# **VOLUME 2 OF 2**

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

SOLICITATION NO: **W9127821B0001** 

CADD NO: CHC20010

## **SPECIFICATIONS**

**FOR** 

# MOBILE HARBOR, ALABAMA DEEPENING AND WIDENING - PHASE 3

**MOBILE, ALABAMA** 

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

"GOOD ENGINEERING RESULTS IN A BETTER ENVIRONMENT"



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





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| 01 | 00 | 00    |    | ADDITIONAL SPECIAL CONTRACT REQUIREMENTS PROJECT SIGNS |
|----|----|-------|----|--|
|    |    |       |    | WAGE RATES   |
| 01 | 00 | 01    |    | GENERAL CONTRACT REQUIREMENTS                          |
|    |    |       |    | CESAM FORM 1151  |
| 01 | 32 | 01.00 | 10 | PROJECT SCHEDULE: BAR CHART                            |
| 01 | 33 | 00    |    | SUBMITTAL PROCEDURES                                   |
|    |    |       |    | SUBMITTAL REGISTERS                                    |
|    |    |       |    | ENGINEERING FORM 4025R                                 |
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| 01 | 57 | 20    |    | ENVIRONMENTAL PROTECTION (PIPELINE HYDRAULIC DREDGE)   |
| 01 | 57 | 20.00 | 10 | ENVIRONMENTAL PROTECTION (HOPPER DREDGE)               |

## DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION

| 35 | 20 | 23.00 | 36 | DREDGING |          |         |            |         |                    |
|----|----|-------|----|----------|----------|---------|------------|---------|--------------------|
| 35 | 20 | 23.13 |    | NATIONAL | DREDGING | QUALITY | MANAGEMENT | PROGRAM | SCOW - ULLAGE      |
|    |    |       |    | PROFILE  |          |         |            |         |                    |
| 35 | 20 | 23.23 |    | NATIONAL | DREDGING | QUALITY | MANAGEMENT | PROGRAM | HOPPER DREDGE      |
| 35 | 20 | 23.33 |    | NATIONAL | DREDGING | QUALITY | MANAGEMENT | PROGRAM | PIPELINE HYDRAULIC |
|    |    |       |    | DREDGE   |          |         |            |         |                    |

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# APPENDIX A

GEOTECHNICAL BORING LOGS AND LAB DATA



Project I.D. Boring Designation SS-95

| DRI              | LLIN               | G LO    | G       | DIVI            | ISION        | l Soi         | uth Atlantic  | II       | IST/             | ALL/            | ATION Mobile                            | District |                  | SHEET<br>OF 3    |                   | ETS     |                       |
|------------------|--------------------|---------|---------|-----------------|--------------|---------------|---------------|----------|------------------|-----------------|---|----------|------------------|------------------|-------------------|---------|-----------------------|
| PROJ             | ECT                |         |         |                 |              |               |               | LAT      | LONG             | COOR            | DINATES LAT = 30.4                      | 173463   |                  |                  |                   |         | 1                     |
| 19               | 63-196             | 4 Subs  | surfac  | e Inves         | stigatio     | n             |               | STA      | TE PLA           | NE CO           | OORDINATES X = 1,                       | 305,465  | Y = 17           | 72,561           |                   |         |                       |
|                  | OF BOI             |         |         |                 |              | RTED          | COMPLETED     |          |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. St | irvov Et | HORIZ<br>NAD8    |                  | <i>VER</i><br>MLL |         |                       |
| DRILI            | ING AG             | ENCY    |         | Corns           | of Fna       | ineers - (    | L<br>CESAM    |          |                  | ATIOI           | NS TOP OF BO                            | DRING    | GRO              | UND W            | ATE               |         | 1                     |
|                  | & TITLE            |         |         |                 | or Eng       | 1             | E OF DRILLER  |          |                  |                 | -27.8 F                                 |          |                  | nderwa           |                   |         | -                     |
|                  |                    | I/A, Ge |         | t .             |              |               | N/A           | N.       | /A               |                 |   |          |                  | D HAMN<br>UAL HA |                   | ER      |                       |
|                  | TION OF<br>VERTICA |         |         | IED             | DEG.<br>VERT | FROM<br>FICAL | BEARING       | SIZI     | E AND            | TYPE C          | OF BIT See R                            | emarks   |                  |                  |                   |         |                       |
| тніск            | NESS OF            | OVERB   | BURDEN  | !               | N/A          |               |               | тот      | AL NU            | MBER            | CORE BOXES (                            | )        |                  |                  |                   |         | 1                     |
| DEPTH            | то тор             | OF ROO  | CK      |                 | N/A          |               |               | тот      | AL SAI           | MPLES           | DISTURBED ()                            | UNI      | DISTURB          | ED (UD)          | ) (               | 0       | 1                     |
| TOTAL            | . DEPTH            |         | ING     |                 | 23.5 F       | eet           |               | тот      |                  | COVER           | Y FOR BORING No                         | t Record | ed               |                  | _                 |         | -                     |
| ELEV.            | DEPTH              | LEGEND  |         | CLASS           | IFICATIO     | ON OF MA      | TERIALS       | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                   | DR<br>RE | RILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |                       |
| -27.8            | 0.0                |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         |                       |
| - 27.0           | - 0.0              |         | (CH)    | CLAY,           | fat, higi    | h plastici    | ty, very soft |          |                  |                 |   |          |                  |                  |                   |         | -0                    |
|                  | _                  |         | COLISI  | stency,         | wet, gra     | ay            |               |          |                  |                 |   |          |                  |                  |                   |         | Ŀ                     |
| -                | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | -1                    |
|                  | <u> </u>           |         |         |                 |              |               |               |          |                  |                 | Advanced Boring                         |          |                  |                  |                   |         | ļ                     |
| -                | _                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | -2                    |
|                  | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | F                     |
| -                | -                  |         |         |                 |              |               |               |          |                  | 1               |   |          |                  |                  | 0                 |         | ţ                     |
| -                | -                  |         |         |                 |              |               |               | NR       |                  |                 | SDT Sampler                             |          |                  | -                | 0                 |         | -3                    |
| -                |                    |         |         |                 |              |               |               | INK      |                  |                 | SPT Sampler                             |          |                  | -                |                   | 0       | F                     |
| -                | _                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  | 0                 |         | <u> </u> 4            |
| -                |                    |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | ŀ                     |
| -                | [                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | F                     |
| -                | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | -5<br>-               |
| -                | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | ŀ                     |
| _                | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | -6                    |
|                  | _                  |         |         |                 |              |               |               |          |                  |                 | Advanced Boring                         |          |                  |                  |                   |         | L                     |
| -                | -                  |         |         |                 |              |               |               |          |                  |                 | / .u.ug                                 |          |                  |                  |                   |         | <b>-</b>              |
| -                | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | <b>⊢</b> 7            |
| -                | _                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | L                     |
| -                | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | -8                    |
| ] .              | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  |                   |         | ļ                     |
|                  | <u> </u>           |         |         |                 |              |               |               |          |                  |                 |   | ]        |                  |                  |                   |         | <u>-</u> 9            |
| ] -              | -                  |         |         |                 |              |               |               |          |                  |                 |   |          |                  |                  | 0                 |         | ۲                     |
| ] :              | <u> </u>           |         |         |                 |              |               |               | NR       |                  |                 | SPT Sampler                             |          |                  |                  | 0                 |         | ļ                     |
| SAM F<br>AUG 201 | ORM 1              | 1836    | Al<br>D | FTER<br>RILLING | ▼ Di         | URING S       | <u> </u>      | Continue | l<br>ed)         | <u> </u>        | Boring De                               | signatio | on S             | S-95             |                   |         | <b>L</b> <sub>1</sub> |

| RDINATES<br>55 Y = 1 |                             | -27.8 Ft  | Distr<br>TE S<br>e - A<br>I TOI | rict<br>YSTE<br>Nabar                  | na We           | est - U.S. Survey Ft.                | HORIZONTAL<br>NAD83             | M                               |                                 |                                   |
|----------------------|-----------------------------|---|---------------------------------|--|-----------------|--------------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------------------------|
| 5 Y = 1              | 172,561                     | State Plane ELEVATION -27.8 Ft  | TE S<br>e - A<br>i TOI<br>i.    | YSTE<br>Alabar<br>P OF E               | na We           | ADVANCEMENT  SPT Sampler             | NAD83                           | VEF<br>M                        | BLOWS/<br>0.5 FT.               | N-VALUE                           |
| 5 Y = 1              | 172,561                     | ELEVATION<br>-27.8 Ft<br>s RÉ   | i TOI                           | P OF E                                 | BORING          | ADVANCEMENT METHOD  SPT Sampler      |                                 |                                 | BLOWS/<br>0.5 FT.               | O N-VALUE                         |
| 5 Y = 1              | 172,561                     | -27.8 Ft  |                                 |  |                 | ADVANCEMENT<br>METHOD<br>SPT Sampler | DRILLIN<br>REMARK               | g g                             |                                 | O N-VALUE                         |
|                      |                             | s RÉ  | Ĉ.                              | BOX OR<br>SAMPLE                       | RODD            | SPT Sampler                          | DRILLIN<br>REMARK               | GS                              |                                 | O N-VALUE                         |
| TEGEND               | CLASSIFICATION OF MATERIALS |   |                                 | BOX OR                                 | RQD<br>OR<br>UD | SPT Sampler                          | DRILLIN<br>REMARK               | <b>ଓ</b> ଓ                      |                                 | O N-VALUE                         |
|                      |                             | N   | R                               |  |                 |                                      |                                 |                                 | 0                               | 0                                 |
|                      |                             |   |                                 |  |                 | Advanced Boring                      |                                 |                                 |                                 |                                   |
|                      |                             |   |                                 |  |                 |                                      |                                 |                                 |                                 |                                   |
|                      |                             | N   | R                               |  |                 | SPT Sampler                          |                                 |                                 | 0 0                             | 0                                 |
|                      |                             |   |                                 |  |                 | Advanced Boring                      |                                 |                                 |                                 |                                   |
|                      |                             | N   | R                               |  |                 | SPT Sampler                          |                                 |                                 | 0 0 0                           | 0                                 |
|                      |                             |   |                                 |  |                 | Advanced Boring                      |                                 |                                 |                                 |                                   |
|                      | 836-A                       | 836-A AFTER PURING PRILLING P |                                 | NR  NR  NR  NR  NR  NR  NR  NR  NR  NR |                 |                                      | NR SPT Sampler  Advanced Boring | NR SPT Sampler  Advanced Boring | NR SPT Sampler  Advanced Boring | NR SPT Sampler 0  Advanced Boring |

|             |                          |        |  |        |         |                  | D               | oring Designation   | )II <b>3</b> C    | S-95   |                   |         |
|-------------|--------------------------|--------|--|--------|---------|------------------|-----------------|---|-------------------|--------|-------------------|---------|
| DRI         | ILLIN                    | G L(   | OG (Cont. Sheet)   | INSTAL |         |                  |                 |   |                   | SHEET  |                   | Te      |
| PROJEC      |                          |        | ,  | COORD  | ile Dis |                  | M/DAT           | IIM   | HORIZONTAL        | OF 3   | TICAL             | 13      |
|             | -                        |        |  | 1      |         |                  |                 | est - U.S. Survey Ft.   |                   |        | LW                |         |
| OCATI       | ON COOR                  | RDINA  | TES  | ELEVAT |         |                  |                 |   |                   |        |                   |         |
| X = 1       | 1,805,46                 | 5 Y    | = 172,561  | -27.8  | 3 Ft.   |                  |                 |   |                   |        |                   |         |
| ELEV.       | DEPTH                    | LEGEND | CLASSIFICATION OF MATERIALS  |        | ĸĚC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>0.5 FT. | N-VALUE |
|             | -                        |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |        |                   |         |
| -           | -                        |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -<br>-<br>- | -<br>-<br>-              |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | -<br>-<br>-              |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | -<br>-<br>-              |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | <del>-</del><br>-        |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | -<br>-<br>-              |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | <del>-</del><br>-        |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | -<br>-                   |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           |                          |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | <del> </del><br> -<br> - |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | <del> </del><br> -<br> - |        |  |        |         |                  |                 |   |                   |        |                   |         |
| -           | ORM 1                    |        | A AFTER ▼ DURING ♀ DRILLING ▼  |        |         |                  |                 |   |                   | 1      |                   |         |

Project I.D. **Boring Designation** MHVBC-34-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.46976648 LONG = -88.01643054 STATE PLANE COORDINATES X = 1,805,806Y = 171,2152020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-09-20 01-09-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -48.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER J. McConnell, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** TOTAL RECOVERY FOR BORING 100 % 17.0 Feet BLOWS/ BOX OF SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -48.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray At El. -52 Ft. -200= 98%, PL= 36, LL= 60, PI= 24, MC= 143%, Gs= 2.89 100 1 Vibracore -56.0 8.0 (CL) CLAY, lean, high plasticity, soft consistency, some silt, few fine to coarse gravel-sized shell, few organic matter, wet, DRILLING ∑ DRILLING ב

(Continued)

MHVBC-34-19

Boring Designation

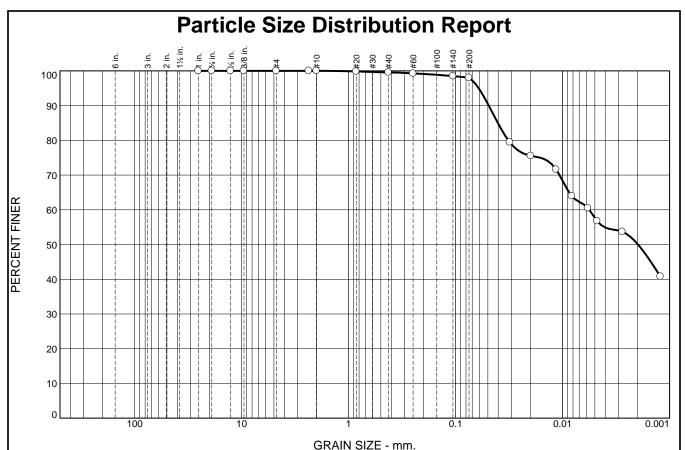
**SAM FORM 1836** 

**AUG 2017** 

DRILLING #

Boring Designation MHVBC-34-19

| Mobile District  | DR               | ILLIN             | G LC   | OG (Cont. Sheet)  | INSTAL |      |                  |  | oring Designation     |   | SHEE                  | <b>T</b> 2 |         |
|--|------------------|-------------------|--------|---|--------|------|------------------|--|-----------------------|---|-----------------------|------------|---------|
| State Plane - Alabama West - U.S. Survey Ft.   NAD83   MLLW  |                  |                   |        | ,   |        |      |                  | M/DAT                                    | IIM I                 | HORIZONTAL  | 1                     |            |         |
| COLATION COORDINATES   ELEVATION TOP OF BORING   48.0 FL   52.0   80.0   ADVANCEMENT   DRILLING   8.1   2.00   95%, PL   21, Lt = 40.0 PL   10, MC = 2.89   .  | NOOL             |                   |        |   |        |      |                  |  |                       |   |                       |            | -       |
| Section   Sect | OCATI            | ON COOF           | RDINAT | TES   |        |      |                  |  |                       |   | •                     |            |         |
| AB LE - SB Pt  | X = '            | 1,805,80          | 6 Y    | = 171,215   | -48.0  | Ft.  |                  |  |                       |   |                       |            |         |
| ## 100 1 Vibracore    100   1   Vibracore  | ELEV.            | DEPTH             | LEGEND | CLASSIFICATION OF MATERIALS   |        | ĸĚC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD                          | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                   | ig<br>KS              | BLOWS/     | N-VALUE |
|  | -63.5            | 15.5              | IEGEI  | (PT) PEAT, wet, dark brown  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils |        |      |                  | 28 E S S S S S S S S S S S S S S S S S S |                       | At El58 F<br>-200= 95%<br>21, LL= 40,<br>19, MC= 58 | ft.<br>, PL=<br>, PI= | BLOW 1 FT  | N-VAL   |
| ‡  | -<br>-<br>-<br>- | -<br>-<br>-       |        |   |        |      |                  |  |                       |   |                       |            |         |
| Ţ  | -<br>-<br>-      | <del>-</del><br>- |        |   |        |      |                  |  |                       |   |                       |            |         |



|           |        |       |        | O 1 () (11 1 O 1 C 1 C | 1111111 |         |      |  |
|-----------|--------|-------|--------|------------------------|---------|---------|------|--|
| % Cobbles | % G    | ravel |        | % Sand                 | d       | % Fines |      |  |
| % Cobbles | Coarse | Fine  | Coarse | Medium                 | Fine    | Silt    | Clay |  |
| 0.0       | 0.0    | 0.0   | 0.0    | 0.5                    | 1.5     | 40.3    | 57.7 |  |

| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 100.0   |         |        |
| #8    | 100.0   |         |        |
| #10   | 100.0   |         |        |
| #20   | 99.8    |         |        |
| #40   | 99.5    |         |        |
| #60   | 99.2    |         |        |
| #140  | 98.5    |         |        |
| #200  | 98.0    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

|   | Material Description                    | nn  |
|---|---|---|
| BROWN SILT  | material Description                    | <u></u>   |
| PL= 36  | Atterberg Limits LL= 60                 | PI= 24  |
| D <sub>90</sub> = 0.0490<br>D <sub>50</sub> = 0.0020<br>D <sub>10</sub> = | Coefficients D85= 0.0403 D30= Cu=       | D <sub>60</sub> = 0.0056<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= MH  | Classification<br>AASHT                 | O= A-7-5(31)  |
| MOISTURE CO<br>SPECIFIC GRA   | Remarks<br>ONTENT: 143.1%<br>VITY: 2.89 |   |

**Date:** 3/4/2020

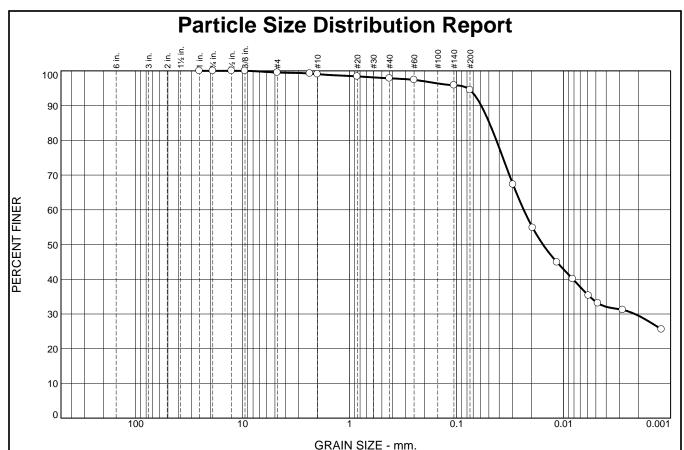
(no specification provided)

Source of Sample: MHVBC-34-19 **Depth:** 4'-6'

**SOUTHERN EARTH** Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045 **SCIENCES** Mobile, Alabama

Project No: M20-069 Figure



| % Cobbles | % Gı   | ravel |        | % Sand |      | % Fines |      |  |
|-----------|--------|-------|--------|--------|------|---------|------|--|
| % Cobbles | Coarse | Fine  | Coarse | Medium | Fine | Silt    | Clay |  |
| 0.0       | 0.0    | 0.5   | 0.5    | 1.2    | 3.3  | 61.0    | 33.5 |  |

| SIEVE | PERCENT                                      | SPEC.*  | PASS?  |
|-------|--|---|--|
| SIZE  | FINER  | PERCENT   | (X=NO)   |
| 1"    | 100.0  |   |  |
| 3/4"  | 100.0  |   |  |
| 1/2"  | 100.0  |   |  |
| 3/8"  | 100.0  |   |  |
| #4    | 99.5   |   |  |
| #8    | 99.2   |   |  |
| #10   | 99.0   |   |  |
| #20   | 98.4   |   |  |
| #40   | 97.8   |   |  |
| #60   | 97.4   |   |  |
| #140  | 95.8   |   |  |
| #200  | 94.5   |   |  |
|       |  |   |  |
|       |  |   |  |
|       |  |   |  |
|       |  |   |  |
|       | 1" 3/4" 1/2" 3/8" #4 #8 #10 #20 #40 #60 #140 | 1" 100.0<br>3/4" 100.0<br>1/2" 100.0<br>1/2" 100.0<br>3/8" 100.0<br>#4 99.5<br>#8 99.2<br>#10 99.0<br>#20 98.4<br>#40 97.8<br>#60 97.4<br>#140 95.8 | SIZE         FINER         PERCENT           1"         100.0           3/4"         100.0           1/2"         100.0           3/8"         100.0           #4         99.5           #8         99.2           #10         99.0           #20         98.4           #40         97.8           #60         97.4           #140         95.8 |

| GRAY CLAY   | Material Description  | <u>on</u>   |
|---|---|---|
| PL= 21  | Atterberg Limits LL= 40   | PI= 19  |
| D <sub>90</sub> = 0.0589<br>D <sub>50</sub> = 0.0156<br>D <sub>10</sub> = | Coefficients D <sub>85</sub> = 0.0494 D <sub>30</sub> = 0.0022 C <sub>u</sub> = | D <sub>60</sub> = 0.0236<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= CL  | Classification<br>AASHT   | O= A-6(19)  |
| MOISTURE CO<br>SPECIFIC GRA   |   |   |

**Date:** 3/4/2020

\* (no specification provided)

**Source of Sample:** MHVBC-34-19 **Depth:** 10'-12'

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation SS-97

| DRI              | LLIN               | G LO   | G        | DIVI           | SION         | Sou          | uth Atlantic  | II       | IST/             | ALL/            | ATION Mobile                           | Distric   | t I              | SHEET<br>OF 2  |                   | ETS     |            |
|------------------|--------------------|--------|----------|----------------|--------------|--------------|---------------|----------|------------------|-----------------|--|-----------|------------------|----------------|-------------------|---------|------------|
| PROJ             | ECT                |        | '        |                |              |              |               | LAT      | /LONG            | COOR            | DINATES LAT = 30.                      | 468135    |                  |                |                   |         | 1          |
| 19               | 63-196             | 4 Subs | surface  | Inves          | tigatio      | n            |               | STA      | TE PLA           | ANE CO          | <b>DORDINATES</b> $X = 1$ ,            | 806,196   | Y = 17           | 70,620         | )                 |         |            |
| DATE             | OF BOI             | RING   |          |                | STAI         | RTED         | COMPLETED     |          |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORI.            |                | <i>VER</i><br>MLL |         |            |
| DRILI            | ING AG             | ENCY   |          | Corps          | of Engi      | ineers - (   | L<br>CESAM    |          |                  | ATIO            | NS TOP OF B                            | ORING     | GRO              | UND I          | VATE              | R       | 1          |
|                  | & TITLE            |        |          |                | · · · ·      |              | E OF DRILLER  |          |                  |                 | -33.8 F                                |           |                  | nderw<br>o нам |                   |         |            |
|                  |                    |        | eologist |                |              |              | N/A           | N.       | /A               |                 |  | į         |                  | UAL H          |                   |         | ]          |
|                  | TION OF<br>VERTICA |        |          | ED             | DEG.<br>VERT | FROM<br>ICAL | BEARING       | SIZI     | E AND            | TYPE C          | OF BIT See R                           | lemarks   |                  |                |                   |         |            |
| тніск            | NESS OF            | OVERB  | URDEN    |                | N/A          |              |               | тот      | AL NU            | MBER            | CORE BOXES                             | )         |                  |                |                   |         |            |
| DEPTH            | то тор             | OF ROC | CK       |                | N/A          |              |               | тот      | 'AL SAI          | MPLES           | DISTURBED (                            | UNI       | DISTURB          | BED (UI        | D)                | 0       |            |
| TOTAL            | . DEPTH            |        | ING      |                | 17.5 Fe      | eet          |               | тот      |                  | COVER           | Y FOR BORING No                        | ot Record | ed               |                |                   |         |            |
| ELEV.            | DEPTH              | LEGEND |          | CLASSI         | FICATIO      | ON OF MA     | TERIALS       | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DF        | RILLING<br>MARKS |                | BLOWS/<br>0.5 FT. | N-VALUE |            |
| 22.0             | 0.0                |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         |            |
| -33.8            | 0.0                |        | (CH)     | CLAY, f        | fat, high    | n plasticit  | ty, very soft |          |                  |                 |  |           |                  |                |                   |         | -0<br>-    |
| -                | -                  |        | consis   | tency, v       | wet, gra     | ay           |               |          |                  |                 |  |           |                  |                |                   |         | -          |
| -                | -                  |        |          |                |              |              |               |          |                  |                 | Advanced Boring                        |           |                  |                |                   |         | -1         |
| -                |                    |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         |            |
| -                | -                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -          |
| -                | -                  |        |          |                |              |              |               |          |                  |                 |  | 1         |                  | Ī              | 0                 |         | -<br>-     |
| -                | _                  |        |          |                |              |              |               | NR       |                  |                 | SPT Sampler                            |           |                  | ŀ              | 0                 |         | -          |
| -                | -                  |        |          |                |              |              |               |          |                  |                 | or r dampier                           |           |                  | ŀ              |                   | 0       | -3         |
|                  | <u> </u>           |        |          |                |              |              |               |          |                  |                 |  | _         |                  |                | 0                 |         | ‡          |
| -                | _                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -<br>-4    |
|                  | -                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | - "        |
| -                | _                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -          |
| -                | _                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -5         |
|                  |                    |        |          |                |              |              |               |          |                  |                 | Advanced Boring                        |           |                  |                |                   |         | Ē          |
| -                | _                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -<br>-6    |
| -                | -                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -          |
| -                | -                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -          |
| -                | -                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                |                   |         | -7<br>-    |
| -                | }                  |        |          |                |              |              |               | -        |                  | -               |  | 1         |                  | }              | _                 |         | $\dagger$  |
| -                | -                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                | 0                 |         | -<br>-8    |
| ] :              | <u> </u>           |        |          |                |              |              |               | NR       |                  |                 | SPT Sampler                            |           |                  |                | 0                 | 0       | Ė          |
| -                | }                  |        |          |                |              |              |               |          |                  |                 |  |           |                  |                | 0                 | 5       | F          |
| -                | <u> </u>           |        |          |                |              |              |               |          |                  |                 |  | 1         |                  | ļ              |                   |         | —9<br>-    |
| ] :              | -                  |        |          |                |              |              |               |          |                  |                 | Advanced Boring                        |           |                  |                |                   |         | -          |
| SAM F<br>AUG 201 | ORM 1              | 836    | AF<br>DR | TER<br>RILLING | ▼ DI         | JRING S      | <u>Z</u> (    | Continue | <b>L</b><br>⊖d)  | <u> </u>        | Boring De                              | signati   | on S             | S-97           | ,                 |         | <b>L</b> 1 |

| DR                    | ILLIN                           | G LC   | G (Cont. Sheet)  | INSTAL<br>Mob |       | SHEET 2 OF 2 SHEETS |                 |   |                   |        |                   |         |   |
|-----------------------|---------------------------------|--------|--|---------------|-------|---------------------|-----------------|---|-------------------|--------|-------------------|---------|---|
| PROJEC                |                                 |        | <del>`</del>   | COORD         |       |                     | M/DAT           | IM  | HORIZONTAL        | +      | RTICAL            | -       | 1 |
|                       | -                               |        |  |               |       |                     |                 | est - U.S. Survey Ft.   |                   |        | LLW               |         |   |
| LOCATI                | ON COO                          | RDINAT | ES   | ELEVAT        |       |                     |                 |   |                   | •      |                   |         | 1 |
| X = -                 | 1,806,19                        | 96 Y   | = 170,620  | -33.8         | 3 Ft. |                     |                 |   |                   |        |                   |         |   |
| ELEV.                 | DEPTH                           | LEGEND | CLASSIFICATION OF MATERIALS  | •             | REC.  | BOX OR<br>SAMPLE    | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARI | ର<br>ଅ | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -                     | -                               |        |  |               |       |                     |                 | Advanced Boring   |                   |        |                   |         |   |
| -<br>-<br>-<br>-      | <del> </del><br> -<br> -<br> -  |        |  |               | NR    |                     |                 | SPT Sampler   |                   |        | 0 0               | 0       | - |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>- |        |  |               |       |                     |                 | Advanced Boring   |                   |        |                   |         |   |
| -51.3                 | 17.5                            |        |  |               |       |                     |                 | 440#1   |                   |        |                   |         | - |
| -<br>-<br>-<br>-      |                                 |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | ı             |       |                     |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |        |                   |         |   |
| -<br>-<br>-           | -<br>-<br>-<br>-                |        |  |               |       |                     |                 |   |                   |        |                   |         | - |
| -<br>-<br>-<br>-      | <br> -<br> -<br> -<br> -        |        |  |               |       |                     |                 |   |                   |        |                   |         |   |
| -<br>-<br>-           | <br> -<br> -<br> -              |        |  |               |       |                     |                 |   |                   |        |                   |         |   |
|                       | -<br>                           |        | A AFTER ▼ DURING ∇ DRILLING □  |               |       |                     |                 |   | esignation        | SS-97  |                   |         | ŀ |

Project I.D. **Boring Designation** VC-24-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.464442 LONG = -88.015455 STATE PLANE COORDINATES X = 1,806,105Y = 169,2771982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -44.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 27.0 Feet BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -44.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black and dark gray, with organic material At El. -46.4 Ft., soft consistency, light gray At El. -48.5 Ft. -200=97.6% 100 1 Vibracore

(Continued)

Boring Designation

VC-24-84

DRILLING ∑ DRILLING ב

DRILLING \*

**SAM FORM 1836** 

**AUG 2017** 

Boring Designation VC-24-84

|        |                      |                      |  |           |                          |                  | В               | oring Designation     | on <b>v</b> e           | C-24-84    |       | _ |
|--------|----------------------|----------------------|--|-----------|--------------------------|------------------|-----------------|-----------------------|-------------------------|------------|-------|---|
| DRI    | ILLIN                | G LO                 | G (Cont. Sheet)  | INSTAL    | <b>LATION</b><br>ile Dis |                  |                 |                       |                         | SHEET 2    |       | ٩ |
| PROJEC |                      |                      |  | COORD     |                          |                  | M/DAT           | UM                    | HORIZONTAL              | VERTI      |       | ٦ |
|        |                      |                      |  |           |                          |                  |                 | est - U.S. Survey Ft. |                         | MLL        |       |   |
|        | ON COOF              |                      |  | ELEVA.    |                          | OP OF            | BORING          | G                     |                         |            |       |   |
| X = ^  | 1,806,10<br><b>I</b> |                      | = 169,277  | -44.      | 0 Ft.<br>T               | ~!!!             |                 |                       | 1                       | Τ.         | Тш    | _ |
| ELEV.  | DEPTH                | LEGEND               | CLASSIFICATION OF MATERIAL   | LS        | REC.                     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK       |            | 1 FT. |   |
| -61.0  | 17.0                 |                      | (OL) CLAV organical, wet black a                                   | nd        | 100                      | 1                |                 | Vibracore             | At El58.5<br>-200=97.6% | ·Ft.       | ż     |   |
| 64.7   | 20.7                 |                      | (CH) CLAY, fat, high plasticity, soft consistency, wet, light gray |           | _                        |                  |                 |                       | At El64.5<br>-200=96.39 | 5 Ft.<br>6 |       |   |
| -      | ţ                    | <u> </u>             | (SM) SAND, silty, wet, white, poor                                 | ıy graded |                          |                  |                 |                       |                         |            |       |   |
|        | +                    | 1   †   † † <b> </b> |  |           |                          |                  |                 |                       | 1                       |            |       |   |

**Boring Designation** VC-24-84 INSTALLATION SHEET 3 **DRILLING LOG (Cont. Sheet)** Mobile District OF 3 SHEETS **PROJECT COORDINATE SYSTEM/DATUM** HORIZONTAL VERTICAL NAD83 MLLW State Plane - Alabama West - U.S. Survey Ft. **LOCATION COORDINATES ELEVATION TOP OF BORING** X = 1,806,105 Y = 169,277 -44.0 Ft. BOX OR SAMPLE LEGEND DRILLING REMARKS ĸĚC. ELEV. DEPTH **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD 24 25 100 1 Vibracore 26 -71.0 27.0 27 NOTES: 1. Soils are field visually classified in accordance with the Unified Soils 28 Classification System.

29 30 31 32 33 34 35 36 SAM FORM 1836-A AUG 2017 AFTER ▼ DRILLING  $\begin{array}{c} \textit{DURING} \\ \textit{DRILLING} \end{array} \underline{\nabla}$ Boring Designation VC-24-84

Project I.D. Boring Designation SS-99

| DRI      | LLIN               | G LO    | G [          | DIVISIO      | N Sou            | uth Atlantic  | IN      | IST/             | ALL/            | ATION Mobile                            | Distric   | t I               | HEET 1  |             | TS       |     |
|----------|--------------------|---------|--------------|--------------|------------------|---------------|---------|------------------|-----------------|---|-----------|-------------------|---------|-------------|----------|-----|
| PROJ     | ECT                |         | •            |              |                  |               | LAT     | LONG             | COOR            | DINATES LAT = 30.                       | 462516    |                   |         |             | _        |     |
| 19       | 63-196             | 4 Subs  | surface I    | Investigati  | on               |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1                        | 805,832   | Y = 16            | 8,578   |             |          |     |
|          | OF BOI             |         |              |              | ARTED            | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>Ibama West - U.S. S | urvev Et  | HORIZ<br>NAD8     |         | ERT.        |          |     |
| DRILI    | ING AG             | ENCY    |              | Corps of En  | aineers - (      | L<br>CESAM    |         |                  | ATIOI           | NS TOP OF B                             | ORING     |                   | UND WA  |             | _        |     |
|          |                    |         | D INSPEC     |              | <del>_</del>     | E OF DRILLER  |         |                  |                 | -26.8 F                                 |           |                   | nderwat |             | _        |     |
|          |                    | I/A, Ge |              |              | 12               | N/A           | N,      |                  |                 |   | [         |                   | HAMME   |             | 2        |     |
|          | TION OF<br>VERTICA |         | INCLINED     | DEG<br>VEF   | . FROM<br>RTICAL | BEARING       | SIZE    | E AND            | TYPE C          | <b>DF BIT</b> See F                     | Remarks   |                   |         |             |          |     |
| тніск    | NESS OF            | OVERB   | URDEN        | N/A          |                  |               | тот     | AL NU            | MBER            | CORE BOXES                              | 0         |                   |         |             |          |     |
| DEPTH    | то тор             | OF ROC  | K            | N/A          |                  |               | тот     | AL SAI           | MPLES           | DISTURBED (                             | ) UN      | DISTURB           | ED (UD) | 0           |          |     |
| TOTAL    | DEPTH              |         | ING          | 24.5         | Feet             |               | тот     |                  | COVER           | Y FOR BORING N                          | ot Record | ed                |         | <del></del> |          |     |
| ELEV.    | DEPTH              | LEGEND  | С            | LASSIFICAT   | ION OF MA        | TERIALS       | RÉC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                   | DI<br>RE  | RILLING<br>EMARKS | BLOWS/  | 0.5 FT.     | N-VALUE  |     |
| -26.8    | 0.0                |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             |          |     |
| -20.0    | - 0.0              |         | (CH) CI      | LAY, fat, hi | gh plastici      | ty, very soft |         |                  |                 |   |           |                   |         |             |          | 0   |
| -        | _                  |         | consiste     | ency, wet, g | ray              |               |         |                  |                 |   |           |                   |         |             | ŀ        |     |
| _        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | F        | 1   |
| -        |                    |         |              |              |                  |               |         |                  |                 | Advanced Boring                         |           |                   |         |             | ţ        |     |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | -        | •   |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | F        | 2   |
| -        | <u> </u>           |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | ļ        |     |
| =        | -                  |         |              |              |                  |               |         |                  |                 |   | -         |                   |         | _           | +        | 3   |
| -        | [                  |         |              |              |                  |               |         |                  |                 |   |           |                   | 0       | _           | F        |     |
| -        | _                  |         |              |              |                  |               | NR      |                  |                 | SPT Sampler                             |           |                   | 0       |             | 0 -      | 4   |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   | 0       |             | `  -     |     |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   | 1         |                   |         |             | 干        |     |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | F        | 5   |
|          | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | ŀ        |     |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | F        | 6   |
|          | _                  |         |              |              |                  |               |         |                  |                 | Advanced Boring                         |           |                   |         |             | ŀ        |     |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | -        | _   |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | F        | 7   |
|          | ţ                  |         |              |              |                  |               |         |                  |                 |   |           |                   |         |             | E        |     |
| -        | -                  |         |              |              |                  |               |         |                  |                 |   | -         |                   | -       | +           | +        | 8   |
| ] -      | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   | 0       | _           | ţ        |     |
|          | <u> </u>           |         |              |              |                  |               | NR      |                  |                 | SPT Sampler                             |           |                   | 0       |             | 0 -      | . 9 |
| ] -      | -                  |         |              |              |                  |               |         |                  |                 |   |           |                   | 0       |             | ĬF       | J   |
| <u> </u> |                    |         |              |              |                  |               |         |                  |                 | Advanced Boring                         |           |                   |         |             | <b>_</b> |     |
| SAM F    | ORM 1              | 1836    | AFTI<br>DRIL | ER 👤 I       | DURING S         | <u>√</u> (c   | ontinue | ed)              |                 | Boring De                               | esignati  | on S              | S-99    |             |          | 1   |

|          |   |         |                |                             |                  |                 |                  | В               | oring Designation                  | on S              | S-99         |                   |        |  |
|----------|---|---------|----------------|-----------------------------|------------------|-----------------|------------------|-----------------|------------------------------------|-------------------|--------------|-------------------|--------|--|
| DR       | II I IN                                   | GIO     | G (Cont. She   | et)                         |                  | INSTALLATION SH |                  |                 |                                    |                   |              |                   |        |  |
|          |   |         | (001111 0110   |                             | _                |                 |                  |                 |                                    |                   | OF 3         |                   | TS     |  |
| ROJE     | CT  |         |                |                             | COORD<br>State F |                 |                  |                 | <b>им</b><br>est - U.S. Survey Ft. | NAD83             |              | TICAL<br>LW       |        |  |
| OCAT     | ION COO                                   | RDINATE | <br>S          |                             | ELEVA.           |                 |                  |                 | NADOO                              | 1 1412            |              |                   |        |  |
|          |   |         | 168,578        |                             |                  | 8 Ft.           |                  |                 |                                    |                   |              |                   |        |  |
| ELEV.    | DEPTH                                     | Q N     |                | TION OF MATERIAL            | .s               | ĸč.             | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD              | DRILLIN<br>REMARK | G<br>(S      | BLOWS/<br>0.5 FT. | -value |  |
| -        |   |         |                |                             |                  |                 |                  |                 | Advanced Boring                    |                   |              |                   |        |  |
| -        | T<br>+<br>-<br>-<br>-<br>-<br>-<br>-<br>- |         |                |                             |                  | NR              |                  |                 | SPT Sampler                        | _                 | -            | 0 0 0             | 0      |  |
| -        |   |         |                |                             |                  |                 |                  |                 | Advanced Boring                    |                   |              |                   |        |  |
| -        | T<br> <br> -<br> -<br> -                  |         |                |                             |                  | NR              |                  |                 | SPT Sampler                        |                   |              | 0<br>0<br>0       | 0      |  |
| -        |   |         |                |                             |                  |                 |                  |                 | Advanced Boring                    |                   |              |                   |        |  |
| A P. 2 - | <del> </del>                              | 1922 1  | A 5 7 5 2      | DUDING T                    |                  | <u> </u>        |                  |                 | _                                  | 1                 |              |                   |        |  |
| am f     | ·ORM                                      | 1836-A  | AFTER DRILLING | DURING <u>▽</u><br>DRILLING | (C               | ontinue         | ed)              |                 | Boring De                          | esignation        | <b>SS-99</b> |                   |        |  |

| DRI                                   | ILLIN                       | G LO  | DG (Cont. Sheet)   | INSTAL   |         |                  |                 |   |                   | SHEET   |                   |          |             |
|---------------------------------------|-----------------------------|-------|--|--|---------|------------------|-----------------|---|-------------------|---------|-------------------|----------|-------------|
|                                       |                             |       | ,  | <del>                                     </del> | ile Dis |                  |                 |   |                   | OF 3    |                   | _        | ł           |
| PROJEC                                | řΤ                          |       |  | COORDI   |         |                  |                 | <b>им</b><br>est - U.S. Survey Ft.  | NAD83             |         | RTICAL<br>LLW     |          |             |
| OCATI                                 | ON COO                      | DDINA | rec  | ELEVAT   |         |                  |                 |   | NAD63             | IVI     | LLVV              | $\dashv$ | l           |
|                                       | <b>ON COO</b> I<br>1,805,83 |       | res<br>′ = 168,578   | -26.8  |         | )P UF I          | DUKIN(          | •   |                   |         |                   |          | l           |
| ELEV.                                 | DEPTH                       | Q     | CLASSIFICATION OF MATERIALS  |  | RÉC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE  |             |
| -<br>-51.3                            | 24.5                        |       |  |  |         |                  |                 | Advanced Boring   |                   |         |                   |          | -<br> -     |
| <u>-51.3</u><br>-<br>-<br>-<br>-<br>- | 24.5<br>-<br>-<br>-<br>-    |       | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |  |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |          |             |
| -<br>-<br>-<br>-                      | -<br>-<br>-<br>-            |       |  |  |         |                  |                 |   |                   |         |                   |          | -<br>-<br>- |
| -<br>-<br>-<br>-                      | -                           |       |  |  |         |                  |                 |   |                   |         |                   |          |             |
| -                                     | -<br>-<br>-                 |       |  |  |         |                  |                 |   |                   |         |                   |          |             |
| -                                     | -<br>-<br>-<br>-            |       |  |  |         |                  |                 |   |                   |         |                   |          |             |
| -                                     | †<br>-<br>-                 |       |  |  |         |                  |                 |   |                   |         |                   |          |             |
| -<br>-<br>-<br>-                      | †<br>-<br>-<br>-            |       |  |  |         |                  |                 |   |                   |         |                   |          |             |
| -                                     | -<br>-<br>-<br>-<br>-       |       |  |  |         |                  |                 |   |                   |         |                   |          |             |
|                                       | ORM 7                       | 1836  | A AFTER ▼ DURING ▽ DRILLING  |  |         |                  |                 | D: 5  | esignation        | SS-99   |                   |          | J           |

Project I.D. **Boring Designation** MHVBC-33-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.46041659 LONG = -88.01513633 STATE PLANE COORDINATES X = 1,806,199Y = 167,8132020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. **DATE OF BORING** 01-18-20 01-18-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -49.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 17.0 Feet BOX OF SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -49.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray, trace shell -52.0 3.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, trace shell, inorganic At El. -53 Ft. -200= 97%, PL= 21, LL= 50, PI= 29, MC= 69% 100 1 Vibracore At El. -58.0 Ft. some shell DURING ∑ DRILLING

(Continued)

MHVBC-33-19

**Boring Designation** 

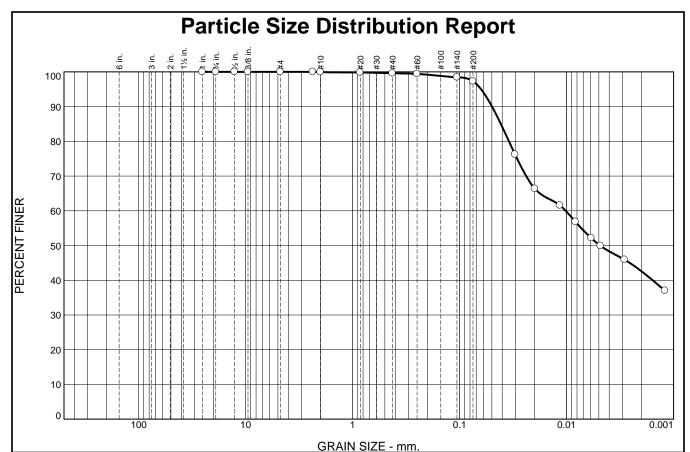
**SAM FORM 1836** 

**AUG 2017** 

DRILLING ¥

Boring Designation MHVBC-33-19

| DRILLING LOG (Cont. Sheet) |                       |           |  |                | INSTALLATION  Mobile District |                  |   |                       |  |                  | SHEET 2 OF 2 SHEETS |         |
|----------------------------|-----------------------|-----------|--|----------------|-------------------------------|------------------|---|-----------------------|--|------------------|---------------------|---------|
| PROJEC                     |                       |           | •  | COORD          |                               |                  | M/DAT                                   | UM                    | HORIZONTAL   |                  | TICAL               |         |
|                            |                       |           |  | _              |                               |                  |   | est - U.S. Survey Ft. | NAD83  | M                | LLW                 |         |
|                            | ON COOF<br>1 806 19   |           | res<br>= 167,813   | <b>ELEVA</b> 1 |                               | OP OF            | BORIN                                   | G                     |  |                  |                     |         |
| ELEV.                      | DEPTH                 | LEGEND    | CLASSIFICATION OF MATERIALS  |                | REC.                          | BOX OR<br>SAMPLE | RQD<br>OR<br>UD                         | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                    | g<br>S           | BLOWS/<br>1 FT.     | N-VALUE |
| -63.0 -66.0 -              | 14.0<br>              | TEG       | (SM) SAND, silty, wet, dark brown, of laden, with roots/wood  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | organic        | 100                           | BOX 1            | ₩ W W W W W W W W W W W W W W W W W W W | Vibracore             | At El65 F<br>-200= 42%,<br>52, LL= 66,<br>14, MC= 19 | t.<br>PL=<br>Pl= | BIO                 | N-VA    |
|                            | -<br>-<br>-<br>-<br>- |           |  |                |                               |                  |   |                       |  |                  |                     |         |
| AM F                       | -<br>ORM 1            | <br>1836- | A AFTER ▼ DURING ∇ DRILLING ▼  |                |                               |                  |   | Boring De             | signation  | MHVE             | 3C-3                | 3-19    |



| % Cobbles | % Gı   | ravel |        | % Sand |      | % Fines |      |  |  |
|-----------|--------|-------|--------|--------|------|---------|------|--|--|
| % Cobbles | Coarse | Fine  | Coarse | Medium | Fine | Silt    | Clay |  |  |
| 0.0       | 0.0    | 0.0   | 0.1    | 0.3    | 2.3  | 47.0    | 50.3 |  |  |
|           |        |       |        |        |      |         |      |  |  |

| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 100.0   |         |        |
| #8    | 100.0   |         |        |
| #10   | 99.9    |         |        |
| #20   | 99.8    |         |        |
| #40   | 99.6    |         |        |
| #60   | 99.4    |         |        |
| #140  | 98.5    |         |        |
| #200  | 97.3    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

| GRAY CLAY   | Material Descripti   | <u>on</u>   |
|---|--|---|
| PL= 21  | Atterberg Limits   | PI= 29  |
| D <sub>90</sub> = 0.0498<br>D <sub>50</sub> = 0.0049<br>D <sub>10</sub> = | Coefficients D <sub>85</sub> = 0.0412 D <sub>30</sub> = C <sub>u</sub> = | D <sub>60</sub> = 0.0102<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= CH  | Classification<br>AASH   | TO= A-7-6(31)   |
| MOISTURE CO<br>ASSUMED SPE  | Remarks<br>ONTENT: 68.8%<br>C. GRAVITY: 2.7                              |   |
|   |  |   |

(no specification provided)

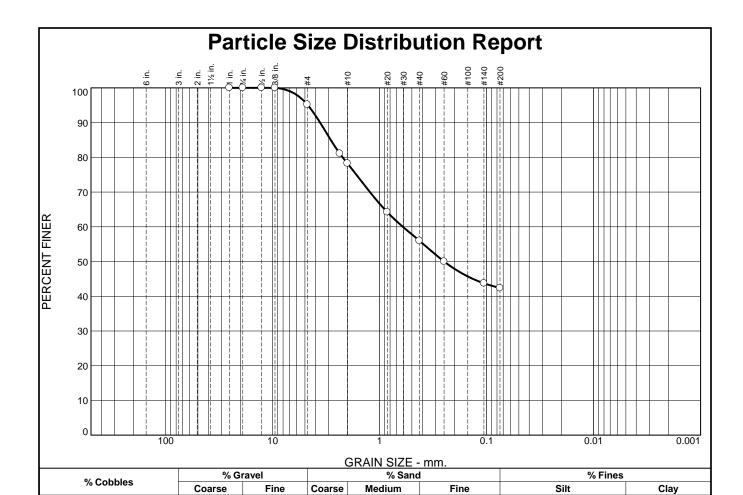
**Source of Sample:** MHVBC-33-19 **Depth:** 4'-5'

Date: 3/2/2020

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure



17.0

4.8

22.2

13.6

| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 95.2    |         |        |
| #8    | 81.1    |         |        |
| #10   | 78.2    |         |        |
| #20   | 64.2    |         |        |
| #40   | 56.0    |         |        |
| #60   | 50.0    |         |        |
| #140  | 43.7    |         |        |
| #200  | 42.4    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
| * .   |         |         |        |

0.0

|   | Material Description SAND W/ ORGANIC                              |   |
|---|---|---|
| PL= 52  | Atterberg Limits LL= 66   | PI= 14  |
| D <sub>90</sub> = 3.6076<br>D <sub>50</sub> = 0.2500<br>D <sub>10</sub> = | D <sub>85</sub> = 2.8662<br>D <sub>30</sub> =<br>C <sub>u</sub> = | D <sub>60</sub> = 0.6076<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= SM  | Classification<br>AASHT   | O= A-7-5(3)   |
| MOISTURE CO<br>ASSUMED SPE  | Remarks<br>NTENT: 193.5%<br>C. GRAVITY: 2.7                       |   |

42.4

**Date:** 3/2/2020

(no specification provided)

0.0

Source of Sample: MHVBC-33-19 Depth: 16'-17'

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation **SS-101** 

| DRI              | LLIN                     | G LO    | G            | DIV               | ISION                     | l Soi                  | uth Atlantic         | IN      | IST <i>A</i>     | \LL#            | ATION        | Mobile                          | District  |                 | SHEET 1<br>OF 2 SI | IFFT    |                           |
|------------------|--------------------------|---------|--------------|-------------------|---------------------------|------------------------|----------------------|---------|------------------|-----------------|--------------|---------------------------------|-----------|-----------------|--------------------|---------|---------------------------|
| PROJ             | ECT                      |         |              |                   |                           |                        |                      | LAT     | LONG             | COORI           | DINATES      | LAT = 30.4                      | 57116     |                 |                    |         | -                         |
| 19               | 63-196                   | 4 Sub   | surfac       | e Inve            | stigatio                  | n                      |                      | STA     | TE PLA           | NE CO           | ORDINATE     | <b>s</b> X = 1,80               | 06,290    | Y = 16          | 6,612              |         |                           |
|                  | OF BOI                   |         |              |                   | STAF                      |                        | COMPLETED            |         |                  |                 | STEM/DATU    | <b>M/UNITS</b><br>st - U.S. Sui | rvev Ft   | HORIZ<br>NAD8   |                    | ERT.    |                           |
| DRILI            | LING AG                  | ENCY    | ,            | Corp              | s of Engi                 | neers - (              | CESAM                | 1       |                  | ATION           |              | TOP OF BOI                      | RING      | GRO             | UND WAT            | ER      |                           |
| NAME             | & TITLE                  | OF FIEL | LD INSF      | PECTOR            |                           | NAM                    | E OF DRILLER         | MAN     | IUFAC            | TURER           | 'S DESIGNA   | -38.8 Fe                        |           | _               | nderwate<br>HAMME  |         | 1                         |
| DIREC            | TION OF                  | I/A, G  |              | t                 | DEG                       | EPOM                   | N/A<br>BEARING       | N/      | Ά                |                 |              |                                 |           | MANU            | JAL HAM            | MER     | 4                         |
|                  | VERTICA                  |         |              | NED               | DEG. I<br>VERT            | ICAL                   | BEARING              | SIZE    | AND 1            | TYPE O          | F BIT        | See Re                          | marks     |                 |                    |         |                           |
| тніск            | NESS OF                  | OVERE   | BURDE        | N                 | N/A                       |                        |                      | тот     | AL NU            | MBER (          | CORE BOXE    | : <b>s</b> 0                    |           |                 |                    |         |                           |
| DEPTH            | 1 ТО ТОР                 | OF RO   | СК           |                   | N/A                       |                        |                      | тот     | AL SAI           | MPLES           | DIST         | URBED ()                        | UND       | ISTURBI         | ED (UD)            | 0       |                           |
| TOTAL            | L DEPTH                  |         | RING         |                   | 12.5 Fe                   | eet                    |                      | тот     |                  | COVER           | Y FOR BOR    | ING Not                         | Recorde   | ed              | Τ.                 | Τ       | 4                         |
| ELEV.            | DEPTH                    | LEGEND  |              | CLAS              | SIFICATIO                 | N OF MA                | TERIALS              | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVAN<br>MET | CEMENT<br>HOD                   | DR<br>REI | ILLING<br>MARKS | BLOWS/             | N-VALUE |                           |
| -38.8            | 0.0                      |         |              |                   |                           |                        |                      |         |                  |                 |              |                                 |           |                 |                    |         |                           |
|                  | -                        |         | (CH)<br>cons | CLAY<br>istency   | , fat, high<br>, wet, gra | ı plastici<br>y, orgal | ty, very soft<br>nic |         |                  |                 | Advance      | ed Boring                       |           |                 |                    |         | - (<br>-<br>-<br>-<br>- 1 |
| -<br>-<br>-<br>- | -<br>-<br>-<br>-         |         |              |                   |                           |                        |                      | NR      |                  |                 | SPT S        | ampler                          |           |                 | 0                  | - a     | -<br>-2<br>-<br>) -<br>-  |
| -                |                          |         |              |                   |                           |                        |                      |         |                  |                 | Advance      | ed Boring                       |           |                 |                    |         |                           |
| -<br>-<br>-      | <br> -<br> -<br> -<br> - |         |              |                   |                           |                        |                      | NR      |                  |                 | SPT S        | ampler                          |           |                 | 0 0                | - c     | -                         |
| -                | T<br>-<br>-<br>-         |         |              |                   |                           |                        |                      |         |                  |                 | Advance      | ed Boring                       |           |                 |                    |         |                           |
| SAM F<br>AUG 201 | ORM 1                    | 836     | A            | AFTER<br>DRILLING | g <b>▼</b> DI             | JRING S                | <u> </u>             | ontinue | ed)              | <u> </u>        | В            | oring Des                       | signatio  | n S             | S-101              | 1       |                           |

| DR                    | ILLIN                          | G LO   | OG (Cont. Sheet)  | INSTALLATION  Mobile District |        |                  |                 |   |                   |         | r 2<br>Shei       | ET C    | 1 |
|-----------------------|--------------------------------|--------|---|-------------------------------|--------|------------------|-----------------|---|-------------------|---------|-------------------|---------|---|
| PROJEC                |                                |        | · ·   | COORD                         |        |                  | M/DAT           | <b>УМ</b>   | HORIZONTAL        | _       | RTICAL            |         | 1 |
|                       |                                |        |   |                               |        |                  |                 | est - U.S. Survey Ft.                                   |                   |         | LLW               |         |   |
| LOCATI                | ON COO                         | RDINA  | res   | ELEVA                         | ION TO | OP OF            | BORING          | 3   |                   |         |                   |         | 1 |
| X = '                 | 1,806,29                       | 90 Y   | z = 166,612   | -38.                          | 3 Ft.  |                  |                 |   | •                 |         |                   |         | ┛ |
| ELEV.                 | DEPTH                          | LEGEND | CLASSIFICATION OF MATERIAL  | s                             | REC.   | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                                   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-          |        |   |                               |        |                  |                 | Advanced Boring   |                   |         |                   |         |   |
| -51.3<br>-51.3        | 12.5                           |        | NOTES:  |                               |        |                  |                 | 140# hammer<br>w/30" drop used                          | _                 |         |                   |         | - |
| -<br>-<br>-<br>-      |                                |        | Soils are field visually classified in accordance with the Unified Soils Classification System. | n                             |        |                  |                 | with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         |   |
| -<br>-<br>-<br>-      | <del> </del><br> -<br> -<br> - |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>-      |                                |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-           |                                |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-               |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>-      | <del> </del><br> -<br> -<br> - |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-           | †<br>†<br>•<br>•               |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>-      | †<br>†<br>†<br>†               |        |   |                               |        |                  |                 |   |                   |         |                   |         |   |
|                       | <del> </del><br>ORM 1<br>7     | 1000   | AFTER ▼ DURING ▽ DRILLING □   |                               |        |                  |                 | _   | signation         | SS-10   |                   |         | ł |

Project I.D. **Boring Designation** MHVBC-32-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.45585261 LONG = -88.01493028 STATE PLANE COORDINATES X = 1,806,256Y = 166,1532020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. **DATE OF BORING** 01-18-20 01-18-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -50.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 18.0 Feet BOX OR SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD DRILLING REMARKS DEPTH REC. -50.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray -52.5 2.5 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, inorganic At El. -53.0 Ft. with indurated clay nodules 100 1 Vibracore At El. -56 Ft. -200= 98%, PL= 24, LL= 51, PI= 27, MC= 74% At El. -57.0 Ft. with indurated clay nodules

(Continued)

MHVBC-32-19

**Boring Designation** 

**SAM FORM 1836** 

**AUG 2017** 

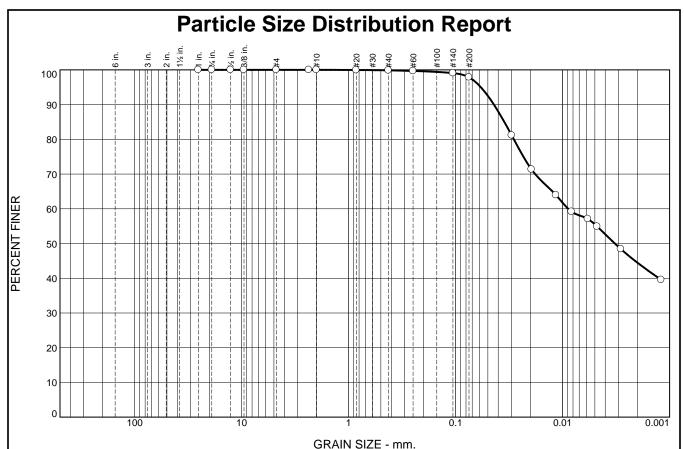
**DURING** 

DRILLING

DRILLING

Boring Designation MHVBC-32-19

| DRI                             | ILLIN            | G LO                       | G (Cont. Sheet)  | INSTALLATION |         |                  |                 |                       |                   |        | SHEET 2 OF 2 SHEETS |         |   |
|---------------------------------|------------------|----------------------------|--|--------------|---------|------------------|-----------------|-----------------------|-------------------|--------|---------------------|---------|---|
| PROJEC                          |                  |                            | (301111 311333)  | COORD        | ile Dis |                  | M/DAT           |                       | HORIZONTAL        |        | SHEE                |         | 4 |
| PROJEC                          | ,,               |                            |  | 1            |         |                  |                 | est - U.S. Survey Ft. | NAD83             |        | LLW                 |         |   |
| LOCATI                          | ON COOF          | RDINAT                     | ES   | ELEVAT       |         |                  |                 |                       |                   |        |                     |         | 1 |
| X = ^                           | 1,806,25         | 6 Y                        | = 166,153  | -50.0        | ) Ft.   |                  |                 |                       |                   |        |                     |         |   |
| ELEV.                           | DEPTH            | LEGEND                     | CLASSIFICATION OF MATERIALS  |              | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>1 FT.     | N-VALUE |   |
|                                 |                  |                            | At El62.0 Ft. trace shell  |              | 100     | 1                |                 | Vibracore             |                   |        |                     |         |   |
| -<br>-<br>-<br>-<br>-<br>-<br>- |                  |                            | At El66.0 Ft. trace wood   |              |         |                  |                 |                       |                   |        |                     |         |   |
| -68.0<br>-<br>-<br>-            | 18.0             |                            | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |              |         |                  |                 |                       | _                 |        |                     |         |   |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>- |                            | ,  |              |         |                  |                 |                       |                   |        |                     |         |   |
| -                               | <u></u>          |                            |  |              |         |                  |                 |                       |                   |        |                     |         |   |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>- |                            |  |              |         |                  |                 |                       |                   |        |                     |         |   |
| -                               | <del> </del>     | <u> </u><br>1836- <i> </i> | A AFTER ▼ DURING ▽ DRILLING  |              |         |                  |                 |                       |                   |        |                     |         | 9 |



|             |        |       |        | <u> </u> | 1111111 |         |      |  |  |
|-------------|--------|-------|--------|----------|---------|---------|------|--|--|
| 0/ 0-1-1-1- | % G    | ravel |        | % Sand   | d       | % Fines |      |  |  |
| % Cobbles   | Coarse | Fine  | Coarse | Medium   | Fine    | Silt    | Clay |  |  |
| 0.0         | 0.0    | 0.0   | 0.0    | 0.2      | 2.0     | 42.3    | 55.5 |  |  |

| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 100.0   |         |        |
| #8    | 100.0   |         |        |
| #10   | 100.0   |         |        |
| #20   | 99.9    |         |        |
| #40   | 99.8    |         |        |
| #60   | 99.7    |         |        |
| #140  | 99.0    |         |        |
| #200  | 97.8    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

|   |  | ·   |
|---|--|---|
| GRAY CLAY   | Material Descriptio  | <u>on</u>   |
| PL= 24  | Atterberg Limits LL= 51  | PI= 27  |
| D <sub>90</sub> = 0.0439<br>D <sub>50</sub> = 0.0032<br>D <sub>10</sub> = | <u>Coefficients</u><br>D <sub>85</sub> = 0.0351<br>D <sub>30</sub> =<br>C <sub>u</sub> = | D <sub>60</sub> = 0.0089<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= CH  | Classification<br>AASHT  | O= A-7-6(30)  |
| MOISTURE CO<br>ASSUMED SPE  | Remarks<br>NTENT: 73.7%<br>C. GRAVITY: 2.7   |   |

(no specification provided)

**Source of Sample:** MHVBC-32-19 **Depth:** 6'-7'

**Date:** 3/2/2020

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation **SS-103** 

| DRI                   | LLIN                       | G LO    | G          | DIVI          | SION        | N Sou                    | ıth Atlantic        | IN                  | IST/             | \LL#            | ATION M                        | obile [  | District  |                 | HEET 1<br>F 2 SH   | EETS       |   |
|-----------------------|----------------------------|---------|------------|---------------|-------------|--------------------------|---------------------|---------------------|------------------|-----------------|--------------------------------|----------|-----------|-----------------|--------------------|------------|---|
| PROJ                  | ECT                        |         | -          |               |             |                          |                     | LAT                 | LONG             | COORI           | DINATES LAT                    | = 30.45  | 51716     | LONG =          |                    |            |   |
| 19                    | 63-196                     | 4 Subs  | urface     | Inves         | tigatio     | n                        |                     | STA                 | TE PLA           | NE CO           | ORDINATES >                    | ζ = 1,80 | 06,748    | Y = 164         | 1,646              |            | 1 |
|                       | OF BOI                     |         |            |               | _           | RTED                     | COMPLETED           |                     |                  |                 | stem/datum/un<br>bama West - U |          | vev Ft    | HORIZ.          |                    | <b>RT.</b> | 1 |
| DRILI                 | LING AG                    | ENCY    |            | Corps         | of Fna      | ineers - C               | CESAM               |                     |                  | ATION           | IS TOP                         | OF BOR   | RING      | GROU            | IND WAT            | ER         | 1 |
|                       | & TITLE                    |         |            |               |             |                          | E OF DRILLER        |                     |                  |                 | -2<br>'S DESIGNATION           | 9.8 Fee  |           | _               | derwater<br>HAMMER |            | 1 |
|                       |                            | I/A, Ge |            |               |             |                          | N/A                 | N/                  | Ά                |                 |                                |          |           |                 | AL HAMN            |            | ╽ |
|                       | TION OF<br>VERTICA         |         |            | D             | DEG.<br>VER | FROM<br>FICAL            | BEARING             | SIZE                | AND T            | TYPE O          | F BIT S                        | See Rei  | marks     |                 |                    |            |   |
| тніск                 | NESS OF                    | OVERB   | URDEN      |               | N/A         |                          |                     | тот                 | AL NU            | MBER (          | CORE BOXES                     | 0        |           |                 |                    |            |   |
| DEPTH                 | 1 ТО ТОР                   | OF ROC  | K          |               | N/A         |                          |                     | тот                 | AL SAI           | MPLES           | DISTURBE                       | 0        | UND       | ISTURBE         | D (UD)             | 0          | 4 |
| TOTAL                 | L DEPTH                    |         | NG         |               | 21.5 F      | eet                      |                     | тот                 |                  | COVER           | Y FOR BORING                   | Not      | Recorde   | ed              |                    | l          | 4 |
| ELEV.                 | DEPTH                      | LEGEND  | •          | CLASSI        | FICATION    | ON OF MA                 | TERIALS             | REC.                | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEME<br>METHOD            | :NT      | DR<br>REI | ILLING<br>MARKS | BLOWS/<br>0.5 FT.  | N-VALUE    |   |
| -29.8                 | 0.0                        |         |            |               |             |                          |                     |                     |                  |                 |                                |          |           |                 |                    |            | 1 |
| - <u>-</u> 23.0       | -                          |         |            |               |             | h plasticit<br>ay, orgar | y, very soft<br>nic |                     |                  |                 | Advanced Bo                    | pring    |           |                 |                    |            |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>-      |         |            |               |             |                          |                     | NR                  |                  |                 | SPT Samp                       | ler      |           |                 | 0                  | 0          | - |
|                       |                            |         |            |               |             |                          |                     |                     |                  |                 | Advanced Bo                    | pring    |           |                 | 0                  |            |   |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-      |         |            |               |             |                          |                     | NR                  |                  |                 | SPT Samp                       | ler      |           |                 | 0 0                | 0          | - |
| -                     | †<br>-<br>-<br>-<br>-<br>- |         |            |               |             |                          |                     |                     |                  |                 | Advanced Bo                    | oring    |           |                 |                    |            |   |
| SAM F<br>AUG 201      | ORM 1                      | 1836    | AFT<br>DRI | TER<br>ILLING | ▼ D         | URING \(\frac{\tau}{2}\) | <u>Z</u> (C         | <u>l</u><br>ontinue | ed)              |                 | Borin                          | g Des    | ignatio   | on SS           | S-103              |            | 1 |

| ŊΡΙ                            | II I IN                          | GIC      | OG (Cont. Sheet)   | INSTAL                                   |         |                  |                 |   |                   | SHEET   |                   |          |
|--------------------------------|----------------------------------|----------|--|--|---------|------------------|-----------------|---|-------------------|---------|-------------------|----------|
|                                |                                  | <u> </u> | oo (oont: oneet)   |  | le Dist |                  |                 |   |                   | OF 2    |                   |          |
| PROJEC                         | CT .                             |          |  | COORDI                                   |         |                  |                 |   | NAD83             |         | RTICAL<br>LLW     |          |
|                                |                                  |          |  |  |         |                  |                 | est - U.S. Survey Ft.   | NAD83             | IVI     | LLVV              |          |
|                                | <b>ON COO</b> I                  |          | = 164,646  | <b>ELEVATION TOP OF BORING</b> -29.8 Ft. |         |                  |                 |   |                   |         |                   |          |
| ELEV.                          | DEPTH                            | Q        | CLASSIFICATION OF MATERIALS  |  | ĸ       | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE  |
| -<br>-<br>-<br>-               | -                                |          |  |  |         |                  |                 | Advanced Boring   |                   |         |                   | <u>z</u> |
| -<br>-<br>-<br>-               | <del>-</del>                     |          |  |  | NR      |                  |                 | SPT Sampler   | _                 |         | 0 0               | 0        |
| -<br>-<br>-<br>-<br>-<br>-     |                                  |          |  |  |         |                  |                 | Advanced Boring   |                   |         |                   |          |
| -<br>-<br>-<br>-<br>-          |                                  |          |  |  | NR      |                  |                 | SPT Sampler   | -                 |         | 0 0               | 0        |
| -<br>-<br>-<br>-<br>-          | <del>-</del><br>-<br>-<br>-<br>- |          |  |  |         |                  |                 |   |                   |         |                   |          |
| -                              | -                                |          |  |  |         |                  |                 |   |                   |         |                   |          |
| -51.3<br>-<br>-<br>-<br>-<br>- | 21.5                             |          | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |  |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |          |
| AN E                           | -<br>                            | 1836     | A AFTER ▼ DURING ▽ DRILLING □  |  |         |                  |                 | Boring De   | <u></u>           | SS-10   |                   |          |

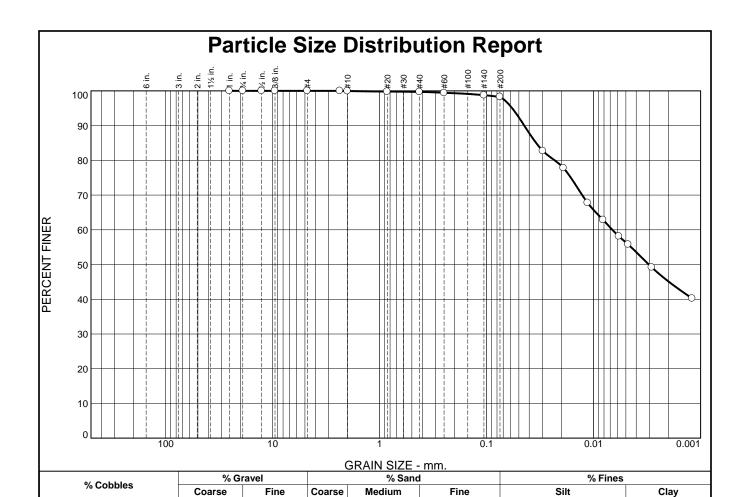
Project I.D. **Boring Designation** MHVBC-31-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.45052422 LONG = -88.0140657 STATE PLANE COORDINATES X = 1,806,520Y = 164,2132020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-19-20 01-19-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 15.0 Feet BOX OR SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray 100 1 Vibracore 7.0 -53.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, with trace shell and wood At El. -55 Ft. -200= 98%, PL= 25, LL= 54, PI= 29, MC= 72% DRILLING ∑ DRILLING ב **SAM FORM 1836** (Continued) Boring Designation MHVBC-31-19

DRILLING T

**AUG 2017** 

Boring Designation MHVBC-31-19

| DRI                        | LIIN                                      | GIO               | DG (Cont. Sheet)   | INSTALL |      | SHEET 2          |                 |                       | 1                                 |             |               |         |   |
|----------------------------|---|-------------------|--|---------|------|------------------|-----------------|-----------------------|-----------------------------------|-------------|---------------|---------|---|
|                            |   | <u> </u>          |  | Mobil   |      |                  |                 |                       |                                   | OF 2 SHEETS |               |         | 4   |
| PROJEC                     | т   |                   |  | COORDIN |      |                  |                 |                       | HORIZONTAL<br>NAD83               |             | RTICA<br>1LLW | L       |   |
| LOGATI                     | ON 000                                    |                   |  | ELEVATI |      |                  |                 | st - U.S. Survey Ft.  | NAD83                             | IV          | ILLVV         |         | 4   |
|                            | <b>on coo</b> i<br>1,806,52               |                   | ′ = 164,213  | -46.0   |      | JP OF            | BORING          | 1                     |                                   |             |               |         |   |
| ELEV.                      | DEPTH                                     | LEGEND            | CLASSIFICATION OF MATERIALS  | ·       | REC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                 | G<br>(S     | BLOWS/        | N-VALUE |   |
| -58.0                      | 12.0                                      |                   | (PT) PEAT, soft consistency, wet, bla<br>with roots  | - 1     | 100  | 1                |                 | Vibracore             | At El58.5<br>-200=23%,<br>MC=251% | Ft.         | 8             | Ż       | - 1<br>1<br>- 1<br>1<br>1<br>1            |
| -60.0<br>-<br>-61.0        | 14.0                                      |                   | (SM) SAND, silty, low plasticity, med consistency, wet, gray, inorganic                                    | ium     |      |                  |                 |                       |                                   |             |               |         | -<br>-<br>-<br>-<br>-<br>-<br>-           |
|                            | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |                   | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |      |                  |                 |                       |                                   |             |               |         | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |
| -<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-                |                   |  |         |      |                  |                 |                       |                                   |             |               |         | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-      |
|                            | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-      |                   |  |         |      |                  |                 |                       |                                   |             |               |         | -<br>-2<br>-<br>-<br>-<br>-<br>-<br>-     |
| SAM F                      | ORM 1                                     | <u> </u><br>1836- | AFTER ▼ DURING ▽ DRILLING ▼  |         |      |                  |                 | Boring De             | esignation                        | MHV         | BC-3          | 1-1     | <u>}</u>                                  |



| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 100.0   |         |        |
| #8    | 100.0   |         |        |
| #10   | 99.9    |         |        |
| #20   | 99.8    |         |        |
| #40   | 99.7    |         |        |
| #60   | 99.4    |         |        |
| #140  | 98.8    |         |        |
| #200  | 98.3    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

0.0

0.0

0.1

0.2

1.4

| GRAY CLAY   | Material Description | <u>on</u>                                     |
|---|----------------------|---|
|   |                      |   |
| DI 05   | Atterberg Limits     | <u>.</u>                                      |
| PL= 25  | LL= 54               | PI= 29  |
|   | Coefficients         |   |
| $D_{00} = 0.0445$   | $D_{85} = 0.0345$    | $D_{eo} = 0.0067$                             |
| $D_{50} = 0.0031$   | D <sub>30</sub> =    | D <sub>60</sub> = 0.0067<br>D <sub>15</sub> = |
| D <sub>90</sub> = 0.0445<br>D <sub>50</sub> = 0.0031<br>D <sub>10</sub> = | Cu≅                  | Cc≅   |
| -   | Classification       |   |
| USCS= CH  |                      | O= A-7-6(33)                                  |
| 0000- 611   | 7.070111             | <b>3</b> = 11-1-0(33)                         |
|   | <u>Remarks</u>       |   |
| MOISTURE CO   | NTENT: 71.9%         |   |
| ASSUMED SPE   | C. GRAVITY: 2.7      |   |
|   |                      |   |
|   |                      |   |

41.9

56.4

**Date:** 3/2/2020

(no specification provided)

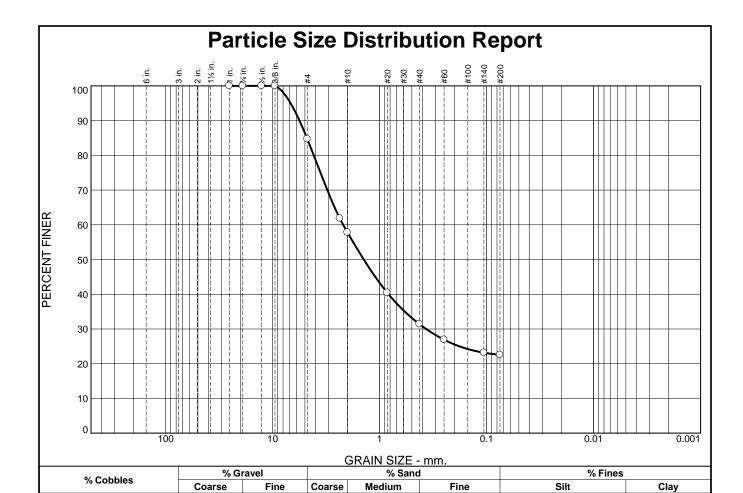
0.0

Source of Sample: MHVBC-31-19 Depth: 9'-10'

SOUTHERN EARTH SCIENCES Mobile, Alabama **Client:** ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure



26.9

26.4

8.9

15.3

| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 84.7    |         |        |
| #8    | 61.9    |         |        |
| #10   | 57.8    |         |        |
| #20   | 40.4    |         |        |
| #40   | 31.4    |         |        |
| #60   | 26.9    |         |        |
| #140  | 23.2    |         |        |
| #200  | 22.5    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

0.0

| Material Description BLACK ORGANICS                                       |   |   |
|---|---|---|
| PL=   | Atterberg Limits<br>LL=   | PI=   |
| D <sub>90</sub> = 5.6241<br>D <sub>50</sub> = 1.4089<br>D <sub>10</sub> = | Coefficients D <sub>85</sub> = 4.7925 D <sub>30</sub> = 0.3682 C <sub>u</sub> = | D <sub>60</sub> = 2.1936<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS=   | Classification<br>AASHT   | 0=  |
| Remarks MOISTURE CONTENT: 250.5% ASSUMED SPEC. GRAVITY: 2.7               |   |   |

22.5

(no specification provided)

0.0

Source of Sample: MHVBC-31-19 Depth: 12.5'-13.5'

