES		ELEVATION TOP OF BORING						
N 237	355.84	E 18	01854.71	-12	.3'	1				
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d	% CORE REC e f			(E	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) a		
-34.0			<b>CH</b> : Very dark gray grades to very dark greeni gray, fat clay, little grading to trace fine quartz in matrix & in occasional burrows to 6.5', trace wood/plant material, high plasticity, soft.	sh sand				Y		
		-								
	24.0		BOTTOM OF BOREHOLE AT 24.0 ft SOILS ARE FIELD VISUALLY CLASSIFIED ACCORDANCE WITH THE UNIFIED SOI CLASSIFICATION SYSTEM							
Mobile Distr	rict									



			1	Borir	ng Des	signation	DIC-BU-	12	
DRI	LLING LOG	South Atlantic Division			ı strict			SHEET 1 OF 2 SHEETS	
1. PROJE	cт hin Island Cause	way Beneficial Use	9. COORDINATE SYSTEM HORIZONTAL VERTICAL State Plane - AL West NAD83 NAVD 88						
			10. SIZE AND TYPE OF BIT3 Sample Barrel						
DIC-B		N 241885.3 E 1802255.19	11. MANUFACTURER'S DESIGNATION OF DRILL Athena Technologies Vibracore System						
Athen	a Technologies		12.10	JIAL SAN	IPLE5		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
4. NAME (	OF DRILLER		13. TC	TAL NUN	MBER CO	RE BOXES		•	
			14. EL	EVATION	I GROUN	D WATER	See Remark	(S	
	RTICAL	VERTICAL	15. DA		GROUP	STARTED	COL		
			16 EI			4/6/22 @ 10	$\frac{131 \text{ nrs.}}{-40.8' \text{ NAV/F}}$	0/22 @ 1034 nrs.	
6. THICKN	NESS OF OVERBURD	EN	17. TC	DTAL COF	RE RECO	VERY FOR BOR	-40.0 NAVE	/ 00	
7. DEPTH	DRILLED INTO ROCK		18. SI	GNATUR	E AND TI	TLE OF INSPEC	TOR		
8. TOTAL	DEPTH OF BORING			J. Wic	ker, Ge	eologist	DEMADIZO		
ELEV (NAVD 88) a	DEPTH LEGEND (feet) b c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f	(D \	REMARKS rilling time, water los weathering, etc., if s g	ss, depth of gnificant)	
10.0	0.0	0.0' TO -40.8' WATER OCEAN BOTTOM AT -40.8' NAVD 3	88			NOTE 1: Oce to NAVD 88 0 Spectra Preconboard the -0.2 feet NAV VIBRACORE	ean Bottom ele using verified ti tision SP80 GN sampling vesse /D 88. EBORING	vation is referenced dal data from a SS system el. Tide Elevation =	
-40.8		<u>H</u> : Brownish gray, fat clay, soft, water satura ms slightly downcore (still soft), color is initia ack/dark gray and rapidly oxidizes to brown	ited, ally	Core Run 23.0' Recovery 83.0%		NOTE: Soils a Accordance w #200 Sieve ar Accordance w	AB CLASSIFIC AB CLASSIFIC ATE Visually Lab ith ASTM-D24 ind Percent She ith ASTM-D69	CATION Classified in 37. Percent Passing II are Determined in 13.	
-51.2	10.0	2: Olive gray, poorly graded sand, medium rained, loose.				Reviewed By:	A. Freeze		
Mobile Distr	Date Drat	fted: 4/15/2022			,	Date Checked VERSION:	: <b>4/19/2022</b> Final		
SAW FC	ORM 1836-A (VIE	RACORE BORING)		Borir	na Des	signation [	DIC-BU-12	SHEET 1 of 2	
JUNE 2016	j .				5	J			

					<u>Borir</u>	n <u>g Des</u>	signatio	n <u>DIC-Bl</u>	J- <u>12</u>
DRILL	ING L	OG (C	Cont Sheet)		LLATION	l strict			SHEET 2
PROJECT		•	,	COOR	DINATE	SYSTEM		HORIZONTAL	VERTICAL
Daupł	hin Islaı	nd Cau	iseway Beneficial Use	Sta	ite Plar	ne - Al	West	NAD83	NAVD 88
LOCATIO	N COORE	DINATES		ELEVA	ATION TO	OP OF BO	RING		
N 241	885.3	E 180	2255.19	-40	.8'				
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f		REMAR (Drilling time, water weathering, etc., i g	KS loss, depth of if significant)
-55.3 -58.0 -58.7 -59.0 -59.9		c	d SP: Olive gray, poorly graded sand, medium -grained, loose. SW: Light olive gray, well graded sand, mediu to coarse -grained, loose, few fine to coarse g red brittle rock fragment at base of unit. SP: Yellowish brown, poorly graded sand, medium -grained, loose. CH: Pale olive, fat clay, medium stiff, trace sat in burrows. SP-SC: Reddish brown, poorly graded sand w clay, fine -grained, loose, few clay in matrix. BOTTOM OF BOREHOLE AT 23.0 ft SOILS ARE FIELD VISUALLY CLASSIFIEE ACCORDANCE WITH THE UNIFIED SO CLASSIFICATION SYSTEM	m ravel,	e	f		g	
	rict								



			5.00			LIN IOT	Borir	ng Des	signation	DIC-BU-	-13
DRI	LLING L	.OG	DIVISI So	uth Atlantic Div	vision			strict			SHEET 1 OF 2 SHEETS
1. PROJE Dauph Mobile	ст nin Island e County	Caus	seway B ama	eneficial Use		9. CO Sta	ORDINAT	TE SYSTE	M West	HORIZONTAL NAD83	VERTICAL NAVD 88
		:				10. SI.					
DIC-B	U-13	,	N 235	834.36 E 180	1753.6	Athena Technologies Vibracie System					
Athen	a Techno	loaie	s			12.10	JIAL SAN	IPLE5	Dis	1	
4. NAME C	OF DRILLER					13. TC	DTAL NUM	MBER CO	RE BOXES		•
		RING			BEARING	14. EL	EVATION	I GROUN	D WATER	See Remar	ks
VERTICAL VERTICAL						15. DA OF BC	ATE TIME DRING	GROUP	STARTED 2/23/22 @	co 1630 hrs. 2/	MPLETED 23/22 @ 1645 hrs
6. THICKN	IESS OF OV	'ERBUF	RDEN			16. EL	EVATION		BORING	-11.4' NAVE	0 88
7. DEPTH	DRILLED IN	ITO RC	CK			17. TC	OTAL COP	RE RECO		RING 88%	
8. TOTAL	DEPTH OF I	BORIN	G 26.0'				Adam	Freeze	e, Geologist	t	
ELEV (NAVD 88) a	DEPTH LE (feet) b	GEND		FIELD CLASSIFICATI (Descri	ON OF MATERIALS ption)		% CORE REC e	BOX OR SAMPLE # f	. (	REMARKS Drilling time, water lo weathering, etc., if s	S ss, depth of ignificant)
			OCE	0.0' TO -11.	4' WATER	88			NOTE 1: Oo to NAVD 88 Spectra Pre onboard the +1.71 feet N	ecan Bottom ele cision SP80 GN sampling vess JAVD 88.	vation is referenced idal data from a ISS system el. Tide Elevation =
-11.4			SC: Dark some ino gravel-siz wood/pla content ir	AN BOTTOM A olive gray, clayey rganic clay, trace zed shells in matri nt material, loose, ncreases with dep	Y sand, fine -graine fine sand to fine ix to 1.0', trace /soft, bioturbated, fi th.	d, ines	Core Run 26.0' Recovery 88.5%	-	VIBRACOR From: 0.0' to Ran: 26.0' F	E BORING o 26.0' Rec: 23.0'	
-15.9	4.0								NOTE: Soils Accordance	LAB CLASSIFI	CATION o Classified in 87. Percent Passing
	6.0  8.0  10.0  12.0 		<u>CH</u> : Very sand in m plasticity,	dark gray, fat cla natrix & in burrow soft.	y, trace fine quartz at 5.0-5.3', high				#200 Sieve a	and Percent She with ASTM-D69	Il are Determined in 13.
Mobile Distr Geotechnica	rict al Section	Date D	rafted: 3/7	7/2022					Date Checke VERSION:	d: 3/10/2022 Final	

					<u>Borir</u>	n <u>g Des</u>	ignatic	on <u>DIC-BU</u>	-1 <u>3</u>
DRILL	ING L	OG (C	Cont Sheet)	INSTA MC	LLATION	i strict			SHEET 2 OF 2 SHEETS
PROJECT				COOR	DINATE	SYSTEM	HORIZONTAL	VERTICAL	
Daupi	nin Islar	nd Cau	seway Beneficial Use	Sta	te Plar	ne - AL	West	NAD83	NAVD 88
LOCATIO		INAIES	~	ELEVA	ATION IC	)h nf rni	RING		
N 235	834.30		01753.6	-11	.4'			REMARK	۹
ELEV (NAVD 88) a	(feet) b	C C	(Description)		% CORE REC e	BOX OK SAMPLE # f		(Drilling time, water lo weathering, etc., if g	oss, depth of significant)
-34.4			<b><u>CH</u></b> : Very dark gray, fat clay, trace fine quartz sand in matrix & in burrow at 5.0-5.3', high plasticity, soft.						
	24.0								
			BOTTOM OF BOREHULE AT 26.0 tt SOILS ARE FIELD VISUALLY CLASSIFIED ACCORDANCE WITH THE UNIFIED SO CLASSIFICATION SYSTEM	) IN IL					
Mobile Distr Geotechnic	rict cal Section					·			





					Borir	ng Des	signation DIC-BU-14
DRIL	LING LC	G	DIVISION South Atlantic Division			ı strict	SHEET 1 OF 2 SHEETS
1. PROJEC Dauph Mobile	on Island C		way Beneficial Use	9. CO Sta	ordinat ate Plar	e syste ne - AL	M HORIZONTAL VERTICAL West NAD83 NAVD 88
				10. SI	ZE AND T	YPE OF	BIT2.5" Sample Barrel
DIC-B	UMBER <b>U-14</b>	1	V 235144.95 E 1801079.9	Ath	nena Te	echnolo	begies Vibracore System
3. DRILLIN Athena	IG AGENCY a <b>Technol</b> c	gies		12. TC	OTAL SAN	<b>IPLES</b>	DISTURBED UNDISTURBED
4. NAME O	F DRILLER	n		13. TC	OTAL NUM	MBER CC	DRE BOXES
5. DIRECTI	ION OF BORI	NG	DEG FROM BEARING	- 14. EL			ND WATER See Remarks
	LINED		VERTICAL	OF BC			2/23/22 @ 1417 hrs.: 2/23/22 @ 1720 hrs
6. THICKNI	ESS OF OVEI	RBURDE	N	10. EL			- BORING -44.0 NAVD 80
7. DEPTH I	DRILLED INT	) ROCK		- 18. SI	GNATUR		TLE OF INSPECTOR
8. TOTAL E	DEPTH OF BC	RING	26.0'		Adam	Freeze	e, Geologist
ELEV (NAVD 88) a	DEPTH LEGE (feet) b c	END	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		<<<<<<<<<<<<><<<><<<><<<><<<<><<<><<	0.0' TO -44.6' WATER				NOTE 1: Ocean Bottom elevation is referenced to NAVD 88 using verified tidal data from a Spectra Precision SP80 GNSS system onboard the sampling vessel. Tide Elevation = +1.55 feet NAVD 88.
-44.6	0.0	CH ma gra	OCEAN BOTTOM AT -44.6' NAVE : Olive gray, fat clay, trace wood/plant terial, low grading to medium plasticity, v ading to soft.	<u>) 88</u> very soft		-	VIBRACORE BORING From: 0.0' to 26.0' Ran: 26.0' Rec: 13.5'
					Core Run		
	2.0—				26.0'		
					Recovery 51.9%		
							LAB CLASSIFICATION
	4.0						NOTE: Soils are Visually Lab Classified in Accordance with ASTM-D2487. Percent Passing
							#200 Sieve and Percent Shell are Determined in Accordance with ASTM-D6913.
	6.0						
	8.0						
-53 7							
	_	SP	: Gray grades to pale brown, poorly grad	ed			
	10.0	fin	e gravel-sized quartz in matrix & layers, f	ine			
		gre					
	12.0						
	Dr	afted B	<b>y:</b> Adam Freeze		•	•	Reviewed By: Neil Wicker
	Da	te Draf	ted: 3/7/2022				Date Checked: 3/10/2022
Geotechnica	Section				Dard		

				Boring Designation DIC-BU-14							
DRILL	ING L	OG (C	ont Sheet)	INSTA Mo	LLATION	strict			SHEET 2 OF 2 SHEETS		
PROJECT	-			COOF	DINATE	SYSTEM		HORIZONTAL	VERTICAL		
Daupl	hin Islaı	nd Cau	seway Beneficial Use	Sta	te Plar	ne - Al	West				
LOCATIO	N COORE	INATES		ELEVA							
N 235	5144.95	E 180	01079.9	-44	.6'						
ELEV (NAVD 88) a	DEPTH (feet) b	LEGEND c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f	4	REMARKS (Drilling time, water los weathering, etc., if s a	ss, depth of ignificant)		
-58.1	_	• • •						9			
							(13.5-) Ma	ade 5 coring attem	ots: sediment		
	14.0						comprised	d of water-saturate	d clay with very		
							sand at th	le base; the meas	ured recovery		
	_						during the 14.2'; last	e 5 coring attempts core retained for	s varied from 7.8' to processing.		
									C C		
	16.0										
	18.0										
	20.0										
	22.0										
	_										
	24.0										
	_										
	26.0		BOTTOM OF BOREHOLE AT 26.0 ft								
			SOILS ARE FIELD VISUALLY CLASSIFIED ACCORDANCE WITH THE UNIFIED SO CLASSIFICATION SYSTEM	) in Il							
Mobile Distr Geotechnic	rict al Section										



				Borir	ng Des	signation	DIC-BU-	-15	
DRIL	LING LOG	South Atlantic Division			i strict			SHEET 1 OF 2 SHEETS	
1. PROJEC Dauph Mobile	on Island Cause County Alabar	way Beneficial Use ma	9. COORDINATE SYSTEM HORIZONTAL VERTICAL State Plane - AL West NAD83 NAVD 88						
			10. SIZE AND TYPE OF BITS SAMPLE BARREL						
DIC-B	U-15	N 242603.66 E 1802240.79	Ath	nena Te	echnolo	gies Vibracor	e System		
3. DRILLIN Athena	a Technologies		12.10	JIAL SAN	<b>NPLES</b>	DIST	JRBED 1		
4. NAME O	F DRILLER		13. TC	DTAL NUM	MBER CO	REBOXES		•	
5. <u>DIRECT</u>	ION OF BORING	DEG FROM BEARING	- 14. EL	EVATION		D WATER	See Remar	ks	
	LINED	VERTICAL	15. DA	ATE TIME DRING	GROUP	STARTED 4/6/22 @ 113	CO 3 hrs. 4/	MPLETED 6/22 @ 1137 hrs.	
6. THICKNI	ESS OF OVERBURD	EN	10. EL		RE RECO		41.4 NAVL NG 87%	0 00	
7. DEPTH I	DRILLED INTO ROCI	K	18. SI	GNATUR	E AND TI	TLE OF INSPECT	OR		
8. TOTAL E	DEPTH OF BORING	23.0'		J. Wic	ker, Ge	eologist	DEMADK	<u>`</u>	
ELEV (NAVD 88) a	DEPTH LEGEND (feet) b c	FIELD CLASSIFICATION OF MATERIALS (Description) d		% CORE REC e	BOX OR SAMPLE # f	(Dril we	REMARKS ling time, water lo eathering, etc., if s g	ss, depth of ignificant)	
		0.0' TO -41.4' WATER				NOTE 1: Ocea to NAVD 88 us Spectra Precis onboard the sa -0.1 feet NAVE	an Bottom ele sing verified t sion SP80 GN ampling vess 0 88.	vation is referenced idal data from a ISS system el. Tide Elevation =	
-41.4		OCEAN BOTTOM AT -41.4' NAVD & <u>H</u> : Brownish gray, fat clay, soft, water satura ms slightly downcore (still soft), color is initia ack/dark gray and rapidly oxidizes to brown.	<u>88</u> ited, ally			VIBRACORE I From: 0.0' to 2 Ran: 23.0' Rec	<u>30RING</u> '3.0' 5: 20.0'		
				Core Run 23 0'					
	2.0			Recovery					
				87.0%				CATION	
								<u>ornon</u>	
	4.0					NOTE: Soils are Accordance wit	e Visually Lat h ASTM-D24	o Classified in 87. Percent Passing	
						#200 Sieve and Accordance wit	l Percent She h ASTM-D69	ell are Determined in 13.	
	6.0								
	8.0								
	10.0								
-52.1				-					
		ay, medium -grained, loose, few clay in mat	rix.						
-53.3									
	12.0	Continued on next sheet)							
	Drafted E	<b>By:</b> J. Wicker		1	1	Reviewed Bv:	A. Freeze		
	Date Dra	fted: 4/15/2022				Date Checked:	4/19/2022		
Mobile Distri Geotechnica	ct I Section					VERSION:	Final		
SAW FO	RM 1836-A (VIE	BRACORE BORING)		Borir	ng Des	signation D	IC-BU-15	SHEET 1 of 2	

					Borir	ng Des	signation	DIC-BU-	15
DRILL	ING L	OG (C	cont Sheet)		LLATION hile Die	l strict			SHEET 2
PROJECT	-	•		COOF	DINATE	SYSTEM		HORIZONTAL	VERTICAL
Daupł	hin Isla	nd Cau	seway Beneficial Use	Sta	te Plar		West	ΝΔΠ83	
LOCATION	N COORE	DINATES		ELEV	ATION TO	DP OF BO	RING	INAD00	
N 242	603.66	E 18	02240.79	-41.4'					
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS		% CORE	BOX OR		REMARKS	
(NAVD 88) a	(feet) b	с	(Description) d		REC e	SAMPLE # f		weathering, etc., if si	gnificant)
-59.0 -59.6 -60.0 -60.6 -61.4			d         SP: Yellowish brown, poorly graded sand, medium to coarse -grained, loose, trace fine gravel. trace silt in lenses and burrows, sand g size is variable throughout unit in packages, s iron-oxidation.         SW: Reddish brown, well graded sand, coarse -grained, loose, trace clay in matrix, iron-oxidi         SC: Yellowish brown, clayey sand, medium -grained, loose, little clay in matrix and burrow slight iron-oxidation.         SC: Olive brown, clayey sand, fine -grained, interbedded fat clay and fine sand.         SC: Olive gray, clayey sand, fine -grained, little clay in matrix.         BOTTOM OF BOREHOLE AT 23.0 ft         SOILS ARE FIELD VISUALLY CLASSIFIED ACCORDANCE WITH THE UNIFIED SOICLASSIFICATION SYSTEM	grain light	e	f		g	
		<u> </u>	I		<u> </u>	<u> </u>			



Checked By: J.Fancher



Checked By: J.Fancher






























## MHSPT/CPT-XX-19 Borings

							<u>Bori</u>	ng [	Designatio	<u>n MHSF</u>	PT/CPT-01	-19		_
DF	RILLIN	IG L	.OG	DIVISION South Atlantic Div	/ision	INSTALI Mob	_ATIO	_N arbo	r AL		SHEET OF 3	г 3 SH	1 eets	,
1. PROJ	ECT		Dania -			9. COOF	RDINA	TE S	STEM	HORIZON				1
	ne Har	por	Borings	•	-	10. SIZE	AND	- Alab TYPE	OF BIT 4	.25" HSA				1
2. HOLE		R		DCATION COORDINATES		11. MAN			R'S DESIGNAT	ION OF DRILL				1
3. DRILL	ING AG	ENCY	1-19			12. TOT	2-750 AL SA	) MPLE	S	DISTURBED	UNDIST	JRBE	)	-
Corp	s of E	ngin	eers - C	CESAS						53		0		
4. NAME	Bower	man			-	13. TOT		JMBE	R CORE BOXES	<u> </u>				-
	CTION O ERTICAL	F BO	RING	DEG FROM VERTICAL	BEARING	14. ELE 15. DAT		n Gr Ring	STAF	See Re RTED 8/21/20	COMPLETE	D 3/20		1
6. THICK	(NESS C	DF OV	ERBURD	: EN >80'	:	16. ELE	VATIO	N TO	: P OF BORING	-16.6'	. 0/20	5/20		1
7. DEPT	H DRILL	ED IN	ITO ROCI	<		17. TOT	AL CO	DRE R	ECOVERY FOR		'A			]
8. TOTA	L DEPTI	H OF	BORING	80'		18. SIGN	Jose	RE AN San	tiago, Geolo	SPECTOR D <b>gist</b>				
ELEV	DEPTH	GEND		FIELD CLASSIFICATION (		% REC	tmp No.	åD %		REMARKS		llows/ 0.5 ft	-Value	1
		[™]	<ul> <li>SILTY</li> </ul>	SAND (SM), dark gray, po	orly graded, fine to	27	ഗ് S1	2	USCS			0 0	Ż 0	ŧ
	_	0 0		n granioa, saturatea, sollie	, ont.	47	S2					0	0	ŧ
-19.9	- 3.3 - -		SILTY	SAND (SP-SM), dark gray	, poorly graded, fine to		S3	-			-	0 0 0	0	ŧ
	- 		•	n graineu, saturateu, rew s		67	S4				-	0	0	Ē
	-		0			67	S5				-	0 0 0 0	0	Ē
	-		o 0			100	S6				-	0 0 0	0	Ē
	- 		<b>o</b>			67	S7				-	0 0 0	0	F
	-		o o			80	S8				-	0 0 0	0	ŧ
	-		•			80	S9				-	0 0 1	0	ŧ
	-		•			87	S10	-			-	1 1 0	2	Ē
-32.6	- <u>16.0</u>		POOR	Y GRADED SAND (SP)	light gray poorly	73	S11				-	0	1	F
-55.5	- - -	3 0	, \graded SILTY	, fine to medium grained, s SAND (SM), dark grav, po	saturated. orly graded, fine to	87	S12				-	1 1 1	2	Ē
	-	0 0 0	<u>Fine to</u>	n grained, saturated, some coarse grained.	e silt.	87	S13					4 4 5	9	Ē
		0 0 0	wood.	yraded, nne to medium gra	ameu, iew siit, trace	87	S14					1 1 1	2	F
	-	0 0	20% in	terbedded with dark gray S	SM	0	S15				-	1 1 1	2	Ē
	-	0 0				0	S16					3 3 3	6	ŧ
	_  _	0 0	4			53	S17				-	3 3 4	7	ŧ
	-	000				33	S18					3 4 6	10	ŧ
	-	0	}			33	S19					3 6 10	16	ŧ
	-	0 0				53	S20					5 11 16	27	ŧ
	-	0 0	Mediun	n to coarse grained.		87	S21				-	3 12 14	26	ŧ
-49.3	- - 32.7 -	•   •		Y GRADED SAND (SP)	light gray poorly	87	S22				-	4 7 7	14	ŧ
	-		graded	, fine to medium grained, s	saturated.	87	S23				-	3 8 9	17	ŧ
		• 1										1		

MHSPT/CPT-012HEGET 1 of 3

					Bori	ng l	Designation	MHSPT/C	<u>CPT-01-19</u>	_	
DRI	LLING	LO	G (Cont Sheet)	INSTALI Mob	LATIO ile H	N arbo	or AL		SHEET 2 OF 3 SHEE	TS	
PROJE	СТ			COORD	INATE	E SYS	TEM	HORIZONTAL	VERTICAL		
Mot	bile Har	bor I	Borings	State	e Pla	ine		NAD83	MLLW		
LOCAT	ION COO	RDIN	ATES	ELEVAI		0 40	FBORING				
		9		-16.6	<b>5</b> 9				t s/	ne	
ELEV	DEPTH	LEGE	(Description)	REC	Samp I	RQD %		REMARKS	Blow 0.51	N-Val	
	-	•	Fine to coarse grained. POORLY GRADED SAND (SP), light gray, poorly	53	S24				3 4	7	3
	E	<ul> <li>POORLY GRADED SAND (SP), light gray, poorly graded, fine to medium grained, saturated. (continent of the second strate of</li></ul>	53	S25				3 7 12	19		
		•	Interbedded sand strata or lenses, 20% interbedded wit dark grav SM.	th 60	S26				5 7 12	19	
				87	S27				4 7 1	17 E	4
		•••		80	S28	-			10 6 10 2	21	
		•		97	\$20	-			11 2 2		
				07	329	-			4 0	<u> </u>	
		•••	Light yellowish, Clay seam around 0.05 ft of thickness.	. 87	S30	-			2 5	7	4
		•••		100	S31				7 9	16	
	-	•	Medium to coarse grained. Fine grained.	73	S32				3 2 5	7 E	
	Ē	•	Gray, Clay seam around 0.10 ft of thickness	73	S33				1 3	8	
	-	•		73	S34	1			5 1 2	6	5
	Ę			100	625	-			4		
	E	•		100	535	-			9 3		
	Ę			100	S36				3 4	7	
		•••		73	S37				25	7	5
	F	•		87	S38				1 3 4	7 E	
	Ē			0	S39	1			6 13 22	35	
	E	•		100	S40	1			5 12 5	37	
	F	• •		73	S/1	-			25 0	16	6
			Light yellowish, Clay seam around 0.05 ft of thickness.		041	-			10 7		
	-	••		0	S42	-			15 21 6	36	
	Ē	• •	Fine grained.	40	S43				11 15	26	
	-		Gray, Clay seam around 0.10 ft of thickness	100	S44				6 12 20	32	6
	Ę			20	S45	]			9 15 10	34	
	E	* *		73	S46	1			9 11 2	27	
	F	*		22	547	-			16 3 2		
	Ē				0+1	-			7	Ť	7
	F			53	S48	-			3 6 7	9	
	E			13	S49				7 1	17	
	-	•		100	S50				6 6	12	_
	F			80	S51				6 9 10	28	1
-93.9	77.3	• •		100	S52				7		

SAS FORM 1836-A FEB 08

DRII	LING	1.00	G (Cont Sheet)	INSTAL		N.		SHEET	. 3	3	
				Mob	ile H	arbo	or AL	OF 3	SH	EETS	
PROJE	СТ			COORD	INATE	E SYS	TEM : HORIZONTAL :	VERTIC	CAL		
Mob	ile Har	bor E	Borings	State	e Pla	ne	NAD83	М	LLW		
LOCAT	ION COO	RDIN/	ATES	ELEVAT	ION T	OP O	FBORING				
				-16.0	5'						
ELEV	LEV DEPTH		FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS		Blows/ 0.5 ft	N-Value	
	CLAY (CH), dark gray,	CLAY (CH), dark gray, wet, high plasticity. (continued)				Sample S-52 was split into two jars (S	3-52	6		E	
-96.6	CLAY (CH), dark gray, wet, high plast			100	S53		A: 93.2-94.0 and S-52 B: 94.0-94.7).	-	1 2 5 7	7	
	BOTTOM OF BOREHOLE AT 80.0	BOTTOM OF BOREHOLE AT 80.0 ft								- 00	
			Notes: 1. Soils visually field classified in accordance with the Unified Soil Classification System.								

2. N-Value: Total blows over last 1.0 foot of 1.5-foot driven interval, unless otherwise indicated, using a 1 3/8-inch ID splitspoon with 140-pound hammer falling

3. The CME-750 drilling rig utilizes an automatic trip

 Undisturbed sampling with 3" by 30" Shelby tube, mechanically pushed with CME-750.
 Component Percentages: Trace: 0 to 5%, Few: 5 to 10%, Little: 15 to 25%, Some 30 to 45%, With 50 to

6. MLLW was calculated from measuring barge deck to mud line, then subtracting barge deck to water and

closest observation station tide reading.

30 inches.

hammer.

100%.

