

Appendix A
Geophysical Surveys



**U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT**

**Mississippi Coastal Improvements Program
Barrier Island Restoration Project**

Offshore Sand Borrow Investigation, 2010-2014

Geotechnical Engineering Report

Prepared by:

**Michael FitzHarris
Geotechnical and Dam Safety Section
And
Elizabeth Godsey, PE
Hydraulics and Hydrology Section**

**109 St. Joseph Street
Mobile, Alabama 36628
(251) 690-4082**

This page was intentionally left blank for duplex printing.

TABLE OF CONTENTS

APPENDICES	III
FIGURES AND TABLES	IV
ACRONYMS.....	VIII
1.0 INTRODUCTION.....	1
1.1 PROJECT DESCRIPTION.....	2
1.2 OBJECTIVES	4
1.3 SCOPE OF WORK	4
1.3.1 BEACH AND ISLAND SEDIMENT SAMPLING	5
1.3.2 GEOPHYSICAL SURVEYS	6
1.3.3 GEOTECHNICAL INVESTIGATION	7
1.3.4 INVESTIGATION RESULTS.....	9
2.0 GEOLOGICAL SETTING.....	11
2.1 GULF COASTAL PLAIN	11
2.2 JACKSON, HARRISON, AND HANCOCK COUNTIES	12
2.3 OUTER CONTINENTAL SHELF	13
3.0 PLACEMENT SITE FIELD INVESTIGATIONS.....	16
3.1 FILL COMPATIBILITY REQUIREMENTS.....	16
3.1.1 COLOR	16
3.1.2 GRAIN SIZE.....	17
3.1.3 GRAIN ANGULARITY	17
3.1.4 CARBONATE CONTENT	18
3.1.5 FINE SEDIMENT CONTENT	18
3.2 BARRIER ISLAND SEDIMENT SAMPLING	19
3.2.1 2006 BEACH SEDIMENT INVESTIGATIONS	20
3.2.2 2009 BEACH SEDIMENT INVESTIGATIONS	21
3.2.3 2010 BEACH SEDIMENT INVESTIGATIONS	25
3.2.4 2011 DA-10/SAND ISLAND SAMPLING.....	30
3.2.5 BARRIER ISLAND SEDIMENT SAMPLING CONCLUSION	31
4.0 GEOPHYSICAL INVESTIGATIONS	33
4.1 2010 GEOPHYSICAL SURVEY	33
4.1.1 2010 SURVEY METHODOLOGY	35

TABLE OF CONTENTS

4.1.2	CONCLUSIONS AND RECOMMENDATIONS FROM 2010 GEOPHYSICAL INVESTIGATION	38
4.2	2013 GEOPHYSICAL SURVEY	44
4.2.1	RESULTS OF THE 2013 GEOPHYSICAL SURVEY	46
5.0	GEOTECHNICAL SAMPLING	49
5.1	VIBRACORE SAMPLING PROCEDURES AND PROTOCOL.....	55
5.2	INVESTIGATION AREAS AND INITIAL FINDINGS	63
5.2.1	GULFPORT CHANNEL INVESTIGATION AREA	63
5.2.2	CAT ISLAND INVESTIGATION AREA.....	65
5.2.3	MISSISSIPPI SOUND INVESTIGATION AREA	67
5.2.4	SHIP ISLAND PASS INVESTIGATION AREA.....	69
5.2.5	SHIP ISLAND INVESTIGATION AREA	71
5.2.6	DOG KEYS PASS INVESTIGATION AREA	73
5.2.7	HORN ISLAND PASS INVESTIGATION AREA.....	75
5.2.8	DISPOSAL AREA 10 (DA-10) INVESTIGATION AREA	79
5.2.9	PETIT BOIS PASS- ALABAMA INVESTIGATION AREA	81
5.2.10	PETIT BOIS PASS-MISSISSIPPI INVESTIGATION AREA.....	88
5.2.11	PETIT BOIS PASS- OUTER CONTINENTAL SHELF (OCS) INVESTIGATION AREA	92
5.2.11.1	PBP-OCS West Investigation Area	95
5.2.11.2	PBP-OCS East Investigation Area	107
5.2.11.2.1	PBP-OCS East, Northwest Corner.....	108
5.2.11.2.2	PBP-OCS East, Central Shoal Complex	109
5.2.11.2.3	PBP-OCS East, Eastern Shoals.....	112
6.0	BORROW AREAS	114
7.0	CONCLUSION	131
8.0	REFERENCES.....	132

TABLE OF CONTENTS

APPENDICES

- APPENDIX A: Barrier Island Sampling Locations and Lab Results
- APPENDIX B: Gulfport Channel Vibracores and Lab Results
- APPENDIX C: Cat Island Vibracores and Lab Results
- APPENDIX D: Mississippi Sound Vibracores and Lab Results
- APPENDIX E: Ship Island Pass Vibracores and Lab Results
- APPENDIX F: Ship Island Vibracores and Lab Results
- APPENDIX G: Dog Keys Pass Vibracores and Lab Results
- APPENDIX H: DA-10 Vibracores and Lab Results
- APPENDIX I: Horn Island Pass and Pascagoula Bar Channel Vibracores and Lab Results
- APPENDIX J: Petit Bois Pass - Mississippi Vibracores and Lab Results
- APPENDIX K: Petit Bois Pass – Outer Continental Shelf Vibracores and Lab Results
- APPENDIX L: Petit Bois Pass – Alabama Vibracores and Lab Results

FIGURES AND TABLES

FIGURES AND TABLES

Figure 1.1.1 – The locations of the Mississippi Barrier Islands and navigation channels in the local vicinity.....	3
Figure 1.1.2- Boundaries of the Mississippi section of the Gulf Islands National Seashore	4
Figure 1.3.1.1- Sediment grab sample locations within the Mississippi section of the Gulf Islands National Seashore and Cat Island.	5
Figure 1.3.3.1- Borrow Material Investigation Locations (Figure 3-2 from USACE SEIS, 2014)	8
Figure 1.3.4.1- Proposed borrow material locations (Figure 3-3 from USACE SEIS, 2014).....	9
Figure 2.2.1 - Generalized Geologic Map of Coastal Mississippi (After Otvos, 1997)	13
Figure 3.2.1 Barrier Island grab sample locations.....	19
Table 3.2.1.1 – Munsell Color Analyses of Beach Samples from Petit Bois, Horn, East Ship, and West Ship Islands taken in 2006	20
Table 3.2.2.1– 2009 Beach Samples Gradation Data.....	21
Table 3.2.2.2 – Location, Color, and Particle Shape of 2009 Beach samples	22
Figure 3.2.3.1 – Location of sampling locations for 2010 West Ship Island beach transect.	26
Table 3.2.3.1 – Results of Grain Size Analyses, Transects at West Ship Island; Depths from 0.0 to 1.0 feet	26
Figure 3.2.3.2 - Location of sampling locations for 2010 Horn Island beach transect.	27
Table 3.2.3.2 – Results of Grain Size Analyses, Transects at Horn Island with Depths from 0.0 to 1.0 feet	27
Figure 3.2.3.3 – Bar graph comparison of grain sizes for West Ship and Horn Island beach transects.....	28
Figure 3.2.3.4 - Sampling locations for 2010 West Ship Island transect.	29
Table 3.2.3.3 - Results of Grain Size Analyses, Transect at West Ship Island, Depth 0.0 to 5.0 feet.....	30
Table 3.2.4.1 - Results of Grain Size Analyses, Beach Grab Samples at DA-10.....	31
Figure 3.2.4.1 - Sampling locations for 2011 DA-10 transect.....	31
Table 3.2.5.1 – Surficial sediment information for barrier islands	32
Figure 4.1.1 – Past geophysical surveys conducted by the USGS at Gulf Islands National Seashore.	33

FIGURES AND TABLES

Figure 4.1.2 – Areas designated for geophysical survey to identify potential sand borrow sites.	34
Figure 4.1.3 Map showing the tracklines for geophysical data collected. Vibracores collected by USACE for the MsCIP project and the USGS for the Northern Gulf of Mexico (NGOM) project are shown. Main features were separated into three Study Areas (From Twichell et al. 2011).	35
Figure 4.1.1.1 - Tracklines along which geophysical data (CHIRP seismic-reflection, swath bathymetry, and sidescan sonar) were collected. Also, locations of vibracores collected by USACE.....	36
Figure 4.1.1.2. Map showing the extent of the survey area affected by shallow gas (gray polygon) and an example profile showing the blanking of the deeper stratigraphy by gas (from Twichell et al., 2011)	38
Figure 4.1.2.1 – Example isopach of area south of Camille Cut and East Ship Island designated as Ship Island study area, part of USGS’ Study Area 1.	39
Figure 4.1.2.2 – Initial interpretation of geophysical data indicating sandy shoals south of Petit Bois Pass and designated as Petit Bois Pass study.	39
Figure 4.1.2.3 Locations of potential sand resources identified in this study. Each deposit is assigned a unit number that corresponds to textural information in Table 4.1.2.1 (from Twichell et al., 2011).....	40
Table 4.1.2.1- Characteristics of potential sand-resource deposits located on the shelf offshore of the barrier islands south of the Mississippi coast. The unit number corresponds to the circled numbers in Figure 4.1.2.3. (Table 4.1 from Twichell et al., 2011).....	40
Figure 4.1.2.4 – Initial field interruptions of geophysical data with recommended proof vibracore locations, western area of investigation	41
Figure 4.1.2.5 – Initial field interruptions of geophysical data with recommended vibracore proof locations, eastern area of investigation south of Petit Bois Pass. ...	42
Figure 4.2.2 Isopach map of surface sediments show shoal systems extending NW-SE across study area surrounded by a thin (<1.5 m) sand sheet. Base of surface sediments is defined by the top of the Holocene transgressive deposits (Flocks, 2014).....	46
Figure 4.2.1.1 Significant features identified in the USGS’s study include shoals and fluvial deposits (Flocks, 2014).....	47
Table 4.2.1.1. Physical characteristics of features identified in the study, the study area, and neighboring Petit Bois Island for comparison (Flocks, 2014).	48
Figure 5.0.1 – 2010 Sampling Areas.....	49
Figure 5.0.2 – 2011 Sampling Areas.....	51
Figure 5.0.3 – 2012 Sampling Areas.....	52
Figure 5.0.4 – 2013 Sampling Areas.....	53