Date: 3/2/2020

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation **SS-105** 

| DRI               | LLIN               | G LO   | G        | DIV             | ISION        | l Soi         | uth Atlantic  | IN      | IST/             | <b>ALL</b>      | ATION Mobile                           | Distric      | t I               | SHEET OF 2       |                   | ETS     |                |
|-------------------|--------------------|--------|----------|-----------------|--------------|---------------|---------------|---------|------------------|-----------------|--|--------------|-------------------|------------------|-------------------|---------|----------------|
| PROJ              | ECT                |        |          |                 |              |               |               | LAT     | LONG             | COORI           | DINATES LAT = 30                       | 446095       |                   |                  |                   |         | 1              |
| 19                | 63-196             | 4 Subs | surface  | e Inves         | stigatio     | n             |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1                       | ,806,384     | Y = 16            | 52,603           |                   |         | 1              |
|                   | OF BOI             |        |          |                 |              | RTED          | COMPLETED     |         |                  |                 | stem/datum/units<br>bama West - U.S. S | unyey Et     | HORIZ<br>NAD8     |                  | <i>ver</i><br>MLL |         | 1              |
| DRILL             | LING AG            | ENCY   |          | Corps           | of Fna       | ineers - (    | L<br>CESAM    |         |                  | ATION           | NS TOP OF B                            | ORING        | GRO               | UND W            | ATE               |         | 1              |
|                   | & TITLE            |        |          |                 | or Eng       |               | E OF DRILLER  |         |                  |                 | -33.8 F                                |              |                   | nderwa           |                   |         | -              |
|                   |                    |        | eologist |                 |              |               | N/A           | N/      | /A               |                 |  | Į.           |                   | D HAMN<br>UAL HA |                   | ER      |                |
|                   | TION OF<br>VERTICA |        |          | ED              | DEG.<br>VERT | FROM<br>FICAL | BEARING       | SIZE    | E AND            | TYPE O          | OF BIT See F                           | Remarks      |                   |                  |                   |         |                |
| тніск             | NESS OF            | OVERB  | BURDEN   |                 | N/A          |               |               | тот     | AL NU            | MBER (          | CORE BOXES                             | 0            |                   |                  |                   |         | _              |
| DEPTH             | і то тор           | OF ROO | CK       |                 | N/A          |               |               | тот     | AL SAI           | MPLES           | DISTURBED                              | ) UN         | DISTURB           | ED (UD)          | ) (               | 0       | 4              |
| TOTAL             | DEPTH              |        | ING      |                 | 17.5 F       | eet           |               | тот     |                  | COVER           | Y FOR BORING N                         | ot Record    | ed                |                  | _                 |         | _              |
| ELEV.             | DEPTH              | LEGEND |          | CLASS           | IFICATIO     | ON OF MA      | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DI           | RILLING<br>EMARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |                |
| -33.8             | 0.0                |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | 1              |
| -33.6             | 0.0                |        | (CH)     | CLAY,           | fat, higl    | h plastici    | ty, very soft |         |                  |                 |  |              |                   |                  |                   |         | -0<br>-        |
| -                 |                    |        | consis   | stency,         | wet, gra     | ay,           |               |         |                  |                 | Advanced Design                        |              |                   |                  |                   |         | -              |
| -                 | Į.                 |        |          |                 |              |               |               |         |                  |                 | Advanced Boring                        |              |                   |                  |                   |         | -1             |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  | _            |                   |                  |                   |         |                |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  | 0                 |         | -              |
| -                 | <u> </u>           |        |          |                 |              |               |               | NR      |                  |                 | SPT Sampler                            |              |                   |                  | 0                 |         | -2<br>-        |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  | 0                 | 0       |                |
| -                 | -                  |        |          |                 |              |               |               |         |                  |                 |  | -            |                   | $\vdash$         |                   |         | <del> </del> 3 |
| -                 | ļ                  |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | _              |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -<br>-4        |
| -                 | -                  |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | ŀ.             |
| -                 | ļ                  |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -              |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -5<br>-        |
| -                 |                    |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -              |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 | Advanced Boring                        |              |                   |                  |                   |         | -<br>-6        |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -              |
| -                 |                    |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -              |
| -                 | <del> </del>       |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -7<br>-        |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -              |
| -                 | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  |                   |         | -8             |
| -                 | ‡                  |        |          |                 |              |               |               |         |                  |                 |  | _            |                   |                  |                   |         | ļ              |
| -                 | Ł                  |        |          |                 |              |               |               |         |                  |                 |  |              |                   |                  | 0                 |         | Ł,             |
| -                 | <u> </u>           |        |          |                 |              |               |               | NR      |                  |                 | SPT Sampler                            |              |                   | Γ                | 0                 |         | -9<br>-        |
| ] [               | <u> </u>           |        |          |                 |              |               |               |         |                  |                 |  |              |                   | 卜                | 0                 | 0       | ļ              |
| SAM F<br>AUG 2011 | I<br>ORM 1         | 1836   | Al<br>Di | FTER<br>RILLING | Ţ Di         | URING S       | <u> </u>      | ontinue | ed)              | l               | Boring De                              | <br>esignati | on S              | S-10             |                   |         | <b>L</b> 1     |

Boring Designation SS-105

| DR                                    | ILLIN  | G LC       | G (Cont. Sheet)  | INSTAL  |          |                  |                 |   |                   | SHEE    |                   |         | 1 |
|---------------------------------------|--|------------|--|---------|----------|------------------|-----------------|---|-------------------|---------|-------------------|---------|---|
|                                       |  |            | (00000000000000000000000000000000000000  | 1       | ile Dis  |                  |                 |   |                   | OF 2    |                   |         | 4 |
| PROJEC                                | •1   |            |  | State P |          |                  |                 | <b>им</b><br>est - U.S. Survey Ft.  | NAD83             | 1       | RTICAL<br>LLW     | •       | 1 |
| OCATI                                 | ON COO   | PNINAT     | FS   | ELEVAT  |          |                  |                 |   | IVADOS            | 10      |                   |         | 1 |
|                                       |  |            | = 162,603  | -33.8   |          | JP OF            | BOKIN           | •   |                   |         |                   |         |   |
| ELEV.                                 | DEPTH  | Q          | CLASSIFICATION OF MATERIALS  |         | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE | 1 |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-  | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |            |  |         |          |                  |                 | Advanced Boring   |                   |         |                   | _       |   |
| -<br>-<br>-<br>-<br>-                 | -<br>-<br>-<br>-                               |            |  |         | NR       |                  |                 | SPT Sampler   |                   |         | 0 0               | 0       |   |
| -<br>-<br>-<br>-                      | -<br>-<br>-<br>-<br>-<br>-                     |            |  |         |          |                  |                 | Advanced Boring   |                   |         |                   |         |   |
| <u>-51.3</u><br>-<br>-<br>-<br>-<br>- | 17.5<br>-<br>-<br>-<br>-<br>-                  |            | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |          |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         |   |
| -<br>-<br>-<br>-                      | -<br>-<br>-<br>-<br>-                          |            |  |         |          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>-<br>-                 | -<br>-<br>-<br>-                               |            |  |         |          |                  |                 |   |                   |         |                   |         |   |
| AM F                                  | ORM 1  | <br>1836-/ | A AFTER ▼ DURING ▽ DRILLING  |         | <u> </u> |                  |                 | Boring De   | signation         | SS-10   | <br>)5            |         | J |

Project I.D. **Boring Designation** VC-26-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.445203 LONG = -88.013608 STATE PLANE COORDINATES X = 1,806,655Y = 162,2771982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -43.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 25.0 Feet ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -43.0 0.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, gray 100 1 Vibracore

SAM FORM 1836

AFTER DURING DURING DRILLING DRILLING

Boring Designation VC-26-84

|                                 |                   | INSTALL   | on <b>V</b> ( | N VC-26-84   SHEET 2 |                 |                       |                   |         |                 |         |
|---------------------------------|-------------------|-----------|---------------|----------------------|-----------------|-----------------------|-------------------|---------|-----------------|---------|
| <b>DRILLING LOG (Cont. Shee</b> | et)               | Mobile    |               |                      |                 |                       |                   | OF 3    |                 | TS      |
| ROJECT                          |                   | COORDIN   |               |                      | M/DATU          | <b>J</b> M            | HORIZONTAL        | +       | TICAL           |         |
|                                 |                   | +         |               |                      |                 | st - U.S. Survey Ft.  | NAD83             | MI      | LLW             |         |
| OCATION COORDINATES             |                   | ELEVATION |               | P OF E               | BORING          | •                     |                   |         |                 |         |
| X = 1,806,655 Y = 162,277       |                   | -43.0     | Ft.           | A/III                |                 |                       | 1                 |         | . 1             | ш       |
| ELEV. DEPTH   G   CLASSIFICAT   | TION OF MATERIALS | ŀ         | REC.          | BOX OR<br>SAMPLE     | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>1 FT. | N-VALUE |
|                                 | DURING ♀ DRILLING |           | 100           | 1                    |                 | Vibracore  Boring De  | esignation        | VC-26   |                 |         |

**Boring Designation** VC-26-84 INSTALLATION SHEET 3 **DRILLING LOG (Cont. Sheet)** Mobile District OF 3 SHEETS **PROJECT COORDINATE SYSTEM/DATUM** HORIZONTAL VERTICAL NAD83 MLLW State Plane - Alabama West - U.S. Survey Ft. **LOCATION COORDINATES ELEVATION TOP OF BORING** X = 1,806,655Y = 162,277-43.0 Ft. BOX OR SAMPLE BLOWS/ LEGEND DRILLING REMARKS ELEV. ĸEC. DEPTH **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD 24 100 1 Vibracore -68.0 25.0 25 NOTES: 1. Soils are field visually classified in accordance with the Unified Soils 26 Classification System. 27 28 29 30 31 32 33 34 35

36

Project I.D. **Boring Designation** MHVBC-30-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.4412254 LONG = -88.013463 STATE PLANE COORDINATES X = 1,806,694Y = 160,8312020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-19-20 01-19-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -45.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR MANUFACTURER'S DESIGNATION OF DRILL NAME OF DRILLER ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** TOTAL RECOVERY FOR BORING 100 % 20.0 Feet BOX OR SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD DRILLING REMARKS DEPTH REC. -45.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray 4.5 -49.5 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, with sand 100 1 Vibracore -53.5 8.5 (CL) CLAY, lean, dark gray, with fine to medium sand and shell At El. -54 Ft. -200= 78%, PL= 22, LL= 45, PI= 23, MC= 58%

(Continued)

Boring Designation

MHVBC-30-19

DRILLING ∑ DRILLING ב

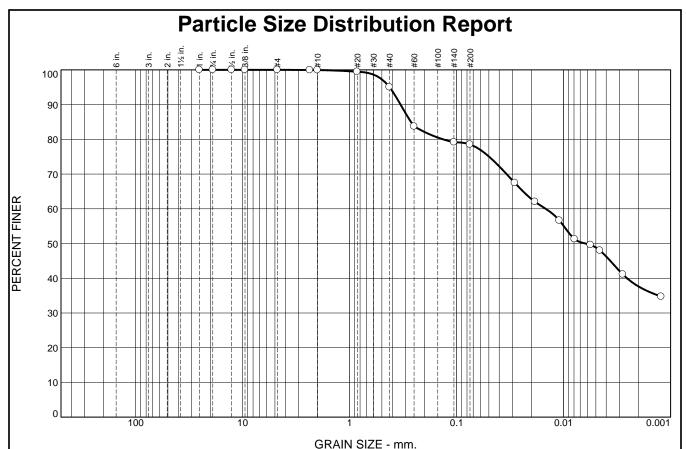
DRILLING #

**SAM FORM 1836** 

**AUG 2017** 

Boring Designation MHVBC-30-19

| DR   | ILLIN   | G LC   | DG (Cont. Sheet)  | INSTAL |         |                  |                 | 3 3                   |  | SHEE       |                 |         | 1            |
|--|---|--------|---|--------|---------|------------------|-----------------|-----------------------|--|------------|-----------------|---------|--------------|
| PROJEC   |   |        | 7   | COORD  | ile Dis |                  | M/DAT           | IM                    | HORIZONTAL   | -          | SHE             |         | $\mathbf{I}$ |
| ROUL   |   |        |   |        |         |                  |                 | est - U.S. Survey Ft. | NAD83  | l .        | ILLW            | •       |              |
| OCATI  | ON COOF   | RDINAT | TES   | ELEVA  |         |                  |                 |                       |  |            |                 |         | 1            |
| X = '  | 1,806,69  | 94 Y   | = 160,831   | -45.   | 0 Ft.   |                  |                 |                       |  |            |                 |         |              |
| ELEV.  | DEPTH   | LEGEND | CLASSIFICATION OF MATERIA   | LS     | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                    | G<br>(S    | BLOWS/<br>1 FT. | N-VALUE |              |
| -58.0  | 13.0  |        | At El57.0 Ft., low plasticity, medi<br>consistency, wet, gray sandy<br>(SC) SAND, clayey, medium consi<br>wet, gray |        | _       |                  |                 |                       | At El57 F<br>-200= 59%,<br>19, LL= 37,<br>18, MC= 46 | PL=<br>PI= |                 |         |              |
| -60.1-<br>-60.1-<br>-<br>-<br>-<br>-<br>-<br>- | 15.1  |        | At El60.0 Ft. sand lense (OH) CLAY, organic-H, wet, gray, wood  At El61.5 Ft. sand lense                            | with   | 100     | 1                |                 | Vibracore             |  |            |                 |         |              |
| -63.0<br>-63.0<br>-<br>-<br>-                  | 18.0  |        | (CH) CLAY, fat, high plasticity, sof consistency, wet, gray  At El64.0 Ft. wood trapped in bit                      |        | _       |                  |                 |                       |  |            |                 |         |              |
| -65.0<br>-65.0<br>-                            | 20.0  |        | NOTES:  |        |         |                  |                 |                       | _  |            |                 |         |              |
| -<br>-<br>-<br>-<br>-<br>-                     | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        | Soils are field visually classified accordance with the Unified Soils Classification System.                        | in     |         |                  |                 |                       |  |            |                 |         |              |



| 0/ Cabbles | % G    | ravel |        | % Sand | I    | % Fines |      |  |  |  |
|------------|--------|-------|--------|--------|------|---------|------|--|--|--|
| % Cobbles  | Coarse | Fine  | Coarse | Medium | Fine | Silt    | Clay |  |  |  |
| 0.0        | 0.0    | 0.0   | 0.1    | 4.9    | 16.5 | 29.6    | 48.9 |  |  |  |

| SIEVE | PERCENT  | SPEC.*  | PASS?   |
|-------|--|---|---|
| SIZE  | FINER  | PERCENT   | (X=NO)  |
| 1"    | 100.0  |   |   |
| 3/4"  | 100.0  |   |   |
| 1/2"  | 100.0  |   |   |
| 3/8"  | 100.0  |   |   |
| #4    | 100.0  |   |   |
| #8    | 99.9   |   |   |
| #10   | 99.9   |   |   |
| #20   | 99.5   |   |   |
| #40   | 95.0   |   |   |
| #60   | 83.7   |   |   |
| #140  | 79.2   |   |   |
| #200  | 78.5   |   |   |
|       |  |   |   |
|       |  |   |   |
|       |  |   |   |
|       |  |   |   |
|       | SIZE  1" 3/4" 1/2" 3/8" #4 #8 #10 #20 #40 #60 #140 | SIZE         FINER           1"         100.0           3/4"         100.0           1/2"         100.0           3/8"         100.0           #4         100.0           #8         99.9           #10         99.9           #20         99.5           #40         95.0           #60         83.7           #140         79.2 | SIZE         FINER         PERCENT           1"         100.0           3/4"         100.0           1/2"         100.0           3/8"         100.0           #4         100.0           #8         99.9           #10         99.9           #20         99.5           #40         95.0           #60         83.7           #140         79.2 |

| GRAY CLAY   | Material Description   | <u>on</u>   |
|---|--|---|
| PL= 22  | Atterberg Limits LL= 45  | PI= 23  |
| D <sub>90</sub> = 0.3344<br>D <sub>50</sub> = 0.0063<br>D <sub>10</sub> = | $\begin{array}{c} \underline{\text{Coefficients}} \\ \text{D}_{85} = 0.2676 \\ \text{D}_{30} = \\ \text{C}_{\text{U}} = \end{array}$ | D <sub>60</sub> = 0.0147<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= CL  | Classification<br>AASHT  | O= A-7-6(18)  |
| MOISTURE CO<br>ASSUMED SPE  | Remarks<br>ONTENT: 58.1%<br>CC. GRAVITY: 2.7   |   |

(no specification provided)

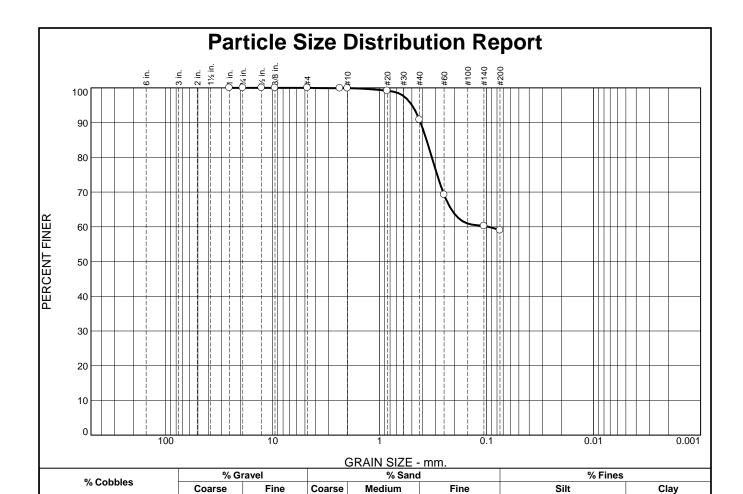
Source of Sample: MHVBC-30-19 Depth: 9'-10'

Date: 3/4/2020

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure



| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 100.0   |         |        |
| #8    | 99.9    |         |        |
| #10   | 99.9    |         |        |
| #20   | 99.2    |         |        |
| #40   | 90.8    |         |        |
| #60   | 69.2    |         |        |
| #140  | 60.2    |         |        |
| #200  | 59.0    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

0.0

0.0

0.1

9.1

31.8

| GRAY CLAY W  | <b>Material Descriptic</b><br>/ SAND                                     | <u>on</u>   |  |  |  |  |  |  |  |
|--|--|---|--|--|--|--|--|--|--|
| PL= 19   | Atterberg Limits LL= 37  | PI= 18  |  |  |  |  |  |  |  |
| D <sub>90</sub> = 0.4147<br>D <sub>50</sub> =<br>D <sub>10</sub> = | Coefficients D <sub>85</sub> = 0.3648 D <sub>30</sub> = C <sub>u</sub> = | D <sub>60</sub> = 0.0965<br>D <sub>15</sub> =<br>C <sub>c</sub> = |  |  |  |  |  |  |  |
| USCS= CL   | Classification<br>AASHT  | O= A-6(8)   |  |  |  |  |  |  |  |
| MOISTURE CONTENT: 46.1%  |  |   |  |  |  |  |  |  |  |
|  |  |   |  |  |  |  |  |  |  |

59.0

**Date:** 3/4/2020

(no specification provided)

0.0

Source of Sample: MHVBC-30-19 Depth: 12'-13'

SOUTHERN EARTH SCIENCES Mobile, Alabama **Client:** ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation SS-107

| DRI   | LLIN               | G LO    | G [       | DIVIS    | ION            | I Sou                  | th Atlantic  | IN      | IST/             | <b>ALL</b>      | ATION Mobile                           | e Distric | xt                | SHEET<br>OF 2    |                   | ETS     |
|-------|--------------------|---------|-----------|----------|----------------|------------------------|--------------|---------|------------------|-----------------|--|-----------|-------------------|------------------|-------------------|---------|
| PROJ  | ECT                |         |           |          |                |                        |              | LAT     | LONG             | COORI           | DINATES LAT = 30                       | .440666   | LONG              |                  |                   |         |
| 19    | 63-196             | 4 Subs  | surface I | Investiç | gatior         | n                      |              | STA     | TE PLA           | NE CO           | ORDINATES X = 1                        | ,806,925  | Y = 1             | 160,626          | 3                 |         |
| DATE  | OF BOI             | RING    |           |          | STAR           | RTED                   | COMPLETED    |         |                  |                 | stem/datum/units<br>bama West - U.S. S | Survey Ft | HOR.              |                  | <i>VER</i><br>MLL |         |
| DRILI | LING AG            | ENCY    |           | Corps of | f Engi         | neers - C              | ESAM         | 1       |                  | ATION           | IS TOP OF E                            | ORING     | GR                | OUND I           | VATE              | R       |
|       |                    |         | D INSPEC  |          |                |                        | OF DRILLER   |         |                  |                 | -32.5                                  |           |                   | Jnderv<br>ro ham |                   |         |
|       |                    | I/A, Ge |           |          |                |                        | N/A          | N/      | Ά                |                 |  |           |                   | NUAL H           |                   | ER      |
|       | TION OF<br>VERTICA |         | INCLINED  | , '      | DEG. F<br>VERT | ROM<br>ICAL            | BEARING      | SIZE    | AND T            | TYPE O          | F BIT See I                            | Remarks   |                   |                  |                   |         |
| тніск | NESS OF            | OVERB   | URDEN     | N        | N/A            |                        |              | тот     | AL NU            | MBER (          | CORE BOXES                             | 0         |                   |                  |                   |         |
| DEPTH | 1 ТО ТОР           | OF ROC  | K         |          | N/A            |                        |              | тот     | AL SAI           | MPLES           | DISTURBED                              | 0 0       | IDISTUR           | BED (U           | D) (              | 0       |
| TOTAL | L DEPTH            |         | NG        | 18       | 8.5 Fe         | eet                    |              | тот     |                  | COVER           | Y FOR BORING                           | lot Recor | ded               |                  |                   |         |
| ELEV. | DEPTH              | LEGEND  | С         | LASSIFI  | CATIO          | ON OF MA               | TERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | R         | RILLING<br>EMARKS | ;                | BLOWS/<br>0.5 FT. | N-VALUE |
| -32.5 | 0.0                |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
|       | 0.0                |         | (CH) CI   | LAY, fat | t, high        | plasticit              | y, very soft |         |                  |                 |  |           |                   |                  |                   |         |
|       | İ                  |         | Consiste  | incy, we | ət, gra        | y, organ               | ic           |         |                  |                 |  |           |                   |                  |                   |         |
| -     | -                  |         |           |          |                |                        |              |         |                  |                 | Advanced Boring                        |           |                   |                  |                   |         |
|       | ļ                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| -     | +                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| -     | Ī                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   | Ī                | 0                 |         |
|       | İ                  |         |           |          |                |                        |              | NR      |                  |                 | SPT Sampler                            |           |                   | ŀ                | 0                 |         |
| -     | -                  |         |           |          |                |                        |              |         |                  |                 | or i damplei                           |           |                   | ŀ                |                   | 0       |
|       | ļ                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  | 0                 |         |
| -     | +                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| -     | Ī                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| •     | t                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| _     | _                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| •     | ‡                  |         |           |          |                |                        |              |         |                  |                 | Advanced Boring                        |           |                   |                  |                   |         |
| -     | +                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| -     | <u> </u>           |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| •     | t                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| _     | +                  |         |           |          |                |                        |              |         |                  |                 |  | _         |                   | }                |                   |         |
|       | ‡                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   | ļ                | 0                 |         |
|       | †                  |         |           |          |                |                        |              | NR      |                  |                 | SPT Sampler                            |           |                   |                  | 0                 | _       |
| -     | ‡                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   | İ                | 0                 | 0       |
|       | t                  |         |           |          |                |                        |              |         |                  |                 |  | +         |                   | ł                |                   |         |
| -     | Į                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| -     | <u> </u>           |         |           |          |                |                        |              |         |                  |                 | Advanced Boring                        |           |                   |                  |                   |         |
|       | +                  |         |           |          |                |                        |              |         |                  |                 |  |           |                   |                  |                   |         |
| SAM F | ORM 1              | 1836    | AFTI      | ER LLING | DU DE          | JRING <u>S</u> RILLING | <u>7</u> (C  | ontinue | ed)              |                 | Boring D                               | esignat   | ion \$            | SS-10            | 7                 |         |

Boring Designation SS-107

| DR  | ILLIN                 | G LO   | G (Cont. Sheet)  | INSTALL<br>Mobi | <b>.ation</b><br>le Dist |                  |                 |   |                   | SHEET 2 OF 2 SI |                   |         |   |
|---|-----------------------|--------|--|-----------------|--------------------------|------------------|-----------------|---|-------------------|-----------------|-------------------|---------|---|
| ROJEC                                     |                       |        | ,  | COORDI          |                          |                  | M/DATI          | Ing   | HORIZONTAL        | _               | TICAL             |         | 4 |
| KOJEC                                     | ••                    |        |  |                 |                          |                  |                 | est - U.S. Survey Ft.   | NAD83             |                 | LLW               | •       |   |
| OCATI                                     | ON COOL               | RDINAT | ES   | ELEVAT          |                          |                  |                 |   |                   |                 |                   |         | 1 |
| X = '                                     | 1,806,92              | 25 Y   | = 160,626  | -32.5           | Ft.                      |                  |                 |   |                   |                 |                   |         |   |
| ELEV.                                     | DEPTH                 | LEGEND | CLASSIFICATION OF MATERIALS  |                 | ĸ.                       | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G               | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | -                     |        |  |                 |                          |                  |                 | Advanced Boring   |                   |                 |                   |         |   |
| -<br>-<br>-<br>-                          | -<br>-<br>-<br>-      |        |  |                 | NR                       |                  |                 | SPT Sampler   | _                 |                 | 0 0               | 0       |   |
| -   | -<br>-<br>-<br>-<br>- |        |  |                 |                          |                  |                 | Advanced Boring   |                   |                 |                   |         |   |
| -<br>-<br>51.0                            | 18.5                  |        |  |                 |                          |                  |                 |   |                   |                 |                   |         |   |
| -<br>-<br>-<br>-                          | -<br>-<br>-<br>-<br>- |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |                 |                          |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |                 |                   |         |   |
| -<br>-<br>-<br>-                          | -<br>-<br>-<br>-      |        |  |                 |                          |                  |                 |   |                   |                 |                   |         |   |
| -<br>-<br>-<br>-<br>-                     | T<br>-<br>-<br>-<br>- |        |  |                 |                          |                  |                 |   |                   |                 |                   |         |   |
| _   | ł                     | 1      |  |                 |                          |                  |                 |   |                   |                 |                   |         |   |

Project I.D. **Boring Designation** VC-27-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.437230 LONG = -88.013408 STATE PLANE COORDINATES X = 1,806,705Y = 159,3771982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -38.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 22.0 Feet BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -38.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with organic material At El. -40.8 Ft., soft consistency At El. -42.5 Ft. -200=97.2% 100 1 Vibracore

(Continued)

Boring Designation

VC-27-84

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DRILLING T

**SAM FORM 1836** 

**AUG 2017** 

Boring Designation VC-27-84

| DR                 | ILLING L    | OG (Cont. Sheet)   | INSTALL |        |                  |                 |                       |                                    | SHEET |   |         |   |
|--------------------|-------------|--|---------|--------|------------------|-----------------|-----------------------|------------------------------------|-------|---|---------|---|
| PROJEC             |             |  | COORDI  | e Dist |                  | 14/D 4 T        |                       | HODITONITAL                        | OF 2  |   |         | 4 |
| ROJEC              | •1          |  |         |        |                  |                 | est - U.S. Survey Ft. | NAD83                              |       | RTICAL<br>LLW                           | •       |   |
| OCATI              | ON COORDINA | TES  | ELEVAT  |        |                  |                 |                       | 10.000                             |       |   |         | 1 |
|                    | 1,806,705   |  | -38.0   |        |                  |                 |                       |                                    |       |   |         |   |
| ELEV.              | DEPTH DEPTH | CLASSIFICATION OF MATERIALS  |         | ĸč.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                  | SS    | BLOWS/                                  | N-VALUE |   |
| -51.2 <sup>-</sup> |             | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         | 100    | BBO SAN          | 56              | Vibracore             | At El52.5<br>LOI=21.7,<br>-200=91% |       | 1 B 1 C C C C C C C C C C C C C C C C C | N-N     |   |

Project I.D. Boring Designation SS-109

| DRI    | LLIN               | G LO     | G        | DIVI          | SION        | N Sou                      | ıth Atlantic | IN      | ISTA             | <b>ALL</b>      | ATION Mobile                                   | District  | SHEE                   | T 1<br>2 <b>She</b> | ETS     |
|--------|--------------------|----------|----------|---------------|-------------|----------------------------|--------------|---------|------------------|-----------------|--|-----------|------------------------|---------------------|---------|
| PROJ   | ECT                |          |          |               |             |                            |              | LAT     | LONG             | COORI           | DINATES LAT = 30.4                             | 135174    | LONG = -88             |                     |         |
| 19     | 63-196             | 4 Subs   | surface  | Inves         | tigatio     | n                          |              | STA     | TE PLA           | NE CO           | PORDINATES $X = 1,8$                           | 306,620   | Y = 158,63             | 30                  |         |
| DATE   | OF BOI             | RING     |          |               | STA         | RTED                       | COMPLETED    |         |                  |                 | <b>STEM/DATUM/UNITS</b><br>bama West - U.S. St | ırvev Ft  | <i>HORIZ.</i><br>NAD83 | <i>VER</i><br>MLL   |         |
| DRILI  | LING AG            | ENCY     |          | Corps         | of Eng      | ineers - C                 | CESAM        | 1       | LEVA             |                 | NS TOP OF BO                                   | DRING     | GROUND                 | WATE                | R       |
| NAME   | & TITLE            | OF FIELI |          | •             |             |                            | E OF DRILLER |         |                  |                 | -38.8 F  |           | Under  AUTO HA         |                     |         |
|        |                    | I/A, Ge  |          |               |             |                            | N/A          | N/      | Ά                |                 |  |           | MANUAL                 |                     |         |
|        | TION OF<br>VERTICA |          |          | ED .          | DEG.<br>VER | FROM<br>FICAL              | BEARING      | SIZE    | AND 1            | TYPE C          | See R  | emarks    |                        |                     |         |
| тніск  | NESS OF            | OVERB    | URDEN    |               | N/A         |                            |              | тот     | AL NU            | MBER (          | CORE BOXES (                                   | )         |                        |                     |         |
| DEPTH  | і то тор           | OF ROC   | K        |               | N/A         |                            |              | тот     | AL SAI           | MPLES           | <b>DISTURBED</b> ()                            | UNE       | DISTURBED (            | (סני                | 0       |
| TOTAL  | . DEPTH            |          | NG       |               | 12.5 F      | eet                        |              | тот     | _                | COVER           | Y FOR BORING No                                | t Recorde | ed                     |                     |         |
| ELEV.  | DEPTH              | LEGEND   |          | CLASSI        | FICATION    | ON OF MA                   | TERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                          | DR<br>RE  | ILLING<br>MARKS        | BLOWS/<br>0.5 FT.   | N-VALUE |
| -38.8  | 0.0                |          |          |               |             |                            |              |         |                  |                 |  |           |                        | П                   |         |
| - 00.0 | 0.0                |          | (CH) (   | CLAY, 1       | fat, hig    | h plasticit                | y, very soft |         |                  |                 |  |           |                        | 1                   |         |
| -      | <u> </u>           |          | CONSISI  | tericy, v     | wet, gr     | ay, orgar                  | IIC          |         |                  |                 |  |           |                        |                     |         |
| -      | -                  |          |          |               |             |                            |              |         |                  |                 | Advanced Boring                                |           |                        |                     |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | -                  |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | -                  |          |          |               |             |                            |              |         |                  |                 |  |           |                        | 0                   |         |
| -      | Ì                  |          |          |               |             |                            |              | NR      |                  |                 | SPT Sampler                                    |           |                        | 0                   |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 | Or i Gamplei                                   |           |                        |                     | 0       |
|        | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        | 0                   |         |
| -      |                    |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | Ī                  |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
|        | <u> </u>           |          |          |               |             |                            |              |         |                  |                 | Advanced Boring                                |           |                        |                     |         |
| -      | -                  |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | ļ.                 |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
|        | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        |                     |         |
| -      | }                  |          |          |               |             |                            |              |         |                  |                 |  |           |                        | 0                   |         |
| -      | F                  |          |          |               |             |                            |              | NR      |                  |                 | SPT Sampler                                    |           |                        | 0                   |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 | -  |           |                        | 0                   | 0       |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 |  |           |                        | $\vdash$            |         |
| -      | <u> </u>           |          |          |               |             |                            |              |         |                  |                 | Advanced Boring                                |           |                        |                     |         |
| -      | }                  |          |          |               |             |                            |              |         |                  |                 | Latanesa Bennig                                |           |                        |                     |         |
| SAM F  | ORM 1              | 836      | AF<br>DR | TER<br>ILLING | ▼ D         | URING \(\frac{\gamma}{2}\) | <u>Z</u> (C  | ontinue | ed)              | •               | Boring De                                      | signatio  | on <b>SS-1</b>         | 09                  |         |

Boring Designation SS-109

| DR               | ILLIN                  | G LO   | OG (Cont. Sheet)  | INSTAL | <b>LATION</b><br>ile Dis |                  |                 |   |                   | SHEET   | T 2<br>Shee       | :Te     | 1 |
|------------------|------------------------|--------|---|--------|--------------------------|------------------|-----------------|---|-------------------|---------|-------------------|---------|---|
| PROJEC           |                        |        | · ·   | COORD  |                          |                  | M/DAT           | <b>УМ</b>   | HORIZONTAL        | _       | RTICAL            |         | 1 |
|                  |                        |        |   |        |                          |                  |                 | est - U.S. Survey Ft.                                   | NAD83             |         | LLW               |         |   |
| LOCATI           | ои соог                | RDINA  | res   | ELEVA  | ION TO                   | OP OF            | BORING          | 3   |                   |         |                   |         | 1 |
| X = '            | 1,806,62               | 20 Y   | ´ = 158,630   | -38.   | 3 Ft.                    |                  |                 |   | _                 |         |                   |         | 1 |
| ELEV.            | DEPTH                  | LEGEND | CLASSIFICATION OF MATERIAL  | s      | REC.                     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                                   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-  |        |   |        |                          |                  |                 | Advanced Boring   |                   |         |                   |         |   |
| -51.3<br>-       | 12.5                   |        | NOTES:  |        |                          |                  |                 | 140# hammer<br>w/30" drop used                          |                   |         |                   |         |   |
| -<br>-<br>-      | -<br>-<br>-<br>-       |        | Soils are field visually classified in accordance with the Unified Soils Classification System. | n      |                          |                  |                 | with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         |   |
| -<br>-<br>-<br>- | <del>-</del><br>-<br>- |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-      | <del>-</del><br>-<br>- |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-      | <del>-</del><br>-<br>- |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-      | -<br>-<br>-            |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-      | -<br>-<br>-            |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>- | -<br>-<br>-            |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -<br>-<br>-<br>- | -<br>-<br>-            |        |   |        |                          |                  |                 |   |                   |         |                   |         |   |
| -                | ORM 1                  |        | A AFTER ▼ DURING ▽ DRILLING □ DRILLING  |        |                          |                  |                 |   |                   |         |                   |         | J |

Project I.D. **Boring Designation** MHVBC-29-29 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.43253299 LONG = -88.01391342 STATE PLANE COORDINATES X = 1,806,538Y = 157,6702020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-19-20 01-19-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -45.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 18.0 Feet ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -45.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray 100 1 Vibracore DURING ∑ DRILLING **SAM FORM 1836** 

(Continued)

DRILLING #

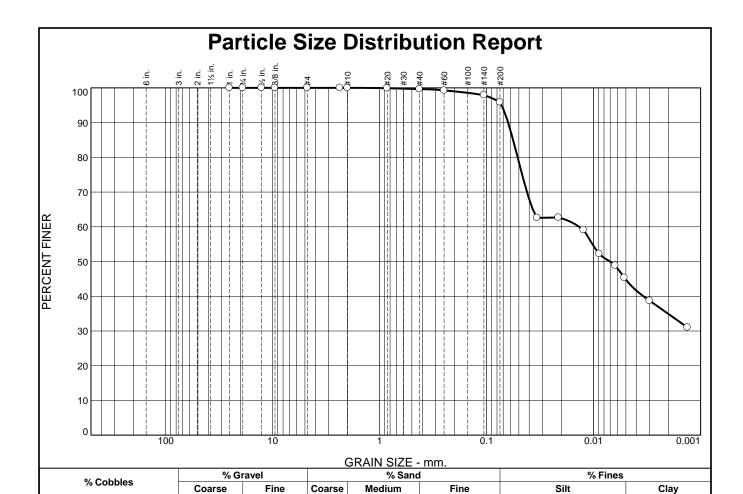
**AUG 2017** 

MHVBC-29-29

Boring Designation

Boring Designation MHVBC-29-29

| DRILLING L  | OG (Cont. Sheet)  | INSTAL |         |                  |                 |                       |  | SHEET      |                 |         | 1 |
|---|---|--------|---------|------------------|-----------------|-----------------------|--|------------|-----------------|---------|---|
| PROJECT   | - (com. cc.,  | COORD  | ile Dis |                  | 14/D A T        |                       | HORIZONTAL   |            | SHEE            |         | 1 |
| ROJECI  |   | 1      |         |                  |                 | est - U.S. Survey Ft. | NAD83  | l          | LLW             | •       |   |
| OCATION COORDINA  | TES   | ELEVAT |         |                  |                 |                       | 1  |            |                 |         | 1 |
| X = 1,806,538   | Y = 157,670   | -45.0  | ) Ft.   |                  |                 |                       |  |            |                 |         |   |
| ELEV. DEPTH   | CLASSIFICATION OF MATERIALS   | •      | ĸĚC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                    | S.S.       | BLOWS/<br>1 FT. | N-VALUE |   |
| -57.0 12.0 -58.0 13.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 -58.0 13.0 13.0 -58.0 13.0 13.0 13.0 -58.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0 13 | (CL) CLAY, lean, low plasticity, soft consistency, wet, gray  (SC) SAND, clayey, low plasticity, so consistency, wet, gray, trace wood  At El61.0 Ft. trace shell | oft    | 100     | 1                |                 | Vibracore             | At EI56 F<br>-200= 96%,<br>33, LL= 58,<br>25, MC= 12 | PL=<br>PI= |                 |         |   |
|   | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.  |        |         |                  |                 |                       |  |            |                 |         |   |



|   | SIEVE | PERCENT | SPEC.*  | PASS?  |
|---|-------|---------|---------|--------|
|   | SIZE  | FINER   | PERCENT | (X=NO) |
| Ī | 1"    | 100.0   |         |        |
|   | 3/4"  | 100.0   |         |        |
|   | 1/2"  | 100.0   |         |        |
|   | 3/8"  | 100.0   |         |        |
|   | #4    | 100.0   |         |        |
|   | #8    | 100.0   |         |        |
|   | #10   | 100.0   |         |        |
|   | #20   | 99.9    |         |        |
|   | #40   | 99.6    |         |        |
|   | #60   | 99.2    |         |        |
|   | #140  | 97.9    |         |        |
|   | #200  | 95.9    |         |        |
|   |       |         |         |        |
|   |       |         |         |        |
|   |       |         |         |        |
|   |       |         |         |        |

0.0

0.0

0.0

| 0.4   | 3.7        | 51.1                                  |  | 44.8   |
|---|------------|---------------------------------------|--|--------|
| GRAY  |            | ial Description                       |  |        |
| PL= 3   | 3 Atte     | erberg Limits<br>= 58                 | PI= 2  | 25     |
| D <sub>90</sub> = (<br>D <sub>50</sub> = (<br>D <sub>10</sub> = |            | oefficients<br>5= 0.0566<br>60=<br>1= | D <sub>60</sub> =<br>D <sub>15</sub> =<br>C <sub>c</sub> = | 0.0136 |
| USCS=   |            | assification<br>AASHTO=               | A-7-5  | 5(30)  |
|   | URE CONTEN |                                       |  |        |

**Date:** 3/4/2020

\* (no specification provided)

0.0

Source of Sample: MHVBC-29-19 Depth: 10'-11'

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation SS-111

| DRI                       | LLIN               | G LO    | G            | DIVIS   | SION           | l Sou                     | uth Atlantic | IN      | IST/             | \LL#            | ATION Mobile                           | Distric   | t I               | SHEET<br>OF 2   |                   | EETS    |                 |
|---------------------------|--------------------|---------|--------------|---------|----------------|---------------------------|--------------|---------|------------------|-----------------|--|-----------|-------------------|-----------------|-------------------|---------|-----------------|
| PROJ                      | ECT                |         |              |         |                |                           |              | LAT     | LONG             | COORI           | DINATES LAT = 30.                      | 429682    |                   |                 |                   |         | 1               |
| 19                        | 63-196             | 4 Subs  | surface      | Invest  | igatio         | n                         |              | STA     | TE PLA           | NE CO           | OORDINATES X = 1,                      | 806,315   | Y = 1             | 56,634          | 4                 |         |                 |
| DATE                      | OF BOI             | RING    |              |         | STAR           | RTED                      | COMPLETED    |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORI<br>NAD       |                 | <i>VER</i><br>MLL |         |                 |
| DRILI                     | LING AG            | ENCY    |              | Corps o | of Engi        | neers - C                 | CESAM        |         |                  | ATION           | NS TOP OF B                            | ORING     | GRO               | DUND            | WATE              | R       | 1               |
|                           |                    |         | D INSPEC     |         |                |                           | E OF DRILLER |         |                  |                 | -34.8 F                                |           |                   | Jnderv<br>o ham |                   |         | -               |
|                           |                    | I/A, Ge |              |         |                |                           | N/A          | N,      | /A               |                 |  | Ì         |                   | UAL H           |                   |         | ]               |
|                           | TION OF<br>VERTICA |         | INCLINE      | :D      | DEG. F<br>VERT | ROM<br>ICAL               | BEARING      | SIZE    | AND .            | TYPE O          | OF BIT See F                           | Remarks   |                   |                 |                   |         |                 |
| тніск                     | NESS OF            | OVERB   | URDEN        |         | N/A            |                           |              | тот     | AL NU            | MBER (          | CORE BOXES                             | 0         |                   |                 |                   |         |                 |
| DEPTH                     | і то тор           | OF ROC  | K            |         | N/A            |                           |              | тот     | AL SAI           | MPLES           | DISTURBED (                            | ) UN      | DISTURE           | BED (U          | D)                | 0       |                 |
| TOTAL                     | DEPTH              |         | NG           | 1       | 16.5 Fe        | eet                       |              | тот     |                  | COVER           | Y FOR BORING N                         | ot Record | ed                |                 |                   |         |                 |
| ELEV.                     | DEPTH              | LEGEND  | C            | CLASSIF | ICATIO         | N OF MA                   | TERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DE        | RILLING<br>EMARKS |                 | BLOWS/<br>0.5 FT. | N-VALUE |                 |
| 04.0                      | 0.0                |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         |                 |
| -34.8                     | 0.0                |         |              |         |                |                           | y, very soft |         |                  |                 |  |           |                   |                 |                   |         | -0<br>-         |
| -                         |                    |         | consiste     | ency, w | ∕et, gra       | ıy, orgar                 | nic          |         |                  |                 |  |           |                   |                 |                   |         | -               |
| -                         | [                  |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -1              |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 | Advanced Boring                        |           |                   |                 |                   |         | -               |
| -                         |                    |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -               |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -2<br>-         |
| -                         | <u> </u>           |         |              |         |                |                           |              | NR      |                  |                 | SPT Sampler                            |           |                   |                 | 0                 |         | t               |
| _                         | <u> </u>           |         |              |         |                |                           |              | INIX    |                  |                 | or i Samplei                           |           |                   |                 | 0/0.0'            | 0+      | -3              |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   | ]               | 0/-0.5            |         | -               |
| -                         | L                  |         |              |         |                |                           |              |         |                  |                 |  |           |                   | Ì               | )/ <b>-</b> 0.5   |         | -<br>-4         |
|                           | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -               |
|                           | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -               |
| -                         | _                  |         |              |         |                |                           |              |         |                  |                 | Advanced Boring                        |           |                   |                 |                   |         | -5              |
|                           | Ī                  |         |              |         |                |                           |              |         |                  |                 | Advanced Bonng                         |           |                   |                 |                   |         | Ē               |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -<br>-6         |
| -                         |                    |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -               |
|                           | [                  |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | Ē               |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | -7<br>-         |
|                           | }                  |         |              |         |                |                           |              |         |                  |                 |  | $\dashv$  |                   | -               | _                 |         | +               |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 | 0                 |         | -<br>-8         |
| ] :                       | <u> </u>           |         |              |         |                |                           |              | NR      |                  |                 | SPT Sampler                            |           |                   |                 | 0                 | 0       | Ė               |
| ] .                       | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 | 0                 |         | ŀ               |
| -                         | <u> </u>           |         |              |         |                |                           |              |         |                  |                 |  |           |                   |                 |                   |         | <del> </del> -9 |
| -                         | ł                  |         |              |         |                |                           |              |         |                  |                 | Advanced Boring                        |           |                   |                 |                   |         | E               |
| SAME                      | ORM 1              | 1836    | Λ <i>E</i> 7 | TEP 1   | ר די           | IRING T                   | 7 / /        | l l     |                  |                 | 5                                      | 1         |                   | <u> </u>        |                   |         | $\mathbf{L}_1$  |
| <b>SAIVI F</b><br>AUG 201 | OKIVI 1<br>7       | 1000    | DRI          | TER '   | ▼ DL<br>DF     | JRING <u>S</u><br>RILLING | <u> </u>     | ontinue | ea)              |                 | Boring De                              | esignati  | on S              | SS-11           | 1                 |         |                 |

Boring Designation SS-111

| DR                                  | ILLIN                                     | G LC   | OG (Cont. Sheet)   | INSTALLAT |     |                  | •               |   |                   | SHEET |                   |         |
|-------------------------------------|---|--------|--|-----------|-----|------------------|-----------------|---|-------------------|-------|-------------------|---------|
| ROJE                                |   |        |  | Mobile [  |     |                  | M/DAT           | IM I  | HORIZONTAL        | OF 2  | SHE               |         |
| ROJEC                               | •1  |        |  | 1         |     |                  |                 | est - U.S. Survey Ft.   | NAD83             |       | LLW               | •       |
| OCATI                               | ON COOF                                   | RDINAT | res  | ELEVATION |     |                  |                 |   |                   |       | •                 |         |
| X =                                 | 1,806,31                                  | 5 Y    | = 156,634  | -34.8 Ft  |     |                  |                 |   |                   |       |                   |         |
| ELEV.                               | DEPTH                                     | LEGEND | CLASSIFICATION OF MATERIALS  | RE        | ́с. | BOX OR<br>SAMPLE | ROR<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | ଜ୍ଞ   | BLOWS/<br>0.5 FT. | N-VALUE |
| -<br>-<br>-<br>-<br>-<br>-          | -   |        |  |           |     |                  |                 | Advanced Boring   |                   |       |                   |         |
| -<br>-<br>-<br>-                    | -<br>-<br>-<br>-<br>-                     |        |  | N         | R   |                  |                 | SPT Sampler   |                   |       | 0 0 0             | 0       |
|                                     | -   |        |  |           |     |                  |                 | Advanced Boring   |                   |       |                   |         |
| -51.3<br>-<br>-<br>-<br>-<br>-<br>- | 16.5                                      |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |           |     |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |       |                   |         |
| -<br>-<br>-<br>-<br>-<br>-<br>-     | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        |  |           |     |                  |                 |   |                   |       |                   |         |
|                                     | ORM 1                                     |        | <b>A</b> AFTER ▼ DURING ▽ DRILLING ▼   |           |     |                  |                 |   | esignation        | SS-1′ |                   |         |

Project I.D. **Boring Designation** VC-28-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.427741 LONG = -88.013993 STATE PLANE COORDINATES X = 1,806,505Y = 155,9271982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -43.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER DIRECTION OF BORING** DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 30.0 Feet BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -43.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black At El. -47.5 Ft. LOI=11%, 100 1 Vibracore -200=99.4% At El. -49.5 Ft., gray At El. -52.5 Ft.

(Continued)

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DRILLING T

**SAM FORM 1836** 

**AUG 2017** 

-200=92.2%

VC-28-84

Boring Designation

Boring Designation VC-28-84

|                     |                                       |           |           |                  | В               | oring Designation                  | on <b>V</b>       | C-28-84                                |       |
|---------------------|---------------------------------------|-----------|-----------|------------------|-----------------|------------------------------------|-------------------|--|-------|
| DRILLING LOG        | G (Cont. Sheet)                       | INSTALL   |           |                  |                 |                                    |                   | SHEET 2                                |       |
| ROJECT              | ,                                     | Mobile    |           |                  |                 |                                    | HORIZONTAL        | OF 3 SI                                |       |
| ROJECT              |                                       | COORDIN   |           |                  |                 | <b>им</b><br>est - U.S. Survey Ft. |                   | VERTIC<br>MLLV                         |       |
| OCATION COORDINATES | • • • • • • • • • • • • • • • • • • • | ELEVATION |           |                  |                 |                                    | 1471200           |  | •     |
| X = 1,806,505 Y =   |                                       | -43.0     |           |                  |                 |                                    |                   |  |       |
| ELEV. DEPTH         | CLASSIFICATION OF MATERIALS           |           | "<br>REC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD              | DRILLIN<br>REMARI | SS SS SS SS SS SS SS SS SS SS SS SS SS | 1 FI. |
| -58.5 15.5          | (SP) SAND, poorly-graded, wet, gray   |           | 100       | SAM 1            | OR UB           | Vibracore                          | REMARI            |  | N-VA  |

Boring Designation VC-28-84

| DRI         | ILLIN       | G LC        | G (Cont. Sheet)   | INSTALLA*  Mobile |          |                  |                 |                       |                   | SHEET<br>OF 3 |                 | ETC      |
|-------------|-------------|-------------|---|-------------------|----------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|----------|
| PROJEC      |             |             | •   | COORDINA          |          |                  | M/DAT:          | IM I                  | HORIZONTAL        | <b>-</b>      | SHE             |          |
| NUJEC       | , .         |             |   |                   |          |                  |                 | est - U.S. Survey Ft. | NAD83             |               | LLW             | •        |
| OCATIO      | ON COOR     | RDINAT      | ES  | ELEVATIO          |          |                  |                 |                       | 30                |               |                 |          |
| X = 1       | 1,806,50    | 5 Y         | = 155,927   | -43.0 F           | t.       |                  |                 |                       |                   |               |                 |          |
| ELEV.       | DEPTH       | LEGEND      | CLASSIFICATION OF MATERIALS   | R                 | ‰<br>EC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S        | BLOWS/<br>1 FT. | N-VALUE  |
| -           | -<br>-<br>- | <del></del> |   |                   |          | 20,              |                 |                       |                   |               | _               | <u>z</u> |
| -           | -<br>-      |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -           | -           |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -           | -<br>-<br>- |             |   | 1                 | 00       | 1                |                 | Vibracore             |                   |               |                 |          |
| -           | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
|             | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| 73.0        | 30.0        | ••••        | NOTES:  |                   |          |                  |                 |                       | _                 |               |                 |          |
| -           | -<br>-<br>- |             | Soils are field visually classified in accordance with the Unified Soils Classification System. |                   |          |                  |                 |                       |                   |               |                 |          |
| -           | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -           | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -<br>-<br>- | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -           | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -<br>-<br>- | -<br>-<br>- |             |   |                   |          |                  |                 |                       |                   |               |                 |          |
| -           | -<br>       | 836-        |   |                   |          |                  |                 |                       |                   |               |                 |          |

Project I.D. Boring Designation SS-113

| DRI               | LLIN              | G LO    | G          | DIVIS    | SION           | <b>S</b> ou             | uth Atlantic  | II       | IST/             | ALL/            | ATION Mobil           | e Dis      | trict        | - 1                    | IEET 1<br>2 SHI   | EETS    |                |
|-------------------|-------------------|---------|------------|----------|----------------|-------------------------|---------------|----------|------------------|-----------------|-----------------------|------------|--------------|------------------------|-------------------|---------|----------------|
| PROJ              | ECT               |         | •          |          |                |                         |               | LAT      | /LONG            | COOR            | DINATES LAT = 30      | ).42412    | 21 L0        |                        |                   |         | 1              |
| 19                | 63-196            | 4 Subs  | surface    | Investi  | igatio         | n                       |               | STA      | TE PLA           | NE CO           | OORDINATES X = 1      | 1,806,6    | 32           | Y = 154                | ,610              |         |                |
|                   | OF BO             |         |            |          | STAR           |                         | COMPLETED     |          |                  |                 | STEM/DATUM/UNITS      | Survey     |              | <i>HORIZ.</i><br>NAD83 |                   |         |                |
| DRILI             | .ING AG           | ENCY    |            | Corns o  | of Engi        | neers - (               | CESAM         |          |                  | ATIOI           | NS TOP OF             | BORING     |              |                        | ND WATE           |         | 1              |
|                   |                   |         | D INSPEC   |          | Ji Liigi       |                         | E OF DRILLER  |          |                  |                 | -30.8                 |            |              |                        | derwater          |         | +              |
|                   |                   | I/A, Ge |            |          |                |                         | N/A           | N.       |                  |                 |                       |            |              |                        | HAMMER<br>AL HAMM |         |                |
|                   | TION OF           |         | INCLINE    | D        | DEG. I<br>VERT | FROM<br>ICAL            | BEARING       | SIZI     | E AND            | TYPE C          | OF BIT See            | Remar      | rks          |                        |                   |         |                |
| тніск             | NESS OF           | OVERB   | URDEN      | l        | N/A            |                         |               | тот      | AL NU            | MBER            | CORE BOXES            | 0          |              |                        |                   |         |                |
| DEPTH             | то тор            | OF ROC  | K          | -        | N/A            |                         |               | тот      | 'AL SAI          | MPLES           | DISTURBED             | 0          | UNDIS        | TURBEL                 | O (UD)            | 0       |                |
| TOTAL             | DEPTH (           |         | ING        | 2        | 20.5 F€        | eet                     |               | тот      |                  | COVER           | Y FOR BORING          | Not Re     | corded       |                        |                   | l       | 4              |
| ELEV.             | DEPTH             | LEGEND  | C          | CLASSIF  | ICATIO         | N OF MA                 | TERIALS       | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD |            | DRIL<br>REMA | LING<br>ARKS           | BLOWS/<br>0.5 FT. | N-VALUE |                |
| -30.8             | 0.0               |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | 1              |
| -                 | -                 |         | (CH) C     | CLAY, fa | at, high       | n plastici<br>ıy, orgaı | ty, very soft |          |                  |                 |                       |            |              |                        |                   |         | -0             |
| -                 | -                 |         | CONSIST    | ency, w  | et, gra        | iy, orgai               | IIC           |          |                  |                 |                       |            |              |                        |                   |         | Ŀ              |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | -1             |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 | Advanced Boring       |            |              |                        |                   |         | -              |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | }              |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | -2<br>-        |
| -                 | -                 |         |            |          |                |                         |               |          |                  | 1               |                       | 1          |              |                        | 0                 |         | †              |
| -                 | =                 |         |            |          |                |                         |               | ,,,,     |                  |                 | ODT O                 |            |              |                        | <u> </u>          |         | -3             |
| -                 | -                 |         |            |          |                |                         |               | NR       |                  |                 | SPT Sampler           |            |              |                        | 0                 | 0       | F              |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        | 0                 |         | <u> </u>       |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | -              |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | F              |
| -                 | <del>-</del><br>- |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | -5<br>-        |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 | Advanced Boring       |            |              |                        |                   |         | -              |
| _                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | -6             |
| -                 | <u>-</u>          |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | ţ              |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | <b>-</b>       |
| -                 | -                 |         |            |          |                |                         |               |          |                  | 1               |                       |            |              |                        | 0                 |         | <del> </del> 7 |
| -                 | -                 |         |            |          |                |                         |               | NR       |                  |                 | SPT Sampler           |            |              |                        | 0                 |         | ţ              |
| _                 | _                 |         |            |          |                |                         |               |          |                  |                 | Or i Gampier          |            |              |                        |                   | 0       | -8             |
| ] -               | -                 |         |            |          |                |                         |               |          |                  | -               |                       | _          |              |                        | 0                 |         | ‡              |
| -                 | _                 |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | -9             |
| -                 | -                 |         |            |          |                |                         |               |          |                  |                 | Advanced Boring       | , [        |              |                        |                   |         | F              |
| ] :               | -<br>-            |         |            |          |                |                         |               |          |                  |                 |                       |            |              |                        |                   |         | ļ              |
| SAM F<br>AUG 2011 | ORM 1             | 836     | AFT<br>DRI | TER S    | ▼ DU           | JRING S                 | <u>Z</u> (    | Continue | <b>L</b><br>⊖d)  | <u> </u>        | Boring D              | l<br>esigr | nation       | SS                     | -113              |         | <b>_</b> _1    |

Boring Designation SS-113

| DRI              | LLING   | 3 LO   | G (Cont. Sheet)  | INSTAL |         |                  |                 |   |                   | SHEET |                   |         | 1 |
|------------------|---|--------|--|--------|---------|------------------|-----------------|---|-------------------|-------|-------------------|---------|---|
| PROJEC.          |   |        |  | COORDI | ile Dis |                  | M/DAT           | 1104  | HORIZONTAL        | OF 2  | SHE               |         | 4 |
| ROJEC            | •   |        |  | 1      |         |                  |                 | est - U.S. Survey Ft.   | NAD83             |       | LLW               | •       |   |
| OCATIO           | ON COOR   | DINAT  | ES   | ELEVAT |         |                  |                 |   |                   |       |                   |         | 1 |
| X = 1            | ,806,632  | 2 Y    | = 154,610  | -30.8  | 3 Ft.   |                  |                 |   |                   |       |                   |         |   |
| ELEV.            | DEPTH   | LEGEND | CLASSIFICATION OF MATERIALS  |        | ĸĚC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | GS    | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -                | -   |        |  |        |         |                  |                 | Advanced Boring   |                   |       |                   |         |   |
| +                | -   |        |  |        | NR      |                  |                 | SPT Sampler   |                   |       | 0 0 0             | 0       |   |
|                  | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-  |        |  |        |         |                  |                 | Advanced Boring   |                   |       |                   |         |   |
| +                | -   |        |  |        | NR      |                  |                 | SPT Sampler   |                   |       | 0 0               | 0       | 1 |
| -51.3            | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        |  |        |         |                  |                 | Advanced Boring   |                   |       |                   |         |   |
|                  | -   |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |       |                   |         |   |
| AM FO<br>UG 2017 | ORM 18  | 836-   | A AFTER ▼ DURING ▽ DRILLING □  |        |         |                  |                 | Boring De   | esignation        | SS-11 | 13                |         | j |

Project I.D. **Boring Designation** MHVBC-28-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.4213228 LONG = -88.01471302 STATE PLANE COORDINATES X = 1,806,267Y = 153,5942020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-20-20 01-20-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -45.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR MANUFACTURER'S DESIGNATION OF DRILL NAME OF DRILLER ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 19.0 Feet BOX OR SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD DRILLING REMARKS DEPTH REC. -45.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray -47.0 2.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, gray, with sand At El. -48 Ft. -200= 81%, PL= 28, LL= 72, PI= 44, MC= 80% 100 1 Vibracore -54.0 9.0 (SC) SAND, clayey, medium plasticity, soft At El. -54 Ft. -200= 49%, PL= consistency, wet, gray 14, LL= 30, PI= 16, MC= 40% DRILLING ∑ **SAM FORM 1836** 

(Continued)

Boring Designation

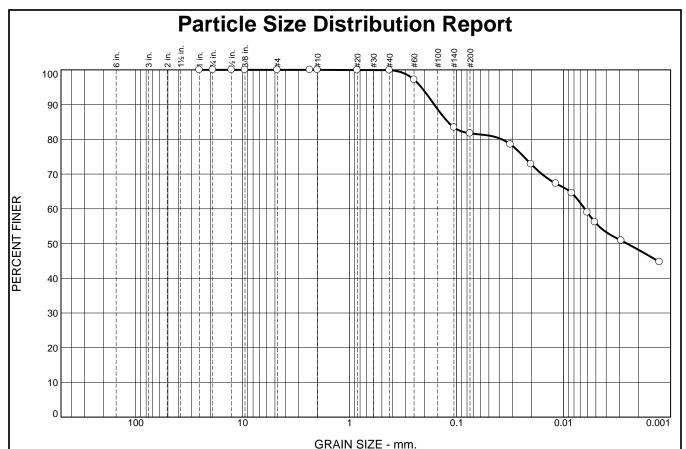
MHVBC-28-19

DRILLING T

**AUG 2017** 

Boring Designation MHVBC-28-19

| DRI   | ILLIN  | G L    | DG (Cont. Sheet)  | INSTAL  |         |                  |                 |                       |                   | SHEE    |                 |         | 1 |
|---|--------|--------|---|---------|---------|------------------|-----------------|-----------------------|-------------------|---------|-----------------|---------|---|
| PROJEC  |        |        |   | _       | ile Dis |                  | M/DATI          | INA                   | HORIZONTAL        | OF 2    |                 |         | - |
| PROJEC  | •1     |        |   | State P |         |                  |                 | est - U.S. Survey Ft. |                   | I       | RTICA<br>ILLW   | _       |   |
| LOCATION  | ON COO | RDINA  | res   | ELEVA   |         |                  |                 |                       | 10.1500           |         |                 |         | 1 |
|   |        |        | ′ = 153,594   | -45.    |         |                  |                 |                       |                   |         |                 |         |   |
| ELEV.   | DEPTH  | LEGEND | CLASSIFICATION OF MATERIAL  | s       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>1 FT. | N-VALUE |   |
| -57.0<br>57.0   | 12.0   |        | (CL) CLAY, lean, low plasticity, soft consistency, wet, gray, sandy  At El58.0 Ft. shell layer  (SC-SM) SAND, silty, clayey, wet, g |         | 100     | 1                |                 | Vibracore             |                   |         |                 |         |   |
| -62.0<br>-63.0  |        |        | (OH) CLAY, organic-H, gray and browith wood  (CH) CLAY, fat, gray   | own,    | -       |                  |                 |                       |                   |         |                 |         |   |
| -64.0<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | 19.0   |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.                          | า       |         |                  |                 |                       |                   |         |                 |         |   |
| AM F<br>UG 2017   | ORM '  | 1836-  | AFTER ▼ DURING ▼ DRILLING ▼   |         |         |                  |                 | Boring De             | esignation        | MHVI    | BC-2            | 8-1     | 9 |



| % Cobbles | % G    | ravel |        | % Sand | I    | % Fines |      |  |  |  |
|-----------|--------|-------|--------|--------|------|---------|------|--|--|--|
| % Cobbles | Coarse | Fine  | Coarse | Medium | Fine | Silt    | Clay |  |  |  |
| 0.0       | 0.0    | 0.0   | 0.0    | 0.1    | 18.2 | 25.8    | 55.9 |  |  |  |

| SIEVE | PERCENT  | SPEC.*  | PASS?   |
|-------|--|---|---|
| SIZE  | FINER  | PERCENT   | (X=NO)  |
| 1"    | 100.0  |   |   |
| 3/4"  | 100.0  |   |   |
| 1/2"  | 100.0  |   |   |
| 3/8"  | 100.0  |   |   |
| #4    | 100.0  |   |   |
| #8    | 100.0  |   |   |
| #10   | 100.0  |   |   |
| #20   | 99.9   |   |   |
| #40   | 99.9   |   |   |
| #60   | 97.2   |   |   |
| #140  | 83.4   |   |   |
| #200  | 81.7   |   |   |
|       |  |   |   |
|       |  |   |   |
|       |  |   |   |
|       |  |   |   |
|       | SIZE  1" 3/4" 1/2" 3/8" #4 #8 #10 #20 #40 #60 #140 | SIZE         FINER           1"         100.0           3/4"         100.0           1/2"         100.0           3/8"         100.0           #4         100.0           #8         100.0           #10         100.0           #20         99.9           #40         99.9           #60         97.2           #140         83.4           #200         81.7 | SIZE         FINER         PERCENT           1"         100.0           3/4"         100.0           1/2"         100.0           3/8"         100.0           #4         100.0           #8         100.0           #20         99.9           #40         99.9           #60         97.2           #140         83.4           #200         81.7 |

| 0.1   | 10.2                        | 25.0                                |  | 33.7 |
|---|-----------------------------|-------------------------------------|--|------|
|   |                             |                                     |  |      |
| GRAY  |                             | ial Description                     |  |      |
|   | A44-                        |                                     |  |      |
| PL= 2   | 8 LL                        | erberg Limits<br>= 72               | PI= 44   |      |
| D <sub>90</sub> = (<br>D <sub>50</sub> = (<br>D <sub>10</sub> = |                             | oefficients<br>5= 0.1208<br>0=<br>= | D <sub>60</sub> = 0.0<br>D <sub>15</sub> =<br>C <sub>c</sub> = | 0064 |
| USCS=   |                             | assification<br>AASHTO=             | A-7-6(40   | 0)   |
|   | URE CONTEN<br>MED SPEC. GRA |                                     |  |      |
|   |                             |                                     |  |      |

\* (no specification provided)

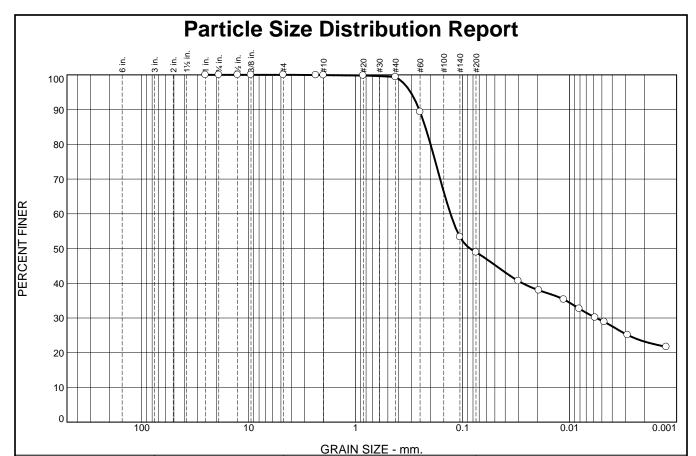
**Source of Sample:** MHVBC-28-19 **Depth:** 3'-4'

Date: 3/4/2020

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure



| % Cobbles     | % Gr   | avel   |        | % Sand | d     | % Fines         |      |
|---------------|--------|--------|--------|--------|-------|-----------------|------|
| % Cobbles     | Coarse | Fine   | Coarse | Medium | Fine  | Silt            | Clay |
| 0.0           | 0.0    | 0.0    | 0.1    | 0.5    | 50.5  | 19.7            | 29.2 |
| SIEVE PERCENT | SPEC.  | * PASS | 3?     |        | Mater | ial Description |      |

| SIEVE | PERCENT | SPEC.*  | PASS?  |
|-------|---------|---------|--------|
| SIZE  | FINER   | PERCENT | (X=NO) |
| 1"    | 100.0   |         |        |
| 3/4"  | 100.0   |         |        |
| 1/2"  | 100.0   |         |        |
| 3/8"  | 100.0   |         |        |
| #4    | 100.0   |         |        |
| #8    | 99.9    |         |        |
| #10   | 99.9    |         |        |
| #20   | 99.8    |         |        |
| #40   | 99.4    |         |        |
| #60   | 89.3    |         |        |
| #140  | 53.3    |         |        |
| #200  | 48.9    |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |
|       |         |         |        |

| GRAY CLAYEY   | <b>Material Descriptic</b><br>ZSAND   | <u>on</u>   |
|---|---|---|
| PL= 14  | Atterberg Limits LL= 30   | PI= 16  |
| D <sub>90</sub> = 0.2549<br>D <sub>50</sub> = 0.0855<br>D <sub>10</sub> = | Coefficients D <sub>85</sub> = 0.2235 D <sub>30</sub> = 0.0056 C <sub>u</sub> = | D <sub>60</sub> = 0.1299<br>D <sub>15</sub> =<br>C <sub>c</sub> = |
| USCS= SC  | Classification<br>AASHT   | O= A-6(4)   |
| MOISTURE CO<br>ASSUMED SPE  | Remarks<br>NTENT: 40.0%<br>C. GRAVITY: 2.7                                      |   |

(no specification provided)

Source of Sample: MHVBC-28-19 Depth: 9'-10'

**Date:** 3/4/2020

SOUTHERN EARTH SCIENCES Mobile, Alabama Client: ARCHWAY SOLUTIONS

**Project:** USACOE - MOBILE HARBOR W91278-19-D-0045

Project No: M20-069 Figure

Project I.D. Boring Designation SS-115

| DRI              | LLIN               | G LO   | G       | DIV             | ISION        | l Soi         | uth Atlantic  | IN      | ISTA             | <b>ALL</b>      | ATION Mob                           | ile D    | istrict  |                 | SHEET<br>OF 2 |                   | ETS     |            |
|------------------|--------------------|--------|---------|-----------------|--------------|---------------|---------------|---------|------------------|-----------------|-------------------------------------|----------|----------|-----------------|---------------|-------------------|---------|------------|
| PROJ             | ECT                |        |         |                 |              |               |               | LAT     | LONG             | COORI           | DINATES LAT = 3                     | 80.41    | 8851     | LONG :          |               |                   |         | 1          |
| 19               | 63-196             | 4 Sub  | surfac  | e Inves         | stigatio     | n             |               | STA     | TE PLA           | NE CO           | ORDINATES X =                       | 1,80     | 5,830    | Y = 15          | 52,697        |                   |         |            |
|                  | OF BOI             |        |         |                 | _            | RTED          | COMPLETED     |         |                  |                 | stem/datum/units<br>bama West - U.S |          | ων Et    | HORIZ<br>NAD8   |               | <i>VER</i><br>MLL |         |            |
| DRILI            | LING AG            | ENCY   | ,       | Corps           | of Eng       | ineers - (    | L<br>CESAM    |         | LEVA             |                 | NS TOP OF                           | BOR      | ING      | GRO             | UND N         | ATE               |         | 1          |
|                  | & TITLE            |        |         |                 | or Eng       |               | IE OF DRILLER |         |                  |                 | -36.8                               | F DRIL   |          |                 | nderw         |                   |         | -          |
|                  |                    |        | eologis | t               |              |               | N/A           | N/      | /A               |                 |                                     |          |          |                 | UAL HA        |                   | ER      |            |
|                  | TION OF<br>VERTICA |        |         | IED             | DEG.<br>VERT | FROM<br>FICAL | BEARING       | SIZE    | E AND            | TYPE O          | OF BIT See                          | Ren      | narks    |                 |               |                   |         |            |
| тніск            | NESS OF            | OVERE  | BURDEN  | ı               | N/A          |               |               | тот     | AL NU            | MBER (          | CORE BOXES                          | 0        |          |                 |               |                   |         |            |
| DEPTH            | і то тор           | OF RO  | CK      |                 | N/A          |               |               | тот     | AL SAI           | MPLES           | DISTURBED                           | 0        | UNE      | DISTURB         | ED (UD        | ) (               | )       |            |
| TOTAL            | . DEPTH            |        | RING    |                 | 14.5 F       | eet           |               | тот     |                  | COVER           | Y FOR BORING                        | Not F    | Recorde  | ed              |               |                   |         |            |
| ELEV.            | DEPTH              | LEGEND |         | CLASS           | IFICATIO     | ON OF MA      | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD               |          | DR<br>RE | ILLING<br>MARKS |               | BLOWS/<br>0.5 FT. | N-VALUE |            |
| -36.8            | 0.0                |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         |            |
| - 00.0           | 0.0                |        | (CH)    | CLAY,           | fat, high    | h plastici    | ty, very soft |         |                  |                 |                                     |          |          |                 |               |                   |         | -0         |
| -                | _                  |        | CONSI   | stericy,        | wei, gra     | ay, orgai     | TIIC          |         |                  |                 | Advanced Borir                      |          |          |                 |               |                   |         | -          |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 | Advanced Boni                       | ig       |          |                 |               |                   |         | -1         |
|                  | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 | -             |                   |         | ‡          |
| -                | _                  |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               | 0                 |         | -<br>-2    |
| -                |                    |        |         |                 |              |               |               | NR      |                  |                 | SPT Sampler                         |          |          |                 |               | 0                 |         | - 1        |
|                  | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               | 0                 | 0       | Ē          |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 | -             |                   |         | -3         |
| -                |                    |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | -          |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | -<br>-4    |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 | Advanced Borir                      |          |          |                 |               |                   |         | -          |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 | , tavariosa Born                    | 9        |          |                 |               |                   |         | ŀ.,        |
| -                | -                  |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | −5<br>-    |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | -          |
| -                | -                  |        |         |                 |              |               |               |         |                  |                 |                                     | $\dashv$ |          |                 | -             |                   |         | -6         |
| ] .              | Ī                  |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 | -             | 0                 |         | Ē          |
| -                | _                  |        |         |                 |              |               |               | NR      |                  |                 | SPT Sampler                         |          |          |                 |               | 0                 | 0       | -<br>-7    |
| -                |                    |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               | 0                 | Ū       | F '        |
| ] :              | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | Ī          |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | -8<br>-    |
| -                | }                  |        |         |                 |              |               |               |         |                  |                 | A.d                                 |          |          |                 |               |                   |         | ŀ          |
| -                | -                  |        |         |                 |              |               |               |         |                  |                 | Advanced Borir                      | ıg       |          |                 |               |                   |         | -<br>-9    |
| ] :              | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | E          |
| -                | <u> </u>           |        |         |                 |              |               |               |         |                  |                 |                                     |          |          |                 |               |                   |         | ŀ          |
| SAM F<br>AUG 201 | ORM 1              | 836    | A<br>D  | FTER<br>RILLING | ▼ DI         | URING S       | <u> </u>      | ontinue | ed)              | -               | Boring                              | Desi     | ignatio  | on S            | S-11          | 5                 |         | <b></b> -1 |

Boring Designation SS-115

| P.D.   | 11 1 12.                   | 616    | OG (Comt Chart)  | INSTAL  | LATION  | N                |                 | oring Designation              | ···               | SHEE | T 2               |      |
|--------|----------------------------|--------|--|---------|---------|------------------|-----------------|--------------------------------|-------------------|------|-------------------|------|
| DR     | ILLIN                      | G LC   | OG (Cont. Sheet)   | Mob     | ile Dis | trict            |                 |                                |                   | OF 2 | SHEE              | ETS  |
| PROJEC | т                          |        |  | COORD   |         |                  |                 |                                | HORIZONTAL        |      | RTICAL            |      |
|        |                            |        |  | State P |         |                  |                 | est - U.S. Survey Ft.          | NAD83             | IV.  | LLW               |      |
|        | <b>ON COO!</b><br>1 805 83 |        | = 152,697  | -36.8   |         | OP OF I          | BORING          | 5                              |                   |      |                   |      |
|        |                            |        |  |         |         | 絽                | RQD             |                                | DRULIN            |      | NS.               |      |
| ELEV.  | DEPTH                      | LEGEND | CLASSIFICATION OF MATERIALS  |         | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD          | DRILLIN<br>REMARK | is . | BLOWS/<br>0.5 FT. | N-VA |
| -      |                            |        |  |         |         |                  |                 | Advanced Boring                |                   |      |                   |      |
| -      |                            |        |  |         |         |                  |                 |                                |                   |      | 0                 |      |
| -      | Ī                          |        |  |         | NR      |                  |                 | SPT Sampler                    |                   |      | 0                 |      |
| -      | †                          |        |  |         |         |                  |                 |                                |                   |      | 0                 | 0    |
| -      | <u> </u>                   |        |  |         |         |                  |                 |                                | 1                 |      |                   |      |
| -      | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | _                          |        |  |         |         |                  |                 | Advanced Boring                |                   |      |                   |      |
| -      | <u> </u>                   |        |  |         |         |                  |                 | , tavariosa Boring             |                   |      |                   |      |
| -      | F                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -51.3  | 14.5                       |        |  |         |         |                  |                 |                                | -                 |      |                   |      |
| -      | <u> </u>                   |        | NOTES:   |         |         |                  |                 | 140# hammer<br>w/30" drop used |                   |      |                   |      |
| -      | l                          |        | Soils are field visually classified in accordance with the Unified Soils |         |         |                  |                 | with 2.0' split<br>spoon       |                   |      |                   |      |
| -      | -                          |        | Classification System.   |         |         |                  |                 | (1-3/8" I.D. x<br>2" O.D.).    |                   |      |                   |      |
| -      | Ī                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | ł                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | -                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | Ī                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | †<br><del> </del>          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
|        | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | L                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | -                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | Ī                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | Ţ                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| -      | ł                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| _      | F                          |        |  |         |         |                  |                 |                                |                   |      |                   |      |
|        | <u> </u>                   |        |  |         |         |                  |                 |                                |                   |      |                   |      |
| AM F   | ORM 1                      | 1836-  | A AFTER ▼ DURING ▽ DRILLING ▼  |         |         |                  |                 | Boring De                      | esignation        | SS-1 | 15                |      |

Project I.D. **Boring Designation** MHVBC-27-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.41604007LONG = -88.01582982 STATE PLANE COORDINATES X = 1,805,906Y = 151,6742020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-20-20 01-20-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -44.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 19.5 Feet BLOWS/ BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -44.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray 100 1 Vibracore At El. -53 Ft. -200= 97%, PL= 34, LL= 63, PI= 29, MC= 137% DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

Boring Designation

MHVBC-27-19

Boring Designation MHVBC-27-19

| DRIL     | LING          | ) LO   | G (Cont. Sheet)  | INSTAL   |         |                  |                 |                       |  | SHEE       |                 |         |  |
|----------|---------------|--------|--|----------|---------|------------------|-----------------|-----------------------|--|------------|-----------------|---------|--|
| PROJECT  |               |        | (  | COORD    | ile Dis |                  | M/DATI          | IM I                  | HORIZONTAL   | OF 2       | SHE             |         |  |
|          |               |        |  |          |         |                  |                 | est - U.S. Survey Ft. | NAD83  |            | LLW             | -       |  |
| LOCATION | N COORI       | DINAT  | ES   | ELEVA1   |         |                  |                 |                       |  |            |                 |         |  |
| X = 1,8  | X = 1,805,906 |        |  | -44.0    | ) Ft.   |                  |                 |                       |  |            |                 |         |  |
| ELEV. D  | ЕРТН          | LEGEND | CLASSIFICATION OF MATERIALS  | <b>3</b> | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                    | g<br>S     | BLOWS/<br>1 FT. | N-VALUE |  |
|          | 12.5          |        | (CH) CLAY, fat, high plasticity, soft consistency, wet, gray, with trace sat shell, inorganic  | nd and   | 100     | 1                |                 | Vibracore             | At El56.5<br>-200= 91%,<br>26, LL= 56,<br>30, MC= 88 | PL=<br>PI= |                 |         |  |
| SAM FO   |               |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.   AFTER DURING □ DURING □ DRILLING |          |         |                  |                 | Boring De             |  | MHVI       |                 |         |  |