**Boring Designation** 

MHSPT/CPT-01-19

						E	<u> Bori</u>	ng [	Designation MHSPT/CPT-	02-19	
D	RILLIN	IG L	.OG	DIVISION South Atlantic Divisio	on	NSTALL Mobi	ATIO	N arbo	r AL	IEET 1 3 SHF	ETS
1. PRO	JECT		<b>.</b> .		9	D. COOF		TESY	(STEM HORIZONTAL VEI	RTICAL	
Mob	oile Har	bor	Borings		1	State I	-lane	- Alab TYPF	OF BIT 4 25" HSA	WILLW	
2. HOLE	E NUMBE	R	LC	CATION COORDINATES	1	11. MAN	UFAC	TURE	R'S DESIGNATION OF DRILL		
			2-19	N 240669.457 E 1802	185.982	CME	-750	) MPIF		ISTURRED	
Cor	ps of E	ngin	eers - C	ESAS		.2. 101	12 OA		47	3	
4. NAM	E OF DRI Bower	LLER			1	13. TOT	AL NU	IMBEF	R CORE BOXES 0		
5. DIRE	CTION O	F BO	RING	DEG FROM BE	EARING	14. ELE\	/ATIO	N GR	OUND WATER See Remarks	TED	
	NCLINED				1	15. DATI			8/26/20 8	B/27/20	
6. THIC	KNESS C		ERBURDI	EN >80'	1	17. TOT		RER	ECOVERY FOR BORING N/A		
1. DEP					1	18. SIGN	IATUF		D TITLE OF INSPECTOR		
8. 101/				80.			ose i	San	liago, Geologist		ē
ELEV	DEPTH	LEGEN		FIELD CLASSIFICATION OF M (Description)	MATERIALS	% REC	Samp N	RQD %	REMARKS	Blows 0.5 ft	N-Valu
	_	3 0	SILTY S	GAND (SM), dark gray, fine to ad, little silt, trace organics.	medium grained,	0	S1		USCS	0 0 0	0
	Ē	0				27	S2			0	0
-16.3	4.0	0				87	S3			0	3
- 10.4	- ^{4.1}	••	shells, t	race clay strata or lenses.	Diasticity, Tew	93	S4			2	8
	E		POORL	Y GRADED SAND (SP), dark grained, saturated. few silt. t	c gray, fine to race shells.					4	Ē
	F			<b>.</b> ,, .		100	S5			1 2 0	3
	- - -		Some v	vood.		87	S6			0	0
	-  -  -		.			80	S7			0	0
	-  -  -	•	.			93	S8			0	0
	-					80	S9			0 0 0	0
	_		.			80	S10			0 0 0	0
	-	•				53	S11			0 0 0	0
	-					93	S12			0	1
	- - -		:			33	S13			0	0
	- - -		.			73	S14			1 0 1	1
-33.9	_ 21.6 _		CLAY (	CH), dark brown, wet, high pla	asticity, little wood.	100	S15		Sample #15 was divided into three jars: S15A 21.0 to 21.6; S15B 21.6 to 22.3;	0	2
	-								S15C 22.3 to 22.5.		Ē
	-					63	U16				
	-					33	S17			1	2
						40	S18			0	0
	-  -  -					40	S19			0	2
	  -					-					-+
						93	U20				F
	F										Ē
	F					100	S21			0	٥Ę
	<u> </u>									0	

Boring Designation

MHSPT/CPT-022HE99T 1 of 3

					Bori	ng l	Designation MHS	SPT/CPT	-02-19		
DRI	ILLING LOG (Cont Sheet) ECT obile Harbor Borings TION COORDINATES	G (Cont Sheet)	Mob	ile H	n arbc	or AL	(	DF 3 SHE	ETS		
PROJE	CT		Denin me	COORD	INATE	E SYS	TEM HORIZO	NTAL	/ERTICAL		
				State	e Pla			D83	MLLW		
N 2/	10660	A57	E 1802185 082	_12 '	22'	01 0					
112	+0003.	2	FIELD CLASSIFICATION OF MATERIALS	-12.	<u>ģ</u>				tt tt	lue	
ELEV	DEPTH	LEGE	(Description)	REC	Samp	RQD %	REMARKS		Blov 0.5	N-Va	25
	_	N COORDINATES         1669.457       E 1802185.982         PEPTH       Image: State of the state of	CLAY (CH), dark brown, wet, high plasticity, little wood (continued)	100	S22				0	0	30
	-			100	S23				0	0	
										Ē	
-52.2	- - 39.9			73	U24					F	
	-		POORLY GRADED SAND (SP), light gray, poorly graded, fine to medium grained, saturated.			-			2	[	40
	(Description) (Description) (CLAY (CH), dark brown, wet, high plasticity, I (continued) POORLY GRADED SAND (SP), light gray, pr graded, fine to medium grained, saturated. Light orange, fine to medium grained. Light orange, fine to medium grained. SILTY SAND (SM), gray, fine grained, Silty si about 0.2 ft of thickness 51.0 Gray, fine grained, Silty sand seam about 0.2 thickness CLAY (CH), dark gray, high plasticity. 53.5 SILTY SAND (SM), dark gray, fine grained. SILTY SAND (SM), dark gray, fine grained.		47	S25	-			2 3	5		
			33	S26				3	8		
			73	S27				2 2	9		
	-	LING LOG (Cont Sheet)         It         le Harbor Borings         DN COORDINATES         0669.457       E 1802185.982         DEPTH       Image: Stress of the stress of the		60	S28				5	22	- 45
			Light orange, fine to medium grained.	60	620	-			13 4	16	
-60.3	48.0		SILTY SAND (SM) gray fine grained Silty sand seam		529	-			8	10	
		0	about 0.2 ft of thickness.	87	S30				7 12	19	
-63.3	- 51.0	٥ ٥	Grav fine grained Silty sand seam about 0.2 ft of	93	S31				3	6	- 50
	_	NG LOG (Cont Sheet)         Harbor Borings         COORDINATES         i69.457       E 1802185.982         PTH       Image: Coordinate Strength (Description)         CLAY (CH), dark brown, wet, high plasticity, litt (continued)         9.9       POORLY GRADED SAND (SP), light gray, poor graded, fine to medium grained.         Image: I	thickness.		S32	1	Sample 33 was divided into S33A 52.5 to 53.5 ft.; S33	o three jars: B 53.5 to 53	.8 0	0	
-65.8	- 53 5		CLAY (CH), dark gray, nign plasticity.	100	533	1	ft.; S33C 53.8 to 54.0 ft.		0	13	
	_	3 0	SILTY SAND (SM), dark gray, fine grained.			-			12 2		
-67.8	55.5	VG LOG (Cont Sheet)         tarbor Borings         COCRDINATES         19.457 E 1802185.982         TTH         Image: State of the state of th		87	\$34	-			4 7 5	11	- 55
		ING LOG (Cont Sheet) Harbor Borings COORDINATES 369.457 E 1802185.982 EPTH  CLAY (CH), dark brown, wet, high plasticity, li CLAY (CH), dark brown, wet, high plasticity, li CLAY (CH), dark brown, wet, high plasticity, li CLAY (CH), dark brown, wet, high plasticity, li Light orange, fine to medium grained, saturated.  Light orange, fine to medium grained, saturated.  Light orange, fine to medium grained, saturated.  Light orange, fine to medium grained.  SILTY SAND (SM), gray, fine grained, Silty se about 0.2 ft of thickness  CLAY (CH), dark gray, high plasticity.  S5.5  POORLY GRADED SAND (SP), light gray, fir medium grained.  POORLY GRADED SAND (SP), light gray, fir medium grained.  POORLY GRADED SAND (SP), light gray, fir	medium grained.	47	S35				6 11	17	
	-			67	S36				2 2 5	7	
	-			67	S37				4 6	14	
	-	•••		60	538	1			8 4 5	11	· 60
	_					-			6 0	<u> </u>	
	-			67	S39	-			2 4	6	
				47	S40				6 12	18	
	  -			80	S41				1 2 1	6	- 65
				53	S42	1			3 6	17	
	-			7	542	-			11 3 5		
	-  -				043	-			9		
	  -			20	S44	-				2	· 70
				40	S45				7 14	21	
	Ē			40	S46				1 5	14	
				73	S47	1			9 3 7	20	
	-	[•.		50	0.40	-			13 3		- 75
	-	•••		53	548	-			12 4	19	
	le Harbor Borings         State Plane         NAD83         MLLW           3R COORDINATES         ELEVATION TO PEORING         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33'''         -12.33''''         -12.33''''         -12.33''''         -12.33''''										

Boring Designation MHSPT/CPT-022HE9T 2 of 3

			Bori	ng D	Designation	MHSPT/C	PT-02-19	
DRILLING LO	G (Cont Sheet)	INSTALL		N	r A I		SHEET	3
PROJECT		COORD		E SYST	r AL	HORIZONTAL	VERTICAL	HEETS
Mobile Harbor	Borings	Chat						<i>,,</i>
LOCATION COORDIN	ATES	ELEVAT	E PIA	DP OF	E BORING	NAD83	: MLL	//
N 240660 457	F 1000105 000	10	201					
N 240009.457	E 1602165.962	-12.3	<u>ه</u>					e
ELEV DEPTH	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp N	RQD %	R	EMARKS	Blows 0 5 ft	N-Valu
- •	POORLY GRADED SAND (SP), light gray, fine to						6	_
		55	S50				5 17	22
92.3 80.0	BOTTOM OF BOREHOLE AT 80.0 ft Notes: 1. Solis visually field classified in accordance with the Unified Soil Classification System. 2. N-Value: Total blows over last 1.0 foot of 1.5-foot driven interval, unless otherwise indicated, using a 1 3/8-inch ID splitspoon with 140-pound hammer falling 30 inches. 3. The CME-750 drilling rig utilizes an automatic trip hammer. 4. Undisturbed sampling with 3" by 30" Shelby tube, mechanically pushed with CME-750. 5. Component Percentages: Trace: 0 to 5%, Few: 5 t 10%, Little: 15 to 25%, Some 30 to 45%, With 50 to 100%. 6. MLLW was calculated from measuring barge deck mud line, then subtracting barge deck to water and closest observation station tide reading.	o to						

80

							Bori	ng I	Designatio	on MHSF	PT/CPT-03-	19		_
D	RILLIN	IG L	OG	DIVISION South Atlantic D	ivision	INSTAL Moh	LATIO ile H	N arbo	r AL		SHEET	2 SH	1 EETS	
1. PRO	JECT					9. COO	RDINA	TE S	/STEM	HORIZONT			<u></u> ,	1
Mob	ile Har	bor E	Borings			State	Plane	- Alab	OF BIT		33 <u> </u> M	LLVV		-
2. HOLE	E NUMBE	R	LO	CATION COORDINATES		11. MAN	IUFAC	TURE	R'S DESIGNA	TION OF DRILL				1
MH	SPT/CF	PT-03	8-19 <u>∶</u> №	N 240965.364 E 1	801917.381		E-750							4
Cor	ps of E	ngine	ers - C	ESAS		12. 101	AL SA	AWPLE	:5	29		2	J	
4. NAM		LLER				13. TOT	AL NU	JMBER	R CORE BOXE	s 0	•			-
JOE 5. DIRE		man	RING	DEG FROM	BEARING	14. ELE	VATIO	N GR		R See Rei	marks			
	/ERTICAL	_		VERTICAL		15. DAT	EBOF	RING	STA	RTED 8/28/20	COMPLETE 8/28	D 3/20		
6. THIC	KNESS C	of ove	ERBURDE	EN >49.5'		16. ELE				-29.54'	/ ^			-
7. DEP	TH DRILL	ED IN	TO ROCK			17. TOT 18. SIGI			D TITLE OF IN	SPECTOR	A			1
8. TOT/	AL DEPTI	H OF E	BORING	49.5'		,	Jose	San	tiago, Geol	ogist				1
ELEV	DEPTH	LEGEND		FIELD CLASSIFICATION (Description	I OF MATERIALS	% REC	Samp No.	RQD %		REMARKS		Blows/ 0.5 ft	N-Value	
	-		SILTY S saturate	SAND (SM), dark gray, fi ed, some silt.	ne to medium grained,	33	S1		USCS			0 0 0	0	Ē
						93	S2	1			-	0 0 0 0	0	Ē
	E	000				100	S3				-	0 0 0	0	Ē
-35.0	5.5		CLAY ((	CH), dark grav dark brov	vn. high plasticity som	93 e	S4				-	0 0 2	2	F
			wood, fe	ew fine sand, organic od	or.	100	S5				-	0 0 1	1	Ē
						100	S6				-	0 0 0	0	ŧ
	-					80	U7							
						100	S8				-	0 0 0	0	Ē
						100	S9				-	0 0 0	0	Ē
	- - - -					93	U10							
						100	S11				-	0 0	0	Ē
-49.7	<u>20.2</u>	// ·	POORL	Y GRADED SAND (SP)	, light gray, fine to	100	S12	]			-	0 0 1	1	F
			medium	grained.		100	S13				-	2 2 5	7	F
			Pale ora	ange.		73	S14					1 3 4	7	ŧ
						100	S15				-	3 3 5	8	ŧ
						100	S16				-	2 5 7	12	ŧ
						100	S17				-	4 6 8	14	ŧ
						67	S18				-	1 3 5	8	Ē
						73	S19				-	4 7 9	16	ŧ
	-  -					87	S20				-	5 8 11	19	ŧ
	-  -		Medium	to coarse grained, little	fine gravel.	80	S21				-	0 8 8	16	ŧ
	L	1 -					1	1	I			2		

MHSPT/CPT-03HE9T 1 of 2

					Bo	ori	ng [	Designation MHSPT/CF	PT-03-19	
DRI			G (Cont Sheet)	INST		TIOI	Ν.		SHEET 2	7
				M	bile		arbo		OF 2 SHEET	s
Mak	ula Uar	harl	Poringo				515		VERTICAL	
	пе пап		Solings	St	ate F	Pla	ne	NAD83	MLLW	
LOCAT	ION COO	RDIN	ATES	ELEV	ΑΤΙΟΙ	ΝT	OP O	FBORING		
N 24	40965.3	364	E 1801917.381	-29	9.54	•				
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	R		Samp No.	RQD %	REMARKS	Blows/ 0.5 ft N-Value	
	_	•	No fine gravel.	g	3 S	22			3 7	F 35
			medium grained. (continued)	7	3 S	523			0 2 5 7	
		•		7	3 S	624			3 9 13	F
	-	•		g	3 S	25			7 10 9	40
				ç	3 S	526			4 6 8	ŧ
	- - -	•••		8	0 S	27			8 9 2	È.
	- -			7	3 S	28			6 14	45
	- - -	•		7	3 S	29			3 5	
	-  -  -			e	7 S	30			$     \begin{array}{c}       11 \\       20 \\       25 \\       \hline       5     \end{array}     $	ŀ
70 5	- -	•••		7	3 S	31			5 5 13	ļ
-79.5	50.0									1

BOTTOM OF BOREHOLE AT 49.5 ft

## Notes:

 Soils visually field classified in accordance with the Unified Soil Classification System.
 N-Value: Total blows over last 1.0 foot of 1.5-foot driven interval, unless otherwise indicated, using a 1 3/8-inch ID splitspoon with 140-pound hammer falling 30 inches.

3. The CME-750 drilling rig utilizes an automatic trip hammer.

4. Undisturbed sampling with 3" by 30" Shelby tube, mechanically pushed with CME-750.

5. Component Percentages: Trace: 0 to 5%, Few: 5 to 10%, Little: 15 to 25%, Some 30 to 45%, With 50 to 100%.

6. MLLW was calculated from measuring barge deck to mud line, then subtracting barge deck to water and closest observation station tide reading.

DRILLING LOG         Division         INSTRUCT         Selfert 1 (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c							E	Bori	ng [	Designatio	n MHSP	T/CPT-04-19		_
IPPOED         COORDINATE SYSTEM         HOREDATIAL         MARK ALL           MAbile Hattor Borings         Subtraction Version Coordinates         IN Data Mark All Lines         IN	DF	RILLIN	IG L	OG	DIVISION South Atlantic Division		INSTALL Mobi	атю <b>Ie H</b>	N arbo	r AL		SHEET	1 HEFTS	
MODIE Hamor Borings         Sole Hamor National Well         NAUBAS         MLLW           2 HOLE MURRER         LOCATION COORDINATES         10.842/874.044.131         E.180.2293.853         11. MARUFACTURERS DESIGNATION OF DRULL           MURSPRICE/T-0719         IN 21014.131         E.180.2293.853         Child - 750         IORTURERS DESIGNATION OF DRULL           MURSPRICE/T-0719         IN 21014.131         E.180.2293.853         Child - 750         IORTURERS DESIGNATION OF DRULL           MURSPRICE/T-0719         IN 21014.131         E.180.2293.853         Child - 750         IORTURES         IORTURES           JORETION OF BORING         IDEG FROM INCLINE         IS IOTAL NUMBER CORE DORES         0         IORTURE MIRES         IORTURE MIRES           JORETION OF BORING         IDEG FROM INCLINE         IS IOTAL DEPTH OFE BORING         IOR SERVICE MIRES	1. PROJ	ECT					9. COOF		TE S	/STEM	HORIZONT	AL VERTICAL	<u></u>	1
2 HOLE NUMBER         LICONTON COORDINATES         IT AMUSER USERS DESIGNATION OF ORL           MHSPT/CPL-01-151         N241014.131         E 180228.853         CME-750         DISTURBED         UNDBTURBED           3.0RLILER         Job Bowman         IS. 1071A. UNMER CORE DOUSS         ID         ID         See Remarks           0.00E CONTROL         DEC FROM         IELENTION GONON WATES         See Remarks         ID           10.00E Bowman         IELENTION GONON WATES         See Remarks         ID         ID         ID           10.00E Bowman         IELENTION GONON WATES         See Remarks         ID	Mob	ile Har	rbor E	Borings		-	State I	-lane AND	- Alab TYPF	OF BIT /	<u>:</u> NAD8 25" HSA	ວ _: MLL	vv	-
MH3PH ICP1 ICP1 04-19:         N241014.131         E 1802293.853         CME_750         UNDISTURBED         UNDISTURBED           Some of Engineers - CESAS         13.107ALNUMEER COME BOXES         0         1         1           Maximum of Engineers - CESAS         13.107ALNUMEER COME BOXES         0         1           Some of Engineers - CESAS         13.107ALNUMEER COME BOXES         0         1           Some of Engineers - CESAS         14.124X100 GROUND WATER         See Remarks         1           Some of Engineers - CESAS         15.017E BOXID WATER         See Remarks         1           Some of Comparison of Porticity Boxids         14.124X100 GROUND WATER         See Remarks         1           MISSING COMPARED NO ROCK         17.171AL COME RECOVER VOR BOXING         N/A         1         1           A TOTAL DEPTH OF DORING         >80'         10.000 KITE OF NOREONE         N/A         1         1           A TOTAL COMP RECOVER DORING IN/A TOP OF COMING         N/A         10.110 OF NYEERDS         10.110 OF NYEERDS         10.110 OF NYEERDS         10.110 OF NYEERDS           A TOTAL COMP RECOVER DORING IN/A TOP OF COMING         13.511         13.51         13.51         10.51         10.51           A TOTAL COMP RECOVER DORING IN/A TOP OF COMING IN/A TOP OF OF COMING         13.51         13.5	2. HOLE	NUMBE	R	LC	OCATION COORDINATES		11. MAN	UFAC	TURE	R'S DESIGNAT	ON OF DRILL			1
Corps of Engineers - CESAS         Interview         State         <			PT-04	4-19 <u>:</u>	N 241014.131 E 1802293.8	853	CME	-750	) .MPI F	S			FD	-
4. MAME OF DRULER       13. TOTAL INVERER CORE BOXES       0         5. DIFFERENCE       IELEVITION OF DORMA       IELEVITION OF DORMA       10. TOTAL INVERER CORE BOXES       0         6. DIFFERENCE       IELEVITION OF DORMA       IELEVITION OF DORMA       30. If       ICOMPLETED         INCLUENCE       INCLUENCE       ISTATUED       ISTATUED       ISTATUED       ISTATUED         0. THCKNESS OF OVERBURDEN       >80°       IS. ELEVITION OF DORMA       3. If       ISTATUED       ISTATUED         7. DEPTIN BRILED INTO ROCK       IS. ELEVITOR FOR DORMA       80°       ISTATUSE PAND TOTE DORMARS       31 ff         8. TOTAL LOPPEN DE RORMS       80°       ISTATUSE PAND TOTE DORMARS       31 ff       ISSATUSE         8. TOTAL LOPPEN DE RORMS       80°       90°       ISTATUSE PAND TOTE DORMARS       31 ff       ISSATUSE         9. OPOORLY OF RORMA       80°       91       ISSATUSE       100 SI       100 ISTA       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	Corp	s of E	ngine	eers - C	ESAS		12. 101	12 OA		.~	51	1		
BALE LEVATION CROUND         DEC FPOM         EEARNG         14. ELEVATION CROUND WATER         See Remarks           WRTK2L	4. NAME	OF DR	ILLER man				13. TOT	AL NU	JMBER	R CORE BOXES	0			4
IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG         IDENT BORNG <thident borng<="" th=""> <thident borng<="" th=""></thident></thident>	5. DIREC		DF BOF	RING	DEG FROM BEARIN	IG -	14. ELE\	/ATIO	N GR	OUND WATER	See Ren			-
B. THICKESS OF OVERBUNDEN         >80'         THE LEVATION TO PO'E BURKING         9.1           7. DEPTH DRULLE NOT ROCX         17. TOTAL CEPTH OF BORNING         NA           8. TOTAL DEPTH OF BORNING         80'           9. TOTAL DEPTH OF BORNING         80'           9. TOTAL DEPTH OF BORNING         80'           9. TOTAL DEPTH OF BORNING         80'           9. TOTAL DEPTH OF BORNING         80'           9. TOTAL DEPTH OF BORNING ROOK         13           9. TOTAL DEPTH OF BORNING ROOK         100           9. TOTAL DEPTH OF BORNING ROOK <t< td=""><td></td><td></td><td>)</td><td></td><td>VERTICAL</td><td></td><td>15. DATI</td><td>EBOF</td><td>RING</td><td>STAR</td><td>8/29/20</td><td>8/31/20</td><td>)</td><td></td></t<>			)		VERTICAL		15. DATI	EBOF	RING	STAR	8/29/20	8/31/20	)	
Cherry Derive Decretion         Bit of La Service AND TITLE of Neprector         Normalize Service AND TITLE of Neprector           8 TOTAL DEPTH of BorRise         80'         Jose Service AND TITLE of Neprector         Jose Service AND TITLE of Neprector           ELEV         DEPTH of BorRise         80'         Jose Service AND TITLE of Neprector         Service AND TITLE of Neprector           ELEV         DEPTH of BorRise         80'         Jose Service AND TITLE of Neprector         Service AND TITLE of Neprector           Image: Service AND CLAY (CL), very dark gray, medium plasticity, trace wood         13         Still         USCS         0         0           -17.8         8.2         SANDY CLAY (CL), very dark gray, medium plasticity, trace wood         100         Still         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	6. THICH	KNESS (	DF OV	ERBURDI	EN >80'		16. ELE				-9.1'	۸		-
B. IOLA BEPTH         B.         FIELD CLASSIFICATION OF MATERIALS (Description)         V. MEC         B.         Description         Description         V. MEC         B.         Description         Description <thdes< td=""><td>7. DEPT</td><td>H DRILL</td><td>ED IN</td><td></td><td></td><td></td><td>18. SIGN</td><td></td><td></td><td>D TITLE OF INS</td><td>PECTOR</td><td>7</td><td></td><td></td></thdes<>	7. DEPT	H DRILL	ED IN				18. SIGN			D TITLE OF INS	PECTOR	7		
ELEV         DEPTH         33         FELD CLASSIFICATION OF MATERILS (Description) $n^{6}_{10}$ $\frac{6}{2}$ $\frac{6}{2}$ REMARKS $\frac{8}{2}$ $\frac{6}{2}$ $6$	8. TOTA	L DEPT		BORING	80'			ose ं	San	tiago, Geolo	gist		Ð	-
POORLY GRADED SAND (SP), pale brown, fine to medium graned, saturated.         13         S1         USCS         0         2         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         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         0	ELEV	DEPTH	EGEN		FIELD CLASSIFICATION OF MATE (Description)	RIALS	% REC	amp N	åD %		REMARKS	3lows	-Valu	
Image in medium grained, saturated.         IS			<u>-</u>	POORL	Y GRADED SAND (SP), pale brow	vn, fine to	40	ů C		USCS		0		+
47       52         40       53         53       54         53       54         53       55         60       56         47       57         100       58         100       59         100       511         100       511         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1         11       1		-		medium	n grained, saturated.		13	51	-			0		ŧ
40       53         41       53         53       54         53       55         60       56         61       56         62       60         63       56         64       56         65       56         67       57         100       58         100       58         100       510         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       511         100       515 <t< td=""><td></td><td>-</td><td></td><td></td><td></td><td></td><td>47</td><td>S2</td><td></td><td></td><td></td><td>0</td><td>0</td><td>F</td></t<>		-					47	S2				0	0	F
17.3       8.2       53       S4         53       S4       53       S5         53       S5       60       S6         54       7       7       7         8.2       5ANDY CLAY (CL), very dark gray, medium plasticity, ittle sand.       60       S6         100       S8       100       S8         100       S10       100       S10        25.0       15.9       100       S11         100       S10       100       S11         100       S11       100       100		- -	[•]				40	S3				0	0	F
-17.3       8.2       SANDY CLAY (CL), very dark gray, medium plasticity, title sand.       53       S5         -17.3       8.2       SANDY CLAY (CL), very dark gray, medium plasticity, title sand.       47       S7         100       S8       100       S8       0       0         100       S9       100       S10       0       0         -25.0       15.9       SILTY SAND (SM), very dark gray, fine to medium grained.       100       S11         -25.0       15.9       SILTY SAND (SM), very dark gray, fine to medium grained.       100       S11         -24.3       25.2       S1       0       0       0         -34.3       25.2       0       CLAY (CH), pale gray, wet, high plasticity, trace wood.       73       S18         67       S19       0       0       0       0       0         -42.5       33.4       0       POORLY GRADED SAND (SP), light gray, fine to medium grained.       100       S21       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 </td <td></td> <td>_</td> <td>•••</td> <td></td> <td></td> <td></td> <td>53</td> <td>S4</td> <td></td> <td></td> <td></td> <td>0</td> <td>1</td> <td>╄</td>		_	•••				53	S4				0	1	╄
-17.3       8.2       •       •       •       0       0         -17.3       8.2       •       •       •       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       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       0       0       0       0       0       0       0       0       0		-							-			1 0		£
-17.3       8.2       •       SANDY CLAY (CL), very dark gray, medium plasticity,       60       86         47       S7       100       S8         100       S8       100       S9         100       S1       100       S1         100       S10       100       S11         100       S11       100       S11         100       S12       100       S11         100       S11       100       S12         100       S14       80       S15         80       S16       100       S17         100       S11       100       S11         100       S14       80       S16         100       S17       100       100         100       S17       100       100         100       S11       100       100         100       S11       100		_					53	S5				0	0	F
-25.0       15.9       Ittle sand.       47       \$7         100       \$8         100       \$8         100       \$9         100       \$11         100       \$11         100       \$11         100       \$11         100       \$11         100       \$11         100       \$11         100       \$12         100       \$11         100       \$12         100       \$11         100       \$12         100       \$11         100       \$12         100       \$11         100       \$12         100       \$14         80       \$15         80       \$16         100       \$17         100       \$17         100       \$17         100       \$16         100       \$17         100       \$17         100       \$17         100       \$10         100       \$11         100       \$10         100       \$21         100       <	-17.3	- 8.2 -	//	SANDY	CLAY (CL), very dark gray, mediu	m plasticity,	60	S6				0	1	F
-25.0       15.9         15.9       SILTY SAND (SM), very dark gray, fine to medium         100       S10         100       S10         100       S10         100       S10         100       S10         100       S11         100       S12         100       S11         100       S12         100       S11         100       S12         100       S14         80       S15         80       S16         100       S17         100       S21         100       S21         100       S21         100       S21		- -		little sar	nd.		47	S7	1			0	0	ŧ,
-25.0       15.9       SILTY SAND (SM), very dark gray, fine to medium       100       S11         100       S10       100       S11         100       S11       100       S12         100       S11       100       S12         100       S11       100       S12         100       S11       100       S12         100       S14       80       S15         80       S16       0       0         100       S17       0       0         CLAY (CH), pale gray, wet, high plasticity, trace wood.       73       S18         67       S19       0       0         0       0       0       0         43       26.2       33.4       POORLY GRADED SAND (SP), light gray, fine to medium grained.       0		-					100	00				0		+ '
-25.0       15.9       100       S10       100       S10         -25.0       15.9       SILTY SAND (SM), very dark gray, fine to medium grained.       100       S11       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       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       0       0       0       0       0       0		-		]			100	58	-			0	0	Ł
-25.0       15.9       100       \$10       \$11         100       \$11       100       \$11         100       \$11       100       \$11         100       \$12       100       \$12         100       \$12       100       \$12         100       \$12       100       \$12         100       \$12       100       \$12         100       \$14       100       \$12         100       \$14       100       \$14         100       \$14       100       \$14         100       \$14       100       \$14         100       \$14       100       \$14         100       \$14       100       \$14         100       \$14       100       \$14         100       \$16       10       \$16         100       \$16       100       \$17         100       \$16       100       \$17         100       \$16       100       \$17         100       \$19       100       \$21         100       \$21       100       \$21         100       \$21       \$100       \$21 <t< td=""><td></td><td>-</td><td></td><td></td><td></td><td></td><td>100</td><td>S9</td><td></td><td></td><td></td><td>0</td><td>0</td><td>F</td></t<>		-					100	S9				0	0	F
-25.0       15.9       100       S11         grained.       100       S12         87       S13         100       S14         80       S15         80       S16         -34.3       -25.2         CLAY (CH), pale gray, wet, high plasticity, trace wood.       73         S18       67         67       S19         -42.5       -33.4         •       POORLY GRADED SAND (SP), light gray, fine to medium grained.		_					100	S10	1			0	0	Ē
100       100       S11         grained.       100       S12         87       S13         100       S14         80       S15         80       S15         80       S16         0       0         0       0         100       S17         100       S16         100       S17         100       S21         100       S21         100       S21         100       S21         100       S21	-25.0	_ - 15 9					100	011	-			0		<u></u> † 1
-34.3       -25.2       -3       -3       CLAY (CH), pale gray, wet, high plasticity, trace wood.       73       518       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       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       0       0       0       0       0       0       0       0       0       0       0       0		_	3	SILTY S	SAND (SM), very dark gray, fine to	medium	100	311	-			1		ŧ
87       \$13         100       \$14         100       \$14         100       \$14         80       \$15         80       \$16         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$17         100       \$19         100       \$21         100       \$21         100       \$21         100       \$21         100       \$21         100       \$22		_	0	graineu			100	S12				0	0	F
-34.3       -25.2       -34.3       -25.2       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3 <td< td=""><td></td><td>-</td><td>0</td><td>4</td><td></td><td></td><td>87</td><td>S13</td><td></td><td></td><td></td><td>0</td><td>2</td><td>F</td></td<>		-	0	4			87	S13				0	2	F
-34.3       -25.2       -34.3       -25.2       -34.3       -34.3       -25.2       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3       -34.3 <td< td=""><td></td><td>-</td><td>0</td><td>]</td><td></td><td></td><td>100</td><td>S14</td><td></td><td></td><td></td><td>1 0 0</td><td>1</td><td>† 2</td></td<>		-	0	]			100	S14				1 0 0	1	† 2
-34.3       -25.2       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       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       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0			0	]				014	-			0 1 0		ŧ
-34.3       -25.2       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       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       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0		-	0				80	S15				0	0	F
-34.3       -25.2       0       100       S17         -34.3       -25.2       0       0       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       2       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3 <td></td> <td>-</td> <td>0</td> <td>•</td> <td></td> <td></td> <td>80</td> <td>S16</td> <td></td> <td></td> <td></td> <td>0</td> <td>0</td> <td>F</td>		-	0	•			80	S16				0	0	F
42.5       33.4         -       POORLY GRADED SAND (SP), light gray, fine to medium grained.	_2/ 2	- - 25.2	<i>•</i>				100	S17				0	2	ŧ.
-42.5       33.4         POORLY GRADED SAND (SP), light gray, fine to medium grained.       100         S21       0         -42.5	-34.3	- 20.2 - -		CLAY (	CH), pale gray, wet, high plasticity,	trace wood.			-			2		$\frac{1}{2}$
-42.5       33.4         -42.5       33.4         -42.5		_					73	S18				0	1	F
-42.5     33.4       -42.5     33.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -42.5     -3.4       -5     -4.4       -7     -4.4       -7     -7.4		-					67	S19				0	0	F
-42.5     33.4       -42.5     33.4       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -42.5       -42.5     -44.5       -42.5     -44.5       -44.5     -44.5       -55.5     -44.5       -7     -44.5       -7     -44.5       -7     -44.5       -7     -44.5       -7     -45.5       -7     -44.5 <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>Ŧ</td>		-							1					Ŧ
-42.5 33.4 -42.5 33.4 POORLY GRADED SAND (SP), light gray, fine to 100 S22 medium grained. 100 S21 100 S22 100 S22		_					83	U20						Ēз
-42.5     33.4     100     S21       -42.5     -33.4     -       -     •     POORLY GRADED SAND (SP), light gray, fine to medium grained.     100     S22		-												F
-42.5         33.4         0         2         2         2         2         4         9         4         9         5         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7         7<		_					100	S21				0	0	F
• medium grained.	-42.5	- 33.4 -	<u>//</u>	POORI	Y GRADED SAND (SP) light grav	, fine to	100	S22	1			2	9	Ŧ
			<u> </u>	medium	n grained.	,						5	Ť	£