FIGURES AND TABLES

Figure 5.0.5 – Locations of vibracores completed for the 2010-2013 sampling events.	54
Figure 5.1.1 Vibracore unit used for 2010, 2011, and 2013 sampling events.	55
Figure 5.1.2 Vibracore unit being deployed during the 2012 sampling event.....	56
Figure 5.1.3 20-ft vibracore tube cut longitudinally for inspector to sample sediment during 2013 sampling event.	57
Figure 5.1.4 Vibracore tube cut into 4 5-ft sections and then longitudinally for logging during 2012 sampling event.	57
Figure 5.1.5 Example gradation curve showing the graphical determination of the D60, D50, D30, and D10 values.	59
Figure 5.2.1.1 – 2010 Vibracores completed for Gulfport Channel sampling area...	64
Figure 5.2.2.1 – 2010 (green circles) and 2011 vibracores (red triangles) completed for the investigation for borrow material at Cat Island.	66
Figure 5.2.3.1 - Layout of the 2010 vibracores completed for the Mississippi Sound area.....	68
Figure 5.2.4.1 - General layout of the vibracores completed for Ship Island Pass...	70
Figure 5.2.5.1 – General layout of the Ship Island vibracores completed for the investigation.	72
Figure 5.2.6.1 - General layout of the vibracores completed for the Dog Keys Pass area.....	74
Figure 5.2.7.1 - General layout of the vibracores completed for the investigation of borrow material from Horn Island Pass area.....	78
Figure 5.2.8.1 - Layout of the vibracores completed for the 2011 investigation for borrow material from Disposal Area 10.	80
Figure 5.2.9.1 - Layout of the vibracores completed for the 2010-2012 investigation for borrow material from the Petit Bois Pass- Alabama area.	85
Figure 5.2.9.2 - Layout of the vibracores completed for the investigation for borrow material from the Petit Bois Pass- Alabama West area. Note the sizeable shoals in the west.	86
Figure 5.2.9.3 – 2010-2012 Vibracores completed for the Petit Bois Pass-Alabama East area.	87
Figure 5.2.10.1 2012 Vibracores for Petit Bois Pass- Mississippi sampling area with bathymetric contours illustrating the main shoal in the area. The blue contours are at 5-ft intervals.	90
Figure 5.2.10.2 Map of sand thicknesses in the Petit Bois Pass- Mississippi sampling area.	91
Figure 5.2.11.1 Petit Bois Pass-OCS sampling areas and vibracore locations.....	94
Figure 5.2.11.1.1 Petit Bois Pass-OCS West with major shoal outlines.....	95
Figure 5.2.11.1.2 Petit Bois Pass-OCS West, Shoal 1 vibracores.	96

FIGURES AND TABLES

Figure 5.2.11.1.3 Petit Bois Pass-OCS West, Shoal 2 vibracores.	98
Figure 5.2.11.1.4 Petit Bois Pass-OCS West, Shoal 2 with USGS Isopach showing potential borrow material vicinity vibracores BI-PBS-94-12 and BI-PBS-268-13.	99
Figure 5.2.11.1.5 Petit Bois Pass-OCS West, Shoal 3 vibracore locations.....	100
Figure 5.2.11.1.6 Western end of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses.	101
Figure 5.2.11.1.7 Petit Bois Pass-OCS West, Shoal 3 (northwest side) suitable borings outlined in red.....	102
Figure 5.2.11.1.8 Central portion of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses.	104
Figure 5.2.11.1.9 Sandy fill area adjacent to central portion of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses.	105
Figure 5.2.11.1.10 Eastern third of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses. The shoal extends across two pipelines into PBP-OCS East investigation area.	106
Figure 5.2.11.2 Petit Bois Pass-OCS East Investigation Area with vibracore locations.....	107
Figure 5.2.11.2.1 Completed vibracores for the northeast corner of the Petit Bois Pass-OCS East investigation area with USGS sand isopach as background. Note: there is a U.S. Air Force communications tower (yellow triangle) in the area that requires a buffer.....	109
Figure 5.2.11.2.2 Completed vibracores for the Petit Bois Pass-OCS East central shoal complex with bathymetric contours illustrating the main shoals in the area..	111
Figure 5.2.11.2.3 Completed vibracores for the Petit Bois Pass-OCS East eastern shoals investigation sub area with the USGS' isopach illustrating sandy substrate thicknesses.	112
Table 6.1 Borrow Area statistics	117
Figure 6.1 Cat Island Borrow Area.....	118
Figure 6.2 Ship Island Pass Borrow Area for north shore placement on West Ship Island	119
Figure 6.3 - Ship Island Borrow Area	120
Figure 6.4 – Horn Island Pass Borrow Area.....	122
Figure 6.5 – Petit Bois Pass-OCS West Borrow Areas 1 thru 4.....	125
Figure 6.6 – Petit Bois Pass-OCS West Borrow Areas 5 and 6, and PBP-OCS East Borrow Areas 1 thru 4.....	128
Figure 6.7 - Petit Bois Pass-AL Borrow Areas	130

This page was intentionally left blank for duplex printing.

ACRONYMS

ACRONYMS

BOEM	Bureau of Ocean Energy Management
CL	low plasticity (lean) clay (USCS classification)
CH	high plasticity (fat) clay (USCS classification)
GSA	Geological Survey of Alabama
GUIS	Gulf Islands National Seashore
mcy	million cubic yards
mya	Million years ago
MAFLA	(M)ississippi-(AL)abama-(FL)orida(A) sand sheet
mm	millimeter
ML	Silt (USCS classification)
MsCIP	Mississippi Coastal Improvements Program
NGOM	Northern Gulf of Mexico
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OCS	outer continental shelf
SC	clayey sand (USCS classification)
SM	silty sand (USCS classification)
SP	poorly graded sand (USCS classification)
SP-SM	poorly graded sand with silt (USCS classification)
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USGS	United States Geological Survey

This page was intentionally left blank for duplex printing.

1.0 INTRODUCTION

In 2005, Hurricane Katrina caused widespread damage along the Mississippi and Louisiana Gulf coasts. The Mississippi Coastal Improvement Plan was developed by the Mobile District, USACE, in conjunction with other Federal and State agencies, to help mitigate future damage along the Mississippi Gulf coast caused by hurricanes and their associated tidal surge flooding.

As part of the Comprehensive Plan, Mississippi's barrier island chain was evaluated for ways to restore it to pre-Katrina form with the overall purpose to restore its natural ability to reduce the impact of hurricanes striking the Mississippi Gulf coast. Storm events and natural sediment transport have eroded and reshaped the barrier islands into their present configuration.

This report chronicles Mobile District's geophysical and geotechnical investigations to find suitable sand borrow sources for use on the Mississippi Barrier Islands. The investigation spans more than 8 years, beginning in 2006 with initial beach sampling from the islands and concluding in 2014 with the identification and delineation of several borrow areas. Multiple agencies were involved in this investigation, including the United States Geological Survey (USGS), the National Park Service (NPS), the Bureau of Ocean Energy Management (BOEM), and the State of Mississippi. Investigative methods included geophysical surveying and geotechnical sampling.

The focus for this report is on the investigative steps taken to identify suitable sand sources for use on and around the different islands involved with the project. Each island has different sediment requirements based on engineering and biological considerations, and the report includes grain size, shape, and color information for each one. Initial placement designs were used to help establish quantities needed for each project site. However, all mentions of placement locations and borrow area shapes or dimensions are initial considerations for planning only and do not necessarily reflect their final designs. Extensive modeling has been conducted to determine optimal borrow area locations, orientations, and dimensions that will maximize sand quality and quantity while reducing potential side effects due to wave action. These final designs are included in this report, but all figures are subject to change.

Should any questions arise concerning this report or the assumed scope of work, please contact Michael FitzHarris, Geotechnical and Dam Safety Section, (251) 690-3488.