Project I.D. Boring Designation SS-117

| DRI              | LLIN               | G LO   | G        | DIVIS       | SION           | Sou                     | ıth Atlantic | IN      | IST/             | \LL#            | ATION M                       | 1obile             | District |                 | SHEET<br>OF 2 |                   | ETS     |                |
|------------------|--------------------|--------|----------|-------------|----------------|-------------------------|--------------|---------|------------------|-----------------|-------------------------------|--------------------|----------|-----------------|---------------|-------------------|---------|----------------|
| PROJ             | ECT                |        |          |             |                |                         |              | LAT     | LONG             | COORI           | DINATES LAT                   | = 30.4             | 13300    |                 |               |                   |         |                |
| 19               | 63-196             | 4 Subs | surface  | Invest      | igatio         | n                       |              | STA     | TE PLA           | NE CO           | ORDINATES                     | X = 1,8            | 05,846   | Y = 15          | 50,678        | ,                 |         |                |
|                  | OF BOI             |        |          |             |                | RTED                    | COMPLETED    |         |                  |                 | stem/datum/u<br>bama West - l |                    | nyoy Et  | HORI.           |               | <i>VER</i><br>MLL |         | 1              |
| DRILI            | LING AG            | ENCY   |          | Corps       | of Engi        | neers - (               | CESAM        |         |                  | ATION           | NS TO                         | P OF BO            | RING     | GRO             | UND N         | VATE              |         |                |
|                  |                    |        | D INSPE  |             | Ji Liigi       |                         | E OF DRILLER |         |                  |                 | 'S DESIGNATIO                 | 35.8 Fe<br>N OF DR |          |                 | nderw         |                   |         |                |
|                  |                    |        | eologist |             |                |                         | N/A          | N/      | /A               |                 |                               |                    |          |                 | UAL HA        |                   | ER      |                |
|                  | TION OF<br>VERTICA |        | INCLINE  | ĒD          | DEG. I<br>VERT | FROM<br>TICAL           | BEARING      | SIZE    | E AND            | TYPE O          | F BIT                         | See Re             | emarks   |                 |               |                   |         |                |
| тніск            | NESS OF            | OVERB  | BURDEN   |             | N/A            |                         |              | тот     | AL NU            | MBER (          | CORE BOXES                    | 0                  |          |                 |               |                   |         |                |
| DEPTH            | і то тор           | OF ROO | CK       |             | N/A            |                         |              | тот     | AL SAI           | MPLES           | DISTURB                       | <b>ED</b> ()       | UNE      | DISTURB         | ED (UD        | ) (               | 0       | 1              |
| TOTAL            | DEPTH              |        | ING      | •           | 15.5 Fe        | eet                     |              | тот     |                  | COVER           | Y FOR BORING                  | Not                | Recorde  | ed              |               |                   |         | ļ              |
| ELEV.            | DEPTH              | LEGEND |          | CLASSIF     | FICATIO        | ON OF MA                | TERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEM<br>METHOI            | IENT<br>D          | DR<br>RE | ILLING<br>MARKS |               | BLOWS/<br>0.5 FT. | N-VALUE |                |
| -35.8            | 0.0                |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         |                |
|                  | - 0.0              |        | (CH) C   | CLAY, fa    | at, high       | n plastici<br>ay, orgai | y, very soft |         |                  |                 |                               |                    |          |                 |               |                   |         | -0<br>-        |
| -                | <u> </u>           |        | COHSIST  | lericy, w   | vet, gra       | iy, Olgal               | IIC          |         |                  |                 | Advanced B                    | Rorina             |          |                 |               |                   |         | -              |
| -                | _                  |        |          |             |                |                         |              |         |                  |                 | Advanced E                    | Joining            |          |                 |               |                   |         | -1             |
|                  | ‡                  |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | ‡              |
| -                | Ĺ                  |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               | 0                 |         | -<br>-2        |
| -                |                    |        |          |             |                |                         |              | NR      |                  |                 | SPT Sam                       | pler               |          |                 |               | 0                 |         | <b>-</b>       |
|                  | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               | 0                 | 0       | ļ              |
| -                | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 | -             |                   |         | -3             |
| -                |                    |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | ŀ              |
| _                | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | L <sub>4</sub> |
|                  | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | Ŀ              |
| -                |                    |        |          |             |                |                         |              |         |                  |                 | Advanced B                    | Boring             |          |                 |               |                   |         | <u> </u>       |
| -                | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | −5<br>-        |
| -                |                    |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         |                |
| _                | _                  |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | -6             |
| ] -              | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | ‡              |
| -                | _                  |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               | 0                 |         | -<br>-7        |
| -                | <u> </u>           |        |          |             |                |                         |              | NR      |                  |                 | SPT Sam                       | pler               |          |                 |               | 0                 | _       | <b> </b>       |
|                  | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               | 0                 | 0       | -              |
| -                | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 | <br>          |                   |         | -8             |
| ] .              | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | F              |
| -                | <u> </u>           |        |          |             |                |                         |              |         |                  |                 | Advanced B                    | Borina             |          |                 |               |                   |         | -<br>-9        |
| -                | <u> </u>           |        |          |             |                |                         |              |         |                  |                 |                               | 9                  |          |                 |               |                   |         | <b> </b>       |
| ] :              | [                  |        |          |             |                |                         |              |         |                  |                 |                               |                    |          |                 |               |                   |         | Ē              |
| SAM F<br>AUG 201 | ORM 1              | 1836   | AF<br>DR | TER SILLING | ▼ DU           | JRING S                 | <u>Z</u> (C  | ontinue | ed)              | ·               | Borii                         | ng Des             | signatio | on S            | S-11          | 7                 |         | <b>-</b> 1     |

Boring Designation SS-117

| DR                        | ILLIN                                   | G LC   | DG (Cont. Sheet)   | INSTAL | LATION<br>ile Dis |                  |                 | <u> </u>  |                   | SHEET<br>OF 2 |                   | ETC     | ] |
|---------------------------|---|--------|--|--------|-------------------|------------------|-----------------|---|-------------------|---------------|-------------------|---------|---|
| PROJEC                    |   |        | · · · · · · · · · · · · · · · · · · ·  | COORD  |                   |                  | M/DAT           | UM  | HORIZONTAL        | <b>-</b>      | RTICAL            |         | 1 |
|                           |   |        |  | 1      |                   |                  |                 | est - U.S. Survey Ft.   | NAD83             |               | LLW               |         |   |
|                           | ои соог                                 |        |  | ELEVAT |                   | OP OF            | BORING          | G   |                   |               |                   |         | 1 |
| X = '                     | 1,805,84<br><b>I</b>                    | _      | ′ = 150,678  | -35.8  | 3 Ft.             |                  | 1               |   | 1                 |               |                   |         | 4 |
| ELEV.                     | DEPTH                                   | LEGEND | CLASSIFICATION OF MATERIALS  |        | RÉC.              | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>.S       | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -<br>-<br>-<br>-          | -<br>-<br>-                             |        |  |        |                   |                  |                 | Advanced Boring   |                   |               |                   |         |   |
| -<br>-                    | <u> </u>                                |        |  |        |                   |                  |                 |   |                   |               | 0                 |         | Ī |
| -<br>-<br>-               | <u> </u>                                |        |  |        | NR                |                  |                 | SPT Sampler   |                   |               | 0                 | 0       | ŀ |
| -<br>-<br>-<br>-<br>-51.3 | -<br>-<br>-<br>-<br>-<br>-<br>-<br>15.5 |        |  |        |                   |                  |                 | Advanced Boring   |                   |               |                   |         | - |
| -01.5<br><br><br><br>     | -                                       |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |                   |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |               |                   |         |   |
| -<br>-<br>-               | -<br>-<br>-                             |        |  |        |                   |                  |                 |   |                   |               |                   |         |   |
| -<br>-<br>-               | <del> </del><br> -<br> -                |        |  |        |                   |                  |                 |   |                   |               |                   |         |   |
| -<br>-<br>-               | †<br>-<br>-                             |        |  |        |                   |                  |                 |   |                   |               |                   |         |   |
| -<br>-<br>-               | †<br>-<br>-                             |        |  |        |                   |                  |                 |   |                   |               |                   |         |   |
| -<br>-<br>-               | <del>-</del><br>-                       |        |  |        |                   |                  |                 |   |                   |               |                   |         |   |
| -<br>-<br>-               |   |        |  |        |                   |                  |                 |   |                   |               |                   |         |   |
| AM F                      | ORM 1                                   | 1836-  | AFTER ▼ DURING ∑ DRILLING □  |        |                   |                  |                 | Borina De   | esignation        | SS-11         | 17                |         | _ |

Project I.D. **Boring Designation** VC-30-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.411929 LONG = -88.014544 STATE PLANE COORDINATES X = 1,806,305Y = 150,1771982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 08-01-84 08-01-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -42.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 30.0 Feet BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -42.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, black At El. -46.0 Ft., high plasticity, soft consistency, light gray At El. -46.5 Ft. LL=77, PL=22, 100 1 Vibracore PI=55

(Continued)

Boring Designation

VC-30-84

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**SAM FORM 1836** 

**AUG 2017** 

Boring Designation VC-30-84

|  | INSTA | LLATION  | 1                |                 | oring Designation     |                   | C-30-84<br>  SHEET | 2                          |
|--|-------|----------|------------------|-----------------|-----------------------|-------------------|--------------------|----------------------------|
| DRILLING LOG (Cont. Sheet)   |       | bile Dis |                  |                 |                       |                   | OF 3               |                            |
| ROJECT   |       | DINATE   |                  |                 |                       | HORIZONTAL        | VERT               |                            |
|  |       |          |                  |                 | est - U.S. Survey Ft. | NAD83             | MLI                | _W                         |
| OCATION COORDINATES  |       | TION TO  | OP OF            | BORING          | 3                     |                   |                    |                            |
| X = 1,806,305 Y = 150,177  | -42   | .0 Ft.   | νш               |                 |                       |                   |                    | . ш                        |
| ELEV. DEPTH 2 CLASSIFICATION OF MATE   | RIALS | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S            | BLOWS/<br>1 FT.<br>N-VALUE |
| AM FORM 1836-A  AFTER DURING DRILLING D |       | 100      | 1                |                 | Vibracore  Borina De  | esignation        | VC-30-             |                            |

Boring Designation VC-30-84

| DR                              | ILLIN            | G LC   | OG (Cont. Sheet)   | INSTAL  | LATION |                  |                 | oning Designation     |                   | SHEET<br>OF 3 |                 | ETC     | 1                               |
|---------------------------------|------------------|--------|--|---------|--------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|---------|---------------------------------|
| PROJEC                          |                  |        |  | COORD   |        |                  | M/DAT           | IIM                   | HORIZONTAL        | +             | TICAL           |         | 1                               |
|                                 |                  |        |  | 1       |        |                  |                 | est - U.S. Survey Ft. | NAD83             |               | LLW             | •       |                                 |
| LOCATI                          | ON COO           | RDINAT | ES   | ELEVA1  |        |                  |                 |                       |                   |               |                 |         | 1                               |
| X = '                           | 1,806,30         | )5 Y   | = 150,177  | -42.0   | ) Ft.  |                  |                 |                       |                   |               |                 |         |                                 |
| ELEV.                           | DEPTH            | LEGEND | CLASSIFICATION OF MATERIALS  |         | ĸĚC.   | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | lG<br>(S      | BLOWS/<br>1 FT. | N-VALUE |                                 |
| -<br>-<br>-<br>-<br>-<br>-<br>- |                  |        |  |         |        |                  |                 |                       |                   |               |                 |         | -<br>-<br>-<br>-<br>-<br>-<br>- |
| -<br>-<br>-<br>-                | †<br>-<br>-<br>- |        |  |         | 100    | 1                |                 | Vibracore             |                   |               |                 |         | -<br>-<br>-2<br>-               |
| -70.0<br>-<br>-                 | 28.0             |        | (CH) CLAY, fat, high plasticity, soft consistency, light gray with high amor organics and wood fragments   | unts of |        |                  |                 |                       |                   |               |                 |         |                                 |
| -72.0                           | 30.0             |        |  |         |        |                  |                 |                       |                   |               |                 |         |                                 |
| -<br>-<br>-<br>-                | †<br>†<br>†<br>† |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |        |                  |                 |                       |                   |               |                 |         | -<br>-<br>-;<br>-               |
| -<br>-<br>-<br>-                | -<br>-<br>-      |        |  |         |        |                  |                 |                       |                   |               |                 |         | -<br>;<br>-<br>-                |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>- |        |  |         |        |                  |                 |                       |                   |               |                 |         | ;<br>-<br>-                     |
| -<br>-<br>-                     | †<br>†<br>†      |        |  |         |        |                  |                 |                       |                   |               |                 |         | ;<br> -<br> -                   |
| -<br>-<br>-<br>-                |                  |        |  |         |        |                  |                 |                       |                   |               |                 |         | -;<br>-<br>-<br>-               |
| -<br>-<br>-                     | †<br>†<br>†<br>† |        |  |         |        |                  |                 |                       |                   |               |                 |         | -<br>-<br>-                     |
| SAM F                           | ORM 1            | 1836-  | A AFTER ▼ DURING ▽ DRILLING ▼  |         | -      | -                | -               | Borina De             | esignation        | VC-30         | )-84            |         | -                               |

Project I.D. **Boring Designation** MHVBC-26-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.41072471 LONG = -88.01624768 STATE PLANE COORDINATES X = 1,805,766Y = 149,7422020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-20-20 01-20-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR MANUFACTURER'S DESIGNATION OF DRILL NAME OF DRILLER ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** 100 % 19.5 Feet **TOTAL RECOVERY FOR BORING** BOX OF SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD DRILLING REMARKS DEPTH REC. -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray At El. -50 Ft. -200= 98%, PL= 40, LL= 60, PI= 20, MC= 139% 100 1 Vibracore -52.5 6.5 (CH) CLAY, fat, high plasticity, soft consistency, wet, gray, with trace shell, inorganic At El. -55 Ft. -200= 98%, PL= 32, LL= 63, PI= 31, MC= 91% **SAM FORM 1836 DURING** 

(Continued)

DRILLING \*

**AUG 2017** 

DRILLING

Boring Designation

MHVBC-26-19

Boring Designation MHVBC-26-19

| DRILLING LOG (Cont. Sheet)   | INSTAL       | <b>LATION</b><br>ile Dis |                  |                 | <u> </u>              |                   | SHEET<br>OF 2 |                 | Te      |   |
|--|--------------|--------------------------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|---------|---|
| PROJECT  | COORD        |                          |                  | M/DAT           | UM                    | HORIZONTAL        | _             | TICAL           | _       | • |
|  |              |                          |                  |                 | est - U.S. Survey Ft. |                   |               | LLW             |         |   |
| LOCATION COORDINATES   | ELEVAT       |                          | OP OF            | BORING          | 3                     |                   |               |                 |         | l |
| X = 1,805,766 Y = 149,742  | -46.0        | ) Ft.                    | νШ               | I               |                       |                   | 1             | ~ T             |         | 1 |
| ELEV. DEPTH B CLASSIFICATION OF MA   | TERIALS      | REC.                     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>1 FT. | N-VALUE | L |
| At El62.5 Ft. with wood at -65.5 19.5  | 16.5' to 19' | 100                      | 1                |                 | Vibracore             |                   |               |                 |         |   |
| NOTES:  1. Soils are field visually class accordance with the Unified State Classification System.  SAM FORM 1836-A  AFTER DRILLING DRILLING | Soils        |                          |                  |                 |                       | esignation        | MHVE          |                 |         |   |

Project I.D. Boring Designation SS-119

| DRI              | LLIN               | G LO   | G        | DIVI           | SION         | Sou                     | uth Atlantic  | IN      | IST/             | \LL#            | ATION                              | Mobile        | District | · I             | SHEET<br>OF 2 |                   | ETS     |             |
|------------------|--------------------|--------|----------|----------------|--------------|-------------------------|---------------|---------|------------------|-----------------|------------------------------------|---------------|----------|-----------------|---------------|-------------------|---------|-------------|
| PROJ             | ECT                |        | •        |                |              |                         |               | LAT     | LONG             | COORI           | DINATES LA                         | T = 30.4      | 07749    |                 |               |                   |         |             |
| 19               | 63-196             | 4 Sub  | surface  | e Inves        | tigatio      | n                       |               | STA     | TE PLA           | NE CO           | ORDINATES                          | X = 1,8       | 05,861   | Y = 14          | 18,659        |                   |         |             |
|                  | OF BOI             |        |          |                |              | RTED                    | COMPLETED     |         |                  |                 | <b>STEM/DATUM</b> /<br>bama West - |               | nyev Et  | HORIZ<br>NAD8   |               | <i>VER</i><br>MLL |         |             |
| DRILI            | LING AG            | ENCY   |          | Corps          | of Engi      | ineers - (              | CESAM         |         |                  | ATION           |                                    | OP OF BO      | RING     | GRO             | UND W         | ATE               |         | 1           |
|                  | & TITLE            |        |          |                | or Eng       |                         | E OF DRILLER  |         |                  |                 | 'S DESIGNATION                     | -31.8 Fe      |          |                 | nderwa        |                   |         | ł           |
|                  |                    |        | eologist |                |              |                         | N/A           | N/      | /A               |                 |                                    |               |          |                 | UAL HA        |                   | R       |             |
|                  | TION OF<br>VERTICA |        |          | ED             | DEG.<br>VERT | FROM<br>ICAL            | BEARING       | SIZE    | E AND            | TYPE O          | )F BIT                             | See Re        | emarks   |                 |               |                   |         |             |
| тніск            | NESS OF            | OVERE  | BURDEN   |                | N/A          |                         |               | тот     | AL NU            | MBER (          | CORE BOXES                         | 0             |          |                 |               |                   |         |             |
| DEPTH            | і то тор           | OF RO  | CK       |                | N/A          |                         |               | тот     | AL SAI           | MPLES           | DISTUR                             | <b>BED</b> () | UNE      | DISTURB         | ED (UD        | ) (               | )       |             |
| TOTAL            | DEPTH              |        | ING      |                | 19.5 Fe      | eet                     |               | тот     |                  | COVER           | Y FOR BORING                       | G Not         | Recorde  | ed              |               |                   |         |             |
| ELEV.            | DEPTH              | LEGEND |          | CLASSI         | FICATIO      | ON OF MA                | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCE<br>METHO                   | MENT<br>OD    | DR<br>RE | ILLING<br>MARKS |               | BLOWS/<br>0.5 FT. | N-VALUE |             |
| -31.8            | 0.0                |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         |             |
|                  | - 0.0              |        | (CH) (   | CLAY, f        | at, high     | n plastici<br>ay, orgai | ty, very soft |         |                  |                 |                                    |               |          |                 |               |                   |         | -0<br>-     |
| -                | <u> </u>           |        | COHSIS   | tericy, v      | wei, gra     | ay, Olyai               | IIC           |         |                  |                 | Advanced                           | Boring        |          |                 |               |                   |         | -           |
| -                | -                  |        |          |                |              |                         |               |         |                  |                 | / tavarioca                        | Domig         |          |                 |               |                   |         | -1          |
|                  | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | ļ           |
| -                | _                  |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               | 0                 |         | -<br>-2     |
| -                |                    |        |          |                |              |                         |               | NR      |                  |                 | SPT San                            | npler         |          |                 |               | 0                 |         | F ~         |
|                  | ļ                  |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               | 0                 | 0       | -           |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 | -             |                   |         | -3<br>-     |
| -                |                    |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | -           |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | -<br>-4     |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         |             |
| -                |                    |        |          |                |              |                         |               |         |                  |                 | Advanced                           | Boring        |          |                 |               |                   |         |             |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | −5<br>-     |
| -                |                    |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | -           |
| _                | _                  |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | -6          |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | ļ           |
| -                | _                  |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               | 0                 |         | -<br>-7     |
| -                | <u> </u>           |        |          |                |              |                         |               | NR      |                  |                 | SPT San                            | npler         |          |                 |               | 0                 | _       | ŀ           |
|                  | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 | F             | 0                 | 0       | -           |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               | _                 |         | -8<br>-     |
| ] .              | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | ŀ           |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 | Advanced                           | Borina        |          |                 |               |                   |         | -<br>-9     |
| -                | <u> </u>           |        |          |                |              |                         |               |         |                  |                 |                                    | ਰ             |          |                 |               |                   |         | ŀ           |
| ] :              | [                  |        |          |                |              |                         |               |         |                  |                 |                                    |               |          |                 |               |                   |         | F           |
| SAM F<br>AUG 201 | ORM 1              | 1836   | AF<br>DF | TER<br>RILLING | ▼ DI         | JRING S                 | <u>Z</u> (C   | ontinue | ed)              | <u> </u>        | Bor                                | ing De        | signatio | on S            | S-119         | )                 |         | <b>L</b> -1 |

| DR                    | LLIN                  | G LC      | OG (Cont. Sheet)   | INSTAL | LATION |                  |                 | oning Designation   |                   | SHEET<br>OF 2                                    |                   | ETP     | ] |
|-----------------------|-----------------------|-----------|--|--------|--------|------------------|-----------------|---|-------------------|--|-------------------|---------|---|
| PROJEC                |                       |           | ,  | COORDI |        |                  | M/DAT           | 1184  | HORIZONTAL        | <del>                                     </del> | RTICAL            |         | ┨ |
| ROJEC                 | ,1                    |           |  | 1      |        |                  |                 | est - U.S. Survey Ft.   | NAD83             |  | LLW               | •       |   |
| OCATI                 | ON COO                | RDINAT    | 'ES  | ELEVAT |        |                  |                 |   | 10.000            | <u> </u>   |                   |         | 1 |
|                       |                       |           | = 148,659  | -31.8  |        |                  |                 |   |                   |  |                   |         |   |
| ELEV.                 | DEPTH                 | LEGEND    | CLASSIFICATION OF MATERIALS  |        | ĸ.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S  | BLOWS/<br>0.5 FT. | N-VALUE |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |           |  |        |        |                  |                 | Advanced Boring   |                   |  |                   |         | - |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |           |  |        | NR     |                  |                 | SPT Sampler   | _                 |  | 0 0               | 0       | - |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-      |           |  |        |        |                  |                 |   |                   |  | 0                 |         | - |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>- |           |  |        |        |                  |                 | Advanced Boring   |                   |  |                   |         |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>- |           |  |        | NR     |                  |                 | SPT Sampler   |                   |  | 0 0               | 0       |   |
| -<br>-<br>-<br>51.3   | -<br>-<br>-<br>19.5   |           |  |        |        |                  |                 | Advanced Boring   |                   |  |                   |         |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>- |           | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |        |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |  |                   |         |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>- |           |  |        |        |                  |                 |   |                   |  |                   |         |   |
| <b>AM F</b><br>G 201  | ORM 1                 | <br>1836- | A AFTER ▼ DURING ▽ DRILLING  |        |        |                  |                 | Boring De   | esignation        | SS-11  | 19                |         | J |

Project I.D. **Boring Designation** MHVBC-25-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.40555442 LONG = -88.01735141 STATE PLANE COORDINATES X = 1,805,409Y = 147,8632020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-20-20 01-20-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -45.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR MANUFACTURER'S DESIGNATION OF DRILL NAME OF DRILLER ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** 100 % 17.5 Feet **TOTAL RECOVERY FOR BORING** BOX OR SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -45.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray 100 1 Vibracore At El. -50 Ft. -200= 94%, PL= 40, LL= 66, PI= 26, MC= 145% <u>-54</u>.0 9.0 (CH) CLAY, fat, high plasticity, soft At El. -54 Ft. -200= 89%, PL= consistency, wet, gray, inorganic 28, LL= 52, PI= 24, MC= 175% DRILLING ∑ **SAM FORM 1836** DRILLING T (Continued) Boring Designation MHVBC-25-19

**AUG 2017** 

Boring Designation MHVBC-25-19

| DR     | ILLIN             | G LC                                   | OG (Cont. Sheet)   | INSTALLA          |      |                  |                 |                       |  | SHEE       | T 2<br>SHE      | ETC     |
|--------|-------------------|--|--|-------------------|------|------------------|-----------------|-----------------------|--|------------|-----------------|---------|
| PROJEC |                   |  | •  | Mobile<br>COORDIN |      |                  | M/DAT           | JM                    | HORIZONTAL   |            | RTICAL          |         |
|        |                   |  |  |                   |      |                  |                 | est - U.S. Survey Ft. | NAD83  | M          | ILLW            |         |
|        | ON COOF           |  |  | ELEVATIO          |      | P OF             | BORING          | •                     |  |            |                 |         |
| ELEV.  | 1,805,40<br>DEPTH | r e                                    | = 147,863  CLASSIFICATION OF MATERIALS   | -45.0 l           | REC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                    | G<br>S     | BLOWS/<br>1 FT. | N-VALUE |
| -62.5  |                   | m //////////////////////////////////// | (CL) CLAY, lean, medium plasticity, s consistency, wet, gray, sandy  At El60.0 Ft., low plasticity, soft consistency, wet, gray, inorganic |                   | 100  | 1                |                 | Vibracore             | At El56 F<br>-200= 53%,<br>17, LL= 36,<br>19, MC= 44 | PL=<br>PI= |                 | -N      |
| -62.5  | - 17.5<br>        |  | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.                                 |                   |      |                  |                 |                       |  |            |                 |         |

Project I.D. Boring Designation **SS-121** 

| DRI               | LLIN               | G LO    | G D            | IVISION                      | N Sou         | uth Atlantic         | IN       | IST/             | <b>ALL</b>       | ATION Mobile          | District             |                 | SHEET 1<br>OF 2 SH | IEETS    | 5              |
|-------------------|--------------------|---------|----------------|------------------------------|---------------|----------------------|----------|------------------|------------------|-----------------------|----------------------|-----------------|--------------------|----------|----------------|
| PROJ              | ECT                |         |                |                              |               |                      | LAT      | LONG             | COORI            | DINATES LAT = 30.4    | 102482               |                 |                    |          | 1              |
| 19                | 63-196             | 4 Subs  | surface In     | vestigatio                   | n             |                      | STA      | TE PLA           | NE CO            | ORDINATES X = 1,8     | 305,059              | Y = 14          | 6,747              |          |                |
|                   | OF BOI             |         |                |                              | RTED          | COMPLETED            |          |                  |                  | STEM/DATUM/UNITS      |                      | HORIZ           |                    | RT.      |                |
| DBILL             | ING AG             | ENCY    |                | erno of Eng                  | incore (      | DECAM                |          |                  | e - Ala<br>ATION | bama West - U.S. Su   |                      | NAD8            | J   ML             | LW<br>ER |                |
|                   |                    |         | D INSPECT      | orps of Eng                  |               | E OF DRILLER         |          |                  |                  | -34.8 Fe              |                      | Ur              | nderwate           | r        | 4              |
| NAME              |                    | I/A, Ge |                | OK .                         | NAW           | N/A                  | N/       |                  | IOKEK            | 3 DESIGNATION OF DI   |                      |                 | HAMMER<br>JAL HAMI |          |                |
| _                 | TION OF<br>VERTICA |         | INCLINED       | DEG.<br>VER                  | FROM<br>FICAL | BEARING              | SIZE     | AND .            | TYPE C           | FBIT See R            | emarks               |                 |                    |          |                |
| тніск             | NESS OF            | OVERB   | URDEN          | N/A                          |               |                      | тот      | AL NU            | MBER (           | CORE BOXES            | )                    |                 |                    |          |                |
| DEPTH             | то тор             | OF ROC  | K              | N/A                          |               |                      | тот      | AL SAI           | MPLES            | DISTURBED ()          | UNI                  | DISTURBI        | ED (UD)            | 0        |                |
| TOTAL             | DEPTH              | OF BORI | NG             | 16.5 F                       | eet           |                      | тот      |                  | COVER            | Y FOR BORING No       | t Record             | ed              |                    |          |                |
| ELEV.             | DEPTH              | LEGEND  | CL             | ASSIFICATION                 | ON OF MA      | TERIALS              | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD  | ADVANCEMENT<br>METHOD | DR<br>RE             | ILLING<br>MARKS | BLOWS/             | N-VALUE  |                |
|                   |                    |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    | -        | 1              |
| -34.8             | 0.0                |         | (011) 01       | *** 6                        |               |                      |          |                  |                  |                       |                      |                 |                    |          | -0             |
| -                 | -                  |         |                | AY, fat, hig<br>icy, wet, gr |               | ty, very soft<br>nic |          |                  |                  | Advanced Boring       |                      |                 |                    |          | ŀ              |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  | Advanced Bennig       |                      |                 |                    |          | ┞.             |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       | 1                    |                 | 0                  |          | <del> </del>   |
| _                 | -                  |         |                |                              |               |                      | NR       |                  |                  | SPT Sampler           |                      |                 | 0                  |          | Ŀ              |
| _                 | _                  |         |                |                              |               |                      | INIX     |                  |                  | SF1 Sampler           |                      |                 |                    | 0        | -2             |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       | ]                    |                 | 0                  |          |                |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          |                |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | <del>-</del> 3 |
| _                 | _                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | Ł              |
| -                 | _                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | -4             |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  | Advanced Boring       |                      |                 |                    |          | ţ              |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | <b>ŀ</b> ,     |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | -5<br>-        |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | ţ              |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | -6             |
| -                 | -<br>-             |         |                |                              |               |                      |          |                  |                  |                       | _                    |                 |                    |          | ‡              |
| -                 | _                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 | 0                  |          | <u>-</u> 7     |
| -                 | -                  |         |                |                              |               |                      | NR       |                  |                  | SPT Sampler           |                      |                 | 0                  |          | -'             |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  |                       |                      |                 | 0                  | 0        | ţ              |
| -                 | -                  |         |                |                              |               |                      | <u> </u> |                  |                  |                       | 1                    |                 | Ļ                  |          | +8             |
| -                 | <u>-</u>           |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | ļ              |
| -                 | _                  |         |                |                              |               |                      |          |                  |                  | Advorsed Design       |                      |                 |                    |          | } ^            |
| -                 | -                  |         |                |                              |               |                      |          |                  |                  | Advanced Boring       |                      |                 |                    |          | <b>-</b> 9     |
| -                 | <u>-</u>           |         |                |                              |               |                      |          |                  |                  |                       |                      |                 |                    |          | ţ              |
| SAM F<br>AUG 2017 | ORM 1              | 836     | AFTEI<br>DRILL | R V D                        | URING S       | <u> </u>             | ontinue  | <b> </b><br>ed)  | <u> </u>         | Boring De             | <u>l</u><br>signatio | on S            | <br>S-121          |          | <u></u> 1      |

| DR                              | ILLIN                          | G LC   | OG (Cont. Sheet)  | INSTALI<br>Mobi | ATION<br>le Dist |                  |                 |  |                   | SHEET<br>OF 2 | 2<br>SHEE1        | <u>ا</u> |
|---------------------------------|--------------------------------|--------|---|-----------------|------------------|------------------|-----------------|--|-------------------|---------------|-------------------|----------|
| PROJEC                          |                                |        | ,   | COORDI          |                  |                  | M/DAT           | 184  | HORIZONTAL        |               | TICAL             | 13       |
| ROJEC                           | • •                            |        |   | 1               |                  |                  |                 | est - U.S. Survey Ft.  | NAD83             | 1             | LLW               |          |
| LOCATI                          | ON COOL                        | RDINAT | ES  | ELEVAT          |                  |                  |                 |  |                   | 1 .71         |                   | ᅦ        |
|                                 |                                |        | = 146,747   | -34.8           |                  |                  |                 |  |                   |               |                   | _        |
| ELEV.                           | DEPTH                          | QN     | CLASSIFICATION OF MATERIALS   |                 | REC.             | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>0.5 FT. | N-VALOE  |
| -<br>-<br>-<br>-<br>-<br>-<br>- | -                              |        |   |                 |                  |                  |                 | Advanced Boring  |                   |               |                   |          |
| -<br>-<br>-<br>-                | <del>-</del><br>-<br>-<br>-    |        |   |                 | NR               |                  |                 | SPT Sampler  |                   |               | 0 0 0             | 0        |
| -51.3                           | 16.5                           |        |   |                 |                  |                  |                 | Advanced Boring  |                   |               |                   |          |
| -<br>-<br>-<br>-                | -<br>-<br>-                    |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils |                 |                  |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x |                   |               |                   |          |
| -<br>-<br>-<br>-                | <del> </del><br> -<br> -<br> - |        | Classification System.  |                 |                  |                  |                 | Ì" Ο.D.).  |                   |               |                   |          |
| -<br>-<br>-                     | <br> -<br> -<br> -             |        |   |                 |                  |                  |                 |  |                   |               |                   |          |
| -<br>-<br>-                     | <del> </del><br> -<br> -       |        |   |                 |                  |                  |                 |  |                   |               |                   |          |
| -<br>-<br>-                     |                                |        |   |                 |                  |                  |                 |  |                   |               |                   |          |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>-               |        |   |                 |                  |                  |                 |  |                   |               |                   |          |
|                                 | ORM 1                          |        | A AFTER ▼ DURING ▽ DRILLING ▼   |                 |                  |                  |                 |  |                   |               |                   | ╝        |

Project I.D. **Boring Designation** CD-4-72 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 4 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.400637 LONG = -88.019243 STATE PLANE COORDINATES X = 1,804,805Y = 146,0771970-1972 Subsurface COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. STARTED **DATE OF BORING** 09-21-72 09-22-72 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -12.7 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER Wilsford, Geologist Dobbs CME-75 **MANUAL HAMMER DIRECTION OF BORING** DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED 8 UNDISTURBED (UD) **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 35.5 Feet 93 % BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -12.7 0.0 (MH) SILT, inorganic-H, high plasticity, gray 3" I.D. Shelby 100 1 Tube Advanced Boring At El. -17.7 Ft., gray and black with organics 3" I.D. Shelby 100 2 Tube Advanced Boring

(Continued)

Boring Designation

CD-4-72

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**SAM FORM 1836** 

**AUG 2017** 

Boring Designation CD-4-72

| DRI                        | LLIN        | G LC   | G (Cont. Sheet)                       | INSTALI<br>Mobi | LATION<br>ile Dis |        |                 | 3 3                    |                   | SHEET<br>OF 4 |                 | ETS     | ]            |
|----------------------------|-------------|--------|---------------------------------------|-----------------|-------------------|--------|-----------------|------------------------|-------------------|---------------|-----------------|---------|--------------|
| PROJEC                     | т           |        |                                       | COORDI          |                   |        |                 |                        | HORIZONTAL        |               | TICAL           |         | 1            |
| OCATIO                     | ON COOR     | RDINAT | ES                                    | State PI        |                   |        |                 | est - U.S. Survey Ft.  | NAD83             | <u>I</u> IVI  | LLW             |         | $\mathbf{f}$ |
|                            |             |        | = 146,077                             | -12.7           |                   |        | •               |                        |                   |               |                 |         |              |
| ELEV.                      | DEPTH       | LEGEND | CLASSIFICATION OF MATERIALS           | 5               | RÉC.              | BOX OR | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>S        | BLOWS/<br>1 FT. | N-VALUE |              |
|                            | -           |        | (OH) SILT, organic-H, high plasticity | , gray          | 100               | 3      |                 | 3" I.D. Shelby<br>Tube |                   |               |                 |         |              |
| -                          | -           |        |                                       |                 |                   |        |                 | Advanced Boring        |                   |               |                 |         |              |
|                            |             |        |                                       |                 | 100               | 4      |                 | 3" I.D. Shelby<br>Tube |                   |               |                 |         |              |
|                            | -           |        |                                       |                 |                   |        |                 | Advanced Boring        |                   |               |                 |         |              |
| -<br>-<br>-<br>-<br>-<br>- | -           |        |                                       |                 | 40                | 5      |                 |                        |                   |               |                 |         |              |
| -<br>-<br>-                | -<br>-<br>- |        |                                       |                 |                   |        |                 | Advanced Boring        | -                 |               |                 |         |              |
| SAM F<br>UG 2017           | ORM 1       | 1836-  | A AFTER ▼ DURING ▼ DRILLING ▼         | (Co             | ntinue            | ed)    | I               | Boring De              | esignation        | CD-4          | 72              |         | 5            |

Boring Designation CD-4-72

| DRI                        | ILLIN                                     | G LC      | DG (Cont. Sheet)   | INSTALI |        |                  |                 |   |                   | SHEET   |                 |         | 1 |
|----------------------------|---|-----------|--|---------|--------|------------------|-----------------|---|-------------------|---------|-----------------|---------|---|
|                            |   |           |  | _       | le Dis |                  |                 |   |                   | OF 4    |                 |         | ┨ |
| PROJEC                     | <b>)</b> I                                |           |  | COORDI  |        |                  |                 | est - U.S. Survey Ft.                     | NAD83             | 1       | TICAL<br>LLW    | -       |   |
| OCATI                      | ON COOL                                   | PDINAT    | res  | ELEVAT  |        |                  |                 |   | NADOS             | IVII    |                 |         | 1 |
|                            |   |           | ′ = 146,077  | -12.7   |        | JP OF            | BORIN           | •   |                   |         |                 |         |   |
| ELEV.                      | DEPTH                                     | LEGEND    | CLASSIFICATION OF MATERIALS  |         | ĸĚC.   | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                     | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>1 FT. | N-VALUE |   |
| -37.7                      | 25.0                                      |           |  |         |        |                  |                 | Advanced Boring                           |                   |         |                 |         |   |
| -                          | -   |           | (CH) CLAY, fat, high plasticity, gray organic odor and limestone fragments                                 | with    | 100    | 6                |                 | 3" I.D. Shelby<br>Tube                    |                   |         |                 |         |   |
| -                          | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |           |  |         |        |                  |                 | Advanced Boring                           |                   |         |                 |         |   |
| -<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-      |           | At El42.7 Ft., high plasticity, gray   |         | 100    | 7                |                 | 3" I.D. Shelby<br>Tube                    |                   |         |                 |         |   |
| -<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-      |           |  |         |        |                  |                 | Advanced Boring                           |                   |         |                 |         |   |
| -48.2<br>-<br>-<br>-<br>-  | 35.5                                      |           | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         | 100    | 8                |                 | 3" I.D. Shelby<br>Tube<br>Advanced Boring | -                 |         |                 |         |   |
| AM F                       | T<br>ORM 1                                | <br>1836- | Sampler lost obtaining sample No.  |         | ntinue | ed)              |                 | Boring De                                 | esignation        | CD-4-   | .72             |         | J |

Boring Designation CD-4-72

| DRI         | ILLIN              | G LC     | G (Cont. Sheet)   | INSTAL<br>Mob     | <b>LATION</b><br>ile Dis |                  |                 |                       |                   | SHEET<br>OF 4 |                 | ETS     |
|-------------|--------------------|----------|---|-------------------|--------------------------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|---------|
| PROJEC      |                    |          |   | COORD             |                          |                  | M/DAT           | UM                    | HORIZONTAL        | VEF           | RTICAI          |         |
|             |                    |          |   | _                 |                          |                  |                 | est - U.S. Survey Ft. | NAD83             | М             | LLW             |         |
|             | ON COOR            |          |   | ELEVA1            |                          | OP OF            | BORING          | 3                     |                   |               |                 |         |
| ELEV.       | DEPTH              | LEGEND C | = 146,077  CLASSIFICATION OF MATERIALS                                    | -12. <sup>-</sup> | REC.                     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S        | BLOWS/<br>1 FT. | N-VALUE |
| -           |                    | - T      | Moved Barge approx. 10 north of CD Fish tailed to depth -47.7, then pushe | -4-72.            | 100                      | 8 <b>8B</b>      |                 | METHOD                |                   |               | ₫~              | ź       |
| -           | <u> </u>           |          | Fish tailed to depth -47.7, then pushe sample No.8 to -50.2 feet.         | ed                |                          |                  |                 |                       |                   |               |                 |         |
| -           | <u> </u>           |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <del> </del>       |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | -                  |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           |                    |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | †<br> -            |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <del> </del><br> - |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           |                    |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           |                    |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | †<br> -<br> -      |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <u> </u>           |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           |                    |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | -                  |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <u> </u>           |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <u>†</u>           |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <del> </del>       |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -<br>-      | <u> </u><br> -     |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -<br>-<br>- |                    |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | <del> </del>       |          |   |                   |                          |                  |                 |                       |                   |               |                 |         |
| -           | ORM 1              |          | A AFTER ▼ DURING ∇ DRILLING □   |                   |                          |                  |                 | Boring De             |                   |               |                 |         |

Project I.D. **Boring Designation** MHVBC-24-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.40020571 LONG = -88.01778357 STATE PLANE COORDINATES X = 1,805,264Y = 145,9182020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-21-20 01-21-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** 100 % 19.5 Feet **TOTAL RECOVERY FOR BORING** BLOWS/ BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray 100 1 Vibracore At El. -55 Ft. -200= 98%, PL= 39, LL= 69, PI= 30, MC= 145% DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

Boring Designation

MHVBC-24-19

Boring Designation MHVBC-24-19

| DRILL            | LING | LO     | G (Cont. Sheet)   | INSTAL              | <b>LATION</b><br>ile Dis |                  |                 |                       |  | SHEET<br>OF 2 |                 | FTe     |
|------------------|------|--------|---|---------------------|--------------------------|------------------|-----------------|-----------------------|--|---------------|-----------------|---------|
| PROJECT          |      |        | •   | COORD               |                          |                  | M/DAT           | <b>Ј</b> М            | HORIZONTAL   |               | TICAL           |         |
|                  |      |        |   | State P             | lane -                   | Alabaı           | na We           | est - U.S. Survey Ft. | NAD83  | MI            | LW              |         |
| OCATION X = 1.80 |      |        | <b>ES</b> = 145,918   | <b>ELEVAT</b> -46.0 |                          | P OF             | BORING          | 3                     |  |               |                 |         |
|                  | EPTH | LEGEND | CLASSIFICATION OF MATERIALS   | •                   | REC.                     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLING<br>REMARK                                   | G<br>S        | BLOWS/<br>1 FT. | N-VALUE |
| -62.0 1          | 16.0 |        | (CH) CLAY, fat, high plasticity, soft consistency, wet, gray, inorganic, with the consistency, wet, gray, with fine sand shell, inorganic |                     | 100                      | 1                |                 | Vibracore             | At El62 F<br>-200= 74%,<br>24, LL= 46,<br>22, MC= 52 | PL=<br>PI=    |                 |         |
|                  |      |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.                                |                     |                          |                  |                 |                       |  |               |                 |         |

Project I.D. Boring Designation SS-123

| DRI              | LLIN           | G LO    | G D          | DIVISIO      | N So               | uth Atlantic  | II      | IST/             | ALL/            | ATION Mobile                           | District  | · I              | HEET 1<br>F 2 SH   | EETS      |            |
|------------------|----------------|---------|--------------|--------------|--------------------|---------------|---------|------------------|-----------------|--|-----------|------------------|--------------------|-----------|------------|
| PROJ             | ECT            |         | <u> </u>     |              |                    |               | LAT     | /LONG            | COOR            | DINATES LAT = 30.                      | 396835    | -                |                    |           | 1          |
| 19               | 63-196         | 4 Subs  | surface I    | Investigat   | ion                |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1,                      | 805,347   | Y = 144          | 4,692              |           |            |
| DATE             | OF BOI         | RING    |              | ST           | ARTED              | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORIZ.           |                    | RT.<br>LW | 1          |
| DRILI            | ING AG         | ENCY    | C            | Corps of Er  | naineers -         | CESAM         |         |                  | ATIO            | NS TOP OF BO                           | ORING     | GROL             | JND WAT            | ER        | 1          |
|                  |                |         | D INSPEC     |              | <del>-</del>       | IE OF DRILLER |         |                  |                 | -30.8 F                                |           |                  | derwater<br>HAMMER |           | +          |
|                  |                | I/A, Ge |              |              |                    | N/A           | N.      | /A               |                 |  |           |                  | AL HAMN            |           | ]          |
|                  | TION OF        |         | INCLINED     | DEC          | G. FROM<br>RTICAL  | BEARING       | SIZI    | E AND            | TYPE C          | OF BIT See R                           | emarks    |                  |                    |           |            |
| тніск            | NESS OF        | OVERB   | URDEN        | N/A          |                    |               | тот     | AL NU            | MBER            | CORE BOXES (                           | )         |                  |                    |           |            |
| DEPTH            | то тор         | OF ROC  | K            | N/A          |                    |               | тот     | 'AL SAI          | MPLES           | DISTURBED (                            | UNI       | DISTURBE         | D (UD)             | 0         | 4          |
| TOTAL            | . DEPTH        |         | NG           | 20.5         | Feet               |               | тот     |                  | COVER           | Y FOR BORING No                        | ot Record | ed               |                    | T         | 4          |
| ELEV.            | DEPTH          | LEGEND  | С            | LASSIFICA    | TION OF MA         | ATERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DR<br>RE  | RILLING<br>MARKS | BLOWS/<br>0.5 FT.  | N-VALUE   |            |
| -30.8            | 0.0            |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           |            |
| -30.0            | - 0.0          |         |              |              |                    | ty, very soft |         |                  |                 |  |           |                  |                    |           | <u>-</u> 0 |
| -                |                |         | consiste     | ency, wet, ( | gray, orga         | nic           |         |                  |                 |  |           |                  |                    |           | ŀ          |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | -1         |
|                  | <u> </u>       |         |              |              |                    |               |         |                  |                 | Advanced Boring                        |           |                  |                    |           | ļ          |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | <b>-</b>   |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | -2<br>-    |
| -                | -              |         |              |              |                    |               |         |                  |                 |  | 1         |                  |                    |           | ţ          |
| -                | -              |         |              |              |                    |               | ,,,,    |                  |                 | ODT O                                  |           |                  |                    |           | -3         |
|                  | [              |         |              |              |                    |               | NR      |                  |                 | SPT Sampler                            |           |                  | 0                  | 0         | F          |
| -                | _              |         |              |              |                    |               |         |                  |                 |  |           |                  | 0                  |           | <u> </u>   |
|                  | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | }          |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | F          |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | -5<br>-    |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | ŀ          |
| -                | -              |         |              |              |                    |               |         |                  |                 | Advanced Boring                        |           |                  |                    |           | -6         |
| -                | _              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | ţ          |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | <b>-</b>   |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | <b>-</b> 7 |
| ] :              | ţ              |         |              |              |                    |               |         |                  | 1               |  | 1         |                  |                    |           | ţ          |
| -                | -              |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | -8         |
| ] .              | -              |         |              |              |                    |               | NR      |                  |                 | SPT Sampler                            |           |                  | 0                  | 0         | Ė          |
| -                | <u> </u>       |         |              |              |                    |               |         |                  |                 |  |           |                  | 0                  |           | <u>-</u> 9 |
| -                | ļ <sup>.</sup> |         |              |              |                    |               |         |                  |                 |  |           |                  |                    |           | F          |
| ] :              | <u> </u>       |         |              |              |                    |               |         |                  |                 | Advanced Boring                        |           |                  |                    |           | -          |
| SAM F<br>AUG 201 | ORM 1          | 1836    | AFTE<br>DRIL | ER ¥         | DURING<br>DRILLING | <u>Ā</u> (C   | ontinue | ed)              |                 | Boring De                              | signatio  | on SS            | S-123              | 1         | <b>-</b> 1 |

| DR  | ILLIN                         | G LO     | G (Cont. Sheet)  | INSTAL |         |                  |                 |   |                   | SHEET   |                   |         | 1                |
|---|-------------------------------|----------|--|--------|---------|------------------|-----------------|---|-------------------|---------|-------------------|---------|------------------|
|   |                               | <u> </u> | (Cont. Onect)  |        | le Dist |                  |                 |   |                   | OF 2    |                   |         | -                |
| PROJEC                                    | CT                            |          |  | COORDI |         |                  |                 |   | HORIZONTAL        |         | RTICAL<br>LLW     |         |                  |
|   |                               |          |  | ELEVAT |         |                  |                 | est - U.S. Survey Ft.   | NAD83             | IVI     | LLVV              |         | 4                |
|   | I <b>ON COO</b> I<br>1,805,34 |          | = 144,692  | -30.8  |         | JP OF I          | BURING          | •   |                   |         |                   |         |                  |
| ELEV.                                     | DEPTH                         | Q        | CLASSIFICATION OF MATERIALS  |        | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE |                  |
| -<br>-<br>-<br>-<br>-<br>-                | -                             |          |  |        |         |                  |                 | Advanced Boring   |                   |         |                   |         |                  |
| -<br>-<br>-<br>-                          | T<br>-<br>-<br>-<br>-         |          |  |        | NR      |                  |                 | SPT Sampler   |                   |         | 0 0 0             | 0       | -<br>-<br>-<br>- |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |                               |          |  |        |         |                  |                 | Advanced Boring   |                   |         |                   |         |                  |
| -<br>-<br>-<br>-                          | -<br>-<br>-<br>-              |          |  |        | NR      |                  |                 | SPT Sampler   |                   |         | 0 0 0             | 0       |                  |
| -<br>-<br>-51.3                           | 20.5                          |          |  |        |         |                  |                 | Advanced Boring   |                   |         |                   |         | -                |
|   | -                             |          | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         | -                |
| -   | ORM ?                         | 1020     | A AFTER ▼ DURING ∇ DRILLING □  |        |         |                  |                 | Boring De   | <u> </u>          | SS-12   | $\perp$           |         | ŀ                |

Project I.D. **Boring Designation** VC-32-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.394866 LONG = -88.018579 STATE PLANE COORDINATES X = 1,805,005Y = 143,9771963-1964 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -43.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 26.5 Feet BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -43.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black, with organic material At El. -45.5 Ft. LOI=11.7% 100 1 Vibracore At El. -49.6 Ft., soft consistency, gray

(Continued)

Boring Designation

VC-32-84

DURING ∑ DRILLING

DRILLING T

**SAM FORM 1836** 

**AUG 2017** 

Boring Designation VC-32-84

| DRILLING LOG (Cont. Sheet)   |
|--|
| PROJECT  COGRINATE SYSTEMDATUM SIAND PIRE - CAIADAM WEST - U.S. SURVey FL NADS3  VERTCAL MILLW  LOCATION COORDINATES  X = 1,005,005  Y = 143,977  CLASSIFICATION OF MATERIALS  REC.  SS NOB ADVANCEMENT  |
| State   Planc - Alabama West - U.S. Survey FL   NAD83   MILW   |
| CLOATION COORDINATES     CLASSIFICATION OF MATERIALS     A   A   A   A   A   A   A   A   A   |
| ELEV. DEPTH Sylvarian of materials Rec. Sylvarian Sylvar |
| -60.5 17.5 (SC) SAND, clayey, soft consistency, gray   |
| -60.5 17.5 (SC) SAND, clayey, soft consistency, gray   |
| SAM FORM 1836-A  AFTER  DURING  DRILLING  DRILLING  DRILLING  Continued)  Boring Designation VC-32-84  |

VC-32-84 **Boring Designation** 

| DR               | ILLIN    | G LC   | OG (Cont. Sheet)   | INSTAL | <b>LATIO</b> I |                  |                 | 3 3                   |                   | SHEET<br>OF 3 |                 | ETC     | ]  |
|------------------|----------|--------|--|--------|----------------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|---------|--|
| PROJEC           |          |        | ,  | COORD  |                |                  | M/DAT           | LIM                   | HORIZONTAL        | -             | TICAL           |         | ł  |
| I KOOL           |          |        |  |        |                |                  |                 | est - U.S. Survey Ft. |                   |               | LLW             | -       |  |
| LOCATI           | ON COOF  | RDINAT | ES   | ELEVA1 |                |                  |                 |                       |                   |               |                 |         | 1  |
|                  | 1,805,00 |        | = 143,977  | -43.0  |                |                  |                 |                       |                   |               |                 |         |  |
| ELEV.            | DEPTH    | LEGEND | CLASSIFICATION OF MATERIALS  |        | REC.           | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>1 FT. | N-VALUE |  |
|                  |          |        |  |        | 100            | 1                |                 | Vibracore             |                   |               |                 |         | -<br>-24<br>-<br>-<br>-<br>-25<br>-<br>-<br>-                        |
| -69.5            | 26.5     |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |                |                  |                 |                       |                   |               |                 |         | - 27<br>- 28<br>- 29<br>29<br>30<br>31<br>33<br>34<br>35<br>36<br>36 |
| SAM F<br>AUG 201 | ORM 1    | 836-   | A AFTER ▼ DURING ▽ DRILLING ▼  |        | <u> </u>       | <u> </u>         | <u> </u>        | Boring De             | esignation        | VC-32         | 2-84            |         | -37  |

Project I.D. Boring Designation **SS-125** 

| DRI     | LLIN               | G LO   | G                   | DIVI           | SION         | Sou                           | uth Atlantic   | 11        | IST/             | ALL/            | ATION Mobile                                   | e Distric | ct                | SHEET<br>OF 2   |                   | EETS    |                 |
|---------|--------------------|--------|---------------------|----------------|--------------|-------------------------------|----------------|-----------|------------------|-----------------|--|-----------|-------------------|-----------------|-------------------|---------|-----------------|
| PROJ    | ECT                |        | '                   |                |              |                               |                | LAT       | /LONG            | COOR            | DINATES LAT = 30                               | .391473   | LONG              |                 |                   |         | 1               |
| 19      | 63-196             | 4 Subs | surface             | Invest         | tigatio      | n                             |                | STA       | TE PLA           | ANE CO          | OORDINATES X = 1                               | ,804,818  | Y = 1             | 42,74           | 4                 |         | 1               |
| DATE    | OF BOI             | RING   |                     |                | STAI         | RTED                          | COMPLETEL      |           |                  |                 | <b>STEM/DATUM/UNITS</b><br>Ibama West - U.S. S | Survey Et | HOR<br>NAD        |                 | <i>VER</i><br>MLL |         |                 |
| DRILI   | LING AG            | ENCY   |                     | Corps          | of Engi      | neers - (                     | CESAM          |           |                  | ATIOI           | NS TOP OF E                                    | BORING    | GR                | OUND            | WATE              | R       | 1               |
|         | & TITLE            |        |                     |                | · · · ·      |                               | E OF DRILLER   |           |                  |                 | -37.8  |           |                   | Jnderv<br>O HAN |                   |         | 1               |
|         |                    |        | eologist            |                |              |                               | N/A            | N.        | /A               |                 |  |           |                   | NUAL H          |                   |         | ↓               |
|         | TION OF<br>VERTICA |        |                     | ED             | DEG.<br>VERT | FROM<br>ICAL                  | BEARING        | SIZI      | E AND            | TYPE C          | OF BIT See I                                   | Remarks   |                   |                 |                   |         |                 |
| тніск   | NESS OF            | OVERB  | URDEN               |                | N/A          |                               |                | тот       | AL NU            | MBER            | CORE BOXES                                     | 0         |                   |                 |                   |         | _               |
| DEPTH   | і то тор           | OF ROO | CK                  |                | N/A          |                               |                | тот       | AL SA            | MPLES           |  |           | IDISTURI          | BED (U          | D)                | 0       | 4               |
| TOTAL   | DEPTH              | . т    | ING                 |                | 13.5 Fe      | eet                           |                | тот       |                  | COVER           | Y FOR BORING                                   | lot Recor | ded               | 1               |                   |         | -               |
| ELEV.   | DEPTH              | LEGEND |                     | CLASSII        | FICATIO      | ON OF MA                      | TERIALS        | REC.      | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                          | R         | RILLING<br>EMARKS | i               | BLOWS/<br>0.5 FT. | N-VALUE |                 |
| -37.8   | 0.0                |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | 1               |
| -57.0   | 0.0                |        | (CH) <sub>.</sub> ( | CLAY, f        | at, high     | n plastici                    | ty, very soft  |           |                  |                 |  |           |                   |                 |                   |         | -0              |
| -       | <u> </u>           |        | consis              | tency, v       | wet, gra     | ay, orgai                     | nic            |           |                  |                 |  |           |                   |                 |                   |         | ŀ               |
| -       | -                  |        |                     |                |              |                               |                |           |                  |                 | Advanced Boring                                |           |                   |                 |                   |         | -1              |
|         | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | ţ               |
| -       | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | }               |
| -       | Ī                  |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 | 0                 |         | <del> </del> -2 |
| -       | <u> </u>           |        |                     |                |              |                               |                | NR.       |                  |                 | SPT Sampler                                    |           |                   |                 | 0                 |         | t               |
| -       | -                  |        |                     |                |              |                               |                |           |                  |                 | or reampler                                    |           |                   |                 |                   | 0       | -3              |
|         | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 | 0                 |         | ‡               |
| -       | Ĺ                  |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | L<br>-4         |
|         | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | }               |
| -       | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | ļ               |
| _       | _                  |        |                     |                |              |                               |                |           |                  |                 | Advanced Design                                |           |                   |                 |                   |         | -5              |
|         | Ī                  |        |                     |                |              |                               |                |           |                  |                 | Advanced Boring                                |           |                   |                 |                   |         | F               |
| -       | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | -6              |
| -       | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | ŀ               |
|         | Ī                  |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | F               |
| -       | <u> </u>           |        |                     |                |              |                               |                |           |                  | 1               |  |           |                   |                 | 0                 |         | <del> </del> 7  |
|         | }                  |        |                     |                |              |                               |                |           |                  |                 | 00-5   |           |                   |                 |                   |         | -               |
| -       | ‡                  |        |                     |                |              |                               |                | NR        |                  |                 | SPT Sampler                                    |           |                   |                 | 0                 | 0       | _<br>-8         |
| -       | ţ                  |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 | 0                 |         | ŀ               |
| ] .     | }                  |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | F               |
| -       | <u> </u>           |        |                     |                |              |                               |                |           |                  |                 | Advanced Boring                                |           |                   |                 |                   |         | -9<br>-         |
| -       | ł                  |        |                     |                |              |                               |                |           |                  |                 |  |           |                   |                 |                   |         | ŀ               |
| SAME    | ORM 1              | 1926   | 1 45                | TED            | <b>T</b> 51  | IDINIC 7                      | <del>7</del> T | (02:-4)   | "                |                 | <b>.</b>                                       |           |                   | 26 11           |                   |         | $\mathbf{L}_1$  |
| AUG 201 | OKIVI 1<br>7       | 000    | DR                  | TER<br>RILLING | ▼ DI         | JRING <sup>5</sup><br>RILLING | ☑ ┃            | (Continue | ea)              |                 | Boring D                                       | esignat   | ion S             | SS-12           | 25                |         |                 |

| DRI                        | ILLIN    | G LC   | OG (Cont. Sheet)   | INSTAL |         |                  |                 |  |                   | SHEET  |                   |         |
|----------------------------|----------|--------|--|--------|---------|------------------|-----------------|--|-------------------|--------|-------------------|---------|
| PROJEC                     |          |        |  | COORD  | ile Dis |                  | M/DAT           | 100  | HORIZONTAL        | OF 2   | SHEE              | -       |
| NOJEU                      | - •      |        |  |        |         |                  |                 | est - U.S. Survey Ft.  | NAD83             |        | LW                |         |
| OCATI                      | ON COO   | RDINAT | ES   | ELEVAT |         |                  |                 |  |                   |        |                   |         |
| X = ′                      | 1,804,81 | 18 Y   | = 142,744  | -37.8  | 8 Ft.   |                  |                 |  |                   |        |                   |         |
| ELEV.                      | DEPTH    | LEGEND | CLASSIFICATION OF MATERIALS  | i      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>0.5 FT. | N-VALUE |
|                            | -        |        |  |        |         |                  |                 | Advanced Boring  |                   |        |                   | -       |
| -51.3                      | 13.5     |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 | 140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). |                   |        |                   |         |
| -<br>-<br>-<br>-<br>-<br>- | ORM 1    | 1836-  | <b>A</b> AFTER ▼ DURING ▽ DRILLING ▼   |        |         |                  |                 | Boring De  | esignation        | SS-12  | 5                 | -       |

Project I.D. **Boring Designation** MHVBC-23-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.3910328 LONG = -88.01941658 STATE PLANE COORDINATES X = 1,804,734Y = 142,5842020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-21-20 01-21-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -45.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 19.5 Feet BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -45.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray -45.5 0.5 (CH) CLAY, fat, high plasticity, soft consistency, wet, gray, inorganic, with traces of sand 100 1 Vibracore At El. -50 Ft. -200= 90%, PL= 30, LL=59, PI= 29, MC=92% At El. -53.0 Ft. with fine sand and shell At El. -53 Ft. -200= 85%, PL= 26, LL= 56, PI= 30, MC= 89%

(Continued)

Boring Designation

MHVBC-23-19

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DRILLING T

**SAM FORM 1836** 

**AUG 2017** 

Boring Designation MHVBC-23-19

| DRI                  | ILLIN                              | G LC   | OG (Cont. Sheet)   | INSTALI<br>Mobi     | ATION |                  |                 | oring Designation     |   | SHEE         | T 2    | ETS     |
|----------------------|------------------------------------|--------|--|---------------------|-------|------------------|-----------------|-----------------------|---|--------------|--------|---------|
| PROJEC               | т                                  |        |  | COORDI              | NATE: | SYSTE            |                 |                       | HORIZONTAL  |              | RTICA  |         |
|                      |                                    |        |  | 1                   |       |                  |                 | est - U.S. Survey Ft. | NAD83   | I            | ILLW   |         |
|                      | <b>on coor</b><br>1.804.73         |        | res<br><sup>r</sup> = 142,584  | <b>ELEVAT</b> -45.0 |       | OP OF            | BORIN           | G                     |   |              |        |         |
| ELEV.                | DEPTH                              | LEGEND | CLASSIFICATION OF MATERIALS  | 10.0                | REC.  | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                   | G<br>(S      | BLOWS/ | N-VALUE |
| -<br>-<br>-<br>-57.0 | -<br>-<br>-<br>-<br>-<br>12.0      |        | (CL) CLAY, lean, low plasticity, soft consistency, wet, gray, with traces of inorganic         | shell,              |       |                  |                 |                       |   |              |        |         |
| -60.5                | - 15.5                             |        | (CL-ML) CLAY, silty, low plasticity, so<br>consistency, wet, gray, sandy and silt<br>inorganic | oft<br>cy,          | 100   | 1                |                 | Vibracore             |   |              |        |         |
| -62.5                | -<br>-<br>-<br>-<br>-<br>-<br>17.5 |        | (SC-SM) SAND, silty, clayey, low plas<br>loose, wet, gray, very clayey, with trac<br>shell     | sticity,<br>ces of  |       |                  |                 |                       | At El61 F<br>-200= 40%<br>21, LL= 27,<br>6, MC= 35% | , PL=<br>PI= |        |         |
| -64.5                | -<br>-<br>-<br>-<br>19.5           |        | (SM) SAND, silty, low plasticity, loose gray, with trace shell                                 | e, wet,             |       |                  |                 |                       |   |              |        |         |
| -                    | -<br>-                             |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils            |                     |       |                  |                 |                       |   |              |        |         |
| -<br>-<br>-<br>-     | -<br>-<br>-                        |        | Classification System.   |                     |       |                  |                 |                       |   |              |        |         |
|                      | -<br>-<br>-                        |        |  |                     |       |                  |                 |                       |   |              |        |         |
| SAM F<br>AUG 2017    | ORM 1                              | 836-   | A AFTER ▼ DURING ▽ DRILLING □  |                     |       |                  |                 | Boring De             | signation   | MHV          | BC-2   | 3-1     |

Project I.D. **Boring Designation** MHVBC-22-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.38744705 LONG = -88.01966322 STATE PLANE COORDINATES X = 1,804,650Y = 141,2812020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-21-20 01-21-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -47.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER M. Shekouh, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 19.5 Feet BOX OF SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -47.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray -49.0 2.0 At El. -48.8 Ft. with wood debris (CH) CLAY, fat, high plasticity, soft consistency, wet, gray, inorganic 100 1 Vibracore At El. -55 Ft. -200= 77%, PL= 29, LL=67, PI= 38, MC= 78% DRILLING ∑ DRILLING ב

(Continued)

**Boring Designation** 

MHVBC-22-19

**SAM FORM 1836** 

**AUG 2017** 

DRILLING T

Boring Designation MHVBC-22-19

| DR             | ILLIN    | G LC   | OG (Cont. Sheet)  | INSTAL |         |                  |                 |                       |  | SHEE         |                 |         | ]   |
|----------------|----------|--------|---|--------|---------|------------------|-----------------|-----------------------|--|--------------|-----------------|---------|---|
| PROJEC         |          |        | (   | COORD  | ile Dis |                  | M/DATI          | JM                    | HORIZONTAL   | -            | 2 SHE           |         | 4   |
|                |          |        |   |        |         |                  |                 | est - U.S. Survey Ft. |  | 1            | /LLW            |         |   |
| LOCATI         | ION COO  | RDINAT | ES  | ELEVAT | ION TO  | OP OF            | BORING          | •                     |  |              |                 |         | 1   |
| X =            | 1,804,65 |        | = 141,281   | -47.   | 0 Ft.   | 1                |                 |                       |  |              |                 | _       | 4   |
| ELEV.          | DEPTH    | LEGEND | CLASSIFICATION OF MATERIALS   | ;      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK                                    | G<br>(S      | BLOWS/<br>1 FT. | N-VALUE | ╽.  |
| -62.5<br>-66.5 |          |        | At El61.0 Ft. with traces of wood  (CL) CLAY, lean, low plasticity, soft consistency, wet, gray, with traces of inorganic  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        | 100     | 1                |                 | Vibracore             | At El63 F<br>-200= 59%,<br>18, LL= 38,<br>20, MC= 49 | , PL=<br>PI= |                 |         | -         - |

Project I.D. Boring Designation SS-127

| DRI              | LLIN               | G LO   | G        | DIVI           | SION         | l Soi                                 | uth Atlantic  | IN      | IST/             | \LL#            | ATION                   | Mobile        | District  |                 | SHEET<br>OF 3 |                   | ETS      |     |
|------------------|--------------------|--------|----------|----------------|--------------|---------------------------------------|---------------|---------|------------------|-----------------|-------------------------|---------------|-----------|-----------------|---------------|-------------------|----------|-----|
| PROJ             | ECT                |        |          |                |              |                                       |               | LAT     | LONG             | COORI           | DINATES L               | AT = 30.3     | 86110     |                 |               |                   |          |     |
| 19               | 63-196             | 4 Subs | surface  | e Inves        | tigatio      | n                                     |               | STA     | TE PLA           | NE CO           | ORDINATES               | X = 1,8       | 04,288    | Y = 14          | 40,796        | i                 |          |     |
|                  | OF BOI             |        |          |                |              | RTED                                  | COMPLETED     |         |                  |                 | stem/datum<br>bama West |               | nyoy Et   | HORI.           |               | <i>VER</i><br>MLL |          |     |
| DRILI            | LING AG            | ENCY   |          | Corns          | of Eng       | ineers - (                            | L<br>CESAM    |         |                  | ATION           |                         | OP OF BO      | _         |                 | DUND N        |                   | _        |     |
|                  | & TITLE            |        |          |                | or Eng       |                                       | E OF DRILLER  |         |                  |                 | 'S DESIGNAT             | -26.8 Fe      |           |                 | nderw         |                   |          |     |
|                  |                    |        | eologist |                |              | T T T T T T T T T T T T T T T T T T T | N/A           | N/      |                  |                 |                         |               |           |                 | UAL H         |                   | ER       |     |
|                  | TION OF<br>VERTICA |        |          | ED             | DEG.<br>VERT | FROM<br>FICAL                         | BEARING       | SIZE    | AND .            | TYPE C          | )F BIT                  | See Re        | emarks    |                 |               |                   |          |     |
| тніск            | NESS OF            | OVERB  | URDEN    |                | N/A          |                                       |               | тот     | AL NU            | MBER (          | CORE BOXES              | 0             |           |                 |               |                   |          |     |
| DEPTH            | і то тор           | OF ROC | CK       |                | N/A          |                                       |               | тот     | AL SAI           | MPLES           | DISTUR                  | RBED ()       | UNE       | DISTURB         | ED (UL        | ) (               | 0        |     |
| TOTAL            | DEPTH              | OF BOR | ING      |                | 24.5 F       | eet                                   |               | тот     | AL RE            | COVER           | Y FOR BORIN             | i <b>G</b> No | t Recorde | ed              |               |                   |          |     |
| ELEV.            | DEPTH              | LEGEND |          | CLASSI         | FICATIO      | ON OF MA                              | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCE<br>METH         | EMENT<br>OD   | DR<br>RE  | ILLING<br>MARKS |               | BLOWS/<br>0.5 FT. | N-VALUE  |     |
|                  |                    |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 | $\dashv$      |                   |          |     |
| -26.8            | 0.0                |        | (CH) (   | CLAV           | fat hial     | h nlaetici                            | ty, very soft |         |                  |                 |                         |               |           |                 |               |                   | -        | -0  |
|                  | <u> </u>           |        | consis   | tency,         | wet, gra     | ay, orgai                             | nic           |         |                  |                 |                         |               |           |                 |               |                   | ļ        |     |
| -                | L                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | Ŀ        | _ 1 |
|                  |                    |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | -        | - 1 |
| -                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 | Advanced                | Boring        |           |                 |               |                   | ţ        |     |
| =                | -                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        | -2  |
| -                | [                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | Ī        |     |
| -                | _                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   |          | -3  |
| -                |                    |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        |     |
| -                | [                  |        |          |                |              |                                       |               | NR      |                  |                 | 1-3/8"<br>Shelby        |               |           |                 |               |                   | Ī        |     |
| -                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 | Grielby                 | Tube          |           |                 |               |                   | ŀ        | -4  |
| -                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               | -                 | $\dashv$ |     |
| _                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ļ        | -5  |
| -                | Ĺ                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        |     |
| -                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        |     |
| -                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ļ        | -6  |
| -                | -                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        |     |
| _                | [                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | F        | -7  |
|                  | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 | Advanced                | Boring        |           |                 |               |                   | ţ        |     |
| -                |                    |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        | _   |
| -                | Ī                  |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | F        | -8  |
|                  | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ŀ        |     |
| -                | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | F        | -9  |
| ] :              | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 |               |                   | ţ        |     |
|                  | <u> </u>           |        |          |                |              |                                       |               |         |                  |                 |                         |               |           |                 | _             |                   | }        | _   |
| SAM F<br>AUG 201 | ORM 1              | 836    | AF<br>DF | TER<br>RILLING | ▼ Di         | URING S                               | <u>√</u> (C   | ontinue | ed)              |                 | Во                      | ring De       | signatio  | on S            | S-12          | 7                 |          | -1  |

|                  |                                      |        |                             | I               |         |                  |                 | oring Designation     |                   | 5-12/         |                   |         | - |
|------------------|--------------------------------------|--------|-----------------------------|-----------------|---------|------------------|-----------------|-----------------------|-------------------|---------------|-------------------|---------|---|
| DR               | ILLIN                                | G LO   | G (Cont. Sheet)             | INSTALI<br>Mobi | le Dis  |                  |                 |                       |                   | SHEET<br>OF 3 |                   | ETS     |   |
| PROJEC           | T T                                  |        |                             | COORDI          |         |                  | M/DAT           | UM                    | HORIZONTAL        | +             | RTICAI            |         | 1 |
|                  |                                      |        |                             | State PI        | ane     | Alabar           | ma We           | est - U.S. Survey Ft. | NAD83             | М             | LLW               |         |   |
|                  | ON COO                               |        |                             | ELEVAT          |         | OP OF I          | BORING          | 3                     |                   |               |                   |         |   |
| X = ′            | 1,804,28                             | T T    | = 140,796                   | -26.8           | Ft.     |                  |                 |                       | 1                 |               |                   |         | 4 |
| ELEV.            | DEPTH                                | LEGEND | CLASSIFICATION OF MATERIALS | •               | ĸ.      | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>0.5 FT. | N-VALUE | ı |
| -<br>-<br>-      |                                      |        |                             |                 |         |                  |                 | Advanced Boring       |                   |               |                   |         |   |
| -                |                                      |        |                             |                 |         |                  |                 |                       |                   |               | 0                 |         | - |
| -                | -                                    |        |                             |                 | NR      |                  |                 | SPT Sampler           |                   |               | 0                 | 0       |   |
| <u>-</u><br>-    | <u> </u>                             |        |                             |                 |         |                  |                 |                       | _                 |               | 0                 |         |   |
| -<br>-<br>-      | <del> </del><br> -<br> -             |        |                             |                 |         |                  |                 |                       |                   |               |                   |         |   |
| -<br>-<br>-      | †<br>†<br>†                          |        |                             |                 |         |                  |                 | Advanced Boring       |                   |               |                   |         |   |
| -<br>-<br>-      | <del> </del><br> -<br> -             |        |                             |                 |         |                  |                 |                       |                   |               |                   |         |   |
| -<br>-           | <u></u>                              |        |                             |                 |         |                  |                 |                       |                   |               | 0                 |         | _ |
| -<br>-           |                                      |        |                             |                 | NR      |                  |                 | SPT Sampler           |                   |               | 0                 | 0       |   |
| -<br>-<br>-<br>- |                                      |        |                             |                 |         |                  |                 |                       |                   |               |                   |         |   |
| -<br>-<br>-<br>- | <del> </del><br> -<br> -<br> -<br> - |        |                             |                 |         |                  |                 | Advanced Boring       |                   |               |                   |         |   |
| -<br>-           | -                                    |        |                             |                 |         |                  |                 |                       |                   |               |                   |         | _ |
| -                |                                      |        |                             |                 | NR      |                  |                 | SPT Sampler           |                   |               | 0                 | 0       | - |
| SAM F            | ORM '                                | 1836-  | AFTER ▼ DURING ▽ DRILLING ▼ | (Co             | ontinue | ed)              |                 | Boring De             | esignation        | SS-12         |                   | 0       | _ |

| DRI    | LLIN                       | G LC   | DG (Cont. Sheet)   | INSTAL       |         |                  |                 |   |                   | SHEET       |                              | J        |
|--------|----------------------------|--------|--|--------------|---------|------------------|-----------------|---|-------------------|-------------|------------------------------|----------|
|        |                            |        |  | <del>1</del> | ile Dis |                  |                 |   |                   | <b>OF</b> 3 |                              | <u>s</u> |
| PROJEC | ) f                        |        |  | COORD        |         |                  |                 | <b>บM</b><br>est - U.S. Survey Ft.  | NAD83             | 1           | T <b>CAL</b><br>LW           |          |
| OCATI  | ON COO                     | BDINAT | rec  | ELEVAT       |         |                  |                 |   | NADOS             | IVIL        | LVV                          | -        |
|        |                            |        | ' = 140,796  | -26.8        |         | JP UF            | BURING          | •   |                   |             |                              |          |
| ELEV.  | DEPTH                      | Q      | CLASSIFICATION OF MATERIALS  |              | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S     | BLOWS/<br>0.5 FT.<br>N-VALUE |          |
| -      | -                          |        |  |              | NR      |                  |                 | SPT Sampler   |                   |             | 0                            |          |
| -51.3  | 24.5                       |        |  |              |         |                  |                 | Advanced Boring   |                   |             |                              |          |
|        |                            |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |              |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |             |                              |          |
|        | -<br>-<br>-<br>-<br>-<br>- |        |  |              |         |                  |                 |   |                   |             |                              |          |
| -      | -<br>-<br>-                |        |  |              |         |                  |                 |   |                   |             |                              |          |
| -      | -<br>-<br>-                |        |  |              |         |                  |                 |   |                   |             |                              |          |
| -      | -<br>-                     |        |  |              |         |                  |                 |   |                   |             |                              |          |
| -      | -<br>-<br>-<br>-           |        |  |              |         |                  |                 |   |                   |             |                              |          |
| -<br>- | ORM                        |        |  |              |         |                  |                 |   |                   |             |                              |          |

Project I.D. **Boring Designation** MHVBC-21-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.38217045 LONG = -88.02073748 STATE PLANE COORDINATES X = 1,804,303Y = 139,3632020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -49.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 19.0 Feet BOX OF SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD DRILLING REMARKS DEPTH REC. -49.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray At El. -51 Ft. -200= 96%, PL= 36, LL= 60, PI= 24, MC= 117% -53.0 4.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, with traces of wood and shell, inorganic 100 1 Vibracore At El. -56 Ft. -200= 99%, PL= 29, LL= 65, PI= 36, MC= 95% DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

**Boring Designation** 

MHVBC-21-19

Boring Designation MHVBC-21-19

| DRILLING LOG (Cont. Sheet)   | INSTALL   |      |                  |                 |                       |                   | SHEET   |        |         | ] |
|--|-----------|------|------------------|-----------------|-----------------------|-------------------|---------|--------|---------|---|
| PROJECT  | Mobile    |      |                  | M/DATI          | IM                    | HORIZONTAL        | OF 2    | SHE    |         | - |
|  |           |      |                  |                 | est - U.S. Survey Ft. |                   |         | LLW    |         |   |
| LOCATION COORDINATES   | ELEVATION |      | P OF             | BORING          | •                     |                   |         |        |         | 1 |
| X = 1,804,303 Y = 139,363  | -49.0     | Ft.  |                  |                 |                       |                   |         |        |         | 4 |
| ELEV. DEPTH CLASSIFICATION OF MATERIALS  | 5         | REC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/ | N-VALUE |   |
| -65.0 16.0 (CL) CLAY, lean, low plasticity, soft consistency, wet, dark gray, with san                     |           | 100  | 1                |                 | Vibracore             |                   |         |        |         |   |
| NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | 1         |      |                  |                 |                       |                   |         |        |         |   |