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**Boring Designation** 

MHSPT/CPT-04FHF9FT 1 of 3

					Bor	ing	Designation MHSPT/0	<u> CPT-04-19</u>	
DRI	LLING	LO	G (Cont Sheet)		LATIC	N Iarbo	or Al	SHEET 2	
PROJE	СТ			COOR	DINATI	E SYS	TEM HORIZONTAL	VERTICAL	
Mot	oile Har	bor l	Borings	Sta	te Pla	ane	NAD83	MLLW	
LOCAT	ION COO	RDIN	ATES	ELEVA	TION 1	FOP C	DF BORING	-	
N 24	41014.1	131	E 1802293.853	-9.1	•		1		
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% RE	Samp No	RQD %	REMARKS	Blows/ 0.5 ft N-Value	- 35
	L	•	POORLY GRADED SAND (SP), light gray, fine to medium grained. <i>(continued)</i>	10	S23	1		9 23 14	- 33 -
		•		10	S24	_		$\frac{1}{2}$ 6 4	
	E	[•]		80	S25			7 10 7	Ē
	-			67	S26			3 6 10	- 40
	F			60	S27			8 10 10	F
	-			67	S28			3 4 10	- - -
	F	•		53	S29			5 7 17 24	⊢ ⊦
	-			93	S S30			$     \begin{array}{c}       17 \\       10 \\       14 \\       18     \end{array}     $ 32	- 45 - -
	F			53	S31			10 9 24	-  -
				87	⁷ S32			$     \begin{array}{c}       15 \\       11 \\       14 \\       19     \end{array}     $ 33	Ē
	E			60	S33			6 9 22	- 50
	- - -			80	S34			13 6 6 8 14	
	E			80	S35			3 4 9	Ē
	-	•		10	5 536	;		5 5 7 11	- 55
	F			10	0 S37	-		$\frac{2}{3}$ 6	_ _ _
	Ē			67	⁷ S38			<u>3</u> 3 9	
		•		47	S39				Ē
				67	S40			$\frac{5}{12}$ 35	- 60 -
	-	•		13	5 S41			$\frac{3}{3}$ 10	Ē
				67	S42			6 5 5	
	-			47	S43			8 17 18 35	- - 65
	F	*		80	S44			4 6 10	- - -
	F			67	S45			6 11 21 32	- - -
	_			53	S46			8 15 31 46	- - - 70
				7	S47			10 15 0	- - -
	F	••		73	S48			7 11 17 28	F
	- - -	* *		47	S49			4 9 14 23	_ _ _ 
	-			0	S50			7 12 13 25	- 75 - -
	+	<u> </u>		40	S51			7 8 24	Ļ

SAS FORM 1836-A FEB 08

Boring Designation MHSPT/CPT-04HF9T 2 of 3

		Bori	ng [	Designation	MHSPT/C	PT-04-1	9	
DRILLING LOG (Cont Sheet)	INSTAL	LATIO	N	~ A I		SHEET	3	
			arbo SYS	TFM :	HORIZONTAL	UF 3	SHE	EIS
Mobile Harbor Borings								
	Stat		ne		NAD83	MLI	LVV	
N 241014.131 E 1802293.853	-9.1	Ġ						Φ
ELEV DEPTH	% REC	Samp No	RQD %	л 	REMARKS	Blows/	0.5 ft	N-Valu
POORLY GRADED SAND (SP), light gray, fine to     medium grained (continued)						1	6 6	-
	85	S52				1	10 17	27
BOTTOM OF BOREHOLE AT 80.0 ft						2	24	_
<ul> <li>Notes:</li> <li>1. Soils visually field classified in accordance with the Unified Soil Classification System.</li> <li>2. N-Value: Total blows over last 1.0 foot of 1.5-foot driven interval, unless otherwise indicated, using a 1 3/8-inch ID splitspoon with 140-pound hammer falling 30 inches.</li> <li>3. The CME-750 drilling rig utilizes an automatic trip hammer.</li> <li>4. Undisturbed sampling with 3" by 30" Shelby tube, mechanically pushed with CME-750.</li> <li>5. Component Percentages: Trace: 0 to 5%, Few: 5 t 10%, Little: 15 to 25%, Some 30 to 45%, With 50 to 100%.</li> <li>6. MLLW was calculated from measuring barge deck mud line, then subtracting barge deck to water and closest observation station tide reading.</li> </ul>	o to							

80

Projec	t I.D.									В	oring Desigi	nation I	MHSPT/	CPT-0	5-1	9
DRI	LLIN	G LO	G DI	VISION	Sou	uth Atlantic	IN	IST/	LLA	ΤΙΟ	N Mobile	Distric	t of	EET 1 8 SHI	EETS	
PROJ	ЕСТ						LAT	LONG	COORI	DINATE	<b>s</b> LAT = 30.6	62281	LONG = -	88.0279	951	
20	20 Geo	otechn	ical Investi	igation			STA	TE PL/	NE CO	ORDIN	<b>ATES</b> X = 1,8	02,842	Y = 241,	441		
DATE	OF BO	D. LING LOG DIVISION South At T Geotechnical Investigation F BORING STARTED CON G AGENCY Corps of Engineers - CESAW ITTLE OF FIELD INSPECTOR NAME OF OF JOE BORING RTICAL INCLINED DEG. FROM BE RTICAL INCLINED N/A D TOP OF ROCK N/A EPTH OF BORING 100.0 Feet EPTH G CLASSIFICATION OF MATERIAL 0.0 0.4 (CL-ML) CLAY, silty, low plasticity, silt, moist, dark brown (SC) SAND, clayey, moist, light brown (SC) SAND, clayey, moist, light brown I SE SAND, clayey, moist, light b		COMPLETED	COC State			STEM/D	ATUM/UNITS	nov Et	HORIZ.		<b>R<i>T.</i></b>			
ו וופח		ENCY	/ Co	rns of Engi	ineers - (	CESAM	Siale	Fi FV		us Js	тор ог во	RING	GROUN		 F <b>R</b>	
NAME	& TITLE				NAM		MAN			'S DESI	-23.0 Fe	et	Und	erwater		-
		,	,	_	Joe	e Bowerman	С	ME-75				l		AMMER L HAMM	ER	
				DEG. VERT	FROM TCAL	BEARING	SIZE	E AND '	ГҮРЕ О	F BIT	See Re	emarks				Ī
тніск	NESS OF		BURDEN	Ν/Δ			тот		MBER	CORE B	<b>OXES</b> ()					
DEPTH		OFRO	CK	N/A			тот	AL SA	MPLES		ISTURBED 67	UN	DISTURBED	(UD)	0	
TOTAL	DEPTH	OF BOF	RING	100.01	Feet		тот				BORING 91	%		(02)	0	
ELEV.	DEPTH	LEGEND	CLA	ASSIFICATIO	DN OF MA	TERIALS	RÉC.	BOX OR SAMPLE	RQD OR UD	AD	VANCEMENT METHOD	DI	RILLING	BLOWS/ 0.5 FT.	4-VALUE	
															-	1
-23.0	0.0															Ļ
-23.4	0.4		(CL-ML)( silt, moist,	CLAY, silty	, low pla n	sticity, some								1		F
-	-	0.4 silt, moist, dark brown (SC) SAND, clayey, moist, light brown			ght brown	47	S1		SF	PT Sampler			1		F	
-	-												3	4	F	
-	-													ł		
-	-													4		F
-	-						93	S2		SF	PT Sampler			4	8	F
-	-													4	Ŭ	ŀ
-	-													2		F
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-	-													4		ļ
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-	-						87	S4		SF	PT Sampler			4		ŀ
-	-													4	8	F
-	-						$\vdash$							2		┟
-	-															ŀ
-	-				100	S5		SF	PT Sampler			5	10	t		
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-	-						93	S6		SF	PT Sampler			4		F
-	-														7	┠
-	-													3		F
-	-						87	57		90	PT Sampler			1		F
-	-									UL.				2		ŀ
	ORM	1836	AFTER		URING S	√ (C	ontinue	ed)			Borina De	signati	on MH	SPT/	СРТ	C

DRIL	LING N COORDIN 802,842 DEPTH 12.0 12.4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	LOG (Cont. Sheet)	RIALS	INATE lane - TION TO 0 Ft. 87	SYSTE Alabar OP OF I	M/DATI ma We BORING BORING OR UD	UM est - U.S. Survey Ft. 3 ADVANCEMENT METHOD	HORIZONTAL NAD83 DRILLIN REMARK	G G S G S G S G S G S G S G S G S G S G	
-35.0 1 -35.4 1 -36.5 1	N COORDII 802,842 DEPTH	INATES       Y = 241,441         CLASSIFICATION OF MATER         Image: Second state         Image: Second state <th< th=""><th>COORD State P ELEVAT -23.</th><th>INATE lane - TION TO 0 Ft. RÉC. 87</th><th>SYSTE Alabar OP OF I Value S7</th><th>M/DATI ma We BORING BORING</th><th>UM est - U.S. Survey Ft. 3 Advancement Method</th><th>HORIZONTAL NAD83 DRILLIN REMARK</th><th>GS GS H</th><th>-VALUE</th></th<>	COORD State P ELEVAT -23.	INATE lane - TION TO 0 Ft. RÉC. 87	SYSTE Alabar OP OF I Value S7	M/DATI ma We BORING BORING	UM est - U.S. Survey Ft. 3 Advancement Method	HORIZONTAL NAD83 DRILLIN REMARK	GS GS H	-VALUE
OCATION X = 1,8 ELEV. DE 	N COORDII 802,842	INATES       Y = 241,441         CLASSIFICATION OF MATER         (SP) SAND, poorly-graded, moil	State P ELEVAT -23.1	lane - rion T 0 Ft. RĚC. 87	Alabar OP OF I UNITED ST	na We BORING ROD OR UD	ADVANCEMENT	NAD83	MLLW BLOWS 0.5 FTS	-VALUE
.0CATION X = 1,8 ELEV. DI 	N COORDII 802,842 DEPTH	Y = 241,441 CLASSIFICATION OF MATER (SP) SAND, poorly-graded, moi	RIALS	60 Ft.	S24	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	წი BLOWS/ 0.5 FT.	-VALUE
-35.0 1 -35.4 1 -36.5 1	рертн 12.0	CLASSIFICATION OF MATER	RIALS	<b>RĚC.</b> 87	<b>BOX OR</b> Sample	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	ທິດ BLOWS/ 0.5 FT.	-VALUE
<u>-35.0 1</u> - <u>35.4 1</u> - <u>36.5 1</u> - <u>36.5 1</u>	12.0 12.4	(SP) SAND, poorly-graded, moi		87	57					17
- <u>35.0 1</u> - <u>35.4 1</u> - <u>36.5 1</u>	12.0 12.4	(SP) SAND, poorly-graded, moi		87	S7					<b>Z</b>
- <u>35.0</u> 1 - <u>35.4 1</u> - <u>36.5 1</u> - <u>36.5 1</u>	12.0 12.4	(SP) SAND, poorly-graded, moi					SPT Sampler		2	-
- <u>35.0</u> 1 - <u>35.4</u> 1 - <u>36.5</u> 1	12.0 12.4	(SP) SAND, poorly-graded, moi							1	
- <u>35.0 1</u> - <u>35.4 1</u> - <u>36.5 1</u> - <u>-</u>	12.0 12.4	(SP) SAND, poorly-graded, moi		1 100	00		SDT Samplar			•
<u>-35.0 1</u> <u>-35.4 1</u> 	12.0 12.4	(SP) SAND, poorly-graded, moi		100	30		SPT Sampler		3	7
<u>-35.4 1</u> 	12.4	(SP) SAND, poorly-graded, moi							4	
-36.5 1			st, light gray						1	
- <u>36.5 1</u> 		(SC) SAND, clayey, moist, light	brown	03	59		SPT Sampler		3	
- <u>36.5 1</u> 	• • • •				00					7
	13.5								4	
Ì		(SP) SAND, poorly-graded, moi	st, dark						2	
ŧ				100	S10		SPT Sampler		3	1
+							•			6
-38.0 1	15.0							_	3	
-38.4 1	15.4	(SC) SAND, clayey, moist, light	brown						2	
Į	· · · ·	<ul> <li>(SP-SM) SAND, poorly-graded</li> <li>silt, trace wood, moist, brownish</li> </ul>	with silt, few gray	73	S11		SPT Sampler		3	
+			0 7							5
Į								-	2	
İ									2	
Ŧ	•••			73	S12		SPT Sampler		2	
t	· · · ·	•   +   -   •   +   -   •   +   -							2	4
+	· · ·	·   [ ]						-		
ţ		•							1	
ł				93	S13		SPT Sampler		1	
-42.3 1	19.3								2	3
ł		(CL) CLAY, lean, low plasticity, wet, brownish grav	little sand,	<u> </u>				-		
ļ										
ł				100	S14		SPT Sampler		0	2
Į		$\langle \lambda \rangle$							2	
Ŧ								1	5	
44.5 2	21.5		ot aroutet	-						
Ţ		tan 15% interbedded clay CH	si, grayish	100	S15		SPT Sampler		4	7
ł	 								3	ĺ '
ţ		···						1		
+	÷			53	S16		SPT Sampler		'	
t	:::			1	1	. 1				

DBILLING LOG (Cont. Shoot)					Boring Designation MHSPT/CPT-								
DR		G LOG	i (Cont. Sheet)	Mobi	le Dis	trict		OF 8 SHEETS					
ROJE	СТ			COORDI	NATE	SYSTE	M/DATU	м	HORIZONTAL	VERTICA	L		
				State Pla	ane - J	Alabar	na We	st - U.S. Survey Ft.	NAD83	MLLW		-	
OCAT	1 802 84	<b>RDINATES</b> 12  Y =	s 241 441	-23.0	ION TO	OP OF I	BORING	3					
	0.002,04			e -20.0	%	PLE	RQD	ADVANCEMENT	DRILLIN	G /S.Y.	TUE	1	
	DEPTH	LEG		.0	REC.	BOX	ŬĎ	METHOD	REMARK	BLO 0.5	77-N		
	t				53	S16		SPT Sampler		3		]	
-	Ŧ									1		F	
	ţ				73	S17		SPT Sampler		2		ŀ	
-	ł				75	517		or i bampier			4	-	
	ţ									2		ļ	
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	‡								_	3		Ĺ	
	ł									1		ŀ	
	‡				93	S19		SPT Sampler		2		F	
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	Į									2		Ţ	
	ł									1		ŀ	
-	Ţ				100	S20		SPT Sampler		2		-	
	ł										6	ŀ	
-	Į								_	4		F	
	t									3		F	
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	t				100	020				1	2	ŀ	
										1	2	Г	

				Boring Designation MHSPT/CP								
DR	ILLIN	GLC	G (Cont. Sheet)	Mobi	le Dis	trict				OF 8 SH	ETS	
ROJEC	т			COORDI	NATE	SYSTE	M/DAT	JM	HORIZONTAL	VERTICA	L	
				State Pla	ane - J	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW		
	ON COOI		ES - 241 441	ELEVAT		OP OF I	BORING	3				
<u> </u>	1,002,04		- 241,441	-23.0	Γι.	щ				. <u>جر</u>	щ	
ELEV.	DEPTH	LEGEN	CLASSIFICATION OF MATERIALS	i	RËC.	BOX OI	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	800 BLOWS	N-VALU	
					100	S25		SPT Sampler		1		
-	-									0		
-	İ.	••••			100	S26		SPT Sampler		0		
-	+				100	020				ļ.	1	
-	Ł									1		
-	F									0		
-	+				400	0.07						
-	Į.				100	527		SP1 Sampler			2	
-	$\frac{1}{2}$									1		
-	Į									1		
-	-	· · · · ·										
-64.5	41.5				100	S28		SPT Sampler		1	2	
مح م	40.0		(SM) SAND, silty, little silt, trace shel	ls, wet,						1	2	
-65.0	42.0		(SP) SAND, poorly-graded, moist, gra	avish					-			
-	Į	•••••	tan	,								
-	ł				100	S29		SPT Sampler		1		
-	İ.									1	2	
-	+	· · · · ·										
-	Ł									0		
-	ŀ				40	S30		SPT Sampler		0		
-	-										0	
-	Ļ									0		
-	F									0		
-	İ.				47	S31		SPT Sampler		0		
-	-	· · · · · ·									1	
-	<u> </u>									1		
-	-	· · · · ·								0		
-					100	622		SDT Somplor				
-	F				100	332		SFT Sampler			1	
-	ł									1		
-	F									0		
-	ł	····										
-	Į				100	S33		SPT Sampler		0	0	
-	ŀ									0		
-	t	$ \cdots $							1			
-	F				00	<b>.</b>						
-	ł				93	534		SPI Sampler		0		
	[									0	0	

				INSTALI		SHEET 5					
DR		g LO	G (Cont. Sheet)	Mobi	le Dis		OF 8 SHEETS				
ROJE	т			COORDI	NATE	SYSTE	M/DAT	UM	HORIZONTAL	VERTIC	\L _
				State Pl	ane	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW	
<b>UCATI</b> X –	0N COOF	RDINAT	ES = 241 441	ELEVAT	1 <b>0N T(</b> ) Ft	OP OF E	SORIN	5			
<u> </u>	1,002,04		- 241,441	-20.0	/ I L.	≈щ				ìo.	щ
ELEV.	DEPTH	. LEGEN	CLASSIFICATION OF MATERIALS		RÉC.	BOX O SAMPL	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI		N-VALU
-	+								-	0	
-	+	· · · · · ·			100	S35		SPT Sampler		0	
-	+									1	1
-										0	
-	-	· ·			100	S36		SPT Sampler		0	- 1
-	+								4	1	
-	ł	· ·								0	
-		· · · · ·			100	S37		SPT Sampler		0	0
-		 							-	0	
-	-				93	S38		SPT Sampler		0	
-	+	 								0	0
-	+	· · · · · · · ·							1	0	
-	+	· · · · · ·			100	S39		SPT Sampler		0	
81.5	58.5		At El81.0 Ft., some wood							1	
-	-		(CL) CLAY, lean, medium plasticity, s wood, little sand, wet, light gray	some						0	
-	+				100	S40		SPT Sampler		2	- 5
-	+								-	3	
-	Ī				02	Q/1		SDT Somelor		2	
-	ļ				93	341		or i Sampier		4	7
-									-	2	
-	+				100	S42		SPT Sampler		3	
86 0	63.0									5	8
		· · · · ·	(SP) SAND, poorly-graded, wet, pale	tan					1	0	
-	Ĺ				93	S43		SPT Sampler		1	
-	ļ									1	<b> </b> ²

				INSTAL		N	_			SHEET 6	
DR	LLIN	g log	(Cont. Sheet)	Mobi	ile Dis	trict		OF 8 SHEETS			
ROJEC	т			COORDI	NATE	SYSTE	HORIZONTAL	VERTICA	L		
				State Pl	ane -	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW	
OCATI	ON COOF	RDINATES		ELEVAT		OP OF I	BORING	G			
X = 2	1,802,84	2 Y = 2	241,441	-23.0	) Ft.				1		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIAL	LS	RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI	ନ୍ତର BLOWS/ 0.5 FT.	N-VALUE
		•••••								1	
	-										
4	-				93	S44		SPT Sampler		1	
-	-										2
]	_	•••••							_		
-	-									1	
-	-										
_					93	S45		SPT Sampler		3	4
-										1	
۲	-								4		
	-									4	
]	-	•••••			100	S46		SPT Sampler		7	
۲	-										18
4	-	•••••								11	
]	-								1	5	
-	-	$\cdots$									
-	-				100	S47		SPT Sampler		11	
_	-									17	28
	-								4		
-	-									10	
-	-				100	0.40					
]	-				100	548		SPT Sampler		21	- 52
-	-									31	
-	_										
]										11	
-	-	•••••			13	S49		SPT Sampler		19	
-	_										52
										33	
]	-									8	
-	-										
-	-				100	S50		SPT Sampler		9	00
]	-									11	20
-	-								4		
-	-									4	
					100	S51		SPT Sampler		7	1
]						551					21
ſ	-	$  \cdots  $								14	
-									1	-	
_											
-	-				100	S52		SPT Sampler		13	
-	-										25
-	F I									12	1

_				INSTALL	ATIO	1	0	ening beorgnatio	SHEET 7		
DR	ILLIN	G LC	DG (Cont. Sheet)	Mobil	e Dis	trict			OF 8 SHEETS		
SOJE	ст			COORDI	NATE	SYSTE	M/DAT	UM	HORIZONTAL	VERTICA	L
				State Pla	ane - J	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW	
DCAT				ELEVATI		OP OF I	BORING	3			
X =	1,802,84	12 Y	= 241,441	-23.0	Ft.					<u> </u>	
LEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		RËC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	So BLOWS/ 0.5 FT.	N-VALUE
	ł									5	
	Ļ	· · · · ·			100	S53		SPT Sampler		8	18
	ŧ	· · · · ·		-						10	
	+				100	SE A				2	-
	Ī	• • • • •			100	504		SPT Sampler		5	10
	ł			-					-	6	
	†				100	S55		SPT Sampler		10	
	Ť	· · · · ·								9	19
	Ļ									5	
	ł				80	S56		SPT Sampler		2	7
	+	· · · · ·	At FL -107.0 Ft little gravel	-					-	5	
	Ì		··· _·· ··· ··· · · · · · · · · · · · ·		67	<b>\$</b> 57		SPT Sampler			
	ļ				07	001		or r campion		7	11
	+	· · · · ·		ŀ					-	6	
	† 1	· · · · ·			100	S58		SPT Sampler		17	25
	ł									18	35
	ŧ									10	-
	1				100	S59		SPT Sampler		11	22
	Į			ŀ					-	3	
	+ +				93	S60		SPT Sampler		4	-
	†									2	6
	Ī	 		Ī					]	3	
	ł	· · · · · ·	At El113.5 Ft., trace clay, trace grav light orangeish brown Interbedded cla	rel, ay 2-3	100	S61		SPT Sampler		3	8
	<u> </u>			-						5	
VW	FORM	1836	AFTER 🗶 DURING 🗸	(Co	ntinue	ed)		Boring De	signation	MUCDT	о п т

							D	oning Designatio			1-0	5-1
DR	ILLIN	G LC	DG (Cont. Sheet)	INSTALI		N				SHEET 8	JEETO	]
10.IF	ст		. ,			SYSTE	M/DAT	UM	HORIZONTAL			Η
				State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLV								
OCAT		RDINA	res	ELEVAT		OP OF I	BORIN	G				1
X =	1,802,84	12 Y	[′] = 241,441	-23.0	) Ft.							
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI	SO BLOWS/	N-VALUE	
	+				100	S62		SPT Sampler		3		┫
-	ł									3		-9
	Į				100	S62		SPT Sampler		4	11	Ē
	ł									7		ŀ
-	ł		At El116.0 Ft., some gravel						-			+
•	Į									4		Ē
	ł				100	S63		SPT Sampler		5		ŀ
-	ŧ										- 25	-9
•	I								_	20		Ţ
	ł		At El117.5 Ft., pale tan							4		ŀ
-	ţ				100	S64		SPT Sampler		11		
	ł				100	004					- 28	ŀ
	ł									17		ł.
-	Ţ									9		Ţ
	ł									-		ŀ
	t				93	S65		SPT Sampler		12	32	Ŀ
	Ţ									20	52	F
	ł								-			+
-	İ.									7		Ĺ
	ł				47	S66		SPT Sampler		6		ŀ
	ŧ										- 15	F
-	Į								_	9		$\Box$
	ł									7		ŀ
	ţ				150	S67		SPT Sampler		12	354	Ŀ
23.0	100.0	• • • •				007			_	12	00 ·	+
	ł		NOTES:					140# hammer w/30" drop used				ŀ
	Į		1 Soils are field visually classified in					with 2.0' split				F
-	ł		accordance with the Unified Soils					spoon (1-3/8" I.D. x				+
	t		Classification System.					2" O.D.).				t
	ł											ŀ
-	ł											ŀ
	Į											
	ł											ŀ
-	t											
	Į											F
	ł											$\mathbf{F}$
-	ţ											F
	ł											ŀ
	ł											$\mathbf{F}$
-	t		<u> </u>								1	F