1.1 PROJECT DESCRIPTION

Following Hurricane Katrina in 2005, the MsCIP was established to conduct comprehensive planning to address the following issues:

- Hurricane and storm damage reduction
- Salt water intrusion
- Shoreline erosion
- Fish and wildlife preservation
- Other water-related resource projects

One of the primary components of the Program is the Comprehensive Barrier Island Restoration Plan. Major tasks of the Plan are the following:

- Renourish the northern shoreline of West Ship Island
- Renourish the eastern shoreline of Cat Island
- Revise the dredge material disposal plan for the Pascagoula navigation channel
- Restore the sediment budget of the Mississippi barrier island chain

The Comprehensive Barrier Island Restoration Plan was developed to restore the sediment budget for the Mississippi Barrier Islands using appropriate coastal engineering designs that would maximize island chain stability while minimizing impacts to the local environment. This chain of barrier islands is located between 6 and 12 miles south of the Mississippi Gulf coastal counties of Hancock, Harrison, and Jackson Counties and consists of five natural islands and one man-made island. From west to east, the natural islands are Cat Island, West Ship Island, East Ship Island, Horn Island, and Petit Bois Island. The man-made island is Sand Island (Disposal Area 10) and it is located between Horn Island and Petit Bois Island. It was created as a disposal area for dredged material from local projects such as the Pascagoula Bar Channel. Major inlets within the island system are Ship Island Pass, Camille Cut, Dog Keys Pass, Horn Island Pass, and Petit Bois Pass. The locations of the islands, along with the location of the local navigation channels, are shown in Figure 1.1.1. In this figure, Ship Island is shown as two separate islands. It was breached during Hurricane Camille (AUG 1969) and

has remained as two separate islands since that time. Historic maps also show that Ship Island has been breached by hurricanes prior to Camille, but natural processes have closed the breaches. Except for Cat Island, all the islands are wholly owned by the NPS and are within the Gulf Islands National Seashore (GUIS). Cat Island is partly owned by the NPS, with most of the island under private ownership. The NPS' guidelines for nourishment within the park boundaries states that only sediment removed from the sediment budget due to anthropogenic activities (e.g. channel dredging) can be restored to the littoral zone. Sediment that was removed due to natural transport processes (i.e. storms, long shore currents, etc.) would not be restored. A study was conducted to determine the sediment budget loss due to anthropogenic activity within the NPS boundary and it was established at 22 million cubic yards of sand. This was based on historical dredging records for that area. This constraint means that only 22 million cubic yards of sand can be placed within the NPS-controlled area of the barrier islands. Cat Island is not completely included in this quantity. Figure 1.1.2 shows the boundaries of the Mississippi section of the GUIS.

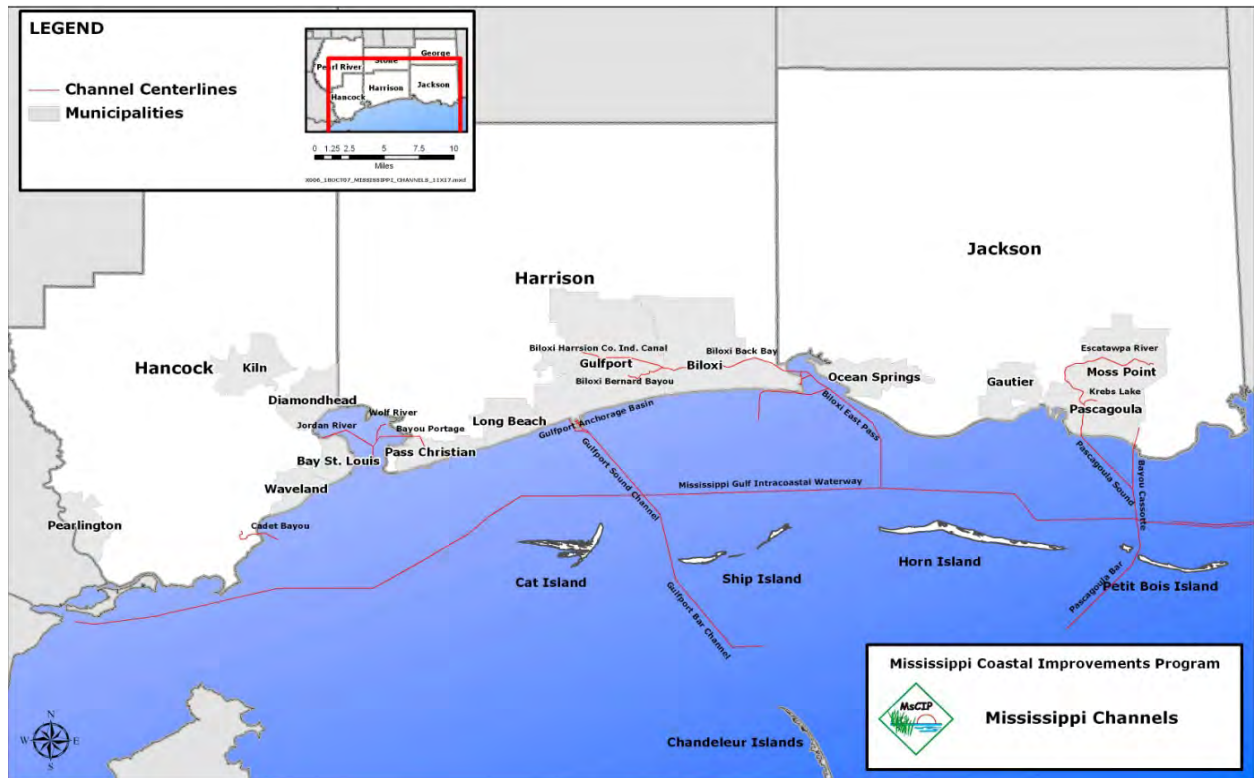


Figure 1.1.1 – The locations of the Mississippi Barrier Islands and navigation channels in the local vicinity.



Figure 1.1.2- Boundaries of the Mississippi section of the Gulf Islands National Seashore

The project to renourish the northern shoreline of West Ship Island was completed in the spring of 2013. A borrow area was identified for the Cat Island renourishment project as part of the 2010 and 2011 vibracore sampling events. However, that project is progressing slowly due to real estate issues. The revision of the dredge material disposal plan for the Pascagoula navigation channel has been implemented and the long term effects are being monitored. A plan has been developed to restore the sediment budget within the barrier islands system. The two major components of this plan include projects to place approximately 12.8 million cubic yards (mcy) of sand within Camille Cut to reconnect East and West Ship Islands, and direct placement of approximately 4.9 mcy of sand on the southern shoreline of East Ship Island.

1.2 OBJECTIVES

The objectives of this report are:

- To outline the procedures of the geotechnical investigation;
- To describe the sampling areas' grain size, fines content, color, and angularity; and,
- To identify potential borrow areas and provide estimates on borrow area sand quantities and characteristics.

1.3 SCOPE OF WORK

The scope of work for this geotechnical engineering study was derived from the project requirements and includes the following technical approaches:

- Identify areas of potential sand resources based on past studies and utilizing subject matter experts from the USGS, the BOEM, and other governmental and non-governmental organizations.

- Conduct geophysical surveys to identify potential sand deposits.
- Conduct vibracore sampling of the deposits and sample potentially useable sediments for further lab testing.
- Conduct laboratory testing of samples for grain size, angularity, percent fine material, calcium carbonate content, and color.
- Use the spatial and textural data to identify areas with suitable borrow material in economical quantities.

1.3.1 BEACH AND ISLAND SEDIMENT SAMPLING

Beginning in 2006, grab-sampling events were conducted by USACE personnel along the Mississippi Barrier Islands (Figure 1.3.1.1). The intent of the sampling was to identify typical sediment characteristics within the barrier island system.