Project I.D. Boring Designation SS-129

| DRI                | LLIN               | G LO    | G         | DIVIS           | SION           | l Sou                     | ıth Atlantic | IN      | IST#             | \LL#            | ATION          | Mobile         | District  |                 | SHEET<br>OF 3    |                   | ETS     |         |
|--------------------|--------------------|---------|-----------|-----------------|----------------|---------------------------|--------------|---------|------------------|-----------------|----------------|----------------|-----------|-----------------|------------------|-------------------|---------|---------|
| PROJ               | ECT                |         |           |                 |                |                           |              | LAT     | LONG             | COORI           | DINATES L      | AT = 30.3      | 80466     |                 |                  |                   |         |         |
| 19                 | 63-196             | 4 Subs  | surface   | Investi         | igatior        | n                         |              | STA     | TE PLA           | NE CO           | ORDINATES      | X = 1,8        | 04,577    | Y = 13          | 38,742           |                   |         |         |
|                    | OF BOI             |         |           |                 | STAR           |                           | COMPLETED    |         |                  |                 | STEM/DATUM     |                | nyoy Et   | HORIZ<br>NAD8   |                  | <i>VER</i><br>MLL |         |         |
| DPILI              | LING AG            | ENCY    |           | Corpo           | of Engli       | neers - C                 | YEQAM        |         |                  | ATION           | bama West      | TOP OF BO      |           |                 | OUND W           |                   |         | l       |
|                    |                    |         | .D INSPEC |                 | JI Eligii      |                           | E OF DRILLER |         |                  |                 | 'S DESIGNAT    | -27.8 Fe       |           |                 | nderwa           |                   |         | ļ       |
| I TAME             |                    | I/A, Ge |           |                 |                | NAM                       | N/A          | N/      |                  |                 | O DEGICAL      |                |           |                 | D HAMN<br>UAL HA |                   | ER      |         |
|                    | TION OF<br>VERTICA |         | INCLINE   | D               | DEG. F<br>VERT | ROM<br>ICAL               | BEARING      | SIZE    | E AND            | TYPE O          | )F BIT         | See Re         | marks     |                 |                  |                   |         |         |
| тніск              | NESS OF            | OVERB   | URDEN     | l               | N/A            |                           |              | тот     | AL NU            | MBER (          | CORE BOXES     | <b>s</b> 0     |           |                 |                  |                   |         |         |
| DEPTH              | і то тор           | OF ROC  | к         | - 1             | N/A            |                           |              | тот     | AL SAI           | MPLES           | DISTU          | <b>RBED</b> () | UNE       | DISTURB         | ED (UD)          | ) (               | )       |         |
| TOTAL              | DEPTH              | OF BORI | ING       | 2               | 23.5 Fe        | eet                       |              | тот     |                  | COVER           | Y FOR BORI     | NG Not         | Recorde   | ed              |                  |                   |         |         |
| ELEV.              | DEPTH              | LEGEND  | c         | CLASSIF         | ICATIO         | N OF MA                   | TERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANC<br>METI | EMENT<br>HOD   | DR<br>REI | ILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |         |
| 07.0               | 0.0                |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         |         |
| <u>-27.8</u>       | 0.0                |         | (CH) C    | LAY, fa         | at, high       | n plasticit               | y, very soft |         |                  |                 |                |                |           |                 |                  |                   |         | -0<br>- |
| -                  |                    |         | consiste  | ency, w         | et, gra        | ıy, orgar                 | nic          |         |                  |                 |                |                |           |                 |                  |                   |         | -       |
| _                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | -<br>1  |
|                    |                    |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | L       |
| -                  |                    |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | -       |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 | Advance        | d Boring       |           |                 |                  |                   |         | -2<br>- |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                | ·              |           |                 |                  |                   |         | Ŀ       |
| _                  | [                  |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | -3      |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | ļ       |
| -                  | -                  |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | ١,      |
|                    | -                  |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | ⊢4<br>- |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  | 0                 |         | ţ       |
| -                  | _                  |         |           |                 |                |                           |              | ,,,,    |                  |                 | ODT O          |                |           |                 |                  |                   |         | -5      |
|                    | [                  |         |           |                 |                |                           |              | NR      |                  |                 | SPT Sa         | ampier         |           |                 | -                | 0                 | 0       | Ē       |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  | 0                 |         | -<br>-6 |
| -                  | }                  |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | FĞ      |
|                    | Ī                  |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | Ė       |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | -7<br>- |
| -                  |                    |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | ŀ       |
| _                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 | Advance        | d Boring       |           |                 |                  |                   |         | -<br>-8 |
| -                  | ł                  |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | E       |
| ] -                | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | F       |
| -                  | <u> </u>           |         |           |                 |                |                           |              |         |                  |                 |                |                |           |                 |                  |                   |         | -9<br>- |
|                    | <u> </u>           |         |           |                 |                |                           |              | ND.     |                  |                 | CDT C          | mpler          |           |                 | -                |                   |         | ŀ       |
| SAME               | OBM 4              | 1936    | A F 7     | TED T           | - 5'           | IDINIO F                  | 7   :-       | NR      |                  |                 | SPT Sa         |                |           |                 |                  | 0                 |         | $L_1$   |
| SAIVI F<br>AUG 201 | ORM 1              | 1036    | DRI       | TER L<br>ILLING | D DE           | JRING <u>T</u><br>RILLING | <u>Z</u> (C  | ontinue | ed)              |                 | Bo             | oring Des      | signatio  | on S            | S-129            | )                 |         |         |

| State Plane - Alabama West - U.S. Survey Ft.   NAD83   |                       |   |        |                             | LINGTALI | ATION   |                  |                 | oring Designation     | ,,,,              | SHEE       | <b>T</b> 2        |         | 7 |
|--|-----------------------|---|--------|-----------------------------|----------|---------|------------------|-----------------|-----------------------|-------------------|------------|-------------------|---------|---|
| COORDINATE SYSTEMIDATUM State Plane - Alabama West - U.S. Survey Pt.  LOCATION COORDINATES X = 1,804,577 Y = 138,742  ELEV. DEPTH  | DR                    | ILLIN   | G LC   | OG (Cont. Sheet)            |          |         |                  |                 |                       |                   | OF 3       |                   | ETS     | , |
| CLASSIFICATION OF MATERIALS  | ROJE                  | СТ  |        |                             |          |         |                  | M/DAT           | UM                    | HORIZONTAL        | L VERTICAL |                   |         | 1 |
| X = 1.804,577 Y = 138,742  CLASSIFICATION OF MATERIALS  REC. SS NO ADVANCEMENT REM  NR SPT Sampler  NR SPT Sampler  Advanced Boring  Advanced Boring                         |                       |   |        |                             | State Pl | ane - A | Alabar           | na We           | est - U.S. Survey Ft. | NAD83             | M          | ILLW              |         |   |
| RELEV. DEPTH DEPTH DEPTH CLASSIFICATION OF MATERIALS REC. SET SAMPLER  NR SPT Sampler  NR SPT Sampler  NR Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring |                       |   |        |                             |          |         | P OF I           | BORING          | G                     |                   |            |                   |         |   |
| NR SPT Sampler  Advanced Boring  NR SPT Sampler  Advanced Boring   | X =                   | 1,804,57<br>T   |        | = 138,742                   | -27.8    | Ft.     |                  |                 |                       | 1                 |            |                   |         | _ |
| Advanced Boring  NR SPT Sampler  Advanced Boring   | LEV.                  | DEPTH   | LEGEND | CLASSIFICATION OF MATERIALS |          | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S    | BLOWS/<br>0.5 FT. | N-VALUE |   |
| NR SPT Sampler  Advanced Boring  |                       |   |        |                             |          | NR      |                  |                 | SPT Sampler           |                   |            | 0                 | 0       |   |
| Advanced Boring  | -                     |   |        |                             |          |         |                  |                 |                       |                   |            | 0                 |         | ı |
| NR SPT Sampler   | -                     |   |        |                             |          | NR      |                  |                 |                       |                   |            | 0                 | 0       | _ |
|  | -<br>-<br>-<br>-<br>- | †<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        |                             |          | NR      |                  |                 | SPT Sampler           | -                 |            | 0 0               | 0       |   |
| Advanced Boring 51.3 23.5  | 51.3                  | 23.5  |        |                             |          |         |                  |                 | Advanced Boring       |                   |            |                   |         |   |

| DRI    | II I INA | G I (    | OG (Cont. Sheet)   |       |      |         |                 |  |                   |        |                   |        |
|--------|----------|----------|--|-------|------|---------|-----------------|--|-------------------|--------|-------------------|--------|
|        |          | <u> </u> |  | _     |      |         |                 |  |                   |        |                   |        |
| PROJEC | CT .     |          |  | 1     |      | 8 S     | -               |  |                   |        |                   |        |
|        |          |          |  | _     |      |         |                 |  | NAD83             | IVIL   | LVV               |        |
|        | ON COOR  |          | = 138,742  | -27.8 |      | )P OF I | BORING          | •  |                   |        |                   |        |
| ELEV.  | DEPTH    | LEGEND   | CLASSIFICATION OF MATERIALS  |       | RÉC. | SOX OR  | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>S | 3LOWS/<br>0.5 FT. | -VALUE |
|        |          |          | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |       | RÉC. | BOX     | OR UD           | 140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). | esignation        | SS-129 |                   | N-VAI  |

Project I.D. **Boring Designation** MHVBC-20-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.37679681 LONG = -88.02108899 STATE PLANE COORDINATES X = 1,804,183Y = 137,4092020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -48.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 18.0 Feet BOX OF SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD DRILLING REMARKS DEPTH REC. -48.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray At El. -52 Ft. -200= 94%, PL= 35, LL= 55, PI= 20, MC= 152% 100 1 Vibracore At El. -54.0 Ft., high plasticity, soft consistency, wet, dark gray At El. -55 Ft. -200= 97%, PL= 32, LL= 60, PI= 28, MC= 113% DRILLING ∑ DRILLING ב

(Continued)

**Boring Designation** 

MHVBC-20-19

**SAM FORM 1836** 

**AUG 2017** 

DRILLING -

Boring Designation MHVBC-20-19

| DRI              | ILLIN                  | G LC      | OG (Cont. Sheet)  | INSTAL |         |                  |                 | oning Designation     |                   | SHEET   | Γ 2    |         | ] |
|------------------|------------------------|-----------|---|--------|---------|------------------|-----------------|-----------------------|-------------------|---------|--------|---------|---|
| PROJEC           |                        |           | (   | COORDI | le Dist |                  | M/DAT           | IIM I                 | HORIZONTAL        | OF 2    | SHE    |         | 1 |
| . NOJEU          |                        |           |   | 1      |         |                  |                 | est - U.S. Survey Ft. | NAD83             |         | LLW    | •       |   |
| LOCATION         | ON COOF                | RDINAT    | ES  | ELEVAT |         |                  |                 |                       |                   |         |        |         | 1 |
| X = 1            | 1,804,18               |           | = 137,409   | -48.0  | Ft.     |                  |                 |                       | _                 |         |        |         | 4 |
| ELEV.            | DEPTH                  | LEGEND    | CLASSIFICATION OF MATERIALS   |        | ĸč.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/ | N-VALUE |   |
| -64.0            | 16.0                   |           | (SC) SAND, clayey, soft consistency, dark gray  | wet,   | 100     | 1                |                 | Vibracore             |                   |         |        | 2       |   |
| -66.0<br>-       | 18.0                   |           | NOTES:  |        |         |                  |                 |                       |                   |         |        |         |   |
| -                | <u>-</u><br>-          |           | Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 |                       |                   |         |        |         |   |
| -                | -<br>-<br>-            |           |   |        |         |                  |                 |                       |                   |         |        |         |   |
| -                | <del>-</del><br>-<br>- |           |   |        |         |                  |                 |                       |                   |         |        |         |   |
| -<br>-<br>-<br>- | -                      |           |   |        |         |                  |                 |                       |                   |         |        |         |   |
| AM F<br>JG 2017  | EORM 1                 | <br> 836- | A AFTER ▼ DURING ▽ DRILLING ▼   |        |         |                  |                 | Borina De             | l<br>esignation   | MHV     | 3C-2   | 0-1     | ļ |

Project I.D. Boring Designation SS-131

| DRI              | LLIN               | G LO    | G D          | OIVISIO      | N So             | uth Atlantic  | II      | IST/             | ALL/            | ATION Mobile                           | District | · I              | HEET 1<br>OF 3 SI | 1EETS      | 3            |
|------------------|--------------------|---------|--------------|--------------|------------------|---------------|---------|------------------|-----------------|--|----------|------------------|-------------------|------------|--------------|
| PROJ             | ECT                |         | <u> </u>     |              |                  |               | LAT     | /LONG            | COOR            | DINATES LAT = 30.                      | 375196   |                  |                   |            | 1            |
| 19               | 63-196             | 4 Subs  | surface I    | nvestigati   | on               |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1,                      | 803,774  | Y = 13           | 6,829             |            |              |
| DATE             | OF BOI             | RING    |              | STA          | ARTED            | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | ırvev Ft | HORIZ<br>NAD8    |                   | ERT.<br>LW |              |
| DRILI            | ING AG             | ENCY    | C            | Corps of En  | aineers - (      | CESAM         |         |                  | ATIO            | NS TOP OF BO                           | DRING    | GRO              | UND WAT           | TER        | 1            |
|                  |                    |         | D INSPECT    |              |                  | IE OF DRILLER |         |                  |                 | -25.8 F                                |          |                  | nderwate<br>HAMME |            | -            |
|                  |                    | I/A, Ge |              |              |                  | N/A           | N.      | /A               |                 |  | į        |                  | JAL HAM           |            | 1            |
|                  | TION OF<br>VERTICA |         | INCLINED     | DEG<br>VEF   | . FROM<br>RTICAL | BEARING       | SIZI    | E AND            | TYPE C          | OF BIT See R                           | emarks   |                  |                   |            |              |
| тніск            | NESS OF            | OVERB   | URDEN        | N/A          |                  |               | тот     | AL NU            | MBER            | CORE BOXES (                           | )        |                  |                   |            |              |
| DEPTH            | то тор             | OF ROC  | K            | N/A          |                  |               | тот     | AL SAI           | MPLES           | DISTURBED (                            | UNI      | DISTURBE         | ED (UD)           | 0          |              |
| TOTAL            | . DEPTH            |         | NG           | 25.5         | Feet             |               | тот     |                  | COVER           | Y FOR BORING No                        | t Record | ed               |                   | T          | 4            |
| ELEV.            | DEPTH              | LEGEND  | C            | LASSIFICAT   | ION OF MA        | ATERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DF<br>RE | RILLING<br>MARKS | BLOWS/            | U.S FI.    |              |
| -25.8            | 0.0                |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            |              |
| -23.0            | - 0.0              |         | (CH) CL      | _AY, fat, hi | gh plastici      | ty, very soft |         |                  |                 |  |          |                  |                   |            | -0           |
| -                | _                  |         | consiste     | ncy, wet, g  | ray, orga        | nic           |         |                  |                 |  |          |                  |                   |            | ŀ            |
| _                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | -1           |
| -                | <u> </u>           |         |              |              |                  |               |         |                  |                 | Advanced Boring                        |          |                  |                   |            | ţ            |
| -                | _                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | }            |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | -2<br>-      |
| -                | _                  |         |              |              |                  |               |         |                  |                 |  | 1        |                  | 0                 |            | †            |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  | -                 |            | -3           |
| -                | -                  |         |              |              |                  |               | NR      |                  |                 | SPT Sampler                            |          |                  | 0                 | 0          | F            |
| -                | _                  |         |              |              |                  |               |         |                  |                 |  |          |                  | 0                 |            | <u> </u>     |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | }            |
|                  | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | ļ            |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | -5<br>-      |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | $\mathbf{I}$ |
| -                | -                  |         |              |              |                  |               |         |                  |                 | Advanced Boring                        |          |                  |                   |            | -6           |
| -                | _                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | ţ            |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | <b>-</b>     |
| -                | -                  |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | F-7          |
| ] :              | ţ                  |         |              |              |                  |               |         |                  | 1               |  | 1        |                  |                   |            | †            |
| -                | -                  |         |              |              |                  |               |         |                  |                 | 0.55                                   |          |                  |                   |            | -8           |
| ] .              | -                  |         |              |              |                  |               | NR      |                  |                 | SPT Sampler                            |          |                  | 0                 | 0          | ļ            |
| -                | <u> </u>           |         |              |              |                  |               |         |                  |                 |  |          |                  | 0                 |            | <u> </u> -9  |
| -                | ļ <sup>.</sup>     |         |              |              |                  |               |         |                  |                 |  |          |                  |                   |            | F            |
| ] :              | <u> </u>           |         |              |              |                  |               |         |                  |                 | Advanced Boring                        |          |                  |                   |            | -            |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AFTE<br>DRIL | ER ¥ L       | DURING '         | <u> </u>      | ontinue | ed)              | <u> </u>        | Boring De                              | signatio | on S             | S-131             |            | <b></b> _1   |

|                                 |  |          |                             | INSTALLATI | ON     |                 | oring Designation     |                   | S-131 SHEET 2           |         |
|---------------------------------|--|----------|-----------------------------|------------|--------|-----------------|-----------------------|-------------------|-------------------------|---------|
| DR                              | ILLIN  | G LOC    | G (Cont. Sheet)             | Mobile D   |        |                 |                       |                   | OF 3 SH                 | EETS    |
| ROJE                            | ст   |          |                             | COORDINAT  |        |                 |                       | HORIZONTAL        | VERTICA                 |         |
|                                 |  |          |                             |            |        |                 | est - U.S. Survey Ft. | NAD83             | MLLW                    |         |
|                                 |  | RDINATES |                             | ELEVATION  | тор оғ | BORIN           | G                     |                   |                         |         |
| X =                             | 1,803,77<br><b>1</b>   | 74 Y=    | 136,829                     | -25.8 Ft.  |        | 1               | <u> </u>              | <u> </u>          |                         | ш       |
| ELEV.                           | DEPTH  | LEGEND   | CLASSIFICATION OF MATERIALS | S REG      | BOX OR | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | SD<br>BLOWS/<br>0.5 FT. | N-VALUE |
| -<br>-<br>-<br>-<br>-           | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-  |          |                             |            |        |                 | Advanced Boring       |                   |                         |         |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>-<br>-  |          |                             | NF         | 2      |                 | SPT Sampler           |                   | 0 0                     | 0       |
| -<br>-<br>-<br>-<br>-<br>-      | †<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |          |                             |            |        |                 | Advanced Boring       |                   |                         |         |
| -<br>-<br>-<br>-                | <br> -<br> -<br> -<br> -<br> -   |          |                             | NF         | R      |                 | SPT Sampler           |                   | 0 0                     | 0       |
| -<br>-<br>-<br>-<br>-<br>-<br>- |  |          |                             |            |        |                 | Advanced Boring       |                   |                         |         |
| -<br>-<br>-                     | †<br> <br> -<br> -   |          |                             | NF         | 1      |                 | SPT Sampler           |                   | 0                       | 0       |

| DR               | ILLIN                          | G LC   | DG (Cont. Sheet)   | INSTAL | <b>LATION</b><br>ile Dis |                  |                 |   |                   | SHEET<br>OF 3 |                              |   |
|------------------|--------------------------------|--------|--|--------|--------------------------|------------------|-----------------|---|-------------------|---------------|------------------------------|---|
| PROJEC           |                                |        |  | COORD  |                          |                  | M/DAT           | ш   | HORIZONTAL        | VERT          |                              | 긤 |
| JEC              | - •                            |        |  | 1      |                          |                  |                 | ом<br>est - U.S. Survey Ft.   | NAD83             | MLI           |                              |   |
| LOCATI           | ON COOL                        | RDINAT | res  | ELEVAT |                          |                  |                 |   |                   |               |                              | ٦ |
|                  |                                |        | ′ = 136,829  | -25.8  |                          |                  |                 |   |                   |               |                              |   |
| ELEV.            | DEPTH                          | LEGEND | CLASSIFICATION OF MATERIALS  |        | REC.                     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>0.5 FT.<br>N-VALUE |   |
| -                |                                |        |  |        | NR                       |                  |                 | SPT Sampler   |                   |               | 0                            | 1 |
| -<br>-<br>-      | <u> </u>                       |        |  |        |                          |                  |                 | Advanced Boring   |                   |               |                              | - |
| -51.3            | 25.5                           |        |  |        |                          |                  |                 |   |                   |               |                              | ŀ |
| -<br>-<br>-<br>- | -<br>-<br>-<br>-               |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |                          |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |               |                              |   |
| -<br>-<br>-<br>- | †<br>†<br>†<br>†               |        |  |        |                          |                  |                 |   |                   |               |                              | - |
| -<br>-<br>-<br>- | <del> </del><br> -<br> -<br> - |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -<br>-<br>-<br>- |                                |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -<br>-<br>-      | <del>-</del><br>-<br>-         |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -                | †<br> <br> -<br>               |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -<br>-<br>-      | †<br>†<br>†                    |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -<br>-<br>-      |                                |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -<br>-<br>-      |                                |        |  |        |                          |                  |                 |   |                   |               |                              |   |
| -<br>-<br>-      | <br> -<br> -                   |        |  |        |                          |                  |                 |   |                   |               |                              |   |
|                  | <u> </u><br>ORM 1<br>7         | 1026   | AFTER ▼ DURING ∇ DRILLING DRILLING   |        |                          |                  | <u> </u>        | <u> </u>  | l<br>esignation   | SS-131        |                              | ┙ |

Project I.D. **Boring Designation** MHVBC-19-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.37144584 LONG = -88.02225243 STATE PLANE COORDINATES X = 1,803,807Y = 135,4652020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -47.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 19.0 Feet BLOWS/ BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -47.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray, 100 1 Vibracore At El. -54 Ft. -200= 95%, PL= 36, LL= 57, PI= 21, MC= 130% DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

Boring Designation

MHVBC-19-19

Boring Designation MHVBC-19-19

|                                  | G (Cont. Sheet)   | INSTALLA   |      |                  |                 |                       |                   | SHEET  |                 |         |   |
|----------------------------------|---|------------|------|------------------|-----------------|-----------------------|-------------------|--------|-----------------|---------|---|
|                                  | (Controllect)   | Mobile     |      |                  |                 |                       |                   | OF 2   |                 |         | 4 |
| PROJECT                          |   | State Plan |      |                  |                 | est - U.S. Survey Ft. | NAD83             | I      | TICAL<br>LLW    | •       |   |
| OCATION COORDINAT                | ES  | ELEVATIO   |      |                  |                 |                       | 1471200           |        |                 |         | 1 |
| X = 1,803,807 Y                  |   | -47.0 F    |      |                  |                 |                       |                   |        |                 |         |   |
| ELEV. DEPTH                      | CLASSIFICATION OF MATERIALS   | F          | «EC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>1 FT. | N-VALUE |   |
| -62.0 15.0 -63.0 16.0 -66.0 19.0 | (CL) CLAY, lean, low plasticity, soft consistency, wet, dark gray, inorgain (SC) SAND, clayey, soft consistency, dark gray, inorganic  At El64.5 Ft. with shell |            | 100  | 1                |                 | Vibracore             |                   |        |                 |         |   |
|                                  | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.  |            |      |                  |                 |                       |                   |        |                 |         |   |

Project I.D. Boring Designation SS-133

| DRI              | LLIN               | G LO    | G E          | DIVISIO      | N So            | uth Atlantic  | II      | IST/             | ALL/            | ATION Mobile                           | District  |                  | HEET 1<br>F 2 SH  | IEETS   |              |
|------------------|--------------------|---------|--------------|--------------|-----------------|---------------|---------|------------------|-----------------|--|-----------|------------------|-------------------|---------|--------------|
| PROJ             | ECT                |         |              |              |                 |               | LAT     | /LONG            | COOR            | DINATES LAT = 30.                      | 369648    |                  |                   |         | 1            |
| 19               | 63-196             | 4 Subs  | surface I    | Investigat   | ion             |               | STA     | TE PLA           | ANE CO          | <b>DORDINATES</b> $X = 1$ ,            | 803,790   | Y = 13           | 4,811             |         |              |
| DATE             | OF BOI             | RING    |              | ST           | ARTED           | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | irvev Ft  | HORIZ<br>NAD83   |                   | RT.     |              |
| DRILI            | LING AG            | ENCY    |              | Corps of Er  | aineers -       | CESAM         |         |                  | ATIOI           | NS TOP OF B                            | ORING     | GRO              | UND WAT           | ER      | 1            |
|                  |                    |         | D INSPEC     |              | <del>_</del>    | IE OF DRILLER |         |                  |                 | -35.0 F                                |           |                  | nderwate<br>HAMME |         | -            |
|                  |                    | I/A, Ge |              |              |                 | N/A           | N.      | /A               |                 |  | į         |                  | JAL HAMI          |         | ↓            |
|                  | TION OF<br>VERTICA |         | INCLINED     | DEC          | FROM<br>RTICAL  | BEARING       | SIZI    | E AND            | TYPE C          | OF BIT See R                           | emarks    |                  |                   |         |              |
| тніск            | NESS OF            | OVERB   | URDEN        | N/A          |                 |               | тот     | AL NU            | MBER            | CORE BOXES                             | )         |                  |                   |         |              |
| DEPTH            | і то тор           | OF ROC  | K            | N/A          |                 |               | тот     | AL SA            | MPLES           | DISTURBED (                            | UNI       | DISTURBE         | ED (UD)           | 0       |              |
| TOTAL            | DEPTH              |         | NG           | 16.3         | Feet            |               | тот     |                  | COVER           | Y FOR BORING No                        | ot Record | ed               |                   | I       | -            |
| ELEV.            | DEPTH              | LEGEND  | С            | LASSIFICAT   | TION OF MA      | ATERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DF<br>RE  | RILLING<br>MARKS | BLOWS/            | N-VALUE |              |
| -35.0            | 0.0                |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | 1            |
| -33.0            | 0.0                |         | (CH) CI      | LAY, fat, hi | gh plastici     | ty, very soft |         |                  |                 |  | 1         |                  |                   |         | -0           |
| -                |                    |         | consiste     | ency, wet, g | gray, orga      | nic           |         |                  |                 |  |           |                  |                   |         | ŀ            |
| -                | Į.                 |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | -1           |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 | Advanced Boring                        |           |                  |                   |         | L            |
| -                |                    |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | -            |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | -2           |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 |  | 1         |                  | 0                 |         | t            |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | -3           |
|                  | <u> </u>           |         |              |              |                 |               | NR      |                  |                 | SPT Sampler                            |           |                  | 0                 | 0       | ļ            |
| -                | L                  |         |              |              |                 |               |         |                  |                 |  |           |                  | 0                 |         | <u> </u>     |
|                  | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | "            |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | ļ            |
| -                | _                  |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | -5           |
|                  | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | F            |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 | Advanced Boring                        |           |                  |                   |         | -6           |
| -                | _                  |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | Ł            |
| ] .              | Ī                  |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | F            |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  |                   |         | <b>−</b> 7   |
| -                | <u> </u>           |         |              |              |                 |               |         |                  | -               |  | 1         |                  |                   |         | t            |
| -                | <u> </u>           |         |              |              |                 |               |         |                  |                 |  |           |                  | 0                 | -       | -8           |
| ] :              | <u> </u>           |         |              |              |                 |               | NR      |                  |                 | SPT Sampler                            |           |                  | 0                 | 0       | ţ            |
|                  | L                  |         |              |              |                 |               |         |                  |                 |  |           |                  | 0                 |         | <u> </u>     |
| ] -              | F                  |         |              |              |                 |               |         |                  | 1               |  | 1         |                  |                   |         | <del> </del> |
| ] :              | <u> </u>           |         |              |              |                 |               |         |                  |                 | Advanced Boring                        |           |                  |                   |         | ļ            |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AFTI<br>DRIL | ER <u>V</u>  | DURING DRILLING | <u> </u>      | ontinue | ed)              | <u> </u>        | Boring De                              | signatio  | on S             | S-133             |         | <b>-</b> 1   |

| DR                         | ILLIN                    | G LC      | OG (Cont. Sheet)   | INSTAL |         |                  |                 | oning Designation   |                   | SHEE.   |                   | ETA     | ]                |
|----------------------------|--------------------------|-----------|--|--------|---------|------------------|-----------------|---|-------------------|---------|-------------------|---------|------------------|
| PROJEC                     |                          |           | ,  | COORD  | ILE DIS |                  | M/DAT           | IM  | HORIZONTAL        | OF 2    | SHE               |         | 1                |
| PROJEC                     | ••                       |           |  |        |         |                  |                 | est - U.S. Survey Ft.   | NAD83             | 1       | LLW               | •       |                  |
| LOCATI                     | ON COO                   | RDINAT    | ES   | ELEVAT |         |                  |                 |   |                   |         |                   |         | 1                |
| X = '                      | 1,803,79                 | 90 Y      | = 134,811  | -35.0  | Ft.     |                  |                 |   |                   |         |                   |         |                  |
| ELEV.                      | DEPTH                    | LEGEND    | CLASSIFICATION OF MATERIALS  |        | ĸ.      | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE |                  |
| -<br>-<br>-<br>-<br>-      | -                        |           |  |        |         |                  |                 | Advanced Boring   |                   |         |                   |         |                  |
| -<br>-<br>-<br>-           |                          |           |  |        | NR      |                  |                 | SPT Sampler   |                   |         | 0 0               | 0       | -<br>-<br>-<br>- |
| -<br>-<br>-<br>-<br>-51.3. | 16.3                     |           |  |        |         |                  |                 | Advanced Boring   |                   |         |                   |         |                  |
| -01.0.<br>-<br>-<br>-<br>- | - 10.3<br>-<br>-<br>-    |           | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         |                  |
| -<br>-<br>-<br>-           | †<br>†<br>†              |           |  |        |         |                  |                 |   |                   |         |                   |         |                  |
| -<br>-<br>-<br>-           | -<br>-<br>-<br>-         |           |  |        |         |                  |                 |   |                   |         |                   |         | -                |
| -<br>-<br>-                | †<br> -<br> -<br> -      |           |  |        |         |                  |                 |   |                   |         |                   |         |                  |
| -<br>-<br>-<br>-           | <br> -<br> -<br> -<br> - |           |  |        |         |                  |                 |   |                   |         |                   |         |                  |
| AM F                       | ORM 1                    | <br>1836- | A AFTER ▼ DURING ▽ DRILLING □  |        |         |                  |                 | Borina De   | esignation        | SS-1:   | 33                |         | J                |

Project I.D. **Boring Designation** MHVBC-18-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.36604189 LONG = -88.02261343 STATE PLANE COORDINATES X = 1,803,684Y = 133,5002020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -50.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 16.5 Feet BOX OF SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -50.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray At El. -52 Ft. -200= 98%, PL=46, LL= 64, PI= 18, MC= 143% -54.0 4.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, with sand and shell and traces of wood, inorganic 100 1 Vibracore At El. -56 Ft. -200= 79%, PL= 30, LL= 56, PI= 26, MC= 83% DRILLING ∑ DRILLING ב

(Continued)

MHVBC-18-19

**Boring Designation** 

**SAM FORM 1836** 

**AUG 2017** 

DRILLING -

Boring Designation MHVBC-18-19

| DR                             | ILLIN                                | GIC    | OG (Cont. Sheet)   | INSTALL   |      |                  |                 |                                    |                   | SHEET  |                 |         |   |
|--------------------------------|--------------------------------------|--------|--|-----------|------|------------------|-----------------|------------------------------------|-------------------|--------|-----------------|---------|---|
|                                |                                      |        | - (  | Mobil     |      |                  |                 |                                    |                   | OF 2   |                 |         | - |
| PROJEC                         | · I                                  |        |  | State Pla |      |                  |                 | <b>um</b><br>est - U.S. Survey Ft. | NAD83             | l      | RTICAL<br>LLW   | •       | 1 |
| OCATI                          | ON COOL                              | RDINAT |  | ELEVATI   |      |                  |                 |                                    | NADOS             | 101    |                 |         | 1 |
|                                | 1,803,68                             |        | = 133,500  | -50.0     |      | . <b>J</b> F     |                 | -                                  |                   |        |                 |         |   |
| ELEV.                          | DEPTH                                | LEGEND | CLASSIFICATION OF MATERIALS  |           | REC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD              | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>1 FT. | N-VALUE |   |
| -<br>-<br>-<br>-<br>-          | -                                    |        | (CL) CLAY, lean, low plasticity, soft consistency, wet, dark gray  |           |      |                  |                 |                                    |                   |        |                 |         |   |
| <u>-62.0</u><br>-<br>-<br>-    | 12.0                                 |        | (SC-SM) SAND, silty, clayey, soft consistency, wet, dark gray  |           | 100  | 1                |                 | Vibracore                          |                   |        |                 |         |   |
| -<br>-<br>-<br>-<br>-          | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        | At El65.0 Ft. shelly   |           |      |                  |                 |                                    |                   |        |                 |         |   |
| -66.5<br>-<br>-<br>-<br>-<br>- | 16.5                                 |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |           |      |                  |                 |                                    | _                 |        |                 |         |   |
| -<br>-<br>-<br>-<br>-          | -<br>-<br>-<br>-<br>-                |        |  |           |      |                  |                 |                                    |                   |        |                 |         |   |
| -<br>-<br>-<br>-<br>-          | -<br> -<br> -<br> -<br> -            |        |  |           |      |                  |                 |                                    |                   |        |                 |         |   |
| -<br>-<br>-<br>-<br>-          |                                      |        |  |           |      |                  |                 |                                    |                   |        |                 |         |   |
| -                              | <del> </del><br>ORM 1<br>7           |        | A AFTER ▼ DURING ▽ DRILLING  |           |      |                  |                 |                                    |                   |        |                 |         | ŀ |

Project I.D. Boring Designation **SS-135** 

| DRI              | LLIN               | G LO    | G          | DIVIS      | SION           | Sou         | uth Atlantic | IN      | IST <i>A</i>     | \LL#            | ATION                          | Mobile       | District |                 | SHEET<br>OF 3    |                   | ETS     |             |
|------------------|--------------------|---------|------------|------------|----------------|-------------|--------------|---------|------------------|-----------------|--------------------------------|--------------|----------|-----------------|------------------|-------------------|---------|-------------|
| PROJ             | ECT                |         | '          |            |                |             |              | LAT     | LONG             | COORI           | DINATES _                      | AT = 30.3    | 64097    |                 |                  |                   |         |             |
| 19               | 63-196             | 4 Subs  | surface    | Investi    | igatior        | า           |              | STA     | TE PLA           | NE CO           | ORDINATES                      | X = 1,8      | 03,806   | Y = 1:          | 32,792           |                   |         |             |
|                  | OF BOI             |         |            |            | STAR           |             | COMPLETED    |         |                  |                 | <b>STEM/DATUN</b><br>bama West |              | rvev Et  | HORI<br>NAD     |                  | <i>VER</i><br>MLL |         |             |
| DRILI            | ING AG             | ENCY    |            | Corps o    | of Fnai        | neers - (   | CESAM        |         |                  | ATION           |                                | TOP OF BO    | RING     | GRO             | DUND W           | ATE               |         | 1           |
|                  |                    |         | D INSPEC   |            | , Liigii       |             | E OF DRILLER |         |                  |                 | 'S DESIGNAT                    | -22.8 Fe     |          |                 | Inderwa          |                   |         | 1           |
|                  |                    | I/A, Ge |            |            |                |             | N/A          | N       |                  |                 |                                |              | Ė        |                 | O HAMN<br>UAL HA |                   | ER      |             |
|                  | TION OF<br>VERTICA |         | INCLINE    | D          | DEG. F<br>VERT | ROM<br>ICAL | BEARING      | SIZE    | AND 1            | TYPE O          | )F BIT                         | See Re       | emarks   |                 |                  |                   |         |             |
| тніск            | NESS OF            | OVERB   | URDEN      | 1          | N/A            |             |              | тот     | AL NU            | MBER (          | CORE BOXES                     | 0            |          |                 |                  |                   |         |             |
| DEPTH            | то тор             | OF ROC  | ĸ          | 1          | N/A            |             |              | тот     | AL SAI           | MPLES           | DISTU                          | RBED ()      | UNI      | DISTURE         | BED (UD          | ) (               | 0       |             |
| TOTAL            | DEPTH              |         | ING        | 2          | 28.5 Fe        | eet         |              | тот     |                  | COVER           | Y FOR BORII                    | NG No        | t Record | ed              |                  |                   |         |             |
| ELEV.            | DEPTH              | LEGEND  | •          | CLASSIF    | ICATIO         | N OF MA     | TERIALS      | RÉC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANC<br>METH                 | EMENT<br>IOD | DR<br>RE | ILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |             |
| 20.0             | 0.0                |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         |             |
| <u>-22.8</u>     | 0.0                |         |            |            |                |             | y, very soft |         |                  |                 |                                |              |          |                 |                  |                   |         | -0          |
| -                | -                  |         | consist    | ency, w    | et, gra        | y, orgar    | nic          |         |                  |                 |                                |              |          |                 |                  |                   |         | ŀ           |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -1          |
|                  | _                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | Ŀ           |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -           |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -2<br>-     |
| -                | _                  |         |            |            |                |             |              |         |                  |                 | Advanced                       | d Boring     |          |                 |                  |                   |         | L           |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -3          |
|                  | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | ļ           |
| -                | _                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -<br>-4     |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         |             |
|                  | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | ļ           |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 | F                | 0                 |         | -5          |
|                  | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 | -                |                   |         | -           |
| -                | _                  |         |            |            |                |             |              | NR      |                  |                 | SPT Sa                         | ampler       |          |                 |                  | 0                 | 0       | -6          |
|                  | _                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  | 0                 |         | Ŀ           |
| ] -              | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | ŀ           |
| -                | <u> </u>           |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -7<br>-     |
|                  | <u> </u>           |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | E           |
| -                | -                  |         |            |            |                |             |              |         |                  |                 | Advance                        | d Boring     |          |                 |                  |                   |         | -8          |
| ] :              | <u> </u>           |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | ļ           |
|                  | }                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | <b>-</b>    |
| -                | -                  |         |            |            |                |             |              |         |                  |                 |                                |              |          |                 |                  |                   |         | -9<br>-     |
| ] :              | <del> </del><br> - |         |            |            |                |             |              | NR      |                  |                 | SPT Sa                         | mpler        |          |                 |                  | 0                 |         | ŧ           |
| SAM F<br>AUG 201 | ORM 1              | 836     | AF1<br>DRI | TER ILLING | DU<br>DR       | IRING S     | <u>Z</u> (C  | ontinue | ed)              |                 | Вс                             | ring De      | signatio | on S            | S-13             | 5                 |         | <b>-</b> -1 |

| DRILLING LOG (Cont. Sheet)         Mobile District         OF 3           PROJECT         COORDINATE SYSTEM/DATUM<br>State Plane - Alabama West - U.S. Survey Ft. NAD83         WL           LOCATION COORDINATES<br>X = 1,803,806         ELEVATION TOP OF BORING<br>-22.8 Ft.  |                                      | SHEET 2           |         |         |
|--|--------------------------------------|-------------------|---------|---------|
| COORDINATE SYSTEMDATUM   State Plane - Alabama West - U.S. Survey Ft.   NAD83   VER   State Plane - Alabama West - U.S. Survey Ft.   NAD84   VER   NAD84     | DR                                   | OF 3 SHE          | EET     | TS      |
| State Plane - Alabama West - U.S. Survey Ft.   NAD83   MI.   | ROJEC                                | VERTICA           |         |         |
| X = 1,803,806   Y = 132,792   -22.8 Ft.  |                                      | MLLW              |         |         |
| RILEV. DEPTH BY CLASSIFICATION OF MATERIALS REC. SET SUPPLY SPECIAL SP | DCATI                                |                   |         |         |
| NR SPT Sampler  Advanced Boring  NR SPT Sampler  Advanced Boring   | X =                                  |                   |         |         |
| NR SPT Sampler  Advanced Boring  NR SPT Sampler  Advanced Boring   | LEV.                                 | BLOWS/<br>0.5 FT. | N-VALUE | N-VALUE |
| NR SPT Sampler  Advanced Boring  | -                                    | 0                 | 0       |         |
|  |                                      | 0 0               | - 0     | 0       |
| NR SPT Sampler   | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- | 0                 |         |         |
|  | -<br>-<br>-<br>-<br>-                | 0 0               | - 0     | 0       |
| Advanced Boring  | -<br>-<br>-<br>-<br>-                |                   |         |         |

| COORDIN       | Y = 132,792  | State  ELEV -2                                   | DINATE Plane - ATION TO 2.8 Ft.  REC.  | SYSTE<br>Alabai<br>OP OF I  | na We   | ADVANCEMENT  Advanced Boring  SPT Sampler        | HORIZONTAL<br>NAD83                            | _  | 0<br>0<br>0  |  |
|---------------|--|--|--|---|---|--|--|--|--|--|
| 3,806 PTH PTH | CLASSIFICATION OF MATERIA                                | State<br>ELEV<br>-2                              | Plane -<br>ATION TO<br>2.8 Ft.<br>REC. | Alabaı<br>OP OF I   | ma We   | ADVANCEMENT  Advanced Boring  SPT Sampler        | NAD83  | G S  | 0 0.5 FT.  | N-VALUE  |
| 3,806 PTH PTH | CLASSIFICATION OF MATERIA                                | <b>ELEV</b><br>-2                                | 2.8 Ft. <b>REC.</b>                    | OP OF   | BORING  | ADVANCEMENT METHOD  Advanced Boring  SPT Sampler |  | G (S   | 0 0 0 0.5 FT.  |  |
| 3,806 PTH PTH | CLASSIFICATION OF MATERIA                                | -2   | 2.8 Ft.                                |   |   | ADVANCEMENT METHOD  Advanced Boring  SPT Sampler | DRILLIN  | _  | 0  |  |
| HTQ           | CLASSIFICATION OF MATERIA                                |  | RÉC.                                   | BOX OR<br>SAMPLE  | RODON   | Advanced Boring  SPT Sampler                     | DRILLIN  | _  | 0  |  |
|               |  | ALS  |  | BOX   | ÖR<br>UD  | Advanced Boring  SPT Sampler                     | DRILLIN  | _  | 0  |  |
| 3.5           | NOTEO  |  | NR                                     |   |   | SPT Sampler                                      | _  |  | 0  | 0  |
| 3.5           | NOTEO  |  | NR                                     |   |   | SPT Sampler                                      | _  |  | 0  | 0  |
| 3.5           | NOTEO  |  | NR                                     |   |   | ·  | _  |  | 0  | 0  |
| 3.5           | NOTEO  |  | NR                                     |   |   | ·  | _  |  | 0  | 0  |
| 3.5           | NOTEO  |  |  |   |   |  | _  | _  |  | 0  |
| 3.5           | NOTEO  |  |  |   |   |  |  |  |  |  |
| 3.5           | NOTES  |  |  |   |   |  |  |  |  |  |
| 3.5           | NOTES  |  |  |   |   | Advanced Boring                                  |  |  |  |  |
| 3.5           | NOTES  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   | 140# hammer                                      |  |  |  |  |
|               | Soils are field visually classified                      | d in   |  |   |   | w/30" drop used<br>with 2.0' split<br>spoon      |  |  |  |  |
|               | accordance with the Unified Soils Classification System. |  |  |   |   | (1-3/8" I.D. x<br>2" O.D.).                      |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               |  |  |  |   |   |  |  |  |  |  |
|               | VI 183   | M 1836-A AFTER DURING DRILLING DRILLING DRILLING | VI 1836-A AFTER ▼ DURING ▼ DRILLING □  | VI 1836-A AFTER DURING DRILLING DURING M 1836-A AFTER PURING PRILLING  VI 1836-A AFTER ▼ DURING ♥ DRILLING ♥ DRILLING ♥ | M 1836-A AFTER ▼ DURING ♥ DRILLING ♥ Boring De | W 1836-A AFTER DURING DURING DRILLING | M 1836-A AFTER DURING ☑ DURING ☑ Boring Designation SS-138 | M 1836-A AFTER DURING ☑ DURING ☑ Boring Designation SS-135 |

Project I.D. **Boring Designation** VC-36-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.360751 LONG = -88.023789 STATE PLANE COORDINATES X = 1,803,305Y = 131,5771982-1984 Subsurface Investigation COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. STARTED **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -42.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER DIRECTION OF BORING** DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 28.5 Feet BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -42.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black, with organic material At El. -43.5 Ft. LOI=11.6% At El. -46.0 Ft., soft consistency, gray 100 1 Vibracore At El. -51.5 Ft. LL=74, PL=27

SAM FORM 1836

AFTER DURING DRILLING DRILLING DRILLING

Boring Designation VC-36-84

|  |                      |          |                  |                 | oring Designation     |                         | C-36-84                                   |         |   |
|--|----------------------|----------|------------------|-----------------|-----------------------|-------------------------|---|---------|---|
| DRILLING LOG (Cont. Sheet)   |                      | LLATIO   |                  |                 |                       |                         | SHEET 2                                   |         | 7 |
| OJECT  |                      | bile Dis |                  | M/DAT           | UM                    | HORIZONTAL              | OF 3 SH                                   |         | 4 |
|  |                      |          |                  |                 | est - U.S. Survey Ft. |                         | MLLW                                      |         |   |
| CATION COORDINATES   |                      | TION T   | OP OF            | BORIN           | G                     |                         |   |         |   |
| X = 1,803,305 Y = 131,577  | -42                  | .0 Ft.   | 24111            | Г               |                       | T                       |   | Т       | 4 |
| EV. DEPTH  | RIALS                | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK       | So Si Si Si Si Si Si Si Si Si Si Si Si Si | N-VALUE |   |
|  |                      |          |                  |                 |                       | PI=47                   |   |         |   |
|  |                      |          |                  |                 |                       |                         |   |         |   |
| 66.0 14.0  |                      |          |                  |                 |                       |                         |   |         |   |
| (ML) SILT, inorganic-L, soft consumptions wet, gray, with fine grained sand trace of shells (max size of 1") | sistency,<br>d and a |          |                  |                 |                       |                         |   |         |   |
|  |                      |          |                  |                 |                       | At El57.5<br>-200=94.5% |   |         |   |
|  |                      | 100      | 1                |                 | Vibracore             |                         |   |         |   |
|  |                      |          |                  |                 |                       |                         |   |         |   |
| 52.0 20.0 (CH) CLAY, fat, high plasticity, s   | soft                 |          |                  |                 |                       |                         |   |         |   |
| consistency, wet, gray   |                      |          |                  |                 |                       |                         |   |         |   |
|  |                      |          |                  |                 |                       |                         |   |         |   |
| † 💹  |                      |          |                  |                 |                       |                         |   |         |   |

Boring Designation VC-36-84

| DRI              | ILLIN                 | G LC   | G (Cont. Sheet)   | INSTAL |         |                  |                 | 3 3                   |                   | SHEET  |                 |         | ] |
|------------------|-----------------------|--------|---|--------|---------|------------------|-----------------|-----------------------|-------------------|--------|-----------------|---------|---|
| PROJEC           |                       |        | ,   | COORD  | ile Dis |                  | M/DAT           | UM                    | HORIZONTAL        | OF 3   | SHE             |         | 1 |
|                  |                       |        |   | 1      |         |                  |                 | est - U.S. Survey Ft. | NAD83             |        | LLW             | -       |   |
| LOCATION         | ON COO                | RDINAT | ES  | ELEVAT |         |                  |                 |                       |                   | •      |                 |         | 1 |
| X = 1            | 1,803,30              | )5 Y   | = 131,577   | -42.0  | Ft.     |                  |                 |                       |                   |        |                 |         | 1 |
| ELEV.            | DEPTH                 | LEGEND | CLASSIFICATION OF MATERIALS   |        | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>1 FT. | N-VALUE |   |
|                  | -<br>-<br>-<br>-<br>- |        |   |        |         |                  |                 |                       |                   |        |                 |         |   |
| -<br>-<br>-<br>- | -<br>-<br>-<br>-<br>- |        |   |        | 100     | 1                |                 | Vibracore             |                   |        |                 |         |   |
| -70.5            | 28.5                  |        | NOTES:  |        |         |                  |                 |                       | _                 |        |                 |         |   |
| -<br>-<br>-      |                       |        | Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 |                       |                   |        |                 |         |   |
| -<br>-<br>-<br>- | -<br>-<br>-<br>-      |        |   |        |         |                  |                 |                       |                   |        |                 |         | - |
| -<br>-<br>-<br>- | -<br>-<br>-<br>-<br>- |        |   |        |         |                  |                 |                       |                   |        |                 |         |   |
| -<br>-<br>-      | †<br>†<br>†<br>†      |        |   |        |         |                  |                 |                       |                   |        |                 |         |   |
| -<br>-<br>-<br>- |                       |        |   |        |         |                  |                 |                       |                   |        |                 |         |   |
| -                | ORM 1                 | 1926   | <b>A</b> AFTER ▼ DURING ▽ DRILLING  |        |         |                  |                 |                       | esignation        | VC-36  |                 |         | J |

Project I.D. Boring Designation SS-137

| DRI              | LLIN               | G LO    | G D          | IVISIO           | N Sou         | uth Atlantic  | IN      | IST/             | ALL/            | ATION Mobile                           | Distric   | t I              | SHEET 1<br>OF 2 S |             | тѕ       |
|------------------|--------------------|---------|--------------|------------------|---------------|---------------|---------|------------------|-----------------|--|-----------|------------------|-------------------|-------------|----------|
| PROJ             | ECT                |         | <u> </u>     |                  |               |               | LAT     | LONG             | COOR            | DINATES LAT = 30.                      | 358827    | LONG =           | -88.02            | 4735        | 5        |
| 19               | <u>63</u> -196     | 4 Subs  | surface In   | nvestigatio      | on            |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1,                      | 803,003   | Y = 13           | 80,879            |             |          |
| DATE             | OF BOI             | RING    |              | STA              | RTED          | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORIZ<br>NAD8    |                   | ERT.<br>LLW |          |
| DRILI            | .ING AG            | ENCY    | C            | orps of Eng      | nineers - (   | CESAM         |         |                  | ATIO            | NS TOP OF B                            | ORING     | GRO              | UND WA            | TER         | _        |
|                  |                    |         | D INSPECT    |                  |               | E OF DRILLER  |         |                  |                 | -33.8 F                                |           |                  | nderwat<br>HAMME  |             |          |
|                  |                    | I/A, Ge |              |                  |               | N/A           | N       | /A               |                 |  | Ĭ         |                  | UAL HAN           |             | <u> </u> |
|                  | TION OF<br>VERTICA |         | INCLINED     | DEG.<br>VER      | FROM<br>TICAL | BEARING       | SIZE    | AND .            | TYPE C          | OF BIT See F                           | lemarks   |                  |                   |             |          |
| тніск            | NESS OF            | OVERB   | URDEN        | N/A              |               |               | тот     | AL NU            | MBER            | CORE BOXES                             | )         |                  |                   |             |          |
| DEPTH            | то тор             | OF ROC  | K            | N/A              |               |               | тот     | AL SAI           | MPLES           | DISTURBED (                            | UN        | DISTURB          | ED (UD)           | 0           |          |
| TOTAL            | DEPTH (            |         | NG           | 17.5 F           | eet           |               | тот     |                  | COVER           | Y FOR BORING N                         | ot Record | ed               |                   | ٠.          | _        |
| ELEV.            | DEPTH              | LEGEND  | CI           | LASSIFICATI      | ON OF MA      | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DI<br>RE  | RILLING<br>MARKS | BLOWS/            | 0.5 FT.     | N-VALOE  |
| -33.8            | 0.0                |         |              |                  |               |               |         |                  |                 |  |           |                  | $\top$            |             |          |
| -33.0            | - 0.0              |         | (CH) CL      | AY, fat, hig     | ıh plastici   | ty, very soft |         |                  |                 |  |           |                  |                   |             | -(       |
| -                | _                  |         | consistei    | ncy, wet, gr     | ay, orgai     | nic           |         |                  |                 |  |           |                  |                   |             | Ŀ        |
| -                | _                  |         |              |                  |               |               |         |                  |                 | Advanced Boring                        |           |                  |                   |             | -1       |
|                  | -                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | Ė        |
| -                | -                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | <b>-</b> |
| -                | -                  |         |              |                  |               |               |         |                  |                 |  |           |                  | 0                 |             | 2        |
| :                | -                  |         |              |                  |               |               | NR      |                  |                 | SPT Sampler                            |           |                  |                   |             | Ė        |
| -                | _                  |         |              |                  |               |               |         |                  |                 | or r campion                           |           |                  | -                 | ۱ ⊢         | 0 -3     |
|                  | -                  |         |              |                  |               |               |         |                  |                 |  | _         |                  | 0                 |             | _‡       |
| -                | _                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | -        |
|                  | -                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | -        |
| -                | -                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | -        |
| -                | _                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | -5       |
|                  | -                  |         |              |                  |               |               |         |                  |                 | Advanced Boring                        |           |                  |                   |             | F        |
| -                | <u>-</u>           |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | -<br>-6  |
| -                | =                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             |          |
| :                | -<br>-             |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | ļ        |
| -                | _                  |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | -7       |
| ] .              | -                  |         |              |                  |               |               |         |                  | -               |  | 4         |                  | $\vdash$          |             | 4        |
| -                | <u>-</u>           |         |              |                  |               |               |         |                  |                 |  |           |                  | 0                 |             | -<br>-8  |
| -                | -                  |         |              |                  |               |               | NR      |                  |                 | SPT Sampler                            |           |                  | 0                 |             | -        |
| ] :              | -                  |         |              |                  |               |               |         |                  |                 |  |           |                  | 0                 |             | 0 -      |
| -                | _                  |         |              |                  |               |               |         |                  | -               |  | 1         |                  | $\vdash$          |             |          |
|                  | -                  |         |              |                  |               |               |         |                  |                 | Advanced Boring                        |           |                  |                   |             | ŀ        |
|                  | 0517               |         |              |                  |               |               |         |                  |                 |  |           |                  |                   |             | 上,       |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AFTE<br>DRIL | ER ¥ D<br>LING D | OURING S      | <u> </u>      | ontinue | ed)              |                 | Boring De                              | esignati  | on <b>S</b>      | S-137             |             |          |

| DR                | ILLIN                                | G LC   | G (Cont. Sheet)  | INSTAL  |         |                  |                 |   |                   | SHEE   |                   |         |
|-------------------|--------------------------------------|--------|--|---------|---------|------------------|-----------------|---|-------------------|--|-------------------|---------|
| PROJE             |                                      |        | (30  | +       | ile Dis |                  | 14/D            |   | UODITONE!         | <del>                                     </del> | SHE               |         |
| KUJE(             | <b>61</b>                            |        |  | State P |         |                  |                 | <b>им</b><br>est - U.S. Survey Ft.  | NAD83             |  | RTICAL<br>LLW     | -       |
| OCAT              | ION COO                              | RDINAT | ES   | ELEVAT  |         |                  |                 |   | 1471200           | 1 1  |                   |         |
|                   |                                      |        | = 130,879  | -33.8   |         |                  |                 |   |                   |  |                   |         |
| ELEV.             | DEPTH                                | LEGEND | CLASSIFICATION OF MATERIALS  | •       | RÉC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S  | BLOWS/<br>0.5 FT. | N-VALUE |
| -                 | -                                    |        |  |         |         |                  |                 | Advanced Boring   |                   |  |                   | 2       |
|                   | †<br>†<br>†<br>†<br>†<br>†           |        |  |         | NR      |                  |                 | SPT Sampler   |                   |  | 0 0               | 0       |
|                   | -<br>-<br>-<br>-<br>-<br>-<br>-      |        |  |         |         |                  |                 | Advanced Boring   |                   |  |                   |         |
| <u>-51.3</u><br>- | 17.5                                 |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |  |                   |         |
| -                 | +<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        |  |         |         |                  |                 |   |                   |  |                   |         |
| -                 | +<br>+<br>+<br>+<br>+<br>+<br>+      |        |  |         |         |                  |                 |   |                   |  |                   |         |

Project I.D. **Boring Designation** MHVBC-17-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.35484434 LONG = -88.02464822 STATE PLANE COORDINATES X = 1,803,024Y = 129,4312020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR MANUFACTURER'S DESIGNATION OF DRILL NAME OF DRILLER ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** 100 % 17.0 Feet **TOTAL RECOVERY FOR BORING** BOX OR SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray, trace sand and shell At El. -49 Ft. -200= 86%, PL= 35, LL= 56, PI= 21, MC= 136% 100 1 Vibracore 7.0 -53.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, inorganic, trace sand and shell At El. -55 Ft. -200= 89%, PL= 26, LL= 61, PI= 35, MC= 84% DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

Boring Designation

MHVBC-17-19

Boring Designation MHVBC-17-19

| DR               | ILLIN                          | G LO   | DG (Cont. Sheet)   | INSTAL  |         |                  |                 |                       |                   | SHEE    |        |         | ]                           |
|------------------|--------------------------------|--------|--|---------|---------|------------------|-----------------|-----------------------|-------------------|---------|--------|---------|-----------------------------|
| PROJEC           |                                |        | (  | COORD   | ile Dis |                  | M/DATI          | IM                    | HORIZONTAL        | OF 2    | SHE    |         | 4                           |
|                  |                                |        |  |         |         |                  |                 | est - U.S. Survey Ft. |                   | I       | ILLW   | _       |                             |
| LOCATI           | ои соо                         | RDINA  | res  | ELEVA.  |         |                  |                 |                       |                   |         |        |         | 1                           |
| X = '            | 1,803,0                        | 24 Y   | = 129,431  | -46.    | 0 Ft.   |                  |                 |                       |                   |         |        |         |                             |
| ELEV.            | DEPTH                          | LEGEND | CLASSIFICATION OF MATERIAL   | s       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/ | N-VALUE |                             |
| -57.0            | 11.0                           |        |  |         |         |                  |                 |                       |                   |         |        |         | -<br>-<br>-<br>-<br>-<br>-1 |
| -<br>-<br>-58.0  | 12.0                           |        | (CL) CLAY, lean, low plasticity, soft consistency, wet, dark gray, inorgar                           | nic     |         |                  |                 |                       |                   |         |        |         | -<br>-<br>-                 |
| -                | -<br>-<br>-                    |        | (SC) SAND, clayey, soft consistenc<br>gray, trace shell  | y, wet, |         |                  |                 |                       |                   |         |        |         | -<br>-<br>-                 |
| -                | -<br>-<br>-                    |        |  |         | 100     | 1                |                 | Vibracore             |                   |         |        |         | -                           |
| -<br>-<br>-<br>- | <del> </del><br> -<br> -       |        |  |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-      | <del>-</del><br>-              |        |  |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -63.0<br>-       | 17.0                           |        | NOTES:   |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-      | †<br>-<br>-<br>-               |        | Soils are field visually classified i<br>accordance with the Unified Soils<br>Classification System. | n       |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-      | <del> </del><br> -<br> -<br> - |        |  |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-      | †<br> -<br> -                  |        |  |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-      | <u></u>                        |        |  |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-      | †<br>-<br>-                    |        |  |         |         |                  |                 |                       |                   |         |        |         | -                           |
| -<br>-<br>-<br>  | †<br> -<br> -                  |        |  |         |         |                  |                 |                       |                   |         |        |         | <u> </u>                    |
| SAM F            | ORM<br>7                       | 1836-  | A AFTER ▼ DURING ▽ DRILLING ▼  |         |         |                  |                 | Boring De             | esignation        | MHV     | BC-1   | 7-1     | _<br> 9                     |

Project I.D. Boring Designation SS-139

| DRI              | LLIN               | G LO   | G        | DIVI           | SION         | So            | uth Atlantic  | IN       | IST/             | ALL/            | ATION M                               | obile              | District |                 | SHEET<br>OF 3 |                   | ETS     |                |
|------------------|--------------------|--------|----------|----------------|--------------|---------------|---------------|----------|------------------|-----------------|---------------------------------------|--------------------|----------|-----------------|---------------|-------------------|---------|----------------|
| PROJ             | ECT                |        | •        |                |              |               |               | LAT      | /LONG            | COOR            | DINATES LAT                           | = 30.3             | 53183    |                 |               |                   |         |                |
| 19               | 63-196             | 4 Subs | surface  | Inves          | tigatio      | n             |               | STA      | TE PLA           | NE CO           | ORDINATES                             | X = 1,8            | 03,292   | Y = 12          | 28,825        | ;                 |         |                |
|                  | OF BOI             |        |          |                |              | RTED          | COMPLETED     |          |                  |                 | <b>STEM/DATUM/UI</b><br>bama West - U |                    | rvev Et  | HORI.           |               | <i>VER</i><br>MLL |         |                |
| DRILI            | LING AG            | ENCY   |          | Corps          | of Eng       | ineers - (    | L<br>CESAM    |          |                  | ATIOI           | NS TOP                                | OF BO              | RING     | GRO             | DUND W        | VATE              | R       | 1              |
|                  | & TITLE            |        |          |                | OI Elig      |               | E OF DRILLER  |          |                  |                 | 'S DESIGNATION                        | 25.0 Fe<br>N OF DR |          |                 | nderw         |                   |         | -              |
|                  |                    |        | eologist |                |              |               | N/A           | N/       | /A               |                 |                                       |                    |          |                 | UAL H         |                   | ER      |                |
|                  | TION OF<br>VERTICA |        |          | ED             | DEG.<br>VERT | FROM<br>FICAL | BEARING       | SIZE     | E AND            | TYPE C          | OF BIT                                | See Re             | marks    |                 |               |                   |         |                |
| тніск            | NESS OF            | OVERB  | BURDEN   |                | N/A          |               |               | тот      | AL NU            | MBER            | CORE BOXES                            | 0                  |          |                 |               |                   |         | 1              |
| DEPTH            | і то тор           | OF ROO | CK       |                | N/A          |               |               | тот      | 'AL SAI          | MPLES           | DISTURBE                              | <b>ED</b> ()       | UNE      | DISTURB         | SED (UE       | <b>)</b>          | 0       | 1              |
| TOTAL            | DEPTH              |        | ING      |                | 26.3 F       | eet           |               | тот      |                  | COVER           | Y FOR BORING                          | Not                | Recorde  | ed              |               |                   |         | -              |
| ELEV.            | DEPTH              | LEGEND |          | CLASSI         | FICATIO      | ON OF MA      | TERIALS       | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMI<br>METHOD                   | ENT                | DR<br>RE | ILLING<br>MARKS |               | BLOWS/<br>0.5 FT. | N-VALUE |                |
| -25.0            | 0.0                |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         |                |
| 20.0             | 0.0                |        | (CH) (   | CLAY, 1        | fat, higl    | h plastici    | ty, very soft |          |                  |                 |                                       |                    |          |                 |               |                   |         | -0             |
| -                | <u> </u>           |        | CONSIS   | tericy, v      | wet, gra     | ay, orga      | TIIC          |          |                  |                 | Advanced Bo                           | oring              |          |                 |               |                   |         | Ł              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 | -             |                   |         | -1             |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               | 0                 |         | Ē              |
| -                | _                  |        |          |                |              |               |               | NR       |                  |                 | SPT Samp                              | oler               |          |                 |               | 0                 | 0       | -2             |
|                  | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               | 0                 | U       | <b>-</b>       |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 | Ī             |                   |         | ţ              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | -3             |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | ŀ              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | - <sub>4</sub> |
|                  | Ĺ                  |        |          |                |              |               |               |          |                  |                 | Advanced Bo                           | oring              |          |                 |               |                   |         | L              |
| -                | <u> </u><br> -     |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | ŀ              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | -5<br>-        |
| -                | Ĺ                  |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | Ŀ              |
| -                | <u> </u>           |        |          |                |              |               |               | -        |                  | -               |                                       |                    |          |                 | }             |                   |         | F-6            |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               | 0                 |         | ļ              |
|                  | _                  |        |          |                |              |               |               | NR       |                  |                 | SPT Samp                              | oler               |          |                 |               | 0                 | 0       | <u>-</u> 7     |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               | 0                 | U       | ŀ'             |
|                  | ‡                  |        |          |                |              |               |               |          |                  | 1               |                                       |                    |          |                 | ļ             |                   |         | ţ              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | -8             |
| ] .              | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | ŀ              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 | Advanced Bo                           | oring              |          |                 |               |                   |         | -<br>-9        |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | <b>ŀ</b>       |
| ] :              | [                  |        |          |                |              |               |               |          |                  |                 |                                       |                    |          |                 |               |                   |         | F              |
| SAM F<br>AUG 201 | ORM 1              | 1836   | AF<br>DF | TER<br>RILLING | ▼ DI         | URING T       | ☑ (0          | Continue | ed)              |                 | Borin                                 | ng Des             | signatio | on S            | S-13          | 9                 |         | <b>-</b> 1     |

| PROJECT COO State  LOCATION COORDINATES ELEV  | EVATION TOP<br>-25.0 Ft.                     | ' <b>STEM/DATU</b><br>abama We | est - U.S. Survey Ft.                     | HORIZONTAL<br>NAD83 | SHEET 2 OF 3 SHI  VERTICA  MLLW | AL.     |
|---|--|--------------------------------|---|---------------------|---------------------------------|---------|
| State           OCATION COORDINATES         ELEV           X = 1,803,292         Y = 128,825         -2 | ate Plane - Ala<br>.EVATION TOP<br>-25.0 Ft. | abama We                       | est - U.S. Survey Ft.  ADVANCEMENT METHOD | NAD83               | MLLW                            |         |
| OCATION COORDINATES         ELEV           X = 1,803,292         Y = 128,825         -2                 | -25.0 Ft.                                    | OF BORING                      | ADVANCEMENT<br>METHOD                     |                     |                                 |         |
| X = 1,803,292 Y = 128,825 -2  | -25.0 Ft.                                    |                                | ADVANCEMENT<br>METHOD                     | DRILLIN             | ගිබ<br>BLOWS/<br>0.5 FT.        | N-VALUE |
|   | RÉC.   | SAMPLE<br>CODD                 |   | DRILLIN             | ගිබ<br>BLOWS/<br>0.5 FT.        | N-VALUE |
| ELEV. DEPTH Z OLASSIFICATION OF MATERIALS  CLASSIFICATION OF MATERIALS                                  |  | ROW<br>ROW<br>UD               |   | DRILLIN             | SWO THE                         | N-VALU  |
|   | NR   |                                | Advanced Boring                           |                     |                                 |         |
|   | NR   |                                |   |                     |                                 | 1       |
|   |  |                                | SPT Sampler                               |                     | 0 0                             | 0       |
|   |  |                                | Advanced Boring                           |                     |                                 |         |
|   | NR   |                                | SPT Sampler                               |                     | 0 0                             | 0       |
|   |  |                                | Advanced Boring                           |                     |                                 |         |
|   | NR   | $\dashv \mid$                  | SPT Sampler                               | 1                   | 0                               |         |

| DRI                  | ILLIN                    | G LC   | OG (Cont. Sheet)   | INSTAL           |         |                  |                 |   |                   | SHEET 3       |                    | 1  |
|----------------------|--------------------------|--------|--|------------------|---------|------------------|-----------------|---|-------------------|---------------|--------------------|----|
|                      |                          |        |  | +                | ile Dis |                  |                 |   |                   | OF 3 S        |                    | 4  |
| PROJEC               | ΣT                       |        |  | COORD<br>State D |         |                  |                 | om<br>est - U.S. Survey Ft.   | NAD83             | VERTIC<br>MLL |                    |    |
| OCATI                | ON COOL                  | PDINAT | res  | ELEVAT           |         |                  |                 |   | NADOS             | IVILL         | •                  | 1  |
|                      |                          |        | ′ = 128,825  | -25.0            |         | J. J             |                 |   |                   |               |                    |    |
| ELEV.                | DEPTH                    | LEGEND | CLASSIFICATION OF MATERIALS  |                  | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | SWO IB        | 0.5 FT.<br>N-VALUE |    |
| -<br>-               | -                        |        |  |                  | NR      |                  |                 | SPT Sampler   |                   | 0             | 0                  | 7- |
| -                    |                          |        |  |                  |         |                  |                 | Advanced Boring   |                   |               |                    | -  |
| -51.3 <sub>-</sub> - | 26.3                     |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |                  |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). | -                 |               |                    | -  |
| -<br>-<br>-<br>-     | -<br>-<br>-<br>-         |        |  |                  |         |                  |                 |   |                   |               |                    | -  |
| -<br>-<br>-          | -<br>-<br>-              |        |  |                  |         |                  |                 |   |                   |               |                    |    |
| -                    |                          |        |  |                  |         |                  |                 |   |                   |               |                    |    |
| -<br>-<br>-          | †<br>-<br>-              |        |  |                  |         |                  |                 |   |                   |               |                    |    |
| -                    | <del>-</del><br>-        |        |  |                  |         |                  |                 |   |                   |               |                    |    |
| -<br>-<br>-          | <del> </del><br> -<br> - |        |  |                  |         |                  |                 |   |                   |               |                    |    |
| -<br>-<br>-          | <del>-</del><br>-        |        |  |                  |         |                  |                 |   |                   |               |                    |    |
| -                    | <u> </u>                 |        |  |                  |         |                  |                 |   |                   |               |                    | Ţ  |
|                      | ORM 1                    | 1000   | AFTER ▼ DURING ∇ DRILLING □  |                  |         | <u> </u>         |                 | Boring De   | 1                 | SS-139        |                    | لـ |

Project I.D. **Boring Designation** MHVBC-16-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.34946773 LONG = -88.02492916 STATE PLANE COORDINATES X = 1,802,926Y = 127,4762020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** TOTAL RECOVERY FOR BORING 100 % 17.0 Feet BOX OF SAMPLE BLOWS/ ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray, trace shell At El. -48 Ft. -200= 91%, PL= 34, LL= 64, PI= 30, MC= 127% -50.0 4.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, trace shell, inorganic 100 1 Vibracore At El. -55 Ft. -200= 99%, PL=30, LL= 63, PI= 33, MC=

(Continued)

Boring Designation

MHVBC-16-19

**SAM FORM 1836** 

**AUG 2017** 

**DURING** 

DRILLING

DRILLING \*

Boring Designation MHVBC-16-19

| PROJECT    COORDINATE SYSTEMDATUM   HORIZONTAL MULLW   | DRI   | LLIN        | G L  | DG (Cont. Sheet)  | INSTAI   |        |        |                 |                       |                   | SHEET    |        |         |                   |
|--|-------|-------------|--|---|----------|--------|--------|-----------------|-----------------------|-------------------|----------|--------|---------|-------------------|
| State Plane - Alabama West - U.S. Survey Ft.   NAD83   MILW  |       |             |  | (   | +        |        |        | M/DAT           | UM                    | HORIZONTAL        | <b>-</b> |        |         | •                 |
| Section   Sect   |       |             |  |   |          |        |        |                 |                       |                   |          |        |         |                   |
| ELEV. DEPTH S CLASSIFICATION OF MATERIALS RC. SS POB ADVANCEMENT RIMARYS SET TO |       |             |  |   |          |        | OP OF  | BORIN           | G                     |                   |          |        |         |                   |
| .59.0 13.0 (CL) CLAY, lean, low plasticity, soft consistency, wet, dark gray, trace shell 100 1 Vibracore  NOTES: 1. Solic are field visually classified in accordance with the Unified Solis Classification System.   | X = 1 | 1,802,92    |  | ′ = 127,476<br>I  | -46      | .0 Ft. | ~!!!   | 1               |                       | 1                 |          |        | ш       |                   |
| -59.0 13.0 ICL) CLAY, lean, low plasticity, soft consistency, wet. dark gray, trace shell 100 f Vibracore  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.  | ELEV. | DEPTH       | LEGEN  | CLASSIFICATION OF MATERIALS   | <b>;</b> | REC.   | BOX OF | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S  | BLOWS  | N-VALUI | L,                |
|  | -59.0 | 13.0        | DE LE COLLEGE DE LA COLLEGE DE | (CL) CLAY, lean, low plasticity, soft consistency, wet, dark gray, trace sh NOTES:  1. Soils are field visually classified in accordance with the Unified Soils | ell      |        |        | SR SR           |                       |                   |          | BLQ 11 | N-VA    |                   |
|  | -     | -<br>-<br>- |  |   |          |        |        |                 |                       |                   |          |        |         | -:<br>-<br>-<br>- |
| AM FORM 1836-A  AFTER  DURING  | -     | -<br>-<br>- |  |   |          |        |        |                 |                       |                   |          |        |         | -:<br> -          |

Project I.D. Boring Designation **SS-141** 

| DR               | ILLIN    | G LO    | G            | DIV               | ISION                     | Sou        | uth Atlantic         | IN      | IST <i>A</i>     | \LL#            | ATION       | Mobile                    | District  |                 | SHEET<br>OF 3 |                   | FTS     |
|------------------|----------|---------|--------------|-------------------|---------------------------|------------|----------------------|---------|------------------|-----------------|-------------|---------------------------|-----------|-----------------|---------------|-------------------|---------|
| PROJ             | IECT     |         |              |                   |                           |            |                      | LAT     | LONG             | COORI           | DINATES     | LAT = 30.3                | 47820     |                 |               |                   |         |
| 19               | 963-196  | 4 Sub   | surfac       | e Inve            | stigatio                  | n          |                      | STA     | TE PLA           | NE CO           | ORDINATE    | <b>s</b> X = 1,8          | 02,762    | Y = 12          | 26,877        |                   | ᅦ       |
|                  | OF BOI   |         |              |                   |                           | RTED       | COMPLETED            |         |                  |                 | STEM/DATU   | JM/UNITS<br>st - U.S. Sui | rvev Ft   | HORIZ<br>NAD8   |               | <i>VER</i>        |         |
| DRIL             | LING AG  | ENCY    |              | Corp              | s of Engi                 | ineers - ( | CESAM                | 1       |                  | ATION           |             | TOP OF BO                 | RING      | GRO             | UND I         | VATE              | _       |
| NAME             | & TITLE  | OF FIEL | LD INSF      |                   |                           |            | E OF DRILLER         | MAN     | UFAC             | TURER           | 'S DESIGNA  | -27.8 Fe<br>Ation of Dr   |           |                 | nderw<br>HAMI |                   |         |
| DIDEC            | TION OF  | I/A, Ge |              | t                 | DEC                       | EDOM.      | N/A<br>BEARING       | N/      | /A               |                 |             |                           | Ī         |                 | UAL HA        |                   | R       |
|                  | VERTICA  |         |              | NED               | DEG.<br>VERT              | ICAL       | BEARING              | SIZE    | E AND            | TYPE O          | F BIT       | See Re                    | marks     |                 |               |                   |         |
| тніск            | NESS OF  | OVERE   | BURDE        | 4                 | N/A                       |            |                      | тот     | AL NU            | MBER (          | CORE BOXI   | <b>ES</b> 0               |           |                 |               |                   |         |
| DEPTI            | н то тор | OF RO   | CK           |                   | N/A                       |            |                      | тот     | AL SAI           | MPLES           | DIST        | URBED ()                  | UND       | ISTURB          | ED (UE        | ) (               | )       |
| TOTAL            | L DEPTH  |         | ING          |                   | 23.5 Fe                   | eet        |                      | тот     |                  | COVER           | Y FOR BOR   | ING Not                   | Recorde   | ed              |               |                   |         |
| ELEV.            | DEPTH    | LEGEND  |              | CLAS              | SIFICATIO                 | ON OF MA   | TERIALS              | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVAN<br>ME | CEMENT<br>THOD            | DR<br>REI | ILLING<br>MARKS |               | BLOWS/<br>0.5 FT. | N-VALUE |
| -27.8            | 0.0      |         |              |                   |                           |            |                      |         |                  |                 |             |                           |           |                 |               |                   |         |
|                  |          |         | (CH)<br>cons | CLAY              | , fat, high<br>, wet, gra | n plastici | ty, very soft<br>nic | NR      |                  |                 |             | ed Boring<br>Sampler      |           |                 |               | 0 0 0             | 0       |
|                  |          |         |              |                   |                           | (DNS)      |                      |         |                  |                 |             | ed Boring                 |           |                 |               |                   |         |
| SAM F<br>AUG 201 | ORM 1    | 1836    | A<br>E       | AFTER<br>DRILLING | g ▼ DI                    | JRING S    | <u>√</u> (C          | ontinue | ed)              |                 | В           | oring Des                 | signatio  | on S            | S-14          | 1                 | ·       |

| DR                 | ILLIN                    | G LO    | G (Cont. Sheet)             | INSTAL |         |                  |                 |                             |                   | SHEE    |                   |         |          |
|--------------------|--------------------------|---------|-----------------------------|--------|---------|------------------|-----------------|-----------------------------|-------------------|---------|-------------------|---------|----------|
|                    |                          |         | - (                         | _      | ile Dis |                  |                 |                             |                   |         | SHE               |         | 4        |
| PROJEC             | ΣT                       |         |                             | COORD  |         |                  |                 | ом<br>est - U.S. Survey Ft. | NAD83             |         | RTICAL<br>LLW     | •       |          |
| OCATI              | ON COO                   | RDINATE | re                          | ELEVAT |         |                  |                 |                             | NADOS             | 101     | LLVV              |         | 1        |
|                    |                          |         | = 126,877                   | -27.8  |         | J. OF            | -CRIM           | -                           |                   |         |                   |         |          |
| ELEV.              | DEPTH                    | Q       | CLASSIFICATION OF MATERIA   |        | ĸ.      | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD       | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE |          |
| -                  |                          |         |                             |        |         |                  |                 |                             |                   |         | 0                 | _       | ŧ        |
| -                  | _                        |         |                             |        | NR      |                  |                 | SPT Sampler                 |                   |         | 0                 | 0       | E        |
| -                  | <del> </del><br> -       |         |                             |        |         |                  |                 |                             |                   |         | 0                 |         | ļ        |
| -<br>-<br>-        |                          |         |                             |        |         |                  |                 |                             |                   |         |                   |         |          |
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| -<br>-<br>-        | †<br>-<br>-              |         |                             |        |         |                  |                 | Advanced Boring             |                   |         |                   |         | -        |
| -<br>-             | <del> </del><br> -<br> - |         |                             |        |         |                  |                 |                             |                   |         |                   |         | ŀ        |
| -<br>-             | -<br>-<br>-              |         |                             |        |         |                  |                 |                             |                   |         |                   |         | -        |
| -                  | -<br>-                   |         |                             |        | ND      |                  |                 | CDT Complex                 | _                 |         | 0                 |         | <u> </u> |
| -<br>-             |                          |         |                             |        | NR      |                  |                 | SPT Sampler                 | _                 |         | 0                 | 0       | -        |
| -                  | <del> </del><br> -<br> - |         |                             |        |         |                  |                 |                             |                   |         |                   |         | -        |
| -                  |                          |         |                             |        |         |                  |                 |                             |                   |         |                   |         | -        |
| -<br>-<br>-        | <del> </del><br> -<br> - |         |                             |        |         |                  |                 |                             |                   |         |                   |         | -        |
| -<br>-<br>-        | †<br>-<br>-              |         |                             |        |         |                  |                 | Advanced Boring             |                   |         |                   |         |          |
| -<br>-<br>-        | <del> </del><br> -<br> - |         |                             |        |         |                  |                 |                             |                   |         |                   |         | ŀ        |
| -<br>-<br>-<br>512 | 23.5                     |         |                             |        |         |                  |                 |                             |                   |         |                   |         | f        |
| -51.3              |                          | 1836-A  | AFTER ▼ DURING ▽ DRILLING □ |        | ontinue | <u> </u>         |                 |                             | -<br>esignation   | SS-14   |                   |         | 上        |

| DRII                | LING  | 2 I C  | OG (Cont. Sheet)   | INSTAL              |         |                  |                 |  |                   | SHEET  |                   |         | 1 |
|---------------------|-------|--------|--|---------------------|---------|------------------|-----------------|--|-------------------|--------|-------------------|---------|---|
|                     |       |        |  | +                   | ile Dis |                  |                 |  |                   | OF 3   |                   |         | 4 |
| PROJECT             | Г     |        |  | COORD               |         |                  |                 |  | HORIZONTAL        |        | TICAI<br>_LW      | -       |   |
|                     |       |        |  |                     |         |                  |                 | est - U.S. Survey Ft.  | NAD83             | IVIL   | LVV               |         | 4 |
| LOCATION<br>X = 1 8 |       |        | = 126,877  | <b>ELEVA1</b> -27.8 |         | )P OF I          | BURING          | •  |                   |        |                   |         |   |
|                     | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS  |                     | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>0.5 FT. | N-VALUE | - |
| ### FCUG 2017       |       |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |                     | RÉC.    | BOX              | OR UD           | 140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.). | esignation        | SS-14  |                   | N-VA    |   |

Project I.D. **Boring Designation** CD-5-72 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 4 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.344514 LONG = -88.027190 STATE PLANE COORDINATES X = 1,802,205Y = 125,6771970-1972 Subsurface COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. STARTED **DATE OF BORING** 09-21-72 09-22-72 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -12.7 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER Wilsford, Geologist Dobbs CME-75 **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED 8 UNDISTURBED (UD) **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 35.5 Feet BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -12.7 0.0 (MH) SILT, inorganic-H, high plasticity, gray 3" I.D. Shelby 100 1 Tube Advanced Boring 3" I.D. Shelby 100 2 Tube Advanced Boring

(Continued)