							Bori	ng [	Designation	MHSPT.	/CPT-06-19		-
D	RILLIN	IG L	.OG	South Atlantic Div	/ision	INSTAL Mob	LATIO ile H	_N arbo	r AL		SHEET OF 2 SH	1 EETS	
1. PRO	JECT					9. COO			(STEM HO		VERTICAL		1
	bile Har	por	Borings			State 10. SIZE	Piane AND	- Alab TYPE	OF BIT <b>4 25"</b> H	INAD03			1
2. HOL		R		CATION COORDINATES	00405 000	11. MAN			ER'S DESIGNATION OF	DRILL			1
3. DRIL	SPT/CF	ENCY	6-19: I	N 241441.035 E 18	02185.039	12. TOT	=-750 AL SA	) MPLE	S DISTU	RBED	UNDISTURBED	)	{
Cor	ps of E	ngin	eers - C	ESAS						40	0		4
Joe	Bower	man	l			13. TOT			R CORE BOXES 0				-
	ECTION O /ERTICAL NCLINED	F BO	RING	DEG FROM VERTICAL	BEARING	15. DAT	E BOF		STARTED 9/1/	20	COMPLETED 9/2/20		
6. THIC	KNESS C	DF OV	ERBURD	EN >60'	•	16. ELE	VATIO	N TO	P OF BORING	31.99'			1
7. DEP	TH DRILL	ED IN	ITO ROCK	<		17. TOT		ORE R	ECOVERY FOR BORIN	G N/A			-
8. TOT	AL DEPTI	H OF	BORING	60'			Jose	San	tiago, Geologist				
ELEV	DEPTH	LEGEND		FIELD CLASSIFICATION ( (Descriptior	OF MATERIALS 1)	% REC	Samp No.	RQD %	REM	ARKS	Blows/ 0.5 ft	N-Value	
	E	» 0	SILTY S	SAND (SM), very dark gra ed, some wood, trace clay	y, fine grained, , organic odor.	87	S1		USCS		0 0 0	0	Ē
		0 0 0	4			73	S2				0 0 1	1	ŧ
-36.5	4.5	° ,	1			40	S3				0 0 1	1	F
	-		POORL coarse	Y GRADED SAND (SP), grained.	light gray, fine to	87	S4				1 0 1	1	F
	Ē					87	S5				0 1 1	2	Ē
	Ē					67	S6				2 2 1	3	Ē
	E					93	S7				0 0 1	1	F 1
	F					60	S8				4 4 8	12	F
	E					40	S9				1 3 3	6	Ē
	-		•			73	S10				3 2 5	7	È,
			•			13	S11				4 6 0	6	<u> </u>
			•			40	S12				0 2 2	4	F
						73	S13				4 6 5	11	F
			•			47	S14				1 1 2	3	
	F					80	S15				4 8 12	20	F
	F		•			67	S16				3 5 3	8	ŧ
	-		:			13	S17				0 1 2	3	<u> </u> 2
	E					7	S18				10 12 13	25	F
	F					0	S19				3 6 7	13	F
	F					0	S20				6 7 6	13	Ē
	F					47	S21				6 7 8	15	Ē
	F		•			47	S22				5 9 13	22	F
	F					80	S23				10 8 7	15	Ē
-67.0	<u> </u>		*					1			4		± 3

SAS FORM 1836-A FEB 08



		Boring Designation MHSPT/CPT-06-19														
DRILLING LO	G (Cont Sheet)	INSTALL	ATIO ile H	N arbo	r Al		SHEET	2								
PROJECT		COORD	INATE	E SYS	TEM : HC	RIZONTAL										
Mobile Harbor	Borings	State	e Pla	ne		NAD83	MLLV	/								
LOCATION COORDIN	IATES	ELEVATION TOP OF BORING														
N 241441.035	E 1802185.039	-31.9	99'													
ELEV DEPTH	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REM	ARKS	Blows/ 0.5 ft	N-Value								
	CLAY (CL), light gray with pale orange, Clay seam around 0.3 feet of thickness	100	S24				1 2 0	3	- 3: - -							
		93	S25	-			1 8 7	18								
		73	S27	-			11 5 10	23	- - - 4							
		53	S28				3 6 15	21								
		67	S29				7 12 15	27	-							
		73	S30				10 10 15	25								
		67	S31				9 11 17 11	28	È T							
		67	S32	-			16 29 4	45								
		93	S33	-			14 20 3	34								
		67	S34	-			9 13 7	22								
		87	535	-			10 25 9	35								
		80	S30	-			27 5 6	17	-							
		93	S38				11 4 6	18	- 3 - -							
		93	S39	-			3 7 17	24								
-92.0 60.0		100	S40				9 18 27	45								
	<ol> <li>Notes:         <ol> <li>Soils visually field classified in accordance with the Unified Soil Classification System.</li> <li>N-Value: Total blows over last 1.0 foot of 1.5-foot driven interval, unless otherwise indicated, using a 1 3/8-inch ID splitspoon with 140-pound hammer falling 30 inches.</li> <li>The CME-750 drilling rig utilizes an automatic trip hammer.</li> <li>Undisturbed sampling with 3" by 30" Shelby tube, mechanically pushed with CME-750.</li> <li>Component Percentages: Trace: 0 to 5%, Few: 5 to 10%, Little: 15 to 25%, Some 30 to 45%, With 50 to 100%.</li> <li>MLLW was calculated from measuring barge deck mud line, then subtracting barge deck to water and closest observation station tide reading.</li> </ol> </li> </ol>	b to														
Projec	t I.D.									B	oring Desigi	nation <b>I</b>	MHSPT/C	CPT-0	7-1	9
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DRI	LLIN	G LO	G DI	VISION	Sou	th Atlantic	IN	IST/	ALLA	ΤΙΟ	N Mobile	Distric	t OF	EET 1 8 SHI	EETS	
PROJ	ЕСТ						LAT	LONG	COORE	DINATE	<b>s</b> LAT = 30.6	62833	LONG = -8	88.0269	919	
20	20 Geo	otechn	ical Investig	gation			STA	TE PL/	ANE CO	ORDIN	<b>ATES</b> X = 1,8	02,838	Y = 241,4	442		]
DATE	OF BOI	RING		STA	RTED	COMPLETED	coc State	ordina e Plan	te sys	STEM/D bama \	ATUM/UNITS West - U.S. Su	rvev Ft	HORIZ. NAD83	MU	<b>?</b> <i>T.</i> W	
DRILL	ING AG	ENCY	<b>C</b> or	ps of Eng	ineers - C	ESAM	E			IS		RING	GROUN	ID WATE	R	
NAME	& TITLE	OF FIE	LD INSPECTO	R	NAME	OF DRILLER	MAN	NUFAC	TURER	'S DESI	0.1 ⊢e GNATION OF DF	et RILL [			•	
			,		Joe	Bowerman	С	ME-75	5			j		L HAMM	ER	
	TION OF VERTICA		G INCLINED	DEG. VERT	FROM FICAL	BEARING	sızı	E AND	ТҮРЕ О	F BIT	See Re	emarks				
тніск	NESS OF	OVER	BURDEN	N/A			тот	AL NU	MBER (	CORE B	OXES ()					1
DEPTH	і то тор	OF RO	СК	N/A			тот	AL SA	MPLES	D	ISTURBED 67	UN	DISTURBED	(UD)	0	1
TOTAL	DEPTH	OF BOI	RING	100.0	Feet		тот	AL RE	COVER	Y FOR I	BORING 91	%				1
ELEV.	DEPTH	LEGEND	CLA	SSIFICATIO	ON OF MAT	<b>FERIALS</b>	RÉC.	BOX OR SAMPLE	RQD OR UD	۸D	/ANCEMENT METHOD	DF RE	RILLING MARKS	BLOWS/ 0.5 FT.	N-VALUE	
-0.1	0.0		(CL-ML) C	LAY, silty	/, low plas	ticity, some	+							1		┟
-0.6	0.5		silt, moist,	dark brow	/n araded m	noist light	-									F
-	-		brown to lig	ght gray	graded, fr	loist, light	80	S1		SP	PT Sampler			1	3	È
-														2		ŀ
-	-													4		ŀ
-	-						87	S2		SP	PT Sampler			4		F
-			At El2.6	Ft., wet, li	ght gray						·				8	F
_	-													-		╞
-														0		F
-4.1	4.0						80	S3		SP	PT Sampler			0	1	L
-	-		(SP-SM) S trace silt, v	SAND, po ery dark o	orly-grade gray	ed with silt,								1		╞
-														1		Ē
-	-						60	S4		SP	PT Sampler			0		-
-	ŀ													Ļ	1	╞
-	F						<u> </u>									F
-	ļ													0		t
-	ł						73	S5		SP	PT Sampler			0		╞
-	F	<b> :</b>												0		F
-	ţ													0		ţ
-	ŀ						70	56		0	Templar					┠
-	F						13	56		SP	ampier				0	F
-9.1	9.0													0		ŀ
-	ŀ		(ML) SILT gray	, inorgani	c-L, trace	clay, wet, dark		07						0		╞
-	F		-				80	57		SP	i Sampler			0		F
		1836	AFTER	▼ D	URING \	7 (0	ontinu	ed)			Boring Do	sianati	0 <i>n</i> ML		רם:	1

				INCTAL	AT:01		В	oring Designatio	n <b>IVI</b>		1-0/	ר-18 ר
DR	LLIN	G LO	DG (Cont. Sheet)	Mobile	e Dist	• trict				OF 8 SH	EETS	
PROJEC	т			COORDIN	IATE	SYSTE	M/DATI	JM	HORIZONTAL	VERTICA	Ĺ	1
				State Pla	ne - /	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW		4
LOCATI X =	<b>ON COOF</b> 1.802 83	RDINA 8 \	<b>TES</b> ( = 241.442	ELEVATIO	он то [:] t.	OP OF I	BORING	3				
ELEV.	DEPTH	EGEND	CLASSIFICATION OF MATERIALS	s	RÉC.	SOX OR	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	SO SLOWS/ 0.5 FT.	-VALUE	
10.6	10.5				80	57		SPT Sampler		1	<b>2</b> 1	<b>4</b> −1  -
-10.0	10.5		(SM) SAND, silty, some silt, trace sh wet, dark gray	nells,						0		ŧ.
-					67	S8		SPT Sampler		0	0	-1
-	-			ļ					_	0		- 1
	-									0		-
-					67	S9		SPT Sampler		0	0	-1
-	-			-						0		ŧ
-	-				67	S10		SPT Sampler		0		1 -
										0	0	Ē
	-									0		-
-	-				93	S11		SPT Sampler		0	0	- _ ′
-				ŀ					-	0		Ē
-	-				100	S12		SPT Sampler		0		1 -
	-									0	0	Ē
										0		Ē
-	-				100	S13		SPT Sampler		0	0	Ŀ
				ŀ					-	0		Ē
-	-				100	S14		SPT Sampler		0		-2
	-									0	0	
-										0		Ē
-	-				73	S15		SPT Sampler		0	0	-2
				ŀ					-	0		ŧ
-					100	S16		SPT Sampler		0		F
	F		l								0	┠

							B	onng Designatio	on vi	HSP1/CP	1-0	
DR	ILLIN	G LC	)G (Cont. Sheet)	Mobile		l trict				SHEET 3	FFTe	]
ROJE	СТ			COORDIN		SYSTE		MC	HORIZONTAL	VERTIC	13	1
				State Plan	ne - /	Alabar	na We	st - U.S. Survey Ft.	NAD83	MLLW	·	
OCAT		RDINAT		ELEVATIO	ON TO	OP OF E	ORING	3				1
X =	1,802,83	88 Y	= 241,442	-0.1 Ft	t.				-			_
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	F	τέc.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI		N-VALUE	
	+				100	S16		SPT Sampler		0		]
	ł									0		
	Ŧ				100	S17		SPT Sampler		0		F
-	ŧ									0	0	
	ł			F					-	0		
-	ł				100	<b>S18</b>		SDT Samplar				ł
	$\frac{1}{2}$				100	510		or i oanipiei			0	ł
-	Ŧ			-					-	0		_
	‡	┃ 								0	4	
-	ŧ.				80	S19		SPT Sampler		0	0	ł
	ł									0		ŀ
	ł									0		ł
-	Ŧ				73	S20		SPT Sampler		0		
•	ŧ									0	0	
-	+			F					-	0		-
	ŧ				100	S21		SPT Sampler		0		ł
31.1	31.0		(CH) CLAY, fat, high plasticity, trace s	silt,				or r compici			0	ł
	Ŧ		wet, brownish gray	-					-			-
-	Ŧ									0		
•	+			Í	100	S22		SPT Sampler		0	0	
	ŧ.									0		
33.6	33.5									0		
	+		(SM) SAND, silty, some silt, trace she wet, dark gray	ells,	100	S23		SPT Sampler		0		
-	Ŧ	<b>│</b> ┆┊┆┇								0		
2F 4	† 	<b> </b>                                   		F					1	0		
35.1	35.0		(SP) SAND, poorly-graded, trace silt,	wet,	100	S24		SPT Sampler		0		ł
	ł		light gray								0	
-	+			┝					-			┦
	Ŧ				100	S25		SPT Sampler		0		ŀ
-	‡					220				0	2	ŀ
<u></u>		4020								2		L

				INSTAL	LATIO	A I				SHEET 4		1
DR	ILLIN	G LOG	(Cont. Sheet)	Mob	ile Dis	trict				OF 8 SH	EETS	
ROJE	ст			COORD	INATE	SYSTE	M/DAT	UM	HORIZONTAL	VERTICA	L	1
				State P	lane -	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW		
OCAT		RDINATES		ELEVAT		OP OF I	BORING	G				1
X =	1,802,83	88 Y = 2	241,442	-0.1	Ft.				-			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIAL	.S	RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	ທິດ BLOWS/ 0.5 FT.	N-VALUE	
	+				100	S25		SPT Sampler		2	-	ł
	t								1			t
-	Ļ									2		Ŀ
	ł				100	S26		SPT Sampler		1		ŀ
	ł										3	F
-	Į.	•••••								2		Ľ
	ł									3		F
	ł											ŀ
	t				87	S27		SPT Sampler		1	1	-
	Į									0		F
	ł								-			╞
	ł	•••••								3		ŀ
-	İ				100	\$28		SPT Sampler		3	1	
	ł					020				Ľ	7	-
	ł									4		ŀ
-	t								-			t
	Į											Ē
	ł				87	S29		SPT Sampler		4		ŀ
-	ł										9	ŀ
	t									5		F
	Į									3		L
-	ł	•••••										-
	ł				87	S30		SPT Sampler		7	10	F
•	İ									0	16	Ē
-	ŧ.				<u> </u>				4			╞
	ł									2		ŀ
-	t				100	624		CDT Compler		6		F
-	L	•••••			100	531		SPT Sampler		0	15	L
	ł									9		ŀ
•	ŧ								-			t
-	Į –									4		L
	ł				100	S32		SPT Sampler		5		╞
	ł										15	ŀ
•	t									10		-
	Į									2		L
	ł											$\mathbf{F}$
-	ł				93	S33		SPT Sampler		4		F
-	Ī	····								4	8	F
	ł				<u> </u>				4			ł
	ł	[::::]								1		ŀ
-	t	]			100	S34		SPT Sampler			1	F
	Į	[:-::]									10	F
	Ļ	$[\cdots]$								7		ŀ

				INSTALI	LATIO	N			11	SHEET 5	
DR		G LOO	j (Cont. Sheet)	Mobi	le Dis	trict				OF 8 SH	EETS
ROJE	т			COORDI	NATE	SYSTE	M/DAT	UM	HORIZONTAL	VERTIC/	AL
				State Pl	ane -	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW	1
OCATI		RDINATES	5	ELEVAT		OP OF I	BORING	G			
X =	1,802,83 I	8 Y=	241,442	-0.1	Ft.				1	<del></del>	<b>.</b>
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIA	LS	RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI	S S S S S S S S S S S S S S S S S S S	N-VALUE
-	-								-	7	
	-				100	S35		SPT Sampler		6	
-										9	15
-	-	· · · · · · ·								7	
					93	S36		SPT Sampler		9	18
-	+								-	9	
	I				80	S37		SPT Sampler		4	-
-	-				00	001				9	14
-	ł								1	4	
-					53	S38		SPT Sampler		5	14
_										9	14
	-									6	_
-	ł				60	S39		SPT Sampler		9	19
-									-	10	
-	-				73	S40		SPT Sampler		6	
	ł									12	18
-	t t								1	9	
-					100	S41		SPT Sampler		13	30
	ł								4	17	
-	+									6	
•	Į				100	S42		SPT Sampler		6	14
-	ŀ								-	2	
	ł				80	S43		SPT Sampler		2	-
-	- -									4	6
		1836-A	AFTER ▼ DURING ▼ DRILLING ▼ DRILLING	(Co	ontinue	ed)		Boring De	esignation	MHSPT/	СРТ

<b>P</b> -		<u></u>		INSTAL	LATIO	N				SHEET 6	
DR	ILLÍN	G LC	JG (Cont. Sheet)	Mob	ile Dis	trict				OF 8 SH	EETS
PROJE	ст					SYSTE				VERTICA	AL
OCAT			res			Alabar		si - 0.5. Survey Fi. G	INAD05		
X =	1,802,83	88 Y	/ = 241,442	-0.1	Ft.			-			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	i	RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI	<u>ශී</u> BLOWS/ 0.5 FT.	N-VALUE
	ł	•••••								1	
-	F										
•	ţ	· . · . · ·			100	S44		SPT Sampler		1	4
	ł	· · · · ·								3	-
-	ŧ	•••••								3	
	ł				100	0.45					
-	F	•••••			100	545		SPT Sampler		0	11
•	ŧ									5	
	ł		At El67.6 Ft., some gravel, trace cla orangeish brown Interbedded clay 2-	ay, light 3						0	
-	Ŧ	•••••	inches in width		100	S46		SPT Sampler		1	
•	ł									6	7
-	+				<u> </u>				-		
•	ŧ									5	_
•	Ł				73	S47		SPT Sampler		1	5
.70 6	70.5	 								4	5
	10.0		(CH) CLAY, fat, high plasticity, little s	and,					1	1	
-	+		wet, light gray		100	0.40					
	Ŧ				100	548		SPT Sampler			5
72.1	72.0									4	
	ł	· · · · ·	(SP) SAND, poorly-graded, trace gravestic wet, light orangeish brown	vel,						4	
	ŧ				53	S49		SPT Sampler		6	
-	t	· · · · · ·								11	17
	Ŧ	••••	At EL -73.6 Et No recovery		<u> </u>				-		
-	‡									5	_
	ł	•••••			100	S50		SPT Sampler		12	0.4
75 1	75.0	· · · · · ·								12	24
-75.1	73.0	7	(CL) CLAY, lean, high plasticity, som	e silt,						4	
	ł		wet, dark gray			0.5.1		007.0			
-	‡	$\langle / \rangle$			100	551		SP1 Sampler		3	7
76.6	76.5									4	
	+		(CL-ML) CLAY, silty, low plasticity, so silt, wet, dark grav	ome						0	
-	ţ		, , - <u>-</u> -,		100	S52		SPT Sampler		3	1
	ŧ										7
	<u>[</u>							-		4	1

							В	oring Designatio	n <b>w</b> i	HSP1/CP	I -0 /
DR	ILLING	LC	G (Cont. Sheet)	INSTAL	LATIO	N trict				SHEET 7	ETS
ROJE	СТ		·	COORDI		SYSTE	M/DAT	UM	HORIZONTAL	VERTICA	L
				State Pl	ane -	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW	
OCAT	ION COORD	DINAT	ES	ELEVAT	ION TO	OP OF I	BORIN	G			
X =	1,802,838	Y	= 241,442	-0.1	Ft.				1		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIA	LS	RÉC.	BOX OR SAMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARK	რი BLOWS/ 0.5 FT.	N-VALUE
	+									1	
•	t P				100	852		SDT Somplor			
-	Į				100	333		SF I Sampler			6
	† [									3	
•										1	
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•	t		silt, wet, dark gray	y, some	100	S54		SPT Sampler		2	6
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-	t ľ	//							1		
	Į į									0	
	†	$\square$			100	S55		SPT Sampler		3	-
-	T K									4	1
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	łł				100	S56		SPT Sampler		4	
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	†									3	
	I ł				100	S57		SPT Sampler		4	
-	+										9
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	+	$\square$								3	
-	t ľ				100	S58		SPT Sampler		5	
	+							er i eampier			10
87.1	87.0									5	
	↓ <b> </b>		(CH) CLAY, fat, high plasticity, we	t, dark						5	_
	t I		9.49		100	620		SDT Somelor			
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	† 1									5	
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	‡				100	S60		SPT Sampler		5	11
	+									6	
-	t I								1	2	
	↓ ↓										
	†				100	S61		SPT Sampler		4	0
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	+ 1								1		

_				INSTALL			D			SHEET 8	1-0	רי ר
DR	ILLIN	G LO	G (Cont. Sheet)	Mobile	e Dis	rict				OF 8 SH	EETS	,
ROJE	ст			COORDIN	IATE	SYSTE	M/DAT	UM	HORIZONTAL	VERTIC	AL .	
				State Pla	ne - /	Alabar	na We	est - U.S. Survey Ft.	NAD83	MLLW	/	-
.0CATI X =	0N COO 1 802 8'	<b>RDINAT</b> 38 ∨	<b>ES</b> = 241 442		ON TO	OP OF I	SORIN	5				
ELEV.	DEPTH		CLASSIFICATION OF MATERIALS		к. Rec.	OX OR AMPLE	RQD OR UD	ADVANCEMENT METHOD	DRILLIN REMARI		VALUE	1
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-	İ.				100	002		of i bampler		3		Ĺ
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	ł				100	S66		SPT Sampler		3	7	-
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00 1	100 0	$\langle \rangle$				S67		•		1	6+	-
								140# hammer		5/0.0	)'	t
	ł		NOTES:					w/30" drop used				ŀ
	t		1. Soils are field visually classified in accordance with the Unified Soils					spoon				Ŀ
	ł		Classification System.					(1-3/8 1.D. x 2" O.D.).				-
	t											Ē
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							Bor	ing I	Designatio	<u>n MHS</u> P	T/CPT-08-19		_
DF	RILLIN	IG L	.OG	DIVISION South Atlantic Di	vision		LATIC	N arbo	or AL		SHEET OF 2 S	1 HEETS	
1. PRO	JECT					9. COC	RDIN/	ATE SY	/STEM	HORIZONT	AL VERTICAL		1
Mob	ile Har	bor l	Borings			State	Plane	- Alab	OF BIT 1		3 MLLV	V	-
2. HOLE	E NUMBE	R	LC	CATION COORDINATES		11. MA			ER'S DESIGNAT	TION OF DRILL			1
	SPT/CF		8-19	N 241562.893 E 18	302654.92	CM	E-75		e				_
Corp	os of Ei	ngin	eers - C	ESAS		12.10	IAL 54		.5	33		.D	
4. NAME		LLER				13. TO	FAL N	JMBE	R CORE BOXES	s 0	1		
5. DIRE	CTION O	F BOI	RING	DEG FROM	BEARING	- 14. ELE	VATIO	ON GR	OUND WATER	See Ren	narks		
	ERTICAL	-		VERTICAL		15. DA				9/2/20	9/2/20		
6. THIC	KNESS C	DF OV	ERBURD	en >50'		17. TO				-11.03 R BORING N/A	4		-
7. DEPT	TH DRILL	ED IN	TO ROCH	<		- 18. SIG	NATU	RE AN	ID TITLE OF IN	SPECTOR			-
8. TOTA	AL DEPTH		BORING	50'			Jose	San	tiago, Geolo	ogist		Ð	-
ELEV	DEPTH	LEGENI		FIELD CLASSIFICATION (Descriptic	OF MATERIALS on)	% RE0	Samp No	RQD %		REMARKS	Blows/ 0.5 ft	N-Valu	
	-	» О	SILTY	SAND (SM), very dark gra	ay, fine grained.	40	S1		USCS		0	0	Ē
		0 0	}			73	S2	1			0	0	ŧ
		000	{			80	S3	1				0	ŧ
	_ -	0				10	) S4	]			0 0 0	0	F
	_	0 0				73	S5				0 0 0	0	F
	_	0 0				87	S6				0 0 0	0	Ē
	_	0 0				93	S7				0 0 0	0	Ē
	E	°	]			10	) S8				0 0 0	0	Ē
	_	0 0				10	) S9				0 0 0	0	F
	_	<i>•</i>	¢			73	S10				0 0 0	0	F
-28.3	_ _ 16 7	000				10	S11				0 0 0	0	F
	_		CLAY (	CH), pale gray with pale	orange, few sand.	10	S12				0 0 1	1	F
-31.1	_ 					73	S13				3 3 6	9	F
			POORI	Y GRADED SAND (SP) n grained.	, light gray, fine to	10	S14				4 2 1	3	ŀ
	F	•				10	S15				0	0	F
		•				10	) S16				0	0	ŧ
	-	•				10	) S17				0	4	Ē
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	Γ	<u> </u>						1			3		

						SOL	ng L	Jesignation MIDSF1/CF	1-00-19		
וסח		10	G (Cont Shoot)	INST	ALL	ATIO	N		SHEET	2	
	LLING	LU	G (Cont Sheet)	M	obi	le H	arbo	r AL	OF 2 SH	IEETS	
PROJE	CT			COC	RDI	NATE	E SYS	TEM HORIZONTAL	VERTICAL		
Mol	oile Har	bor	Borings	S	tate	e Pla	ine	NAD83	MLLW	/	
LOCAT	ION COO	RDIN	ATES	ELE	VAT	ON T	OP O	F BORING			
N 2	241562.893 E 1802654.92					3'					
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	F	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value	
	-	•	POORLY GRADED SAND (SP), light gray, fine to		60	\$24			8 10	18	- 35 -
	Ę				73	S25			6 7 10	17	_
	Ę				67	S26			5 5 7	12	-
	Ē				67	S27			3 7 10	17	- - 40
	F				100	S28			4 6 9	15	-
	Ē				100	S29			1 2 7	9	-
	F				100	S30			4 2 5	7	-
	F				100	S31			2 4 5	9	- 45 - -
	Ē				100	S32			3 5 5	10	
-61.6	50.0				100	S33			0 0 1	1	-
-01.0	00.0	<u> </u>								L	L 50

Devine Decimenties

MUCDT/ODT 00 40

#### Notes:

BOTTOM OF BOREHOLE AT 50.0 ft

1. Soils visually field classified in accordance with the

 Unified Soil Classification System.
 N-Value: Total blows over last 1.0 foot of 1.5-foot driven interval, unless otherwise indicated, using a 1 3/8-inch ID splitspoon with 140-pound hammer falling 30 inches.

3. The CME-750 drilling rig utilizes an automatic trip hammer.

Undisturbed sampling with 3" by 30" Shelby tube, mechanically pushed with CME-750.
 Component Percentages: Trace: 0 to 5%, Few: 5 to

10%, Little: 15 to 25%, Some 30 to 45%, With 50 to 100%.

6. MLLW was calculated from measuring barge deck to mud line, then subtracting barge deck to water and closest observation station tide reading.


































































































































































































































Deer River Site Data
#### **APPENDIX A**

Subsurface Soil Profile Sheet



#### SUBSURFACE DIAGRAM



#### CLIENT DISL - MBNEP

PROJECT NUMBER 19-1101-0184

PROJECT NAME _____ Deer River Restoration PROJECT LOCATION __Refer to Boring Location Plan







#### **APPENDIX B**

**Records of Test Boring** 

		th	0	m	рs	on	RE	CO	R	D	O	F	ΤE	S1	ΓВ	OF	RIN	١G	Ì
PR SAI LO ST	oje Mpl Cat Atic GW GW	ECT: [ LE ME [*] TION: F DN: L: L AT 2		er Riv OD: / er to	ver R ASTM Borir	estoration 1 D1586 & 1587 ng Location Plan	CLIENT: DISL TYPE BORING DRILLER: V.Tr DRILL RIG: Sir ENGINEER: WEATHER:	- MBN : Mud nomps nco 24	EP Rota on 100	ary			B P L L D E	ORII ROJ AGE AT.: ONG ATE LEV/	NG NG ECT N : 1 C 30.51 .: -88 : 6/2/2 ATION	D.:ME NO.: DF 2 8015 .0922 22 N: -2.	3-12 19-1 5 211 4 ft	101-(	0184
DEP ELE (F	PTH/ EV. T)	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	Ы	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
	5			WOR WOR WOR	S-1		Very loose, medium grained, brown	0	19.5										
5 -			X	WOR WOR WOR	S-2		Very loose	0	1.4										
	- - 10		-			SILTY SAND (SM)	Medium dense, brown and												
10 -				ъ 5 8	S-3		orange	13	10.7										
	15		X	2 1 2	S-4	CLAYEY SAND (SC)	Very loose, medium grained, gray	3	75.1	46	54	35							
15								_											
20 -	-		X	2 1 3	S-5		Soft, gray, with organics	4											
	25				T-1	CLAY (CH)	No Recovery, attempted 2 X	(0%)											
25 -					1-1														
Refer	to Not	tes and Lea	egen	2 1 2 d on se	S-6	sheet for additional inform	Soft, brown and gray, with trace organics nation. This Record of Test Boring is pa	3 rt of the p	roject	Geote	chnica	Repo	prt.						