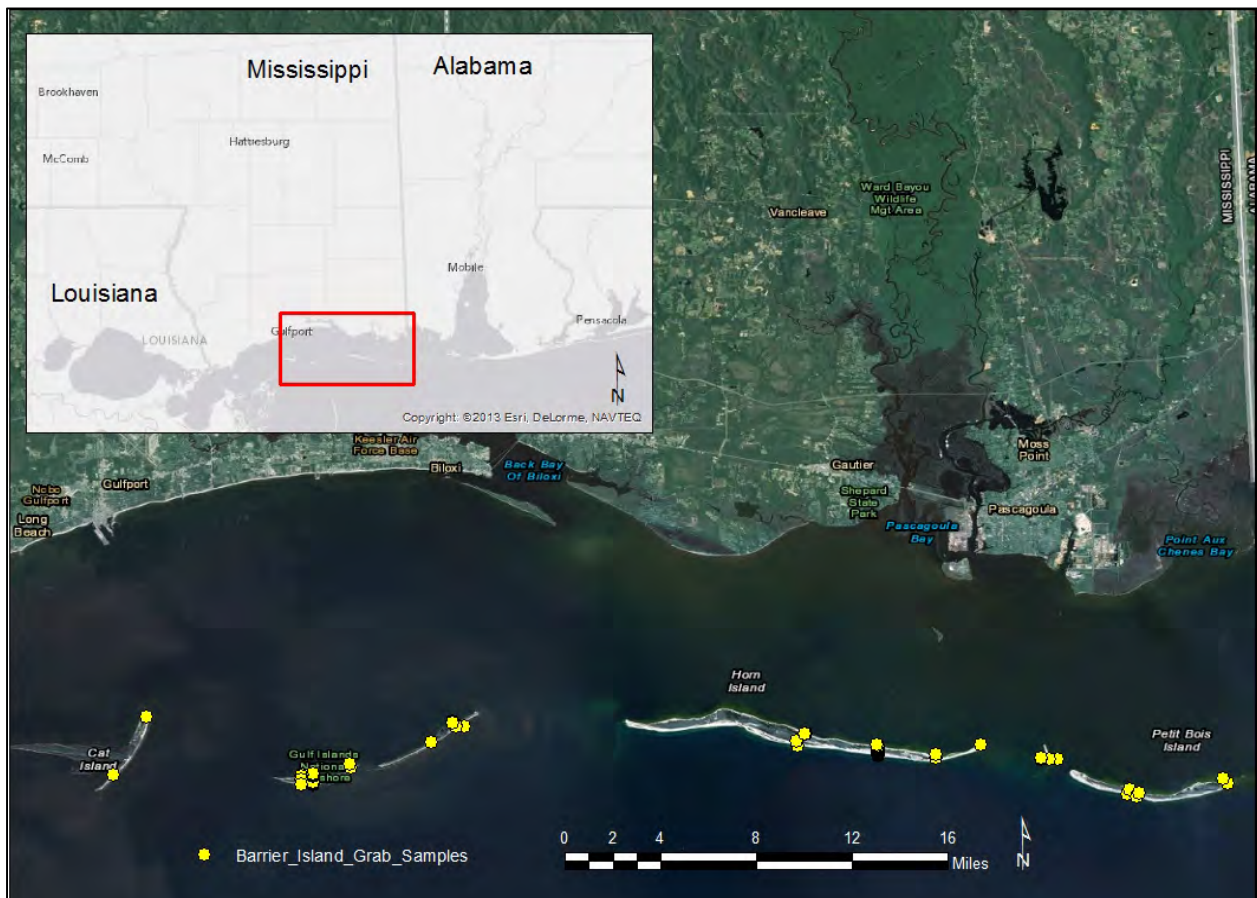


Figure 1.3.1.1- Sediment grab sample locations within the Mississippi section of the Gulf Islands National Seashore and Cat Island.

Based on the sampling, the following sediment characteristics and in situ condition baselines were established for potential sand sources for the Camille Cut and East Ship Island projects.

Table 1.3.1.1 Baselines for suitable sediment characteristics and borrow areas

Characteristic	Baseline
Sand layer thickness	Greater than or equal to 4 ft.
D50 Grain Size range	0.26 to 0.32 mm
Percent Fines	Less than 15% silt and/or clay content
Color	Dry Munsell Color Value greater than or equal to 6
Overburden / unsuitable sediments	≤ 2 feet of unsuitable material on top of the sand, or, throughout the entire useable thickness of sand with at least 4 feet of suitable material intermixed
Location	Outside active littoral zone; Outside GUI boundaries; Within economical distance to placement sites

Although borrow area location was initially restricted to areas outside of the GUI boundaries during the 2010 geotechnical investigation, the findings of the Engineer Research and Development Center / Coastal and Hydraulics Laboratory Technical Report-12-9 “Littoral Sediment Budget for the Mississippi Sound Barrier Islands” (Byrnes et al., 2012) identified DA-10 (Sand Island) as a potential sand source because of its position within Horn Island Pass and the effect this had on the barrier island littoral system. This report provided a justification for sampling the area adjacent to DA-10 during the 2011 geotechnical sampling event. For the purposes of the 2012 and 2013 sampling events, no areas were sampled within the GUI boundaries or within the littoral zone. Section 3 details these island sediment sampling events.

1.3.2 GEOPHYSICAL SURVEYS

The USGS, in conjunction with USACE, the NPS, and the State of Mississippi, conducted three major geophysical surveys in the areas surrounding the barrier islands. The first survey was in 2009, the second survey in 2010, and the third survey in 2013. The two main purposes of these surveys were to gather information about the geological setting surrounding the islands and further offshore from Petit Bois Island, and to identify possible sources of sandy material for use with the barrier island restoration project. Section 4.0 details these surveys.

1.3.3 GEOTECHNICAL INVESTIGATION

For the geotechnical investigation, vibracore sampling was used to collect sediment samples in areas identified by the USGS as having potentially suitable sand. These samples were then laboratory-tested and classified according to the Unified Soils Classification System (USCS). Sampling was conducted from 2010-2014. The 2010 vibracore sampling locations were initially identified during the preceding geophysical surveys (see Section 4.0) and were altered and augmented throughout the sampling event based on the real-time results of the sampling. It consisted of 369 vibracores scattered across the barrier island chain's waters, from Gulfport Channel in the west to Petit Bois Pass in the east. The 2011 sampling event only consisted of 89 vibracores near Cat Island, DA-10, and the Petit Bois Pass area. The 2012 sampling event consisted of 230 vibracores and focused on Horn Island Pass, Petit Bois Pass (Alabama and Mississippi waters), and the Outer Continental Shelf area south of Petit Bois Island. Following the USGS's geophysical survey in August 2013, the 2013 sampling event consisted of 206 vibracores and focused on Horn Island Pass and the OCS area south of Petit Bois Island. Figure 1.3.3.1 outlines the sampling areas and Table 1.3.3.1 shows the breakdown of vibracores and lab samples per sampling event. Vibracores containing visually suitable material for use in the project placement areas were sampled. All other material was discarded. The samples were lab-tested to determine grain size distribution and percentage of fine material, while qualitative Munsell color classification and grain angularity classification were conducted mostly by USACE personnel. These test results helped determine if a particular vibracore's contents met the fill textural characteristics criteria established during the beach and island sediment sampling events. The vibracores containing suitable sediments were then spatially analyzed to delineate potential borrow areas. Section 5.0 details this investigation.

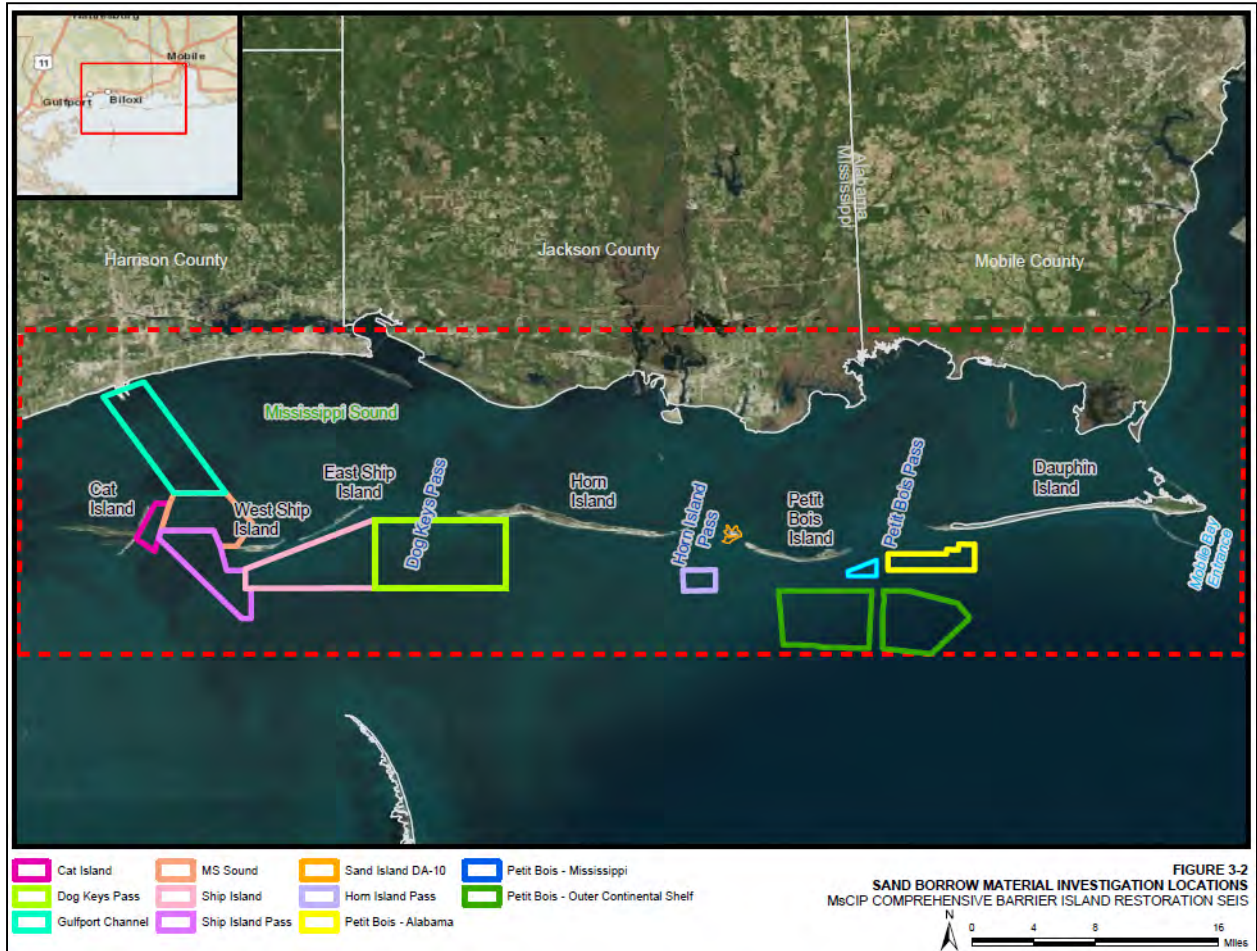


Figure 1.3.3.1- Borrow Material Investigation Locations (Figure 3-2 from USACE SEIS, 2014)

Table 1.3.3.1 Number of vibracores and lab samples per sampling event.