Boring Designation

CD-5-72

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**SAM FORM 1836** 

**AUG 2017** 

Boring Designation CD-5-72

| DRI                        | ILLIN                           | G LC   | OG (Cont. Sheet)                      | INSTAL |         |                  |                 | 3 3                    |                   | SHEE |                 |         | ] |
|----------------------------|---------------------------------|--------|---------------------------------------|--------|---------|------------------|-----------------|------------------------|-------------------|------|-----------------|---------|---|
| PROJEC                     |                                 |        | ,                                     | COORD  | ile Dis |                  | M/DAT           | IIM                    | HORIZONTAL        | OF 4 | RTICA           |         | ┨ |
| PROJEC                     | ••                              |        |                                       |        |         |                  |                 | est - U.S. Survey Ft.  |                   |      | ILLW            | _       |   |
| LOCATI                     | ON COOL                         | RDINAT | ES                                    | ELEVA1 |         |                  |                 |                        |                   |      |                 |         | 1 |
| X = 1                      | 1,802,20                        | )5 Y   | = 125,677                             | -12.   |         |                  |                 |                        |                   |      |                 |         |   |
| ELEV.                      | DEPTH                           | LEGEND | CLASSIFICATION OF MATERIALS           |        | ĸ.      | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G    | BLOWS/<br>1 FT. | N-VALUE |   |
| -<br>-<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>-<br>-      |        | (CH) CLAY, fat, high plasticity, grey |        | 100     | 3                |                 | 3" I.D. Shelby<br>Tube |                   |      |                 |         |   |
| -<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>- |        |                                       |        |         |                  |                 | Advanced Boring        |                   |      |                 |         |   |
|                            | -<br>-<br>-<br>-<br>-<br>-<br>- |        |                                       |        | 100     | 4                |                 | 3" I.D. Shelby<br>Tube |                   |      |                 |         | - |
| -<br>-<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>-<br>-      |        |                                       |        |         |                  |                 | Advanced Boring        |                   |      |                 |         |   |
| -<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-      |        | At El32.7 Ft. with shell              |        | 100     | 5                |                 | 3" I.D. Shelby<br>Tube |                   |      |                 |         |   |
| -<br>-<br>-                | <del> </del><br> -<br> -        |        |                                       |        |         |                  | -               | Advanced Boring        |                   |      |                 |         |   |
| SAM F                      | ORM 1                           | 1836-  | A AFTER ▼ DURING □ DRILLING □         | (Co    | ontinue | ed)              | <u> </u>        | Boring De              | esignation        | CD-5 | -72             |         | 7 |

Boring Designation CD-5-72

|  |        |        |  |             |                  | В               |   |                   |       |                  |
|--|--------|--------|--|-------------|------------------|-----------------|---|-------------------|-------|------------------|
| DRILLING LOG (Cont. Sheet)                     |        |        |  | Mobile Dis  |                  | SHEET 3 OF 4 S  |   |                   |       |                  |
| PROJECT  |        |        |  | COORDINATE  | HORIZONTAL       |                 |   |                   |       |                  |
|  |        |        |  |             |                  |                 | est - U.S. Survey Ft.                     | NAD83             | MLL   | N                |
|  | N COOR |        |  | ELEVATION T | OP OF            | BORIN           | G   |                   |       |                  |
| X = 1,8  | 802,20 |        | = 125,677  | -12.7 Ft.   |                  | Π               |   | <del>1</del>      |       | Тш               |
| ELEV. C  | DEPTH  | LEGEND | CLASSIFICATION OF MATERIALS  | REC.        | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                     | DRILLIN<br>REMARK | SOMS/ | 1 FT.<br>N-VALUE |
| +  |        |        |  |             |                  |                 | Advanced Boring                           |                   |       |                  |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        |        |  | 100         | 6                |                 | 3" I.D. Shelby<br>Tube                    |                   |       |                  |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-           |        |        |  |             |                  |                 | Advanced Boring                           |                   |       |                  |
| +  |        |        |  | 100         | 7                |                 | 3" I.D. Shelby<br>Tube                    |                   |       |                  |
| †<br>†<br>†<br>†<br>†                          |        |        |  |             |                  |                 | Advanced Boring                           |                   |       |                  |
| -48.2<br>                                      | 35.5   |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | 100         | 8                |                 | 3" I.D. Shelby<br>Tube<br>Advanced Boring |                   |       |                  |

Boring Designation CD-5-72

|   |                      |        |                               | INSTAL  | LATION    |            | CD-5-72<br>SHEET 4 |                       |                   |         |                 |         |
|---|----------------------|--------|-------------------------------|---------|-----------|------------|--------------------|-----------------------|-------------------|---------|-----------------|---------|
| DRILLING LOG (Cont. Sheet)                |                      |        |                               |         | ile Dis   |            | OF 4 SHEETS        |                       |                   |         |                 |         |
| PROJECT                                   |                      |        |                               |         | INATE     | HORIZONTAL | <b>I</b>           |                       |                   |         |                 |         |
|   |                      |        |                               | State P |           |            |                    | NAD83                 | M                 | LLW     |                 |         |
| <b>LOCATION COORDINATES</b> X = 1,802,205 |                      |        |                               |         | ION TO    | OP OF      | BORIN              | G                     |                   |         |                 |         |
| X = '                                     | 1,802,20<br><b>I</b> |        | = 125,677                     | -12.7   | / Ft.<br> | 24111      | ı                  |                       | 1                 | -       | <u>. I</u>      |         |
| ELEV.                                     | DEPTH                | TEGEND | CLASSIFICATION OF MATERIALS   |         | REC.      | BOX OR     | RQD<br>OR<br>UD    | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>1 FT. | N-VALUE |
|   |                      |        |                               |         | 100       | 8          |                    |                       |                   |         |                 |         |
| -   | -                    |        |                               |         |           |            |                    |                       |                   |         |                 | ŀ       |
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| -   | <b>-</b>             |        |                               |         |           |            |                    |                       |                   |         |                 | -       |
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| -   | [                    |        |                               |         |           |            |                    |                       |                   |         |                 |         |
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|   | <u> </u>             |        |                               |         |           | L_         | L_                 |                       |                   |         |                 | [       |
|   | ORM 1                | 936    | A AFTER ▼ DURING ▽ DRILLING ▼ |         |           |            |                    | Boring De             |                   | CD-5-   |                 |         |

Project I.D. **Boring Designation** MHVBC-15-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.34414935 LONG = -88.02622357 STATE PLANE COORDINATES X = 1,802,509Y = 125,5432020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-22-20 01-22-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -48.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 17.0 Feet BLOWS/ BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -48.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray, At El. -50 Ft. -200=92%, PL=34, LL=61, PI=27. MC=148% 100 1 Vibracore 6.0 -54.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, inorganic, trace shell At El. -56 Ft. -200= 98%, PL=32, LL=65, PI= 33, MC= 107% DRILLING ∑ DRILLING ב

(Continued)

Boring Designation

MHVBC-15-19

**SAM FORM 1836** 

**AUG 2017** 

DRILLING T

Boring Designation MHVBC-15-19

| DRI         | ILLIN             | G LC   | OG (Cont. Sheet)  | INSTAL |         |                  |                 | 3 3                   |                   | SHEE   |                 |         | ]              |
|-------------|-------------------|--------|---|--------|---------|------------------|-----------------|-----------------------|-------------------|--------|-----------------|---------|----------------|
| PROJEC      |                   |        | ,   | COORD  | ILE DIS |                  | M/DAT           | шм                    | HORIZONTAL        |        | SHE             |         | 1              |
|             |                   |        |   | 1      |         |                  |                 | est - U.S. Survey Ft. | NAD83             | I      | ILLW            |         |                |
|             | ои сооі           |        |   | ELEVAT |         | P OF             | BORING          | 9                     |                   |        |                 |         | 1              |
| X = 1       | 1,802,50<br>I     |        | = 125,543   | -48.0  | Ft.     | 2411             |                 |                       | 1                 |        | Ι. Ι            | III     | 4              |
| ELEV.       | DEPTH             | LEGEND | CLASSIFICATION OF MATERIALS   |        | ĸĚC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>1 FT. | N-VALUE |                |
| -62.1-      | - 14.1<br>        |        | At El62.0 Ft. with shells (CH) CLAY, fat, high plasticity, very sconsistency, wet, tan          | stiff  | 100     | 1                |                 | Vibracore             |                   |        |                 |         |                |
| -65.0<br>-  | -<br>17.0         |        | NOTES:  |        |         |                  |                 |                       | _                 |        |                 |         |                |
| -           | -<br>-<br>-       |        | Soils are field visually classified in accordance with the Unified Soils Classification System. |        |         |                  |                 |                       |                   |        |                 |         |                |
| -           | -<br>-<br>-       |        |   |        |         |                  |                 |                       |                   |        |                 |         |                |
| -           | -<br>-<br>-<br>-  |        |   |        |         |                  |                 |                       |                   |        |                 |         |                |
| -<br>-<br>- | -<br>-<br>-<br>-  |        |   |        |         |                  |                 |                       |                   |        |                 |         |                |
| <br>AM F    | -<br> -<br> ORM 1 | 1836-  | A AFTER ▼ DURING ▽ DRILLING   |        |         |                  |                 | Borina De             | esignation        | MHV    | BC-1            | <br>5-1 | <u>ا</u><br>؟ا |

Project I.D. Boring Designation **SS-143** 

| DRI              | LLIN               | G LO   | G        | DIV              | ISION        | N Sou         | uth Atlantic  | IN      | IST/             | <b>ALL</b>      | ATION Mo                                | bile I   | District |                 | SHEET<br>OF 2    |                   | ETS     |                |
|------------------|--------------------|--------|----------|------------------|--------------|---------------|---------------|---------|------------------|-----------------|---|----------|----------|-----------------|------------------|-------------------|---------|----------------|
| PROJ             | ECT                |        |          |                  |              |               |               | LAT     | /LONG            | COORI           | DINATES LAT                             | = 30.34  | 12457    |                 |                  |                   |         | 1              |
| 19               | 63-196             | 4 Sub  | surfac   | e Inve           | stigatio     | n             |               | STA     | TE PLA           | NE CO           | ORDINATES                               | ( = 1,80 | 02,233   | Y = 1:          | 24,929           | )                 |         |                |
|                  | OF BOI             |        |          |                  |              | RTED          | COMPLETED     |         |                  |                 | <b>STEM/DATUM/UN</b><br>bama West - U   |          | vev Ft   | HORI<br>NAD     |                  | <i>VER</i><br>MLL |         |                |
| DRILI            | ING AG             | ENCY   |          | Corps            | s of Ena     | ineers - (    | CESAM         |         |                  | ATION           | NS TOP                                  | OF BOR   | RING     | GRO             | DUND V           | VATE              | R       | 1              |
|                  | & TITLE            |        |          |                  |              |               | E OF DRILLER  |         |                  |                 | -3 'S DESIGNATION                       | 1.8 Fe   |          |                 | Inderw<br>O HAMI |                   |         | ┨              |
|                  |                    |        | eologist | t                |              |               | N/A           | N/      | /A               |                 |   |          |          |                 | UAL H            |                   |         | ]              |
|                  | TION OF<br>VERTICA |        |          | IED              | DEG.<br>VERT | FROM<br>FICAL | BEARING       | SIZE    | E AND            | TYPE O          | OF BIT S                                | See Re   | marks    |                 |                  |                   |         |                |
| тніск            | NESS OF            | OVERE  | BURDEN   | ·                | N/A          |               |               | тот     | AL NU            | MBER (          | CORE BOXES                              | 0        |          |                 |                  |                   |         | 1              |
| DEPTH            | то тор             | OF RO  | СК       |                  | N/A          |               |               | тот     | AL SAI           | MPLES           | DISTURBE                                |          |          | DISTURE         | BED (UL          | <b>)</b>          | 0       | -              |
| TOTAL            | . DEPTH            |        | ING      |                  | 19.5 F       | eet           |               | тот     |                  | COVER           | Y FOR BORING                            | Not      | Recorde  | ed              |                  | .                 |         | 4              |
| ELEV.            | DEPTH              | LEGEND |          | CLASS            | SIFICATIO    | ON OF MA      | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEME<br>METHOD                     | NT       | DR<br>RE | ILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |                |
| -31.8            | 0.0                |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         |                |
| -51.0            | - 0.0              |        | (CH)     | CLAY,            | fat, hig     | h plastici    | ty, very soft |         |                  |                 |   |          |          |                 |                  |                   |         | -0<br>-        |
| -                | _                  |        | consi    | stency,          | wet, gra     | ay, orgai     | nic           |         |                  |                 |   |          |          |                 |                  |                   |         | -              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | -1             |
|                  |                    |        |          |                  |              |               |               |         |                  |                 | Advanced Bo                             | rina     |          |                 |                  |                   |         |                |
| -                | _                  |        |          |                  |              |               |               |         |                  |                 | , | 9        |          |                 |                  |                   |         | <b>-</b>       |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | -2<br>-        |
| :                | <u> </u>           |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | Ė              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 | -                |                   |         | <del> </del> 3 |
|                  | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 | -                | 0                 |         | Ē              |
| -                | _                  |        |          |                  |              |               |               | NR      |                  |                 | SPT Sampl                               | er       |          |                 |                  | 0                 | 0       | <u>-</u> 4     |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  | 0                 | Ů       | <b> </b>       |
|                  | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | ţ.             |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | -5<br>-        |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | ŀ              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | -6             |
|                  |                    |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | ŀ              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 | Advanced Bo                             | ring     |          |                 |                  |                   |         | ŀ              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | <b>-</b> 7     |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | ŀ              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | -8             |
| :                | <u> </u>           |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | ţ              |
| -                | -                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 |                  |                   |         | <b>-</b>       |
| -                | F                  |        |          |                  |              |               |               |         |                  |                 |   |          |          |                 | ļ                | 0                 |         | <b>-</b> 9     |
| ] :              | ŀ                  |        |          |                  |              |               |               | NR      |                  |                 | SPT Sampl                               | er       |          |                 | <b> </b>         | 0                 |         | Ė              |
| SAM F<br>AUG 201 | ORM 1              | 836    | A        | FTER<br>PRILLING | <b>▼</b> D   | URING S       | <u>√</u> (C   | ontinue | <b></b><br>ed)   | <u> </u>        | Boring                                  | g Des    | signatio | on S            | SS-14            |                   |         | $\perp_1$      |

|                     |                       |        |  |         |        |                  | B               | oring Designatio  | on 58             | S-143         |                   |         |
|---------------------|-----------------------|--------|--|---------|--------|------------------|-----------------|---|-------------------|---------------|-------------------|---------|
| DRI                 | ILLIN                 | G LC   | OG (Cont. Sheet)   | INSTALI |        |                  |                 |   |                   | SHEET<br>OF 2 |                   |         |
| PROJEC              |                       |        | ,  | COORDI  | le Dis |                  | M/DAT           | IM I  | HORIZONTAL        | VERT          |                   | 15      |
|                     | •                     |        |  | 1       |        |                  |                 | est - U.S. Survey Ft.   | NAD83             | ML            |                   |         |
| OCATI               | ON COO                | RDINAT | res  | ELEVAT  |        |                  |                 |   |                   | •             |                   |         |
| X = 1               | 1,802,23              | 33 Y   | = 124,929  | -31.8   | Ft.    |                  |                 |   | T                 |               |                   |         |
| ELEV.               | DEPTH                 | LEGEND | CLASSIFICATION OF MATERIALS  |         | ĸ.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>S        | BLOWS/<br>0.5 FT. | N-VALUE |
| -                   |                       |        |  |         | NR     |                  |                 | SPT Sampler   |                   |               | 0                 | 0       |
| -<br>-<br>-<br>-    | -<br>-<br>-<br>-<br>- |        |  |         |        |                  |                 |   |                   |               |                   | -       |
| -<br>-<br>-<br>-    | -<br>-<br>-           |        |  |         |        |                  |                 | Advanced Boring   |                   |               |                   | -       |
| -<br>-<br>-         | †<br>-<br>-<br>-<br>- |        |  |         |        |                  |                 |   | -                 |               |                   | -       |
| -<br>-<br>-         | -<br>-<br>-<br>-      |        |  |         | NR     |                  |                 | SPT Sampler   |                   |               | 0 0               | 0       |
| -                   | -<br>-<br>-<br>-      |        |  |         |        |                  |                 | Advanced Boring   |                   |               |                   |         |
| -<br>-<br>-<br>51.3 | -<br>-<br>-<br>19.5   |        |  |         |        |                  |                 |   |                   |               |                   |         |
| -                   | -<br>-<br>-<br>-<br>- |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |        |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |               |                   |         |
| -<br>-<br>-<br>-    | -<br>-<br>-<br>-<br>- |        |  |         |        |                  |                 |   |                   |               |                   |         |
| -<br>-<br>          | ORM 1                 | 1836-  | A AFTER ▼ DURING ▽ DRILLING □  |         |        |                  |                 | Davin - D   | esignation        | SS-143        |                   |         |

Project I.D. **Boring Designation** VC-38-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.338743 LONG = -88.026525 STATE PLANE COORDINATES X = 1,802,405Y = 123,5771982-1984 Subsurface Investigation COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. STARTED **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -43.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 21.0 Feet BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -43.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black, with organic material At El. -44.5 Ft. LOI=9.9%, -200=81.3% At El. -47.0 Ft., soft consistency, dark gray 100 1 Vibracore

(Continued)

**Boring Designation** 

VC-38-84

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DRILLING T

**SAM FORM 1836** 

**AUG 2017** 

Boring Designation VC-38-84

|       |              |        |  | INSTAL              | LATION  | 1                | ь               |                       |                   | SHEET       | Г 2      |          | _ |
|-------|--------------|--------|--|---------------------|---------|------------------|-----------------|-----------------------|-------------------|-------------|----------|----------|---|
| DR    | ILLIN        | G LC   | G (Cont. Sheet)  | l                   | le Dist |                  |                 |                       |                   | <b>OF</b> 2 |          | ETS      | s |
| ROJE  | СТ           |        |  | COORD               |         |                  |                 |                       | HORIZONTAL        |             | RTICAI   | L        |   |
|       |              |        |  |                     |         |                  |                 | est - U.S. Survey Ft. | NAD83             | M           | LLW      |          | _ |
|       | ON COO!      |        | <b>ES</b> = 123,577  | <b>ELEVAT</b> -43.0 |         | OP OF            | BORING          | 3                     |                   |             |          |          |   |
| Λ-    | 1,002,40     |        | - 120,011  | -40.0               | ) i i.  | ĞМ               |                 |                       |                   |             | <u>ن</u> | <b>=</b> | _ |
| ELEV. | DEPTH        | LEGEND | CLASSIFICATION OF MATERIALS  |                     | ĸ.      | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S     | BLOWS/   | N-VALUE  |   |
|       |              | =      |  |                     |         | S/B              |                 | -                     |                   |             | ₩.       | ż        | _ |
|       | ł            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| •     | İ            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | -            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | ł            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | Ţ            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | +            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| •     | t            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | Į            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | +            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | ‡            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | -            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | t            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | Į            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | ł            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | Ţ            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | <del> </del> |        |  |                     | 100     | 1                |                 | Vibracore             |                   |             |          |          |   |
|       | t            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | Ţ            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| •     | †            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| _     | 1            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | +            |        | At El60.0 Ft., medium consistency, I gray  | ight                |         |                  |                 |                       |                   |             |          |          |   |
|       | İ            |        | 9.4,   |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | -            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| •     | t            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | Į            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | ł            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | Ţ            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| •     | ł            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | İ            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | }            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| 64.0  | 21.0         |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | 1            |        | NOTES:   |                     |         |                  |                 |                       |                   |             |          |          |   |
| •     | t            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | Į            |        | <ol> <li>Soils are field visually classified in<br/>accordance with the Unified Soils</li> </ol> |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | †            |        | Classification System.   |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | <u> </u>     |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
| -     | +            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | t            |        |  |                     |         |                  |                 |                       |                   |             |          |          |   |
|       | ORM 1        |        |  |                     |         |                  |                 |                       | Ī                 |             |          |          |   |

Project I.D. Boring Designation **SS-145** 

| DRI   | LLIN  | G LO   | 3 DI                     | IVISIO  | N Sou       | th Atlantic   | IN   | IST/  | \LL#  | ATION M   | obile [  | District   |                 |                   | EETS    |
|---|---|--|--------------------------|---|-------------|---|--|---|---|---|--|------------|-----------------|-------------------|---------|
| PROJ  | PROJECT    STATE   LAILANGE COMPINATES   LAILANGE   LA |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| 19  | PROJECT    CATLONG COORDINATES   LAT-30,338613   LONG = -8.0  | 75   |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
|   |   |  |                          |   |             | COMPLETED   |  |   |   |   |  | vev Ft     |                 | <i>VER</i><br>MLL |         |
| DRILL   | ING AG  | ENCY   | Co                       | orps of Fno   | nineers - C | :FSAM   |  |   |   | NS TOP  | OF BOR   | ING        | GROUN           | WATE              | R       |
|   |   |  |                          |   | _           |   |  |   |   | -2  |  |            | _               |                   |         |
|   | ROJECT    CALALONG COORDINATES   LATE 30.338813   LONG = -88.   |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
|   | TATE PLANE COORDINATES LAT = 30.336813 LONG = -88.1  1963-1964 Subsurface Investigation  DATE OF BORING  STARTED COMMLETED  COMMLETED  CORDINATE SYSTEMADITUMINITS  SUBSTITUTE OF FIRED INSPECTOR  NA COORDINATE SYSTEMADITUMINITS  SUBSTITUTE OF FIRED INSPECTOR  NA COORDINATE SYSTEMADITUMINITS  COORDINATE  COORDINATE  AND OF OF OF OF OR OR OR OR OR OR OR OR OR OR OR OR OR  |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| тніск   | THICKNESS OF OVERBURDEN    PROJECT  |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| DEPTH   | PROJECT   1963-1964 Subsurface Investigation   STARTED   COMPLETED   STATE PLANE COORDINATES   X = 1,802,521   Y = 122,875   Y = 122,875   X = 1,802,521   X = 1,802,521   X =    | (סט)   | 0                        |   |             |   |  |   |   |   |  |            |                 |                   |         |
| TOTAL   | DEPTH (   | OF BORII   | NG                       | 25.5 F  | eet         |   | тот  |   | COVER   | Y FOR BORING  | Not  | Recorde    | ed              | ,                 |         |
| ELEV.   | DEPTH   | LEGEND   | CL                       | ASSIFICATI  | ION OF MA   | ΓERIALS   | RÉC.   | BOX OR<br>SAMPLE  | RQD<br>OR<br>UD   | ADVANCEME<br>METHOD   | ENT  | DRI<br>REM | ILLING<br>MARKS | BLOWS/<br>0.5 FT. | N-VALUE |
| -25 8   | 0.0   |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
|   | -   | Advanced Boring   INSTALLATION   Mobile District   Opf 3   | 1                        |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | _   |  | Subsurface Investigation |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             | LATILONG COORDINATES   LAT = 30.336813   LONG = -88.0     STATE PLANE COORDINATES   X = 1,802,521   Y = 122,875     FED |  |   |   |   |  |            |                 |                   |         |
| -   |   |  |                          |   |             |   | LATILONG COORDINATES   LAT = 30.336813   LONG = -88.1     STATE PLANE COORDINATES   X = 1,802,521   Y = 122,878     COORDINATE SYSTEM/DATUM/UNITS   HORIZ.   NADB3     ELEVATIONS   TOP OF BORING   -25.8 Feet   Underw.     MANUFACTURER'S DESIGNATION OF DRILL   AUTO HAM   MANUAL H.     SIZE AND TYPE OF BIT   See Remarks     TOTAL NUMBER CORE BOXES   0     TOTAL SAMPLES   DISTURBED   0   UNDISTURBED (U.     TOTAL RECOVERY FOR BORING   NOT RECORDED     REC.   SO  |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   |  |   |   | OF 3 ORDINATES LAT = 30.336813 LONG = -88. COORDINATES X = 1,802,521 Y = 122,87: SYSTEM/DATUM/UNITS HORIZ. Alabama West - U.S. Survey Ft. NAD83 ORDINATES TOP OF BORING GROUND Undervise SER'S DESIGNATION OF DRILL MANUAL HORIZ. DE OF BIT See Remarks  FRE CORE BOXES 0  JES DISTURBED 0 UNDISTURBED (U.M.)  JEC OF BIT REMARKS  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   |  |   |   |   | SE LAT = 30.336813 LONG = -88.0  IATES   |            |                 |                   |         |
| -   |   |  |                          |   |             |   |  |   |   |   | Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring |            |                 |                   |         |
| -   | -   |  |                          |   |             |   | LATILONG COORDINATES LAT = 30.336813 LONG = -88.1  STATE PLANE COORDINATES X = 1,802,521 Y = 122,876  COORDINATE SYSTEM/DATUM/UNITS State Plane - Alabama West - U.S. Survey Ft. NADB3 ELEVATIONS TOP OF BORING -25.8 Feet Underw. N/A SIZE AND TYPE OF BIT See Remarks  TOTAL NUMBER CORE BOXES  TOTAL SAMPLES DISTURBED TOTAL RECOVERY FOR BORING REC.  SOR BOD ADVANCEMENT REMARKS  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring  |   |   |   |  |            |                 |                   |         |
| -   |   |  |                          |   |             |   | Advanced Boring    Advanced Boring   Advanced Bo |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   |  |   | STALLATION Mobile District  OF 3  ONG COORDINATES LAT = 30.336813 LONG = -88.  E PLANE COORDINATES X = 1,802,521 Y = 122,875  RIDINATE SYSTEM/DATUM/UNITS HORIZ.  Plane - Alabama West - U.S. Survey Ft. NAD83  LEVATIONS TOP OF BORING -25,8 Feet Underwind MANUAL HORIZ.  UPACTURER'S DESIGNATION OF DRILL MANUAL HORIZ.  AND TYPE OF BIT See Remarks  AL NUMBER CORE BOXES 0  LL SAMPLES DISTURBED 0 UNDISTURBED (U.M. RECOVERY FOR BORING NOT RECORDED WITH METHOD REMARKS)  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring |   |  |            |                 |                   |         |
| -   |   |  |                          |   |             |   |  | LONG COORDINATES  LAT = 30.336813  LONG = -88  TE PLANE COORDINATES  X = 1,802,521  Y = 122,87  RDINATE SYSTEM/DATUM/UNITS Plane - Alabama West - U.S. Survey Ft.  Plane - Alabama West - U.S. Survey Ft.  Plane - Alabama West - U.S. Survey Ft.  LEVATIONS  TOP OF BORING -25.8 Feet Underwick  AL NUMBER CORE BOXES  AL SAMPLES  DISTURBED  DISTURBED  O  AL RECOVERY FOR BORING  ADVANCEMENT  BRILLING  REMARKS  Advanced Boring  Advanced Boring  Advanced Boring  Advanced Boring |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   |  |   |   | CORDINATES  LAT = 30.336813  LONG = -88.0  NE COORDINATES  X = 1,802,521  Y = 122,875  TE SYSTEM/DATUMUNITS - Alabama West - U.S. Survey Ft Alabama West - U.S. Survey Ft Alabama West - U.S. Survey Ft Alabama West - U.S. Survey Ft 25.8 Feet  Underwork Underwork Underwork  TOP OF BORING -25.8 Feet - Underwork Underwork Underwork  TOP OF BORING -25.8 Feet - Underwork Underwork  AUTO HAMM MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork MANUAL H.  TOP OF BORING -25.8 Feet - Underwork |  |            |                 |                   |         |
| _   |   |  |                          |   |             |   |  |   |   |   | ES LAT = 30.336813 LONG = -88.0  NATES   |            |                 |                   |         |
| -   |   |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          |   |             |   | -  |   |   |   |  |            |                 |                   |         |
| _   | -   |  |                          |   |             |   |  |   |   |   |  |            |                 | 0                 |         |
| -   | _   |  |                          |   |             |   | NR   |   |   | SPT Samp  | ler  |            |                 | 0                 | 0       |
| -   |   |  |                          |   |             |   |  |   |   |   |  |            |                 | 0                 |         |
| -   |   |  |                          |   |             |   | LATILONG COORDINATES   LAT = 30.336813   LONG = -86     STATE PLANE COORDINATES   X = 1,802,521   Y = 122.8     STATE PLANE COORDINATES   X = 1,802,521   Y = 122.8     STATE PLANE COORDINATES   X = 1,802,521   Y = 122.8     STATE PLANE COORDINATES   X = 1,802,521   Y = 122.8     STATE PLANE COORDINATES   X = 1,802,521   Y = 122.8     STATE PLANE COORDINATES   X = 1,802,521   Y = 122.8     MPLETED   COORDINATE SYSTEM/DATUM/UNITS   LATING     |   |   |   |  |            |                 |                   |         |
| -   | -   |  |                          | DIVISION   South Atlantic   INSTALLATION   Mobile District   Option |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | _   | LING LOG DIVISION SOUth Atlantic INSTALLATION Mobile District OF STATE PLANE COORDINATES (AT = 30.336813 LONG = -8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 Y = 122.8 STATE PLANE COORDINATES × = 1.802.521 PLANE COORDINATES × |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | -   | LING LOG DIVISION South Atlantic INSTALLATION Mobile District OF THE COMPLETED STATED COMPLETED STATE PLANE COORDINATES X = 1.80.2.514 Y = 1.22.81   |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| -   | ECT    STAFFER   LAT = 30.336813   LONG = .88   |  |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |
| PROJECT  1963-1964 Subsurface Investigation  DATE OF BORING  PROJECT  1963-1964 SUbsurface Investigation  DATE OF BORING  DIRECTION STAFFED  COMPLETED  DATE OF BORING  COPENHATE SUBSTITUTE SO 3036813 LONG - 8-86 LONG - 8- | <br> 45   | <u> </u>   |                          |   |             |   |  |   |   |   |  |            |                 |                   |         |

|                                      |                                | <u> </u> | oc (Cont. Shoot)              | INSTALL   | ATIO   | ١                |                 | ornig Boolghau        |                   | SHEET       | Γ 2               |         | 1                                     |
|--------------------------------------|--------------------------------|----------|-------------------------------|-----------|--------|------------------|-----------------|-----------------------|-------------------|-------------|-------------------|---------|---------------------------------------|
| DΚ                                   | ILLIN                          | G LU     | G (Cont. Sheet)               | Mobil     | e Dis  | trict            |                 |                       |                   | <b>OF</b> 3 | SHE               | ETS     |                                       |
| PROJEC                               | т                              |          |                               | COORDIN   | NATE   | SYSTE            | M/DAT           | UM                    | HORIZONTAL        |             | RTICA             | L       |                                       |
|                                      |                                |          |                               | State Pla | ne -   | Alabaı           | ma We           | est - U.S. Survey Ft. | NAD83             | M           | LLW               |         |                                       |
| LOCATI                               | ON COO                         | RDINAT   | ES                            | ELEVATI   | ON TO  | OP OF            | BORING          | G                     |                   |             |                   |         |                                       |
| X =                                  | 1,802,52                       | 21 Y     | = 122,875                     | -25.8     | Ft.    |                  |                 |                       |                   |             |                   |         |                                       |
| ELEV.                                | DEPTH                          | LEGEND   | CLASSIFICATION OF MATERIALS   |           | ĸč.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | S           | BLOWS/<br>0.5 FT. | N-VALUE |                                       |
| -<br>-<br>-<br>-<br>-                | -                              |          |                               |           |        |                  |                 | Advanced Boring       |                   |             |                   |         | - 10<br>-<br>-<br>-<br>- 11<br>-<br>- |
| -<br>-<br>-<br>-                     |                                |          |                               |           | NR     |                  |                 | SPT Sampler           |                   |             | 0 0               | 0       | 12<br>-<br>-<br>-<br>13<br>-          |
| -                                    |                                |          |                               |           |        |                  |                 | Advanced Boring       |                   |             |                   |         | - 14<br>15<br>15<br>16<br>17          |
| -<br>-<br>-<br>-                     | <br> -<br> -<br> -<br> -<br> - |          |                               |           | NR     |                  |                 | SPT Sampler           |                   |             | 0 0               | 0       | -<br>- 18<br>-<br>-<br>-              |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>- |                                |          |                               |           |        |                  |                 | Advanced Boring       |                   |             |                   |         | - 19<br>20<br>20<br>22<br>22          |
| -<br>-<br>-                          |                                |          |                               |           | NR     |                  |                 | SPT Sampler           |                   |             | 0                 | 0       | -<br>-<br>-2:<br>-                    |
| SAM F<br>AUG 201                     | ORM 7                          | 1836-    | A AFTER ▼ DURING ▼ DRILLING ▼ | (Cor      | ntinue | ed)              |                 | Boring De             | esignation        | SS-14       | 15                |         | -                                     |

| PROJECTION X = 1      | т                           | RDINAT<br>21 Y | CLASSIFICATION OF MATERIALS  | COORDII<br>State Pla<br>ELEVATI<br>-25.8 | ane - <i>i</i>                   | <b>syste</b><br>Alabaı | na We           | est - U.S. Survey Ft.   | HORIZONTAL<br>NAD83<br>DRILLIN<br>REMARK | М      | RTICAI<br>LLW       |         |                         |
|-----------------------|-----------------------------|----------------|--|--|----------------------------------|------------------------|-----------------|---|--|--------|---------------------|---------|-------------------------|
| LOCATION X = 1        | DN COOR<br>,802,52<br>DEPTH | 21 Y           | CLASSIFICATION OF MATERIALS  | State Pla<br>ELEVATI<br>-25.8            | ane - /<br>ION TO<br>Ft.<br>REC. | Alabaı<br>OP OF I      | ma We           | est - U.S. Survey Ft.   | NAD83                                    | М      | O BLOWS/            |         |                         |
| X = 1                 | ,802,52 <b>DEPTH</b>        | 21 Y           | CLASSIFICATION OF MATERIALS  | <b>ELEVATI</b><br>-25.8                  | Ft.                              | P OF                   | BORING          | ADVANCEMENT<br>METHOD   |  |        | G BLOWS/<br>0.5 FT. | N-VALUE |                         |
| X = 1                 | ,802,52 <b>DEPTH</b>        | 21 Y           | CLASSIFICATION OF MATERIALS  | -25.8                                    | Ft.                              |                        |                 | ADVANCEMENT<br>METHOD   | DRILLING<br>REMARK                       | G<br>S | 0                   | N-VALUE |                         |
| ELEV.                 | DEPTH                       | TEGEND         | CLASSIFICATION OF MATERIALS  |  | REC.                             | BOX OR<br>SAMPLE       | RQD<br>OR<br>UD |   | DRILLIN<br>REMARK                        | g<br>S | 0                   | N-VALUE |                         |
| -51.3                 | 25.5<br>-<br>-<br>-<br>25.5 |                | NOTES  |  | NR                               |                        |                 | SPT Sampler   | -  |        | 0                   | _       | ļ                       |
| -51.3                 | 25.5<br>-<br>-<br>25.5      |                | NOTES  |  |                                  |                        |                 |   | 1  |        |                     |         | <u> </u>                |
| -51.3                 |                             |                | NOTES  |  |                                  |                        |                 | Advanced Boring   |  |        |                     |         | -<br>-<br>-<br>-2       |
|                       |                             |                | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |  |                                  |                        |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). | -  |        |                     |         | -<br>2<br>-<br>-<br>-   |
| +                     | -<br>-<br>-                 |                |  |  |                                  |                        |                 |   |  |        |                     |         | -<br>-<br>-<br>-2<br>-  |
| +                     | -<br>-<br>-                 |                |  |  |                                  |                        |                 |   |  |        |                     |         | :<br>-<br>-<br>:<br>-   |
| †<br>†                | -<br>-                      |                |  |  |                                  |                        |                 |   |  |        |                     |         | -<br>-<br>-<br>-<br>-   |
|                       | -                           |                |  |  |                                  |                        |                 |   |  |        |                     |         | -;<br>-<br>-<br>-;<br>- |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-                 |                |  |  |                                  |                        |                 |   |  |        |                     |         | -<br>-;<br>-            |
| +                     | -                           |                |  |  |                                  |                        |                 |   |  |        |                     |         | -;<br>-<br>-<br>-;<br>- |
| 5AM F(<br>AUG 2017    |                             | 1836           | A AFTER ▼ DURING ▽ DRILLING □  |  |                                  |                        |                 | Boring De   |  | SS-14  |                     |         | F                       |

Project I.D. **Boring Designation** MHVBC-14-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.33480101 LONG = -88.02715384 STATE PLANE COORDINATES X = 1,802,200Y = 122,1452020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-17-20 01-17-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 20.0 Feet BLOWS/ BOX OF SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, dark gray, traces of shell from 0' to 1' At El. -50.0 Ft. sand lense At El. -50 Ft. -200=91%, PL=37, LL=65, PI=28, MC=153% 100 1 Vibracore DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

MHVBC-14-19

Boring Designation

Boring Designation MHVBC-14-19

| DR          | ILLIN                    | G LC      | G (Cont. Sheet)   | INSTAL<br>Mob | LATION<br>ile Dist |                  |                 |                       |                   | SHEET<br>OF 2 |                 | ETS     | ֡֝֟֝֟֝֟֝֟֝ <del>֚</del> |
|-------------|--------------------------|-----------|---|---------------|--------------------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|---------|-------------------------|
| ROJEC       |                          |           | -   | COORD         |                    |                  | M/DATU          | JM                    | HORIZONTAL        | <b>!</b>      | TICAL           |         | 1                       |
|             |                          |           |   | _             |                    |                  |                 | est - U.S. Survey Ft. | NAD83             | М             | LLW             |         | _                       |
|             | ON COOL                  |           |   | ELEVAT        |                    | P OF             | BORING          | •                     |                   |               |                 |         |                         |
| X = '       | 1,802,20<br>             |           | = 122,145   | -46.0         | ) Ft.              | νШ               |                 |                       | T                 |               | <u> </u>        | ш       | ┨                       |
| ELEV.       | DEPTH                    | LEGEND    | CLASSIFICATION OF MATERIALS   |               | ĸĚC.               | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>1 FT. | N-VALUE |                         |
| -<br>-56.5  | 10.5                     |           |   |               |                    |                  |                 |                       |                   |               |                 |         | Ī                       |
| -           | <br> -<br> -             |           | (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, inorganic traces of shell    | C,            |                    |                  |                 |                       |                   |               |                 |         |                         |
| -           | †<br>†<br> -             |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -           | <u>-</u><br>-            |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -<br>-<br>- |                          |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -<br>-<br>- |                          |           |   |               | 100                | 1                |                 | Vibracore             |                   |               |                 |         |                         |
| -<br>-      | -<br>-<br>-              |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -<br>-<br>- | <del> </del><br> -<br> - |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -           | <del> </del><br> -<br> - |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -           | †<br>-<br>-              |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| 6.0<br>-    | 20.0                     |           | NOTES:  |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -<br>-<br>- | <del> </del><br> -<br> - |           | Soils are field visually classified in accordance with the Unified Soils Classification System. |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -           | †<br>-<br>-              |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
| -           | †<br>-<br>-              |           |   |               |                    |                  |                 |                       |                   |               |                 |         |                         |
|             | <u> </u>                 | <br> 836- | A AFTER ▼ DURING ∇ DRILLING V   |               |                    |                  |                 |                       |                   |               |                 |         | ı                       |

Project I.D. Boring Designation **SS-147** 

| DRI              | LLIN               | G LO    | G D           | IVISIO             | N So             | uth Atlantic  | II      | IST/             | ALL/             | ATION Mo             | bile [           | District |                 | SHEET<br>OF 3    |                   | ETS     |                |
|------------------|--------------------|---------|---------------|--------------------|------------------|---------------|---------|------------------|------------------|----------------------|------------------|----------|-----------------|------------------|-------------------|---------|----------------|
| PROJ             | ECT                |         | l             |                    |                  |               | LAT     | /LONG            | COOR             | DINATES LAT =        | 30.33            | 31543    |                 |                  |                   |         | 1              |
| 19               | 63-196             | 4 Subs  | surface Ir    | nvestigati         | on               |               | STA     | TE PLA           | ANE CO           | OORDINATES           | = 1,80           | )1,719   | Y = 12          | 20,962           |                   |         |                |
|                  | OF BO              |         |               |                    | ARTED            | COMPLETED     |         |                  |                  | STEM/DATUM/UNI       |                  | vov Et   | HORI            |                  | VER               |         |                |
| DPILI            | LING AG            | ENCY    | C             | orno of En         | ginooro (        | CESAM         |         |                  | e - Ala<br>ATION | bama West - U.S      | o. Sur<br>OF BOR |          | NAD8            | DUND W           | MLL<br>ATE        |         | 1              |
|                  |                    |         | D INSPECT     | orps of En         |                  | IE OF DRILLER |         |                  |                  | -28                  | 8.8 Fee          |          |                 | Inderwa          |                   |         | -              |
| , traine         |                    | I/A, Ge |               |                    | NAM              | N/A           | N.      |                  |                  | o beolonarion        | J. J             |          |                 | O HAMN<br>UAL HA |                   | ER      |                |
|                  | TION OF<br>VERTICA |         | INCLINED      | DEG<br>VER         | . FROM<br>RTICAL | BEARING       | SIZI    | E AND            | TYPE C           | DF BIT Se            | ee Rer           | marks    |                 |                  |                   |         |                |
| тніск            | NESS OF            | OVERB   | URDEN         | N/A                |                  |               | тот     | AL NU            | MBER             | CORE BOXES           | 0                |          |                 |                  |                   |         |                |
| DEPTH            | і то тор           | OF ROC  | K             | N/A                |                  |               | тот     | AL SA            | MPLES            | DISTURBED            | 0                | UNE      | DISTURE         | BED (UD          | ) (               | 0       |                |
| TOTAL            | DEPTH              | OF BORI | NG            | 22.5 I             | Feet             |               | тот     | AL RE            | COVER            | Y FOR BORING         | Not              | Recorde  | ed              |                  |                   |         |                |
| ELEV.            | DEPTH              | LEGEND  | CL            | _ASSIFICAT         | ION OF MA        | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD  | ADVANCEMEN<br>METHOD | iT               | DR<br>RE | ILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |                |
| 00.5             |                    |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | 1              |
| -28.8            | 0.0                |         | (CH) CL       | AY, fat, hiç       | gh plastici      | ty, very soft |         |                  |                  |                      |                  |          |                 |                  |                   |         | -0             |
|                  | <u> </u>           |         | consister     | ncy, wet, g        | ray,             |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -              |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -<br>-1        |
|                  |                    |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | L              |
| -                | Į.                 |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | F              |
| -                | <del> </del>       |         |               |                    |                  |               |         |                  |                  | Advanced Bor         | ing              |          |                 |                  |                   |         | -2<br>-        |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -              |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -3             |
| :                | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         |                |
| -                |                    |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | ŀ.,            |
| -                | <b>†</b>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  | 0                 |         | <del>  4</del> |
|                  | <u> </u>           |         |               |                    |                  |               | NR      |                  |                  | SPT Sample           | or               |          |                 | F                | 0                 |         | _              |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  | Or i Gample          | 7                |          |                 | -                |                   | 0       | -5             |
|                  | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 | L                | 0                 |         | ‡              |
| -                | L                  |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -              |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | <del>-</del> 6 |
| ] :              | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | ļ              |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -7             |
| -                | [                  |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | -              |
| -                | <u> </u>           |         |               |                    |                  |               |         |                  |                  | Advanced Bor         | ing              |          |                 |                  |                   |         | -<br>-8        |
| -                | -                  |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | F              |
| ] :              | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | ļ              |
| -                | ŀ                  |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | <b>-</b> 9     |
| ] .              | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | F              |
|                  | <u> </u>           |         |               |                    |                  |               |         |                  |                  |                      |                  |          |                 |                  |                   |         | 上₁             |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AFTE<br>DRILL | ER ▼ L<br>LING ▼ L | DURING S         | <u> </u>      | ontinue | ed)              |                  | Boring               | Des              | ignatio  | on S            | S-147            | 7                 |         |                |

| ŊΡ                                  | II I ING         | 2100   | G (Cont. Sheet)   | INSTAL |         |                  |                 |  |                   | SHEE   | <b>T</b> 2        |          | 1  |
|-------------------------------------|------------------|--------|---|--------|---------|------------------|-----------------|--|-------------------|--------|-------------------|----------|--|
|                                     |                  | LOC    | (Cont. Sheet)   |        | le Dis  |                  |                 |  |                   | OF 3   |                   |          | 4  |
| PROJEC                              | CT               |        |   | COORDI |         |                  |                 |  | HORIZONTAL        |        | RTICA<br>ILLW     | L        |  |
| LOCATI                              | ON COORI         | DINATE |   | ELEVAT |         |                  |                 | est - U.S. Survey Ft.                                      | NAD83             | I IV   | ILLVV             |          | 1  |
|                                     | 1,801,719        |        |   | -28.8  |         | JP OF I          | BURING          | •  |                   |        |                   |          |  |
| ELEV.                               | DEPTH            | LEGEND | CLASSIFICATION OF MATERIALS   | 20.0   | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                                      | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>0.5 FT. | 4-VALUE  |  |
| -<br>-<br>-<br>-                    |                  |        |   |        |         |                  |                 | Advanced Boring  |                   |        |                   | <u>-</u> | -1<br>-<br>-<br>-<br>-1  |
| -<br>-<br>-<br>-                    | †<br>†<br>†<br>† |        |   |        | NR      |                  | •               | SPT Sampler  |                   |        | 0 0               | 0        | †<br> -<br> 1<br> -<br> -  |
| -<br>-<br>-<br>-<br>-<br>-          |                  |        |   |        |         |                  |                 | Advanced Boring  |                   |        |                   |          |  |
| -<br>-<br>-<br>-<br>-               |                  |        |   |        |         |                  |                 |  | _                 |        | 0                 |          | -<br>-<br>-<br>-<br>-  |
| -<br>-<br>-                         |                  |        |   |        | NR      |                  |                 | SPT Sampler  |                   |        | 0                 | 0        | -<br> -<br> -  |
| -<br>-<br>-<br>-<br>-<br>-<br>-51.3 | 22.5             |        |   |        |         |                  |                 | Advanced Boring  |                   |        |                   |          | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |
| -<br>-<br>-                         | -<br>-<br>-      |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils |        |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon |                   |        |                   | _        | -<br> -<br> -2<br> -   |
| SAM F                               | ORM 18           | 836-A  | AFTER ▼ DURING ▽ DRILLING □   | (Co    | ontinue | ed)              |                 | Boring De  | esignation        | SS-1   | 47                |          |  |

| Mobile District  | PROJECT             |     | COORDI    |        |                  | M/DATI   |                       |                   |      |                   | TS      |
|--|---------------------|-----|-----------|--------|------------------|--|-----------------------|-------------------|------|-------------------|---------|
| State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW  LOCATION COORDINATES  X = 1,801,719 Y = 120,962  CLASSIFICATION OF MATERIALS  PRODUCTION OF MATERIALS  REC. OR OF METHOD  ADVANCEMENT METHOD  ADVANCEMENT METHOD  DRILLING REMARKS  REC. OR OF METHOD  DRILLING REMARKS  REC. OR OF METHOD  DRILLING REMARKS  REC. OR OF METHOD  DRILLING REMARKS  DRILLING REMARKS  DRILLING REMARKS   | OCATION COORDINATES |     |           | NATE : | SYSTE            | BA/DATI  |                       |                   |      |                   |         |
| CCATION COORDINATES  X = 1,801,719 Y = 120,962  CLASSIFICATION OF MATERIALS  ELEVATION TOP OF BORING  -28.8 Ft.  CLASSIFICATION OF MATERIALS  REC. OR OR OR OR OR OR OR OR OR OR OR OR OR  |                     |     | ICtoto Di | ana    |                  |  |                       |                   |      |                   |         |
| X = 1,801,719 Y = 120,962 -28.8 Ft.  ELEV. DEPTH   |                     |     |           |        |                  |  |                       | NAD63             | IVIL | LVV               |         |
| ELEV. DEPTH OF CLASSIFICATION OF MATERIALS ROD OR DOWN METHOD OF MATERIALS ROD OR METHOD OF METH |                     | 962 | 1         |        | P OF I           | BURING   | •                     |                   |      |                   |         |
|  |                     |     | 20.0      |        | BOX OR<br>SAMPLE | RQD<br>OR<br>UD  | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | S    | BLOWS/<br>0.5 FT. | N-VALUE |
|  |                     |     |           | REC.   | BOX OR           | POR DE CONTROL DE CONT |                       | DRILLIN           |      | BLOWS:<br>0.5 FT. | N-VALUE |

Project I.D. **Boring Designation** MHVBC-13-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.32946113 LONG = -88.02830475 STATE PLANE COORDINATES X = 1,801,827Y = 120,2042020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. **DATE OF BORING** 01-17-20 01-17-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -46.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** TOTAL RECOVERY FOR BORING 100 % 19.0 Feet BLOWS/ BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -46.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, black, 3.5 -49.5 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, traces of shell, inorganic 100 1 Vibracore At El. -53 Ft. -200=97%, PL=34, LL=70, PI=36, MC=112% DRILLING ∑ DRILLING ב

(Continued)

MHVBC-13-19

Boring Designation

**SAM FORM 1836** 

**AUG 2017** 

DRILLING T

Boring Designation MHVBC-13-19

| COORDINATE SYSTEM/DATUM State Plane - Alabama West - U.S. Survey Ft.  NAD83  LOCATION COORDINATES  X = 1,801,827 Y = 120,204  CLASSIFICATION OF MATERIALS  RELEV. DEPTH  GRAPH CLASSIFICATION OF MATERIALS  (SC) SAND, clayey, soft consistency, wet, dark gray  (SC) SAND, clayey, soft consistency, wet, dark gray  | 2 SHEETS RTICAL //LLW      | VEI     | HORIZONTAL V<br>NAD83   | est - U.S. Survey Ft.<br><b>G</b> | ma We     | SYSTE<br>Alabaı<br>OP OF I | inate<br>lane - | COORE   |  | G LC                                    |          |       |
|---|----------------------------|---------|-------------------------|-----------------------------------|-----------|----------------------------|-----------------|---------|--|---|----------|-------|
| State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLV  LOCATION COORDINATES  X = 1,801,827 Y = 120,204  CLASSIFICATION OF MATERIALS  REC. REC. REC. REC. REC. REC. REC. REC.  | /ILLW                      | M       | NAD83                   | est - U.S. Survey Ft.<br><b>G</b> | ma We     | Alabaı<br>OP OF I          | lane -          |         |  |   | T .      | PROJE |
| ELEV. DEPTH DEPTH CLASSIFICATION OF MATERIALS REC. DEPTH DEPTH CLASSIFICATION OF MATERIALS REC. DEPTH | BLOWS/<br>1 FT.<br>N-VALUE | 1       | I                       | G                                 | BORING    | OP OF                      | ION T           |         |  |   |          |       |
| ELEV. DEPTH BY CLASSIFICATION OF MATERIALS REC. 2 ROD OR OR OWN METHOD  ADVANCEMENT PRINTING REMARKS  SEC. 2 ROD ON ADVANCEMENT PRINTING REMARKS  SEC. 2 ROD ON ADVANCEMENT PRINTING REMARKS  SEC. 2 ROD ON ADVANCEMENT PRINTING REMARKS  SEC. 2 ROD ON ADVANCEMENT PRINTING REMARKS  SEC. 2 ROD ON ADVANCEMENT PRINTING REMARKS  | BLOWS/<br>1 FT.<br>N-VALUE | <u></u> | DRILLING<br>REMARKS     | ADVANCEMENT<br>METHOD             | RQD<br>OR | αш                         | ) Ft.           | _       | TES  | RDINAT                                  | ON COO   | LOCAT |
| -59.5 13.5  (SC) SAND, clayey, soft consistency, wet, dark gray   | BLOWS/<br>1 FT.<br>N-VALUE | 3       | DRILLING<br>REMARKS     | ADVANCEMENT<br>METHOD             | RQD       | R                          |                 | -46     | = 120,204  | 27 Y                                    | 1,801,82 | X =   |
| (SC) SAND, clayey, soft consistency, wet, dark gray   |                            |         |                         |                                   | ŬĎ        | BOX O                      | REC.            | ;       | CLASSIFICATION OF MATERIALS  | LEGEND                                  | DEPTH    | ELEV. |
| At El62.0 Ft., soft consistency, wet, dark gray  At El62.0 Ft., soft consistency, wet, dark gray  At El62.0 Ft., soft consistency, wet, dark gray  (SM) SAND, silty, soft consistency, wet, dark gray  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System.   |                            |         | PL=14, LL=29,<br>PI=15, | Vibracore                         | UB        |                            |                 | /, wet, | (SC) SAND, clayey, soft consistency, dark gray  At El62.0 Ft., soft consistency, wet, gray  (SM) SAND, silty, soft consistency, w dark gray  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils | TEG TEG TEG TEG TEG TEG TEG TEG TEG TEG | 13.5     | -63.0 |

Project I.D. Boring Designation **SS-149** 

| DRI              | LLIN               | G LO   | G        | DIVI           | SION         | l Sou         | uth Atlantic  | II       | IST/             | ALL/            | ATION Mobile                           | District       |                  | SHEET<br>OF 2   |                   | ETS     |                 |
|------------------|--------------------|--------|----------|----------------|--------------|---------------|---------------|----------|------------------|-----------------|--|----------------|------------------|-----------------|-------------------|---------|-----------------|
| PROJ             | ECT                |        |          |                |              |               |               | LAT      | /LONG            | COOR            | DINATES LAT = 30.                      | 325992         |                  |                 |                   |         | 1               |
| 19               | 63-196             | 4 Subs | surface  | e Inves        | stigatio     | n             |               | STA      | TE PLA           | ANE CO          | <b>DORDINATES</b> $X = 1$ ,            | 801,735        | Y = 11           | 18,943          |                   |         |                 |
| DATE             | OF BOI             | RING   |          |                | STAI         | RTED          | COMPLETED     |          |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | ırvev Ft       | HORIZ<br>NAD8    |                 | <i>VER</i><br>MLL |         |                 |
| DRILI            | LING AG            | ENCY   |          | Corps          | of Eng       | ineers - (    | CESAM         |          |                  | ATIO!           | NS TOP OF BE                           | DRING          | GRO              | UND I           | VATE              | R       | 1               |
|                  | & TITLE            |        |          |                | 01 2.19      |               | E OF DRILLER  |          |                  |                 | -34.8 F                                |                |                  | nderw<br>D HAMI |                   |         | -               |
|                  |                    |        | eologist |                |              |               | N/A           | N.       | /A               |                 |  | ָ <u></u>      |                  | UAL HA          |                   | ER      | ]               |
|                  | TION OF<br>VERTICA |        |          | ED             | DEG.<br>VERT | FROM<br>FICAL | BEARING       | SIZI     | E AND            | TYPE C          | OF BIT See R                           | emarks         |                  |                 |                   |         |                 |
| тніск            | NESS OF            | OVERB  | BURDEN   |                | N/A          |               |               | тот      | AL NU            | MBER            | CORE BOXES (                           | )              |                  |                 |                   |         |                 |
| DEPTH            | і то тор           | OF ROO | CK       |                | N/A          |               |               | тот      | AL SA            | MPLES           | <b>DISTURBED</b> (                     | UNI            | DISTURB          | ED (UD          | ) (               | 0       |                 |
| TOTAL            | DEPTH              |        | ING      |                | 16.5 F       | eet           |               | тот      |                  | COVER           | Y FOR BORING No                        | t Record       | ed               |                 |                   |         |                 |
| ELEV.            | DEPTH              | LEGEND |          | CLASS          | IFICATIO     | ON OF MA      | TERIALS       | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DR<br>RE       | RILLING<br>MARKS |                 | BLOWS/<br>0.5 FT. | N-VALUE |                 |
| -34.8            | 0.0                |        |          |                |              |               |               |          |                  |                 |  |                |                  | $\dashv$        |                   |         |                 |
| -34.6            | 0.0                |        | (CH)     | CLAY,          | fat, higl    | h plastici    | ty, very soft |          |                  |                 |  |                |                  |                 |                   |         | -0<br>-         |
| -                | <u> </u>           |        | consis   | stency,        | wet, gra     | ay,           |               |          |                  |                 |  |                |                  |                 |                   |         | -               |
| -                | [                  |        |          |                |              |               |               |          |                  |                 | Advanced Boring                        |                |                  |                 |                   |         | -1              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         |                 |
| -                |                    |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | -               |
| -                | -                  |        |          |                |              |               |               |          |                  |                 |  | 1              |                  |                 | 0                 |         | -<br>-          |
| -                | _                  |        |          |                |              |               |               | NR       |                  |                 | SPT Sampler                            |                |                  | ŀ               | 0                 |         | -               |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 | Or i Gampiei                           |                |                  | F               |                   | 0       | -3              |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  | 1              |                  |                 | 0                 |         | ‡               |
| -                | L                  |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | -<br>-4         |
|                  | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | "               |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | -               |
| _                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | -5              |
|                  | [                  |        |          |                |              |               |               |          |                  |                 | Advanced Boring                        |                |                  |                 |                   |         | Ē               |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | -<br>-6         |
| -                | <u> </u><br>       |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | <u> </u>        |
|                  | Ī                  |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | -               |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 |                   |         | <del>-</del> 7  |
|                  | <u> </u>           |        |          |                |              |               |               |          |                  | $\mathbf{I}$    |  | -              |                  | }               |                   |         | +               |
| -                | ‡                  |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 | 0                 |         | -<br>-8         |
| -                | ł                  |        |          |                |              |               |               | NR       |                  |                 | SPT Sampler                            |                |                  |                 | 0                 | 0       | E               |
| ] :              | <u> </u>           |        |          |                |              |               |               |          |                  |                 |  |                |                  |                 | 0                 | 0       | Ē               |
| -                | <u> </u>           |        |          |                |              |               |               |          |                  | 1               |  | 1              |                  |                 |                   |         | <del> </del> -9 |
| :                | -                  |        |          |                |              |               |               |          |                  |                 | Advanced Boring                        |                |                  |                 |                   |         | ŀ               |
| SAM F<br>AUG 201 | I<br>ORM 1         | 1836   | AF<br>DF | TER<br>RILLING | ▼ DI         | URING S       | <u>Z</u> (    | Continue | <b>L</b><br>∋d)  | I               | Boring De                              | l<br>esignatio | on S             | S-14            | 9                 |         | <b>L</b> 1      |

| DR                    | ILLIN                          | G LC   | OG (Cont. Sheet)   | INSTALI |        |                  |                 |   |                   | SHEET   |                   | = <b>T</b> ^ | ] |
|-----------------------|--------------------------------|--------|--|---------|--------|------------------|-----------------|---|-------------------|---------|-------------------|--------------|---|
| PROJEC                |                                |        | •  | COORDI  | le Dis |                  | M/DAT           | IIM   | HORIZONTAL        | OF 2    | SHE               |              | 1 |
| PROJEC                | •1                             |        |  |         |        |                  |                 | est - U.S. Survey Ft.   | NAD83             | 1       | LLW               |              |   |
| LOCATI                | ON COO                         | RDINAT | 'ES  | ELEVAT  |        |                  |                 |   | 10.000            |         |                   |              | 1 |
|                       |                                |        | = 118,943  | -34.8   |        |                  |                 |   |                   |         |                   |              |   |
| ELEV.                 | DEPTH                          | Q      | CLASSIFICATION OF MATERIALS  |         | REC.   | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE      |   |
|                       | -                              |        |  |         |        |                  |                 | Advanced Boring   |                   |         |                   |              |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>-          |        |  |         | NR     |                  |                 | SPT Sampler   |                   |         | 0 0               | 0            |   |
| -<br>-<br>-51.3       | 16.5                           |        |  |         |        |                  |                 | Advanced Boring   |                   |         |                   |              | - |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-          |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |        |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |              |   |
| -<br>-<br>-           | †<br>-<br>-                    |        |  |         |        |                  |                 |   |                   |         |                   |              | - |
| -<br>-<br>-           | <del> </del><br> -<br> -       |        |  |         |        |                  |                 |   |                   |         |                   |              | - |
| -<br>-<br>-           | <u>-</u><br>-<br>-             |        |  |         |        |                  |                 |   |                   |         |                   |              | - |
| -<br>-<br>-<br>-      | <del> </del><br> -<br> -<br> - |        |  |         |        |                  |                 |   |                   |         |                   |              |   |
|                       | 1                              |        |  |         |        |                  |                 |   |                   |         |                   |              | F |
| A B / E               | ORM 1                          | 1836-  | A AFTER ▼ DURING ∑ DRILLING □  |         |        | •                | •               | Boring De   | olanotica         | SS-14   | -                 |              | _ |

Project I.D. **Boring Designation** VC-40-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 3 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.324161 LONG = -88.028824 STATE PLANE COORDINATES X = 1,801,655Y = 118,2771982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -42.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 28.7 Feet ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -42.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black, with organic material At El. -45.5 Ft., soft consistency, gray 100 1 Vibracore

(Continued)

Boring Designation

VC-40-84

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**SAM FORM 1836** 

**AUG 2017** 

Boring Designation VC-40-84

|                    |                                   | I                  |           |                  | ь               | oring Designatio      | )II <b>V</b> (    | J-4U-04       |                 | _          |
|--------------------|-----------------------------------|--------------------|-----------|------------------|-----------------|-----------------------|-------------------|---------------|-----------------|------------|
| DRILLING LO        | G (Cont. Sheet)                   | INSTALLA<br>Mobile |           |                  |                 |                       |                   | SHEET<br>OF 3 |                 | TS         |
| ROJECT             |                                   | COORDINA           |           |                  | M/DATI          | JM T                  | HORIZONTAL        | 1             | TICAL           | _          |
|                    |                                   | 1                  |           |                  |                 | est - U.S. Survey Ft. |                   |               | LW              |            |
| DCATION COORDINATE | s                                 | ELEVATIO           |           |                  |                 |                       |                   |               |                 |            |
| X = 1,801,655 Y =  | 118,277                           | -42.0 F            |           |                  |                 |                       |                   |               |                 |            |
| ELEV. DEPTH        | CLASSIFICATION OF MATERIALS       | R                  | %<br>REC. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S       | BLOWS/<br>1 FT. | N-VALUE    |
|                    | At El58.0 Ft., medium consistency |                    | 100       | 1 1              |                 | Vibracore             |                   |               |                 | 1 <u>2</u> |

Boring Designation VC-40-84

| DRI                   | ILLIN                 | G LO   | G (Cont. Sheet)  | INSTAL   |         |        |                 |                       |                   | SHEET   |                 |         |   |
|-----------------------|-----------------------|--------|--|----------|---------|--------|-----------------|-----------------------|-------------------|---------|-----------------|---------|---|
| PROJEC                |                       |        | 7  | COORD    | ile Dis |        | M/DAT           | UM I                  | HORIZONTAL        | OF 3    | SHEE            |         | 1 |
|                       |                       |        |  |          |         |        |                 | est - U.S. Survey Ft. |                   |         | LW              |         |   |
| LOCATI                | ON COO                | RDINAT | ES   | ELEVA1   |         |        |                 |                       |                   |         |                 |         | 1 |
| X = ′                 | 1,801,65              | 5 Y    | = 118,277  | -42.0    | ) Ft.   |        |                 |                       |                   |         |                 |         |   |
| ELEV.                 | DEPTH                 | LEGEND | CLASSIFICATION OF MATERIALS  | <b>3</b> | REC.    | BOX OR | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>1 FT. | N-VALUE |   |
|                       | -<br>-<br>-<br>-<br>- |        |  |          |         |        |                 |                       |                   |         |                 |         |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>- |        |  |          | 100     | 1      |                 | Vibracore             |                   |         |                 |         |   |
| -70.7                 | 28.7                  |        |  |          |         |        |                 |                       | _                 |         |                 |         |   |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | 1        |         |        |                 |                       |                   |         |                 |         |   |
| -<br>-<br>-<br>-      | †<br>†<br>†<br>†      |        |  |          |         |        |                 |                       |                   |         |                 |         |   |
| -<br>-<br>-           | -<br>-<br>-           |        |  |          |         |        |                 |                       |                   |         |                 |         |   |
| -                     | <br> -<br> -<br> -    |        |  |          |         |        |                 |                       |                   |         |                 |         |   |
| -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>- |        |  |          |         |        |                 |                       |                   |         |                 |         |   |
| -                     | +                     |        | A AFTER ▼ DURING ▼ DRILLING ▼  |          |         |        |                 |                       |                   |         |                 |         |   |

Project I.D. **Boring Designation** MHVBC-12-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.32201493 LONG = -88.02894799 STATE PLANE COORDINATES X = 1,801,612Y = 117,4972020 Geotechnical Investigation COORDINATE SYSTEM/DATUM/UNITS STARTED COMPLETED HORIZ. VERT. **DATE OF BORING** 01-17-20 01-17-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER **TOP OF BORING DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -49.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR MANUFACTURER'S DESIGNATION OF DRILL NAME OF DRILLER ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING BEARING DEG. FROM VERTICAL SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A **DEPTH TO TOP OF ROCK** N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING** TOTAL RECOVERY FOR BORING 100 % 18.0 Feet BLOWS/ BOX OF SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -49.0 0.0 (MH) SILT, inorganic-H, high plasticity, very soft consistency, wet, black, with shell At El. -51.0 Ft., soft consistency, dark gray -52.0 3.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, traces of sand and shell, inorganic 100 1 Vibracore At El. -56 Ft. -200=99.2%, PL=29, LL=61, PI=32, MC=112% DRILLING ∑ DRILLING ב **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

Boring Designation

MHVBC-12-19

Boring Designation MHVBC-12-19

| DRI                  | ILLIN            | G LC   | DG (Cont. Sheet)   | INSTAL   |         |                  |                 |                             |   | SHEE   |               |         |                         |
|----------------------|------------------|--------|--|----------|---------|------------------|-----------------|-----------------------------|---|--|---------------|---------|-------------------------|
| PROJEC               |                  |        |  | COORD    | ile Dis |                  | M/DAT           | INA                         | HORIZONTAL  | <del>                                     </del> | 2 SHE         |         | 4                       |
| PRUJEC               | , 1              |        |  |          |         |                  |                 | ом<br>est - U.S. Survey Ft. |   | l .  | RTICA<br>1LLW |         |                         |
| LOCATION             | ON COO           | RDINAT | res  | ELEVA    |         |                  |                 |                             | 1.0.00  |  |               |         | 1                       |
| X = 1                | 1,801,61         | 12 Y   | ′ = 117,497  | -49.     | 0 Ft.   |                  |                 |                             |   |  |               |         |                         |
| ELEV.                | DEPTH            | LEGEND | CLASSIFICATION OF MATERIALS  | <b>.</b> | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD       | DRILLIN<br>REMARK   | G<br>(S  | BLOWS/        | N-VALUE |                         |
| -62.0                | 13.0             |        | (CL) CLAY, lean, low plasticity, soft  |          |         |                  |                 |                             |   |  |               |         |                         |
| -<br>-<br>-<br>-65.0 |                  |        | consistency, wet, dark gray, inorgani  | ic       | 100     | 1                |                 | Vibracore                   | At El63 F<br>-200=52%,<br>PL=20, LL=<br>PI=24, MC=<br>53% | :44,   |               |         |                         |
| -67.0                | 18.0             |        | (SC) SAND, clayey, soft consistency<br>dark gray, inorganic  | /, wet,  |         |                  |                 |                             |   |  |               |         |                         |
| -<br>-<br>-<br>-     | -<br>-<br>-<br>- |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | 1        |         |                  |                 |                             |   |  |               |         | -<br>-<br>-<br>-        |
| -<br>-<br>-<br>-     | -<br>-<br>-<br>- |        |  |          |         |                  |                 |                             |   |  |               |         | -;<br>-<br>-<br>-<br>-; |
| -<br>-<br>-<br>-     | -<br>-<br>-<br>- |        |  |          |         |                  |                 |                             |   |  |               |         |                         |
| SAM F<br>AUG 2017    | ORM '            | 1836-  | A AFTER ▼ DURING ▼ DRILLING  |          |         |                  |                 | Boring De                   | esignation  | MHV  | BC-1          | 12-1    | }                       |

Project I.D. Boring Designation SS-151

| DRI              | LLIN               | G LO    | G I      | DIVIS        | SION           | l Sou       | uth Atlantic  | IN      | IST/             | <b>ALL</b>      | ATION Mobile                           | Distric   | t I              | SHEET<br>OF 2    |                   | ETS     |                |
|------------------|--------------------|---------|----------|--------------|----------------|-------------|---------------|---------|------------------|-----------------|--|-----------|------------------|------------------|-------------------|---------|----------------|
| PROJ             | ECT                |         |          |              |                |             |               | LAT     | /LONG            | COORI           | DINATES LAT = 30.                      | 320444    |                  |                  |                   |         | 1              |
| 19               | 63-196             | 4 Subs  | surface  | Investi      | igatio         | n           |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1,                      | 801,750   | Y = 1            | 16,925           |                   |         | 1              |
| DATE             | OF BOI             | RING    |          |              | STAR           | RTED        | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORIZ<br>NAD8    |                  | <i>VER</i><br>MLL |         |                |
| DRILI            | LING AG            | ENCY    | (        | Corps o      | of Engi        | neers - (   | CESAM         |         |                  | ATION           | NS TOP OF B                            | ORING     | GRO              | OUND W           | ATE               |         | 1              |
|                  |                    |         | D INSPEC |              |                |             | E OF DRILLER  |         |                  |                 | -32.3 F                                |           |                  | nderwa<br>D HAMI |                   |         | 1              |
|                  |                    | I/A, Ge |          |              |                |             | N/A           | N,      | /A               |                 |  | į         |                  | UAL HA           |                   | ER      | ]              |
|                  | TION OF<br>VERTICA |         | INCLINE  | D            | DEG. F<br>VERT | ROM<br>ICAL | BEARING       | SIZE    | E AND            | TYPE O          | OF BIT See F                           | lemarks   |                  |                  |                   |         |                |
| тніск            | NESS OF            | OVERB   | URDEN    | 1            | N/A            |             |               | тот     | AL NU            | MBER (          | CORE BOXES                             | )         |                  |                  |                   |         | 1              |
| DEPTH            | і то тор           | OF ROC  | K        | 1            | N/A            |             |               | тот     | 'AL SAI          | MPLES           | DISTURBED (                            | UNI       | DISTURB          | ED (UD           | ) (               | 0       |                |
| TOTAL            | DEPTH              |         | NG       | 1            | 9.0 Fe         | eet         |               | тот     |                  | COVER           | Y FOR BORING N                         | ot Record | ed               |                  |                   |         | 4              |
| ELEV.            | DEPTH              | LEGEND  | c        | CLASSIF      | ICATIO         | N OF MA     | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DF<br>RE  | RILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |                |
| -32.3            | 0.0                |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | 1              |
| -32.3            | 0.0                |         | (CH) C   | LAY, fa      | nt, high       | plastici    | ty, very soft |         |                  |                 |  |           |                  | $\neg$           |                   |         | -0<br>-        |
| -                | <u> </u>           |         | consiste | ency, w      | et, gra        | ıy,         |               |         |                  |                 |  |           |                  |                  |                   |         | ŀ              |
| -                | [                  |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | -1             |
|                  | <u> </u>           |         |          |              |                |             |               |         |                  |                 | Advanced Boring                        |           |                  |                  |                   |         | L              |
| -                | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | -              |
| -<br>  -         | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | -2<br>-        |
| -                | _                  |         |          |              |                |             |               |         |                  |                 |  | 1         |                  | ┢                | 0                 |         | t              |
| _                | [<br>-             |         |          |              |                |             |               |         |                  |                 |  |           |                  | F                | U                 |         | -3             |
|                  | <u> </u>           |         |          |              |                |             |               | NR      |                  |                 | SPT Sampler                            |           |                  | L                | 0                 | 0       | ļ              |
| -                | _                  |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  | 0                 |         | L              |
| -                | F                  |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | <b>├</b> ⁴     |
| -                | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | ļ              |
| -                | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | -5             |
|                  | [                  |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | Ē              |
| -                |                    |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | -<br>-6        |
| -                |                    |         |          |              |                |             |               |         |                  |                 | Advanced Boring                        |           |                  |                  |                   |         | ŀ              |
|                  | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | ļ              |
| -                | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | <b>-</b> 7     |
| ] .              | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | F              |
| -                | _                  |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | -<br>-8        |
| -                | <u> </u>           |         |          |              |                |             |               |         |                  |                 |  |           |                  |                  |                   |         | F              |
| ] :              | Ţ                  |         |          |              |                |             |               |         |                  | ]               |  | 1         |                  |                  | 0                 |         | F              |
| -<br>  .         | <u> </u>           |         |          |              |                |             |               | NR      |                  |                 | SPT Sampler                            |           |                  |                  | 0                 |         | -9<br>-        |
| -                | }                  |         |          |              |                |             |               |         |                  |                 |  |           |                  | -                |                   | 0       | ŀ              |
|                  |                    | 1990    | 1 45-    | -            | :              | 1D1110 5    | <del></del>   |         | <u> </u>         |                 | _                                      | 1         |                  |                  | 0                 |         | $\mathbf{L}_1$ |
| SAM F<br>AUG 201 | UKINI 1<br>7       | 1836    | DRII     | TER<br>LLING | DL<br>DF       | JRING S     | <u> </u>      | ontinue | ed)              |                 | Boring De                              | esignati  | on <b>S</b>      | S-15             | 1                 |         |                |

| PROJECT  COORDINATE SYSTEMIDATUM State Plane - Alabama West - U.S. Survey Ft.  NAD83  VERTICAL NAD83  VERTICAL NAD83  MILLW  LOCATION COORDINATES  X = 1.801,750 Y = 116,925  ELEV. DEPTH | DR                               | ILLIN                           | G LC   | OG (Cont. Sheet)   | INSTAL   |    |                  |                 | oning Designation   |                   | SHEE   |                   | FTC     | 1 |
|---|----------------------------------|---------------------------------|--------|--|--|----|------------------|-----------------|---|-------------------|--|-------------------|---------|---|
| State Plane - Alabama West - U.S. Survey Ft   |                                  |                                 |        | ,  | <del>                                     </del> |    |                  | M/DAT           | 1184  | HODIZONTAL        | <del>                                     </del> |                   |         | 1 |
| ELEV. DEPTH   Section     | PROJEC                           | • 1                             |        |  | 1  |    |                  |                 |   |                   |  |                   | -       |   |
| X = 1,801,750   Y = 116,925   -32.3 Ft.   | LOCATI                           | ON COOL                         | RDINAT | 'ES  |  |    |                  |                 |   | 10.000            |  |                   |         | 1 |
| ELEV. DEPTH By CLASSIFICATION OF MATERIALS REC. 50 Rgb ADVANCEMENT PRINTING REMARKS BY SPT Sampler  NR SPT Sampler  NOTES: 1. Solls are field visually classified in accordance with the Unified Solis  NOTES: 1. Solis are field visually classified in accordance with the Unified Solis  NOTES: 1. Solis are field visually classified in accordance with the Unified Solis  |                                  |                                 |        |  |  |    |                  |                 |   |                   |  |                   |         |   |
| Advanced Boring  O  NR  SPT Sampler  O  O  Advanced Boring  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils  (1-38" I.D. x  |                                  |                                 |        |  |  |    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S  | BLOWS/<br>0.5 FT. | N-VALUE |   |
| NR SPT Sampler  Advanced Boring  NOTES:  1. Soils are field visually classified in accordance with the Unified Soils  NR SPT Sampler  140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x  |                                  |                                 |        |  |  |    |                  |                 | Advanced Boring   |                   |  |                   |         |   |
| NOTES:  1. Soils are field visually classified in accordance with the Unified Soils  1. Soils are field visually classified in accordance with the Unified Soils  1. Soils are field visually classified in accordance with the Unified Soils  1. Soils are field visually classified in accordance with the Unified Soils  | -<br>-<br>-<br>-<br>-            | -<br>-<br>-<br>-<br>-           |        |  |  | NR |                  |                 | SPT Sampler   | -                 |  | 0                 | 0       |   |
| NOTES:  1. Soils are field visually classified in accordance with the Unified Soils  1. Soils are field visually classified in accordance with the Unified Soils  1. Soils are field visually classified in spoon (1-3/8" I.D. x  | -<br>-<br>-<br>-<br>-            | -<br>-<br>-<br>-<br>-<br>-<br>- |        |  |  |    |                  |                 | Advanced Boring   |                   |  |                   |         |   |
|   | <u>-51.3</u><br>-<br>-<br>-<br>- | 19.0                            |        | Soils are field visually classified in accordance with the Unified Soils |  |    |                  |                 | w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x |                   |  |                   |         |   |
|   | -<br>-<br>-<br>-                 | -<br>-<br>-                     |        |  |  |    |                  |                 |   |                   |  |                   |         |   |
|   | -<br>-<br>-<br>-                 | -<br>-<br>-<br>-                |        |  |  |    |                  |                 |   |                   |  |                   |         |   |

Project I.D. **Boring Designation** MHVBC-11-19 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.31673335 LONG = -88.03016603 STATE PLANE COORDINATES X = 1,801,219Y = 115,5782020 Geotechnical Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. **DATE OF BORING** 01-17-20 01-17-20 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -49.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER C. Long, Geotechnical Engineer CSI Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks □ VERTICAL □ INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 20.0 Feet BOX OR SAMPLE BLOWS/ 1 FT. ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -49.0 0.0 (CH) CLAY, fat, high plasticity, soft consistency, wet, dark gray, inorganic, trace shell At El. -51.5 Ft. with light gray indurated clay/silt nodules 100 1 Vibracore At El. -55 Ft. -200=99%, PL=30, LL=66, PI=36, MC=110% DURING ∑ DRILLING **SAM FORM 1836** 

(Continued)

DRILLING T

**AUG 2017** 

MHVBC-11-19

Boring Designation

Boring Designation MHVBC-11-19

| DR               | II I IN | GIO    | OG (Cont. Sheet)  | INSTAL   |         |                  |                 |                             |                   | SHEE    |               |         | 1                                    |
|------------------|---------|--------|---|--|---------|------------------|-----------------|-----------------------------|-------------------|---------|---------------|---------|--------------------------------------|
|                  |         |        | - (John Greet)  | <del>                                       </del> | ile Dis |                  |                 |                             |                   | OF 2    |               |         | 4                                    |
| PROJEC           | CT .    |        |   | COORD<br>State D                                   |         |                  |                 | JM<br>est - U.S. Survey Ft. | NAD83             |         | RTICA<br>ILLW |         |                                      |
| LOCATI           | ON COO  | RDINAT | TES .   | ELEVAT   |         |                  |                 |                             | NADOS             | 10      |               |         | 1                                    |
|                  |         |        | = 115,578   | -49.0  |         |                  |                 |                             |                   |         |               |         |                                      |
| ELEV.            | DEPTH   | QN     | CLASSIFICATION OF MATERIALS   |  | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD       | DRILLIN<br>REMARK | G<br>(S | BLOWS/        | N-VALUE |                                      |
| -69.0            | 20.0    |        | NOTES:  |  | 100     | 1                |                 | Vibracore                   |                   |         |               |         |                                      |
| -                | -       |        | Soils are field visually classified in accordance with the Unified Soils Classification System. |  |         |                  |                 |                             |                   |         |               |         | -<br>-<br>-<br>-<br>-<br>-<br>-<br>- |
| SAM F<br>AUG 201 | ORM '   | 1836-  | A AFTER ▼ DURING □ DRILLING □   |  | -       | <u> </u>         |                 | Boring De                   | esignation        | MHV     | BC-1          | 1-1     | 9                                    |