PROJ	ECT: I		m GINEE er Riv	PS RING /er Re	on	CLIENT: DISL	- MBN	EP				B			D.:ME 10.:	3-12 19-1	101-0	0184
DEPTH/ ELEV. (FT)	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	AGE OC (%)	: 2 C	UC (psf)	PP (psf)	VS (psf)	FS (psf)
35	5	X	6 5 8	S-7	CLAY (CH) (continued)	Stiff, gray	13											
40		X	6 6 6	S-8		Stiff Bottom of borehole at 40.0 feet.	12											

		the	o m	рs	on	REC	CO	R	D	O	F '	ΤE	S1	ΓВ	OF	RIN	٩G	Ì
PRO SAM LOO STA	DJE MPL CAT ATIO GWI GWI	CT: D E MET ION: R DN: L: L: L AT 24	eer R HOD: efer to	iver R ASTN b Bori	Restoration M D1586 & 1587 ng Location Plar	CLIENT: DISL - TYPE BORING: DRILLER: V.Th DRILL RIG: Sim ENGINEER: WEATHER:	MBN Mud omps co 24	EP Rota on I00	ary			B P L L D E	ORII ROJ AGE AT.: ONG ATE LEV	NG NG ECT N 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.510	D.:ME NO.: DF 2 1663 .092 22 N: -2.	3-13 19-1 1 861 5 ft	101-0	0184
DEP ⁻ ELE (F1	TH/ EV. F)	SYMBOL	SAMPLER SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
	-		WOF WOF WOF	S-1	-	Very loose, medium grained, gray	0	64.5										
5 -	5		WOF	S-2	SILTY SAND (SM)	Very loose, brown, with trace gravel	0	5.5										
- - - - - -			WOH WOH WOH	S-3	SANDY CLAY (CH)	Very soft, brown and gray	0	39.1	42	34	18							
- - - 15 -			2 2 3	S-4		Loose, medium grained, brown and gray	5											
20 -			2 1 2	S-5	CLAY (CH)	Soft, gray	3											
25 -				T-1	-	Gray and yellow	(8%)	59.5	45	49	30						151	
Refer t Actual		es and Leg	3 2 2 gend on s may be o	S-6 separate radual or	sheet for additional inform	Soft, gray nation. This Record of Test Boring is par	4 t of the p	roject	Geote	chnica	   Repo	prt.						

••••		$\cup$		P 2	011													
		EN	GINEE	RING								В	ORIN		D.:MF	3-13		
PROJE	<b>CT</b> : [	Dee	er Riv	/er R	estoration	CLIENT: DISL	- MBN	IEP				 P	ROJ	ECTN	NO.:	19-1 ⁻	101-0	018
								1		1		P	AGE	: 2 0	)F 2			
DEPTH/ ELEV. (FT)	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	Ы	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	F (p
-					CLAY (CH) (continued)		_											
35			6	6.7		Stiff, medium grained, gray	15											
35 -			8	3-7	SILTY SAND (SM)			-										
<b>40</b>																		
-		X	8 6 5	S-8		Stiff	11											
40		V V	0			Bottom of borehole at 40.0												

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		the	o m	рs	on	RE	CO	R	D	O	F	ΤE	S1	ΓВ	OF	RIN	١G	j
•••	•••	E	NGINE	ERING								В	ORII	NG NG	D.:ME	3-14		
PRO SAM LOO STA	DJE MPL CAT ATIC GW GW	ECT: D LE MET TON: R DN: L: L AT 24	eer Ri [·] HOD: / efer to HRS.	ver R ASTM Borir	estoration 1 D1586 & 1587 ng Location Plar	CLIENT: DISL TYPE BORING DRILLER: V.Th DRILL RIG: Sin ENGINEER: WEATHER:	- MBN : Mud iomps nco 24	EP Rota on 400	ary			P P L L D E	ROJ AGE AT.: ONG ATE	ECT N : 1 C 30.51 : -88 : 6/1/2 ATION	<b>NO.:</b> DF 2 5302 .093 22 <b>1:</b> -2.	19-1 2 68 <u>4 ft</u>	101-0	0184
DEP1 ELE (FT	ГН/ .V. `)	SYMBOL	SAMPLER SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
	-		WOR WOR WOR	S-1		Very loose, medium grained, tan	0	1.1										
5 -	5		WOH WOH WOH	S-2	SILTY SAND (SM)	Very loose	0	2.5										
10 -			WOH WOH WOH	S-3		Very soft, gray	0	59.2	66	70	46							
-	15			T-1		Dark gray	(100%)	)84.2	81	87	55							
15 -	<b>-20</b>		1		CLAY (CH)	Very soft		-										
20 -	25		1	S-4			2	-										
25 -	- - - -		WOH WOH WOH	S-5		Very soft	0	-										
	30		1		CLAYEY SAND (SC)	Very loose, medium grained,		-										
Refer t Actual	o Not strata	tes and Leg	1 2 gend on so may be or	S-6 eparate s adual ov	sheet for additional inforn er depth.	gray nation. This Record of Test Boring is pa	3 rt of the p	project	Geote	chnica	l Repo	prt.						

THOMPSON - ONSHORE BOREHOLE - DF STD US LAB.GDT - 6/16/22 08:39 - L//GINT PROJECTS/2013/19-1101-0184 - MBNEP - DEER RIVER RESTORATION/19-1101-0184 - MBNEP - DEER RIVER RESTORATION/ GPJ

	the	m	рs	on	RE	CO	R	D	0	F	ΤE	S	ΓВ	OF	RIN	٩G	6
	E	NGINE	ERING											<u>ר י</u> אזי	2 1 /		
PROJE	CT: D	eer Riv	ver R	estoration	CLIENT: DISL	- MBN	EP				B P	ROJ	ECT	<b>10</b> .:	<u>- 14</u> 19-1	101-	018
											P	AGE	: 2 0	)F 2	1		
DEPTH/ ELEV. (FT)	SYMBOL	SAWIFLER SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	ш	Ы	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (ps
-				CLAYEY SAND (SC) (continued)		_											
35 - -		8 8 9	S-7		Medium dense, medium grained, white	17											
35				SILTY SAND (SM)													
		3 3 5	S-8		Loose, brown and gray, with trace gravel	8	-										

		th	O	m	<b>ps</b>	on	REC	CO	R	D	O	F	TE	S1	ΓВ	OF	RIN	١G	,
PROJ SAMF LOCA STAT GV GV		CT: [ E ME [*] ON: F N: .: . AT 2	Dee THe Ref	er Riv OD: / er to	ver R ASTM Borir	estoration 1 D1586 & 1587 ng Location Plan	CLIENT: DISL - TYPE BORING: DRILLER: V.Th DRILL RIG: Sim ENGINEER: WEATHER:	MBN Mud omps ico 24	EP Rota on 100	ary			B P P L L D E	ORIN ROJI AGE AT.: ONG ATE: LEV/	NG NG ECT N : 1 C 30.51 .: -88 : 5/4/2 ATION	D.:ME IO.: DF 2 399 .094 22 I: -2.	<u>3-15</u> 19-1 ⁻ 42 7 ft	101-(	0184
DEPTH/ ELEV. (FT)	,	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
	5		X	WOR WOR WOR	S-1		Very loose, fine to medium grained, gray	0	3.0										
5			X	1 1 2	S-2	SILTY SAND (SM)	Very loose, with trace shell	3	6.8										
	10		V	1			Very soft, gray		74.8										
				WOH	5-3	CLAY (CL)		0											
15	15				T-1			(80%)	73.8	63	NP	NP						100	
20	20		X	2 3 3	S-4	SILTY SAND (SM)	Loose, fine to medium grained, gray	6											
	25			WOH			Very soft, gray		-										
25			Å	WOH 1	S-5	CLAY (CL)		1											
	30		X	2 2 3	S-6		Medium stiff	5	93.5	84									
Refer to N Actual stra	lote ata o	s and Le	egen s ma	d on se y be gra	parate s idual ov	sheet for additional inform /er depth.	nation. This Record of Test Boring is par	t of the p	roject	Geote	chnica	l Repo	ort.						

		$\cup$			011													
		ΕN	GINEE	RING								R			<b>)</b> • M/F	3-15		
PROJ	ECT:	De	er Riv	/er Re	estoration	CLIENT: DISL	- MBN	IEP				P	ROJ		NO.:	19-1 [°]	101-(	018
												P.	AGE	: 2 C	DF 2			
DEPTH/ ELEV. (FT)	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (ps
	5																	
-		X	2 3 3	S-7	CLAY (CL)	Medium stiff	6											
35					(continued)													
-4	ю																	
-		X	3 3 3	S-8		Medium stiff	6											
10						Bottom of borehole at 40.0 feet.												

		the	0 m	<b>ps</b>	on	RE	CO	R	D	O	F	TE	S1	ΓВ	OF	RIN	١G	Ì
PRO SAI LOO STA	OJE MPL CAT ATIC GWI	CT: D E MET ION: R DN: L: L: L AT 24	eer Ri HOD: efer to	ver R ASTN Borii	estoration 1 D1586 & 1587 ng Location Plar	CLIENT: DISL TYPE BORING DRILLER: V.T DRILL RIG: Si ENGINEER: WEATHER:	- MBN 3: Mud homps mco 24	EP Rota on 400	ary			B P L L D E	orii Roji Age At.: Ong Ate: Lev/	NG NG ECT N : 1 C 30.51 .: -88 : 5/4/2 ATION	D.:ME NO.: DF 2 284 .095 22 N: -2.	3-16 19-1 ⁻ 7 5 ft	101-(	)184
DEP ELE (F1	TH/ EV. F)	SYMBOL	SAMPLER SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	Ы	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
	5		WOR WOR WOR	S-1	SILTY SAND (SM)	Very loose, fine to medium grained, tan	0	17.9										
5 -	-		WOH WOH WOH	S-2	CLAYEY SILT (ML)	Very loose, gray	0	60.7										
10 -	- 		WOH WOH WOH	S-3		Very soft, gray	0	31.8	232	231	163							
	- 					Very soft		-										
15 -				T-1			(26%)	36.3	86	NP	NP						353	
20 -			2 1 2	S-4	CLAY (CL)	Soft	3	-										
	25		WOH	T-2		Soft	3	80.2	72	99	62						805	
25 -			3				(80%)											
Refer	to Not	es and Leg	WOH WOH 3 gend on s	S-5 eparate	sheet for additional inform	Soft nation. This Record of Test Boring is p	3 Part of the p	project	Geote	chnica	l Repo	ort.						

		the	m	ps	on	REG	CO	R	D	O	F	ΤE	S1	ΓВ	OF	RIN	١G	j
PRO SAM LOC STA		CT: De E METH ION: Re DN: L: L AT 24	er Riv IOD: / IOD: /	ver R ASTN Borii	estoration / D1586 & 1587 ng Location Plar	CLIENT: DISL - TYPE BORING: DRILLER: V.Th DRILL RIG: Sim ENGINEER: WEATHER:	MBN Mud omps nco 24	EP Rota on 100	ary			B Pl P/ L/ C D/ El	ORIN ROJI AGE AT.: ONG ATE: LEV/	NG NC ECT N 30.51 .: -88 : 5/3/2 ATION	D.:ME NO.: DF 2 123 .097( 22 N: -2.	3-17 19-1 ⁻ 01 1 ft	101-0	)184
DEPTI ELEV (FT)	H/ Y.	SYMBOL SAMPI FR	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
-			WOR WOR WOR	S-1	SILTY SAND (SM)	Loose, fine to medium grained, tan	0	11.2										
5	5		2 2 2	S-2	CLAYEY SAND (SC)	Very loose, fine to medium grained, tan	4	31.8	26	24	8							
10	10			T-1		Very soft, gray	(80%)	69.6	49	36	19						366	
- - -	-15		2	8-3	SANDY CLAY (CL)	Medium stiff	6	-										
15 -			4				-	-										
20	20		3 3 3	S-4	SILTY SAND (SM)	Loose, fine to medium grained, gray	6											
-	-25		2 2 2	S-5		Soft, gray	4											
	-30				CLAY (CL)													
Refer to Actual s	Note	es and Lege changes m	end on se ay be gra	S-6 eparates	sheet for additional inform	Medium stiff	t of the p	roject	Geote	chnica	l Repo	ort.						

	th	0	m	рs	on	RE	CO	R	D	O	F.	ΤE	S	ΓB	O	RIN	١G	ì
		ENG	GINEE	RING												3_17		
PROJE	CT:	Dee	er Riv	/er Re	estoration	CLIENT: DISL	- MBN	EP				 P		ECT	NO.:	19-1 ⁻	101-0	) 18
	T						1		1			P		: 2 C	)F 2	1		
DEPTH/ ELEV. (FT)	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf
35		X		S-7	CLAY (CL) (continued)	Medium stiff												
-		Y		S-8		Medium stiff												
40						Bottom of borehole at 40.0												
Refer to Not	tes and Le	egen	d on se	parate s	heet for additional inform	nation. This Record of Test Boring is pa	art of the p	roject	Geote	chnica	l Repo	ort.						

		tho	m	рs	on	RE	CO	R	D	O	F	ΤE	S	ΓВ	OF	RIN	١G	j
	•	EN	GINEE	RING								В	ORII		D.:ME	3-18		
PRO. SAMI LOCA STAT G ¹ G ¹	JE PL AT FIC WI	CT: De E METH ION: Re DN: L: L: L AT 24	er Riv IOD: / fer to HRS.	ver R ASTM Borir	estoration 1 D1586 & 1587 ng Location Plan	CLIENT: DISL - TYPE BORING: DRILLER: V.Th DRILL RIG: Sim ENGINEER: WEATHER:	MBN Mud omps nco 24	EP Rota on 100	ary			P P L L D E	ROJ AGE AT.: ONG ATE LEV/	ECT N 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.51 30.510	<b>NO.:</b> DF 2 06 .097 22 <b>N:</b> -2.	19-1 ⁻ 05 <u>3 ft</u>	101-0	0184
DEPTH ELEV. (FT)	ł/	SYMBOL SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	Ы	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
			WOR WOR WOR	S-1	SILTY SAND (SM)	Very loose, fine to medium grained, gray	0	5.3	23	NP	NP							
5	-5		2 2 2	S-2		Medium stiff, gray and orange	4	68.6	61	58	39							
	-10			T-1		Medium stiff	(90%)	89.3	64	79	55						273	
15	-15	X	1 1 1	S-3		Soft, gray	2											
	-20				CLAY (CL)													
20			1 2 2	S-4		ivieaium sun	4											
25	-25	X	4 5 8	S-5		Stiff, some clam sheel	13											
	-30																	
Refer to	Not	es and Lege	2 2 2 nd on se	S-6	sheet for additional inform	Medium stiff, green and gray	4 t of the n	roiect	Geote	chnica	Rep	prt.						
Actual st	rata	changes ma	ay be gra	adual ov	er depth.	and the rescard of rest boring is par		. 0,001	20010	en noa								

	thompson RECORD OF TEST BORING								ì											
	ENGINEERING							BORING NO ·MB-18												
ł	<b>PROJECT:</b> Deer River Restoration						estoration	CLIENT: DISL - MBNEP PROJECT NO.: 19-1101-018										0184		
								PAGE: 2 OF 2												
RATION.GPJ	DEPTH/ ELEV. (FT)		SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
STORATION\19-1101-0184 - MBNEP - DEER RIVER RESTOR	35			X	3 2 3 2 2 2 2	S-7 S-8	CLAY (CL) (continued)	Medium stiff Medium stiff	5	90.1	52	72	48							
PSON - ONSHORE BOREHOLE - DF STD US LAB.GDT - 6/16/22 08:39 - L.\GINT PROJECTS/2019/19-1101-0184 - MBNEP - DEER																				
THON	Refer to Actual s	o Note strata	es and Lo changes	egen ma	d on se y be gra	parate s adual ov	sheet for additional inforn er depth.	nation. This Record of Test Boring is pa	rt of the p	project	Geote	chnica	l Repo	ort.						

	•••	tŀ		m	<b>ps</b>	on	RE	CO	R	D	O	F '	TE	S	ΓВ	OF	RIN	١G	j
PRO SAM LOO STA	DJE MPL CAT ATIC GW	CT: E M ION DN: L: L AT	Dee ETH : Ref	er Riv OD: / fer to	ver Ri ASTM Borir	estoration 1 D1586 & 1587 ng Location Plar	CLIENT: DISL TYPE BORING DRILLER: V.Th DRILL RIG: Sir ENGINEER: WEATHER:	- MBN : Mud nomps nco 24	EP Rota on 100	ary			B P L L D E	ORII ROJ AGE AT.: ONG ATE LEV	NG NG ECT N : 1 C 30.51 : -88 : 6/2/2 ATION	D.:ME NO.: DF 2 6851 .094 22 N: -2.	3-19 19-1 ⁻ 1 781 <u>3 ft</u>	101-(	0184
DEP ELE (F1	гн/ .v. `)	SYMBOL	SAMPLER	SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	FS (psf)
	-			WOR WOR WOR	S-1	SANDY CLAY (CH)	Very soft, brown	0	44.1	71	96	54							
5 -	<b>-</b>		X	WOR WOR WOR	S-2		Very loose, medium grained, brown	0	13.8										
- - - - - - -					T-1		No Recovery	(0%)	-										
15 -				8 8 10	S-3	SILTY SAND (SM)	Medium dense, medium grained, white and gray	18	-										
20 -	<b>-20</b>		X	6 5 2	S-4		Loose, gray and brown	7	-										
25 -	<b>-25</b>			4 4 3	S-5	CLAY (CH)	Medium stiff, gray	7	-										
Refer 1		tes and	d Leger	3 3 3 nd on se y be ar	S-6	sheet for additional inform	Medium stiff nation. This Record of Test Boring is pa	6 irt of the p	- project	Geote	chnica	l Repo	prt.						

	the	m	рs	on	RE	CO	R	D	O	F	ΤE	S	ΓВ	OF	RIN	١G	Ì
••••	E	NGINE	ERING											ייעים	3_10		
PROJE	CT: De	eer Riv	ver R	estoration	CLIENT: DISL	- MBN	EP				P P	ROJ		NO.: NO.: DF 2	19-1 [°]	101-(	)18
DEPTH/ ELEV. (FT)	SYMBOL	SPT SPT BLOWS	SAMPLE I.D.NO.	MAJOR SOIL COMPONENT	OTHER COMPONENTS	SPT N/ (REC%)	% F	мс	LL	PI	UW (pcf)	OC (%)	UU (psf)	UC (psf)	PP (psf)	VS (psf)	F (p:
				CLAY (CH) (continued)													
- 			T-2	- 	No Recovery	(0%)											
				SILTY SAND (SM)													
-		7 6 7	S-7		Medium dense, medium grained, gray and brown	13											
0	1111111	'			Bottom of borehole at 40.0												
∋fer to Note	es and Leo	end on se	eparates	sheet for additional inform	nation. This Record of Test Boring is pa	art of the n	roject	Geote	chnica	l Repo	ort.						

## **APPENDIX C**

Laboratory Test Results

#### Final Voids [Log]

ASTM D-2435



Preconsolidation Stress (tsf)	1.000			Cc	0.505	Cr 0.360
	BEFORE	AFTER	Liquid Limits	0	Test Dat	e 6/13/2022
Moisture (%)	65.5	36.6	Plastic Limits	0		
Dry Density (pcf)	62.4	85.1				
Saturation (%)	105.0	102.2				
Void Ratio	1.66	0.95	Specific Gravity	2.66	ASSUME	D
Sample Description	Dark gray, SA	ANDY CLAY				
Project Number	19-1101-0184		Depth (ft) 1	3.5-15.5	Remarks	
Sample Number	T-1		Boring Number N	/IB-15	Atterberg	- NP
Project	Deer River					
Client	MBNEP					
Location						

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/13/2022 Checked By: ___

Date:

#### Coefficients of Consolidation

ASTM D-2435



Project Name: Deer River Project Number: 19-1101-0184

Checked By: ____

Date:

#### Summary

ASTM D-2435

Sample D	escription	Dark	gray, SANDY C	CLAY							
Project N	umber	19-11	01-0184	Depth (ft)	13.5-15.5		Remarks				
Sample N	umber	T-1		Boring Nu	amber MB-15		Atterberg - NP				
Project		Deer	River								
Client		MBN	EP								
Location											
		Cummulativa					TQA	T50			
	Loading	Change in	Specimen	Height of	Vertical		Fitting	Fitting	<b>T90</b>	<b>T50</b>	
	Sequence	Height	Height	Voids	Strain	Void	Time	Time	Cv	Cv	Sequence
Index	(tsf)	(in)	(in)	(in)	(%)	Ratio	(Hr)	(Hr)	(ft²/Day)	(ft²/Day)	Status
0	0.000	0.0000	0.9950	0.0000	0.0	1.661	0.000	0.000	0.00000	0.00000	ENABLED
1	0.125	0.0495	0.9455	0.5709	5.0	1.524	0.532	0.193	0.24247	0.03643	ENABLED
2	0.250	0.0835	0.9115	0.5369	8.4	1.433	0.560	0.377	0.15821	0.01570	ENABLED
3	0.500	0.1343	0.8607	0.4861	13.5	1.298	0.804	0.273	0.10353	0.01721	ENABLED
4	1.000	0.1889	0.8061	0.4315	19.0	1.152	1.061	0.150	0.06323	0.02344	ENABLED
5	2.000	0.2452	0.7498	0.3752	24.6	1.002	0.368	0.111	0.11629	0.02177	ENABLED
6	4.000	0.2931	0.7019	0.3273	29.5	0.874	0.157	0.097	0.17583	0.01624	ENABLED
7	8.000	0.3226	0.6724	0.2978	32.4	0.795	0.095	0.058	0.20927	0.01911	ENABLED
8	2.000	0.3135	0.6815	0.3068	31.5	0.819	0.000	0.000	0.00000	0.00000	ENABLED
9	0.500	0.2921	0.7029	0.3283	29.4	0.876	0.000	0.000	0.00000	0.00000	ENABLED
10	0.125	0.2624	0.7326	0.3580	26.4	0.956	0.000	0.000	0.00000	0.00000	ENABLED

Project Name: Deer River Project Number: 19-1101-0184

Checked By:_____

Technician: B.Hak Report Created: 7/6/2022

Date: _

#### Logarithmic Time [1] 0.125 tsf

ASTM D-2435



Tangent Construction Results							
T90 (Min)	NA						
T50 (Min)	11.573						
Cv (ft²/Day)	0.0364						

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/14/2022

Checked By: _

Date: ____

## Logarithmic Time [2] 0.250 tsf

ASTM D-2435



Tangent Construction Results							
T90 (Min)	NA						
T50 (Min)	22.613						
Cv (ft²/Day)	0.0157						

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

## Logarithmic Time [3] 0.500 tsf

ASTM D-2435



Tangent Construction Results							
T90 (Min)	NA						
T50 (Min)	16.372						
Cv (ft²/Day)	0.0172						

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/16/2022

Checked By: _

Date: ____

## Logarithmic Time [4] 1.000 tsf

ASTM D-2435



Tangent Construction Results							
T90 (Min)	NA						
T50 (Min)	8.994						
Cv (ft²/Day)	0.0234						

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

# Logarithmic Time [5] 2.000 tsf

ASTM D-2435



Tangent Construction Results							
T90 (Min)	NA						
T50 (Min)	6.685						
Cv (ft²/Day)	0.0218						

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ___

# Logarithmic Time [6] 4.000 tsf

ASTM D-2435



Tungent Construction Results							
T90 (Min)	NA						
T50 (Min)	5.848						
Cv (ft²/Day)	0.0162						

Project Name: Deer River Project Number: 19-1101-0184

Checked By:

Date: ____

# Logarithmic Time [7] 8.000 tsf

ASTM D-2435



Tangent Construction Results				
T90 (Min)	NA			
T50 (Min)	3.483			
Cv (ft²/Day)	0.0191			

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/20/2022

Checked By: _

Date: ____

#### Logarithmic Time [8] 2.000 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	NA				
Cv (ft²/Day)	NA				

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/21/2022

Checked By: _

Date: ____

## Logarithmic Time [9] 0.500 tsf

ASTM D-2435



Tangent Construction Results				
T90 (Min)	NA			
T50 (Min)	NA			
Cv (ft²/Day)	NA			

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

#### Logarithmic Time [10] 0.125 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	NA				
Cv (ft²/Day)	NA				

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

#### Final Voids [Log]

ASTM D-2435



Preconsolidation Stress (tsf)	1.014			Cc	0.714	Cr 0.401		
	BEFORE AFTER Liquid Limits			0	Test Dat	Test Date 6/22/2022		
Moisture (%)	154.6	41.0	Plastic Limits	0		, ,		
Dry Density (pcf)	39.0	80.7						
Saturation (%)	126.4	103.3						
Void Ratio	3.25	1.06	Specific Gravity	2.66	ASSUME	ASSUMED		
Sample Description Very dark brown, SANDY CLAY with ORGANICS								
Project Number	19-1101-0184 <b>Depth (ft)</b>		Depth (ft) 1	3.5-15.5	Remarks			
Sample Number	T-1 Boring Number		Boring Number N	AB-16 Atterberg - NP		- NP		
Project	Deer River							
Client	MBNEP							
Location								

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/22/2022 Checked By: ____

#### Coefficients of Consolidation

ASTM D-2435



Project Name: Deer River Project Number: 19-1101-0184

Checked By: _____

Date: _
#### Summary

ASTM D-2435

Sample <b>F</b>	Description	Verv (	dark brown. SA	NDY CLAY with	ORGANICS						
Project Number 19-1101-0184		01_0184	Depth (ft)	13 5-15 5		Remarks					
Sample Number		Т 1	51-0104	Boring Nur	nber MB-16		Atterberg - NP				
Project	umber	 Door l	Piwor	Doning Ivui	inder wid-10						
Cliont		MBN	ED								
Location		WIDIN.									
LUCATION											
		Cummulative					T9A	T50			
	Loading	Change in	Specimen	Height of	Vertical		Fitting	Fitting	Т90	<b>T50</b>	
	Sequence	Height	Height	Voids	Strain	Void	Time	Time	Cv	Cv	Sequence
Index	(tsf)	(in)	(in)	(in)	(%)	Ratio	(Hr)	(Hr)	(ft²/Day)	(ft²/Day)	Status
0	0.000	0.0000	0.9930	0.0000	0.0	3.254	0.000	0.000	0.00000	0.00000	ENABLED
1	0.125	0.0172	0.9758	0.7420	1.7	3.173	7.628	1.985	0.01775	0.00388	ENABLED
2	0.250	0.0414	0.9516	0.7178	4.2	3.069	0.032	0.128	4.00775	0.05423	ENABLED
3	0.500	0.0751	0.9179	0.6840	7.6	2.925	0.025	0.075	4.51916	0.08078	ENABLED
4	1.000	0.1173	0.8757	0.6419	11.8	2.745	0.015	0.044	6.32417	0.11278	ENABLED
5	2.000	0.1721	0.8209	0.5870	17.3	2.510	0.015	0.042	4.72306	0.08984	ENABLED
6	4.000	0.2109	0.7821	0.5483	21.2	2.345	0.028	0.058	1.96185	0.04926	ENABLED
7	8.000	0.2573	0.7357	0.5018	25.9	2.146	0.025	0.034	1.54395	0.05946	ENABLED
8	2.000	0.2475	0.7455	0.5117	24.9	2.188	0.000	0.000	0.00000	0.00000	ENABLED
9	0.500	0.2307	0.7623	0.5284	23.2	2.260	0.000	0.000	0.00000	0.00000	ENABLED
10	0.125	0.2166	0.7764	0.5425	21.8	2.320	0.000	0.000	0.00000	0.00000	ENABLED

Project Name: Deer River Project Number: 19-1101-0184

Checked By:_____

Technician: B.Hak Report Created: 7/6/2022

Date: _

## Logarithmic Time [1] 0.125 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	119.069				
Cv (ft²/Day)	0.0039				

Project Name: Deer River Project Number: 19-1101-0184

Checked By: ____

Date: ____

#### Logarithmic Time [2] 0.250 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	7.708				
Cv (ft²/Day)	0.0542				
	-				

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

# Logarithmic Time [3] 0.500 tsf

ASTM D-2435



l angent Construction Results					
T90 (Min)	NA				
T50 (Min)	4.499				
Cv (ft²/Day)	0.0808				

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/24/2022

Checked By: _

Date:

## Logarithmic Time [4] 1.000 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	2.647				
Cv (ft²/Day)	0.1128				

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/25/2022

Checked By: _

Date: ____

## Logarithmic Time [5] 2.000 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	2.529				
Cv (ft²/Day)	0.0898				

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

## Logarithmic Time [6] 4.000 tsf

ASTM D-2435



Tangent Construction Results				
T90 (Min)	NA			
T50 (Min)	3.489			
Cv (ft²/Day)	0.0493			

Project Name: Deer River Project Number: 19-1101-0184

Checked By:_

Date: ____

# Logarithmic Time [7] 8.000 tsf

ASTM D-2435



Tangent Construction Results				
T90 (Min)	NA			
T50 (Min)	2.058			
Cv (ft²/Day)	0.0595			

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/28/2022

Checked By: _

Date:

#### Logarithmic Time [8] 2.000 tsf

ASTM D-2435



l angent Construction Results					
T90 (Min)	NA				
T50 (Min)	NA				
Cv (ft²/Day)	NA				

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

#### Logarithmic Time [9] 0.500 tsf

ASTM D-2435



l angent Construction Results					
T90 (Min)	NA				
T50 (Min)	NA				
Cv (ft²/Day)	NA				

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

#### Logarithmic Time [10] 0.125 tsf

ASTM D-2435



Tangent Construction Results					
T90 (Min)	NA				
T50 (Min)	NA				
Cv (ft²/Day)	NA				