Sampling Event	No. of Vibracores	No. of Lab Samples
2010	369	649
2011	89	176
2012	230	488
2013	206	455
Total	894	1,768

1.3.4 INVESTIGATION RESULTS

From 2010-2014, each sampling event either identified or refined potential borrow areas. Potential borrow areas were identified just east of Cat Island, just west of West Ship Island, south of West Ship Island, south of Horn Island Pass, south of Petit Bois Island in Mississippi state waters, south of Petit Bois Island in Federal waters, and south of Petit Bois Pass in Alabama state waters. Figure 1.3.4.1 highlights these areas.

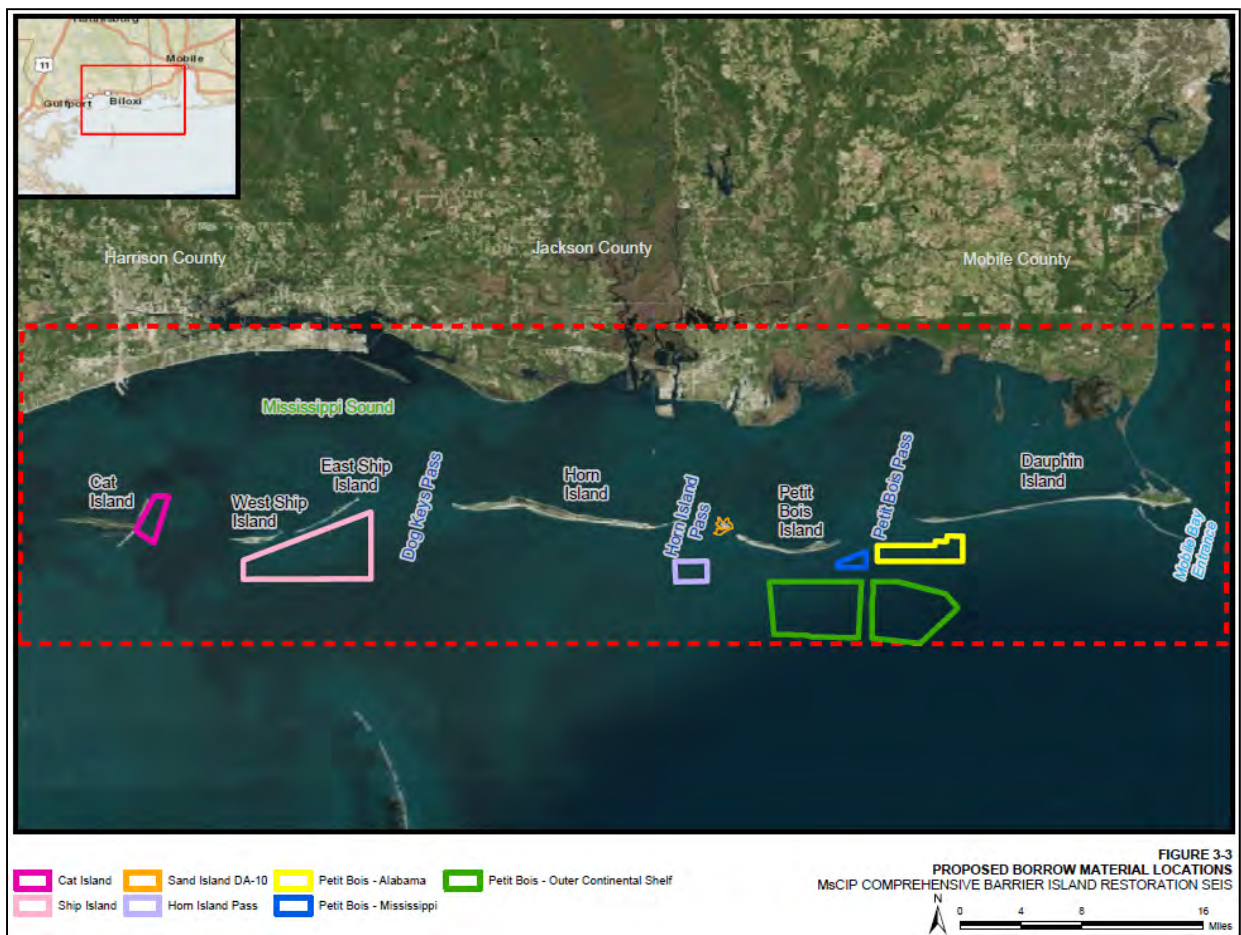


Figure 1.3.4.1- Proposed borrow material locations (Figure 3-3 from USACE SEIS, 2014)

The following table is a consolidated list of the spatial and textural characteristics for each of the new potential borrow areas.

Table 1.3.4.1 Potential Borrow Area Characteristics

<i>Borrow Area</i>	<i>Template Volume (mcy)²</i>	<i>Area (Acres)³</i>	<i>D50 (mm)</i>	<i>Percent Fines</i>	<i>Dry Munsell Value</i>
Petit Bois Pass-Alabama East	14.7	885	0.33	7	6
Petit Bois Pass-Alabama West	5.1	380	0.31	4	6
Petit Bois Pass-Mississippi	2.0	175	0.31	3	7
Petit Bois Pass-Outer Continental Shelf East	4.2	464	0.29	2	7
Petit Bois Pass-Outer Continental Shelf West	15.4	1,383	0.27	3.4	6
Horn Island Pass	4.9	612	0.28	4.4	7
Ship Island	2.7	183	0.21	6	7
Ship Island Pass ¹	0.45	20.9	0.48	< 1	6
Cat Island	4.3	429	0.20	5	6
Total	53.7				

¹The Ship Island Pass borrow area was used for the West Ship Island North Shore Restoration Project.

²Borrow area template volume does not include estimated losses caused by dredging inefficiencies. Template volume includes the estimated required dredge volume and the estimated allowable dredge volume.

³Borrow area acreages are estimated based on cut bottom area and do not include side slopes.

These values are estimates. While borrow area designs attempt to optimize the in situ characteristics of the sediments within their boundaries, sediment characteristics in the fill template will vary due to natural variability in the borrow area, dredging efficiency, handling and placement losses, placement method, and, ultimately, natural processes (wind, waves, and precipitation) at the placement site winnowing out finer sediments as the fill settles into equilibrium with site conditions.

2.0 GEOLOGICAL SETTING

The study area for this geotechnical report is a subset of the MsCIP study area and includes the barrier islands and surrounding waters off the Mississippi coast and south of Alabama's western end of Dauphin Island. The study area also includes an area of the outer continental shelf located approximately south and southeast of Petit Bois Island, MS. The purpose of this section is to provide an overview of the geology for the study area in order to better understand where potential sand sources might be located.

2.1 GULF COASTAL PLAIN

The coastal area of Mississippi is part of the Gulf Coastal Plain which extends from Florida westward to Texas. This plain includes the barrier island chain which lies 6 to 12 miles offshore and that is of interest for this project. This island chain consists of the following islands: (east to west) Petit Bois, Horn, East Ship, West Ship, and Cat Islands. It was first thought of this area to be remnants of topographic highs of the upland surface that had been separated from the mainland by marine inundation as the Gulf Coast slowly subsided (McGee, 1891). However, this interpretation was proven to be incorrect after accurately dating and correlating the stratigraphy and sediments of the Coastal Plains through core sampling (Morton, 1977).

Interpretations of these cores led to indicate the gradual near shore sediment aggradation that led to the formation of the narrow, sandy platform belt over the lower muddy-sandy nearshore deposits (Otvos, 1985). This near surface deposit stratigraphy of the Mississippi-Alabama Shelf is the product of the fluvial-deltaic deposition during sea level lowstands that have occurred since the late Pleistocene. The gulfward growth of the deltas during the glacio-eustatic fluctuations in sea level produced stacked, off-lapped sedimentary sequences derived from the Mississippi, Pearl, Pascagoula, Tombigbee, Alabama, and west Florida river watersheds. During the late Pleistocene, deltaic loads from the fluvial systems produced differential rates of subsidence of the shelf which acts as the primary mechanism for fluvial orientation and shelf geometry (Bartek et al, 2004). During this time period, sea level changes associated with global glacial action caused a transgressive-regressive sequence reworking sand along the coast. The last glacial period created a coastline near the edge of the continental shelf. As the ice began to melt, the associated sea level rise and wave action began to form the exposed sand into barrier islands with replenishment to this system coming from the east associated

with sediments from the Apalachicola River that contribute to the barrier islands in northwest Florida westward into Alabama along Dauphin Island.

The sediment supply of the barrier islands is transported by the long shore littoral drift moving from the east to the west, along with Mobile Bay's huge ebb-tidal delta which receives sand intermixed with dominant mud from the Bay interior by powerful tidal currents. A relic late Pleistocene barrier ridge on the western flank of the Bay entrance became the intermediate base that enabled continued westward sand transport by littoral drift and currents off, and parallel with, the mainland shore which sourced sediment for the northern Gulf of Mexico barrier islands (Otvos, 1981). The relics of the earliest islands are buried under deltaic deposits and preserved west of the Square Handkerchief Shoals, approximately 2-3 miles south of Bay St. Louis, MS. The littoral drift reaches Petit Bois Island and the other islands via the shoals and ebb-tide deltas south of the inter-island passes (Otvos, 1985). However, growth of the St. Bernard sub-deltas of the Mississippi River south of Hancock and Harrison Counties in Mississippi resulted in the cutoff of the littoral drift west of Ship Island approximately 4,000 years ago (Frazer, 1967).