Project I.D. Boring Designation SS-153

| DRI              | LLIN               | G LO    | G       | DIVI           | SION         | Sou          | uth Atlantic  | IN           | IST#             | \LL#            | ATION                      | Mobile       | District  |                 | SHEET<br>OF 3    |                   | ETS     |                 |
|------------------|--------------------|---------|---------|----------------|--------------|--------------|---------------|--------------|------------------|-----------------|----------------------------|--------------|-----------|-----------------|------------------|-------------------|---------|-----------------|
| PROJ             | ECT                |         |         |                |              |              |               | LAT          | LONG             | COORI           | DINATES LA                 | AT = 30.3    | 15174     |                 |                  |                   |         | 1               |
| 19               | 63-196             | 4 Subs  | surface | Invest         | tigatio      | n            |               | STA          | TE PLA           | NE CO           | ORDINATES                  | X = 1,8      | 00,948    | Y = 1           | 15,012           |                   |         |                 |
| DATE             | OF BOI             | RING    |         |                | STAI         | RTED         | COMPLETED     |              |                  |                 | stem/datum/<br>bama West - |              | rvev Ft   | HORI.           |                  | <i>VER</i><br>MLL |         |                 |
| DRILI            | ING AG             | ENCY    |         | Corps          | of Engi      | neers - (    | CESAM         |              |                  | ATION           |                            | OP OF BO     | RING      | GRO             | OUND W           | ATE               | R       | 1               |
|                  |                    |         | D INSPE |                |              |              | E OF DRILLER  |              |                  |                 | 'S DESIGNATI               | -28.3 Fe     |           |                 | nderwa<br>D HAMN |                   |         |                 |
|                  |                    | I/A, Ge |         |                |              |              | N/A           | N,           | /A               |                 |                            |              |           |                 | UAL HA           |                   | ER      | ]               |
|                  | TION OF<br>VERTICA |         | INCLINE | :D             | DEG.<br>VERT | FROM<br>ICAL | BEARING       | SIZE         | E AND            | TYPE O          | )F BIT                     | See Re       | emarks    |                 |                  |                   |         |                 |
| тніск            | NESS OF            | OVERB   | URDEN   |                | N/A          |              |               | тот          | AL NU            | MBER (          | CORE BOXES                 | 0            |           |                 |                  |                   |         |                 |
| DEPTH            | то тор             | OF ROC  | CK      |                | N/A          |              |               | тот          | AL SAI           | MPLES           | DISTUR                     | BED ()       | UNE       | DISTURB         | ED (UD           | ) (               | 0       |                 |
| TOTAL            | . DEPTH            |         | ING     | :              | 23.0 Fe      | eet          |               | тот          |                  | COVER           | Y FOR BORIN                | <b>G</b> Not | t Recorde | ed              |                  |                   |         |                 |
| ELEV.            | DEPTH              | LEGEND  | ,       | CLASSII        | FICATIO      | ON OF MA     | TERIALS       | REC.         | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCE<br>METH            | MENT<br>OD   | DR<br>RE  | ILLING<br>MARKS |                  | BLOWS/<br>0.5 FT. | N-VALUE |                 |
| 20.0             | 0.0                |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         |                 |
| -28.3            | 0.0                |         | (CH) C  | CLAY, f        | at, high     | n plastici   | ty, very soft |              |                  |                 |                            |              |           |                 |                  |                   |         | -0<br>-         |
| -                | -                  |         | consist | tency, v       | vet, gra     | ay,          |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -1              |
|                  | _                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         |                 |
| -                | -                  |         |         |                |              |              |               |              |                  |                 | Advanced                   | Boring       |           |                 |                  |                   |         | -               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -2<br>-         |
| -                | _                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -3              |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | ‡               |
| -                | _                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  | 0                 |         | -<br>-4         |
| -                | -                  |         |         |                |              |              |               | NR           |                  |                 | SPT Sar                    | mpler        |           |                 |                  | 0                 |         | -               |
|                  | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  | 0                 | 0       | -               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 | -                |                   |         | <del>-</del> 5  |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -<br>-6         |
| -                |                    |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | Ŀ               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 | Advanced                   | Boring       |           |                 |                  |                   |         | -7<br>-         |
| -                |                    |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | -               |
| _                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | _<br>-8         |
| :                | <u> </u>           |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | ţ               |
| -                | -                  |         |         |                |              |              |               |              |                  |                 |                            |              |           |                 |                  |                   |         | <u>۔</u>        |
| -                | F                  |         |         |                |              |              |               |              |                  | ]               |                            |              |           |                 |                  | 0                 |         | <del> </del> -9 |
| ] :              | <u> </u>           |         |         |                |              |              |               | NR           |                  |                 | SPT Sar                    | mpler        |           |                 |                  | 0                 |         | Ė               |
| SAM F<br>AUG 201 | <br> ORM           | 1836    | AF DR   | TER<br>PILLING | ▼ DI         | JRING S      | <u>Z</u> (C   | <br>Continue | ed)              | <u> </u>        | Boi                        | ring De      | signatio  | on S            | SS-153           |                   |         | $\mathbf{L}_1$  |

| DR  | II I IN                         | G I C | OG (Cont. Sheet)                      | INSTAL         |          |                  |                 |                                |                   | SHEE   |                   |         |   |
|---|---------------------------------|-------|---------------------------------------|----------------|----------|------------------|-----------------|--------------------------------|-------------------|--|-------------------|---------|---|
|   |                                 |       |                                       | _              | ile Dist |                  |                 |                                |                   | <del>                                     </del> | SHE               |         | 4 |
| PROJEC  | T                               |       |                                       | COORD          |          |                  |                 |                                | HORIZONTAL        |  | RTICAL<br>LLW     |         |   |
|   |                                 |       |                                       | _              |          |                  |                 | est - U.S. Survey Ft.          | NAD83             | I IVI  | LLVV              |         | 4 |
|   | ON COO                          |       | res<br>′ = 115,012                    | <b>ELEVA</b> 1 |          | OP OF I          | BORING          | j                              |                   |  |                   |         |   |
| ELEV.   | DEPTH                           | Q     | CLASSIFICATION OF MATERIA             |                | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD          | DRILLIN<br>REMARK | G<br>(S  | BLOWS/<br>0.5 FT. | N-VALUE | 1 |
| -   |                                 |       |                                       |                | NR       |                  |                 | SPT Sampler                    |                   |  | 0                 | 0       | † |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |                                 |       |                                       |                |          |                  |                 | Advanced Boring                |                   |  |                   |         |   |
| -<br>-<br>-<br>-<br>-   | -<br>-<br>-<br>-<br>-<br>-<br>- |       |                                       |                | NR       |                  |                 | SPT Sampler                    | _                 |  | 0 0               | 0       | - |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-   |                                 |       |                                       |                |          |                  |                 | Advanced Boring                |                   |  |                   |         |   |
| -51.3<br>-<br>-   | 23.0<br>ORM                     |       | NOTES:  A AFTER ▼ DURING ▽ DRILLING □ |                | ontinue  |                  |                 | 140# hammer<br>w/30" drop used | _                 | SS-1   |                   |         | - |

| DR                    | ILLIN                 | G LC   | G (Cont. Sheet)   | INSTAL           |         |                  |                 |   |                    | SHEET        |                    | إ                   |
|-----------------------|-----------------------|--------|---|------------------|---------|------------------|-----------------|---|--------------------|--------------|--------------------|---------------------|
|                       |                       |        |   |                  | ile Dis |                  |                 |   |                    | OF 3 5       |                    | 긕                   |
| ROJEC                 | •1                    |        |   | COORD<br>State P |         |                  |                 | <b>บM</b><br>est - U.S. Survey Ft.                      | NAD83              | VERTI<br>MLL |                    |                     |
| OCATI                 | ON COOR               | DINAT  | TEC .   | ELEVA1           |         |                  |                 |   | NADOS              | IVILL        | . v v              | ┪                   |
|                       |                       |        | = 115,012   | -28.3            |         | ,r Ut            | SURIN(          | 9   |                    |              |                    |                     |
| ELEV.                 |                       | LEGEND | CLASSIFICATION OF MATERIAL  |                  | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                                   | DRILLING<br>REMARK | S I          | 0.5 FT.<br>N-VALUE |                     |
| -<br>-<br>-<br>-<br>- | -                     |        | Soils are field visually classified in accordance with the Unified Soils Classification System. | n                |         |                  |                 | with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                    |              |                    |                     |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-<br>- |        |   |                  |         |                  |                 |   |                    |              |                    | -                   |
| -<br>-<br>-<br>-      | -                     |        |   |                  |         |                  |                 |   |                    |              |                    |                     |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |        |   |                  |         |                  |                 |   |                    |              |                    |                     |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |        |   |                  |         |                  |                 |   |                    |              |                    |                     |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |        |   |                  |         |                  |                 |   |                    |              |                    | -                   |
| -<br>-<br>-           | -<br>-<br>-<br>-      |        |   |                  |         |                  |                 |   |                    |              |                    | -                   |
| -<br>-<br>-<br>-      |                       |        |   |                  |         |                  |                 |   |                    |              |                    | -<br> -<br> -<br> - |
| -<br>-<br>-<br>-      | -<br>-<br>-<br>-      |        |   |                  |         |                  |                 |   |                    |              |                    |                     |
| -                     | ORM 1                 | 000    | <b>A</b> AFTER ▼ DURING ▽ DRILLING □  |                  |         |                  |                 | _   | esignation         | SS-153       |                    |                     |

Project I.D. Boring Designation SS-155

| DRI              | LLIN         | G LO    | G       | DIV               | ISION         | Soi          | uth Atlantic   | II       | IST/             | ALL/            | ATION Mobile                                    | District | · I              | SHEET<br>Of 3     |                   | FTS     | ]          |
|------------------|--------------|---------|---------|-------------------|---------------|--------------|----------------|----------|------------------|-----------------|---|----------|------------------|-------------------|-------------------|---------|------------|
| PROJ             | ECT          |         |         |                   |               |              |                | LAT      | /LONG            | COOR            | DINATES LAT = 30.3                              | 309530   |                  |                   |                   |         | 1          |
| 19               | 63-196       | 4 Sub   | surfac  | e Inve            | stigatio      | n            |                | STA      | TE PLA           | ANE CO          | OORDINATES X = 1,8                              | 301,236  | Y = 1            | 12,958            |                   |         | 1          |
|                  | OF BOI       |         |         |                   |               | RTED         | COMPLETED      |          |                  |                 | <b>STEM/DATUM/UNITS</b><br>.bama West - U.S. Sเ | INAV Ft  | HORI.            |                   | <i>VER</i><br>MLL |         | 1          |
| DRILI            | LING AG      | ENCY    | ,       | Corp              | s of Eng      | ineers - (   | CESAM          |          |                  | ATIOI           | TOP OF BO                                       | DRING    | GRO              | DUND N            | ATE               |         | 1          |
| NAME             | & TITLE      | OF FIEI | LD INSP |                   |               |              | E OF DRILLER   |          |                  |                 | -29.0 Fe  |          |                  | Inderwa<br>O HAMI |                   |         | 1          |
| DIREC            | TION OF      |         | eologis | t                 | DEC           | EDOM         | N/A<br>BEARING | N.       | /A               |                 |   | Ī        |                  | UAL HA            |                   | ER      | ┦          |
|                  | VERTICA      |         |         | NED               | VERT          | FROM<br>TCAL | BEARING        | SIZI     | E AND            | TYPE C          | OF BIT See R                                    | emarks   |                  |                   |                   |         |            |
| тніск            | NESS OF      | OVER    | BURDEN  | 1                 | N/A           |              |                | тот      | AL NU            | MBER            | CORE BOXES (                                    | )        |                  |                   |                   |         | ]          |
| DEPTH            | і то тор     | OF RO   | СК      |                   | N/A           |              |                | тот      | AL SAI           | MPLES           | DISTURBED ()                                    | UNI      | DISTURB          | BED (UD           | ) (               | 0       | _          |
| TOTAL            | DEPTH        |         | RING    |                   | 22.3 F        | eet          |                | тот      |                  | COVER           | Y FOR BORING NO                                 | t Record | ed               |                   | . 1               |         | 4          |
| ELEV.            | DEPTH        | LEGEND  |         | CLAS              | SIFICATIO     | ON OF MA     | TERIALS        | RÉC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                           | DR<br>RE | RILLING<br>MARKS |                   | BLOWS/<br>0.5 FT. | N-VALUE |            |
| -29.0            | 0.0          |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         |            |
| -29.0            | 0.0          |         | (CH)    | CLAY              | , fat, higl   | n plastici   | ty, very soft  | +        |                  |                 |   |          |                  |                   |                   |         | -0         |
|                  |              |         | consi   | istency           | , wet, gra    | ay,          |                |          |                  |                 |   |          |                  |                   |                   |         | ŀ          |
| -                | -            |         |         |                   |               |              |                |          |                  |                 | Advanced Boring                                 |          |                  |                   |                   |         | -1         |
|                  | Ī            |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | F          |
| -                | <del> </del> |         |         |                   |               |              |                |          |                  |                 |   | 1        |                  |                   |                   |         | <u> </u>   |
|                  |              |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   | 0                 |         | -          |
| -                | -            |         |         |                   |               |              |                | NR       |                  |                 | SPT Sampler                                     |          |                  |                   | 0                 | •       | }          |
| -                | Ī            |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   | 0                 | 0       | -3<br>-    |
|                  | <u> </u>     |         |         |                   |               |              |                |          |                  |                 |   | 1        |                  | F                 |                   |         | ţ          |
| -                | _            |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | -4         |
|                  |              |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | ŀ          |
| -                | -            |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | -5         |
|                  | †<br>-       |         |         |                   |               |              |                |          |                  |                 | Advanced Boring                                 |          |                  |                   |                   |         | Ė          |
|                  | <u> </u>     |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | -<br>-6    |
|                  | <u> </u>     |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | Ę          |
|                  | }            |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | -          |
| -                | Ţ.           |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | <b>⊢</b> 7 |
|                  | ‡            |         |         |                   |               |              |                |          |                  | 1               |   | 1        |                  |                   | 0                 |         | ţ          |
| -                | <u> </u>     |         |         |                   |               |              |                | NR       |                  |                 | SPT Sampler                                     |          |                  | -                 | 0                 |         | -8<br>-    |
|                  | }            |         |         |                   |               |              |                | INIX     |                  |                 | or roample                                      |          |                  | -                 |                   | 0       | ŀ          |
| -                | ļ .          |         |         |                   |               |              |                | _        |                  | -               |   | -        |                  | -                 | 0                 |         | <u> </u>   |
| -                | <u> </u>     |         |         |                   |               |              |                |          |                  |                 | Advanced Boring                                 |          |                  |                   |                   |         | F          |
|                  |              |         |         |                   |               |              |                |          |                  |                 |   |          |                  |                   |                   |         | <u> </u>   |
| SAM F<br>AUG 201 | ORM 1        | 836     | A<br>D  | AFTER<br>DRILLING | g <u>▼</u> Di | JRING S      | ☑ (0           | Continue | ed)              |                 | Boring De                                       | signatio | on S             | SS-15             | 5                 |         | 1          |

| DIVILLING        | LOG (Cont. Sheet)  | INSTALLA               |     |                  |                 |  |                   | SHEET  |                   |         | 1             |
|------------------|--|------------------------|-----|------------------|-----------------|--|-------------------|--------|-------------------|---------|---------------|
|                  | Log (dont. dileet)   | Mobile                 |     |                  |                 |  |                   | OF 3   |                   |         | 4             |
| PROJECT          |  | COORDINA<br>State Plan |     |                  |                 | <b>บท</b><br>est - U.S. Survey Ft.   | NAD83             |        | TICAL<br>LLW      |         |               |
| LOCATION COORDIN | IATES  | ELEVATIO               |     |                  |                 |  | IVADOO            | 1 141  |                   |         | 1             |
| X = 1,801,236    |  | -29.0 F                |     |                  |                 |  |                   |        |                   |         |               |
| ELEV. DEPTH      | CLASSIFICATION OF MATERIALS  | F                      | œc. | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>0.5 FT. | N-VALUE |               |
|                  |  |                        |     |                  |                 | Advanced Boring  |                   |        |                   |         |               |
|                  |  |                        | NR  |                  |                 | SPT Sampler  |                   |        | 0 0 0             | 0       | †<br> -<br> - |
|                  |  |                        |     |                  |                 | Advanced Boring  |                   |        |                   |         | -             |
|                  |  |                        | NR  |                  |                 | SPT Sampler  |                   |        | 0 0 0             | 0       |               |
| -51.3 22.3       |  |                        |     |                  |                 | Advanced Boring  |                   |        |                   |         |               |
| -01.0+ 22.0      | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |                        |     |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x | -                 |        |                   |         |               |

| PROJECT  LOCATION (  X = 1,80           |       |        | G (Cont. She |                    | Mob    | ile Dist | trict            |                 |                       |                    | <b>OF</b> 3 | SHE               | ETS     |
|---|-------|--------|--------------|--------------------|--------|----------|------------------|-----------------|-----------------------|--------------------|-------------|-------------------|---------|
| X = 1,80                                | COORI |        |              |                    | COORD  | NATE :   |                  | M/DAT           | IIM I                 | HORIZONTAL         |             | ΓICAL             |         |
| X = 1,80                                | COORI |        |              |                    |        |          |                  |                 | est - U.S. Survey Ft. | NAD83              |             | LW                | •       |
|   |       | DINAT  | ES           |                    | ELEVAT |          |                  |                 |                       |                    |             |                   |         |
| ELEV. DE                                |       |        | = 112,958    |                    | -29.0  |          |                  |                 |                       |                    |             | _                 |         |
|   | ЕРТН  | LEGEND | CLASSIFICA   | ATION OF MATERIALS |        | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLING<br>REMARK | S           | BLOWS/<br>0.5 FT. | N-VALUE |
| †<br>†<br>†<br>†<br>†                   |       |        |              |                    |        |          |                  |                 | 2" O.D.).             |                    |             |                   |         |
| + |       |        |              |                    |        |          |                  |                 |                       |                    |             |                   |         |
| +                                       |       |        |              |                    |        |          |                  |                 |                       |                    |             |                   |         |
| +                                       |       |        |              |                    |        |          |                  |                 |                       |                    |             |                   |         |
| +                                       |       |        |              |                    |        |          |                  |                 |                       |                    |             |                   |         |
|   |       |        |              |                    |        |          |                  |                 |                       |                    |             |                   |         |

**Boring Designation** MHSPT-16-19 DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL Mobile Harbor Borings State Plane - Alabama West NAD83 MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL N 113538.444 E 1801187.853 MHSPT-16-19 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 9 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/27/20 9/27/20 16. ELEVATION TOP OF BORING -46.23' 6. THICKNESS OF OVERBURDEN >14' 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 14' Chris Killam, Geologist N-Value Blows/ 0.5 ft EGEN FIELD CLASSIFICATION OF MATERIALS **ELEV** DEPTH **REMARKS** Samb RQD % REC (Description) 0 CLAYEY SILT (MH), olive green, saturated, high **USCS** 47 S1 0 0 plasticity, trace fine sand. 0 -48.2 2.0 87 S2 0 0 SILT (ML), dark olive gray, little sand, trace shells. 0 100 S3 0 0 0 5 100 S4 0 0 -52.2 6.0 0 CLAYEY SILT (MH), high plasticity, trace fine sand. S5 100 0 0 0 100 S6 0 0 Greenish gray. 0 100 S7 0 0 0 100 S8 0 0 0 0 0 100 S9 0

## BOTTOM OF BOREHOLE AT 14.0 ft

## Notes:

-60.2

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

Project I.D. **Boring Designation** VC-42-84 SHEET 1 **DRILLING LOG DIVISION** South Atlantic **INSTALLATION** Mobile District OF 2 SHEETS **PROJECT** LAT/LONG COORDINATES LAT = 30.307791 LONG = -88.031271 STATE PLANE COORDINATES X = 1,800,855Y = 112,3271982-1984 Subsurface Investigation STARTED COMPLETED COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT. **DATE OF BORING** 01-08-84 01-08-84 State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW GROUND WATER TOP OF BORING **DRILLING AGENCY ELEVATIONS** Corps of Engineers - CESAM -41.0 Feet Underwater NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER MANUFACTURER'S DESIGNATION OF DRILL ☐ AUTO HAMMER H. Gates, Geologist C. Fuller Vibrocore **MANUAL HAMMER** DIRECTION OF BORING DEG. FROM VERTICAL BEARING SIZE AND TYPE OF BIT See Remarks ▼ VERTICAL INCLINED **TOTAL NUMBER CORE BOXES** 0 THICKNESS OF OVERBURDEN N/A DEPTH TO TOP OF ROCK N/A **TOTAL SAMPLES** DISTURBED UNDISTURBED (UD) 1 **TOTAL DEPTH OF BORING TOTAL RECOVERY FOR BORING** 100 % 20.0 Feet BOX OR SAMPLE ELEV. **CLASSIFICATION OF MATERIALS** DRILLING REMARKS DEPTH REC. ADVANCEMENT METHOD -41.0 0.0 (CH) CLAY, fat, high plasticity, very soft consistency, wet, black At El. -43.6 Ft., soft consistency, gray 100 1 Vibracore

SAM FORM 1836

AFTER DURING DRILLING DRILLING DRILLING

Boring Designation VC-42-84

**Boring Designation** MHSPT-15-19 DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL NAD83 Mobile Harbor Borings State Plane - Alabama West MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-15-19 N 111830.896 E 1800543.956 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 13 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/23/20 9/23/20 16. ELEVATION TOP OF BORING -40.5 6. THICKNESS OF OVERBURDEN >19.5 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 19.5' Adam Tew, Geologist N-Value Blows/ 0.5 ft EGEN FIELD CLASSIFICATION OF MATERIALS **ELEV** DEPTH Samb REMARKS RQD % REC (Description) 0 0 LEAN CLAY (CL), gray, wet, medium plasticity, trace USCSall drives WOR 100 S1 0 0 shell fragments. 0 100 S2 0 0 0 100 S3 0 0 0 5 S4 100 0 0 S5 100 0 0 0 100 S6 0 0 73 S7 0 0 0 67 S8 0 0 0 0 S9 0 0 73 53 S10 0 0 0 15 0 87 S11 0 0 S12 0 80 0 100 S13 0 -60.0 BOTTOM OF BOREHOLE AT 19.5 ft 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 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.

Project I.D. Boring Designation SS-157

| DRI   | LLIN         | G LO   | G I        | DIVIS   | SION     | So         | uth Atlantic   | II                   | IST/             | ALLA             | ATION Mobil           | e Dis   | trict         | - 1          | HEET 1<br>F 2 SH | EETS    |            |
|---|--------------|--------|------------|---------|----------|------------|--|----------------------|------------------|------------------|-----------------------|---------|---------------|--------------|------------------|---------|------------|
| PROJECT   |              |        |            |         |          |            | LAT  | /LONG                | COORI            | DINATES LAT = 30 | .30416                | 67 LC   |               |              |                  | 1       |            |
| 19  | 63-196       | 4 Subs | surface    | Invest  | igatio   | n          |  | STA                  | TE PLA           | NE CO            | OORDINATES X = 1      | ,800,7  | 07            | Y = 111      | 1,010            |         |            |
| DATE OF BORING STARTED COMPLETED                                    |              |        |            |         |          |            | COORDINATE SYSTEM/DATUM/UNITS HORIZ. VERT  |                      |                  |                  |                       |         |               |              |                  |         |            |
| DRILLING AGENCY Corps of Engineers - CESAM                          |              |        |            |         |          |            | State Plane - Alabama West - U.S. Survey Ft. NAD83 MLLW  ELEVATIONS TOP OF BORING GROUND WATER |                      |                  |                  |                       |         |               |              |                  | 1       |            |
| NAME & TITLE OF FIELD INSPECTOR NAME OF DRILLER                     |              |        |            |         |          |            |  | -3/.8 Feet Underwate |                  |                  |                       |         |               |              |                  | -       |            |
|   |              |        |            |         |          | N/A        | N.   | N/A AUTO HAI         |                  |                  |                       |         |               |              |                  | ↓       |            |
| DIRECTION OF BORING  VERTICAL INCLINED  DEG. FROM VERTICAL  BEARING |              |        |            |         |          |            |  | SIZI                 | E AND            | TYPE O           | OF BIT See            | Remar   | ks            |              |                  |         |            |
| тніск   | NESS OF      | OVERB  | URDEN      |         | N/A      |            |  | тот                  | AL NU            | MBER (           | CORE BOXES            | 0       |               |              |                  |         | _          |
| DEPTH   | і то тор     | OF ROC | K          |         | N/A      |            |  | тот                  | AL SAI           | MPLES            |                       | 0       |               | TURBE        | D (UD)           | 0       |            |
| TOTAL   | DEPTH        |        | NG         |         | 13.5 Fe  | eet        |  | тот                  |                  | COVER            | Y FOR BORING          | lot Red | corded        |              | Τ.               | Ι       | -          |
| ELEV.   | DEPTH        | LEGEND | c          | CLASSIF | ICATIO   | ON OF MA   | TERIALS  | REC.                 | BOX OR<br>SAMPLE | RQD<br>OR<br>UD  | ADVANCEMENT<br>METHOD |         | DRILI<br>REMA | LING<br>ARKS | BLOWS/           | N-VALUE |            |
| -37.8   | 0.0          |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         |            |
| -57.0   | 0.0          |        | (CH) C     | LAY, fa | at, high | n plastici | ty, very soft  |                      |                  |                  |                       |         |               |              |                  |         | -0         |
| -   | _            |        | consiste   | ency, w | et, gra  | ıy,        |  |                      |                  |                  |                       |         |               |              |                  |         | Ł          |
| -   | -            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | -1         |
| † //  |              |        |            |         |          |            |  |                      |                  | Advanced Boring  |                       |         |               |              |                  | ļ       |            |
| -   | <u> </u>     |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | <b>!</b> , |
| -   | F            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | -2<br> -   |
|   | <u> </u>     |        |            |         |          |            |  |                      |                  | 1                |                       |         |               |              |                  |         | †          |
| -   | -            |        |            |         |          |            |  | ND                   |                  |                  | CDT Complex           |         |               |              |                  | 1       | -3         |
|   | [            |        |            |         |          |            |  | NR                   |                  |                  | SPT Sampler           |         |               |              | 0                | 0       | F          |
| -   | _            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              | 0                |         | <u> </u>   |
| -   | -            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | ŀ          |
| -   | [            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | F          |
| -   | <del> </del> |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | -5<br>-    |
| -   |              |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | ŀ          |
| -   | <u>[</u>     |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | -6         |
|   | <del> </del> |        |            |         |          |            |  |                      |                  |                  | Advanced Boring       |         |               |              |                  |         | t          |
| -   |              |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | <b>-</b>   |
| -   | F            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | -7<br> -   |
| :   | <u> </u>     |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | t          |
| -   | -            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              |                  |         | -8         |
| ] .   | <u> </u>     |        |            |         |          |            |  |                      |                  | -                |                       | 4       |               |              |                  |         | ‡          |
|   | <u> </u>     |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              | 0                |         | -9         |
| ] -   | <u> </u>     |        |            |         |          |            |  | NR                   |                  |                  | SPT Sampler           |         |               |              | 0                |         | <b> </b>   |
| :   | ‡            |        |            |         |          |            |  |                      |                  |                  |                       |         |               |              | 0                | 0       | ļ          |
| SAM F<br>AUG 201  | ORM 1        | 1836   | AFT<br>DRI | TER '   | ▼ DU     | JRING S    | ☑ (0   | Continue             | ed)              | <u> </u>         | Boring D              | esign   | ation         | SS           | S-157            |         | <b>-</b> 1 |

| DRILLING LOG (Cont. Sheet)      |        |        |  | INSTALLATION Mobile District                        |  |                  |                 |   |                   |         |                              |                                 |
|---------------------------------|--------|--------|--|---|--|------------------|-----------------|---|-------------------|---------|------------------------------|---------------------------------|
| PROJECT                         |        |        |  | Mobile District  COORDINATE SYSTEM/DATUM HORIZONTAL |  |                  |                 |   |                   |         | SHEET                        | S                               |
| JEC                             |        |        |  |   | State Plane - Alabama West - U.S. Survey Ft. NAD83 |                  |                 |   |                   |         |                              |                                 |
| OCATI                           | ON COO | RDINAT | res  |   | ELEVATION TOP OF BORING                            |                  |                 |   |                   |         |                              |                                 |
| X = 1,800,707 Y = 111,010       |        |        |  | -37.  | -37.8 Ft.  |                  |                 |   |                   |         |                              |                                 |
| ELEV.                           | DEPTH  | LEGEND | CLASSIFICATION OF MATERIALS  | 5   | REC.   | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT.<br>N-VALUE |                                 |
| -                               | -      |        |  |   |  |                  |                 | Advanced Boring   |                   |         |                              |                                 |
| -51.3                           |        |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. | 1   |  |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                              |                                 |
| -<br>-<br>-<br>-<br>-<br>-<br>- | FORM   |        | <b>A</b> AFTER ▼ DURING ▽ DRILLING ▼   |   |  |                  |                 |   |                   |         |                              | -<br>-<br>-<br>-<br>-<br>-<br>- |

**Boring Designation** MHSPT-14-19 DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL Mobile Harbor Borings State Plane - Alabama West NAD83 MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-14-19 N 109730.091 E 1800752.382 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 11 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/25/20 9/25/20 16. ELEVATION TOP OF BORING -43.77' 6. THICKNESS OF OVERBURDEN >16.5 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 16.5' Michael Loveland, Geologist N-Value Blows/ 0.5 ft EGEN FIELD CLASSIFICATION OF MATERIALS **ELEV** DEPTH Samb REMARKS ROD % REC (Description) 0 0 CLAYEY SILT (ML), greenish gray, saturated, very soft, **USCS** 0 S1 0 0 non plastic, no toughness, few fine sand, trace organics. 0 20 S2 0 0 0 -47.9 4.1 80 S3 0 0 ELASTIC SILT (MH), dark gray, saturated, medium 0 plasticity, no dilatancy, no toughness, trace shells. 5 100 S4 0 0 0 Dark gray and black. S5 100 0 0 0 0 100 S6 0 0 0 100 S7 0 0 0 100 S8 0 0 0 0 S9 0 0 100 0 Interbedded fine to medium sand. 100 S10 0 0 -58.8 0 15

100 S11

## BOTTOM OF BOREHOLE AT 16.5 ft

## Notes:

-60.3\_

16.5

1. Soils visually field classified in accordance with the Unified Soil Classification System.

SILTY SAND (SM), greenish gray, fine to medium

grained, saturated, some silt.

- 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 to 10%, Little: 15 to 25%, Some 30 to 45%, With 50 to 100%.
- MLLW was calculated from measuring barge deck to mud line, then subtracting barge deck to water and closest observation station tide reading.

0

0

Project I.D. Boring Designation SS-159

| DRI              | LLIN               | G LO    | G [          | DIVISIO     | N So               | uth Atlantic  | IN      | IST/             | ALL/            | ATION Mobile                           | Distric   |                  | SHEET 1<br>OF 3 S  |                    | TS              |     |
|------------------|--------------------|---------|--------------|-------------|--------------------|---------------|---------|------------------|-----------------|--|-----------|------------------|--------------------|--------------------|-----------------|-----|
| PROJ             | ECT                |         | <u> </u>     |             |                    |               | LAT     | /LONG            | COOR            | DINATES LAT = 30.                      | 298801    | LONG =           | = -88.03           | 3370               | 0               |     |
| 19               | 63-196             | 4 Subs  | surface l    | Investiga   | tion               |               | STA     | TE PLA           | NE CO           | <b>DORDINATES</b> $X = 1$ ,            | 800,177   | Y = 10           | 09,061             |                    |                 |     |
| DATE             | OF BOI             | RING    |              | s           | TARTED             | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORIZ<br>NAD8    |                    | <i>ERT.</i><br>LLV |                 |     |
| DRILI            | LING AG            | ENCY    | (            | Corps of E  | ngineers -         | CESAM         |         |                  | ATIO            | NS TOP OF B                            | ORING     | GRO              | UND WA             | TER                | _               |     |
|                  |                    |         | D INSPEC     |             | <del>-</del>       | IE OF DRILLER |         |                  |                 | -26.3 F                                |           |                  | nderwat<br>D HAMME |                    |                 |     |
|                  |                    | I/A, Ge |              |             |                    | N/A           | N       | /A               |                 |  | Ĭ         |                  | UAL HAN            |                    | 2               |     |
|                  | TION OF<br>VERTICA |         | INCLINE      | D DE        | G. FROM<br>RTICAL  | BEARING       | SIZE    | E AND            | TYPE C          | OF BIT See R                           | lemarks   |                  |                    |                    |                 |     |
| тніск            | NESS OF            | OVERB   | URDEN        | N/A         |                    |               | тот     | AL NU            | MBER            | CORE BOXES                             | )         |                  |                    |                    |                 |     |
| DEPTH            | і то тор           | OF ROC  | :K           | N/A         |                    |               | тот     | AL SAI           | MPLES           | DISTURBED (                            | UN        | DISTURB          | ED (UD)            | 0                  |                 |     |
| TOTAL            | DEPTH              |         | ING          | 25.0        | Feet               |               | тот     |                  | COVER           | Y FOR BORING No                        | ot Record | ed               |                    | <del></del>        |                 |     |
| ELEV.            | DEPTH              | LEGEND  | c            | CLASSIFICA  | TION OF MA         | ATERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DF        | RILLING<br>MARKS | BLOWS/             | 0.5 FT.            | N-VALUE         |     |
| -26.3            | 0.0                |         |              |             |                    |               |         |                  |                 |  |           |                  |                    | $\dagger$          |                 |     |
| -20.5            | 0.0                |         | (CH) C       | LAY, fat, h | igh plastici       | ty, very soft |         |                  |                 |  |           |                  |                    |                    | ŀ               | -0  |
| -                | _                  |         | consiste     | ency, wet,  | gray,              |               |         |                  |                 |  |           |                  |                    |                    | Ł               |     |
| _                | [                  |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | F               | - 1 |
| -                | <u> </u>           |         |              |             |                    |               |         |                  |                 | Advanced Boring                        |           |                  |                    |                    | ţ               |     |
| -                |                    |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | -               | ^   |
| -                | F                  |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | F               | -2  |
|                  | <u> </u>           |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | ţ               |     |
| =                | -                  |         |              |             |                    |               |         |                  |                 |  | -         |                  |                    | +                  | +               | -3  |
| -                | [                  |         |              |             |                    |               |         |                  |                 |  |           |                  | 0                  | 4                  | F               |     |
| -                | <u> </u>           |         |              |             |                    |               | NR      |                  |                 | SPT Sampler                            |           |                  | 0                  |                    | 0 -             | -4  |
|                  | <u> </u>           |         |              |             |                    |               |         |                  |                 |  |           |                  | 0                  |                    | Ĭ               | •   |
| -                | Ī                  |         |              |             |                    |               |         |                  |                 |  | 1         |                  |                    |                    | Ŧ               |     |
| -                | -                  |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | t               | -5  |
| -                |                    |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | ŀ               |     |
| -                | [                  |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | F               | -6  |
| -                | <u> </u>           |         |              |             |                    |               |         |                  |                 | Advanced Boring                        |           |                  |                    |                    | ŀ               |     |
| -                |                    |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | -               | _   |
| -                | <del> </del>       |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | F               | -7  |
| ] :              | t                  |         |              |             |                    |               |         |                  |                 |  |           |                  |                    |                    | ŀ               |     |
| -                | -                  |         |              |             |                    |               |         |                  | -               |  | -         |                  | <u> </u>           | +                  | -               | -8  |
| ] :              | <u> </u>           |         |              |             |                    |               |         |                  |                 |  |           |                  | 0                  | _                  | ţ               |     |
|                  | L                  |         |              |             |                    |               | NR      |                  |                 | SPT Sampler                            |           |                  | O                  |                    | $\int_{\Gamma}$ |     |
| -                | F                  |         |              |             |                    |               |         |                  |                 |  |           |                  | 0                  |                    | 0 -             | -9  |
| ] :              | <del> </del>       |         |              |             |                    |               |         |                  | -               | Advanced Boring                        |           |                  |                    | $\dagger$          | 十               |     |
| SAM F<br>AUG 201 | ORM 1              | 836     | AFT.<br>DRII | ER ¥        | DURING<br>DRILLING | ∑ (C          | ontinue | ed)              | _               | Boring De                              | esignati  | on S             | S-159              |                    |                 | -1  |

|                                 |                            |        |                             | INSTALL | ATION  |                  |                 | oring Designation     |                   | S-159<br>SHEET | 2                 | —       |
|---------------------------------|----------------------------|--------|-----------------------------|---------|--------|------------------|-----------------|-----------------------|-------------------|----------------|-------------------|---------|
| DR                              | ILLIN                      | G LO   | G (Cont. Sheet)             | Mobil   |        |                  |                 |                       |                   | OF 3           |                   | TS      |
| ROJEC                           | ;T                         |        |                             | COORDIN |        |                  | M/DAT           | <b>J</b> M            | HORIZONTAL        | 1              | TICAL             |         |
|                                 |                            |        |                             | _       |        |                  |                 | est - U.S. Survey Ft. | NAD83             | MI             | LW                |         |
|                                 | ON COOF                    |        |                             | ELEVATI |        | )P OF E          | BORING          | •                     |                   |                |                   |         |
| X = '                           | 1,800,17<br><b>I</b>       |        | : 109,061                   | -26.3   | Ft.    | 24111            |                 |                       | 1                 | Т              | . 1.              | _       |
| ELEV.                           | DEPTH                      | LEGEND | CLASSIFICATION OF MATERIALS | s       | ĸ.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>(S        | BLOWS/<br>0.5 FT. | N-VALUE |
| -<br>-<br>-<br>-<br>-<br>-<br>- | -                          |        |                             |         |        |                  |                 | Advanced Boring       |                   |                |                   |         |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>-           |        |                             | -       | NR     |                  |                 | SPT Sampler           |                   | -              | 0 0 0             | 0       |
|                                 |                            |        |                             |         |        |                  |                 | Advanced Boring       |                   |                |                   |         |
| -<br>-<br>-<br>-                | -<br>-<br>-<br>-           |        |                             |         | NR     |                  |                 | SPT Sampler           |                   | -              | 0 0 0             | 0       |
| -<br>-<br>-<br>-<br>-           | -<br>-<br>-<br>-<br>-<br>- |        |                             |         |        |                  |                 | Advanced Boring       |                   |                |                   |         |
| -                               | <u> </u>                   |        |                             | ļ       | NR     |                  |                 | SPT Sampler           |                   | Į              | 0                 |         |
| AM F                            | ORM 1                      | 1836-A | AFTER ▼ DURING ∇ DRILLING   | (Coi    | ntinue | <u></u>          |                 | Boring De             | I<br>esignation   | SS-15          | <br>9             | _       |

**Boring Designation SS-159** INSTALLATION SHEET 3 **DRILLING LOG (Cont. Sheet)** Mobile District OF 3 SHEETS **PROJECT COORDINATE SYSTEM/DATUM** HORIZONTAL VERTICAL NAD83 MLLW State Plane - Alabama West - U.S. Survey Ft. **LOCATION COORDINATES ELEVATION TOP OF BORING** X = 1,800,177 Y = 109,061-26.3 Ft. BOX OR SAMPLE BLOWS/ 0.5 FT. LEGEND DRILLING REMARKS ELEV. ĸEC. DEPTH **CLASSIFICATION OF MATERIALS** ADVANCEMENT METHOD 0 0 -24 NR SPT Sampler 0 Advanced Boring 25.0 -51.3 25 140# hammer NOTES: w/30" drop used with 2.0' split 1. Soils are field visually classified in spoon (1-3/8" I.D. x 2" O.D.). accordance with the Unified Soils 26 Classification System. 27 28 29 30 31 32 33

SAM FORM 1836-A

AFTER DURING DRILLING DRILLING DRILLING

Boring Designation SS-159

34

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MHSPT-13-19 **Boring Designation** DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL of 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL NAD83 Mobile Harbor Borings State Plane - Alabama West MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-13-19 N 107831.342 E 1800095.395 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 9 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/20/20 9/20/20 16. ELEVATION TOP OF BORING -46.7 6. THICKNESS OF OVERBURDEN >34.5' 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 34.5' Adam Tew, Geologist N-Value LEGEND Blows/ 0.5 ft FIELD CLASSIFICATION OF MATERIALS **ELEV** DEPTH REMARKS Samb RQD % REC (Description) 0 0 SILT (ML), greenish brown, saturated, non plastic. **USCS** 40 S1 0 0 Dark gray. 73 S2 0 0 hole drilled using rotary spade bit and 0 minimal fluid return throughout drilling 73 S3 0 0 5 100 S4 0 0 Interbedded fine to medium sand. 100 S5 0 0 0 100 S6 0 0 0 Trace shell fragments, discontinue interbedded sand. 100 S7 0 0 0 Gray, very soft, medium plasticity, some fine sand. 100 S8 0 0 WOR to 11.0 ft. 12.0 -58.7 0 0 SILTY SAND (SM), light gray, fine grained, saturated, 27 S9 2 0 some silt. -60.2 13.5 15 20 25 30 Project I.D. Boring Designation SS-161

| DRI              | LLIN               | G LO    | G D          | IVISIO      | ON So              | uth Atlantic        | II      | IST/             | ALL/            | ATION Mobil                            | e Distric | ∽t I              | SHEET 1<br>Of 3 S  |                    | тѕ      |   |
|------------------|--------------------|---------|--------------|-------------|--------------------|---------------------|---------|------------------|-----------------|--|-----------|-------------------|--------------------|--------------------|---------|---|
| PROJ             | ECT                |         | 1            |             |                    |                     | LAT     | LONG             | COOR            | DINATES LAT = 30                       | .293157   |                   |                    |                    |         |   |
| 19               | 63-196             | 4 Subs  | surface I    | nvestiga    | ition              |                     | STA     | TE PLA           | NE CO           | OORDINATES X = 1                       | ,800,466  | Y = 10            | 07,007             |                    |         |   |
| DATE             | OF BOI             | RING    |              | s           | TARTED             | COMPLETED           |         |                  |                 | stem/datum/units<br>bama West - U.S. S | Survey Et | HORI.             |                    | <i>ERT.</i><br>LLV |         |   |
| DRILI            | LING AG            | ENCY    | C            | Corps of E  | ingineers -        | CESAM               |         |                  | ATIO            | NS TOP OF E                            | BORING    | GRO               | OUND WA            | TER                | _       |   |
|                  |                    |         | D INSPEC     |             |                    | ME OF DRILLER       |         |                  |                 | -24.3                                  |           |                   | nderwat<br>D HAMME |                    | _       |   |
|                  |                    | I/A, Ge |              |             |                    | N/A                 | N.      | /A               |                 |  |           |                   | UAL HAN            |                    | ₹       |   |
|                  | TION OF<br>VERTICA |         | INCLINED     | VI          | G. FROM<br>ERTICAL | BEARING             | SIZI    | AND .            | TYPE C          | OF BIT See                             | Remarks   |                   |                    |                    |         |   |
| тніск            | NESS OF            | OVERB   | URDEN        | N/A         | 4                  |                     | тот     | AL NU            | MBER            | CORE BOXES                             | 0         |                   |                    |                    | _       |   |
| DEPTH            | і то тор           | OF ROC  | K            | N/A         | 4                  |                     | тот     | AL SAI           | MPLES           | DISTURBED                              | 0 0       | IDISTURB          | SED (UD)           | 0                  |         |   |
| TOTAL            | DEPTH              |         | NG           | 27.0        | ) Feet             |                     | тот     |                  | COVER           | Y FOR BORING                           | lot Recor | ded               |                    | ٠.                 | _       |   |
| ELEV.            | DEPTH              | LEGEND  | С            | LASSIFICA   | ATION OF MA        | ATERIALS            | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | D<br>R    | RILLING<br>EMARKS | BLOWS              | 0.5 FT.            | N-VALUE |   |
|                  |                    |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    | Ť                  |         |   |
| -24.3            | 0.0                |         | (CH) CL      | _AY. fat. h | nigh plastic       | ity, very soft      |         |                  |                 |  |           |                   |                    |                    | F       | 0 |
|                  | [                  |         | consiste     | ncy, wet,   | gray,              | <i>y</i> . <i>y</i> |         |                  |                 |  |           |                   |                    |                    | F       |   |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | L       | 1 |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | -       |   |
| -                | ļ                  |         |              |             |                    |                     |         |                  |                 | Advanced Boring                        |           |                   |                    |                    | F       |   |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | ŀ       | 2 |
|                  | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | -       |   |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | Ĺ       | 3 |
| -                |                    |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    |         |   |
| -                | [                  |         |              |             |                    |                     |         |                  |                 |  |           |                   | 0                  |                    | Ŧ       |   |
| -                | <u> </u>           |         |              |             |                    |                     | NR      |                  |                 | SPT Sampler                            |           |                   |                    |                    |         | 4 |
| -                |                    |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | 0 -     |   |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  | 4         |                   | 0                  |                    | 4       | 5 |
| :                | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | Ė       |   |
|                  | }                  |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | }       | _ |
| -                | Ī                  |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | F       | 6 |
|                  | <u> </u>           |         |              |             |                    |                     |         |                  |                 | Advanced Boring                        |           |                   |                    |                    | ŀ       |   |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 | Advanced boning                        |           |                   |                    |                    | ⊦       | 7 |
|                  | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | ļ       |   |
| -                |                    |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | -       | _ |
| ] -              | [                  |         |              |             |                    |                     |         |                  |                 |  |           |                   |                    |                    | F       | 8 |
| ] :              | <u> </u>           |         |              |             |                    |                     |         |                  | 1               |  | 1         |                   |                    | $\dagger$          | 十       |   |
| -                | <u> </u>           |         |              |             |                    |                     |         |                  |                 | 00-5                                   |           |                   | $\vdash$           |                    | -       | 9 |
| ] :              | <u> </u>           |         |              |             |                    |                     | NR      |                  |                 | SPT Sampler                            |           |                   | 0                  |                    | 0 -     |   |
|                  | <u> </u>           |         |              |             |                    |                     |         |                  |                 |  |           |                   | 0                  |                    | 上       | 1 |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AFTE<br>DRIL | ER          | DURING<br>DRILLING | <u> </u>            | ontinue | ed)              |                 | Boring D                               | esignat   | ion S             | S-161              |                    |         | • |

|                     |                             |             |                  | В               | oring Designation     | on <b>3</b>       | S-161              |         |
|---------------------|-----------------------------|-------------|------------------|-----------------|-----------------------|-------------------|--------------------|---------|
| DRILLING LO         | G (Cont. Sheet)             | Mobile D    |                  |                 |                       |                   | SHEET 2<br>OF 3 SH | EETC    |
| ROJECT              | <u> </u>                    | COORDINAT   |                  | EM/DAT          | UM                    | HORIZONTAL        | VERTICA            |         |
|                     |                             |             |                  |                 | est - U.S. Survey Ft. |                   | MLLW               |         |
| OCATION COORDINATES |                             | ELEVATION T | OP OF            | BORIN           |                       |                   |                    |         |
| X = 1,800,466 Y =   | 107,007                     | -24.3 Ft.   | ~ш               | Т               | Γ                     | 1                 |                    | ш       |
| LEV. DEPTH          | CLASSIFICATION OF MATERIALS | REC         | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARI | BLOWS,             | N-VALUE |
|                     |                             |             |                  |                 | Advanced Boring       |                   |                    |         |
|                     |                             | NF          |                  |                 | SPT Sampler           |                   | 0 0                | - 0     |
|                     |                             |             |                  |                 | Advanced Boring       |                   |                    |         |
|                     |                             | NF          |                  |                 | SPT Sampler           |                   | 0 0                | - 0     |
| † <b>//</b>         |                             | <u> </u>    |                  | $\frac{1}{2}$   | Advanced Boring       | †                 | <u> </u>           |         |

|                  |                          |        |   | INSTAL              | LATION  | N                |                 |  |                   | SHEET   | 3                 |         |
|------------------|--------------------------|--------|---|---------------------|---------|------------------|-----------------|--|-------------------|---------|-------------------|---------|
| DR               | ILLIN                    | G LC   | OG (Cont. Sheet)  | Mob                 | ile Dis | trict            |                 |  |                   | OF 3    | SHE               | ETS     |
| PROJEC           | СТ                       |        |   | COORD               |         |                  |                 |  | HORIZONTAL        |         | TICAL             |         |
|                  |                          |        |   | _                   |         |                  |                 | est - U.S. Survey Ft.  | NAD83             | MI      | LW                |         |
|                  | ON COOI                  |        | res<br>′ = 107,007  | <b>ELEVAT</b> -24.3 |         | OP OF            | BORIN           | 3  |                   |         |                   |         |
| ^ -              | 1,000,40                 | 1      | - 107,007<br>   | -24.0               | ) Ft.   | αШ               |                 |  |                   | Т       | <u>,</u>          | ш       |
| ELEV.            | DEPTH                    | LEGEND | CLASSIFICATION OF MATERIALS   |                     | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE |
| -<br>-<br>-<br>- | -                        |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-<br>- | †<br>†<br>†<br>†         |        |   |                     |         |                  |                 | Advanced Boring  |                   |         |                   |         |
| -51.3<br>-       | 27.0                     |        | NOTES:  |                     |         |                  |                 | 140# hammer  | _                 |         |                   |         |
| -<br>-<br>-<br>- | †<br>†<br>†<br>†         |        | Soils are field visually classified in accordance with the Unified Soils Classification System. |                     |         |                  |                 | w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         |
| -<br>-<br>-      | <del> </del><br> -<br> - |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-      |                          |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-      | -<br>-<br>-<br>-         |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-      | <del>-</del><br>-<br>-   |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-      | <del> </del><br> -<br> - |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-      | <del> </del>             |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -                | <del> </del><br> -<br> - |        |   |                     |         |                  |                 |  |                   |         |                   |         |
| -<br>-<br>-      | <del> </del><br> -<br> - |        |   |                     |         |                  |                 |  |                   |         |                   |         |
|                  | ORM 1                    |        |   |                     |         |                  |                 |  |                   |         |                   |         |

**Boring Designation** MHSPT-12-19 DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 2 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL State Plane - Alabama West NAD83 MLLW Mobile Harbor Borings 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-12-19 N 105901.235 E 1800496.571 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 27 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/26/20 9/26/20 ] INCLINED 16. ELEVATION TOP OF BORING -20.26 6. THICKNESS OF OVERBURDEN >40.5 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 40.5' Michael Loveland, Geologist N-Value EGEN Blows/ 0.5 ft FIELD CLASSIFICATION OF MATERIALS **ELEV DEPTH** Samb REMARKS ROD % REC (Description) 0 0 CLAYEY ELASTIC SILT (MH), greenish gray, saturated, **USCS** 73 S1 0 high plasticity, no dilatancy, trace fine sand, trace shells. 0 60 S2 0 0 100 S3 0 0 0 5 100 S4 0 0 100 S5 0 0 100 S6 0 0 100 S7 0 0 0 100 S8 0 0 0 0 S9 0 100 0 100 S10 0 0 0 15 0 80 S11 0 0 Trace silty sand (SM) seams. S12 80 0 0 100 S13 0 0 0 20 53 S14 0 0 -41.3 21.0 SANDY SILT (ML), greenish gray, saturated, very soft, 0 40 S15 0 non plastic, trace shells. 0 0 20 S16 0 0 -44.3 24.0 0 SAND (SM), greenish gray, fine to medium grained, 47 S17 0 saturated, little silt, trace shells. 25 0 93 S18 1 Interbedded silt. 73 S19 0 0 -48.8 28.5 0 POORLY GRADED SAND (SP), gray, poorly graded, 53 S20 0 fine to medium grained, saturated, very loose, trace silt, <u>-50.3</u> 30.0 30 trace shells 100 S21 0 CLAY (CH), green and gray, moist, very soft, high plasticity, trace sp nodules. -52.7 32.4 100 S22 1 CLAYEY ELASTIC SILT (MH), blueish green, moist, very soft to stiff, trace fine sand. 5 100 S23 35

MHSPT-12-19 **Boring Designation** INSTALLATION 2 **DRILLING LOG (Cont Sheet)** Mobile Harbor AL 2 SHEETS PROJECT COORDINATE SYSTEM HORIZONTAL VERTICAL Mobile Harbor Borings State Plane NAD83 **MLLW** LOCATION COORDINATES **ELEVATION TOP OF BORING** N 105901.235 E 1800496.571 -20.26' EGEND N-Value Blows/ 0.5 ft FIELD CLASSIFICATION OF MATERIALS ELEV DEPTH REMARKS RQD % REC (Description) 35 S24 73 10 -55.8 35.5 SILTY SAND (SM), green with yellowish brown, fine grained, wet, low plasticity, few clay. 100 S25 7 100 S26 8 Light gray, fine grained, saturated, few silt, With trace silt (ML) blue green seams.

100 S27

### BOTTOM OF BOREHOLE AT 40.5 ft

### Notes:

-60.8 40.5

- 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 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.

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Project I.D. Boring Designation SS-163

| DRI              | LLIN               | G LO    | G [          | DIVISIO      | N So           | uth Atlantic  | IN      | IST/             | <b>ALL</b>      | ATION Mobile                           | Distric   | t I               | SHEET 1<br>OF 3 S | HEET               | TS        |     |
|------------------|--------------------|---------|--------------|--------------|----------------|---------------|---------|------------------|-----------------|--|-----------|-------------------|-------------------|--------------------|-----------|-----|
| PROJ             | ECT                |         | •            |              |                |               | LAT     | LONG             | COORI           | DINATES LAT = 30.                      | 287890    | LONG =            |                   |                    | _         |     |
| 19               | 63-196             | 4 Subs  | surface l    | Investigat   | ion            |               | STA     | TE PLA           | NE CO           | OORDINATES X = 1,                      | 799,663   | Y = 10            | 5,095             |                    | $\exists$ |     |
| DATE             | OF BOI             | RING    |              | ST           | ARTED          | COMPLETED     |         |                  |                 | STEM/DATUM/UNITS<br>bama West - U.S. S | urvev Ft  | HORIZ<br>NAD8     |                   | ERT.<br>LLW        |           |     |
| DRILI            | LING AG            | ENCY    |              | Corps of En  | aineers - (    | L<br>CESAM    |         | LEV              |                 | NS TOP OF B                            | ORING     | GRO               | UND WA            | TER                | _         |     |
|                  |                    |         | D INSPEC     | •            | <del>_</del>   | E OF DRILLER  |         |                  |                 | -25.8 F                                |           |                   | nderwate<br>HAMME |                    | $\dashv$  |     |
|                  |                    | I/A, Ge |              |              |                | N/A           | N/      | /A               |                 |  | į         |                   | JAL HAM           |                    | ž .       |     |
|                  | TION OF<br>VERTICA |         | INCLINE      | DEG          | FROM<br>RTICAL | BEARING       | SIZE    | AND .            | TYPE O          | OF BIT See F                           | Remarks   |                   |                   |                    |           |     |
| тніск            | NESS OF            | OVERB   | URDEN        | N/A          |                |               | тот     | AL NU            | MBER (          | CORE BOXES                             | 0         |                   |                   |                    | _         |     |
| DEPTH            | і то тор           | OF ROC  | :K           | N/A          |                |               | тот     | AL SAI           | MPLES           | DISTURBED (                            | ) UNI     | DISTURBI          | ED (UD)           | 0                  | _         |     |
| TOTAL            | DEPTH              |         | ING          | 25.5         | Feet           |               | тот     |                  | COVER           | Y FOR BORING N                         | ot Record | ed                |                   | т.                 | _         |     |
| ELEV.            | DEPTH              | LEGEND  | c            | CLASSIFICAT  | TION OF MA     | TERIALS       | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                  | DF        | RILLING<br>EMARKS | BLOWS             | 0.5 FT.<br>N-VALUE | N-VALCE   |     |
| -25.8            | 0.0                |         |              |              |                |               |         |                  |                 |  |           |                   |                   | T                  |           |     |
| -23.0            | 0.0                |         | (CH) C       | LAY, fat, hi | gh plastici    | ty, very soft |         |                  |                 |  |           |                   |                   |                    | _         | -0  |
| -                |                    |         | consiste     | ency, wet, g | gray,          |               |         |                  |                 |  |           |                   |                   |                    | -         |     |
| _                | Į.                 |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | F         | · 1 |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 | Advanced Boring                        |           |                   |                   |                    |           |     |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 | , tavag                                |           |                   |                   |                    | -         | _   |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | F         | -2  |
| :                | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | Ė         |     |
| -                | -                  |         |              |              |                |               |         |                  |                 |  |           |                   | $\vdash$          | +                  | +         | -3  |
|                  | Ī                  |         |              |              |                |               |         |                  |                 |  |           |                   | 0                 | _                  | F         |     |
| -                | <u> </u>           |         |              |              |                |               | NR      |                  |                 | SPT Sampler                            |           |                   | 0                 |                    | 0 -       | -4  |
| -                |                    |         |              |              |                |               |         |                  |                 |  |           |                   | 0                 |                    | Ĭ -       | •   |
| -                | Ī                  |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | Ŧ         |     |
| -                | -                  |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | -         | -5  |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | -         |     |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | Ē         | -6  |
|                  | ŀ                  |         |              |              |                |               |         |                  |                 | Advanced Boring                        |           |                   |                   |                    | Ŀ         |     |
|                  | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | -         |     |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | F         | -7  |
| -                | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   |                   |                    | }         |     |
| -                | <u> </u>           |         |              |              |                |               | _       |                  |                 |  | _         |                   |                   | +                  | 4         | -8  |
| ] :              | <u> </u>           |         |              |              |                |               |         |                  |                 |  |           |                   | 0                 |                    | ţ         |     |
| -                | }                  |         |              |              |                |               | NR      |                  |                 | SPT Sampler                            |           |                   | 0                 |                    | <u>_</u>  | _   |
| -                | F                  |         |              |              |                |               |         |                  |                 |  |           |                   | 0                 |                    | 0  -      | -9  |
| ] :              | <del> </del>       |         |              |              |                |               |         |                  |                 | Advanced Boring                        | 1         |                   |                   | +                  | 十         |     |
| SAM F<br>AUG 201 | ORM 1              | 836     | AFT.<br>DRII | ER LLING     | DURING '       | <u> </u>      | ontinue | ed)              |                 | Boring De                              | esignati  | on S              | S-163             |                    |           | - 1 |

| PROJECT COORDI   | e Distr<br>NATE S<br>ane - A      | rict<br>SYSTE<br>Alabar    | ma We           | est - U.S. Survey Ft.                                  | HORIZONTAL<br>NAD83 | ML       | SHEE<br>TICAL<br>LW |         |
|--|-----------------------------------|----------------------------|-----------------|--|---------------------|----------|---------------------|---------|
| COORDINATES   State PI   | NATE S<br>ane - A<br>ON TO<br>Ft. | SYSTE<br>Alabar<br>OP OF I | ma We           | ADVANCEMENT  ADVANCEMENT  ADVANCEMENT  Advanced Boring | NAD83               | VER1     | BLOWS/              |         |
| State Pi   LOCATION COORDINATES   ELEVAT     X = 1,799,663   Y = 105,095   -25.8     ELEV.   DEPTH | ane - Allon To                    | Alabar<br>P OF I           | ma We           | ADVANCEMENT  ADVANCEMENT  ADVANCEMENT  Advanced Boring | NAD83               | ML       | BLOWS/              |         |
| ELEV. DEPTH  | Ft.                               |                            | I               | ADVANCEMENT METHOD  Advanced Boring                    | DRILLIN             | IG<br>(S |                     | N-VALUE |
| CLASSIFICATION OF MATERIALS  CLASSIFICATION OF MATERIALS   | RÉC.                              | BOX OR<br>SAMPLE           | RQD<br>OR<br>UD | Advanced Boring  | DRILLIN             | IG<br>(S |                     | N-VALUE |
| 45.8 20.0  |                                   | BOX OR<br>SAMPLE           | ROPE            | Advanced Boring  | DRILLIN             | IG<br>(S |                     | N-VALUE |
|  | NR                                |                            |                 |  |                     |          |                     |         |
|  | NR                                |                            |                 | SPT Sampler  | _                   | -        | 0                   |         |
|  |                                   |                            |                 |  |                     | -        | 0                   | 0       |
|  |                                   |                            |                 | Advanced Boring  |                     |          |                     |         |
|  | NR                                |                            |                 | SPT Sampler  |                     |          | 0                   | 0       |

| DR                             | ILLIN                    | GIO    | DG (Cont. Sheet)   | INSTAL              |          |                  |                 |   |                   | SHEET   |                   | $\Box$ |
|--------------------------------|--------------------------|--------|--|---------------------|----------|------------------|-----------------|---|-------------------|---------|-------------------|--------|
|                                |                          |        | oo (oont: oncet)   | <del>1</del>        | ile Dis  |                  |                 |   |                   | OF 3    |                   | rs     |
| ROJEC                          | CT                       |        |  | COORD               |          |                  |                 |   | HORIZONTAL        | 1       | ICAL              |        |
|                                |                          |        |  |                     |          |                  |                 | est - U.S. Survey Ft.   | NAD83             | I IVIL  | LW                | _      |
|                                | ON COO                   |        | r <b>es</b><br>' = 105,095   | <b>ELEVAT</b> -25.8 |          | OP OF I          | BORING          | 3   |                   |         |                   |        |
|                                | 1,799,00                 |        | - 105,095  | -23.0               | ) Ft.    | νш               | ı               |   | 1                 | Т       | - I u             | _      |
| ELEV.                          | DEPTH                    | LEGEND | CLASSIFICATION OF MATERIALS  |                     | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VAL  |
| -                              | -                        |        |  |                     | NR       |                  |                 | SPT Sampler   |                   |         | 0                 |        |
| -<br>-<br>-                    | †<br> -<br> -            |        |  |                     |          |                  |                 | Advanced Boring   |                   |         |                   |        |
| -51.3<br>-<br>-<br>-<br>-<br>- | 25.5                     |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |                     |          |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). | _                 |         |                   |        |
| -<br>-<br>-<br>-<br>-          | †<br>-<br>-<br>-<br>-    |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -<br>-<br>-<br>-               | -<br>-<br>-<br>-<br>-    |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -<br>-<br>-                    | †<br>-<br>-              |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -<br>-<br>-                    |                          |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -                              | <del>-</del><br>-<br>-   |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -<br>-<br>-                    | <del> </del><br> -<br> - |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -                              | <del> </del><br> -<br> - |        |  |                     |          |                  |                 |   |                   |         |                   |        |
| -<br>-<br>-                    | <u>-</u>                 |        |  |                     |          |                  |                 |   |                   |         |                   |        |
|                                | ORM <sup>7</sup>         | 1020   | A AFTER ▼ DURING ▽ DRILLING  |                     | <u> </u> |                  |                 |   | l<br>esignation   | SS-16   |                   | _      |

MHSPT-11-19 **Boring Designation** DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL NAD83 Mobile Harbor Borings State Plane - Alabama West MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-11-19 N 104081.253 E 1799422.912 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 24 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED **VERTICAL** 15. DATE BORING 9/19/20 9/19/20 16. ELEVATION TOP OF BORING -28.6' 6. THICKNESS OF OVERBURDEN >34.5 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 34.5' Adam Tew, Geologist N-Value Blows/ 0.5 ft EGEN FIELD CLASSIFICATION OF MATERIALS **ELEV DEPTH** Samb REMARKS RQD % REC (Description) 0 SANDY SILT (ML), dark gray, very soft, low plasticity, **USCS** 100 S1 0 few fine sand, trace shells. 0 100 S2 1 hole drilled using rotary spade bit and minimal fluid return throughout drilling 93 S3 0 0 5 100 S4 0 0 S5 0 47 0 100 S6 0 0 -38.6 10.0 100 S7 0 SILTY SAND (SM), light gray, fine grained, wet, very loose, some silt. 2 100 S8 80 S9 4 100 S10 3 15 SAND, light brownish gray, fine to medium grained, very 87 S11 1 loose, little silt. 0 -46.1 17.5 87 S12 CLAY (CH), greenish gray, high plasticity, no dilatancy. 0 0 17.5 93 l S13 20 47 S14 3 100 S15 3 100 S16 2 Grayish brown, trace wood. 80 S17 3 25 100 S18 3 -56.1 100 S19 4 SANDY CLAY (CL), grayish brown, wet, medium plasticity, some fine to medium sand. Few fine sand. 100 S20 3 30 100 S21 4 100 S22 3 100 S23 4

Project I.D. Boring Designation **SS-165** 

| DRI              | LLIN               | G LO    | G        | DIVI           | SION         | <b>S</b> ou  | ıth Atlantic | IN      | ISTA             | <b>ALL</b>      | ATION Mobile                                  | Distric   | t I               | SHEET<br>OF 2   |                   | ETS     |            |
|------------------|--------------------|---------|----------|----------------|--------------|--------------|--------------|---------|------------------|-----------------|---|-----------|-------------------|-----------------|-------------------|---------|------------|
| PROJ             | ECT                |         |          |                |              |              |              | LAT     | LONG             | COORI           | DINATES LAT = 30                              | 282339    | LONG              | = -88.0         | 0348              | 59      | 1          |
| 19               | 63-196             | 4 Subs  | surface  | Inves          | tigatio      | n            |              | STA     | TE PLA           | NE CO           | OORDINATES X = 1                              | ,799,679  | Y = 1             | 03,076          | 3                 |         |            |
| DATE             | OF BOI             | RING    |          |                | STAI         | RTED         | COMPLETED    |         |                  |                 | <b>STEM/DATUM/UNITS</b><br>bama West - U.S. S | urvev Ft  | HORI<br>NAD       |                 | <i>VER</i><br>MLL |         |            |
| DRILI            | LING AG            | ENCY    |          | Corps          | of Engi      | neers - (    | CESAM        | 1       |                  | ATION           | NS TOP OF B                                   | ORING     | GRO               | DUND V          | VATE              | R       | 1          |
|                  | & TITLE            |         |          |                | · · · ·      |              | E OF DRILLER |         |                  |                 | -32.8 F                                       |           |                   | Inderw<br>o ham |                   |         |            |
|                  |                    | I/A, Ge |          |                |              |              | N/A          | N/      | /A               |                 |   | Ì         |                   | UAL H           |                   |         | ]          |
|                  | TION OF<br>VERTICA |         |          | ED             | DEG.<br>VERT | FROM<br>ICAL | BEARING      | SIZE    | E AND            | TYPE O          | OF BIT See F                                  | Remarks   |                   |                 |                   |         |            |
| тніск            | NESS OF            | OVERB   | URDEN    |                | N/A          |              |              | тот     | AL NU            | MBER (          | CORE BOXES                                    | 0         |                   |                 |                   |         |            |
| DEPTH            | і то тор           | OF ROC  | CK .     |                | N/A          |              |              | тот     | AL SAI           | MPLES           | DISTURBED                                     | ) UN      | DISTURE           | BED (UL         | <b>)</b>          | 0       |            |
| TOTAL            | . DEPTH            | т т     | ING      |                | 18.5 Fe      | eet          |              | тот     |                  | COVER           | Y FOR BORING N                                | ot Record | led               |                 | _                 |         | _          |
| ELEV.            | DEPTH              | LEGEND  |          | CLASSI         | FICATIO      | ON OF MA     | TERIALS      | REC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD                         | DI<br>RE  | RILLING<br>EMARKS |                 | BLOWS/<br>0.5 FT. | N-VALUE |            |
| -32.8            | 0.0                |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | 1          |
| -02.0            | 0.0                |         | (CH) (   | CLAY, 1        | at, high     | plasticit    | y, very soft |         |                  |                 |   |           |                   |                 |                   |         | -0<br>-    |
| -                | <u> </u>           |         | consisi  | tency, \       | wet, gra     | ıy,          |              |         |                  |                 |   |           |                   |                 |                   |         | Ė          |
| -                | <u> </u>           |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | -1         |
|                  | <u> </u>           |         |          |                |              |              |              |         |                  |                 | Advanced Boring                               |           |                   |                 |                   |         | -          |
| -                |                    |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | <u>ا</u> ، |
| -                | F                  |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | -2<br>-    |
|                  | <u> </u>           |         |          |                |              |              |              |         |                  |                 |   | 1         |                   | f               | 0                 |         | ţ          |
| -                | -                  |         |          |                |              |              |              | ND      |                  |                 | CDT Complex                                   |           |                   | -               | _                 |         | -3         |
|                  | [                  |         |          |                |              |              |              | NR      |                  |                 | SPT Sampler                                   |           |                   | -               | 0                 | 0       | F          |
| -                | _                  |         |          |                |              |              |              |         |                  |                 |   | _         |                   |                 | 0                 |         | <u> </u> 4 |
| -                | <u> </u>           |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | -          |
| -                | [                  |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | Ē          |
| -                | <b>-</b>           |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | −5<br>-    |
| -                |                    |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | -          |
| -                | [                  |         |          |                |              |              |              |         |                  |                 | Advanced Boring                               |           |                   |                 |                   |         | _<br>_6    |
|                  | <u> </u>           |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | _          |
| -                |                    |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | - ,        |
| -                | [                  |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | -7<br>-    |
| ] :              | <u> </u>           |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 |                   |         | Ė          |
| -                | -                  |         |          |                |              |              |              |         |                  |                 |   | -         |                   | - }             |                   |         | -8         |
| ] .              | ļ                  |         |          |                |              |              |              |         |                  |                 |   |           |                   | -               | 0                 |         | Ė          |
| :                | _                  |         |          |                |              |              |              | NR      |                  |                 | SPT Sampler                                   |           |                   |                 | 0                 | 0       | -<br>-9    |
| ] -              | <u> </u>           |         |          |                |              |              |              |         |                  |                 |   |           |                   |                 | 0                 | J       | -          |
|                  |                    |         |          |                |              |              |              |         |                  |                 | Advanced Boring                               |           |                   |                 |                   |         | <u> </u>   |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AF<br>DR | TER<br>RILLING | ▼ DI         | JRING S      | <u>Z</u> (C  | ontinue | ed)              |                 | Boring D                                      | esignati  | on S              | SS-16           | 5                 |         | <b></b> -1 |

| DΚ    | ILLIN                 | G LC   | OG (Cont. Sheet)   | INSTALI |         |                  |                 |   |                   | SHEET   |                   |         |                     |
|-------|-----------------------|--------|--|---------|---------|------------------|-----------------|---|-------------------|---------|-------------------|---------|---------------------|
| PROJE |                       |        |  | COORDI  | le Dist |                  | 14/D A T        |   | HORIZONTAL        | OF 2    | SHE               |         | 1                   |
| KOJE  | 61                    |        |  |         |         |                  |                 | est - U.S. Survey Ft.   | NAD83             |         | LLW               | •       |                     |
| OCAT  | ION COOL              | RDINAT | rs.  | ELEVAT  |         |                  |                 | -   | IVADOS            | 101     |                   |         | 1                   |
|       |                       |        | = 103,076  | -32.8   |         | . <b>.</b> .     |                 |   |                   |         |                   |         |                     |
| ELEV. | DEPTH                 | Q      | CLASSIFICATION OF MATERIALS  |         | ĸč.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD   | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | N-VALUE | 1                   |
|       |                       |        |  |         |         |                  |                 | Advanced Paving   |                   |         |                   |         |                     |
| -46.8 | 14.0                  |        | (SC) SAND, clayey, dense, wet, gray,   |         |         |                  |                 | Advanced Boring   |                   |         |                   |         | -<br> -<br> -<br> - |
|       | +<br>-<br>-<br>-<br>- |        |  |         |         |                  |                 |   | _                 |         | 15                |         |                     |
| -     | +<br>-<br>-<br>-<br>- |        |  |         | NR      |                  |                 | SPT Sampler   | _                 |         | 25                | 63      |                     |
| 51.3  | 18.5                  |        |  |         |         |                  |                 | Advanced Boring   |                   |         |                   |         |                     |
| -     | -<br>-<br>-<br>-      |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils Classification System. |         |         |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x<br>2" O.D.). |                   |         |                   |         |                     |
| -     |                       |        |  |         |         |                  |                 |   |                   |         |                   |         |                     |
| -     | +<br>+<br>+<br>+      |        |  |         |         |                  |                 |   |                   |         |                   |         |                     |
| -     | ORM 1                 |        | <b>A</b> AFTER ▼ DURING ▽ DRILLING ▼   |         |         |                  |                 |   |                   |         |                   |         |                     |

Project I.D.

Boring Designation

SS-167

DRILLING LOG DIVISION South Atlantic INSTALLATION Mobile District SHEET 1

of 2 SHEETS

| DR               | LLIN                 | G LO   | G                            | DIV             | ISION          | Sou        | uth Atlantic        | IN       | ISTA             | \LL#            | ATION          | Mobile                   | District  |                 | OF 2         |                   | ETS        |                |
|------------------|----------------------|--------|------------------------------|-----------------|----------------|------------|---------------------|----------|------------------|-----------------|----------------|--------------------------|-----------|-----------------|--------------|-------------------|------------|----------------|
| PROJ             | ECT                  |        |                              |                 |                |            |                     | LAT      | LONG             | COORI           | DINATES L      | AT = 30.2                | 76788     |                 |              |                   |            | 1              |
| 10               | 163 <sub>-</sub> 106 | M Sub  | curface                      | a Inva          | estigatio      | n          |                     | STA      | TE PLA           | NE CO           | ORDINATES      | X = 1,7                  | 99,695    | Y = 1           | 01,057       | ,                 |            | 1              |
|                  | OF BO                |        | Suriaci                      | I               | STAF           |            | COMPLETED           |          |                  |                 | STEM/DATU      | W/UNITS                  |           | HORI            | z.           | VER               |            |                |
| - DAIL           | . 0. 00              |        |                              |                 |                |            |                     | 1        |                  |                 | bama West      | t - U.S. Su<br>TOP OF BO |           | NAD             | 83<br>DUND V | MLL               |            | -              |
|                  | LING AC              |        |                              |                 | s of Engi      | neers - (  | CESAM               |          |                  | OITA            | 49             | -36.8 Fe                 | et        |                 | Inderw       |                   |            |                |
| NAME             | & TITLE              |        | <b>LD INSP</b> I<br>eologist |                 |                | NAM        | E OF DRILLER<br>N/A | MAN<br>N |                  | TURER           | 'S DESIGNAT    | TION OF DR               | "LL       |                 | O HAM        |                   | ED         |                |
| DIREC            | TION OF              |        |                              | П               | DEG. I<br>VERT | FROM       | BEARING             | IN       |                  |                 |                |                          |           | WAN             | OAL II       | HIVIIVII          | <u>- K</u> | ł              |
| $\square$        | VERTICA              | AL 🗆   | INCLIN                       | ED              | VERT           | ICAL       |                     | SIZE     | AND.             | TYPE C          | OF BIT         | See Re                   | marks     |                 |              |                   |            |                |
| тніск            | NESS OF              | OVERE  | BURDEN                       |                 | N/A            |            |                     | тот      | AL NU            | MBER (          | CORE BOXES     | <b>s</b> 0               |           |                 |              |                   |            |                |
| DEPTH            | 1 то тор             | OF RO  | СК                           |                 | N/A            |            |                     | тот      | AL SAI           | MPLES           | DISTU          | RBED ()                  | UNE       | DISTURE         | BED (UL      | <b>)</b> )        | 0          |                |
| TOTAL            | L DEPTH              | OF BOR | RING                         |                 | 14.5 Fe        | eet        |                     | тот      | AL RE            | COVER           | Y FOR BORII    | <b>NG</b> Not            | Recorde   | ed              |              |                   |            |                |
| ELEV.            | DEPTH                | LEGEND |                              | CLAS            | SIFICATIO      | ON OF MA   | TERIALS             | ĸ.       | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANC<br>METI | EMENT<br>HOD             | DR<br>REI | ILLING<br>MARKS |              | BLOWS/<br>0.5 FT. | N-VALUE    |                |
|                  |                      |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            |                |
| -36.8            | 0.0                  |        | (CH)                         | CLAY,           | , fat, high    | n plastici | ty, very soft       | 1        |                  |                 |                |                          |           |                 |              |                   |            | -0             |
|                  | Ţ                    |        | consis                       | stency,         | , wet, gra     | ıy         | •                   |          |                  |                 | Advance        | d Boring                 |           |                 |              |                   |            | F              |
|                  | İ                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | Ŀ₁             |
|                  | -                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              | 0                 |            | ├ '            |
|                  | <u> </u>             |        |                              |                 |                |            |                     | NR       |                  |                 | SPT Sa         | ampler                   |           |                 | ŀ            | 0                 |            | L              |
| -                | +                    |        |                              |                 |                |            |                     | '''`     |                  |                 |                | ampioi                   |           |                 | -            |                   | 0          | -2             |
|                  | ‡                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              | 0                 |            | 1              |
|                  | +                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | ١.             |
| -                | Ī                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | -3<br>-        |
|                  | †                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | ŀ              |
| -                | ļ                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | _<br>-4        |
|                  | İ                    |        |                              |                 |                |            |                     |          |                  |                 | Advance        | d Boring                 |           |                 |              |                   |            | L              |
|                  | Ī                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | -              |
| -                | İ                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | -5<br>-        |
|                  | +                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | ŀ              |
| -                | ‡                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | <u> </u> 6     |
|                  | +                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              | 0                 |            | Fĭ             |
|                  | ‡                    |        |                              |                 |                |            |                     | NR       |                  |                 | SPT Sa         | ampler                   |           |                 |              | 0                 |            | ļ              |
| -                | +                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   | 0          | -7             |
|                  | Į.                   |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 | -            | 0                 |            | ļ              |
|                  | †                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | <b>-</b>       |
| ] -              | Ī                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | <b>−</b> 8     |
|                  | İ                    |        |                              |                 |                |            |                     |          |                  |                 | Advance        | d Borina                 |           |                 |              |                   |            | E              |
| _                | 1                    |        |                              |                 |                |            |                     |          |                  |                 | Advance        | u builiy                 |           |                 |              |                   |            | _ <sub>9</sub> |
|                  | İ                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | ţ              |
|                  | +                    |        |                              |                 |                |            |                     |          |                  |                 |                |                          |           |                 |              |                   |            | F              |
| SAM F<br>AUG 201 | ORM 7                | 1836   | Al<br>Di                     | FTER<br>RILLING | g <b>▼</b> DU  | JRING S    | <u>√</u> (C         | ontinue  | ed)              |                 | Во             | oring Des                | signatio  | on S            | SS-16        | 7                 |            | <b>-</b> 1     |

| DRI         | LLIN              | G La  | OG (Cont. Sheet)  | INSTAL           |          |                  |                 |  |                     | SHEE   |                   |         | 1          |
|-------------|-------------------|-------|---|------------------|----------|------------------|-----------------|--|---------------------|--------|-------------------|---------|------------|
|             |                   |       |   | +                | ile Dis  |                  |                 |  | HODITONITA          | OF 2   |                   |         | 4          |
| PROJEC      | ;T                |       |   | COORD<br>State P |          |                  |                 | est - U.S. Survey Ft.  | HORIZONTAL<br>NAD83 | ı      | RTICA<br>1LLW     | L       |            |
| LOCATION    | ON COO            | RDINA | TES   | ELEVAT           |          |                  |                 |  | 10.000              |        |                   |         | 1          |
|             |                   |       | ′ = 101,057   | -36.8            |          |                  |                 |  |                     |        |                   |         |            |
| ELEV.       | DEPTH             | Q     | CLASSIFICATION OF MATERIALS   |                  | REC.     | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK   | G<br>S | BLOWS/<br>0.5 FT. | N-VALUE |            |
| -           | -                 |       |   |                  |          |                  |                 |  |                     |        | 0                 |         | <b>+</b> ′ |
| -           | -                 |       |   |                  | NR       |                  |                 | SPT Sampler  |                     |        | 0                 | 0       | <u>-</u>   |
| -           | -<br>-<br>-       |       |   |                  |          |                  | _               |  |                     |        |                   |         | +<br>-     |
| -49.8       | 13.0              |       |   |                  |          |                  |                 | Advanced Boring  |                     |        |                   |         |            |
| -           | -<br>-            |       | (SC) SAND, clayey, wet, gray with la<br>of fat clay                                 | iyers            |          |                  |                 | ravanosa Boning  |                     |        |                   |         | -          |
| -51.3       | 14.5              |       |   |                  |          |                  |                 | 4.00   | -                   |        |                   |         | F          |
| -           | -<br>-            |       | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils |                  |          |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x |                     |        |                   |         |            |
| -           | -<br>-<br>-       |       | Classification System.  |                  |          |                  |                 | 2" O.D.).  |                     |        |                   |         | -          |
| -           | -<br>-            |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -           | -                 |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -           | -<br>-<br>-       |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -           | -<br>-<br>-       |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -           | -<br>-<br>-       |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -           | <del>-</del><br>- |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -<br>-<br>- | -                 |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| -<br>-      | -<br>-            |       |   |                  |          |                  |                 |  |                     |        |                   |         | -          |
| SAM F       | ORM '             | 1836- | AFTER ▼ DURING ∇ DRILLING DRILLING  |                  | <u> </u> |                  |                 | Parina Da  | <u> </u>            | SS-1   | <br>67            |         |            |

**Boring Designation** MHSPT-09-19 DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL Mobile Harbor Borings State Plane - Alabama West NAD83 MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-09-19 N 100364.582 E 1798938.319 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 21 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ☑ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/11/20 9/11/20 16. ELEVATION TOP OF BORING -27.98 6. THICKNESS OF OVERBURDEN >32' 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 32 April Kelly, Geologist N-Value Blows/ 0.5 ft EGEN FIELD CLASSIFICATION OF MATERIALS **ELEV** DEPTH **REMARKS** Samb RQD % REC (Description) 0 0 SANDY SILT (ML), dark greenish gray, medium **USCS** 100 S1 0 plasticity, little fine sand, trace shells. 0 87 S2 0 0 0 Organic odor. 100 S3 0 0 0 5 S4 100 0 0 S5 80 0 0 Some fine sand. -35.5 7.5 SILTY SAND (SM), dark gray, fine grained, little silt, 100 S6 0 0 trace shells -37.0 9.0 SILTY SAND (SP-SM), dark gray, few silt, trace shells. 60 S7 1 73 S8 3 100 S9 3 53 S10 2 15 0 33 S11 0 -44.5 16.5 SANDY SILT (ML), dark blueish gray, medium plasticity, 100 S12 2 few fine sand, trace shells. -46.0 18.0 ELASTIC SILT (MH), high plasticity, trace wood, trace 33 S13 4 fine sand. 20 100 S14 3 100 S15 0 100 S16 2 100 S17 3 25 -54.2 26.2 80 S18 4 SANDY PEAT (OL), dark gray and dark brown, little fine sand, little wood. 20 S20 5 -56.5 28.5 ELASTIC SILT (MH), dark grayish green, high plasticity, 100 S21 4 trace wood, trace fine sand. 30 100 S22 5 -60.0 32.0 BOTTOM OF BOREHOLE AT 32.0 ft

**Boring Designation** MHSPT-10-19 DIVISION INSTALLATION **DRILLING LOG** South Atlantic Division Mobile Harbor AL 1 SHEETS 1. PROJECT 9. COORDINATE SYSTEM HORIZONTAL VERTICAL Mobile Harbor Borings State Plane - Alabama West NAD83 MLLW 10. SIZE AND TYPE OF BIT 4" Fishtail Upward Discharge 2. HOLE NUMBER : LOCATION COORDINATES 11. MANUFACTURER'S DESIGNATION OF DRILL MHSPT-10-19 N 101921.727 E 1799799.836 CME-750 3. DRILLING AGENCY 12. TOTAL SAMPLES DISTURBED UNDISTURBED Corps of Engineers - CESAS 11 0 4. NAME OF DRILLER 13. TOTAL NUMBER CORE BOXES 0 Joe Bowerman 14. ELEVATION GROUND WATER See Remarks 5. DIRECTION OF BORING DEG FROM BEARING ✓ VERTICAL STARTED COMPLETED VERTICAL 15. DATE BORING 9/12/20 9/12/20 16. ELEVATION TOP OF BORING -41.65 6. THICKNESS OF OVERBURDEN >16.5 17. TOTAL CORE RECOVERY FOR BORING N/A 7. DEPTH DRILLED INTO ROCK 18. SIGNATURE AND TITLE OF INSPECTOR 8. TOTAL DEPTH OF BORING 16.5' April Kelly, Geologist N-Value LEGEND Blows/ 0.5 ft FIELD CLASSIFICATION OF MATERIALS **ELEV** DEPTH Samb REMARKS RQD % REC (Description) 0 0 SANDY SILT (ML), dark gray, low plasticity, little fine **USCS** 33 S1 0 0 sand, trace shells. 0 Trace fine sand, no shells. 87 S2 0 0 0 47 S3 0 0 0 5 S4 100 0 0 -47.7 6.0 0 SILTY SAND (SM), dark gray, fine grained, few silt. S5 0 47 0 -49.2 7.5 0 SANDY SILT (ML), dark gray, medium plasticity, few 0 100 S6 0 0 fine sand. 0 100 S7 0 0 0 100 S8 0 0 Trace wood Low plasticity, some fine sand. 0 Dark gray and dark brown, few fine sand, few wood. 100 S9 3 100 S10 3 -56.7 15 n ELASTIC SILT (MH), dark grayish green, high plasticity, -57.7 16.0 100 S11 4 trace wood, trace fine sand.