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 7/1/2022

Checked By: _

Date: ____

#### Final Voids [Log]

ASTM D-2435



Preconsolidation Stress (tsf)	0.742			Cc	0.567	<b>Cr</b> 0.313
	BEFORE	AFTER	Liquid Limits	79	Test Dat	e 6/21/2022
Moisture (%)	60.2	36.5	Plastic Limits	55		, ,
Dry Density (pcf)	65.8	80.6				
Saturation (%)	105.1	91.5				
Void Ratio	1.52	1.06	Specific Gravity	2.66	ASSUME	D
Sample Description	Gray, CLAY					
Project Number	19-1101-0184		Depth (ft)	8.5-10.5	Remarks	
Sample Number	T-1		Boring Number	MB-18		
Project	Deer River					
Client	MBNEP					
Location						

Project Name: Deer River Project Number: 19-1101-0184

#### Coefficients of Consolidation

ASTM D-2435



Project Name: Deer River Project Number: 19-1101-0184

Checked By: ____

Date: _

#### Summary

ASTM D-2435

Sample Description		Gray,	CLAY								
Project Number		19-11	01-0184	Depth (ft)	8.5-10.5		Remarks				
Sample N	lumber	T-1		Boring Nu	umber MB-18						
Project		Deer	River								
Client		MBN	EP								
Location											
		<b>C</b> 1.0					TOO	TEO			
	Loading	Cummulative Change in	Specimen	Height of	Vertical		190 Fitting	150 Fitting	<b>T9</b> 0	T50	
	Sequence	Height	Height	Voids	Strain	Void	Time	Time	Cv	Cv	Sequence
Index	(tsf)	(in)	(in)	(in)	(%)	Ratio	(Hr)	(Hr)	(ft²/Day)	(ft²/Day)	Status
0	0.000	0.0000	0.9920	0.0000	0.0	1.523	0.000	0.000	0.00000	0.00000	ENABLED
1	0.125	0.0157	0.9763	0.5825	1.6	1.479	0.039	0.101	3.67558	0.07609	ENABLED
2	0.250	0.0365	0.9555	0.5616	3.7	1.426	2.346	0.437	0.05603	0.01625	ENABLED
3	0.500	0.0771	0.9149	0.5210	7.8	1.323	0.104	0.617	1.00509	0.00985	ENABLED
4	1.000	0.1330	0.8590	0.4652	13.4	1.181	3.269	0.425	0.02657	0.01120	ENABLED
5	2.000	0.2005	0.7915	0.3977	20.2	1.010	4.297	0.563	0.01437	0.00581	ENABLED
6	4.000	0.2669	0.7251	0.3312	26.9	0.841	4.263	0.609	0.00922	0.00335	ENABLED
7	8.000	0.3351	0.6569	0.2631	33.8	0.668	2.942	0.606	0.00649	0.00177	ENABLED
8	2.000	0.3041	0.6879	0.2941	30.7	0.747	0.000	0.000	0.00000	0.00000	ENABLED
9	0.500	0.2627	0.7293	0.3355	26.5	0.852	0.000	0.000	0.00000	0.00000	ENABLED
10	0.125	0.2274	0.7646	0.3707	22.9	0.941	0.000	0.000	0.00000	0.00000	ENABLED

Project Name: Deer River Project Number: 19-1101-0184

Checked By:_____

_ Date: _

#### Logarithmic Time [1] 0.125 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	6.050							
Cv (ft²/Day)	0.0761							

Project Name: Deer River Project Number: 19-1101-0184

Checked By:_

Date: ____

#### Logarithmic Time [2] 0.250 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	26.242							
Cv (ft²/Day)	0.0163							

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

## Logarithmic Time [3] 0.500 tsf

ASTM D-2435



Tangent Construction Results									
T90 (Min)	NA								
T50 (Min)	37.007								
Cv (ft²/Day)	0.0098								

Project Name: Deer River Project Number: 19-1101-0184

Checked By:_

Date: ____

## Logarithmic Time [4] 1.000 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	25.504							
Cv (ft²/Day)	0.0112							

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

## Logarithmic Time [5] 2.000 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	33.773							
Cv (ft²/Day)	0.0058							

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ___

#### Logarithmic Time [6] 4.000 tsf

ASTM D-2435



langent Construction Results								
T90 (Min)	NA							
T50 (Min)	36.539							
Cv (ft²/Day)	0.0033							

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

## Logarithmic Time [7] 8.000 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	36.356							
Cv (ft²/Day)	0.0018							

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/27/2022

Date: ____

#### Logarithmic Time [8] 2.000 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	NA							
Cv (ft²/Day)	NA							

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/28/2022

Checked By: _

Date: ____

#### Logarithmic Time [9] 0.500 tsf

ASTM D-2435



Tangent Construction Re	suns
T90 (Min)	NA
T50 (Min)	NA
Cv (ft²/Day)	NA

Project Name: Deer River Project Number: 19-1101-0184

Checked By: _

Date: ____

#### Logarithmic Time [10] 0.125 tsf

ASTM D-2435



Tangent Construction Results								
T90 (Min)	NA							
T50 (Min)	NA							
Cv (ft²/Day)	NA							

Project Name: Deer River Project Number: 19-1101-0184

Test Date: 6/30/2022

Checked By: _

Date: ____

#### Dauphin Island Causeway Site Data

#### FIGURES



Figure 1. Geotechnical Borings and CPT Probing Locations

#### APPENDIX B

Mud-Rotary and Marine Boring Logs

	G	eo	syntec⊳					B	OR	ING	5 NU	JME	BER PAG	<b>MR</b> E 1 C	<b>t-1</b>
HIN ISLAND.GPJ	CLIENT Mobile County, Alabama PROJECT NUMBER GK7115				PROJECT NAME Dauphin Island Causeway PROJECT LOCATION Mobile County, Alabama										
AUPF	DATE	STAR	TED _2/11/20         COMPLETED _2/11/20	MU	JD LIN	E ELEVAT	<b>FION</b> -3.0	03 ft		HOLE	SIZE	3.78	5 in		
OS D	DRILL	ING CO	ONTRACTOR Southern Environmental Services	_ GF	ROUNE	WATER I	LEVELS:								
S/GE	DRILL	ING M	ETHOD Mud Rotary/Barge	AT TIME OF DRILLING N/A											
ΡOΘ	LOGO	GED BY	K. Carlton         CHECKED BY         C. Hug	_	AT	END OF D	RILLING	N/A							
RING	NOTE	S Nor	thing: 114538.23 Easting: 1767644.17	_	AF		_ING _N/A	\			1		1		
ION/MR DRILLING/BO	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)	LABORATORY SAMPLE ID	USCS LASSIFICATION	MOISTURE CONTENT (%)	RAVEL CONTENT (%)	SAND CONTENT (%)	INES CONTENT (%)			
ELD INVESTIGAT	0		(0') Water.					0		5	0	(Note 1)			
E-	-		(3.03') No recovery - very soft material.				-								
ECH_PHASE05	5	-		SP	ТО	WOH	_								
DAUPHIN ISLAND/GEOT	- - 10		(8.03') FAT CLAY with SAND (CH); dark gray, saturated, very soft, high plasticity, with oyster shell fragments and strong organic odor.	SP	т 75	WOH	20B007	-	81.7	0.2	25.9	73.9 S:46 C:27.9	69	21	48
	- - - - -		(13.03') Shell Fragments; poor recovery, shell fragments blocking sampler (mix mud to assist with drilling).	SP	т 6	4-3-2 (5)	-								
- 4/9/20 12:11 - N:\M\	20		(18.03') POORLY GRADED SAND (SP); gray, saturated, very loose, fine-medium sand with approximately 50% shell fragments (poor recovery).	SP	т 100	2-2-1 (3)	-								
GDT	-														
SINT STD US	-		(22.03') No recovery.	SH	1 0										
GSF DIC - G	25		(24.03') No recovery.	S⊦	I 0	_									
GEOTECH BH COLUMNS W COMP SAMPLE	Note 1	1: Hydrom S = Silt ( C = Clay	Bottom of borehole at 26.0 feet.												

C	ieo	syntec⊳					B	OR	ING	5 NL	JME	BER PAG	E 1 C	<b>{-9</b> )F 2	
65		consultants										(*	Vote 1	/	
	ENT Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway												
	JECT N	UMBER _ GK7115	PROJECT LOCATION Mobile County, Alabama												
	E STAR	TED         1/15/20         COMPLETED         1/15/20	MUD LINE ELEVATION _3.18 ft HOLE SIZE Unknown												
	LING C	ONTRACTOR Unknown	GROUND WATER LEVELS:												
	LING M	ETHOD Mud rotary		AT		RILLING	<u>N/A</u>								
		M. Coaker CHECKED BY C. Hug		AT		RILLING	<u>N/A</u>								
	ES NO	tning: 126438.36 Easting: 1772284.95	AFTER DRILLING N/A												
	() GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)	LABORATORY SAMPLE ID	USCS CLASSIFICATION	MOISTURE CONTENT (%)	GRAVEL CONTEN (%)	SAND CONTENT (%)	FINES CONTENT (%)	LIQUID			
	(((	(0') Water.									e 2)				
	(()										(Note				
	-///	(3.18') FAT CLAY with SAND (CH); gray, very soft.	SPT		woн										
5	-///												<u> </u>		
		(5.18') SANDY LEAN CLAY (CL); gray and orange, firm to stiff.	SH			20C001	-	22.4	1.6	43.2	55.2 S: 20.5 C:34.7	40	13	27	
	-///	(7.18') FAT CLAY with SAND (CH), stiff.			457						84.6				
	-///		SPT		4-5-7 (12)	20B008		23.6	0.0	15.4	S: 45.9 C:38.7	54	13	41	
		(13.18') Firm.	<b>X</b> ISPT		3-4-4	-									
15	_///				(8)	-									
		(16.18') FAT CLAY (CH); gray, very soft.													
10.71					woн	-									
20						_									
		(21.18') FAT CLAY (CH); gray, brown and black, very soft, with organic lenses.													
			SPT		1-1-1 (2)	20B009		94.3	0.0	6.0	94.0 S: 40.8 C:53.2	95	33	62	
25 29 29															
		(26.18') SANDY SILT (ML); gray, very stiff.													
≣ 00- ≥ 30	-		SPT		7-12-5 (17)	20B010		32.9	0.0	48.4	51.6	23	20	3	
		(31.18') I FAN CLAY (CL): grav, very soft	_												
		נסיד דס / בבאות טבאד נטבן, yray, עסוץ שטונ.													
35			SPT		1-2-2 (4)	20B011	_	40.1	0.0	1.5	98.5	40 S: 76.4 C:22.1	19	21	

G	eo	syntec ^D					В	OR	ING	i NL	JME	BER PAGI	<b>MR</b> ≣ 2 0	<b>-9</b> F 2	
CLIEN	NT Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway												
PROJ	ECT N	UMBER _GK7115	PROJECT LOCATION _Mobile County, Alabama												
C DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)	LABORATORY SAMPLE ID	USCS CLASSIFICATION	MOISTURE CONTENT (%)	GRAVEL CONTENT (%)	SAND CONTENT (%)	FINES CONTENT (%)	LIQUID LIMIT			
		(31.18') LEAN CLAY (CL); gray, very soft. <i>(continued)</i> (36.18') FAT CLAY with SAND (CH); gray, soft to firm, medium sand, with oyster shells.	-								70.0				
			SPT		2-2-3 (5)	20B012		44.0	7.0	21.0	72.0 S:38 C:34	62	20	42	

Bottom of borehole at 39.7 feet.

Note 1: Boring completed by Southern Earth Sciences, Inc.

Note 2: Hydrometer results included underneath total fines content: S = Silt component in % C = Clay component in %

G	eo	syntec⊳					BC	DRII	NG	NUI	MBE	ER I PAG	<b>MR-</b> E 1 C	<b>10</b> 0F 2	
	(	consultants													
CLIE	NT Mo	bile County, Alabama	_ PRO	JECT		Dauphin Is	land C	ausew	/ay						
PRO.	JECT NU	JMBER GK7115	PROJECT LOCATION Mobile County, Alabama												
DATI	E STAR	COMPLETED         2/27/20	MUD LINE ELEVATION2.1 ft HOLE SIZE3.785 in												
DRIL	LING CO	ONTRACTOR Southern Environmental Services													
DRIL		ETHOD Mud Rotary/Barge	_	AT			<u>N/A</u>								
	GED BY	K. Carlton CHECKED BY C. Hug	_	AT			N/A								
NOT		uning. 129370.00 Easung. 1774092.03	_						ТЕ	Ι.	1.	ΔΤ	TERRE	RC	
	0		JE L	۲ %	۵Ŵ	, K [□]	l õ	щ(%)	ITEN	EN1				S	
PTH ft	Hag	MATERIAL DESCRIPTION	́—́	/ER		SATC	SCS	IN THE	б © ®		NO §		₽L	È×	
	GRA		MPL	S	N < COL	BOR	SSIF	10IS	Щ,		S S S		AST IMI-	STIC DEC	
			SA	R		N N	CLA	20	SRA/	SAN	EIN BIN			PLA LA	
0	$\sim$	(0') Water.									()				
											lote				
		(2.1') No recovery - too soft.		_	MOLL						٤				
Ļ			SPT	0	WOH										
5															
_	-	(5.6') WELL-GRADED SAND (SW); gray, saturated, very		100	2-2-2	_									
_		loose, fine-medium grained with some silt.		100	(4)	_									
_	-///	yellow, soft, high plasticity.			-						86.4				
-			SH	100		20C002	СН	40.5	2.0	11.6	S:37.4	67	19	48	
10	-///				-						C: 49				
_															
-		(12.1') Becomes gray, soft.			1-1-2						92.8				
-			A SPT	100	(3)	20C005	СН	56.7	0.0	7.2	S:42.2 C: 50.6	67	21	46	
- 15															
_		(17.1') Very soft.	SPT	100	1-1-1										
_			<b>^</b>		(2)	-									
20															
-					-										
-		(21.1') SANDY FAT CLAY (CH); with shell fragments, oyster shells with large fragments and whole shells	SH	38		20C006	СН	63.3	14.0	27.0	59.0	69	25	44	
_		present (bagged sample).			-										
-															
_ 25															
F											58.9				
-			SH	100		20C003	СН	51.2	0.0	41.1	S:34.9	56	20	36	
-											U: 24				
30															
L		(32.1') SANDY LEAN CLAY (CL); gray, medium dense,	SPT	100	6-8-9	20C007	CL	37.0	0.5	43.2	56.3	31	19	12	
Ļ		เบพ piasuoity, ราเอก กลุปเปยาเร.	<b>–</b> –		(17)										
35															

#### **BORING NUMBER MR-10** Geosyntec[▷] PAGE 2 OF 2 GEOTECH BH COLUMNS W COMP SAMPLE GSF DIC-GINT STD US;GDT - 4/9/20 11:58 - N;MMMOBILE COUNTY AL/DAUPHIN ISLAND/GEOTECH PHASE05/01 FIELD INVESTIGATIONMR DRILLING/BORING LOGS/GEOS DAUPHIN ISLAND, GPJ consultants CLIENT Mobile County, Alabama PROJECT NAME Dauphin Island Causeway PROJECT NUMBER GK7115 PROJECT LOCATION Mobile County, Alabama ATTERBERG USCS CLASSIFICATION SRAVEL CONTEN (%) SAND CONTENT (%) FINES CONTENT (%) SAMPLE TYPE % LABORATORY SAMPLE ID MOISTURE CONTENT (%) LIMITS BLOW COUNTS (N VALUE) GRAPHIC LOG RECOVERY DEPTH (ft) PLASTICITY INDEX PLASTIC LIMIT LIQUID MATERIAL DESCRIPTION 35 (32.1') SANDY LEAN CLAY (CL); gray, medium dense, low plasticity, shell fragments. (continued) (37.1') FAT CLAY with SAND (CH); gray, saturated, soft, 1-2-2 SPT 100 high plasticity, some shell fragments. (4) 40 (42.1') With shell fragments. 83.0 S: 31.5 1-2-2 SPT 100 20C008 СН 69.3 0.0 17.0 80 22 58 (4) 45 (47.1') Firm. 1-2-4 SPI 100 (6) Bottom of borehole at 48.6 feet. Note 1: Hydrometer results included underneath total fines content: S = Silt component in % C = Clay component in %

G	eo	syntec⊳					BC	DRII	NG	NUI	MB	ER I PAG	<b>MR-</b> E 1 (	- <b>12</b> DF 2		
5	(	consultants														
	NT Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway													
PRO	JECT NI	JMBER _ GK7115	PROJECT LOCATION Mobile County, Alabama													
DATI	E STAR	TED _2/3/20         COMPLETED _2/3/20	MUD LINE ELEVATION         -2.8 ft         HOLE SIZE         3.785 in													
DRIL	LING C	ONTRACTOR Southern Environmental Services	GROUND WATER LEVELS:													
DRIL	LING M	ETHOD Mud Rotary/Barge	AT TIME OF DRILLING <u>N/A</u>													
LOG	GED BY	K. Carlton CHECKED BY C. Hug		AT	end of d	RILLING	N/A									
NOT	ES Nor	thing: 122161.17 Easting: 1769652.42		AFT	ER DRILL	ING N/A	۱									
			ш	%		~	N		INT	Г	NT	AT	TERBE	ERG		
	₽		ΓYΡ	RY .	_s L⊡s_	l S ⊟	ATIC	T (%	NTE	1 E L	I I I I I I I I I I I I I I I I I I I			  ≻		
₩ EPT		MATERIAL DESCRIPTION	Ц	DVE		IPLI	IFIC:	STL	08	00%	IO S S	≘⊨	E E	E E E		
	- GR		AMF	U U U U	^m O ²	SAN	U ASS	NO NO	VEI	g	ES	l₫∃	I_AS LIM	AST		
0			Ś	R			CL	0	GRA	SA	Ľ Ľ	-	<b>_</b>	Ы		
	()	(0') Water.									ş 2)					
											Note					
Ì				-						-			-	-		
		(2.8') FAT CLAY with SAND (CH); dark gray, very soft, high plasticity, trace sand and organics.	SPT	100	woн	20B013	СН	80.7	0.0	24.5	75.5 S:36.9	76	24	52		
5											C:38.6					
											00.0					
		(7.8) FAT CLAY (CH) Very Soit.	SPT	100	woн	20B014	СН	145.1	0.0	1.1	98.9 S:42.9	155	36	119		
10			SH	67	(Note 1)	208015	СН	150.0	02	0.9	98.9	145	33	112		
				07		200013		150.5	0.2	0.5	S:37	145	- 55	112		
											0.01.9					
15	_////		SH	0												
2	_///	(15.3') FAT CLAY (CH); light gray and orange, firm,														
_	-///	nigh plasticity.	SH	100												
2	-///				124						91.6					
	-///		SPT	100	(6)	20B016	СН	29.3	0.0	8.4	S:36.8 C:54.8	73	19	54		
20	-////															
-	-///															
		(21.8') CLAYEY SAND (SC).									38.2					
_			SH	100		20B017	SC	26.0	0.0	61.8	S:15.8	41	17	24		
5_										+	0.22.4		+			
25																
8-																
5				400	2-2-2	0000015		40.5		70.0		10		1-		
-		(28.3') Gray-dark gray, very loose.	<b>A</b> SPT	100	(4)	20B018	SC	49.8	0.0	76.6	23.4	40	25	15		
30																
-																
8-																
	- <u>     </u>	(32.8') SILT (ML); gray, firm, low plasticity, trace		400	2-3-4	0000015		40.5			92.3	-	00	-		
-		fine sand.	<b>A</b> SPT	100	(7)	208019	ML	40.2	0.0	1.7	5:73.4 C:18.9	33	26	/		
1 35				1	1	1	1	1	1	1	1	1	1	1		

(		PC	syntec					BC	DRI	NG	NUI	MBE		<b>VR-</b> E 2 C	- <b>12</b> DF 2
PJ.			consultants										1710		
	.IEN	<b>IT</b> _М	obile County, Alabama	_ PRO	OJECT		Dauphin Is	land C	ausew	ay					
ISI µ ₽F	SOJI		IUMBER _ GK7115	_ PRO	OJECT		<b>N</b> Mobile	e Cour	nty, Ala	bama					
DAUPI				PE	%		λ	NOI.	= %)	TENT	ENT	ENT	AT	TERBE	ERG S
VG LOGS/GEOS	(ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TY	RECOVERY	BLOW COUNTS (N VALUE	LABORATO SAMPLE II	USCS CLASSIFICAT	MOISTURI CONTENT (	RAVEL CON ⁻ (%)	SAND CONTE (%)	FINES CONTI (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
	-		(32.8') SILT (ML); gray, soft, low plasticity, trace fine sand. <i>(continued)</i>							U					
	-		(37.8') FAT CLAY (CH); light gray, firm, high plasticity.	SPT	100	2-3-5 (8)	20B020	СН	70.9	0.0	8.2	91.8 S:40.4 C:51.4	94	26	68
PHASE05/01_FIELD INVESTIGA			(42.8') Same as above.	SPT	100	2-2-3 (5)	-								
HIN_ISLAND/GEOTECH			(47.8') Some mottled tan/light brown coloration with the gray overall color, stiff.	SPT	- 100	4-4-5 (9)	20B021	СН	35.9	0.0	4.7	95.3 S:56.9 C:38.4	52	18	34
	- - - 5_		(52.8') Gray, firm, with trace silt and no sand, stiff.	SPT	100	3-4-5 (9)	-								
/9/20 11:40 - N:\M\MC	-		(57.8') Same as above - poor recovery.	SPT	100	4-5-6 (11)	-								
EOTECH BH COLUMNS W COMP SAMPLE GSF DIC - GINT STD US.GDT -	lote 1	1: SPT : 2: Hydi S = 5 C = (	sample advanced from 5-7 ft below mud line, recovery 24 inches. Following She rometer results included underneath total fines content: Silt content in % Clay content in %	lby Tube v	vas adva	anced from 6-	8 ft below mu	ud line, r	ecovery	16 inche	es.				

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#### **BORING NUMBER MR-26** Geosyntec[▶] PAGE 1 OF 2 consultants CLIENT Mobile County, Alabama **PROJECT NAME** Dauphin Island Causeway PROJECT LOCATION Mobile County, Alabama PROJECT NUMBER GK7115 DATE STARTED 04/06/21 **COMPLETED** 04/06/21 MUD LINE ELEVATION _-2.0 ft HOLE SIZE 3.785 in DRILLING CONTRACTOR _ Southern Earth Sciences, Inc. **GROUND WATER LEVELS:** DRILLING METHOD ______ Mud Rotary/Tripod Barge AT TIME OF DRILLING N/A LOGGED BY T. Wilson CHECKED BY AT END OF DRILLING N/A NOTES Latitude: ~30 deg 21' 01" N; Longitude: ~88 deg 07' 09" W. AFTER DRILLING N/A ATTERBERG USCS CLASSIFICATION SRAVEL CONTEN (%) FINES CONTENT (%) SAND CONTENT DEPTH (ft below mud line) % LABORATORY SAMPLE ID SAMPLE TYPE LIMITS CONTENT (%) GRAPHIC LOG BLOW COUNTS (N VALUE) MOISTURE RECOVERY PLASTICITY INDEX PLASTIC (%) LIQUID MATERIAL DESCRIPTION LIMIT 0 GEOTECH BH COLUMNS W COMP SAMPLE GSF DIC - GINT STD US.GDT - 06/09/21 14:18 - C:/USERS/USER/UERKTOP/GINT/PROJECTS/GEOSYNTEC/GEOS DAUPHIN ISLAND.GP. (0') SILT (MH); dark gray, wet, soft, low plasticity. WOH-1-1 SPT 100 (0.3') CLAY (CH); brown, wet, soft, high plasticity, trace (2) silt. (5') CLAY (CH); light gray, moist, firm, high plasticity. 2-2-2 SPT 100 (5.8') Silt stringers. (4) SH 100 10 (10') With brown mottling, without silt stringers. 2 - 2 - 3100 SP1 (5) (15') Same as 11-16 feet. 2-1-1 SPT 100 (2) (20') ORGANICS (PT); wood. 3-2-4 SPT 83 (20.5') CLAY (CH); light gray with brown mottling, moist, (6) firm, high plasticity. (21') SILT (MH); gray, wet, soft, low plasticity, trace fine sand. 25 (25') CLAYEY SAND (SC); gray, wet, dense, poorly 13-7-9 SPT 50 graded, fine-grained, with trace shell fragments. (16) 30 (30') SILT (MH); gray, wet, soft, medium plasticity, with 2-1-1 SPT 100 clay, trace shell fragments. (2) 35
### **BORING NUMBER MR-26**

PAGE 2 OF 2

consultants

CLIENT Mobile County, Alabama

Geosyntec▷

PROJECT NAME Dauphin Island Causeway

	PROJ		JMBER _ GK7115	PRO	DJECT	LOCATIO	N Mobil	e Cour	ity, Ala	bama					
	DEPTH ft below mud line)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)	ABORATORY SAMPLE ID	USCS LASSIFICATION	MOISTURE CONTENT (%)	AVEL CONTENT (%)	AND CONTENT (%)	NES CONTENT (%)	LIQUID LIMIT	PLASTIC	
	<u>35</u>  		(35') CLAY (CH); greenish gray, moist, firm, high plasticity, trace silt.	SPT	100	2-2-2 (4)		Ö		8	S	Ē			ď
IN ISLAND.GPJ	40		(40') Trace shell fragments.	SPT	100	2-3-3 (6)									
CIGEOS DAUPH	45		(45') With increased silt, trace shell and wood fragments	SH	100										
SIGEOSYNTEC	 		(45) with increased slit, trace shell and wood fragments.	SPT	100	3-3-4 (7)									
GINT/PROJEC	 50 		(50') SAND (SP); gray, wet, loose, poorly graded, medium-grained with silt and clay, with trace wood	SPT	-	7-6-10 (16)									
- C:\USERS\USER\DESKT			Bottom of borehole at 51.5 feet below mud line.												
US.GDT - 06/09/21 14:18															
E GSF DIC - GINT STD															
<b>VS W COMP SAMPLI</b>															
EOTECH BH COLUMI															

#### **BORING NUMBER MR-18** Geosyntec[▶] PAGE 1 OF 2 consultants CLIENT Mobile County, Alabama PROJECT NAME Dauphin Island Causeway PROJECT LOCATION Mobile County, Alabama PROJECT NUMBER GK7115 DATE STARTED 04/07/21 _____ COMPLETED __04/20/21 MUD LINE ELEVATION 0.0 ft HOLE SIZE 3.785 in DRILLING CONTRACTOR Southern Earth Sciences, Inc. **GROUND WATER LEVELS:** DRILLING METHOD ______ Mud Rotary/Tripod Barge AT TIME OF DRILLING N/A LOGGED BY T. Wilson/K. Carlton CHECKED BY AT END OF DRILLING N/A NOTES _Latitude: 30 deg 19' 0.66" N; Longitude: 88 deg 8' 12.12" W. AFTER DRILLING N/A MOISTURE CONTENT (%) RAVEL CONTENT (%) ATTERBERG USCS LASSIFICATION INES CONTENT (%) AND CONTENT (%) DEPTH (ft below mud line) LABORATORY SAMPLE ID SAMPLE TYPE % GRAPHIC LOG BLOW COUNTS (N VALUE) RECOVERY LIQUID MATERIAL DESCRIPTION

LIMITS

ASTICITY INDEX

DEPT	O(ft below mud	GRAPH LOG	MATERIAL DESCRIPTION	SAMPLE T	RECOVER	BLOW COUNT WALU	LABORAT	USCS CLASSIFIC/	MOISTU	GRAVEL COI (%)	SAND CON (%)	FINES CON (%)	LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
	_		(0') No recovery.	SPT	0	WOH									
	- - 5														
	-		(5') SILTY SAND (SM); gray, wet, loose, poorly graded, fine-grained, with abundant shell fragments.	SPT	100	2-4-2 (6)									
	10		(10') CLAY (CH); gray, wet, soft, high plasticity, with		67	1-1-1									
	_		abundant shell fragments at 16 feet and trace shells with depth.		07	(2) 2-1-1									
	_		(11') No recovery. (11.5') CLAY (CH); gray, wet, soft, high plasticity, with	<b>A</b> SPT	100	(2)									
	-		abundant shell fragments at 16 feet and trace shells with depth.												
	-		(15') SILT (MH); gray, wet, soft, medium plasticity, with clay and few fine sand, trace shells.	SPT	100	2-1-1 (2)									
	20		(20') FAT CLAY (CH); gray, wet, soft, high plasticity, with			3-2-3									
	_		abundant silty sand lenses and stringers.	SPT	100	(5)									
	_			SH	0										
	-														
			(25') SAND (SP); light brown, wet, loose, poorly graded,	SPT	100	1-2-1									
			(25.8') ORGANIC SILT (MH); brown, wet, firm, low plasticity, increasing clay with depth, abundant wood fragments.			(3)									
	_		(30') SAND (SP); light brown, wet, dense, poorly graded, fine-grained, trace shells.	SPT	100	9-3-5 (8)									
	-														
	35														

### **BORING NUMBER MR-18**

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consultants

Geosyntec[▶]

CLIENT Mobile County, Alabama PROJECT NAME Dauphin Island Causeway PROJECT NUMBER GK7115 PROJECT LOCATION Mobile County, Alabama ATTERBERG USCS CLASSIFICATION GRAVEL CONTEN (%) SAND CONTENT (%) FINES CONTENT (%) SAMPLE TYPE တ္တ DEPTH တ(ft below mud line) % LABORATORY SAMPLE ID MOISTURE CONTENT (%) LIMITS BLOW COUNTS (N VALUE) GRAPHIC LOG RECOVERY PLASTICITY INDEX PLASTIC LIMIT LIQUID MATERIAL DESCRIPTION (35') CLAYEY SILT (MH); gray, moist, firm, medium 2-3-2 100 SPT plasticity, some clay, homogeneous. (5) (36') CLAY (CH); greenish gray, moist, very firm, homogeneous. GEOTECH BH COLUMNS W COMP SAMPLE GSF DIC - GINT STD US.GDT - 06/09/21 14:18 - C:UVSERS/USER/DESKTOP/GINT/PROJECTS/GEOSYNTEC/GEOS DAUPHIN ISLAND.GP-40 (40') Shelby tube sample collected. SH 100 45 (45') CLAY (CH); greenish gray, moist, very firm, high 3-2-3 SPT 100 plasticity, some silt, homogeneous. (5) 50 (50') Very firm, little to no silt or sand. 3-3-4 SPT 100 (7) Bottom of borehole at 51.5 feet below mud line.