2.2 JACKSON, HARRISON, AND HANCOCK COUNTIES

The Geologic Map of Mississippi (Moore, 1976), published by the Mississippi Geological Survey, identifies three strata, or formations, that underlie the three subject counties north of the barrier islands. These include the alluvial/coastal deposits of Holocene age, the Citronelle formation of Pliocene/Pleistocene age, and the Pascagoula/Hattiesburg formation of Miocene age. Otvos (1986, 1992, and 2005) further defines the various formations and provides information to their depositional environment. These formations and environments also apply to the barrier islands concerning this project. The later work addresses the presence of, or lack of, sand and other sediments along the coast, in the Mississippi Sound and near the barrier islands.

Within the Mississippi Sound, Holocene-aged deposits form thin, muddy strata that cover the older Pleistocene formations. These include alluvial, estuarine, and lagoonal-bay deposits. Sampling studies have shown the strata to contain particle sizes from colloidal to sand size depending on the energy associated with its depositional environment (Upshaw, Creath and Brooks, 1966).

The transgressive-regressive sequence, which reworked the sand and other sediments along the coast, resulted in three formations that correlate from the alluvium along the coast to the barrier islands: the Prairie, Biloxi, and Gulfport formations. The Gulfport and Prairie formations are generally very sandy and have some economic value because of this characteristic. A generalized geologic map of the Mississippi coast based on these studies is shown in Figure 2.1, (after Otvos, 1997). The Prairie formation is found just landward of the coast in all three counties, while the Gulfport formation is found along the beaches and barrier islands.

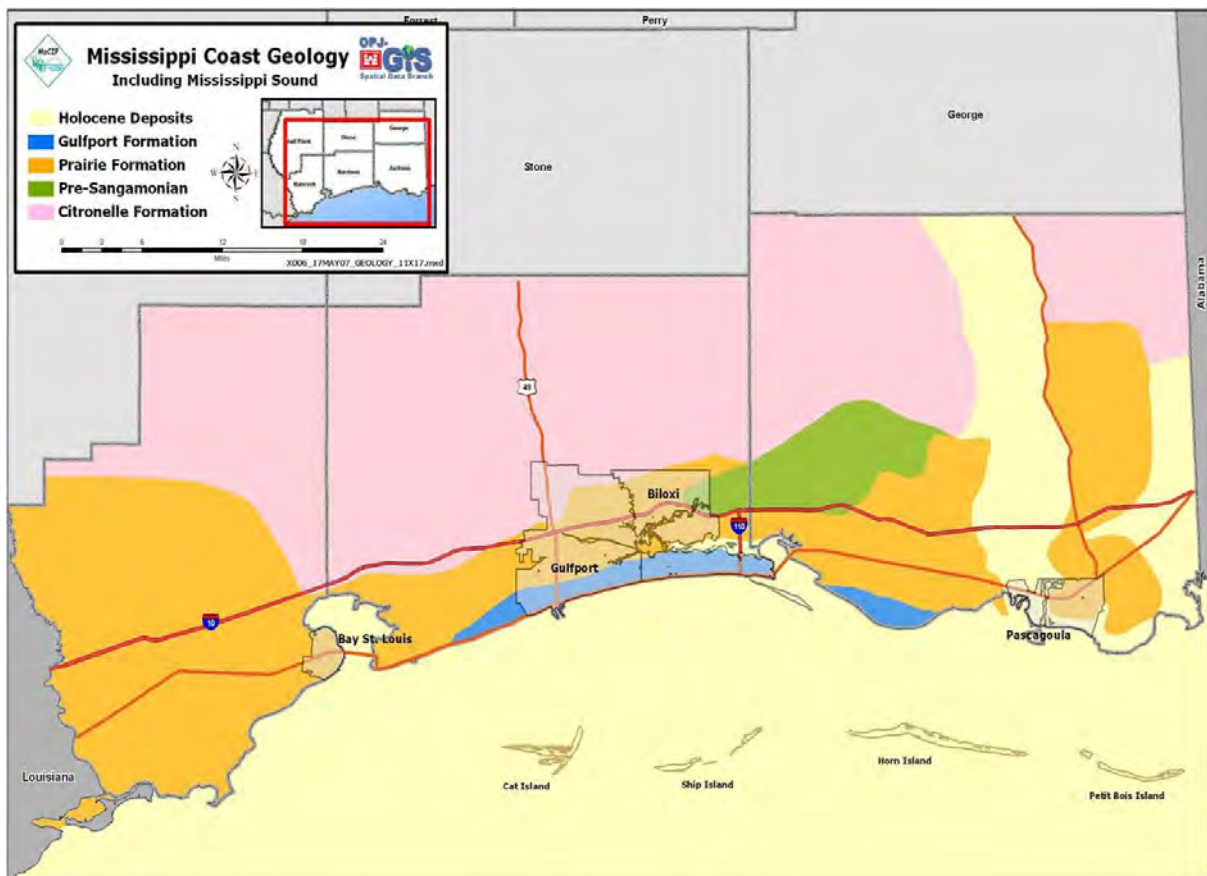


Figure 2.2.1 - Generalized Geologic Map of Coastal Mississippi (After Otvos, 1997)

2.3 OUTER CONTINENTAL SHELF

The following is an excerpt from the 2014 USGS report, *Near-surface stratigraphy and morphology, Mississippi inner shelf, northern Gulf of Mexico*, describing the modern morphological setting for this region.

The area south of the barrier islands is “the inner Mississippi-Alabama shelf, which is a slowly subsiding, passive continental margin bound to the west by the Mississippi River delta and to the east by the DeSoto Canyon located offshore of the Florida panhandle (Sydow and Roberts, 1994). The shallow stratigraphy of this region is the product of fluvial-marine sedimentation, driven by sea-level oscillations during the late Pleistocene and into the Holocene (Flocks and others, 2011b). During periods of lower sea level, the region was a flat, low elevation coastal plain, with low gradient rivers meandering across older shelf stratigraphy (Kindinger and others, 1994; Bartek and others, 2004). Within the study area, fluvial systems that extended across the shelf are related to the modern watersheds of southern Mississippi and Alabama (e.g. Fowl, Bayou La Batre, Pascagoula, and Pearl Rivers). Throughout the Holocene, sea-level rise flooded the coastal plain, infilling the river embayments with sediment and forcing bayhead deltas to migrate upstream (Bart and Anderson, 2004). Burial of these transgressive deposits produced the most complete stratigraphic component of inner-shelf features. Tidal inlet and barrier island development seaward of the embayments were inundated by rapid sea-level rise and reworked into expansive sand sheets and shoals comprised of moderately sorted, medium to fine sand (Doyle and Sparks, 1980). West of present day Mobile Bay, shoals are rare and occur almost exclusive to the area between Dauphin and Petit Bois Islands. These shoals are stable features extending from ~4 to 20 m water depth (13.1 to 65.6 feet). They trend NW-SE, parallel to the prevailing wave climate, and are composed of poor to moderately-sorted, medium sand (Flocks and others, 2011a). By about 5 thousand years before present (kyr BP), sea-level rise reached the position of GUIIS, and a dominant westward littoral system initiated the development of the barrier islands. Sediment supply for the islands was sourced primarily from the Mobile River embayment deposits (Otvos, 1981; Greene and others, 2007). As sea level reached its present position, the St. Bernard delta complex of the Mississippi River delta encroached into the western Mississippi-Alabama shelf, covering the backfilled stratigraphy with muddy, prodelta deposits until delta development ceased about 2 kyr BP (Otvos and Giardino, 2005), completing the modern morphologic setting of the inner shelf.” (Flocks, 2014)

Section 4 includes more details about the geology and geomorphology of the sampling areas, with emphasis on potential borrow sites, while discussing the

USGS's 2010 and 2013 geophysical surveys around the GUIS islands and south of Petit Bois Island.

3.0 PLACEMENT SITE FIELD INVESTIGATIONS

Textural and color characteristics of the native material at the placement sites are critical to determining the fill characteristics required to meet the project's objectives. Before any borrow area investigation could begin in earnest, sediments at the placement sites had to be analyzed to determine their textural and color characteristics.

3.1 FILL COMPATIBILITY REQUIREMENTS

Shorelines are dynamic environments and vary spatially and temporally. Therefore, determining the in situ characteristics of the placement areas is challenging. Fill material should match native material as closely as possible to ensure stability and minimize environmental impacts due to changes in material characteristics. Color, grain size, shape, and carbonate content all affect the engineering and environmental characteristics of the fill. General guidelines for identification of compatible borrow were reviewed in USACE publications, as well as other agency publications such as the National Oceanic and Atmospheric Administration's (NOAA) publication, "Beach Nourishment: A Guideline for Local Government Officials" and Florida's Department of Environmental Protection guide for selecting borrow material for beach nourishment projects.

3.1.1 COLOR

The color of beach sand is an issue not only for aesthetics, but it also affects marine life. The color of the sand directly affects the absorption of solar energy from the sun, which in turn affects the temperature of the sand. Darker sand absorbs more solar energy, making it warmer than lighter colored sand which reflects more of the solar energy. Temperature plays a role in determining the gender of sea turtle hatchlings. Researchers have discovered that the warmer the sand, the higher the percentage of female sea turtle hatchlings that develop (Hayes, G.C.; et al.). For this investigation, samples were qualitatively analyzed and assigned a Munsell Color Munsell color hue, value, and chroma classification (ASTM D1535-12a) in order to quantitatively compare each sample. For the purposes of classifying the color of large borrow areas, the Munsell value is used because it describes the material's lightness on a continuous scale from 1 to 10. 1 is black and 10 is white, with shades of gray in between. The value gives an indication to the lightness of the sediment, regardless of its hue or chroma, thus simplifying comparisons between samples that

might have different hues. In general, a wet sample is one to two Munsell values darker than a dried sample. Because moisture affects color, wet and dry color characterization was done for each sample. For this report, a volumetrically-weighted average Munsell value was used for describing the sediment for borrow areas and placement areas when possible.