### BOTTOM OF BOREHOLE AT 16.5 ft

### 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 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.

Project I.D. Boring Designation SS-169

| DRI              | LLIN               | G LO    | G D           | IVISIO      | N Sou             | uth Atlantic  | IN      | IST/             | \LL#            | ATION M                     | lobile I        | District  |                 | HEET 1<br>F 3 SHI  | EETS    |   |
|------------------|--------------------|---------|---------------|-------------|-------------------|---------------|---------|------------------|-----------------|-----------------------------|-----------------|-----------|-----------------|--------------------|---------|---|
| PROJ             | ECT                |         |               |             |                   |               | LAT     | LONG             | COORI           | DINATES LAT                 | Γ = 30.27       | 71517     |                 | -88.0372           |         |   |
| 19               | 63-196             | 4 Subs  | urface Ir     | nvestigat   | tion              |               | STA     | TE PLA           | NE CO           | ORDINATES                   | X = 1,79        | 98,892    | Y = 99,         | 144                |         |   |
| DATE             | OF BO              | RING    |               | ST          | ARTED             | COMPLETED     |         |                  |                 | stem/datum/u<br>bama West - |                 | vev Ft    | HORIZ.          |                    |         |   |
| DRILI            | LING AG            | ENCY    | C             | orps of Fr  | ngineers - (      | CESAM         | 1       | LEVA             |                 | NS TO                       | P OF BOR        | RING      | GROU            | IND WATE           | ER      | 1 |
|                  |                    |         | D INSPECT     |             |                   | E OF DRILLER  |         |                  |                 | 'S DESIGNATIO               | 28.8 Fe         |           |                 | derwater<br>HAMMER |         | 1 |
|                  |                    | I/A, Ge |               |             |                   | N/A           | N,      | /A               |                 |                             |                 |           |                 | AL HAMM            |         |   |
|                  | TION OF<br>VERTICA |         | INCLINED      | DEC<br>VE   | G. FROM<br>RTICAL | BEARING       | SIZE    | E AND            | TYPE C          | F BIT                       | See Re          | marks     |                 |                    |         |   |
| тніск            | NESS OF            | OVERBI  | URDEN         | N/A         |                   |               | тот     | AL NU            | MBER            | CORE BOXES                  | 0               |           |                 |                    |         | 4 |
| DEPTH            | 1 ТО ТОР           | OF ROC  | K             | N/A         |                   |               | тот     | AL SAI           | MPLES           | DISTURB                     | <b>SED</b> ()   | UND       | ISTURBE         | D (UD)             | 0       |   |
| TOTAL            | L DEPTH            |         | NG            | 22.4        | Feet              |               | тот     |                  | COVER           | Y FOR BORING                | Not             | Recorde   | ed              |                    | l       | 4 |
| ELEV.            | DEPTH              | LEGEND  | CL            | .ASSIFICA   | TION OF MA        | TERIALS       | RÉC.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEN<br>METHO           | IENT<br>D       | DR<br>REI | ILLING<br>MARKS | BLOWS/<br>0.5 FT.  | N-VALUE |   |
| -28.8            | 0.0                |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | 1 |
| -20.0            | 0.0                |         |               |             |                   | ty, very soft |         |                  |                 |                             |                 |           |                 |                    |         | F |
|                  | t                  |         | consister     | ncy, wet, ( | gray,             |               |         |                  |                 |                             |                 |           |                 |                    |         | Ł |
| -                | -                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | ŀ |
|                  | ‡                  |         |               |             |                   |               |         |                  |                 | Advanced E                  |                 |           |                 |                    | ļ       |   |
| -                | †                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | Ŀ |
| -                | Ţ                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | - |
|                  | <u> </u>           |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | L |
| -                | -                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 | -                  |         | ł |
|                  | ‡                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 | 0                  |         | ļ |
| -                | Ĺ                  |         |               |             |                   |               | NR      |                  |                 | SPT Sam                     | pler            |           |                 | 0                  | 0       | - |
|                  | }                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 | 0                  |         | ŀ |
|                  | ‡                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | ţ |
| -                | +                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | H |
|                  | Ī                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | F |
|                  | 1                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         |   |
|                  | +                  |         |               |             |                   |               |         |                  |                 | l                           |                 |           |                 |                    |         | ŀ |
|                  | ‡                  |         |               |             |                   |               |         |                  |                 | Advanced E                  | Boring          |           |                 |                    |         | ļ |
| -                | t                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | F |
| ] .              | +                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | F |
| -                | ‡                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | L |
|                  | †                  |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 |                    |         | F |
| ] :              | Ţ                  |         |               |             |                   |               |         |                  | ]               |                             |                 |           |                 | 0                  |         | Ŧ |
| -                | †                  |         |               |             |                   |               | NR      |                  |                 | SPT Sam                     | <sub>nler</sub> |           |                 | 0                  |         | ŀ |
|                  | +                  |         |               |             |                   |               |         |                  |                 | Ji i Galli                  | Pici            |           |                 | -                  | 0       | F |
|                  | <u> </u>           |         |               |             |                   |               |         |                  |                 |                             |                 |           |                 | 0                  |         | 上 |
| SAM F<br>AUG 201 | ORM 1              | 1836    | AFTE<br>DRILL | R<br>LING ▼ | DURING S          | <u> </u>      | ontinue | ed)              |                 | Bori                        | ng Des          | signatic  | n SS            | S-169              |         |   |

| DR  | ILLIN                                     | G LC   | OG (Cont. Sheet)  | INSTALI                 |       |                  |                 |  |                   | SHEET   |                   |            |
|---|---|--------|---|-------------------------|-------|------------------|-----------------|--|-------------------|---------|-------------------|------------|
| PROJEC  |   | ,      | Mobi  | OF 3 SHEETS AL VERTICAL |       |                  |                 |  |                   |         |                   |            |
| KOJEC   | ě I                                       |        | State Pl  |                         | NAD83 |                  | LLW             |  |                   |         |                   |            |
| OCATI   | ON COOL                                   |        | ELEVAT  |                         | NADOO | 101              |                 | -  |                   |         |                   |            |
|   |   |        | = 99,144  | -28.8                   |       |                  |                 |  |                   |         |                   |            |
| ELEV.   | DEPTH                                     | LEGEND | CLASSIFICATION OF MATERIALS   |                         | ĸ.    | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD  | DRILLIN<br>REMARK | G<br>(S | BLOWS/<br>0.5 FT. | <br> -<br> |
| -<br>-<br>-<br>-<br>-<br>-<br>-                     | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- |        |   |                         |       |                  |                 | Advanced Boring  |                   |         |                   |            |
| -   | <del> </del><br> -<br> -<br> -            |        |   |                         | NR    |                  |                 | SPT Sampler  |                   |         | 0 0               | 0          |
| -43.8   | 15.0                                      |        | (SC) SAND, clayey, wet, gray,   |                         |       |                  |                 | Advanced Boring  |                   |         |                   |            |
| -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | 22.4                                      |        |   |                         |       |                  |                 |  |                   |         |                   |            |
| -<br>-<br>-<br>                                     | †<br>†<br>†                               |        | NOTES:  1. Soils are field visually classified in accordance with the Unified Soils |                         |       |                  |                 | 140# hammer<br>w/30" drop used<br>with 2.0' split<br>spoon<br>(1-3/8" I.D. x |                   |         |                   |            |

| DRILLING LOG (Cont. Sheet) |          |        |                               |       | INSTALLATION  Mobile District                      |                  |                 |                       |                   |        |                    | ETS     |  |
|----------------------------|----------|--------|-------------------------------|-------|--|------------------|-----------------|-----------------------|-------------------|--------|--------------------|---------|--|
| PROJECT                    |          |        |                               |       | COORDINATE SYSTEM/DATUM HORIZONTAL                 |                  |                 |                       |                   |        |                    |         |  |
|                            |          |        |                               |       | State Plane - Alabama West - U.S. Survey Ft. NAD83 |                  |                 |                       |                   |        | L VERTICAL<br>MLLW |         |  |
| LOCATION COORDINATES       |          |        |                               | ELEVA |  | OP OF            | BORING          |                       |                   |        |                    |         |  |
| X = '                      | 1,798,89 |        | = 99,144                      | -28.  | 8 Ft.  |                  |                 |                       | <u> </u>          |        |                    | 111     |  |
| ELEV.                      | DEPTH    | LEGEND | CLASSIFICATION OF MATERIAL    | .s    | REC.   | BOX OR<br>SAMPLE | RQD<br>OR<br>UD | ADVANCEMENT<br>METHOD | DRILLIN<br>REMARK | G<br>S | BLOWS/<br>0.5 FT.  | N-VALUE |  |
| -                          | -        |        | Classification System.        |       |  |                  |                 | 2" O.D.).             |                   |        |                    |         |  |
| -                          |          |        |                               |       |  |                  |                 |                       |                   |        |                    |         |  |
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| -                          | <u> </u> |        |                               |       |  |                  |                 |                       |                   |        |                    |         |  |
|                            | ORM 1    |        | A AFTER ▼ DURING ▽ DRILLING ▼ |       |  |                  |                 |                       |                   |        |                    |         |  |

## APPENDIX B ENVIRONMENTAL COMPLIANCE

## **Turtle Trawl Net Specifications**

### **Turtle Trawl Net Specifications**

DESIGN: 4 Seam, 4 Legged, 2 Bridal Trawl Net

WEBBING: 4 inch bar, 8 inch stretch

Top - 36 Gauge Twisted Nylon Dipped Side - 36 Gauge Twisted Nylon Dipped Bottom - 84 Gauge Braided Nylon Dipped

NET LENGTH: 60 ft from cork line to cod end

BODY TAPER: 2 to 1

WING END HEIGHT: 6 feet

CENTER HEIGHT: Dependent on depth of trawl - 14 to 18 feet COD END: Length 50 meshes x 4 inches equals 16.7 feet

Webbing 2 inch bar, 4 inch stretch, 84 gauge braid nylon

Dipped, 80 meshes around, 40 rigged meshes with 1/4 x 2

inch choker rings, 1 each ½ x 4 inch at end

Cod End Cover - none Chaffing Gear - none

HEAD ROPE: 60 ft ½ inch combination rope (braid nylon with stainless cable center)

FOOT ROPE: 65 ft ½ inch combination rope

LEG LINE: Top - 6 ft, Bottom - 6 ft

FLOATS: Size - Tuna Floats (football style), Diameter - 7

Inches; Length - 9 inches; number 12 each;

Spacing - center of top net 2 inches apart MUD ROLLERS: Size - 5 inch Diameter. 5.5 inch length

Number - 22 each; spacing - 3 ft attached with 3/8 inch Polypropylene rope (replaced with snap on roller when broken)

TICKLER CHAINS: NONE (Discontinued - but previously used ½ inch x 74 ft galvanized chain)

WEIGHT: 20 ft of ¼ inch galvanized chain on each wing, 40 ft per net looped and tied

DOOR SIZE: 7 ft x 40 inches (or 8 ft x 40 inches); Shoe - 1 inch X 6 inch: bridles - 3/8 inch high test chain

CABLE LENGTH: (Bridle Length, Total): 7/16 inch x 240-300 ft varies with bottom conditions

FLOAT BALL: NONE LAZY LINES: 1 inch nylon

PICKUP LINES: 3/8 inch polypropylene

WHIP LINES: 1 inch nylon

# ODESS System Requirements and Forms

### HARDWARE REQUIREMENTS FOR THE ODESS SYSTEM

The dredge shall be equipped and the contractor is responsible for an ODESS hardware system consisting of a tablet computer, wireless keyboard, wireless mouse and data modem (or equivalent onboard internet connection) along with a proper tote bag and setup location for the afore mentioned hardware components. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor shall be responsible for repairing it within 48 hours of determination of the condition. The contractor shall also keep ODESS personnel updated on the status of the onboard ODESS system and the progress of any repairs.

### Computer

The Contractor shall provide a dedicated onboard tablet computer for use by the observers and shall have ODESS software installed on it prior to project initiation. This computer shall be located and oriented to allow data entry and data viewing. It must meet or exceed the following specifications:

| Tablet Hardware Component | Specification                                  |
|---------------------------|--|
| CPU                       | Intel or AMD processor with a (non-            |
|                           | overclocked) clock speed of at least 2.4       |
|                           | gigahertz (GHz)                                |
| Hard Disk                 | 128 gigabytes (GB); solid state internal       |
|                           | storage  |
| RAM                       | 4 gigabytes (GB)                               |
| Network Adapter           | Internal wired or wireless network hardware to |
|                           | match internet connection                      |
| Video Adapter             | Support for 1024x768 resolution at 16-bit      |
|                           | color depth                                    |
| Display                   | >= 10.8 in.                                    |
| Integrated Camera         | 2MP HD webcam (front); 8MP (back)              |
| Ports                     | 1 free USB port                                |

### Internet Access

The Contractor shall maintain an Internet connection capable of transmitting data to the ODESS database. The telemetry system shall always be available and have connectivity in the contract area. If connectivity is lost, unsent data shall be stored locally within the FC tool and transmitted upon restoration of connectivity. The Contractor shall acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the ODESS database. The hardware and software must be configured to allow remote access to the computer by USACE ODESS personnel. Coordination between

the dredging company's IT and ODESS Support may be required in order to configure remote access through any security, firewall, router, and telemetry systems. Telemetry systems must be capable of meeting these minimum reporting requirements in all operating conditions.

### SOFTWARE REQUIREMENTS

ODESS personnel shall be responsible for installing and testing all ODESS software tools on the dedicated onboard ODESS tablet computer. No other software which conflicts with the ODESS function of recording and transmitting data shall be installed on the tablet computer. The Contractor shall be responsible for installing and/or maintaining any necessary manufacturer-provided software for the installed hardware. If any software problem occurs, the Contractor shall contact ODESS Support at ODESS@usace.army.mil or 1-877-840-8024.

The ODESS tablet computer shall have the following minimum software installed in support of the ODESS system:

| Software                  | Specification  |
|---------------------------|--|
| Operating System          | Windows 10, Contractor-installed                         |
| Browser**                 | Chrome, Internet Explorer, Contractor-installed          |
| ODESS Software            | Field Collector (FC) tool, USACE ODESS Support Installed |
| Remote Access<br>Software | Team Viewer, USACE ODESS Support-installed               |

<sup>\*\*</sup>Latest version recommended, Chrome is preferred





# Operations and Dredging Endangered Species System (ODESS) USACE Sea Turtle Deflector Checklist for Hopper Dredges for USACE and USACE/Army-Permitted Projects

- Read the contract plans and specs and/or all applicable permits (Dept. of the Army Permit, State Permits) to determine the contract or permit requirements for the protection of endangered sea turtles. (Each District spec or permit may be different.)
- 2. Read the Biological Opinion and any USACE Protocol, if available.
- 3. Develop a list of inspection requirements:
  - a. Deflector leading edge angle (90° or less).
  - Approach angle or leading edge plowing depth (6" or more).
  - c. Aft rigid attachment of the deflector to the draghead (hinged or trunnion).
  - d. Forward deflector attachment point (adjustable pinned or cable/chain with stop).
  - e. Opening between draghead and deflector (4" x 4" max).
  - Dredged material screening requirement (yes/no).
  - g. Screen type requirement (inflow, overflow, or both).
  - Inflow basket screen openings (4" x 4" max) and dredged material screening (100%).
  - Lighting of the inflow and overflow screens and proper access for cleaning (must meet EM 385-1-1).
  - UXO (Unexploded Ordnance) screening in use (yes/no).
  - k. Structural design of the deflector (per the approved deflector submittal).
  - Dredge operational requirements (starting/stopping the dredge pump, draghead plugging, raising the draghead, turning the dredge).

Operations and Dredging Endangered Species System (ODESS) USACE Sea Turtle Inspection Checklist for Hopper Dredges National Dredging Quality Management (DQM) Program Version 5 • July 2016 Page 1 of 4





- m. Dredging Quality Management (DQM) dredging data recording requirement. Is dredging data recording (drag elevation, slurry density, and velocity) required by specs or permit? If so, is it being collected, is DQM turned on, and is data being submitted?
- n. Turtle trawling requirement. Is turtle trawling required by specs or permit? If so, is it being performed?
- o. Turtle observer requirements (12 or 24 hours).
- p. A copy of the approved turtle deflector submittal is on board the vessel.
- q. Copies of the contract plans and specs or the Dept. of the Army permit are on board the vessel
- 4. Review the turtle deflector submittal. (Do not allow dredging to start until the submittal is approved.)
  - a. Structural soundness.
  - Deflector leading edge angle (90° or less).
  - c. Approach angles submitted for the project's dredging depths.
  - d. 4" x 4" opening between the deflector and the draghead.
  - e. Aft rigid deflector attachment to draghead (hinged or trunnion).
  - Forward deflector attachment point (adjustable pinned or cable/chain with stop).
- 5. Ensure that the Contractor Quality Control (CQC) performs a pre-dredging inspection. The CQC is required to review and inspect all items in section 3.
- Ensure that the CQC performs a startup-dredging inspection:
  - a. The CQC is required to check the turtle deflector to see if the deflector is installed and adjusted for the required dredge depth of the project in accordance with the approved deflector submittal.
  - b. The CQC is required to ensure that the drag tenders are operating the dredge pump and draghead in accordance with the specs/permit.
  - c. The CQC should perform a paint test to ensure that the deflector is plowing at least 6" into the dredge material while the dragtender is consistently maintaining the submitted and approved approach angle to a tolerance of +0 to -4°.
  - The CQC should note the inspection results in the Quality Control (QC) Daily Report.
- 7. Quality Assurance (QA) should perform a dredging operation inspection soon after the dredge starts dredging:
  - Review and inspect all items in section 3.

Operations and Dredging Endangered Species System (ODESS) USACE Sea Turtle Inspection Checklist for Hopper Dredges National Dredging Quality Management (DQM) Program Version 5 - July 2016 Page 2 of 4





- b. Inspect the turtle deflector to ensure that the deflector is installed and adjusted for the required dredge depth of the project in accordance with the approved deflector submittal.
- c. Require the contractor to perform a paint test to ensure that the deflector is plowing at least 6" into the dredge material while the dragtender is consistently maintaining the submitted and approved approach angle to a tolerance of +0 to -4°. (While overpenetration of the deflector may reduce production and increase fuel consumption of the dredge, it is allowed.)
- d. Ride the dredge through at least one dredging cycle (from dredging to the dump and then back to the dredge site).
- e. Watch the dragtender to ensure that he/she is operating the dredging equipment in accordance with the plans and specs:
  - i Starting the dredge pump only when the draghead is firmly on the bottom by watching the slurry specific gravity and swell compensator.
  - ii Reducing the slurry velocity to the dredge pump idle speed velocity before raising the draghead off the bottom.
  - iii Consistently maintaining the approach angle to a tolerance of +0 to -4° whenever the draghead is on the bottom and the dredge pump is operating
  - iv Raising the draghead off the bottom due to draghead plugging or ship crabbing.
- f. Ensure that the lockout tagout procedure for cleaning the inflow and overflow screens meets EM 385-1-1.
- Talk to the turtle observers to ensure that they are aware of contract and permit requirements and that they are inspecting the screens and deflectors and reporting any required maintenance to the dredge personnel. Also ensure that correct turtle observer forms are being used and filled out properly.
- Talk to the dredge Captain about maintaining the screens and deflectors.
- i. Ensure that DQM data is being sent to the National Dredging Quality Management Program.
- j. Note all pre-dredge/post-dredge and followup inspections in the QA and the QC Daily Reports.





| Project Name:                    |                     |
|----------------------------------|---------------------|
| Project Location:                |                     |
| Contract No.:                    |                     |
| Dept. of the Army Permit No.:    |                     |
| Dredging Company Name:           |                     |
| Dredge Name:                     |                     |
| Contractor CQC Inspector's Name: |                     |
| USACE Inspector Name:            |                     |
| Office Symbol:                   | Date of Inspection: |
| Comments:                        |                     |
|                                  |                     |
| 5                                |                     |
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|                                  |                     |
| <u> </u>                         |                     |
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|                                  |                     |
| <u> </u>                         |                     |
|                                  |                     |
|                                  |                     |

Operations and Dredging Endangered Species System (ODESS) USACE Sea Turtle Inspection Checklist for Hopper Dredges National Dredging Quality Management (DQM) Program Version 5 • July 2016 Page 4 of 4







# Operations & Dredging Endangered Species System (ODESS)



### **Dredge Load**

| District                         | Project                   | Contract                         | Dredge                          | Dredging Company                                      |
|----------------------------------|---------------------------|----------------------------------|---------------------------------|---|
|                                  |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
| Load Number (Required)/Date      | Start Date (Required)     | Start Time (24 hours) (Required) | Stop Date (Required)            | Stop Time (24 hours) (Required)                       |
|                                  |                           |                                  | otop buto (taquita)             |   |
|                                  |                           |                                  |                                 |   |
| David Carram Cam dittian         | Decade and Middle (A)     | Marthay Can ditions              | Air Trans (96)                  | I Carran Cantanta                                     |
| Port Screen Condition  Excellent | Draghead Width (ft)       | Weather Conditions  ☐ Sunny      | Air Temp (℃)                    | Screen Contents 1 Port Screen                         |
| ☐ Good                           |                           | ☐ Cloudy                         |                                 | Contents (incl. # of each item)                       |
| ☐ Fair                           |                           | ☐ Partly Cloudy                  |                                 | Contents (Inc. # of each near)                        |
| □ Bad                            | Draghead Type             | La Tartiy Cloudy                 | Surface Water Temp (℃)          |   |
| _ bud                            | ☐ California Style        | Beaufort Sea Scale               | Surface Water Tellip ( C)       |   |
| Starboard Screen Condition       | □ IHC ′                   | □ 0 (0-1 kn, 0-0 ft)             |                                 |   |
| ☐ Excellent                      | ☐ IHC + Water Injection   | ☐ 1 (1-3 kn, 0-1 ft)             |                                 | 2 Starboard Screen                                    |
| □ Good                           | ☐ Wild Dragon             | ☐ 2 (4-6 kn, 1-2 ft)             | Mid-Depth Water Temp (℃)        | Contents (incl. # of each item)                       |
| ☐ Fair                           | ☐ Other (Specify)         | ☐ 3 (6-10 kn, 2-3.5 ft)          |                                 |   |
| □ Bad                            |                           | 4 (10-16 kn, 3.5-6 ft)           |                                 |   |
| 0 0 0 0                          |                           | ☐ 5 (16-21 kn, 6-9 ft)           |                                 |   |
| Overflow Screen Condition        | D 0                       | ☐ 6 (21-27 kn, 9-13 ft)          | Bottom Water Temp (℃)           | 3 Overflow Concept                                    |
| □ Excellent                      | Deflector Condition       | ☐ 7 (27-33 kn, 13-19 ft)         |                                 | 3 Overflow Screens<br>Contents (incl. # of each item) |
| Good                             | Good                      | □ 8 (33-40 kn, 19-25 ft)         |                                 | Contents (incl. # of each item)                       |
| ☐ Fair                           | ☐ Fair                    | □ 9 (40-47 kn, 25-32 ft)         | Totalia Dia Condust 12          |   |
| □ Bad                            | Poor                      | □ 10 (47-55 kn, 32-41 ft)        | Trawling Being Conducted? ☐ Yes |   |
| Inflow Screen Percent            | □ None                    | □ 11 (55-63 kn, 41-52 ft)        | □ No                            |   |
| □ 25%                            | UXO Screening in Use?     | □ 12 (>63 kn, >52 ft)            | L NO                            | 4 Other Screen or Location                            |
| □ 50%                            | ☐ Yes                     | Wave Height (ft)                 | Any Incidents Involving         | (Specify)   |
| □ 75%                            | □ No                      | wave neight (it)                 | Endangered or Protected         |   |
| □ 100%                           | N-18 1000                 |                                  | Species?                        |   |
|                                  | Material Type             |                                  | ☐ Yes                           |   |
| Overflow Screen Percent          | □ Clay                    | Wind Speed (K)                   | □ No                            | Contents (incl. # of each item)                       |
| □ 25%                            | ☐ Consolidated Material   |                                  | 2                               |   |
| □ 50%                            | ☐ Mud                     |                                  | If Yes, Which Species?          |   |
| □ 75%                            | □ Other                   |                                  | (Complete a Turtle or Sturgeon  |   |
| □ 100%                           | □ Rock                    | Wind Direction (°)               | Incident form)                  |   |
| Other Screen Percent             | ☐ Sand - Course           |                                  | ☐ Marine Mammal                 | 5 Port Draghead                                       |
| □ 25%                            | ☐ Sand - Fine             |                                  | ☐ Sea Turtle                    | Contents (incl. # of each item)                       |
| □ 50%                            | ☐ Sand - Medium           | Tide                             | ☐ Sturgeon                      |   |
| □ 75%                            | ☐ Sand - Mixed<br>☐ Shell | ☐ High                           | ☐ Other                         |   |
| □ 100%                           | ☐ Silt                    | Low                              | □ Unknown                       |   |
|                                  | ☐ Unknown                 | □ Slack                          | Whale Sighting Notification     | 6 Starboard Draghead                                  |
| # Dragheads Used                 | LI OHKHOWH                | Rising                           | Received?                       | Contents (incl. # of each item)                       |
|                                  |                           | ☐ Falling                        | □ Yes                           |   |
|                                  |                           | □ Unknown                        | □ No                            |   |
| 5 1 11 120                       |                           |                                  |                                 |   |
| Draghead Length (ft)             |                           |                                  | Alert Sent to District?         |   |
|                                  |                           |                                  | ☐ Yes                           |   |
|                                  |                           | Į,                               | □ No                            | 1   |
| Comments                         |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |
|                                  |                           | TOTAL PROBLEM CONTESTS OF THE    |                                 |   |
| # Observers Used/24 Hours        | % Monitoring/Project      | Observer(s) Name(s) (Req; Print) | Observer(s) Signature(s)        | Observer(s) Company                                   |
|                                  | □ None □ 75%              |                                  |                                 |   |
|                                  | □ 25% □ 100%              |                                  |                                 |   |
|                                  | □ 50%                     |                                  |                                 |   |
|                                  |                           |                                  |                                 |   |

### Notes

• <u>Screen Contents</u>—Examples include sea turtle (sp.), sturgeon (sp.), shark (sp.), ray (sp.), other fish of note (sp.), horseshoe crab, blue crab, other crab species, coral, jellyballs, other species of note, environmental debris, and trash.

ODESS Form 1(7) - 071116



## **Operations & Dredging Endangered Species System (ODESS) Marine Mammal Observation**



| District   | Project   |  | Contract  |
|--|---|--|---|
|  |   |  |   |
| Dredge   | Dredging Company                                |  | Load Number (Required)/Date   |
|  |   |  |   |
| Start Date (Required)  | Start Time (24 hours) (Required)                | End Date (Required)  | End Time (24 hours) (Required)  |
|  |   |  |   |
| □ 1 (1-3 kn, 0-1 ft) □ 8 □ 2 (4-6 kn, 1-2 ft) □ 9 □ 3 (6-10 kn, 2-3.5 ft) □ 10 □ 4 (10-16 kn, 3.5-6 ft) □ 11 □ 5 (16-21 kn, 6-9 ft) □ 12 □ 6 (21-27 kn, 9-13 ft) | (40-47 kn, 25-32 ft)                            | Whale         □ Manate           Length (ft.)         #           □ Minke \         Length (ft.)         #           Whale         □ Pilot W | Est. Length (ft.) #Est. Length (ft.)<br>Whale □ Unknown<br>Est. Length (ft.) #Est. Length (ft.) |
| Magnetic Bearing to Sighting   | Estimated Distance                              | Vessel's Heading   | Heading of Animal(s)  |
|  |   |  |   |
| Coloration   |   | Fins or Flippers Observed  |   |
|  |   |  |   |
| Behaviors Observed   |   |  | Surfacing Intervals Time  |
|  |   |  |   |
|  |   |  | Surfacing Intervals Distance  |
|  |   |  |   |
|  |   |  |   |
| Comments (Was the behavior of the an   | nimal(s) affected by the vessel? How far did th | e animal(s) move? Who was no   | tified?)  |
| Comments (was the bending of the an  | in the state of the vesses. How the did the     | canimally more. who was no   | anca. <sub>j</sub>  |
|  |   |  |   |
| Observer(s) Name(s) (Required; Print)  | Observer(s) Signature(s)                        | )  | Observer(s) Company   |
|  |   |  |   |

ODESS Form 4(7) - 071116



# Operations & Dredging Endangered Species System (ODESS)



### Sturgeon Incident

| District   | Project                                    | Contract   |  |  |  |  |
|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |
| Dredge   | Dredging Company                           | Species (Required)   |  |  |  |  |
|  |  | ☐ Atlantic ☐ Gulf ☐ Unknown ☐ Green ☐ Shortnose  |  |  |  |  |
| Load Number ( <i>Required</i> )/Date Recovery Date   | (Required) Recovery Time (24 hours) (F     |  |  |  |  |  |
| The state of the s | (reduced)                                  | □ Yes  |  |  |  |  |
|  |  | □ No   |  |  |  |  |
| Incident/Take Description  |  | 1  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Location Specimen Recovered  | Specimen Condition                         | Rows of Preanal Shields  |  |  |  |  |
| <ul><li>□ Deck</li><li>□ Hopper</li><li>□ Draghead</li><li>□ Overflow Screen (Circ.</li></ul>  |  | ly Decomposed $(SSN = 1/ATL = 2)$  |  |  |  |  |
| ☐ Inflow Cage (Circle one) Starboard/Port/Other  | ☐ Fresh Dead ☐ Skeleto                     | on Old Bone  |  |  |  |  |
| Starboard/Port/Other   | ☐ Moderately Decomposed ☐ Undete           | erminea L  |  |  |  |  |
| Location Comment   |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| # Dorsal Scutes (SSN = 8-13/ATL = 7-16)  | # Lateral Scutes (SSN = 22-33/ATL = 24-35) | # Ventral Scutes (SSN = 7-11/ATL = 6-9)  |  |  |  |  |
| # Bolsdi Sedies (SSN = 0 15)/NE = 7 10)  | # Euteral Seates (SSN = 22 SSN E = 24 SS)  | a ventual seates (ssiv = 7 Ti)/ME = 0 Sj   |  |  |  |  |
|  |  |  |  |  |  |  |
| Fork Length (cm/in)  | Standard Length ( <i>cm/in</i> )           | Total Length ( <i>cm/in</i> )  |  |  |  |  |
|  |  |  |  |  |  |  |
| Mouth Width (cm/in)  | Head Width at Eyes (cm/in)                 | Other (cm/in)  |  |  |  |  |
|  |  |  |  |  |  |  |
| Genetic Samples Taken?   | Samples Frozen/Preserved?                  | Photo Attached?  |  |  |  |  |
| ☐ Yes ☐ No   | ☐ Yes ☐ No                                 | (If Yes, label the species, date, geographic site, and dredge name on the photo)   |  |  |  |  |
|  |  | □ Yes □ No   |  |  |  |  |
| Comments   |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Use those diagrams to illustrate the speciment for the t   | was resourced                              |  |  |  |  |  |
| Use these diagrams to illustrate the specimen/part that  | was recovered.                             |  |  |  |  |  |
| The second second second   |  | SHALL  |  |  |  |  |
| The state of the s |  | The state of the s |  |  |  |  |
| Observation Name (A) (Oscillation of A)  | Observator Circustores (a)                 | Observatory Comments   |  |  |  |  |
| Observer(s) Name(s) (Required; Print)  | Observer(s) Signature(s)                   | Observer(s) Company  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

ODESS Form 3(6)-071116

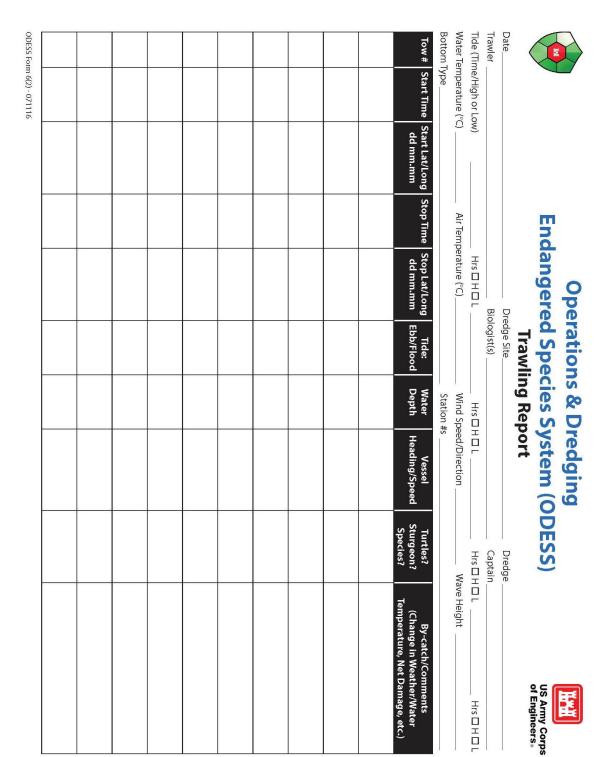


## **Operations & Dredging Endangered Species System (ODESS) Turtle Incident**



| District   |                   | Project                                 |   |                    | ontract   |   |  |  |  |
|--|-------------------|---|---|--------------------|---|---|--|--|--|
|  |                   |   |   | _                  |   |   |  |  |  |
| Dredge   |                   | Dredging Company                        |   |                    | Species (Required)  Green  Hawksbill                  |   |  |  |  |
| Load Number (Required)/Date                                |                   | Is this a Take? (Required) ☐ Yes ☐ No   | Project Incident # (Required)   |                    | 1 Kemp's Ri<br>1 Leatherba<br>1 Loggerhe<br>1 Unknown | ck  |  |  |  |
| Recovery Date (Required)                                   | Recovery Time     | (24 hours) (Required)                   | Incident/Take Descrip   |                    |   |   |  |  |  |
| Air Temp (℃)   | Surface Water T   | emperature (℃)                          |   |                    |   |   |  |  |  |
| Mid-Depth Water Temperature (℃)                            | Bottom Water 1    | emperature (℃)                          |   |                    |   |   |  |  |  |
|  |                   | reen ( <i>Circle one</i> )<br>ort/Other | Age Class Gender  □ Juvenile □ Female (10.1-80 cm) □ Male Sub-Adult □ Unknown (80.1-87 cm) □ Adult (×87 cm) □ Unknown |                    |   | Specimen Condition  Alive  Dead Fresh Dead  Moderately Decomposed Severely Decomposed Skeleton Skeleton Old Bone Undetermined |  |  |  |
| Iag Type       ☐ Flipper     ☐ Other (Specify)       ☐ Pit | Head Width (an    | n/in)                                   | How Gender Determin  Tail Length  Eggs Observed  Other  | ned                |   | Photo Attached? (If Yes, label the species, date, geographic site, and dredge name on the photo)  ☐ Yes ☐ No                  |  |  |  |
| Tag Number   | Plastron Length   | n (cm/in)                               | Carapace Straight Len   | ngth ( <i>cm/</i>  | /in)  | Carapace Curved Length (cm/in)  |  |  |  |
| Tag Date   | Plastron Width    | (cm/in)                                 | Carapace Straight Wid   | dth ( <i>cm/ii</i> | n)  | Carapace Curved Width (cm/in)   |  |  |  |
| Genetic Samples Taken? ☐ Yes ☐ No                          | Final Disposition | n of Specimen                           |   |                    |   |   |  |  |  |
| Use these diagrams to illustrate the spe                   | cimen/part that   | was recovered.                          | Comments  |                    |   |   |  |  |  |
|  |                   |   |   |                    |   |   |  |  |  |
| Observer(s) Name(s) (Required; Print)                      |                   | Observer(s) Signature(s)                |   | 0                  | bserver(s) (  | Company   |  |  |  |
|  |                   |   |   |                    |   |   |  |  |  |

ODESS Form 2(6) - 071116



# Cooperative Marine Turtle Tagging Program (CMTTP) Tagging Data Form

## COOPERATIVE MARINE TURTLE TAGGING PROGRAM (CMTTP) TAGGING DATA FORM

| SPECIES:  | DATE [  | DAY_               | MC              | )                    | -   `    | /R  | DAT           | E RELEASED:                            | DAY_   |         | MO        | YR |
|---|---|--------------------|-----------------|----------------------|----------|---|---------------|--|--------|---------|-----------|----|
| TAG NUMBERS (LIST ALL NUMBERS AND LETTER PREFIXES; CIRCLE TAG NUMBERS ALREADY ON THE TURTLE [="OLD TAGS"]):   |   |                    |                 |                      |          |   |               |  |        |         |           |    |
| LEFT  | RIGHT   |                    |                 |                      |          | LEFT  |               |  | 7.5000 | RIGHT   |           |    |
| FRONT: FRONT:   |   |                    |                 | REAR:                |          |   | REAR:         |  |        |         |           |    |
| PIT TAG#:   |   |                    |                 | LOCATION OF PIT TAG: |          |   |               |  |        |         |           |    |
| WAS TURTLE CARRYING TAGS WHEN ENCOUNTERED?:   |   |                    |                 | 0.000                |          | NO  |               | IF YES, THEN CIRCLE CORRECT STATEMENT: |        |         |           |    |
| 1. RECAPTURE OF SAI   | and the second section of the second section of | theorem and a read | 10              |                      | 2016 CON | THE RESIDENCE OF THE PROPERTY | EASONS        | s)                                     |        |         |           |    |
| 2. RECAPTURE OF DIF   | FERENT PROJEC                                   | T TURTLE           | (NO             | T A TAG YOUR         | R GROU   | JP APPLIED)   |               |  |        |         |           |    |
| TAG RETURN ADDRESS:   |   |                    |                 |                      |          |   |               |  |        |         |           |    |
| ORGANIZATION TAGGING AND/OR RELEASING TURTLE (INCLUDE AREA CODE/PHONE NUMBER; AND EMAIL):   |   |                    |                 |                      |          |   |               |  |        |         |           |    |
| PROJECT TYPE (CIRCLE ONE):  |   |                    |                 |                      |          |   |               |  |        |         |           |    |
| [NESTING BEACH]   | [TANGLE N                                       | 25.00              | ٠-              | OUND NET]            | -        | ND CATCH]   |               | STRANDING]                             | [отне  | ER, DES | CRIBE]    |    |
| IF NESTING BEACH: D   | ID TURTLE NES                                   | Γ? YES             | 5               | NO                   | U        | NDETERMIN   | ED            |  |        |         |           |    |
| FACILITY WHERE TURTLE WA  | S BEING HELD                                    | :                  |                 |                      |          |   |               |  |        |         |           |    |
| DESCRIBE CAPTURE LOCATIO  | N. Be specifi                                   | C, INCLUD          | DE COL          | JNTY AND LAT         | T/LON    | G IF AVAILAI  | 3LE           |  |        |         |           |    |
| DESCRIBE RELEASE LOCATION. BE SPECIFIC, INCLUDE COUNTY AND LAT/LONG IF AVAILABLE.   |   |                    |                 |                      |          |   |               |  |        |         |           |    |
| TURTLE MEASUREMENTS:  |   |                    |                 |                      |          |   |               |  |        |         |           |    |
| STRAIGHT CARAPACE LENGTH (SCLMINIMUM):  |   |                    |                 | ):                   |          |   |               |  |        | INCHES  |           |    |
| STRAIGHT CARAPACE LENGTH (SCLNOTCH-TIP):  |   |                    |                 | ):                   |          |   |               | INCHES                                 |        |         |           |    |
| Straight carapace width (SCW):  |   |                    |                 |                      |          |   |               |  | INCHES |         |           |    |
| CURVED CARAPACE LENGTH (CCLMINIMUM)   |   |                    |                 |                      |          |   |               |  | INCHES |         |           |    |
| Curved carapace length (CCLnotch-tip  |   |                    |                 |                      |          |   |               | INCHES                                 |        |         |           |    |
| Curved carapace width (CCW)   |   |                    |                 | CM                   |          |   | <u>INCHES</u> |  |        |         |           |    |
| Weight  |   |                    |                 | KG                   |          |   |               |  |        | LE      | <u>.S</u> |    |
| TURTLE WAS INSPECTED AND  | OR SCANNE                                       | FOR:               |                 |                      |          |   |               |  |        |         |           |    |
| TAG SCARS:  | YES   | NO                 | WHERE LOCATED?  |                      |          |   |               |  |        |         |           |    |
| PIT TAGS:   | YES   | NO                 | WHAT FREQUENCY? |                      |          |   |               |  |        |         |           |    |
| MAGNETIC WIRES:   | YES   | NO                 | WHERE LOCATED?  |                      |          |   |               |  |        |         |           |    |
| LIVING TAGS:  | YES   | NO                 | WHERE LOCATED?  |                      |          |   |               |  |        |         |           |    |
| ADDITIONAL REMARKS OR DATA ON BACK OF YEARS.  |   |                    |                 | YES NO               |          |   |               |  |        |         |           |    |
| MAIL COMPLETED FORM TO:  ARCHIE CARR CENTER FOR SEA TURTLE RESEARCH, DEPARTMENT OF ZOOLOGY, PO BOX 118525  UNIVERSITY OF FLORIDA, GAINESVILLE, FL 32611 USA  and  SCDNR Marine Turtle Program, PO Box 12559, Charleston, SC 29422 |   |                    |                 |                      |          |   |               |  |        |         |           |    |

# **Protocol for Collecting Tissue from Live and Dead Turtles for Genetic Analysis**

#### Appendix II:

## PROTOCOL FOR COLLECTING TISSUE FROM DEAD TURTLES FOR GENETIC ANALYSIS Method for Dead Turtles

<<<IT IS CRITICAL TO USE A NEW SCALPEL BLADE AND GLOVES FOR EACH TURTLE TO AVOID CROSS-CONTAMINATION OF SAMPLES>>>

- 1. Put on a new pair of latex gloves.
- 2. Use a new disposable scalpel to cut out an approx. 1 cm (½ in) cube (bigger is NOT better) piece of muscle. Easy access to muscle tissue is in the neck region or on the ventral side where the front flippers "insert" near the plastron. It does not matter what stage of decomposition the carcass is in.
- 3. Place the muscle sample on a hard uncontaminated surface (plastron will do) and make slices through the sample so the buffer solution will penetrate the tissue.
- 4. Put the sample into the plastic vial containing saturated NaCl with 20% DMSO \*(SEE BELOW)
- 5. Use the pencil to write the stranding ID number (observer initials, year, month, day, turtle number by day), species, state and carapace length on the waterproof paper label and place it in the vial with the sample. EXAMPLE: For a 35.8 cm curved carapace length green turtle documented by Jane M. Doe on July 15, 2001 in Georgia, the label should read "JMD20010715-01, C. mydas, Georgia, CCL=35.8 cm". If this had been the third turtle Jane Doe responded to on July 15, 2001, it would be JMD20010715-03.
- 6. Label the outside of the vial with the same information (stranding ID number, species, state and carapace length) using the permanent marker.
- 7. Place clear scotch tape over the writing on the vial to protect it from being smeared or erased.
- 8. Wrap parafilm around the cap of the vial by stretching it as you wrap.
- 9. Place vial within whirlpak and close.
- 10. Dispose of the scalpel.
- 11. Note on the stranding form that a part was salvaged, indicating that a genetic sample was taken and specify the location on the turtle where the sample was obtained.
- 12. Submit the vial with the stranding report to your state coordinator. State coordinators will forward the reports and vials to NMFS for processing and archiving.

\*The 20% DMSO buffer in the plastic vials is nontoxic and nonflammable. Handling the buffer without gloves may result in exposure to DMSO. This substance soaks into skin very rapidly and is commonly used to alleviate muscle aches. DMSO will produce a garlic/oyster taste in the mouth along with breath odor. The protocol requires that you WEAR gloves each time you collect a sample and handle the buffer vials.

The vials (both before and after samples are taken) should be stored at room temperature or cooler. If you don't mind the vials in the refrigerator, this will prolong the life of the sample. DO NOT store the vials where they will experience extreme heat (like in your car!) as this could cause the buffer to break down and not preserve the sample properly.

Questions:

Sea Turtle Program NOAA/NMFS/SEFSC 75 Virginia Beach Drive Miami, FL 33149 305-361-4207

THANK YOU FOR COLLECTING SAMPLES FOR SEA TURTLE GENETIC RESEARCH!!

### Genetic Sample Kit Materials - DEAD turtles

latex gloves
single-use scalpel blades (Fisher Scientific 1-800-766-7000, cat. # 08-927-5A)
plastic screw-cap vial containing saturated NaCl with 20% DMSO, wrapped in parafilm
waterproof paper label, ¼" x 4"
pencil to write on waterproof paper label
permanent marker to label the plastic vials
scotch tape to protect writing on the vials
piece of parafilm to wrap the cap of the vial
whirl-pak to return/store sample vial

### Appendix III:

### PROTOCOL FOR COLLECTING TISSUE FROM LIVE TURTLES FOR GENETIC ANALYSIS

#### **Method for Live Turtles**

 $<\!<$ TI IS CRITICAL TO USE A NEW BIOPSY PUNCH AND GLOVES FOR EACH TURTLE TO AVOID CROSS-CONTAMINATION OF SAMPLES>>>

- 1. Turn the turtle over on its back.
- 2. Put on a new pair of latex gloves.
- 3. Swab the entire cap of the sample vial with alcohol.
- Wipe the ventral and dorsal surfaces of the rear flipper 5-10 cm from the posterior edge with the Betadine/iodine swab.
- 5. Place the vial under the flipper edge to use the cleaned cap as a hard surface for the punch.
- 6. Press a new biopsy punch firmly into the flesh as close to the posterior edge as possible and rotate one complete turn. Cut all the way through the flipper to the cap of the vial.
- 7. Wipe the punched area with Betadine/iodine swab; rarely you may need to apply pressure to stop bleeding.
- 8. Use a wooden skewer to transfer the sample from the biopsy punch into the plastic vial containing saturated NaCl with 20% DMSO \*(SEE BELOW)
- 9. Use the pencil to write the stranding ID number (observer initials, year, month, day, turtle number by day), species, state and carapace length on the waterproof paper label and place it in the vial with the sample. EXAMPLE: For a 35.8 cm curved carapace length green turtle documented by Jane M. Doe on July 15, 2001 in Georgia, the label should read "JMD20010715-01, <u>C. mydas</u>, Georgia, CCL=35.8 cm". If this had been the third turtle Jane Doe responded to on July 15, 2001, it would be JMD20010715-03.
- 10. Label the outside of the vial with the same information (stranding ID number, species, state and carapace length) using the permanent marker.
- 11. Place clear scotch tape over the writing on the vial to protect it from being smeared or erased.
- 12. Wrap parafilm around the cap of the vial by stretching it as you wrap.
- 13. Place vial within whirlpak and close.
- 14. Dispose of the biopsy punch.
- 15. Note on the stranding form that a part was salvaged, indicating that a genetic sample was taken and specify the location on the turtle where the sample was obtained.
- 16. Submit the vial with the stranding report to your state coordinator. State coordinators will forward the reports and vials to NMFS for processing and archiving.

\*The 20% DMSO buffer in the plastic vials is nontoxic and nonflammable. Handling the buffer without gloves may result in exposure to DMSO. This substance soaks into skin very rapidly and is commonly used to alleviate muscle aches. DMSO will produce a garlic/oyster taste in the mouth along with breath odor. The protocol requires that you WEAR gloves each time you collect a sample and handle the buffer vials.

The vials (both before and after samples are taken) should be stored at room temperature or cooler. If you don't mind the vials in the refrigerator, this will prolong the life of the sample. DO NOT store the vials where they will experience extreme heat (like in your car!) as this could cause the buffer to break down and not preserve the sample properly.

Questions:

Sea Turtle Program NOAA/NMFS/SEFSC 75 Virginia Beach Drive Miami, FL 33149 305-361-4207

## THANK YOU FOR COLLECTING SAMPLES FOR SEA TURTLE GENETIC RESEARCH!! Genetic Sample Kit Materials – LIVE turtles

- latex gloves
   alcohol swabs
   Betadine/iodine swabs
   4-6 mm biopsy punch sterile, disposable (Moore Medical Supply 1-800-678-8678, part #0052442)
   plastic screw-cap vial containing saturated NaCl with 20% DMSO, wrapped in parafilm
   wooden skewer
   waterproof paper label, ¼" x 4"
- pencil to write on waterproof paper label permanent marker to label the plastic vials scotch tape to protect writing on the vials piece if parafilm to wrap the cap of the vial whirl-pak to return/store sample vial



## Sea Turtle Handling and Resuscitation Guidelines

### Appendix IV: SEA TURTLE HANDLING AND RESUSCITATION GUIDELINES

Any sea turtles taken incidentally during the course of fishing or scientific research activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to the following procedures:

- A) Sea turtles that are actively moving or determined to be dead (as described in paragraph (B)(4) below) must be released over the stern of the boat. In addition, they must be released only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.
  - B) Resuscitation must be attempted on sea turtles that are comatose or inactive by:
    - Placing the turtle on its bottom shell (plastron) so that the turtle is right side up and elevating its hindquarters at least 6 inches (15.2 cm) for a period of 4 to 24 hours. The amount of elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (7.6 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.
    - Sea turtles being resuscitated must be shaded and kept damp or moist but under no
      circumstance be placed into a container holding water. A water-soaked towel placed
      over the head, carapace, and flippers is the most effective method in keeping a turtle
      moist.
    - 3. Sea turtles that revive and become active must be released over the stern of the boat only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) must be returned to the water in the same manner as that for actively moving turtles.
    - A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh
      has begun to rot; otherwise, the turtle is determined to be comatose or inactive and
      resuscitation attempts are necessary.

Any sea turtle so taken must not be consumed, sold, landed, offloaded, transshipped, or kept below deck.

These guidelines are adapted from 50 CFR § 223.206(d)(1). Failure to follow these procedures is therefore a punishable offense under the Endangered Species Act.

## **Online Resources**

### REFERENCE THE GRBO AND REVISIONS ONLINE AT:

https://www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast

# ADEM Water Quality and Coastal Zone Consistency Certifications

LANCE R. LEFLEUR DIRECTOR



KAY IVEY GOVERNOR

Alabama Department of Environmental Management adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 Post Office Box 301463 Montgomery, Alabama 36130-1463 (334) 271-7700 FAX (334) 271-7950

May20, 2020

Department of the Army
Mobile District, U.S. Army Corps of Engineers
Mr. Todd A. Nettles, Acting Chief
Planning and Environmental Division
Post Office Box 2288
Mobile, Alabama 36628-0001

RE:

State of Alabama Water Quality Certification (WQC) Pursuant to Clean Water Act (CWA) §401(a) Mobile Harbor Federal Navigation
U.S. Army Corps of Engineers (USACE) Joint Public Notice (JPN): FP15-MH01-10
Alabama Department of Environmental Management (ADEM) Tracking Code: ADEM-2018-345-WQC-COEP

Dear Mr. Nettles:

On April 13, 2020, the ADEM received the USACE's request for WQC for the above referenced federal activity.

In this proposed federal activity, the U.S. Army Corps of Engineers would widen the Mobile Harbor Navigation Channel utilizing mechanical and hydraulic dredging methods. The area would be dredged to a total depth of -56 -54 feet within a previously dredged area of Mobile Bay. Minor bend easings would occur at the double bends in the Bar Channel approach to the Bay Channel. The Bay Channel would be widened from 400 to 500 feet to a total depth of 54 feet from the mouth of Mobile Bay northward for three nautical miles to provide two-way traffic area for passing. In addition, the Choctaw Pass Turning Basin will be expanded 250 feet to the south to a total depth of 56 feet for safe turning. The purpose is to provide sufficient water depth and lateral clearance for larger vessels experiencing transportation delays and inefficiencies due to limited channel width and depth of the existing channel dimensions. Dredged material will be disposed of in established, protected, and previously approved disposal areas which include the Relic Shell Mined Area, Sand Island Beneficial Use Area, and the Ocean Dredged Material Site.

Action pertinent to WQC is required by CWA §401(a)(1), 33 U.S.C. §1251, et. seq. If conducted in accordance with the conditions prescribed herein, there is reasonable assurance that the discharge resulting from the proposed activities will not violate applicable water quality standards established under §303 of the CWA and §22-22-9(g), Code of Alabama (1975). By this letter, the ADEM hereby notifies the USACE that CWA §401 WQC is granted. This WQC terminates with the expiration of FP15-MH01-10. This WQC only addresses potential discharges to state waters resulting from the activities. ADEM certifies that there are no applicable effluent limitations under §301 and §302 nor applicable standards under §306 and §307 of the CWA in regard to the activities specified.

In recognition that projects are site specific in nature and conditions can change during project implementation, the ADEM reserves the right to request additional information or request additional management measures to be implemented, as necessary on a case-by-case basis, in order to ensure the protection of water quality and coastal resources. Deviation from the approved project design may necessitate additional coordination.

This WQC does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, trespass, or any infringement of Federal, State, or local laws or regulations and in no way purports to vest in the USACE title to lands now owned by the State of Alabama nor shall it be construed as acquiescence by the State of Alabama of lands owned by the State that may be in the USACE's possession. This certification is not transferable without prior written notice and approval of the ADEM. Upon such notice, the Director may require submission of additional information.

Birmingham Branch 110 Vulcan Road Birmingham, AL 35209-4702 (205) 942-6168 (205) 941-1603 (FAX)

Decatur Branch 2715 Sandlin Road, S.W. Decatur, AL 35603-1333 (256) 353-1713 (256) 340-9359 (FAX) Mobile Branch 2204 Perimeter Road Mobile, AL 36615-1131 (251) 450-3400 (251) 479-2593 (FAX)

Mobile-Coastal 3664 Dauphin Street, Suite B Mobile, AL 36608 (251) 304-1176 (251) 304-1189 (FAX) USACE File No. FP15-MH01-10 ADEM Tracking Code: ADEM-2018-345 -WQC-COE-IP Page 2 of 2

Adherence to the following conditions is required in order to ensure protection of water quality.

- Appropriate and Effective Best Management Practices (BMPs) shall be implemented to minimize turbidity impacts to the maximum extent practicable. Turbidity generated by the activity must not cause substantial visible contrast nor result in an increase of more than fifty (50) Nephelometric turbidity units above background in state waters. If turbidity generated from project exceeds acceptable levels, operations must cease until turbidity is restored to acceptable levels. The ADEM Mobile Coastal office (251) 304-1176 must be notified of resultant work stoppage.
- Upon the loss or failure of any treatment facility, BMP, or other management control measure as identified
  by responsible on-site staff during day-to-day operations or as identified by ADEM technical staff during
  inspections, work/activity and all discharges shall, where necessary to maintain compliance with this WQC,
  be suspended, halted, reduced, or otherwise controlled until effective treatment is restored.
- 3. The USACE and/or its assigns are responsible for the condition of land-based dredge spoil disposal areas for the life of the placement activity and until the disposal areas are reclaimed or adequately stabilized, and for pumping and discharge rates to ensure settling of suspended solids within the confines of the spoil disposal areas sufficient to ensure that turbidity in the return water will not cause substantial visible contrast within the receiving waters, or result in an increase of 50 NTUs above background turbidity levels in the receiving waters. The salinity of return waters shall be similar to that of the receiving waters.
- Spoil material utilized beneficially through strategic placement onto state water bottoms shall be free of toxic pollutants in toxic amounts.

Contact the Mobile-Coastal office anytime with questions. Always include the ADEM tracking code above when corresponding on this matter. Allen Phelps is the Mobile-Coastal office contact for this project; he may be reached by phone at 251.304.1176 or by e-mail at cap@adem.alabama.gov.

Sincerely

Anthony Scott Hughes, Chief Field Operations Division

cc: EPA, Molly Martin

DCNR.Coastal@dcnr.alabama.gov

USACE, Donald Mroczko

ASH/jsb/cap

File: 401WQC/12532

LANCE R. LEFLEUR DIRECTOR



Alabama Department of Environmental Management adem.alabama.gov

1400 Collseum Blvd. 36110-2400 Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 FAX (334) 271-7950

KAY IVEY GOVERNOR

May 20, 2020

Department of the Army Mobile District, U.S. Army Corps of Engineers Mr. Todd A. Nettles, Acting Chief Planning and Environmental Division Post Office Box 2288 Mobile, Alabama 36628-0001

RE: State of Alabama Concurrence with the U.S. Army Corps of Engineers' Coastal Consistency
Determination
Modifications to the Mobile Harbor Federal Navigation Channel
U.S. Army Corps of Engineers (USACE) Joint Public Notice (JPN): FP15-MH01-10
Alabama Department of Environmental Management (ADEM) Tracking Code: ACAMP-2018345-FC-FAA-COEP

Dear Mr. Nettles:

On April 13, 2020 the ADEM received the USACE's Consistency Determination (CD) that the proposed federal activity, referenced above, is consistent with the Alabama Coastal Area Management Program.

In this proposed federal activity, the U.S. Army Corps of Engineers would widen the Mobile Harbor Navigation Channel utilizing mechanical and hydraulic dredging methods. The area would be dredged to a total depth of -56 -54 feet within a previously dredged area of Mobile Bay. Minor bend easings would occur at the double bends in the Bar Channel approach to the Bay Channel. The Bay Channel would be widened from 400 to 500 feet to a total depth of 54 feet from the mouth of Mobile Bay northward for three nautical miles to provide two-way traffic area for passing. In addition, the Choctaw Pass Turning Basin will be expanded 250 feet to the south to a total depth of 56 feet for safe turning. The purpose is to provide sufficient water depth and lateral clearance for larger vessels experiencing transportation delays and inefficiencies due to limited channel width and depth of the existing channel dimensions. Dredged material will be disposed of in established, protected, and previously approved disposal areas which include the Relic Shell Mined Area, Sand Island Beneficial Use Area, and the Ocean Dredged Material Site.

Pursuant to Title 15 C.F.R. §930.41(a) and based upon review of the information submitted by the USACE, by this letter the ADEM hereby notifies the USACE of its **concurrence** with the USACE's CD.

Should it become necessary to modify the activities described in the JPN after this concurrence has been issued, a revised CD may be necessary pursuant to Title 15 C.F.R. §930.46. Contact the Mobile-Coastal office anytime with questions. Always include the ADEM tracking code above when corresponding on this matter. Allen Phelps is the Mobile-Coastal office contact for this project; he may be reached by phone at 251.304.1176 or by e-mail at cap@adem.alabama.gov.

Birmingham Branch 110 Vulcan Road Birmingham, AL 35209-4702 (205) 942-6168 (205) 941-1603 (FAX) Decatur Branch 2715 Sandlin Road, S.W. Decatur, Al. 35603-1333 (256) 353-1713 (256) 340-9359 (FAX)



Mobile Branch 2204 Perimeter Road Mobile, AL 36615-1131 (251) 450-3400 (251) 479-2593 (FAX) Mobile-Coastal 3664 Dauphin Street, Suite B Mobile, AL 36608 (251) 304-1176 (251) 304-1189 (FAX) USACE Joint Public Notice (JPN): FP15-MH01-10 ADEM Tracking Code: ACAMP-2018-345-FC-FAA-COEP Page 2 of 2

Sincerely,

Anthony Scott Hughes, Chief Field Operations Division

EPA, Molly Martin DCNR.Coastal@dcnr.alabama.gov

USACE, Donald Mroczko

ASH/jsb/cap

File: CZCERT/12532

## Letter from U.S. Fish and Wildlife Service



## United States Department of the Interior

FISH AND WILDLIFE SERVICE 1208-B Main Street Daphne, Alabama 36526

2016-CPA-0130

DEC 2 1 2018

Lekesha W. Reynolds Chief, Coastal Environment Team Department of the Army Mobile District, Corps of Engineers P.O. Box 2288 Mobile, AL 36628

Dear Ms. Reynolds:

Thank you for your letter received by our office on November 20, 2018, requesting Endangered Species Act (ESA) Section 7 concurrence on the Army Corps of Engineers (USACE) effects determination for the Mobile Harbor Federal Navigation Project Draft Integrated General Reevaluation Report with Supplemental Environmental Impact Statement. The project is located in Mobile County, Alabama. Our comments are provided in accordance with provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

We understand that you determined this project may affect, but is not likely to adversely affect the following federally listed species:

West Indian manatee (Trichechus manatus) – Threatened
Wood stork (Mycteria americana) - Threatened
Piping plover (Charadrius melodus) – Threatened
Red knot (Calidris canutus rufa) – Threatened
Southern clubshell (Pleurobema decisum) - Endangered
Inflated heelspliter (Potamilus inflatus) – Threatened
Gopher tortoise (Gopherus polyphemus) – Threatened
Eastern indigo snake (Drymarchon corais couperi) – Endangered
Black pine snake (Pituophis melanoleucus lodingi) – Threatened
Alabama red-bellied turtle (Pseudemys alabamensis) - Endangered

We are concerned about the potential indirect or direct physical impact on manatees that may be migrating through the project area during the proposed dredging operation. Direct impacts could occur from either boat, barge, cutterhead, or hydraulic pipeline strikes. Because manatees are known to seasonally occur in the Mobile channel, and could be affected by this activity, we believe that a "may affect" situation exists for the manatee.

PHONE: 251-441-5181 FAX: 251-441-6222

Ms. Lekesha W. Reynolds

2

You have proposed to implement our "Standard Manatee Construction Conditions" for this project. We believe that if these conditions can be implemented, then there will be no adverse impact to this species and further consultation will not be required for the manatee. If these steps cannot be exercised, or there is an occurrence of collision with and/or injury to a manatee, because of the proposed project, then further consultation may be required.

Based upon a review of our records and the information provided in your letter, we concur with your determination that the project actions may affect, but are not likely to adversely affect the species listed above.

We also understand that, for this project, Gulf sturgeon and sea turtles fall under the jurisdiction of the National Marine Fisheries Service (NMFS). USACE will utilize the NMFS issued Gulf Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287).

Thank you for the opportunity to provide ESA Section 7 concurrence for your project. For further discussion, please contact Mr. Josh Rowell of my staff at (251) 441-5836. Please refer to the reference number located at the top of this letter in future phone calls or written correspondence.

Sincerely,

William J. Pearson Field Supervisor

Alabama Ecological Services Field Office

## Letter from NOAA National Marine Fisheries Service



#### UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration NATIONAL MARINE FISHERIES SERVICE Southeast Regional Office 263 13th Avenue South St. Petersburg, Riorida 33701-5505 http://sero.mrfs.noaa.gov

September 7, 2018 F/SER46/BH:jk 225/389-0508

Ms. Jennifer L. Jacobson Planning and Environment Division Mobile District Environmental Branch U.S. Army Corps of Engineers Post Office Box 2288 Mobile, Alabama 86628-0001

Dear Ms. Jacobson:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Draft Integrated General Reevaluation Report with Supplemental Environmental Impact Statement (SEIS), dated July 24, 2018, on the "Mobile Harbor Navigation Project." The U.S. Army Corps of Engineers (USACE) proposes to conduct maintenance dredging and placement activities. The maintenance dredging includes a navigation channel from the Gulf of Mexico to turning basins near the Cochrane Bridge, Alabama State Docks, and McDuffie Island. The following is provided in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and 600.920 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; P.L. 104-297).

The NMFS provided comments to the public notice for the project by letter dated January 25, 2017, recommending the beneficial use of dredge material. The USACE responded by letter dated February 21, 2017, acknowledging the comments. The maintenance dredging will generate approximately 5.5 million cubic yards of sediment annually. As proposed in the Public Notice, the sediment would be disposed at the Mobile Offshore Dredged Material Disposal Site (ODMDS), open bay thin-layer disposal areas, the Sand Island Beneficial Use Area (SIBUA), Blakely Island, and Gilliard Island.

Section 2.5.4 of the SEIS confirms little change to water quality parameters such as turbidity, salinity, and dissolved oxygen will result from the project. Due to NMFS' early involvement as a cooperating agency and close coordination with USACE, the project has been designed in such a way as to not have a substantial adverse effect on EFH or federally managed fishery species in Mobile Bay and surrounding waters. The NMFS Habitat Conservation Division does not object to the project as proposed and agrees with USACE's determination the project will not adversely affect EFH.

We appreciate your consideration of our comments. If you wish to discuss this project further or have questions concerning our recommendations, please contact Brandon Howard at (225) 389-0508, extension 203

Sincerely

Virginia M. Fay

Assistant Regional Administrator Habitat Conservation Division

Vergue m. Fay



c: FWS, Paul\_Necaise@fws.gov F/SER46, Swafford F/SER4, Dale, Fay, Silverman Files

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## Letter from Alabama State Historic Preservation Officer



## ALABAMA HISTORICAL COMMISSION

468 South Perry Street P.O. Box 300900 Montgomery, Alabama 36130-0900 334-242-3184 / Fax: 334-240-3477 Lisa D. Jones Executive Director State Historic Preservation Officer

July 6, 2020

Patrick O'Day Corps of Engineers P.O. Box 2288 Mobile, AL 36628-0001

Re: AHC 20-1051

CRA

Mobile Harbor Phase II Diver Verification Survey Report

Mobile County

Dear Mr. O'Day:

Upon review of the cultural resource assessment conducted for the above referenced project, we have determined that project activities will have no effect on cultural resources eligible for or listed on the National Register of Historic Places. Therefore, we concur with the proposed project activities.

Consultation with the State Historic Preservation Office does not constitute consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public. If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal, and glass objects. The federal agency or the applicant receiving federal assistance should contact our office immediately. If human remains are encountered, the provisions of the Alabama Burial Act (Code of Alabama 1975, §13A-7-23.1, as amended; Alabama Historical Commission Administrative Code Chapter 460-X-10 Burials) should be followed. This stipulation shall be placed on the construction plans to insure contractors are aware of it.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Amanda McBride at 334.230.2692 or Amanda.McBride@ahc.alabama.gov. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Ofle Unne Work
Lee Anne Wofford

Deputy State Historic Preservation Officer

LAW/amh

THE STATE HISTORIC PRESERVATION OFFICE www.ahc.alabama.gov

## **Section 103 Concurrence from EPA**



#### UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-3104

July 14, 2020

Mr. Todd A. Nettles Acting Chief-Planning and Environmental Division U.S. Army Corps of Engineers-Mobile District P.O. Box 2288 Mobile, Alabama 36628

Dear Mr. Nettles:

This letter is in response to your request for concurrence on the proposed disposal of new work dredged material from the Mobile Harbor GRR Project into the Mobile Ocean Dredged Material Disposal Site (ODMDS). We received your concurrence request and evaluation of dredged material suitability on June 16, 2020 with additional information provided on July 6, 2020.

Pursuant to Section 103(c) of the Marine Protection, Research, and Sanctuaries Act (Act), as amended, concurrence from the U.S. Environmental Protection Agency is based upon compliance with the criteria, conditions and restrictions established pursuant to Sections 102(a) [environmental criteria], and Section 102(c) [disposal site designation and management] of the Act. Based upon our review of the information you provided, we concur that the proposed new work dredged material from the Mobile Harbor GRR Project meets the criteria for ocean disposal as proposed and with the conditions described below.

The proposed project includes new work dredging parts of the navigation channel segments of the Mobile Harbor Federal Navigation Project including the River Channel, the Bay Channel, and Bar Channel. The Choctaw Pass Turning Basin is also included. Dredged material volumes are estimated to be approximately 17 million cubic yards.

Our concurrence on the disposal of this material is contingent upon compliance with all specifications and conditions of the Mobile ODMDS Site Management and Monitoring Plan (SMMP). Specifically, disposal shall occur no less than 330 feet (100 meters) inside the site boundaries of the ODMDS. In accordance with the SMMP, the USACE or site user is required to conduct post-disposal bathymetric surveys within 30 days and submit a final disposal summary report to the EPA within 90 days of project completion. Disposal will be completed prior to leaving the ODMDS boundaries as indicated by hull status showing that the hopper doors are closed. All reporting should be consistent with the SMMP. Notification of initiation must be provided 15 days in advance of the start date to EPA. Disposal monitoring data

shall be provided to the EPA electronically on a weekly basis. The operator shall notify the USACE and the EPA within 24 hours if a violation of the contract and/or concurrence conditions occur during disposal operations. At no time may any debris be placed in the ODMDS. In addition, the SMMP also requires that monitoring and precautions be taken to protect sea turtles and Gulf sturgeon when using hopper dredges in accordance with the National Marine Fisheries Service Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by Corps Galveston, New Orleans, Mobile, and Jacksonville Districts, or any version current as of the time of dredging and disposal. This concurrence is based on dredging by hydraulic methods and load volumes not to exceed 15,000 cubic yards. Furthermore, this concurrence is conditioned on the EPA's review and approval of any relevant sections of dredging contract specifications addressing ocean disposal.

A copy of the current SMMP (amended version of March 2019) must be provided to the contractor (or prospective contractors) and EPA must be notified that the document has been provided to them. If possible, it may be worthwhile to share the upcoming SMMP revision to avoid potential issues once that SMMP becomes effective.

The EPA reserves the right to provide an amended concurrence if changes are required to manage the ODMDS. Revisions to the SMMP may also require the EPA to provide an amended concurrence.

The EPA's concurrence is effective for a three-year period as of the date of this letter. If you have any questions concerning this letter, please contact Dr. Wade Lehmann at (404) 562-8082.

Sincerely,

JEANEANNE Digitally signed by JEANEANNE GETTLE Date: 2020.07.14 08:45:24-04'00'

Jeaneanne M. Gettle. Director

Water Division

# Mobile Harbor ODMDS Site Management and Monitoring Plan (SMMP)



#### DEPARTMENT OF THE ARMY CORPS OF ENGINEERS, MOBILE DISTRICT P.O. BOX 2288 MOBILE, AL 36628-0001

CESAM-PD-E

22 February 2019

#### MEMORANDUM FOR THE DISTRICT COMMANDER

SUBJECT: Mobile 4.75-square nautical mile (nm²) Ocean Dredged Material Management Site (ODMDS) Site Management and Monitoring Plan (SMMP)

- 1. PROBLEM. It is the responsibility of the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) pursuant to Section 102 of the Marine, Protection, Research and Sanctuaries Act (MPRSA) of 1972 to manage and monitor each designated ODMDS. All ODMDSs must have a current SMMP in order to actively utilize the site for dredged material placement. The SMMP for the Mobile 4.75-nm² ODMDS must be extended for 2 years to ensure continue maintenance operations can occur for the Federal Mobile Harbor navigation project.
- 2. RECOMMENDATION. It is recommended that the District Commander initial the enclosed Memorandum.

| APPROVED. | 91 | SEE ME | OTHER |  |
|-----------|----|--------|-------|--|
|           |    |        |       |  |

#### 3. BACKGROUND AND DISCUSSION.

- a. The existing Mobile 4.75 nm² ODMDS was previously designated by the EPA in accordance with Section 102 of the MPRSA of 1972. Continued use of this 4.75 nm² site is necessary until EPA finalizes its rule-making effort to designate the 24-nm² ODMDS, which overlays and expands the existing smaller site.
- b. EPA in conjunction with the USACE published the SMMP for the Mobile 4.75 nm² ODMDS on 30 April 2015. In anticipation of completing an expansion of the Mobile ODMDS prior to 2019, the 2015 SMMP was developed for use on a short-term basis and included an expiration date of 29 April 2019. However, the process to complete the expansion of the Mobile ODMDS has taken longer than initially anticipated, thereby warranting an extension of the effective period of the 2015 SMMP not to exceed an additional two years. During this time, it is expected that the expansion of the ODMDS, and development of a new SMMP for the expanded site, will be complete. The Memorandum will serve as an addendum to the 2015 SMMP to extend the expiration of the current SMMP from 29 April 2019, until such time as the final rulemaking for the proposed expansion of the Mobile ODMDS is completed and goes into effect, or to 29 April 2021, whichever occurs sooner.

CESAM-PD-E 22 February 2019 SUBJECT: Mobile 4.75-square nautical mile (nm²) Ocean Dredged Material Management Site (ODMDS) Site Management and Monitoring Plan (SMMP)

- 4. IMPACTS. Without the District Commander's signature, use of the ODMDS would be discontinued and navigation utilizing the Federal Mobile Harbor channel would be impeded.
- 5. MOBILE DISTRICT POC. Please contact the undersign at (251) 690-2724.