### Geosyntec[▶] consultants CLIENT Mobile County, Alabama _____ PROJECT NUMBER GK7115

#### **BORING NUMBER MR-21**

PAGE 1 OF 1

PROJECT NAME Dauphin Island Causeway

PROJECT LOCATION Mobile County, Alabama

MUD LINE ELEVATION _-3.5 ft HOLE SIZE _3.785 in

**GROUND WATER LEVELS:** 

AT TIME OF DRILLING N/A AT END OF DRILLING N/A

NOTES Latitude: ~30 deg 19' 39" N; Longitude: ~88 deg 08' 00" W.

DRILLING METHOD Mud Rotary/Tripod Barge

DATE STARTED 04/05/21 COMPLETED 04/05/21

DRILLING CONTRACTOR Southern Earth Sciences, Inc.

LOGGED BY T. Wilson CHECKED BY

AFTER DRILLING N/A

	ine)			PE	%		RY	NOI	Е %)	TENT	ENT	ENT	ATT	lerbe Limits	RG
	TH I pnu	UHC DHC			ERY	NTS		CS	NT	NOC (9	ONTE ()	ITNC ()	0.	0	È
		LO	MATERIAL DESCRIPTION	MPLI	COV	BLO	AMP	US SSIF	IOIS ⁻	ЕГ (%)	0	00 00 00	<b>NIT</b>	ASTI	DEV
2	o(ft be			SAN	RE		S	CLAS	l≥õ	RAV	SAN	FINE		2-	PLAS
ND.GF	0		(0') No recovery.		0	WOH				0					
I ISLA							1								
NHA															
S DAI															
C/GEO	5	╎╻╻╻╽	(5') CILT (MU); gray, acturated acft popplastic				-								
NTEO			(5.8') WELL-GRADED SAND (SW); gray, saturated,	SPT	83	(6)									
EOSY			loose, with silt, 90% shell fragments.				1								
CTS/G															
SOJEC	 10														
<b>INTPF</b>			(10') CLAY (CH); gray, saturated, very soft, high	SPT	100	WOH	1								
OP/G			plasticity, with shell hagments from 17.5-10 feet.	<b>A</b>			-								
ESKT															
SER/D															
RS/U	15		(15') CLAY (CH): light gray with brown mottling moist			3_3_3	-								
:\USE			soft, high plasticity, with shell fragments from 22.5-22.7	SPT	67	(6)	-								
18 - C		1	(16') No recovery.		-										
21 14		1	(17') Shelby tube sample collected.	SH											
/60/90			Bottom of borehole at 19.0 feet below mud line.												
DT - (															
O US.G															
T STC															
- GIN															
F DIC															
-E GS															
SAMP															
S MMC															
V CO															
SNMU															
1 COL															
CHB															
EOTE															
٥															

#### **BORING NUMBER MR-21R** Geosyntec[▶] consultants CLIENT Mobile County, Alabama PROJECT NAME Dauphin Island Causeway PROJECT NUMBER GK7115 PROJECT LOCATION Mobile County, Alabama DATE STARTED 04/13/21 COMPLETED 04/20/21 MUD LINE ELEVATION _-3.0 ft HOLE SIZE _3.785 in DRILLING CONTRACTOR Southern Earth Sciences, Inc. **GROUND WATER LEVELS:** DRILLING METHOD Mud Rotary/Tripod Barge AT TIME OF DRILLING N/A LOGGED BY K. Carlton CHECKED BY AT END OF DRILLING N/A NOTES _Latitude: ~30 deg 19' 39" N; Longitude: ~88 deg 08' 00" W. AFTER DRILLING N/A

PAGE 1 OF 2

ATTERBERG

GPJ	O(ft below mud line	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPI	RECOVERY %	BLOW COUNTS (N VALUE)	LABORATOR' SAMPLE ID	USCS CLASSIFICATIC	MOISTURE CONTENT (%	GRAVEL CONTE (%)	SAND CONTEN (%)	FINES CONTEN (%)	LIMIT	
AND.(			(0') No recovery.	SPT	0	WOH								
HUP														
SEOS	5													
			(5') SILT (MH); gray, saturated, soft, high plasticity, some clay, homogeneous.	SPT	100	WOH								
NXSO:		╎┚┚┚┚	(6.5') Shelby tube sample collected.		400									
:TS/GE				SH	100	_								
ROJEC	 10													
		<u></u>	(10') No recovery.	SPT	33	5-0-0 (0)								
10P/G			shell fragments.			(0)								
DESK			(11.1) SILT (MH); gray, moist, soft, high plasticity, some clay, homogeneous.											
USER	 15		(13') Shells from approximately 20-23 feet; difficult drilling (almost refusal).											
SERS				SPT	67	2-4-3								
- C:\U			(16') CLAY (CH); gray, saturated, soft, high plasticity, some silt and fine sand.			(7)								
14:18														
6/09/21	20													
DT - 0(				SPT	100	2-2-2								
DIS.G			(21') CLAYEY SAND (SC); gray, wet, dense, fine-grained, with some wood/peat lenses.			(4)								
VT STI			(21.5') Fine- to medium-grained.											
-0 -														
SF DI			(25.5') SAND (SP): gray wet dense fine-grained shell	SPT	67	14-18-16								
APLE O			fragments present at 32.5 feet.			(34)								
P SAN														
NNS V	30		(30') No recovery.	SPT	0	1-2-1								
COLU						(3)								
CH BH														
EOTE														
U	30			1				I						

# Geosyntec[▶]

### **BORING NUMBER MR-21R**

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consultants

CLIENT Mobile County, Alabama

PROJECT NAME Dauphin Island Causeway

P	ROJ	ECT NU	JMBER _ GK7115	PRO	DJECT	LOCATIO	N Mobi	e Cour	nty, Ala	bama					
	ine)			ЪЕ	%		ЪЧ	NOI	ш(%	TENT	ENT	ENT	AT	FERBE	RG
DEPTH	G(ft below mud I	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TY	RECOVERY	BLOW COUNTS (N VALUE	LABORATO SAMPLE II	USCS CLASSIFICAT	MOISTURI CONTENT (	GRAVEL CON (%)	SAND CONTI (%)	FINES CONT (%)	LIQUID	PLASTIC LIMIT	PLASTICITY INDEX
	- - - 40		(35') CLAY (CH); greenish gray, moist, firm, high plasticity, inferred contact.	SPT	100	2-1-3 (4)									
SEOS DAUPHIN ISLAND.G	- - - 45		(40') Trace fine sand.	SPT	100	2-1-2 (3)									
SYNTEC/G	-		(45') Shelby tube sample attempted.	SH	0										
	- - 50		(47') CLAY (CH); greenish gray, moist, firm, high plasticity, trace fine sand.												
GINTIP	-		(50') CLAY (CH); greenish gray, moist, very firm, high plasticity, little to no silt or sand.	SPT	100	4-4-6 (10)									
06/09/21 14:18 - C:\USERS\USER\DESKTOF			Bottom of borehole at 51.5 feet below mud line.												

	G	eo	syntec⊳	BORING NU	IMBE	ER N PAGE	<b>NB-1</b> 1 OF 1
		(	consultants				
	CLIEN	T Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway			
	PROJ		JMBER <u>GK7115A</u>	PROJECT LOCATION _ Mobile County, Alabama			
	DATE	STAR	TED     05/24/21     COMPLETED     05/24/21	MUD LINE ELEVATION HOLE SIZE	3 in		
	DRILL	ING C	ONTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
	DRILL	ING M	ETHOD _ Mud Rotary/SPT	AT TIME OF DRILLING			
	LOGO	GED BY	K. Carlton CHECKED BY	AT END OF DRILLING			
	NOTE	S Lat	itude: 30 deg 18' 57.8" N; Longitude: 88 deg 08' 11.9" W.	AFTER DRILLINGN/A			
ſ.	O(ft below mud line)	GRAPHIC LOG	MATERIAL D	ESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
AND.GF		-	(0') Logged by Challenge Engineering.		SPT		WOH-1- WOH
NIST							
IN DAUPHI	  5	-			SPT		WOH- WOH- WOH
II EC/GEC		-			SPT		WOH
NYSO							
IECTS/GE	 	-			SPT		WOH
VI VPRO		-			SPT		1-1-1 (2)
SER/DESKIOP/GIL	  		(11.5') No recovery.				
2 - C:\USERS\U			(15') CLAY (CH); gray, moist, firm, high plasticity, some si	ilt, with some shells at 15.5 feet.	SPT	100	WOH- WOH- WOH
5/16/21 11:3	20						
SINT STD US.GDT - 0			(20) SANDY CLAY (CH); mottled colorations of light gray, sand with clay, with shells at 21 feet.	, tan, and drownish red, moist, tirm, nigh plasticity, medium	SPT	67	3-3-4 (7)
- <u>-</u>	25		(25') CLAY (CH): very moist very soft with sand lens at 2	6 feet			112
UMP SAMPLE GSF L	 				SPT	100	(4)
	<u> </u>		(30') Firm, with sand lens at 30.5 feet.		SPT	100	3-3-6 (9)
SEOTECH BH NO C		<u></u>	Bottom of borehole at	31.5 feet below mud line.		<u> </u>	( <i>9)</i>

	G	eo	syntec⊳	BORING NU	MBE	ER I PAGE	<b>MB-2</b> 1 OF 1
		(	consultants				
	CLIEN	MT Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway			
	PROJ		MBER _ GK7115A	PROJECT LOCATION Mobile County, Alabama			
	DATE	STAR	ED     05/24/21     COMPLETED     05/24/21	MUD LINE ELEVATION HOLE SIZE	3 in		
	DRILL	ING C	ONTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
	DRILL	ling m	THOD Mud Rotary/SPT	AT TIME OF DRILLING N/A			
	LOGO	SED BY	K. Carlton CHECKED BY				
	NOTE	S Lat	ude: 30 deg 19' 1.3" N; Longitude: 88 deg 08' 12.0" W.	AFTER DRILLING <u>N/A</u>			
	O(ft below mud line)	GRAPHIC LOG	MATERIAL DES	SCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
ק			(0') SILTY SAND (SM); gray, saturated, loose, fine sand with	h silt, poor recovery.	SPT	25	WOH
ISLAP							
N H			(2.5') No recovery.			0	WOH
DAU		-					won
N N N N	5	•••••	(5') SAND (SWI): dark gray, saturated loose fine to coarse	argined with silt, with shell fragments		<u> </u>	100
EC.			(J) SAND (SW), dark gray, saturateu, iouse, inte- to coarse	-grained with sit, with shell hagments.	SPT	75	(4)
N XS							
			(7.5') CLAYEY SAND (SC); saturated, loose, with soft high	plasticity clay and shells at 8.5 feet.	SPT	100	1-1-1
							(2)
COX.	10		(10') With shells from 10.8-10.9 feet.				1-1-1
					<b>A</b> SPT	70	(2)
5							
ESK							
EK/D							
	10		(15') SAND (SP); light gray, wet, loose, fine-grained with so	me silt, with shells at 16 feet.		75	WOH
							won
: ۲							
11:3							
16/21	20						
90 -			(20') SAND (SP); grayish tan, moist, dense, fine-grained wit	h little to no silt.	SPT	80	1-2-2
20			(20.8') CLAY with SAND (CH); gray to tan mottled, moist, fir	m, nighly plastic.			(4)
Э́ Э							
N Z							
פ י	25					<u> </u>	
SF DI			(25') SAND (SP); mottled light gray, tan, orange, moist, firm $\neg$ lens from 25.1-25.3 feet.	, fine- to coarse-grained with little to no clay, with gray clay	SPT	100	4-4-5 (9)
С. Ц			(26') FAT CLAY (CH); mottled light gray to red and orange, t	tan, moist, firm, highly plastic.			(-)
SAMF							
HMIC							
N N	30		(30') SAND (SP); light gray, saturated, loose, fine-grained w		COT.	E0	4-7-8
			Dottom of horsests at 9	1.5 fact below mud line		50	(15)
Z H8			Bottom of borenole at 5				
ЦСН							
C L L C L							

C	Geo	syntec⊳	BORING N	JMB	<b>ER</b> PAGE	<b>MB-3</b> 1 OF 1
		consultants				
CLI	ENT Mo	bbile County, Alabama	PROJECT NAME Dauphin Island Causeway			
PRC	JECT N	UMBER GK7115A	PROJECT LOCATION Mobile County, Alabama			
DAT	E STAR	COMPLETED     05/24/21	_ MUD LINE ELEVATION HOLE SIZE	3 in		
DRI	LLING C	ONTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
DRI	LLING N	IETHOD Mud Rotary/SPT	_ AT TIME OF DRILLING _N/A			
LOC	GED B	K. Carlton CHECKED BY	AT END OF DRILLING			
NOT	ES Lat	titude: 30 deg 19' 12.7" N; Longitude: 88 deg 08' 10.5" W.	_ AFTER DRILLING <u>N/A</u>			
DEPTH t below mud line)	GRAPHIC LOG	MATERIAL DE	SCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
0.6PJ		(0') SAND (SP); light brown, saturated, loose, fine-grained.			15	WOH
	]	(2.5') Increasing silt content.				
				SPT	25	WOH
SO 5						
	_	(5') No recovery.		SPT	0	WOH
ZNIE	_					
20 10 10 10 10 10 10 10 10 10 10 10 10 10	-////	(7.5') SILTY CLAY (CH); dark gray, saturated, very soft, sti	cky, with silt present.		100	0-0-1
	-///				100	(1)
<u>10</u>		(10') CLAYEY SAND (SC); dark grav, saturated, soft, fine s	and with some clay, with shells at 10.8 feet.			1_1_1
z_		(···/ ·· - · - · · · · · · · · · · ·		SPT	25	(2)
040						
IS 15		(15') Without shells.				0-0-1
SER 2				<b>SPT</b>	75	(1)
- 33						
211						
20		(20') SANDY CLAY (CH); mottled gray and tan, moist, firm,	, highly plastic, medium sand.		100	0-2-2
					100	(4)
	-////					
	-////					
Z - 0 25						
		(25') SAND (SP); gray, wet, dense, medium-grained with lit	tle silt/clay, sand contact possible at approximately 24.5		75	12-26-42
		feet.			10	(68)
L SA	7					
30 30						
≷		(30') With clay (CH) lens at 30.2-30.4 feet.		SPT	67	7-4-5
		Bottom of borehole at 3	1.5 feet below mud line.			(9)
CH BH			· · · · ·			
OIEC						
5						

(	J	eo	syntec	BORING NU	JMBE	ER   PAGE	<b>MB-4</b> 1 OF 1
		(	consultants				
CL	.IEN	IT _Mc	bile County, Alabama	PROJECT NAME Dauphin Island Causeway			
PR	ROJI	ECT N	UMBER GK7115A	PROJECT LOCATION Mobile County, Alabama			
DA	ΥE	STAR	TED     05/25/21     COMPLETED     05/25/21	MUD LINE ELEVATION HOLE SIZE	3 in		
DF	RILL	ING C	ONTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
DF	RILL	ING M	ETHOD Mud Rotary/SPT	AT TIME OF DRILLING			
LC	GG	ED B	K. Carlton CHECKED BY	AT END OF DRILLING N/A			
NC	DTE	S Lat	itude: 30 deg 19' 26.7" N; Longitude: 88 deg 08' 7.4" W.	AFTER DRILLING N/A			
DEPTH	(ft below mud line)	GRAPHIC LOG	MATERIAL D	ESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
<u>ا</u> د	_		(0') SAND (SP); gray, saturated, loose, fine-grained with s	silt.	SPT	20	WOH
	_						
	_		(2.5') CLAYEY SAND (SC); dark gray, saturated, loose, st	ticky clay, fine sand.	SPT	50	WOH
DAU -	_						
	5	////	(5') No recovery				
Ц Ц Ц	-				SPT	0	WOH
	-						
	-		(7.5') SILTY SAND (SM); saturated, dense, nonplastic, fin	e sand, with shells at 8.7 feet.	SPT	80	2-2-2
	_						(4)
	0		(10') Same as above.				0-1-0
Ż–	-				SPT	80	(1)
	-						
	-						
	- -						
	5		(15') SILTY SAND (SM); gray, saturated, loose/soft.	[		75	WOUL
Ϋ́-	-		(15.3') SILTY CLAY (CH).			/5	WOH
	-		(15.7') SILTY SAND (SM); dark gray, loose, medium sand	1.			
- 132	-						
2/9 2	0						
- 00/1	.0		(20') FAT CLAY (CH); mottled gray to tan, moist, stiff, high	hly plastic.		100	2-2-3
en l	-					100	(5)
	_						
~ ~	-						
<u>اوا</u> 2 ا	5						
	-		(25') FAT CLAY (CH); mottled gray to tan, moist, stiff, high	hly plastic.	SPT	100	1-4-7
קאר שור	_		(26') SAND (SP); gray, moist, dense, fine-grained.				(11)
	_						
2	_						
5 3	0						
×			(30') Fine- to medium-grained, with clayey sand at 31 feet		SPT	75	7-6-7
			Bottom of borehole at	31.5 feet below mud line.		L	(10)
н Н Н Н Н							
L د							

	G	eo	syntec⊳	BORING NU	MBE	ER I PAGE	<b>MB-5</b> 1 OF 1
		(	consultants				
	CLIEN	MT Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway			
	PROJ	ECT N	JMBER GK7115A	PROJECT LOCATION Mobile County, Alabama			
	DATE	STAR	TED     05/25/21     COMPLETED     05/25/21	MUD LINE ELEVATION HOLE SIZE _	3 in		
	DRILL	ING C	ONTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
	DRILL	ING M	ETHOD Mud Rotary/SPT	AT TIME OF DRILLING _N/A			
	LOGG	SED BY	K. Carlton CHECKED BY	AT END OF DRILLING N/A			
	NOTE	S Lat	itude: 30 deg 19' 50.4" N; Longitude: 88 deg 07' 54.4" W.	AFTER DRILLING N/A			
	O(ft below mud line)	GRAPHIC LOG	MATERIAL DES	SCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
ANU.G	-		(0') SAND (SP); grayish brown, saturated, loose, fine-graine	d with some silt.	SPT	10	WOH
	-						
타	-		(2.5') Poor recovery.		SPT	10	WOH
оц Ц	5		(5') Poor recovery.				
- E	-				SPT	5	WOH
s l	-						
	-		(7.5') CLAYEY SAND (SC); dark gray, wet, soft, fine sand.		SPT	100	WOH
- IS	-		(8.5') CLAY (CH); soft, highly plastic, with some sand.				
	10		(0.0) OLATET GAND (00).				0.0.0
	-		(10) CLATET SAND (SC).	tio	SPT	70	(4)
ISER/DESKTOP/GI	- - 15		(TT) CLAT (CH), motileu gray to tan, moist, mm, mgniy pla	SUC.			
/16/21 11:32 - C:\USERS\L			(15') Very firm.		SPT	90	2-2-4 (6)
- GINT STD US.GDT - 06	- - - 25		(20') SANDY CLAY (CL); mottled reddish tan to gray, moist,	firm, medium plasticity, with medium sand throughout.	SPT	100	2-3-3 (6)
	20	<i>\/////</i>	(25') SAND (SP); light gray, moist, dense, fine-grained with			~-	6-11-20
COMP SAMPLE GSF	- - - 30					67	(31)
			(30') SILTY SAND (SM); gray, soft, very fine sand with silt a	nd some clay.	SPT	90	NR
GEOTECH BH NO			Bottom of borehole at 3	1.5 feet below mud line.			

	G	eo	syntec⊳	BORING NU		ER I PAGE	<b>MB-6</b> 1 OF 1
		(	consultants				
	CLIE	NT Ma	bile County, Alabama	PROJECT NAME Dauphin Island Causeway			
	PROJ		JMBER _ GK7115A	PROJECT LOCATION Mobile County, Alabama			
	DATE	STAR	TED     05/25/21     COMPLETED     05/25/21	MUD LINE ELEVATION HOLE SIZE	3 in		
	DRILI	LING C	ONTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
	DRILI	LING M	ETHOD Mud Rotary/SPT	AT TIME OF DRILLING N/A			
	LOGO	GED BY	K. Carlton CHECKED BY	AT END OF DRILLING N/A			
	NOTE	ES Lat	tude: 30 deg 20' 28.3" N; Longitude: 88 deg 07' 32.0" W.	AFTER DRILLING N/A			
	O(ft below mud line)	GRAPHIC LOG	MATERIAL DES	SCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
SLANU.G			(0') CLAYEY SAND (SC); dark brown to gray, saturated, sof	t, fine sand.	SPT	100	WOH
			(2.5') Light gray to tan.		SPT	50	WOH
2 L L C N	5		(EI) Increasing elev content				
			(5) increasing day content.		SPT	90	WOH
Э Ц			(7.5') CLAYEY SAND (SC); light gray to tan, saturated, soft,	fine sand.		100	4-6-6
			(8.3') CLAY (CH); light gray to reddish tan, moist, firm to stif	f, highly plastic.		100	(12)
	<u>    10                                </u>		(10') CLAY (CH); light gray to reddish tan, moist, firm to stiff	, highly plastic.	SPT	75	5-6-6 (12)
SER/DESKIOP/GI	  15						
0/21 11:32 - C:\USERS\U			(15') SANDY CLAY (CL); dark gray, moist, soft, medium pla	sticity, medium sand throughout.	SPT	75	1-2-3 (5)
NI SID US.GDI - 06/1			(20') SAND (SP); light gray, saturated, dense, fine-grained v	vith trace to some silt present.	SPT	80	22-18-12 (30)
- C	25						
			(25') Same as above.		SPT	67	4-5-5
	  30		(26') SILT (ML); light gray, moist, stiff, low plasticity.				
× J			(30') FAT CLAY (CH); greenish gray, moist, stiff, high plastic	; city.	SPT	100	1-1-2
GEULECH BH NU C			Bottom of borehole at 31	1.5 feet below mud line.		<u> </u>	(J)

	Geo	syntec⊳	BORING NU	JMBE	ER I PAGE	<b>MB-7</b> 1 OF 1
		consultants				
	CLIENT Mo	bile County, Alabama	PROJECT NAME Dauphin Island Causeway			
	PROJECT N	JMBER _ GK7115A	PROJECT LOCATION Mobile County, Alabama			
	DATE STAR	COMPLETED     05/26/21	MUD LINE ELEVATION HOLE SIZE	3 in		
	DRILLING C	DNTRACTOR Challenge Engineering	GROUND WATER LEVELS:			
	DRILLING M	ETHOD Mud Rotary/SPT	AT TIME OF DRILLING N/A			
	LOGGED BY	K. Cariton CHECKED BY	AT END OF DRILLING N/A			
	NOTES Lat	tude: 30 deg 20' 40.5" N; Longitude: 88 deg 07' 23.0" W.	AFTER DRILLINGA		1	
	O(ft below mud line) GRAPHIC LOG	MATERIAL D	ESCRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
ישי.חאשט		(0') SILTY CLAY (CH); mottled gray to tan, saturated, stiff	, high plasticity, some fine sand.	SPT	100	WOH
		(2.5') Moist.		SPT	75	0-1-2 (3)
YNI EC/GEOS		(5') Same as above.		SPT	80	3-4-4 (8)
		(7.5') Slightly moist, very firm.		SPT	100	2-4-5 (9)
ESKIUP/GINI/PRUJ		(10') FAT CLAY (CH); mottled gray to tan/orange, moist, f	irm to stiff, high plasticity, little to no silt or sand.	SPT	100	1-2-3 (5)
SERS/USER/D	 15 -	(15') Very stiff, little to no silt with sand content increasing	at 16.5 feet.	SPT	100	2-2-1 (3)
0/21 11:32 - C:\U	   20	(16.4') CLAYEY SAND (SC); dark gray, saturated, dense,	medium to fine sand.			
GINTSTD 03.GDT - 00/	   25	(20') SAND (SP); light gray, wet, dense, fine-grained with	little to no silt or clay.	SPT	100	10-15-17 (32)
COMP SAMPLE GOF UIL		(25') SILTY SAND (SM); light gray, wet, dense, very fine s	and within silt matrix and little to no clay.	SPT	50	7-7-6 (13)
		(30') SANDY/SILTY CLAY (CH); gray, moist, firm, high pla	asticity, with some fine sand and silt.	SPT	50	1-1-2 (3)
GEULECH BH NU		Bottom of borehole at	31.5 feet below mud line.			