3.1.2 GRAIN SIZE

The grain size distribution, or gradation, of a sediment sample refers to the range of particle sizes contained in the sample and is a significant factor for nourishment projects because particle size distribution directly affects beach fill stability and the equilibrium profile's slope. Existing beach sediments are typically in a state of equilibrium with the energy from waves and currents surrounding them. Generally, the sediments finer (smaller) than those in equilibrium with these surrounding conditions will be transported away by wind, waves, and currents, leaving only the proper particle size based on existing environmental conditions (Dean, 1974 and 1991). Coarser (larger) grain sizes require relatively greater energy to be moved, in comparison to finer grains, so coarser sands generally remain in place (unless a significant storm event occurs), thereby increasing beach stability. Coarser grained sand also has a steeper angle of repose, which produces steeper equilibrium profiles.

Although no single statistic can completely describe a sediment's grain size distribution, the D50 (median grain size, in mm) was used because it provided a more conservative estimate of the approximate average sample grain size due to the poorly graded (relatively uniform) nature of the samples. Therefore, when possible, volumetrically-weighted average D50 was used for describing the sediment size for borrow areas and placement areas.

3.1.3 GRAIN ANGULARITY

The angularity, or roundness, of individual grains affects sediment settling, compaction, and motion initiation. The sand found on the barrier islands is typically a sub-angular to rounded shape, which is expected with sand grains that have been transported over long distances. More angular sand grains tend to pack tightly together and make a harder beach surface, while rounded sand grains tend to be less compacted and contain a higher porosity. These variations in the firmness of

the surface will affect the use of the islands by many types of fauna. Nesting sea turtles prefer sand that is loosely packed for nesting. The more rounded sand grains allow for easier nest digging by the turtles. Changes in the compaction of the beaches will also affect the benthic community at the shoreline, which will in turn influence the use of the beaches by shorebirds. USACE and NPS personnel qualitatively compared a representative sample from each vibracore sample to a Geotechnical Gauge containing different degrees of angularity to determine the overall angularity of that sample. Compaction testing on the native beaches was not conducted.

3.1.4 CARBONATE CONTENT

Beach sands can be broadly categorized by their chemical composition into either carbonate (CaCO_3) beaches or siliciclastic/quartz (SiO_2) beaches. Carbonate content is important because carbonate sands perform differently from silica sands due to different intraparticle porosities, density, bulk density, and structural integrity of carbonate grains (Halley, 2000). Weathering of carbonates can produce sediments with higher concentrations of silt- and clay-sized material resulting in cementation of grains and elevated turbidity. Carbonate content was generally not an issue with this investigation because the vast majority of sand located was siliciclastic / quartz with very little shell fragments. That is not to say that there will not be shell fragments in the borrow material, but the overwhelming constituent of the borrow material will be quartz sand. Quartz sand is very resistant to physical and chemical weathering, so sand of this type will tend to have less turbidity and cementation issues in the long term.

3.1.5 FINE SEDIMENT CONTENT

The Unified Soil Classification System (USCS) defines fine sediment, or fines, as any sediment that passes through a U.S. Standard #200 (0.074 mm) sieve. This fine sediment can be either silt- or clay-size particles. Fines affect the overall quality of the sand. It increases turbidity in the foreshore area and, in significant amounts, can alter the engineering properties of the sand. Aesthetically, quartz sand with a high percentage of fine material tends to look dirty and is not appealing to beachgoers. Therefore, clean quartz sand with less than 5% fine sediment is optimal and 10% or less fines is acceptable. The NPS was willing to allow up to 10% fine material on beaches (15% in the nearshore area) because of natural

sorting that occurs along the coast over time. The dredging and placement process will winnow out fine sediments as well. When hopper dredges are filling up, the fine sediments will tend to stay in suspension and be pushed out of the hold with the water as it is filled up. Further, silty or clayey sand are expected to contain less fine sediments after placement because the fines are again in suspension during placement and will likely be dispersed during hydraulic placement and through subsequent natural coastal processes. Because of the anticipated loss of fines due to dredging and natural coastal processes, sand sources with fines up to 15% were considered acceptable.

3.2 BARRIER ISLAND SEDIMENT SAMPLING

Multiple beach and island sediment sampling events took place between 2006 and 2011 (Figure 3.2.1). Their purpose was to identify the native materials' textural characteristics in order to determine the best matching fill for the projects. Samples were taken from sandy sediments that were most representative; relatively small exposed deposits of clay or peat were not sampled and tested.

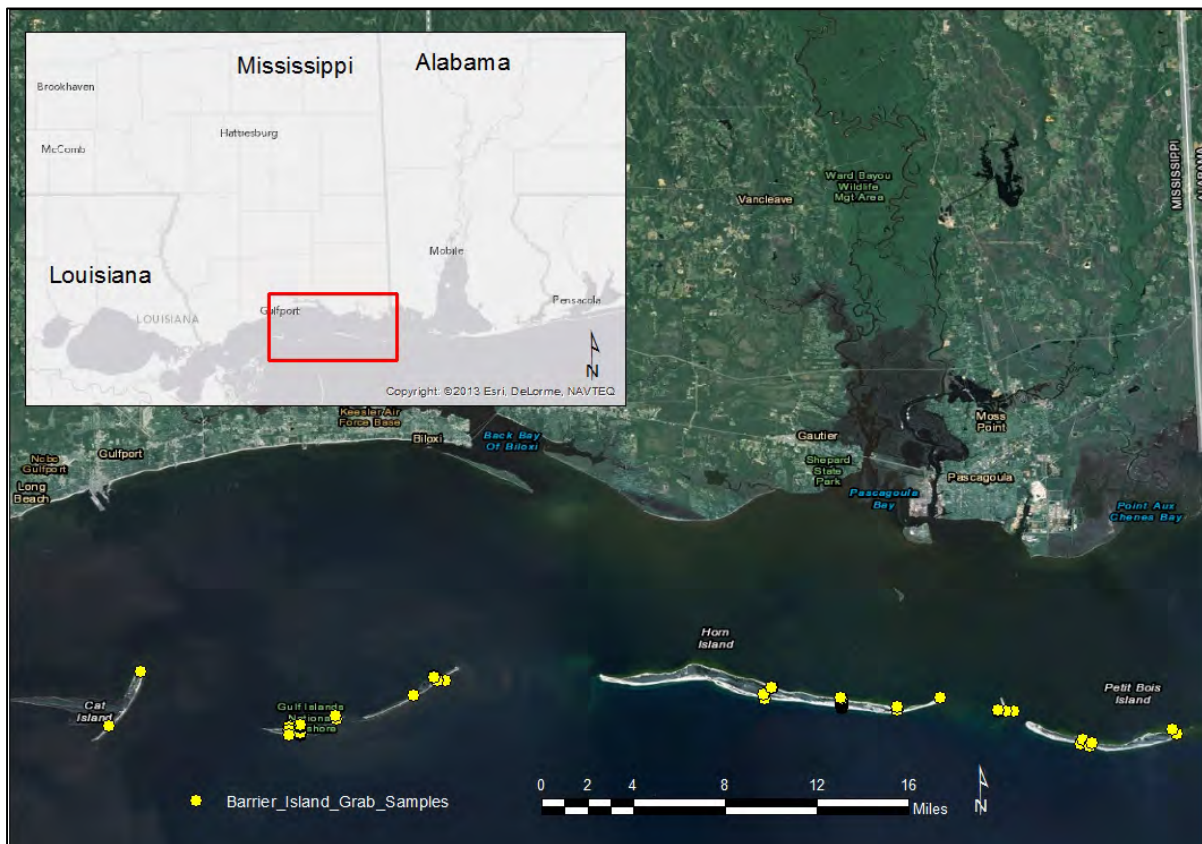


Figure 3.2.1 Barrier Island grab sample locations

3.2.1 2006 BEACH SEDIMENT INVESTIGATIONS

During initial stages of the Barrier Island Plan in 2006, geologists and biologists from the USACE Mobile District took samples from various locations on beaches on Petit Bois, Horn, East Ship, and West Ship Islands. Cat Island was not included in the project plan at this time. These samples were analyzed for color using Munsell Color Charts and for angularity by qualitative comparison using a McCollough Geotechnical Gauge. The samples were not lab-tested for grain size distribution, but were visually-manually classified according to the USCS. The results of the sampling indicated that the majority of the sediments were poorly graded, sand-sized quartz, light gray in color, with sub-angular to rounded particle shape. The results of the sampling are shown in Table 3.2.1.1. Aerial imagery maps for the 2006 sampling events are shown in Appendix A.