Encls

JENNIFER L. JACOBSON
Chief, Environment and Resources
Branch

#### **MEMORANDUM**

SUBJECT: Extension to the current expiration date of the Site Management and Monitoring

Plan for the Mobile Ocean Dredged Material Disposal Site

FROM:

Mary S. Walker, Acting Regional Administrator U.S. Environmental Protection Agency, Region 4

Sebastian P. Joly, Colonel, Corps of Engineers

District Commander, Mobile District

TO:

Pursuant to the Water Resources Development Act Amendments of 1992 (WRDA 92) to the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), the Environmental Protection Agency, Region 4 (EPA), in conjunction with the U.S. Army Corps of Engineers, Mobile District (USACE), published the Site Management and Monitoring Plan (SMMP) for the Mobile Ocean Dredged Material Disposal Site (Mobile ODMDS) on April 30, 2015. In anticipation of completing an expansion of the Mobile ODMDS prior to 2019, the 2015 SMMP was developed for use on a short-term basis and included an expiration date of April 29, 2019. However, the process to complete the expansion of the Mobile ODMDS has taken longer than initially anticipated, thereby warranting an extension of the effective period of the 2015 SMMP not to exceed an additional two years. During this time, it is expected that the expansion of the ODMDS, and development of a new Site Management and Monitoring Plan for the expanded site, will be complete. Through this memorandum, which will serve as an addendum to the 2015 SMMP, the EPA and the USACE are extending the expiration of the current SMMP from April 29, 2019, until such time as the final rulemaking for the proposed expansion of the Mobile ODMDS is completed and goes into effect, or to April 29, 2021, whichever occurs sooner.

The MPRSA Section 102(c)(3), as amended by WRDA 92, sets forth several requirements regarding the content and development of site management plans, as follows:

(a) A baseline assessment of conditions at the site;

The initial baseline assessment of the Mobile ODMDS was conducted in 1985, as part of the Environmental Impact Statement process for the establishment of the site. This study included assessment of the physical, chemical, geological, and biological structure of the site, as well as consideration of the impacts of disposal at the ODMDS. More recently, a new baseline study was conducted in 2010 to assess baseline conditions at the proposed expanded Mobile ODMDS. This included further sampling at the existing site.

(b) A program for monitoring the site;

Since the initial baseline assessment conducted in 1985, a regular monitoring program examining the physical, chemical, and biological conditions at the site has been in

place. The most recent monitoring of the site was a Status and Trends study conducted in October of 2017. The survey found no significant differences in conditions inside and outside of the Mobile ODMDS, and no significant changes since the previous Status and Trends study conducted in 2009.

(c) Special management conditions or practices to be implemented at each site that are necessary for the protection of the environment;

Based on the results of the most recent monitoring study conducted in 2017, the EPA and USACE found no need to change or alter the management conditions and practices currently in place at the Mobile ODMDS (as described in the current SMMP), as these management conditions and practices are still appropriate.

(d) Consideration of the quantity of the material to be disposed of at the site, and the bioavailability of the contaminants in the material;

Projected volumes and rates of operation and maintenance (O&M) dredged material disposal for existing projects during the next few years, from both Federal and private applicants, are expected to be similar to disposal volumes and rates from previous years. Since 2012, open-water in bay thin-layer disposal of dredged material has been utilized for the disposal of some of the O&M dredged material. This has decreased the average O&M material being disposed of in the Mobile ODMDS from 4,400,000 to 2,900,000 cubic yards annually. However, the Alabama State Port Authority has proposed a project to deepen and widen portions of the Federal Mobile Harbor Navigation project. This proposed project could potentially add an approximate 24,000,000 cubic yards of new work material and an associated increase of 2,000,000 cubic yards in annual O&M material to the amount of sediment being disposed of at the Mobile ODMDS. In the future, further deepening and widening of the Mobile Harbor Navigation project could add a total of approximately 100,000,000 cubic yards of material to the Mobile ODMDS.

All material to be disposed of at the Mobile ODMDS will continue to be tested to the level outlined in Section 103 of the MPRSA, as well as in Title 40 of the Code of Federal Regulations, Parts 220-228. The suitability of the dredged material for ocean disposal must be verified by the USACE and the EPA prior to disposal.

(e) Consideration of the anticipated use of the site over the long term, including the anticipated closure date for the site, if applicable, and any need for management of the site after the closure of the site; and

The current site does not have the capacity to accommodate the projected amount of material that is expected to be disposed at the Mobile ODMDS during the next ten years. As a result of the proposed Mobile Harbor expansion project, as well as regular new work and O&M needs, the EPA has proposed to expand the current Mobile ODMDS from its current 4.75 square nautical mile (nmi²) size to an area of approximately 23.8 nmi². The draft Environmental Assessment and draft SMMP for

the expanded site was provided for public notice and comment on September 24, 2018. The expanded site coordinates and new SMMP would supersede the current site and SMMP when finalized.

In the interim period, remaining site capacity at the current Mobile ODMDS will be closely monitored. The SMMP for the existing Mobile ODMDS outlines several monitoring strategies and thresholds for action, including ensuring a safe navigable depth of the site, which will be implemented if necessary.

(f) A schedule for review and revision of the plan (which shall not be reviewed and revised less frequently than 10 years after the adoption of the plan, and every 10 years thereafter).

The current SMMP was signed on April 30, 2015, and has been in place for approximately four years. Typically, SMMPs are in place for a period of ten years before they are revised. The current SMMP was initially established for a shorter period, in anticipation of the completion of an expansion of the site by April 2019. Pursuant to this memorandum, the SMMP will remain effective until April 29, 2021, or the date an expansion of the ODMDS is effective, whichever occurs sooner. If an expansion of the ODMDS does not occur by April 29, 2021, a revised SMMP for the current Mobile ODMDS will be published before then.

Any questions related to the extension of the current SMMP for the Mobile ODMDS may be addressed to the Site Manager, Ms. Lena Weiss (404-562-9228 or weiss.lena@epa.gov).

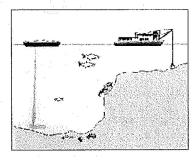
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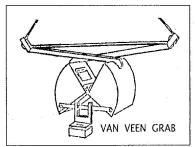


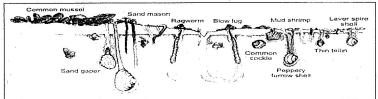
EPA OCEAN DREDGED MATERIAL DISPOSAL SITE

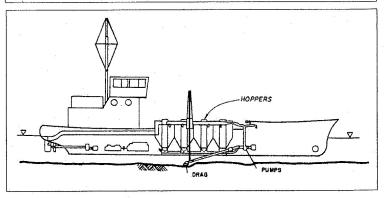


## SITE MANAGEMENT AND MONITORING PLAN









The following Site Management and Monitoring Plan for the Mobile QDMDS has been developed pursuant to the Water Resources Development Act Amendments of 1992 (WRDA 92) to the Marine Protection, Research, and Sanctuaries Act of 1972 for the management and monitoring of ocean disposal activities.

em hyma 30 AP

Date

Heather McTeer Toney Regional Administrator

Date

Colonel, U.S. Army District Commander Mobile District

U.S. Army Corps of Engineers

Mobile, Alabama

U.S. Environmental Protection Agency

Region 4

Atlanta, Georgia

This plan is effective from the date of EPA and USACE signature for a period not to exceed four years.

# MOBILE OCEAN DREDGED MATERIAL DISPOSAL SITE SITE MANAGEMENT AND MONITORING PLAN

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## Mobile ODMDS Site Management and Monitoring Plan

#### 1.0 INTRODUCTION

It is the responsibility of the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 to manage and monitor each of the Ocean Dredged Material Disposal Sites (ODMDSs) designated by the EPA pursuant to Section 102 of MPRSA. Section 102(c)(3) of the MPRSA requires development of a Site Management and Monitoring Plan (SMMP) for each ODMDS and review and revision of the SMMP not less frequently than every 10 years. The 1996 document, Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites (EPA/USACE, 1996) and the EPA Region 4 and USACE South Atlantic Division (SAD) Memorandum of Understanding (EPA/USACE, 2007) have been used as guidance in developing this SMMP.

Specific responsibilities of EPA and the USACE are:

EPA. EPA is responsible for designating/de-designating MPRSA Section 102 ODMDSs, for implementing and evaluating environmental effects of disposal dredged material at these sites, and for reviewing and concurring on dredged material suitability determinations.

USACE: The USACE is responsible for evaluating dredged material suitability, issuing MPRSA Section 103 permits, regulating site use, and developing and implementing disposal monitoring programs.

The SMMP provisions shall be requirements for all dredged material disposal activities at the site. All Section 103 (MPRSA), ocean disposal permits or contract specifications shall be conditioned as necessary to assure consistency with the SMMP.

#### 2.0 SITE MANAGEMENT

Section 228.3 of the Ocean Dumping Regulations (40 CFR 220-229) states: "Management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of, developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation."

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#### 2.1 Disposal Site Characteristics

The designation of the Mobile ODMDS can be found in 40 CFR 228.15(h)(14). Coordinates in the CFR are provided in NAD 27. The Mobile ODMDS is a 4.75 square nautical mile (nmi²) area.

Table 1: Site Coordinates

| Geographi  | c (NAD 27) |
|------------|------------|
| 30°10'00"N | 88°07'42"W |
| 30°10'24"N | 88°05'12"W |
| 30°09'24"N | 88°04'42"W |
| 30°08'30"N | 88°05'12"W |
| 30°08'30"N | 88°08'12"W |

The site (see Figure 1) lies on the shallow continental shelf, 4 nmi offshore Mobile Point, Alabama with an average depth of 14 meters. Physical, chemical, and biological conditions at the ODMDS are described in, "Final Environmental Impact Statement for the Pensacola, FL, Mobile, AL, and Gulfport, MS Dredged Material Disposal Site Designation." (EPA, 1987)

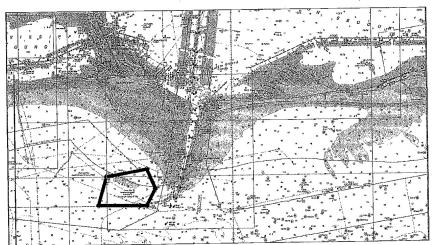


Figure 1: Mobile ODMDS Location Map.

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2.2 Management Objectives. Appropriate management of an ODMDS is aimed at assuring that disposal activities will not unreasonably degrade or endanger human health, welfare, the marine environment or economic potentialities (MPRSA §103(a)). The primary objectives in the management of these ODMDSs are:

- Protection of the marine environment:
- · Documentation of disposal activities and compliance; and
- Maintenance of a long term disposal alternative for dredged material, while encouraging beneficial use where practical.

The following sections provide the framework for meeting these objectives to the extent possible.

2.3 Disposal History and Dredged Material Volumes. Disposal history can be found at the Ocean Disposal Database maintained by the USACE (http://el.erdc.usace.army.mil/odd/). The Mobile ODMDS and the Mobile North ODMDS (selected by the USACE pursuant to Section 103 of the MPRSA) have been used for disposal of 120 million cubic yards since 1987 (USACE, 2014). Currently, the average annual disposal volume is about 4 million cys. The composition of the dredged material is primarily silts and clays. Future volumes and rates of disposal, from both Federal and private applicants, are expected to be similar to previous years. However, this estimate may increase if it is determined feasible to deepen and widen the Federal channel into Mobile Harbor to its currently authorized project dimensions. Also, the Mobile Harbor Turning Basin constructed in 2010 requires annual maintenance dredging of about 425,000 cubic yards per year which may go to the ODMDS (USACE, 2014). The USACE has estimated the remaining capacity of the Mobile ODMDS at 15 million cubic yards based on projected volumes and the remaining capacity the ODMDS has an estimated life of four years (USACE 2014). EPA in cooperation with the Mobile District is in the process of expanding the Mobile ODMDS through preparation of an Environmental Assessment and rulemaking and expects to expand the site within the next four years.

#### 2.4 Dredged Material Characteristics.

2.4.1 Associated Beach Quality Materials. USACE Beneficial Use of Dredged Material EM 1110-2-5026 requires dredged material be maximized within the coastal system. Dredged materials that qualify for beach or near-shore placement per the applicable State standards shall be beneficially placed in such location, to the maximum extent practicable. It is expected that the applicable State will exercise its authority and responsibility, regarding beach nourishment, to the full extent during any future permitting activities. Beneficial use of beach compatible dredged material for beach nourishment is strongly encouraged and supported by EPA. Most sandy material is placed in the Sand Island Beneficial Use Area located due east of the ODMDS (USACE, 2014).

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2.4.2 <u>Dredged Material Quality Verification</u>. The suitability of dredged material for ocean disposal must be verified by the USACE and agreed to via written concurrence from EPA prior to disposal. Verification will be valid for three years from the most current verification.

Verification process:

- 1) Case-specific evaluation against the exclusion criteria (40 CFR 227.13(b)).
- Determination of testing requirements for non-excluded material based on the potential of sediment contamination since last verification.
- 3) When applicable, execute testing and determination of suitability of non-excluded material for ocean disposal.

Verification documentation for suitability will be completed prior to use of the ODMDS. Documentation will be in the form of a MPRSA Section 103 Evaluation. Potential testing and the Evaluation will follow the procedures outlined in the 1991 EPA/USACE Dredged Material Testing Manual and 2008 Southeast Regional Implementation Manual (SERIM) or the appropriate updated versions. This includes how dredging projects will be subdivided into project segments for sampling and analysis. The MPRSA Section 103 Evaluation will be in the form outlined in Appendix C of the SERIM. Water Quality Compliance determinations will be made using the STFATE (ADDAMS) model. Only material determined to be suitable and in compliance with the Ocean Dumping Criteria (40 CFR Part 227) through the verification process by the USACE and EPA, Region 4 can be disposed in this ODMDS.

- <u>2.5 Time of disposal</u>. At present no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biotic activity at the Mobile ODMDS.
- 2.6 Disposal Technique. No specific disposal technique is required for the site. In order to protect sea turtles and Gulf sturgeon, the National Marine Fisheries Service, Protected Resources Division requires monitoring according to guidance outlined in the Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts (NMFS, 2003 and amended 2005 & 2007). In addition, standard surveillance and evasive measures to protect sea turtles and marine mammals shall be employed during all disposal operations at the ODMDS.
- 2.7 Disposal Location. 40 CFR §227.28 requires all disposals to occur at least 330 feet (100 meters) inside any site boundaries. Release zones may be established by the USACE in consultation with EPA at the time of site use for operational reasons or to insure compliance with the Ocean Dumping Criteria (40 CFR Part 227). Disposal shall be initiated within the applicable release zone boundary and completed (i.e. doors closed) prior to leaving the ODMDS boundaries. Placement methods, which prevent mounding of dredged materials from becoming an unacceptable navigation hazard, will be used. Dredged material shall be disposed so that at no point will depths less than -25 feet Mean Lower Low Water (MLLW) occur (i.e., a clearance of

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- 25 feet above the bottom will be maintained). The physical removal or leveling of material above -25 feet MLLW is a management alternative should mounds greater than that elevation occur. Disposal shall not occur closer than 1,300 feet to any oil and gas rigs that may be present within the site boundaries.
- 2.8 Permit and Contract Conditions. The disposal monitoring and post-disposal monitoring requirements described under Site Monitoring will be included as permit conditions on all MPRSA Section 103 permits and will be incorporated in the contract language for all federal projects. A summary of the management and monitoring requirements to be included are listed in Table 2.

Table 2. Summary of Permit and Contract Conditions

| The state Contract Continuous   |  |
|---|--|
| Condition   | Reference  |
| Dredged Material Suitability and Term of Verification                                 | SMMP page 3, Southeast Regional<br>Implementation Manual |
| Disposal within Appropriate Zones   | SMMP page 4  |
| Pre and Post Bathymetric Surveys  | SMMP pages 6,8   |
| Disposal Monitoring and Recording of Disposal Locations                               | SMMP pages 7-8   |
| Reporting Requirements: Disposal Summary Reports within 90 Days of Project Completion | SMMP page 10   |

- 2.9 Permit Process. All disposal of dredged material in the ocean, with the exception of Federal Civil Works projects, requires an ocean dumping permit issued by the USACE pursuant to Section 103 of the MPRSA. A summary of the permitting process can be found at: <a href="http://www.epa.gov/region4/water/oceans/Dredged\_Material\_Permit\_Process.htm">http://www.epa.gov/region4/water/oceans/Dredged\_Material\_Permit\_Process.htm</a>.
- 2.10 Information Management of Dredged Material Placement Activities. EPA Region 4 and USACE SAD have agreed on an eXtensible Markup Language (XML) standard for sharing of disposal monitoring data (see also Section 3.5).

#### 3.0 SITE MONITORING

The MPRSA establishes the need for including a monitoring program as part of the Site Management Plan. Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site and to verify compliance with the site designation criteria, any special management conditions, and with permit requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs. The intent of the program is to provide the following:

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- (1) Information indicating whether the disposal activities are occurring in compliance with the permit and site restrictions;
- (2) Information indicating the short-term and long-term fate of materials disposed of in the marine environment.
- (3) Information concerning the short-term and long-term environmental impacts of the disposal.

The main purpose of a disposal site monitoring program is to determine whether dredged material site management practices, including disposal operations at the site, need to be changed to avoid significant adverse impacts.

3.1 Baseline Monitoring. The results of investigations presented in the designation EIS (EPA, 1987) and subsequent surveys listed in Table 3 will serve as the main body of data for the monitoring of the impacts associated with the use of the Mobile ODMDS. A bathymetric survey will be conducted by the USACE or site user within three (3) months prior to project disposal for projects expected to exceed 50,000 cubic yards. Bathymetric surveys will be used to monitor the disposal mound to insure a navigation hazard is not produced, to assist in verification of material placement, to monitor bathymetry changes and trends and to insure that the site capacity is not exceeded, ie., the mound does not exceed the site boundaries. Surveys will conform to the minimum performance standards for Corps of Engineers Hydrographic Surveys as described in the USACE Engineering Manual, EM1110-2-1003, Hydrographic Surveying dated November 30, 2013[http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM\_11 10-2-1003 pdf] or updates. The number and length of transects required will be sufficient to encompass the release zone and a 500 foot-wide area around it. The surveys will be taken along lines spaced at 500-foot intervals or less. The minimum performance standards from Table 3-1 in Hydrographic Surveying shall be followed. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing a differential global positioning system. The vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for that area or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83). No additional pre-disposal monitoring is required.

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Table 3. Surveys and Studies Conducted at or in the vicinity of the Mobile ODMDS

| Survey/Study Title  | Conducted By:                                 | - Date                    | Purpose  | Results  |
|---|---|---------------------------|--|--|
| Analysis & Synthesis<br>of Oceanic Conditions<br>in the Mississippi<br>Sound Offshore<br>Region | USACE   | March .<br>1984           | Determine the direction<br>and amount of sediment<br>transport from a dredged<br>material disposal site. | Circulation patterns within<br>the site are controlled by<br>astronomical tides, winds,<br>and freshwater discharges.  |
| Sediment Mapping  | UGA Center for<br>Applied Isotopes<br>for EPA | 2002                      | Characterization of<br>bottom sediments using<br>gamma spectrometry                                      | - Baseline Survey  |
| Mobile ODMDS<br>Expansion Survey  | USACE/BPA                                     | May 2010                  | Collect physical,<br>chemical and biological<br>data on sediments and<br>water                           | Collected and analyzed 30 sediment and 10 water samples covering entire ODMDS  |
| Mobile ODMDS Post<br>Oil Spill Sediment<br>Sampling   | USACE   | December<br>2010          | Determine if any oil from<br>the Deep Water Horizon<br>Oil Spill has<br>contaminated the<br>sediments.   | -Test results released<br>February 2011 indicate<br>there were no discernible<br>changes in the sediment<br>quality attributed to the<br>Deepwater Horizon Oil Spill |
| Bathymetric Survey  | USACE   | Before and<br>After Event | Monitor bathymetry changes   | -Safe navigation depths<br>have been maintained  |

3.2 Disposal Monitoring. For all disposal activities, an electronic tracking system (ETS) must be utilized. The ETS will provide surveillance of the transportation and disposal of dredged material. The ETS will be maintained and operated to continuously track the horizontal location and draft condition (accuracy±0.1 foot) of the disposal vessel (i.e. hopper dredge or disposal scow) from the point of dredging to the disposal site and return to the point of dredging. Data shall be collected at least every 0.25 nautical mile or every 4 minutes during travel to and from the ODMDS and twelve seconds or every 30 feet of travel, while the hull status is open within the ODMDS. In addition to the continuous tracking data, the following trip information shall be electronically recorded for each disposal cycle:

- a. Load Number
- b. Disposal Vessel Name and Type (e.g. scow)
- c. Estimated volume of Load
- d. Description of Material Disposed
- e. Source of Dredged Material
- f. Date, Time and Location at Initiation and Completion of Disposal Event

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It is expected that disposal monitoring will be conducted utilizing the Dredging Quality Management (DQM) system for Civil Works projects [see <a href="http://dqm.usacc.army.mil/Specifications/Index.aspx">http://dqm.usacc.army.mil/Specifications/Index.aspx</a>], although other systems are acceptable. Disposal monitoring and ETS data will be reported to EPA Region 4 on a weekly basis (within one week of disposal) utilizing the extensible Markup Language (XML) specification and protocol per Section 3.5. EPA Region 4 and the USACE District shall be notified within 24 hours if disposal occurs outside of the ODMDS or specified disposal zone or if excessive leakage occurs.

3.3 Post Discharge Monitoring. The USACE or other site user will conduct a bathymetric survey consistent with the pre-disposal survey requirements within 30 days after disposal project completion. Surveys will not be required for projects less than 50,000 cubic yards. If a release zone is utilized and adhered to, the number and length of the transects required will be sufficient to encompass the release zone and a 500 foot wide area around it. Bathymetric surveys will be used to monitor the disposal mound to insure a navigation hazard is not produced; to assist in verification of material placement, to monitor bathymetry changes and trends and to insure that the site capacity is not exceeded, i.e., the mound does not exceed the site boundaries.

3.4 Disposal Effects Monitoring. Based on the type and volume of material disposed and impacts of concern, various monitoring surveys can be used to examine if and the direction the disposed dredged material is moving, and what environmental effect the material is having on the site and adjacent areas. At the current time, no nearby biological resources have been identified that are of concern for potential impact. The Mobile ODMDS is at least one nautical mile from all known fish havens, artificial reefs, and fishing areas. The site has been characterized as dispersive. This means that it is expected that material will be moved outside the site boundaries. It is also expected that this material will not move in distinct mounds, but instead will blend with the surrounding environment causing a progressive transition to sediments containing a higher percentage of silt and clay. Changes in sediment composition will likely after the benthic community structure. However, based on previous benthic studies, it is unlikely that permanent or long-term adverse impacts will result due to changes in sediment composition. At a minimum, a Trend Assessment Survey (40 CFR 228.13) will be conducted approximately every ten years.

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| Mobile ODAGDS SAMP  Table 4. Site Monitoring Strategies and Threscholifs for Action | SMMP<br>Strategies  | and Thresh | olds for Action  |   | March 2015   |  | Turrelle<br>Sign  |             |
|---|---|------------|--|---|--|--|---|-------------|
| Goal  | fechnique   | Sponsor    | Rationale  | Frequency   | Physicid to Action   | Mai<br>Threshold Not<br>Exceded                    | Vanagement Options or Threshold Exceeded  | 1 V V V V V |
| Trend.<br>Assessment  | Water and<br>Sediment<br>Ovality, Benthic<br>Community<br>Analysis<br>(40CFR228.13) | U.S. EPA   | Periodically evaluate<br>the impact of disposal<br>on the marine<br>arvironment (40CFR<br>228.9) | Approximately every 10 years  | -Absence from the site of<br>pollution seastive blots<br>Progressive non-seasonal<br>changes in water or<br>sediment quality | Confine<br>Monitoring per<br>site specific<br>SMMP | U.S. EPA Periodically evaluate Approximately -Absence from the site of Continue Conduct Environmental the impact of disposal every 10 years pollution sensitive bloss Monitoring or Atvanced Environmental environment (40CFR Progressive non-seasonal site specific Atvanced Environmental environment (40CFR sediment quality sediment quality sediment quality sediment quality every 10 years (40CFR Sediment quality every 10 years) | 44.15       |
| Insure Safe<br>Navigation<br>Depth & Monitor<br>Bathymetric<br>Trends               | Bathymetry  | Site User  | Determine height of mound and any excessive mounding   | Pre & Post<br>disposal for<br>projects<br>greater than<br>50,000 cy | Mound height > -30 feet Continue mean lower low water (MLLW) Mound height > -25 feet Continue MLLW                           | Continue<br>Monitoring<br>Continue<br>Monitoring   | -Modify future disposal<br>method/placement<br>-Restrict disposal volumes<br>- Physically level material  |             |
| Compliance  | Disposal Site<br>Use Records in<br>EPA Region 4's<br>XML format                     | Site User  | fusure management requirements are being met. To assist in site monitoring.                      | Report weekly<br>during the<br>project                              | Disposal records required by SAGNP are not submitted or are incomplete.  | Continue<br>Moniforing                             | Restrict site use until<br>requirements are met   |             |

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#### 3.5 Reporting and Data Formatting.

- 3.5.1 Project Initiation and Violation Reporting. The USACE or other site user shall notify EPA 15 days prior to the beginning of a dredging cycle or project disposal. The user is also required to notify the USACE and the EPA within 24 hours if a violation of the permit and/or contract conditions related to MPRSA Section 103 or SMMP requirements occur during disposal operations.
- 3.5.2 Disposal Monitoring Data. It is expected that disposal monitoring will be conducted utilizing the Dredge Quality Management (DQM) system for Civil Works projects [see <a href="http://dqm.usace.army.mii/Specifications/index.aspx">http://dqm.usace.army.mii/Specifications/index.aspx</a>], although other systems are acceptable. Disposal monitoring data shall be provided to EPA Region 4 electronically on a weekly basis (within one week of disposal event). Data shall be provided per the EPA Region 4 XML format and delivered as an attachment to an email to <a href="mailto:DisposalData.R4@epa.gov">DisposalData.R4@epa.gov</a>. The XML format is available from EPA Region 4.
- 3.5.3 Post Disposal Summary Reports. A Post Disposal Summary Report shall be provided to EPA within 90 days after project completion. These reports should include: dredging project title; permit number and expiration date (if applicable); contract number; name of contractor(s) conducting the work, name and type of vessel(s) disposing material in the ODMDS; disposal timeframes for each vessel; volume disposed at the ODMDS (total paid and un paid in situ volume, and gross volume reported by dredging contractor in the disposal logs), number of loads to ODMDS, type of material disposed at the ODMDS; identification by load number of any misplaced material; dates of pre and post disposal bathymetric surveys of the ODMDS and a narrative discussing any violation(s) of the 103 concurrency and/or permit (if applicable). The narrative should include a description of the violation, indicate the time it occurred and when it was reported to the EPA and USACE, discuss the circumstances surrounding the violation, and identify specific measures taken to prevent reoccurrence. The Post Disposal Summary Report should be accompanied by the bathymetry survey results (plot and X,Y,Z ASCII data file), a summary scatter plot of all disposal start locations, and a summary table of the trip information required by Section 3.2 with the exception of the disposal completion data. If all data is provided in the required XML format, scatter plots and summary tables will not be necessary.
- 3.5.4 Environmental Monitoring. Disposal effects monitoring shall be coordinated with and be provided to appropriate federal and state agencies as specified in the site specific SMMP to be developed. Reports prepared by or for EPA will be posted to EPAs website at: <a href="http://www.epa.gov/region4/water/oceans/sites.html">http://www.epa.gov/region4/water/oceans/sites.html</a> or alternative EPA website.

#### 4.0 MODIFICATION OF THE MOBILE ODMDS SMMP

This SMMP will be effective for four years from the date of signature. It is expected that EPA will expand the Mobile ODMDS within four years and a new SMMP will be developed for the

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expanded ODMDS and supersede this SMMP.

#### **5.0 REFERENCES**

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Fredette, Thomas J., Nelson, David A., Clausner, James E., and Anders, Fred J. 1990. *Guidelines for Physical and Biological Monitoring of Aquatic Dredged Material Disposal Sites*, Technical Report D-90-12, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

NMFS. (2003). Regional Biological Opinion for Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredging by USACE Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287), NOAA, NMFS, Southeast Regional Office, Protected Resources Division, St. Petersburg, FL, 121 pp.

Pequegnat, Willis E., Gallaway, Benny J., and Wright, Thomas D., 1990. Revised Procedural Guide for Designation Surveys of Ocean Dredged Material Disposal Sites, Technical Report D-90-8, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

- U.S. Army Corps of Engineers (COE). 2002. Engineering & Design Hydrographic Surveying. Engineering Manual 1110-2-1003, Department of the Army, Washington D.C.
- U.S. Army Corps of Engineers Mobile District (USACE). 2014. Working Draft Environmental Assessment for the Proposed Expansion Mobile Section 102 ODMDS November 2014.
- U.S. Environmental Protection Agency, 1987. Final Environmental Impact Statement for the Pensacola, FL, Mobile, AL, and Gulfport, MS Dredged Material Disposal Site Designation. EPA Region 4, January 27, 1987.
- U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1991. Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual), February 1991. Prepared by Environmental Protection Agency Office of Marine and Estuarine Protection and Department of Army United States Army Corps of Engineers under EPA Contract No. 68-C8-0105.

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U.S. Environmental Protection Agency, Region 4, 2007. Dredged Material Ocean Disposal Verification System - Specifications for Data Submittal, revised October 30, 2007. Prepared by Wetlands and Marine Regulatory Section.

U.S. Environmental Protection Agency Region 4 and U.S. Army Corps of Engineers South Atlantic Division, 2008. Southeast Regional Implementation Manual Requirements and Procedures for Evaluation of the Ocean Disposal of Dredged Material in Southeastern Atlantic and Gulf Coastal Waters, August 2008.

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#### APPENDIX A

### WATER COLUMN EVALUATIONS NUMERICAL MODEL (STFATE) INPUT PARAMETERS

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#### Water Column Evaluations Numerical Model (STFATE) Input Parameters Mobile ODMDS

#### SITE DESCRIPTION

| SITE DESCRIPTION   |        |       |
|--|--------|-------|
| Parameter  | Value  | Units |
| Number of Grid Points (left to right)                          | 80     |       |
| Number of Grid Points (top to bottom)                          | 80     |       |
| Spacing Between Grid Points (left to right)                    | 250    | ft    |
| Spacing Between Grid Points (top to bottom)                    | 250    | ft    |
| Constant Water Depth   | 46     | ft    |
| Roughness Height at Bottom of Disposal Site                    | .005¹  | ft    |
| Slope of Bottom in X-Direction                                 | . 0    | Deg.  |
| Slope of Bottom in Z-Direction                                 | 0      | Deg.  |
| Number of Points in Ambient Density Profile Point <sup>1</sup> | 3      |       |
| Ambient Density at Depth = 3 ft                                | 1.0206 | g/cc  |
| Ambient Density at Depth = 26 ft                               | 1.0206 | g/cc  |
| Ambient Density at Depth = 46 ft                               | 1.0207 | g/cc  |

<sup>&</sup>lt;sup>1</sup> from EPA Mobile ODMDS Designation Survey Report (2009) for Zone A

#### AMBIENT VELOCITY DATA

| Parameter                      | Value        | Units         |
|--------------------------------|--------------|---------------|
| Profile <sup>2</sup>           | 2-Point at o | onstant depth |
| X-Direction Velocity = 11 feet | 0.12         | ft/sec        |
| Z-Direction Velocity = 11 feet | -0.41        | ft/sec        |
| X-Direction Velocity = 33 feet | 0.22         | ft/sec        |
| Z-Direction Velocity = 33 feet | -0.37        | ft/sec        |

<sup>&</sup>lt;sup>2</sup> from EPA Mobile ODMDS Designation Survey Report (2009)

#### DISPOSAL OPERATION DATA

| Parameter   | Value  | Units |
|---|--------|-------|
| Location of Disposal Point from Top of Grid       | 10,000 | ft    |
| Location of Disposal Point from Left Edge of Grid | 10,000 | ft    |
| Dumping Over Depression                           | 0      | _     |

| TMDHT | EXECUTION | ABIC | OHT DIT |
|-------|-----------|------|---------|
|       |           |      |         |

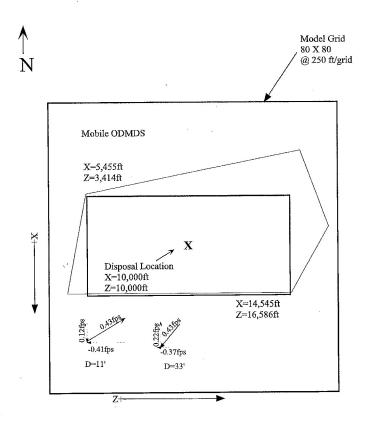
| Parameter   |   | Value  | Units |
|---|---|--------|-------|
| Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge   | - | 5,455  | ft    |
| Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge  | : | 3,414  | ft    |
| Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge  |   | 14,545 | ft    |
| Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge |   | 16,586 | ft    |
| Duration of Simulation  |   | 14,400 | sec   |
| Long Term Time Step   |   | 600    | sec   |

#### COEFFICIENTS

| Parameter   | Keyword | Value                |
|---|---------|----------------------|
| Settling Coefficient                              | BETA    | 0.0001               |
| Apparant Mass Coefficient                         | СМ      | 1.000¹               |
| Drag Coefficient                                  | CD      | 0.500¹               |
| Form Drag for Collapsing Cloud                    | CDRAG   | 1.000¹               |
| Skin Friction for Collapsing Cloud                | CFRIC   | 0.010 <sup>1</sup>   |
| Drag for an Ellipsoidal Wedge                     | CD3     | 0.100¹               |
| Drág for a Plate                                  | CD4     | 1.000 <sup>1</sup>   |
| Friction Between Cloud and Bottom                 | FRICTN  | 0.0101               |
| 4/3 Law Horizontal Diffusion Dissipation Factor   | ALAMDA  | 0.0011               |
| Unstratified Water Vertical Diffusion Coefficient | AKYO    | Pritchard Expression |
| Cloud/Ambient Density Gradient Ratio              | GAMA    | 0.250 <sup>1</sup>   |
| Turbulent Thermal Entrainment                     | ALPHAO  | 0.2351               |
| Entrainment in Collapse                           | ALPHAC  | 0.100¹               |
| Stripping Factor                                  | CSTRIP  | .0,0031              |

<sup>&</sup>lt;sup>1</sup> Model Default Value

## **Mobile ODMDS STFATE Input Parameters**



| Mobile ODMDS Background Water Concentration. |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
| Chemicals of Concern                         | Background Concentration Levels (μg/l) |  |  |  |  |  |  |  |
| Arsenic                                      | 1.66 ¹                                 |  |  |  |  |  |  |  |
| Cadmium                                      | 0.01 1                                 |  |  |  |  |  |  |  |
| Chromium (VI)                                | 0.75 1                                 |  |  |  |  |  |  |  |
| Copper                                       | 1.11 1                                 |  |  |  |  |  |  |  |
| Lead   | 0.75 1                                 |  |  |  |  |  |  |  |
| Mercury                                      | . 0.10 1,3                             |  |  |  |  |  |  |  |
| Nickel .                                     | 0.75 1                                 |  |  |  |  |  |  |  |
| Selenium                                     | 0.23 1                                 |  |  |  |  |  |  |  |
| Silver                                       | 0.0051                                 |  |  |  |  |  |  |  |
| Zinc   | 3.781                                  |  |  |  |  |  |  |  |
| Cyanide                                      | • •                                    |  |  |  |  |  |  |  |
| Tributyltin (TBT)                            | 0.025 2,3                              |  |  |  |  |  |  |  |
| Aldrin                                       | 0.005 1,3                              |  |  |  |  |  |  |  |
| Chlordane                                    | 0.10 1,3                               |  |  |  |  |  |  |  |
| DDT  | 0.05 1,3                               |  |  |  |  |  |  |  |
| Dieldrin                                     | 0.005 1,3                              |  |  |  |  |  |  |  |
| alpha - Endosulfan                           | 0.005 1,3                              |  |  |  |  |  |  |  |
| beta - Endosulfan                            | 0.005 1,3                              |  |  |  |  |  |  |  |
| Endrin                                       | 0.005 1,3                              |  |  |  |  |  |  |  |
| gamma-BHC (Lindane)                          | 0.005 1,3                              |  |  |  |  |  |  |  |
| Heptachlor                                   | 0.005 <sup>l,3</sup>                   |  |  |  |  |  |  |  |
| Heptachlor Epoxide                           | 0.005 1,3                              |  |  |  |  |  |  |  |
| Toxaphene                                    | .25 1,3                                |  |  |  |  |  |  |  |
| Pentachlorophenol                            | 5.0 2.3                                |  |  |  |  |  |  |  |

<sup>&</sup>lt;sup>1</sup> Mobile ODMDS Site Designation Study (2010)

<sup>2</sup> Pensacola ODMDS Trend Assessment Study (2013)

<sup>3</sup> Analyte not detected. Value based on one half the reporting limit.

#### **APPENDIX B**

# TEMPLATE For MPRSA Section 103 Permits

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# TEMPLATE GENERIC SPECIAL CONDITIONS FOR MPRSA SECTION 103 PERMITS Mobile-North ODMDS

#### I. DISPOSAL OPERATIONS

A. For this permit, the term disposal operations shall mean: navigation of any vessel used in disposal of operations, transportation of dredged material from the dredging site to the Mobile ODMDS, proper disposal of dredged material at the disposal area within the Mobile ODMDS, and transportation of the hopper dredge or disposal barge or scow back to the dredging site.

B. The Mobile ODMDS is defined as the polygon with corner coordinates as follows:

| Cito | ( 'AAI | dinates | 3 |
|------|--------|---------|---|
| DILL | COU    | uman.   | 3 |

| Geographic (NAD 27) |             |  |  |  |  |  |  |
|---------------------|-------------|--|--|--|--|--|--|
| 30°10'00''N         | 88°07'42"W  |  |  |  |  |  |  |
| 30°10'24"N          | 88°05'12"W  |  |  |  |  |  |  |
| 30°09'24"N          | 88°04'42"W  |  |  |  |  |  |  |
| 30°08'30"N          | 88°05'12''W |  |  |  |  |  |  |
| 30°08'30"N          | 88°08'12"W  |  |  |  |  |  |  |

- C. No more than [NUMBER] cubic yards of dredged material excavated at the location defined in [REFERENCE LOCATION IN PERMIT] are authorized for disposal at the Mobile ODMDS.
- D. The permittee shall use an electronic positioning system to navigate to and from the Mobile ODMDS. For this section of the permit, the electronic positioning system will be as per the DQM specifications. If the electronic positioning system fails or navigation problems are detected, all disposal operations shall cease until the failure or navigation problems are corrected.
- E. The permittee shall certify the accuracy of the electronic positioning system proposed for use during disposal operations at the Mobile ODMDS. The certification shall be accomplished by providing current certification documentation from the National DQM Program for scow and hopper dredge

instrumentation systems. The National DQM certification is valid for one year from the date of certification.

- F. The permittee shall not allow any water or dredged material placed in a hopper dredge or disposal barge or scow to flow over the sides or leak from such vessels during transportation to the Mobile ODMDS.
- G. A disposal operations inspector and/or captain of any tugboat, hopper dredge or other vessel used to transport dredged material to the Mobile ODMDS shall insure compliance with disposal operation conditions defined in this permit.
  - 1. If the disposal operations inspector or the captain detects a violation, he shall report the violation to the permittee immediately.
  - 2. The permittee shall contact the U.S. Army Corps of Engineers, Mobile District's Regulatory Branch (251) 690-2658 and EPA Region 4 at (404) 562-9395 to report the violation within twenty-four (24) hours after the violation occurs. A complete written explanation of any permit violation shall be included in the post-dredging report.
- H. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Mobile ODMDS as defined in Special Condition B. Additionally, disposal shall occur within a specified disposal zone defined as [DEFINE COORDINATES AND SIZE OF DISPOSAL ZONE]. Disposal shall not occur closer than 1,300 feet to any oil and gas rigs that may be present within the site boundaries.
- l. The permittee shall use an automated disposal verification system that is certified by the National DQM program to continuously track the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) to and from the Mobile ODMDS. This real-time information is available on-line to the Mobile District and will be provided to the EPA Region 4 via email using the eXtensible Markup Language (XML) specification and protocol. Data shall be provided per the EPA Region 4 XML format and delivered as an attachment to an email to <a href="DisposalData.R4@epa.gov">DisposalData.R4@epa.gov</a>. The XML format is available from EPA Region 4.
- J. The permittee shall conduct a bathymetric survey of the Mobile ODMDS within 30 days following project completion.
  - 1. The number and length of the survey transects shall be sufficient to encompass the defined disposal zone within the Mobile ODMDS and a 500 foot wide area around the disposal zone. The transects shall be spaced at 500-foot intervals or less with a depth recording density of 20 to 70 feet.

- 2. Vertical accuracy of the survey shall be ±0.1 feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either microwave line of site system or differential global positioning system. The vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum. MLLW is 1.8 feet below NGVD 1929. The horizontal datum will be Alabama State Plane (zone 2301 MS East) or Geographic (NAD 1983). State Plane coordinates shall be reported to the nearest 0.10 foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.
- K. The permittee has read and agrees to assure that they are in compliance with the requirements of the Mobile ODMDS Site Management and Monitoring Plan.

#### II. REPORTING REQUIREMENTS

- A. The permittee shall send the U.S. Army Corps of Engineers, Mobile District's Regulatory Branch and EPA Region 4's Wetlands, Oceans and Streams Protection Branch (61 Forsyth Street, Atlanta, GA 30303) a notification of commencement of work at least fifteen (15) days before initiation of any dredging operations authorized by this permit.
- B. The permittee shall submit to the U.S. Army Corps of Engineers weekly disposal monitoring reports. These reports shall contain the information described in Special Condition 1.1.
- C. The permittee shall develop and send one (1) copy of the disposal summary report to the Mobile District's Regulatory Branch and one (1) copy of the disposal summary report to EPA Region 4 documenting compliance with all general and special conditions defined in this permit. The disposal summary report shall be sent within 90 days after completion of the disposal operations authorized by this permit. The disposal summary report shall include the following information:
  - 1. The report shall indicate whether all general and special permit conditions were met. Any violations of the permit shall be explained in detail.
  - 2. The disposal summary report shall include the following information: USACE permit number, actual start date and completion date of dredging and disposal operations, total cubic yards disposed at the Mobile ODMDS, locations of disposal events, and post disposal bathymetric survey results (in hard and electronic formats).

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#### APPENDIX C

### TYPICAL CONTRACT LANGUAGE FOR IMPEMENTING THE MOBILE ODMDS SMMP REQUIREMENTS

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#### TYPICAL CONTRACT LANGUAGE FOR IMPEMENTING SMMP REQUIREMENTS

#### 3.3 DISPOSAL OF DREDGED MATERIAL

#### 3.3.1 General

All material dredged shall be transported to and deposited in the disposal area(s) designated on the drawings. The approximate maximum and average distance to which the material will have to be transported are as follows:

Disposal Area

Maximum Distance

Average Distance

Statute Miles

Statute Miles

Mobile ODMDS

[INSERT DISPOSAL AREA 2]

[XX miles]

[XX miles]

[IF MATERIAL FROM DIFFERENT PROJECT AREAS GO TO DIFFERENT DISOSAL AREAS, IT COULD BE SPECIFIED HERE]

#### 3.3.2 Ocean Disposal Notification

- a. The contractor shall notify EPA Region 4 's Wetlands, Oceans and Streams Protection Branch (61 Forsyth Street, Atlanta, GA 30303) at least 15 calendar days and the local Coast Guard Captain of the Port at least 5 calendar days prior to the first ocean disposal. The notification will be by certified mail with a copy to the Contracting Officer. The following information shall be included in the notification:
  - (1) Project designation; Corps of Engineers' Contracting Officer's name and contract number; and, the Contractor's name, address, and telephone number.
  - (2) Port of departure.
  - (3) Location of ocean disposal area (and disposal zone if required).
  - (4) Schedule for ocean disposal, giving date and time proposed for first ocean disposal.

#### 3.3.3 Ocean Dredged Material Disposal Sites (ODMDS)

The material excavated shall be transported to and deposited in the Mobile ODMDS shown on the drawings. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be outside of the boundaries of the Mobile ODMDS as shown on the drawings. Additionally, disposal shall be initiated within the disposal release zone defined by the following coordinates:

| [insert coordin | ates for appropriate release zone] |                    |  |  |  |  |  |
|-----------------|------------------------------------|--------------------|--|--|--|--|--|
| Vertices        | Geographic NAD 83                  | State Plane NAD 83 |  |  |  |  |  |
| Center          |                                    |                    |  |  |  |  |  |
| North           |                                    |                    |  |  |  |  |  |
| West            |                                    |                    |  |  |  |  |  |
| South           |                                    |                    |  |  |  |  |  |
| East            |                                    |                    |  |  |  |  |  |

#### 3.3.4 Logs

The Contractor shall keep a log for each load placed in the Mobile ODMDS. The log entry for each load shall include:

- a. Load Number
- b. Disposal Vessel Name and Type (e.g. scow)
- c. Estimated volume of Load
- d. Description of Material Disposed
- e. Source of Dredged Material
- f. Date, Time and Location at Initiation and Completion of Disposal Event At the completion of dredging and at any time upon request, the log(s) shall be submitted in paper and electronic formats to the Contracting Officer for forwarding to the appropriate agencies.

#### 3.3.5 Overflow, Spills and Leaks

Water and dredged materials shall not be permitted to overflow or spill out of barges, hopper dredges, or dump scows during transport to the disposal site(s). Failure to repair leaks or change the method of operation which is resulting in overflow of spillage will result in suspension of dredging operations and require prompt repair or change of operation to prevent overflow or spillage as a prerequisite to the resumption of dredging.

#### 3.3.6 Electronic Tracking System (ETS) for Ocean Disposal Vessels

The Contractor shall furnish an ETS for surveillance of the movement and disposition of dredged material during dredging and ocean disposal. This ETS shall be established, operated and maintained by the Contractor to continuously track in real-time the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) for the entire dredging cycle, including dredging area and disposal area. The ETS shall be capable of displaying and recording in real-time the disposal vessel's draft and location.

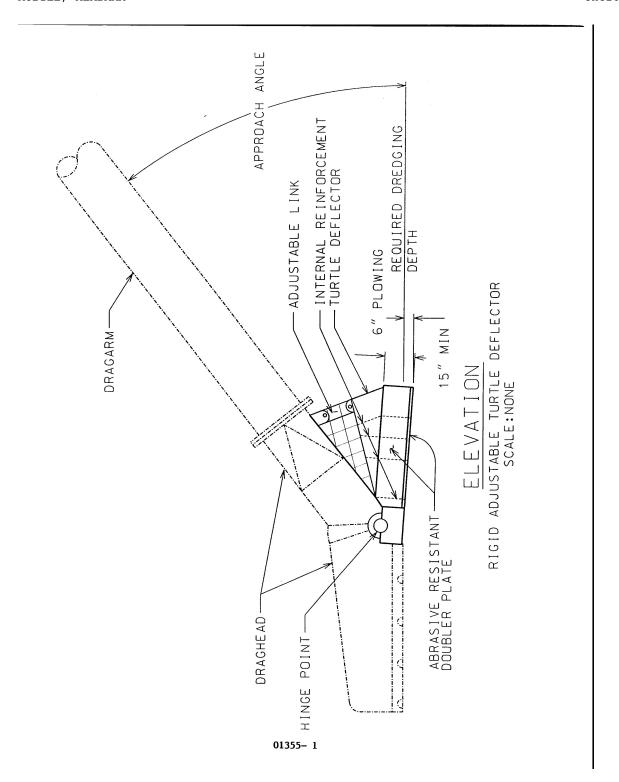
| [FOR DQM PROJECTS] See: http://dqm.usace.army.mil/Specifications/Index.aspx |                            |         |          |         |         |      |   |    |  |
|---|----------------------------|---------|----------|---------|---------|------|---|----|--|
| See: http://dqm.usace.army.mil/Specifications/Index.aspx                    | [FOR DQM PROJECTS]         |         | ,:       |         |         |      |   | p. |  |
|   | See: http://dqm.usace.army | .mil/Sp | ecificat | tions/I | Index.a | aspx | ē |    |  |

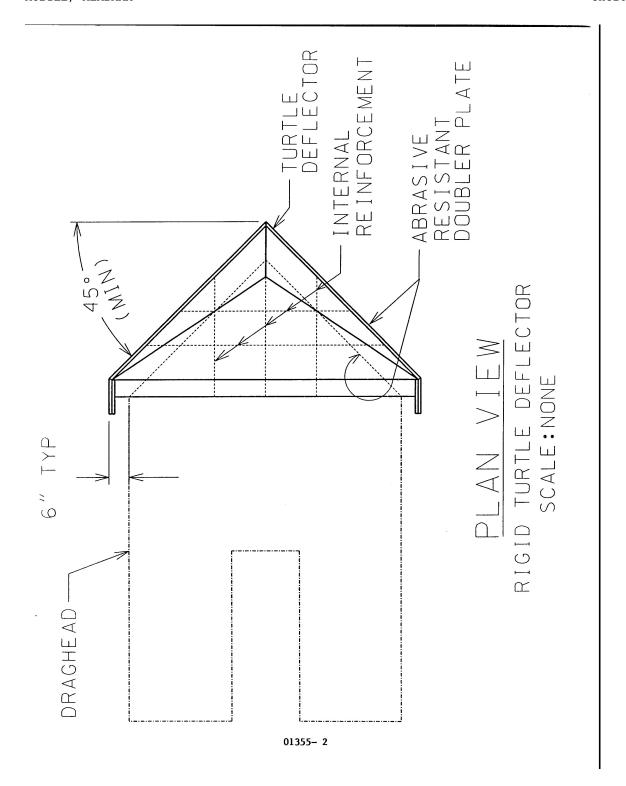
For scows, the monitoring profile, TDS profile or Ullage profile shall be used.

#### 3.3.6.1 Misplaced Materials

Materials deposited outside of the disposal zone specified in 3.3.3 will be classified as misplaced material and will result in a suspension of dredging operations. Redredging of such materials will be required as a prerequisite to the resumption of dredging unless the Contracting Officer, at his discretion, determines that redredging of such material is not practical. If redredging of such material is not required then the quantity of such misplaced material shall be deducted from the Contractor's pay quantity. If the quantity for each misplaced load to be deducted cannot initially be agreed to by both the Contractor and Contracting Officer, then an average hopper/scow load quantity for the entire contract will be used in the determination. Misplaced loads may also be subject to penalty under the Marine, Protection, Research and Sanctuaries Act. Materials deposited above the maximum indicated elevation or outside of the disposal area template shown will require the redredging or removal of such materials at the Contractor's expense. In addition, the Contractor must notify the Contracting Officer and the Environmental Protection Agency Region 4 's Wetlands, Oceans and Streams Protection Branch (61 Forsyth Street, Atlanta, GA 30303) within 24 hours of a misplaced dump or any other violation of the Site Management and Monitoring Plan for the Mobile ODMDS. Corrective actions must be implemented by the next dump and the Contracting Officer must be informed of actions taken.

# **Sea Turtle Deflector Specification**





# **Turbidity Monitoring Report**

#### TURBIDITY MONITORING REPORT IRVINGTON SITE OFFICE CONTRACT NUMBER:

| ATE: REPORT NO. #                                       |
|---|
| IME OF DAY SAMPLE TAKEN:hrs                             |
| VEATHER CONDITIONS:                                     |
| RECTION OF WATER FLOW:TIDAL STAGE:                      |
| VATER TEMP: " WIND SPEED (MPH)                          |
| VAVE CONDITIONS (CALM, CHOPPY, ROUGH):                  |
| URBIDITY MEASUREMENT TAKEN APPROX FT. FROM DREDGE       |
| URBIDITY MEASUREMENT TAKEN APPROXFT. FROM DISCHARGE     |
| SISCHARGE IS APPROXFT FROM DREDGE WITH AZIMUTH°         |
| EPTH AT DREDGE:FT. DEPTH AT DISCHARGE:FT.               |
| URFACE TURBIDITY AT DREDGE:NTU                          |
| IID-DEPTH TURBITY AT DREDGE:NTU                         |
| URFACE TURBIDITY AT DISCHARGE:NTU D/A #: 11, SECTION 1a |
| IID-DEPTH TURBITY AT DISCHARGE:NTU                      |
| ACKGROUND TURBIDITY TAKEN APPROXFT FROM DREDGE          |
| ZIMUTH FROM DREDGE:°                                    |
| VATER DEPTH:FT  |
| URFACE TURBIDITY:NTU MID-DEPTH TURBIDITY:NTU            |
| EMARKS (VISIBLE PLUME, ETC.): Sea too rough for samples |
| INSPECTOR:  |

## **Standard Manatee Conditions**

#### STANDARD MANATEE CONSTRUCTION CONDITIONS April 2003

- a. The lessee/grantee shall instruct all personnel associated with the project of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatees.
- b. The lessee/grantee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to, or exit from, essential habitat.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- e. If manatees are seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure their protection. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. Operation of any equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.
- f. Any collision with and/or injury to a manatee shall be reported immediately to Mr. Paul Necaise at (228) 493-6631 of the U.S. Fish and Wildlife Service in Jackson, Mississippi.
- g. Temporary signs concerning the manatees shall be posted prior to and during all construction/dredging activities. All signs are to be removed by the lessee/grantee upon completion of the project. A sign measuring at least 3 ft. by 4 ft. which reads Caution: Manatee Area will be posted in a location prominently visible to water related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8',6" by 11" which reads Caution: Manatee Habitat. Idle speed is required if operating a vessel #7 the construction area. All equipment must be shutdown if a manatee comes within 50 feet of operation. Any collision with and/or injury to a manatee shall be reported immediately to the U.S. Fish and Wildlife Service in Jackson, Mississippi (228-493-6631).

APPENDIX C

DREDGING QUANTITIES



# APPENDIX C, CUT TEMPLATE AVERAGE END AREA VOLUME REPORT MOBILE HARBOR, ALABAMA, DEEPENING AND WIDENING - PHASE :

#### **DREDGE VOLUMES**

**Phase 3 Dredge Template** 

Phase 3 O&M Template

**Phase 3 New Work Template** 

|            | Pha      | se 3 Dredge Template Phase 3 O&M Template |              |          | Phase 3 New Work Template |               |          |                   |               |
|------------|----------|---|--------------|----------|---------------------------|---------------|----------|-------------------|---------------|
| Baseline   | Cut Area | <b>Cut Volume</b>                         | Cumulative   | Cut Area | <b>Cut Volume</b>         | Cumulative    | Cut Area | <b>Cut Volume</b> | Cumlative     |
| Station    | (S.F.)   | (C.Y.)                                    | Volume (C.Y) | (S.F.)   | (C.Y.)                    | Volume (C.Y.) | (S.F.)   | (C.Y.)            | Volume (C.Y.) |
| 950+00.00  | 2896.2   | 0.0                                       | 0.0          | 559.9    | 0.0                       | 0.0           | 2336.3   | 0.0               | 0.0           |
| 955+00.00  | 2998.0   | 54575.6                                   | 54575.6      | 631.6    | 11031.6                   | 11031.6       | 2366.4   | 43544.0           | 43544.0       |
| 960+00.00  | 3041.3   | 55919.2                                   | 110494.8     | 656.4    | 11925.5                   | 22957.1       | 2384.9   | 43993.7           | 87537.7       |
| 965+00.00  | 2985.3   | 55801.3                                   | 166296.1     | 615.7    | 11779.0                   | 34736.1       | 2369.6   | 44022.3           | 131560.0      |
| 970+00.00  | 2921.0   | 54687.2                                   | 220983.3     | 537.3    | 10676.3                   | 45412.4       | 2383.7   | 44010.9           | 175570.9      |
| 975+00.00  | 2663.4   | 51706.9                                   | 272690.2     | 402.3    | 8700.3                    | 54112.7       | 2261.1   | 43006.6           | 218577.5      |
| 980+00.00  | 2506.6   | 47870.4                                   | 320560.6     | 276.2    | 6282.9                    | 60395.6       | 2230.4   | 41587.5           | 260165.0      |
| 985+00.00  | 2702.5   | 48232.5                                   | 368793.2     | 401.9    | 6278.9                    | 66674.5       | 2300.6   | 41953.6           | 302118.7      |
| 990+00.00  | 3040.5   | 53175.8                                   | 421969.0     | 646.0    | 9703.2                    | 76377.7       | 2394.5   | 43472.6           | 345591.3      |
| 995+00.00  | 3182.4   | 57619.2                                   | 479588.1     | 728.4    | 12726.4                   | 89104.1       | 2454.0   | 44892.8           | 390484.0      |
| 1000+00.00 | 3204.3   | 59135.6                                   | 538723.7     | 743.6    | 13629.7                   | 102733.8      | 2460.7   | 45505.9           | 435989.9      |
| 1005+00.00 | 3158.7   | 58916.7                                   | 597640.4     | 718.4    | 13537.0                   | 116270.8      | 2440.3   | 45379.7           | 481369.6      |
| 1010+00.00 | 3078.4   | 57751.2                                   | 655391.6     | 672.0    | 12874.4                   | 129145.2      | 2406.4   | 44876.8           | 526246.4      |
| 1015+00.00 | 3083.7   | 57056.0                                   | 712447.6     | 666.5    | 12393.8                   | 141539.0      | 2417.2   | 44662.2           | 570908.6      |
| 1020+00.00 | 3028.6   | 56594.9                                   | 769042.5     | 633.0    | 12032.1                   | 153571.1      | 2395.6   | 44562.8           | 615471.4      |
| 1025+00.00 | 2957.5   | 55426.6                                   | 824469.2     | 556.4    | 11012.6                   | 164583.7      | 2401.1   | 44414.0           | 659885.4      |
| 1030+00.00 | 3050.7   | 55631.0                                   | 880100.1     | 664.7    | 11306.0                   | 175889.8      | 2386.0   | 44325.0           | 704210.4      |
| 1035+00.00 | 3156.9   | 57477.0                                   | 937577.1     | 721.7    | 12836.4                   | 188726.1      | 2435.2   | 44640.6           | 748851.0      |
| 1040+00.00 | 3418.2   | 60879.7                                   | 998456.9     | 829.9    | 14366.4                   | 203092.6      | 2588.2   | 46513.3           | 795364.3      |
| 1045+00.00 | 3770.4   | 66561.2                                   | 1065018.0    | 974.1    | 16703.4                   | 219796.0      | 2796.4   | 49857.8           | 845222.1      |
| 1050+00.00 | 4099.5   | 72869.4                                   | 1137887.4    | 1190.3   | 20039.9                   | 239835.8      | 2909.2   | 52829.5           | 898051.6      |
| 1055+00.00 | 4400.4   | 78702.2                                   | 1216589.6    | 1265.6   | 22739.5                   | 262575.4      | 3134.8   | 55962.7           | 954014.3      |
| 1060+00.00 | 4262.8   | 80214.5                                   | 1296804.1    | 1225.2   | 23062.6                   | 285638.0      | 3037.6   | 57151.9           | 1011166.2     |
| 1065+00.00 | 3937.5   | 75928.7                                   | 1372732.8    | 1102.5   | 21552.0                   | 307190.0      | 2835.1   | 54376.6           | 1065542.8     |
| 1070+00.00 | 3541.8   | 69253.3                                   | 1441986.1    | 904.6    | 18584.3                   | 325774.3      | 2637.2   | 50669.0           | 1116211.8     |
| 1073+60.09 | 3314.7   | 45721.9                                   | 1487707.9    | 810.6    | 11419.3                   | 337193.6      | 2504.1   | 34302.6           | 1150514.3     |
| 1075+00.00 | 3280.7   | 17088.3                                   | 1504796.2    | 808.8    | 4213.5                    | 341407.1      | 2471.9   | 12874.8           | 1163389.1     |
| 1080+00.00 | 3339.7   | 61300.1                                   | 1566096.3    | 799.6    | 14892.7                   | 356299.9      | 2540.1   | 46407.3           | 1209796.4     |

| 1085+00.00 | 3352.1 | 61960.7 | 1628057.0 | 807.5  | 14880.4 | 371180.3 | 2544.6 | 47080.3 | 1256876.7 |
|------------|--------|---------|-----------|--------|---------|----------|--------|---------|-----------|
| 1090+00.00 | 3324.2 | 61816.9 | 1689873.9 | 796.9  | 14855.4 | 386035.7 | 2527.2 | 46961.5 | 1303838.2 |
| 1095+00.00 | 3442.9 | 62658.1 | 1752532.0 | 925.5  | 15948.0 | 401983.7 | 2517.5 | 46710.1 | 1350548.3 |
| 1098+75.99 | 3510.1 | 48412.2 | 1800944.1 | 925.5  | 12867.8 | 414851.5 | 2584.5 | 35544.3 | 1386092.6 |
| 1100+00.00 | 3593.5 | 16313.2 | 1817257.3 | 1001.3 | 4446.0  | 419297.5 | 2592.2 | 11867.2 | 1397959.8 |
| 1105+00.00 | 4112.0 | 71347.5 | 1888604.8 | 1278.1 | 21105.2 | 440402.7 | 2834.0 | 50242.2 | 1448202.0 |
| 1110+00.00 | 4568.1 | 80371.4 | 1968976.2 | 1517.0 | 25879.8 | 466282.5 | 3051.1 | 54491.6 | 1502693.7 |
| 1115+00.00 | 4900.4 | 87671.4 | 2056647.6 | 1704.5 | 29828.6 | 496111.1 | 3195.9 | 57842.8 | 1560536.5 |
| 1120+00.00 | 4459.4 | 86664.8 | 2143312.4 | 1412.4 | 28860.1 | 524971.2 | 3047.0 | 57804.7 | 1618341.2 |
| 1125+00.00 | 3945.4 | 77821.6 | 2221134.0 | 1065.4 | 22942.7 | 547913.9 | 2879.9 | 54879.0 | 1673220.1 |
| 1130+00.00 | 3451.1 | 68485.6 | 2289619.6 | 793.3  | 17210.1 | 565124.0 | 2657.9 | 51275.5 | 1724495.7 |
| 1133+58.40 | 3201.8 | 44155.3 | 2333774.9 | 676.5  | 9727.4  | 574851.3 | 2525.3 | 34427.9 | 1758923.5 |
| 1135+00.00 | 3175.2 | 16722.3 | 2350497.1 | 662.7  | 3536.4  | 578387.8 | 2512.5 | 13185.8 | 1772109.3 |
| 1140+00.00 | 3243.9 | 59436.2 | 2409933.4 | 756.7  | 13142.6 | 591530.3 | 2487.2 | 46293.7 | 1818403.0 |
| 1145+00.00 | 3364.1 | 61185.2 | 2471118.5 | 828.5  | 14677.5 | 606207.8 | 2535.6 | 46507.7 | 1864910.7 |
| 1150+00.00 | 3271.2 | 61437.6 | 2532556.1 | 725.2  | 14386.0 | 620593.9 | 2546.0 | 47051.5 | 1911962.2 |
| 1155+00.00 | 3275.8 | 60619.8 | 2593175.9 | 746.5  | 13626.9 | 634220.7 | 2529.3 | 46992.9 | 1958955.2 |
| 1160+00.00 | 3261.6 | 60531.2 | 2653707.1 | 752.0  | 13875.2 | 648095.9 | 2509.6 | 46656.1 | 2005611.2 |
| 1165+00.00 | 3222.6 | 60038.6 | 2713745.7 | 732.5  | 13745.8 | 661841.7 | 2490.1 | 46292.8 | 2051904.0 |
| 1170+00.00 | 3336.4 | 60730.8 | 2774476.5 | 838.2  | 14543.7 | 676385.4 | 2498.2 | 46187.1 | 2098091.1 |
| 1175+00.00 | 3286.6 | 61323.2 | 2835799.7 | 791.1  | 15085.8 | 691471.2 | 2495.5 | 46237.4 | 2144328.5 |
| 1180+00.00 | 3335.9 | 61318.6 | 2897118.3 | 806.5  | 14792.3 | 706263.5 | 2529.4 | 46526.2 | 2190854.8 |
| 1185+00.00 | 3331.9 | 61738.0 | 2958856.2 | 829.1  | 15144.6 | 721408.1 | 2502.7 | 46593.4 | 2237448.1 |
| 1190+00.00 | 3315.7 | 61551.2 | 3020407.4 | 802.6  | 15108.3 | 736516.4 | 2513.1 | 46442.9 | 2283891.0 |
| 1195+00.00 | 3301.4 | 61268.7 | 3081676.1 | 794.7  | 14789.8 | 751306.2 | 2506.6 | 46478.9 | 2330369.9 |
| 1200+00.00 | 3353.0 | 61614.2 | 3143290.3 | 842.3  | 15157.3 | 766463.5 | 2510.7 | 46456.9 | 2376826.9 |
| 1205+00.00 | 3341.9 | 61989.9 | 3205280.3 | 814.1  | 15337.0 | 781800.5 | 2527.8 | 46652.9 | 2423479.8 |
| 1210+00.00 | 3394.8 | 62376.6 | 3267656.9 | 857.4  | 15477.4 | 797277.9 | 2537.3 | 46899.3 | 2470379.0 |
| 1215+00.00 | 3402.6 | 62938.6 | 3330595.5 | 863.1  | 15931.1 | 813209.0 | 2539.5 | 47007.5 | 2517386.5 |
| 1220+00.00 | 3354.5 | 62566.0 | 3393161.5 | 851.9  | 15880.1 | 829089.0 | 2502.6 | 46685.9 | 2564072.4 |
| 1225+00.00 | 3381.6 | 62371.4 | 3455532.9 | 867.9  | 15924.3 | 845013.4 | 2513.7 | 46447.1 | 2610519.5 |
| 1230+00.00 | 3401.5 | 62806.6 | 3518339.4 | 902.0  | 16387.8 | 861401.2 | 2499.6 | 46418.8 | 2656938.3 |
| 1235+00.00 | 3409.6 | 63066.0 | 3581405.4 | 883.7  | 16534.3 | 877935.4 | 2525.9 | 46531.7 | 2703470.0 |
| 1240+00.00 | 3400.9 | 63060.0 | 3644465.5 | 876.0  | 16293.7 | 894229.1 | 2524.9 | 46766.3 | 2750236.3 |
| 1245+00.00 | 3358.5 | 62586.9 | 3707052.3 | 832.5  | 15819.6 | 910048.7 | 2526.0 | 46767.3 | 2797003.6 |

| 1250+00.00 | 3418.6 | 62751.4 | 3769803.8 | 879.2 | 15849.3 | 925898.0  | 2539.5 | 46902.1 | 2843905.8 |
|------------|--------|---------|-----------|-------|---------|-----------|--------|---------|-----------|
| 1255+00.00 | 3348.8 | 62661.1 | 3832464.8 | 858.0 | 16085.3 | 941983.3  | 2490.7 | 46575.8 | 2890481.5 |
| 1260+00.00 | 3398.4 | 62473.8 | 3894938.6 | 867.1 | 15973.4 | 957956.6  | 2531.3 | 46500.4 | 2936981.9 |
| 1265+00.00 | 3317.0 | 62179.5 | 3957118.0 | 823.2 | 15650.9 | 973607.6  | 2493.8 | 46528.6 | 2983510.5 |
| 1270+00.00 | 3361.7 | 61839.1 | 4018957.1 | 860.0 | 15585.0 | 989192.6  | 2501.7 | 46254.1 | 3029764.6 |
| 1275+00.00 | 3380.0 | 62422.9 | 4081380.1 | 865.5 | 15976.6 | 1005169.2 | 2514.5 | 46446.3 | 3076210.9 |
| 1280+00.00 | 3408.1 | 62853.3 | 4144233.3 | 877.0 | 16134.2 | 1021303.4 | 2531.1 | 46719.1 | 3122930.0 |
| 1285+00.00 | 3329.9 | 62389.2 | 4206622.6 | 853.9 | 16026.6 | 1037330.0 | 2476.0 | 46362.6 | 3169292.6 |
| 1290+00.00 | 3372.2 | 62056.6 | 4268679.2 | 870.1 | 15962.7 | 1053292.7 | 2502.1 | 46093.9 | 3215386.5 |
| 1295+00.00 | 3304.6 | 61822.1 | 4330501.2 | 819.7 | 15646.3 | 1068939.0 | 2484.9 | 46175.8 | 3261562.2 |
| 1300+00.00 | 3255.0 | 60736.7 | 4391237.9 | 796.2 | 14962.2 | 1083901.2 | 2458.8 | 45774.5 | 3307336.7 |
| 1305+00.00 | 3232.8 | 60072.1 | 4451310.1 | 783.0 | 14622.2 | 1098523.4 | 2449.8 | 45449.9 | 3352786.6 |
| 1310+00.00 | 3226.1 | 59804.8 | 4511114.9 | 757.7 | 14265.7 | 1112789.1 | 2468.4 | 45539.2 | 3398325.8 |
| 1315+00.00 | 3212.5 | 59616.7 | 4570731.6 | 765.2 | 14100.9 | 1126890.0 | 2447.3 | 45515.8 | 3443841.5 |
| 1320+00.00 | 3230.0 | 59652.9 | 4630384.5 | 777.0 | 14279.7 | 1141169.7 | 2453.0 | 45373.2 | 3489214.7 |
| 1325+00.00 | 3241.8 | 59923.8 | 4690308.3 | 779.7 | 14413.9 | 1155583.6 | 2462.1 | 45510.0 | 3534724.7 |
| 1330+00.00 | 3254.2 | 60147.3 | 4750455.6 | 784.3 | 14481.5 | 1170065.1 | 2469.8 | 45665.8 | 3580390.5 |
| 1335+00.00 | 3277.6 | 60478.9 | 4810934.4 | 814.2 | 14801.0 | 1184866.1 | 2463.4 | 45677.8 | 3626068.4 |
| 1340+00.00 | 3320.8 | 61095.4 | 4872029.9 | 818.4 | 15116.1 | 1199982.1 | 2502.4 | 45979.4 | 3672047.7 |
| 1345+00.00 | 3314.4 | 61437.0 | 4933466.8 | 827.7 | 15241.4 | 1215223.6 | 2486.7 | 46195.5 | 3718243.2 |
| 1350+00.00 | 3281.2 | 61070.6 | 4994537.4 | 804.5 | 15113.2 | 1230336.8 | 2476.7 | 45957.4 | 3764200.6 |
| 1355+00.00 | 3288.0 | 60825.8 | 5055363.2 | 818.9 | 15031.4 | 1245368.1 | 2469.1 | 45794.4 | 3809995.1 |
| 1360+00.00 | 3357.5 | 61532.4 | 5116895.6 | 876.2 | 15695.3 | 1261063.4 | 2481.3 | 45837.2 | 3855832.2 |
| 1365+00.00 | 3254.9 | 61225.4 | 5178121.0 | 785.7 | 15388.0 | 1276451.4 | 2469.1 | 45837.4 | 3901669.6 |
| 1370+00.00 | 3264.2 | 60361.5 | 5238482.5 | 767.2 | 14378.7 | 1290830.1 | 2497.0 | 45982.8 | 3947652.4 |
| 1375+00.00 | 3219.0 | 60029.6 | 5298512.1 | 759.2 | 14133.4 | 1304963.5 | 2459.8 | 45896.2 | 3993548.7 |
| 1380+00.00 | 3188.0 | 59324.5 | 5357836.6 | 739.9 | 13880.4 | 1318843.9 | 2448.2 | 45444.1 | 4038992.8 |
| 1385+00.00 | 3171.7 | 58886.3 | 5416722.9 | 714.2 | 13463.7 | 1332307.6 | 2457.5 | 45422.6 | 4084415.3 |
| 1390+00.00 | 3126.3 | 58314.5 | 5475037.3 | 676.5 | 12876.8 | 1345184.4 | 2449.8 | 45437.7 | 4129853.0 |
| 1395+00.00 | 3097.0 | 57623.1 | 5532660.4 | 650.8 | 12289.8 | 1357474.1 | 2446.2 | 45333.3 | 4175186.3 |
| 1400+00.00 | 3102.9 | 57406.2 | 5590066.6 | 651.5 | 12058.1 | 1369532.2 | 2451.4 | 45348.1 | 4220534.4 |
| 1405+00.00 | 3084.0 | 57285.9 | 5647352.5 | 652.8 | 12076.7 | 1381609.0 | 2431.2 | 45209.1 | 4265743.5 |
| 1410+00.00 | 3027.3 | 56586.4 | 5703938.8 | 605.8 | 11653.5 | 1393262.5 | 2421.6 | 44932.8 | 4310676.3 |
| 1415+00.00 | 3060.5 | 56368.6 | 5760307.4 | 612.7 | 11282.0 | 1404544.5 | 2447.8 | 45086.5 | 4355762.9 |
| 1420+00.00 | 3023.1 | 56329.4 | 5816636.8 | 587.4 | 11111.7 | 1415656.2 | 2435.7 | 45217.7 | 4400980.5 |

| 1425+00.00 | 2961.6 | 55414.2 | 5872051.0 | 542.9 | 10465.0 | 1426121.2 | 2418.8 | 44949.2 | 4445929.7 |
|------------|--------|---------|-----------|-------|---------|-----------|--------|---------|-----------|
| 1430+00.00 | 3005.9 | 55255.1 | 5927306.1 | 563.3 | 10242.3 | 1436363.6 | 2442.6 | 45012.8 | 4490942.5 |
| 1435+00.00 | 2930.1 | 54963.3 | 5982269.4 | 532.2 | 10144.0 | 1446507.5 | 2397.9 | 44819.3 | 4535761.8 |
| 1440+00.00 | 2893.3 | 53920.2 | 6036189.6 | 494.6 | 9507.7  | 1456015.2 | 2398.7 | 44412.5 | 4580174.4 |
| 1445+00.00 | 2859.5 | 53265.8 | 6089455.4 | 468.1 | 8913.5  | 1464928.8 | 2391.4 | 44352.3 | 4624526.6 |
| 1450+00.00 | 2866.4 | 53017.1 | 6142472.5 | 456.2 | 8558.2  | 1473487.0 | 2410.2 | 44458.9 | 4668985.5 |
| 1455+00.00 | 2900.1 | 53393.3 | 6195865.7 | 476.2 | 8633.6  | 1482120.5 | 2423.9 | 44759.7 | 4713745.2 |
| 1460+00.00 | 2908.1 | 53779.2 | 6249644.9 | 476.3 | 8819.7  | 1490940.2 | 2431.8 | 44959.5 | 4758704.7 |
| 1465+00.00 | 2900.6 | 53784.3 | 6303429.2 | 500.4 | 9043.3  | 1499983.5 | 2400.3 | 44740.9 | 4803445.7 |
| 1470+00.00 | 2940.2 | 54081.4 | 6357510.6 | 516.2 | 9412.9  | 1509396.5 | 2423.9 | 44668.4 | 4848114.1 |
| 1475+00.00 | 2899.9 | 54074.4 | 6411585.0 | 504.8 | 9454.2  | 1518850.7 | 2395.1 | 44620.2 | 4892734.3 |
| 1480+00.00 | 2892.5 | 53633.6 | 6465218.6 | 479.7 | 9115.6  | 1527966.3 | 2412.9 | 44518.0 | 4937252.3 |
| 1485+00.00 | 2836.4 | 53045.9 | 6518264.5 | 446.7 | 8577.6  | 1536543.9 | 2389.7 | 44468.3 | 4981720.6 |
| 1490+00.00 | 2756.3 | 51784.0 | 6570048.5 | 396.7 | 7809.7  | 1544353.6 | 2359.5 | 43974.3 | 5025694.9 |
| 1495+00.00 | 2783.3 | 51292.6 | 6621341.0 | 396.2 | 7341.8  | 1551695.3 | 2387.2 | 43950.8 | 5069645.7 |
| 1500+00.00 | 2737.1 | 51114.8 | 6672455.8 | 366.4 | 7060.9  | 1558756.3 | 2370.7 | 44053.8 | 5113699.5 |
| 1505+00.00 | 2739.9 | 50712.2 | 6723168.0 | 355.0 | 6679.1  | 1565435.4 | 2384.9 | 44033.1 | 5157732.6 |
| 1510+00.00 | 2822.3 | 51501.8 | 6774669.8 | 426.1 | 7232.1  | 1572667.5 | 2396.2 | 44269.7 | 5202002.3 |
| 1515+00.00 | 2733.0 | 51438.2 | 6826108.0 | 379.3 | 7457.6  | 1580125.0 | 2353.7 | 43980.6 | 5245982.9 |
| 1520+00.00 | 2727.4 | 50559.1 | 6876667.0 | 353.9 | 6789.1  | 1586914.1 | 2373.5 | 43770.0 | 5289752.9 |
| 1525+00.00 | 2709.8 | 50344.1 | 6927011.1 | 335.1 | 6379.8  | 1593294.0 | 2374.7 | 43964.3 | 5333717.1 |
| 1530+00.00 | 2642.6 | 49558.9 | 6976570.0 | 297.4 | 5856.3  | 1599150.3 | 2345.2 | 43702.6 | 5377419.7 |
| 1535+00.00 | 2578.3 | 48341.6 | 7024911.6 | 261.1 | 5171.1  | 1604321.4 | 2317.2 | 43170.5 | 5420590.3 |
| 1538+01.00 | 2568.7 | 28689.5 | 7053601.1 | 260.0 | 2894.8  | 1607216.2 | 2308.7 | 25794.7 | 5446384.9 |
| 1540+00.00 | 2610.1 | 19085.0 | 7072686.1 | 255.1 | 1907.8  | 1609124.0 | 2355.0 | 17177.2 | 5463562.2 |
| 1545+00.00 | 2659.1 | 48788.5 | 7121474.7 | 217.0 | 4371.6  | 1613495.5 | 2442.1 | 44417.0 | 5507979.1 |
| 1550+00.00 | 2756.2 | 50141.6 | 7171616.3 | 207.2 | 3928.0  | 1617423.5 | 2549.0 | 46213.6 | 5554192.7 |
| 1555+00.00 | 2796.5 | 51414.1 | 7223030.4 | 153.3 | 3338.0  | 1620761.5 | 2643.2 | 48076.1 | 5602268.8 |
| 1560+00.00 | 3030.0 | 53948.6 | 7276979.0 | 176.8 | 3056.6  | 1623818.1 | 2853.1 | 50892.0 | 5653160.8 |
| 1565+00.00 | 3182.4 | 57521.6 | 7334500.5 | 171.4 | 3224.2  | 1627042.3 | 3011.0 | 54297.4 | 5707458.2 |
| 1570+00.00 | 3490.8 | 61788.6 | 7396289.1 | 190.0 | 3346.0  | 1630388.3 | 3300.8 | 58442.6 | 5765900.8 |
| 1575+00.00 | 3773.9 | 67265.7 | 7463554.8 | 176.3 | 3391.7  | 1633780.0 | 3597.6 | 63874.0 | 5829774.8 |
| 1580+00.00 | 3899.4 | 71049.0 | 7534603.7 | 167.6 | 3183.9  | 1636963.9 | 3731.8 | 67865.1 | 5897639.9 |
| 1585+00.00 | 3827.4 | 71544.4 | 7606148.1 | 132.8 | 2780.8  | 1639744.7 | 3694.6 | 68763.6 | 5966403.4 |
| 1590+00.00 | 3676.7 | 69482.2 | 7675630.3 | 146.8 | 2588.9  | 1642333.6 | 3529.8 | 66893.3 | 6033296.8 |