Geosyntec ^D BORING NUME					IMBE	ER I PAGE	<b>MB-8</b> 1 OF 1
consultants							
	CLIENT Mobile County, Alabama PROJECT NAME Dauphin Island Causeway			PROJECT NAME Dauphin Island Causeway			
	PROJECT NUMBER     GK7115A     PROJECT LOCATION     Mobile County, Alabama						
	DATE STARTED 05/26/21 COMPLETED 05/26/21 MUD LINE ELEVATION HOLE SIZE			3 in			
	DRIL			GROUND WATER LEVELS:			
	LUG		<u>K. Cariton</u> CHECKED BY				
	NOT		ude. 50 deg 20 55.1 N, Longitude. 66 deg 07 15.1 W.				
2	O(ft below mud line)	GRAPHIC LOG	MATERIAL DESC	CRIPTION	SAMPLE TYPE	RECOVERY %	BLOW COUNTS (N VALUE)
ISLAND.GF			(0') CLAYEY SAND (SC); dark gray, saturated, loose, medium (approximately 5%).	a sand with clay and some silt, poor recovery	SPT	5	WOH
IS DAUPHIN			(2.5') SANDY CLAY (CH); mottled gray to tan, moist, very firm	n/stiff, high plasticity, fine sand.	SPT	100	4-5-5 (10)
YNTEC/GEC			(5') Same as above.				4-5-6 (11)
ECTS/GEOS			(7.5') CLAY (CH); mottled gray to tan/reddish orange, moist, very firm/stiff, high plasticity, without sand.				4-4-5 (9)
<b>PROJ</b>	10		(10') CLAY (CH); mottled gray to tan/reddish orange, moist, very firm/stiff, high plasticity, without sand.			100	2-2-4
SER/DESKTOP/GINT	- · ·						(6)
RS/U			(15') CLAY (CH); mottled gray to tan/reddish orange, moist, very firm/stiff, high plasticity, without sand.			75	2-2-4
/16/21 11:32 - C:\USE			(16') SANDY CLAY (CH); mottled gray to orange/tan, moist, firm, high plasticity, fine sand.				(6)
- GINT STD US.GDT - 06			(20') SILTY/SANDY CLAY (CH); mottled gray to orange/tan, very moist, soft, high plasticity, increasing fine sand with silt.				0-0-1 (1)
MP SAMPLE GSF DIC -			(25') CLAYEY SAND (SC); light gray, wet, loose, fine to medium sand with some clay.				4-4-4 (8)
	30		(30') SAND (SP); gray, moist, dense, medium-grained.			50	5-9-12 (21)
EOTECH BH NO C	Bottom of borehole at 31.5 feet below mud line.						
σL							

	G	eo	syntec⊳	BORING NU	MBE	ER I PAGE	<b>MB-9</b> 1 OF 1	
consultants								
	CLIENT Mobile County, Alabama PR			PROJECT NAME Dauphin Island Causeway	PROJECT NAME Dauphin Island Causeway			
	PROJECT NUMBER _GK7115A PROJECT LOCATION _Mobile County, Alabama							
	DATE	STAR	COMPLETED     05/27/21	MUD LINE ELEVATION HOLE SIZE _	3 in			
	DRILLING CONTRACTOR     Challenge Engineering     GROUND WATER LEVELS:			_ GROUND WATER LEVELS:				
	DRILL							
				AI END OF DRILLING <u>N/A</u>				
-	NUTE		tude: 30 deg 21 7.3 N, Longitude: 88 deg 07 5.0 W.	AFIER DRILLING _N/A				
	line)	υ			ΥΡΕ	% ≻	ر س	
	PTH mud	НЧ ЮН	MATERIAL DE	ESCRIPTION	н Ц Щ	VER	ALUIA	
		GR/			MPI	0 0		
	0 (# P				SA	R		
1.GPJ			(0') CLAYEY SAND (SC); gray to tan, saturated, loose, me	dium sand, with some shells present.	SPT	80	WOH	
Z	_		(2.5') SANDY CLAY (CH); mottled grav to orangeish tan, m	noist. stiff. high plasticity. fine sand.			3-6-6	
	_				<b>A</b> SPT	100	(12)	
	5		(5') Very firm/stiff.					
-C							5-5-6 (11)	
	_							
Ő L C	-	- (7.5') CLAY (CH); mottled gray to red to tan/orange, stiff, high plasticity.				50	0-2-2	
							(4)	
	10		(10') CLAY (CH); mottled gray to red to tan/orange, stiff, high plasticity, with some small sand lenses less than 1/8 inch thick at 11.2 and 11.4 feet.				2-3-3	
	_						(6)	
	_							
E SH	-							
	15							
Ű/SY			(15') CLAY (CH); gray (without mottles), moist, soft, high plasticity and sticky, with shells at 10.9 feet.			75	0-2-1	
							(3)	
	_							
	_							
1/9/2	20							
- -			(20') CLAY (CH); gray (without mottles), moist, soft, high p	lasticity and sticky, with shells and sand at 20.7-21 feet.	SPT	75	1-1-1 (2)	
	-		(21) CLAYEY SAND (SC); dark gray, dense, fine sand.				(-/	
	-							
	-							
	25	(25') SAND (SP): light gray, wet very dense medium-grained with little to no silt or day				50	16-50/4"	
	-			······································			10 00/4	
╞	-							
NAS-	-							
ġŀ	30							
	00		(30') SILTY SAND (SM); gray, wet, soft/loose, very fine sand with some clay.			100	2-3-3	
	Bottom of borehole at 31.5 feet below mud line.						(0)	
H BH								
ц С								

# APPENDIX C

SPT Photographic Logs



GEOSYNTEC CONSULTANTS Geosyntec Photographic Record consultants					
Client: Mobile County, A	labama	Project Number: GK7115			
Site Name: Dauphin Islan	d Causeway	Site Location: Dauphin Island	1		
Boring: MR-1					
Direction: NA		A CHARLES MARTER D	Martin Alton		
<b>Description:</b> SPT 03 15.0 – 16.5 ft (2-2-1, N = 3) Note: Depth on picture recorded as depth below mud line.		MR-1 5 15-16.5	177-3 '865		





	GEOSYNTE Photog	C CONSULTANTS raphic Record	Geosyntec Consultants
Client: Mobile County, A	labama Project N	umber: GK7115	
<b>Site Name:</b> Dauphin Isla Causeway	d Site Loca	tion: Dauphin Island	
Boring: MR-10			
Date: 02/27/2020	in all	19 00	
Direction: NA			
<b>Description:</b> SPT-05 35-36.5 ft (1-2-2, N = 4) Note:			
Depth on picture recorded as depth below mud line.		MR-10 SPT-5 35-36.5	
Boring: MR-10			
Date: 02/27/2020			
Direction: NA		(	
<b>Description:</b> SPT 06 40-41.5 ft (1-2-2, N = 4)			
Depth on picture recorded as depth below mud line.		MR-10 SPT-6 40-41.5	

	GEOSYNTEC CONSULTANTS Photographic Record	Geosyntec [▷] consultants
Client: Mobile County, A	labama Project Number: GK7115	
<b>Site Name:</b> Dauphin Islar Causeway	d Site Location: Dauphin Island	
Boring: MR-10		
Date: 02/27/2020		
Direction: NA	A second a second	14 10 10
Description: SPT-07 45-46.5 ft (1-2-4, N =6) Note: Depth on picture recorded as depth below mud line.	MB-10 SFT=7 HS-46.5	



	GEOSYNTEC CONSULTANTS Photographic Record	Geosyntec Consultants
Client: Mobile County, Al	abama Project Number: GK7115	
Site Name: Dauphin Islan	d Causeway Site Location: Dauphin Island	
Boring: MR-12		
<b>Date:</b> 02/03/2020		
Direction: NA		
Description: SPT 03 15.0 – 17 ft (1-2-4, N = 6) Note: Depth on picture recorded as depth below mud line.	MR-12 15-17	
Boring: MR-12		
<b>Date:</b> 02/03/2020		
Direction: NA Description: SPT-04 25-26.5 ft (2-2-2, N =4) Note: Depth on picture recorded as depth below mud line.	MR-12 SPT4 25'-26.5'	



	GEOSY	NTEC CONSUL	TANTS ord	
Client: Mobile County, Alabama		ject Number: GK	7115	
Site Name: Dauphin Islan	d Causeway Site	e Location: Daup	hin Island	
Boring: MR-12				
<b>Date:</b> 02/03/2020	A COMME			
Direction: NA	13		Harry Marine The	
<b>Description:</b> SPT 07 40-41.5 ft (2-2-3, N =5)				
Note: Depth on picture recorded as depth below mud line.		MR-12	2 SPT 52/3/2020	-7 40-411.5
Boring: MR-12				
<b>Date:</b> 02/03/2020			-1	
Direction: NA	CAN DO		Le le	
<b>Description:</b> SPT-08 45-46.5 ft (4-4-5, N = 9) Note: Depth on picture recorded as depth below mud line.		MR-12	SPT-8 45-46.5	

	GE	OSYNTEC CONSULTANTS Photographic Record	Geosyntec ^D consultants
Client: Mobile County, Al	abama	Project Number: GK7115	
Site Name: Dauphin Island	d Causeway	Site Location: Dauphin Island	
Boring: MR-12Date: $02/03/2020$ Direction: NADescription: SPT 09 $50-51.5$ ft $(3-4-5, N = 9)$ Note:Depth on picture recorded asdepth below mud line.		MR-12 SPT-9	50 - 51.5
Boring: MR-12 Date: 02/03/2020 Direction: NA Description: SPT-10 55-56.5 ft (4-5-6, N =11) Note: Depth on picture recorded as depth below mud line.		MR-12 55	T - 10 $5T' - T6.5'$

## APPENDIX D

## CPT Field Data

Operator: Jamison Short Sounding: CPT-1 Cone Used: DSA1033 GPS Data: N30.31340 W88.13655 CPT Date/Time: 1/7/2020 9:39:45 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



^{*}Soil behavior type and SPT based on data from UBC-1983

Operator: Jamison Short Sounding: CPT-15 Cone Used: DSA1033 GPS Data: N30.31545 W88.13710 CPT Date/Time: 1/7/2020 3:37:49 PM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



^{*}Soil behavior type and SPT based on data from UBC-1983

Operator: Jamison Short Sounding: CPT-2 Cone Used: DSA1033 GPS Data: N30.31840 W88.13645 CPT Date/Time: 1/7/2020 9:02:16 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

Operator: Jamison Short Sounding: CPT-3 Cone Used: DSA1033 GPS Data: N30.32200 W88.13559 CPT Date/Time: 1/7/2020 8:31:04 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Jamison Short Sounding: CPT-4 Cone Used: DSA1033 GPS Data: N30.32585 W88.13414 CPT Date/Time: 1/7/2020 7:54:51 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

Operator: Jamison Short Sounding: CPT-5 Cone Used: DSA1033 GPS Data: N30.32937 W88.13299 CPT Date/Time: 1/6/2020 11:37:41 AM Location: Dauphin Island Causway Living Shoreline Job Number: M19-496



^{*}Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Jamison Short Sounding: MR-2 Cone Used: DSA1033 GPS Data: N30.33215 W88.13092 CPT Date/Time: 1/7/2020 2:36:17 PM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Jamison Short Sounding: CPT-12 Cone Used: DSA1033 GPS Data: N30.33440 W88.13029 CPT Date/Time: 1/8/2020 8:07:46 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496


Operator: Jamison Short Sounding: CPT-6 Cone Used: DSA1033 GPS Data: N30.33610 W88.12854 CPT Date/Time: 1/6/2020 10:51:28 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



^{*}Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Jamison Short Sounding: CPT-7 Cone Used: DSA1033 GPS Data: N30.33988 W88.12627 CPT Date/Time: 1/6/2020 10:18:38 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Jamison Short Sounding: CPT-8 Cone Used: DSA1033 GPS Data: N30.34282 W88.12463 CPT Date/Time: 1/6/2020 9:33:11 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

Operator: Jamison Short Sounding: CPT-9 Cone Used: DSA1033 GPS Data: N30.34615 W88.12193 CPT Date/Time: 1/7/2020 11:05:13 AM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



*Soil behavior type and SPT based on data from UBC-1983

Operator: Jamison Short Sounding: CPT-10 Cone Used: DSA1033 GPS Data: NO GPS

CPT Date/Time: 1/6/2020 1:57:27 PM Location: Dauphin Island Causeway Living Shoreline Job Number: M19-496



N30 35452 เพิ่มชุม 11685 *Soil behavior type and SPT based on data from UBC-1983

(ft)

## APPENDIX E

Laboratory Test Results

<b>,</b>	Excel G	eotech "Excellen	ce in Tes	ting"	g, inc.										
G	953 Forre	st Street,	Roswell,	Georgia	30075				Projec	t Nan	ne: Daup	hin Isla	nd Cause	eway	
	Tel: (77(	)) 910 753	7 Fax: (7	70) 910 7	7538						Project	No.: 98			
							Test In	formatio							
		Moisture		Gra	in Size Ana	alysis		Atte	rberg Li	mits	Engine.	Organic	Specific	Other	
Site ID	Lab	Content	Me	chanical Si STM D691	ieve 13	Hydro	ometer D7928	A	TM D43	18	Classifi.	Content	Gravity	Tests	
		ASTM								2	ASTM	ASTM	ASTM		Remarks
		D2216	Gravel	Sand	Fines	Silt	Clay	LL	PL	Ы	D2487	D2974	D854		
( - )	(-)	(%)	Content	Content	Content	Content	Content	(-)	(-)	(-)	(-)	(%)	(-)		
MR-1 (5-6.5)	20B007	81.7	0.2	25.9	73.9	46.0	27.9	69	21	48	CH	2.8			
MR-9 (1.5-3.5)	20C001	22.4	1.6	43.2	55.2	20.5	34.7	40	13	27	CL	1.5	2.701	1-D	ST
MR-9 (5-6.5)	20B008	23.6	0.0	15.4	84.6	44.9	38.7	54	13	41	CH	1.7			
MR-9 (20-21.5)	20B009	94.3	0.0	6.0	94.0	40.8	53.2	95	33	62	CH	15.1			Note 1
MR-9 (25-26.5)	20B010	32.9	0.0	48.4	51.6			23	20	з	ML				
MR-9 (30-31.5)	20B011	40.1	0.0	1.5	98.5	76.4	22.1	40	19	21	CL				
MR-9 (35-36.5)	20B012	44.0	7	21	72	38	34	62	20	42	CH				Note 2
MR-10 (6-8)	20C002	40.5	2.0	11.6	86.4	37.5	49.0	67	19	48	CH	2.9		1-D	ST
MR-10 (10-11.5)	20C005	56.7	0.0	7.2	92.8	42.2	50.6	67	21	46	CH	13.9			Note 1
MR-10 (19-21)	20C006	63.3	14	27	59			69	25	44	CH				Note 2
MR-10 (24-26)	20C003	51.2	0.0	41.1	58.9	34.9	24.0	56	20	36	CH	4.8	2.650	1-D	ST
MR-10 (30-31.5)	20C007	37.0	0.5	43.2	56.3			31	19	12	CL				
MR-10 (40-41.5)	20C008	69.3	0.0	17.0	83.0	31.5	51.5	80	22	58	СН				
MR-12 (0-1.5)	20B013	80.7	0.0	24.5	75.5	36.9	38.6	76	24	52	CH	3.8			
MR-12 (5-6)	20B014	145.1	0.0	1.1	98.9	44.9	54.0	155	36	119	CH	11.6			Note 1
MR-12 (6-8)	20B015	150.9	0.2	0.9	98.9	37.0	61.9	145	33	112	CH		2.643	1-D	ST (16")
MR-12 (13-15)	20C004														ST
MR-12 (15-16.5)	20B016	29.3	0.0	8.4	91.6	36.8	54.8	73	19	54	CH				



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### **Test Results Summary**

**MR 18** 

953 Forrest Street, Roswell, Georgia 30075 Tel: (770) 910 7537, www.excelgeotesting.com Project Name: Dauphin Island Causeway Shoreline Restoration

Project No.: PN1040

								Test	Inform	ation								
		Moisture		Grai	n Size An	alysis		Atte	rberg L	limits	Engine.	Specific	Organic	Standar	d Proctor	Other	1	
		Content									Classifi.	Gravity	Content	Compa	ction Test	Tests		
Site ID	Lab No		ASTM D6913 ASTM D4318												D I			
	110.	ASTM									ASTM	ASTM	ASTM	ASTN	1 D698		Remarks	
			D2216	Gravel	Sand	Fines	Silt	Clay	LL	PL	PI	D2487	D854	D4373	Maximum	<b>Moisture</b>	-	
			Content	Content	Content	Content	Content							DUW	Content			
(-)	(-)	(%)	(%)	(%)	(%)	(%)	(%)	(-)	(-)	(-)	(-)	(-)	(%)	(pcf)	(%)			
MR 18 (5-5.6')	21E115	25.8											1.1					
MR 18 (10-11.5')	21E116	41.9						54	13	41								
MR 18 (15-16.5')	21E117	40.4	12	55	33	14	19	27	18	9	SC						Note 1 & 2	
MR 18 (20-21.5')	21E118	33.8						57	14	43			3.1					
MR 18 (25.75-26.5')	21E119	85.0	4	59	37	15	22	108	33	75	SC		13.8				Note 1 & 2	
MR 18 (30-31.5')	21E120	27.9	3	77	20	13	7										Note 1	
MR 18 (35-36')	21E121	45.3						47	18	29		2.681					1	
MR 18 (36-36.5')	21E122	87.2																
MR 18 (45-46.5')	21E123	49.4						64	18	46								
MR 18 (50-51.3')	21E124																	
MR 18 (40-42)	21E125					V.										1D, CU		
MR 18 (11.5-11.75')	21E159																	
MR 18 (25-26.75')	21E160																	
																1.80		
												ta a di di di ta ka di sa ka na ka sa ka sa ka sa ka sa ka sa ka sa ka sa ka sa ka sa ka sa ka sa ka sa ka sa k					Internet of Contractory of Contracto	
Notes: 1 - Sieve test sp	becimen was	s not large	enough to	report the	results to t	he accurac	y of one de	ecimal p	ooint.	2 - Si	eve test spe	ecimen was	s undersize	ed.			207,54	
																6-100	RKIN	









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### **Test Results Summary**

**MR 21** 

Project Name: Dauphin Island Causeway Shoreline Restoration

Project No.: PN1040

6-10 XK

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								Test	Inform	ation								
		Moisture		Grai	n Size An	alysis		Atterberg Limits			Engine.	Specific	Organic	Standar	d Proctor	Other	]	
	Lah	Content									Classifi.	Gravity	Content	Compac	tion Test	Tests		
Site ID	No.			Α	STM D69	13		AS	TM D4	318							Remark	
		ASTM							1		ASTM	ASTM	ASTM	ASTN	1 D698			
			D2216	Gravel	Sand	Fines	Silt	Clay	LL	PL	PI	D2487	D854	D4373	Maximum	Moisture		
			Content	Content	Content	Content	Content							DUW	Content			
(-)	(-)	(%)	(%)	(%)	(%)	(%)	(%)	(-)	(-)	(-)	(-)	(-)	(%)	(pcf)	(%)			
MR 21 (3-6.5')	21E126																Note 1	
MR 21 (5-6.5') BML	21E127	105.9						102	21	81								
MR 21 (10-11')	21E128	25.0	14	58	29	18	11						1.2				Note 2 & 2	
MR 21 (15-16.5')	21E129	35.9	8	19	73	28	45	65	15	50	СН					140	Note 2 & 2	
MR 21 (20-21.5')	21E130	41.2						34	14	20			6.3					
MR 21 (25-26.5')	21E131	26.2	2	79	19	12	7	NP	NP	NP	SM						Note 2	
MR 21 (35-36.5')	21E132	77.7										2.752						
MR 21 (40-41.5')	21E133	52.2	0.0	10.8	89.2	46.4	42.8	67	15	52	СН							
MR 21 (50-51.5')	21E134	38.7	0.0	12.1	87.9	33.1	54.8	66	15	51	СН							
MR 21 (6.5-8.5')	21E135															1D, CU		
MR 21 (17-19')	21E136		2													1D, CU		
MR 21 (5-6.5')	21E161																	
	-																	
······																		













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### **Test Results Summary**

**MR 26** 

953 Forrest Street, Roswell, Georgia 30075 Tel: (770) 910 7537, www.excelgeotesting.com Project Name: Dauphin Island Causeway Shoreline Restoration

Project No.: PN1040

								Test	Inform	ation								
		Moisture		Grai	in Size An	alysis		Atte	rberg L	imits	Engine.	Specific	Organic	Standar	d Proctor	Other	1	
		Content									Classifi.	Gravity	Content	Compac	tion Test	Tests		
Site ID	Lab No			Α	STM D69	13		AS	TM D4	318								
	110.	ASTM									ASTM	ASTM	ASTM	ASTN	1 D698		Remarks	
			D2216	Gravel	Sand	Fines	Silt	Clay	LL	PL	PI	D2487	<b>D</b> 854	D4373	Maximum	Moisture		
			Content	Content	Content	Content	Content							DUW	Content			
(-)	(-)	(%)	(%)	(%)	(%)	(%)	(%)	(-)	(-)	(-)	(-)	(-)	(%)	(pcf)	(%)			
MR 26 (0-1.5')	21E137	29.4						28	13	15								
MR 26 (3-6.5')	21E138																	
MR 26 (10-11.5')	21E139	43.8	0.0	6.6	93.4	44.6	48.8	68	16	52	СН							
MR 26 (15-16.5')	21E140																	
MR 26 (20-21.5')	21E141	94.1											12.1					
MR 26 (25-26.5')	21E142	39.9	0	61	39	25	14	38	22	16	SC						Note 1	
MR 26 (30-31.5')	21E143	42.2					-	35	19	16		2.702						
MR 26 (35-36.5')	21E144	78.1																
MR 26 (40-41.5')	21E145	54.9	1	8	91	42	49	68	16	52	СН		4.5				Note 1	
MR 26 (45-46.5')	21E146	34.0																
MR 26 (50-51.5')	21E147	35.9	0.1	68.0	31.9	18.8	13.1	34	15	19	SC							
MR 26 (6-8.5')	21E148															1D, CU		
MR 26 (41.5-43.5')	21E149																	
			•	2														
Votes: 1 - Sieve test s	pecimen was	not large	enough to	report the	results to t	he accurac	y of one de	ecimal p	oint.	2 - Si	eve test spe	cimen was	s undersize	d.		2	DZ CA	
											·					6-10 07	K, N'	











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For each pressure increment, the vertical strain values were calculated based on the final deformation measurements.

3-18-2020 AAINSA




















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3-12-2020 3-12-2020 3-12-2020





















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3-18-2020 3-AA,NSR





















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3-16-2020 AAINSR

















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3-16-2020 AAINSR


























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For each pressure increment, the vertical strain values were calculated based on the final deformation measurements.

06-10-2021 06-10-2021



















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06-10-2021 AAINSR



953 Forrest Street, Roswell, Georgia 30075 Tel: (770) 910 7537, www.excelgeotesting.com Project Name:

Dauphin Island Causeway Shoreline Restoration

Project No: PN1040

Client Sample ID: MR 18 (40-42')

Lab Sample No: 21E125

Figure 1 - 50 psf





















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06-10-2021 06-201 NJR




















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are merement, the vertical strain values were calculated based on the final deformation measurement

06-10-2021 06-10 NSR





















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Test	Deviator	Effective	Effective	Pore	Axial
Specimen	Stress	Axial Stress	Radial Stress	Pressure	Strain
No.	$(\sigma'_1 - \sigma'_3)$	(σ' ₁ )	(σ '3)	(u)	$(\epsilon_a)$
	(psi)	(psi)	( psi )	( psi )	(%)
1	10.1	14.1	4.0	76.0	9.7
2	14.2	22.7	8.5	81.5	10.3

	Strength at App. 15% Axial Strain				
Test	Deviator	Effective	Effective	Pore	Axial
Specimen	Stress	Axial Stress	Radial Stress	Pressure	Strain
No.	$(\sigma'_1 - \sigma'_3)$	(σ' ₁ )	(σ '3)	(u)	$(\epsilon_a)$
	( psi )	( psi )	( psi )	(psi)	(%)
1	8.7	13.0	4.3	75.7	15.8
2	13.5	21.9	8.4	81.6	15.2

Notes:

 $\sigma'_{c}$  = Consolidation pressure, (psi)  $u_{i}$  = Initial pore pressure,(psi)

06-10-2021 AAI NS A





953 Forrest Street, Roswell, Georgia 30075 Tel: (770) 910 7537, www.excelgeotesting.com

Project Name:	Dauphin Island Causeway Shoreline Restoration
Project No:	PN1040
Sample ID:	MR 18 (40-42)
Lab Sample No:	21E125

ASTM D 4767

# CONSOLIDATED-UNDRAINED (CU) TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENTS





Specimen No. 1 Dark grey silty clay

Specimen No. 2 Grey silty clay





( a )

Specimen No. 3

(b)

( a ) Failure after shear Notes:

( b ) Specimen split open

06 AA, NSR



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1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Maximum Strength				
Test	Deviator	Effective	Effective	Pore	Axial
Specimen	Stress	Axial Stress	Radial Stress	Pressure	Strain
No.	$(\sigma'_1 - \sigma'_3)$	(σ' ₁ )	(σ' ₃ )	(u)	$(\epsilon_a)$
	(psi)	( psi )	( psi )	(psi)	(%)
1	3.9	4.5	0.6	71.9	8.3
2	3.9	5.7	1.8	73.2	5.9
3	6.1	8.8	2.7	77.3	12.7

	Strength at App. 15% Axial Strain				
Test Specimen No.	Deviator	Effective	Effective	Pore	Axial
	Stress	Axial Stress	Radial Stress	Pressure	Strain
	$(\sigma'_1 - \sigma'_3)$	(σ' ₁ )	(σ' ₃ )	(u)	$(\epsilon_a)$
	(psi)	(psi)	(psi)	(psi)	(%)
1	3.4	3.9	0.5	72.0	15.3
2	3.8	5.2	1.4	73.6	15.2
3	6.1	8.6	2.5	77.5	15.1

06-10-2021 ANINSA

Notes:

 $\sigma'_{e}$  = Consolidation pressure, (psi)  $u_{i}$  = Initial pore pressure,(psi)







953 Forrest Street, Roswell, Georgia 30075 Tel: (770) 910 7537, www.excelgeotesting.com Project Name: Dauphin Island Causeway Shoreline Restoration

Project No: PN1040

Site Sample ID: MR 21 (6.5-8.5')

Lab Sample No: 21E135

ASTM D 4767

# CONSOLIDATED-UNDRAINED (CU) TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENTS





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# LAST PAGE

#### Test Applicability and Limitations:

- The results are applicable only for the materials received at the laboratory and tested which may or may not be representative of the materials at the site.

#### **Storage Policy:**

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Notes:

 $\sigma'_{c}$  = Consolidation pressure, (psi)  $u_{i}$  = Initial pore pressure,(psi)

06-10-2021 AAI NSR





Specimen No.1

Dark khaki, dark golden brown sandy silty clay



Dark khaki, dark golden brown sandy silty clay



Specimen No. 3

Dark khaki sandy silty clay

06-10-2021 06-10-2021

Notes:



953 Forrest Street, Roswell, Georgia 30075 Tel: (770) 910 7537, www.excelgeotesting.com Project Name: Dauphin Island Causeway Shoreline Restoration

Project No: PN1040

Site Sample ID: MR 21 (17-19')

Lab Sample No: 21E136

ASTM D 4767

### CONSOLIDATED-UNDRAINED (CU) TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENTS



Specimen No. 1 Dark khaki, dark golden brown sandy silty clay

Specimen No. 2 Dark khaki, dark golden brown sandy silty clay

Specimen No. 3 Dark khaki sandy silty clay







(b)

06 AAINSR

(b)

(b)

Notes: ( a ) Failure after shear

( b ) Specimen split open



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Notes:

 $\sigma'_{c}$  = Consolidation pressure, (psi)  $u_{i}$  = Initial pore pressure,(psi)

06 A 1 NSR



Specimen No.1

Light yellow, golden brown sandy silty clay



Specimen No. 2 Dark golden brown sandy silty clay



Specimen No. 3

Dark golden brown, very light grey sandy silty clay

06-10-2021 AA: NSR

Notes



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ASTM D 4767

(a)

(a)

### CONSOLIDATED-UNDRAINED (CU) TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENTS



215148



Specimen No. 2 Dark golden brown sandy silty clay

Specimen No. 3

Dark golden brown, very light grey sandy silty clay



(b)

(b)

(b)

06-10-2021 06-10-2021





Notes: (a) Failure after shear

( b ) Specimen split open

21E148 (1) 10.0



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## Test Applicability and Limitations:

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#### **Storage Policy:**

- Uncontaminated Material: All samples (or what is left) will be archived for a period of 3 months from the date received. Thereafter the samples will be discarded unless a written request for extended storage is received. A rate of \$1.00 per sample per day will be applied after the initial 3 month storage period.

# APPENDIX F

Results from Cone Penetration Tests (CPTs)



CPT-7

Dauphin Island Causeway Project Mobile County, Alabama

250 500 750 1000 0 0 Z -10 -20 Elevation (ft) 05--40 -50 -60

Undrained Shear Strength, S_u (psf)

Legend:	
	: Mud line
	: Bottom of Clay 1N
	: Bottom of Clay 3N/Top of Clay 4N
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress



CPT-8

Dauphin Island Causeway Project Mobile County, Alabama

Legend:	
	: Mud line
	: Bottom of Clay 1N
	: Bottom of Clay 3N/Top of Clay 4N
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress


Dauphin Island Causeway Project Mobile County, Alabama



250 500 750 1000 0 0 -10 3 -20 Elevation (ft) -40 -50 -60

Legend:	
	: Mud line
	: Bottom of Clay 1N
	: Bottom of Clay 2N
	: Bottom of Clay 3N/Top of Clay 4N
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress

Undrained Shear Strength, S_u (psf)



Dauphin Island Causeway Project Mobile County, Alabama

- ------ : Mud Line
- : Bottom of Sand/Top of Clay 6N
- : Hydrostatic Water Pressure
- ----: Water Level
- ----: CPT Termination
  - : Effective Stress
    - -: Total Stress





- -: Mud Line
- Bottom of Clay 1S/Top of Shell/Sand
- : Hydrostatic Water Pressure
- : Water Level
- : CPT Termination
- : Effective Stress
- : Total Stress



Dauphin Island Causeway Project Mobile County, Alabama

-0	
	: Mud Line
	: Bottom of Clay 1S
	: Bottom of Clay 2S
	: Bottom of Clayey Sand/Top of Clay 3S
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress





Dauphin Island Causeway Project Mobile County, Alabama

CPT Termination Effective Stress Total Stress	: Mud line : Bottom of Clay 1S : Bottom of Clay 2S : Bottom of Clayey Sand/top of Clay 3S : Hydrostatic Water Pressure : Water Level
	 : Water Level : CPT Termination : Effective Stress : Total Stress



Dauphin Island Causeway Project Mobile County, Alabama

: Mud line
: Bottom of Clay 1S
: Bottom of Clay 2S
: Water Level
: CPT Termination
: Effective Stress
: Total Stress



Legend:	
	: Bottom of Clay 1S
	Bottom of Clay 2S
	: Bottom of Clayey Sand/Top of Clay 3S
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress



0	
	: Mud line
	: Bottom of Clay 1S
	: Bottom of Clay 2S
	: Bottom of Clayey Sand/Top of Clay 3S
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress



Mobile County, Alabama

# : Bottom of Silt/Top of Clay 4S

- : Hydrostatic Water Pressure
- : Water Level
- : CPT Termination
  - : Effective Stress
    - : Total Stress



CPT-15

Legend:
---------

-0	
	: Mud line
	: Bottom of Clay 1S
	: Bottom of Clay 2S
	: Bottom of Clayey Sand/Top of Clay 3S
	- : Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	: Total Stress



CPT-16

Dauphin Island Causeway Project Mobile County, Alabama

- <b>0</b>	
	: Mud line
	: Bottom of Clay 1S
	: Bottom of Clay 2S
	: Bottom of Silt/Top of Clay 4S
	: Hydrostatic Water Pressure
	: Water Level
	: CPT Termination
	: Effective Stress
	· Total Stress
	. 10(01)(10)