Table 3.2.1.1 – Munsell Color Analyses of Beach Samples from Petit Bois, Horn, East Ship, and West Ship Islands taken in 2006

Sample #	Location	Latitude	Longitude	Description	Dry Munsell Color
HI-1-06	North beach of Horn Island See Appendix A, Fig 3.2.2.1.4	30.2376	-88.6674	Medium, poorly graded sand, SP	white, 2.5Y 8/1
HI-2-06	South beach of Horn Island See Appendix A, Fig 3.2.2.1.4	30.2329	-88.6725	Medium, poorly graded sand, SP	lt. grey, 2.5Y 7/2
PB-3-06	North beach Petit Bois Island See Appendix A, Fig 3.2.2.1.5	30.2023	-88.4653	Medium, poorly graded sand, SP	lt. grey, 2.5Y 7/2
PB-4-06	South beach Petit Bois Island See Appendix A, Fig 3.2.2.1.5	30.2001	-88.467	Medium, poorly graded sand, SP	lt. grey, 2.5Y 7/2
ES-5-06	North beach East Ship Island See Appendix A, Fig 3.2.2.1.3	30.2441	-88.8803	Medium, poorly-graded sand, SP	lt. grey, 2.5Y 7/2
ES-6-06	South beach East Ship Island See Appendix A, Fig 3.2.2.1.3	30.2418	-88.8784	Medium, poorly graded sand, SP	lt. grey, 2.5Y 7/1
ES-7-06	South beach East Ship Island See Appendix A, Fig 3.2.2.1.3	30.2423	-88.8785	Organic Peat	black, 5Y 2.5/2
WS-8-06	South beach West Ship Isl. See Appendix A, Fig 3.2.2.1.2	30.2072	-88.9721	Medium, poorly graded sand, SP, contains some dark particles	lt. grey, 2.5Y 7/1
WS-9-06	Central part West Ship Island See Appendix A, Fig 3.2.2.1.2	30.2105	-88.9721	Medium, poorly graded sand, SP, mix of light and dark particles	dk. Grey, 5Y 4/1
WS-10-06	North beach W. Ship Island at Pier See Appendix A, Fig 3.2.2.1.2	30.2127	-88.9717	Medium, poorly graded sand, SP	lt. brownish grey, 2.5Y 6/2

3.2.2 2009 BEACH SEDIMENT INVESTIGATIONS

In 2009, a sampling event was completed on all the GUIS islands, including Cat Island. This event was performed by personnel from the USACE Mobile District, accompanied by a coastal geomorphologist from the NPS Regional Office in Atlanta, GA. In addition to qualitatively determining the Munsell color and particle shape, the samples were taken to a soils laboratory for grain size analysis. The samples were analyzed using methods contained in ASTM D2487, "Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)". Selected results of the grain size analyses are shown in Table 3.2.2.1 and complete results are shown in Appendix A. The sampling locations and the results of the qualitative color and particle shape classification are shown in Table 3.2.2.2.

Table 3.2.2.1– 2009 Beach Samples Gradation Data

Sample ID	Sample Location	USCS	Percentages Passing Sieves					D ₅₀
			#20	#40	#60	#100	#200	
CI-1-09	Cat Island - East Shore Spit See Appendix A, Fig 3.2.2.1.1	SP	100	94	6.6	0.2	0.2	0.3275
CI-2-09	Cat Island – E. Shore S. Spit See Appendix A, Fig 3.2.2.1.1	SP	100	96.4	17	0.9	0.2	0.3129
WSI-1-09	West Ship Island – Dock See Appendix A, Fig 3.2.2.1.2	SP	99.4	40.2	7.9	0.2	0	0.4735
WSI-2-09	West Ship Island - South East See Appendix A, Fig 3.2.2.1.2	SP	100	96.7	14.3	0	0	0.316
WSI-3-09	West Ship Island - East North See Appendix A, Fig 3.2.2.1.2	SP	99.7	79.7	9.8	0.7	0.2	0.341
WSI-4-09	West Ship Island - East South See Appendix A, Fig 3.2.2.1.2	SP	100	96.1	27	3.1	0.1	0.2988
ES-1-09	East Ship Island - West End South See Appendix A, Fig 3.2.2.1.3	SP	100	95.7	13.2	0.4	0.2	0.3183
ES-2-09	East Ship Island - East North See Appendix A, Fig 3.2.2.1.3	SP	100	90.9	14.7	0.3	0.1	0.3209
ES-3-09	East Ship Island - East South See Appendix A, Fig 3.2.2.1.3	SP	100	91.2	12.3	0.3	0.3	0.3237
HI-1-09	Horn Island - Center North See Appendix A, Fig 3.2.2.1.4	SP	99.9	31.4	1.6	0.4	0.4	0.5088
HI-2-09	Horn Island - Center South See Appendix A, Fig 3.2.2.1.4	SP	100	76.1	2.8	0.1	0	0.3539
HI-3-09	Horn Island - East North See Appendix A, Fig 3.2.2.1.4	SP	100	81.5	7.1	0.2	0	0.3414
HI-4-09	Horn Island - East South See Appendix A, Fig 3.2.2.1.4	SP	99.9	89.9	11.5	0.3	0.2	0.3259
HI-5-09	Horn Island – Sand Spit East See Appendix A, Fig 3.2.2.1.4	SP	100	92.3	9.9	0.4	0.3	0.3255
S-1-09	Sand Island (DA-10)- South Shore See Appendix A, Fig 3.2.2.1.5	SP	100	88.4	6.2	0.4	0.4	0.3337
PBI-1-09	Petit Bois Island - North Center See Appendix A, Fig 3.2.2.1.5	SP	98.7	59.5	6.3	0.7	0.6	0.3888

SECTION 3

Offshore Sand Borrow Investigation, 2010-2014 Placement Site Field Investigations

PBI-2-09	Petit Bois Island - South Center See Appendix A, Fig 3.2.2.1.5	SP	99.9	84.4	6.4	0.4	0.4	0.3382
PBI-3-09	Petit Bois Island - North East See Appendix A, Fig 3.2.2.1.5	SP	99.9	83.9	8	0.5	0.2	0.3371
PBI-4-09	Petit Bois Island - South East See Appendix A, Fig 3.2.2.1.5	SP	99.9	71.1	4.7	0.8	0.8	0.3613

Table 3.2.2.2 – Location, Color, and Particle Shape of 2009 Beach samples

Name	Location	Latitude	Longitude	Angularity	Wet color code	Wet color	Dry color code	Dry color
CI-1-09	Cat Island - East shore north spit See Appendix A, Fig 3.2.2.1.1	30.24744	-89.065957	Sub-angular to rounded	2.5Y 7/2	Lt. Gray	2.5Y 8/1	Lt. Gray
CI-2-09	Cat Island - East shore south spit See Appendix A, Fig 3.2.2.1.1	30.212874	-89.085645	Sub-angular to rounded	2.5Y 7/2	Lt. Gray	2.5Y 7/1	Lt. Gray
WSI-1-09	West Ship Island - Boat dock north shore - See Appendix A, Fig 3.2.2.1.2	30.212801	-88.971456	Sub-angular to rounded	GLE Y1 5/N	Gray	GLE Y1 5/N	Gray
WSI-2-09	West Ship Island - End of boardwalk, south shore See Appendix A, Fig 3.2.2.1.2	30.207668	-88.972008	Sub-angular to rounded	5Y 7/1	Lt. Gray	5Y 7/1	Lt. Gray
WSI-2A-09	West Ship Island - End of boardwalk, south shore See Appendix A, Fig 3.2.2.1.2	30.207668	-88.972008	Sub-angular to rounded	GLE Y1 4/N	Dark gray	GLE Y1 5/N	Gray
WSI-3-09	West Ship Island - East end on north shore See Appendix A, Fig 3.2.2.1.2	30.219334	-88.943008	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray
WSI-4-09	West Ship Island - East end on south shore See Appendix A, Fig 3.2.2.1.2	30.217771	-88.941908	Sub-angular to rounded	GLE Y1 5/N	Gray	GLE Y1 5/N	Gray
ES-1-09	East Ship Island - West tip See Appendix A, Fig 3.2.2.1.3	30.232522	-88.893823	Sub-angular to rounded	2.5Y 7/2	Lt. Gray	2.5Y 7/1	Lt. Gray
ES-2-09	East Ship Island - East end on north shore See Appendix A, Fig 3.2.2.1.3	30.244648	-88.880641	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray

SECTION 3

**Offshore Sand Borrow Investigation, 2010-2014
Placement Site Field Investigations**

Name	Location	Latitude	Longitude	Angularity	Wet color code	Wet color	Dry color code	Dry color
ES-3-09	E Ship Isl. - East end south shore See Appendix A, Fig 3.2.2.1.3	30.241771	-88.873645	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray
HI-1-09	Horn Isl. - Boat dock north shore See Appendix A, Fig 3.2.2.1.4	30.237523	-88.667247	Sub-angular to rounded	2.5Y 7/2	Lt. Gray	2.5Y 7/2	Lt. Gray
HI-2-09	Horn Island - End of path from boat dock on south shore See Appendix A, Fig 3.2.2.1.4	30.230631	-88.67218	Sub-angular to rounded	2.5Y 7/2	Lt. Gray	2.5Y 8/1	Lt. Gray
HI-3-09	Horn Island - Eastern end on north shore See Appendix A, Fig 3.2.2.1.4	30.225408	-88.588682	Sub-angular to rounded	5Y 5/1	Gray	5Y 5/1	Gray
HI-4-09	Horn Island - Eastern end on south shore See Appendix A, Fig 3.2.2.1.4	30.222977	-88.588228	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray
H1-5-09	Horn Island - Sand Spit east of eastern end of island See Appendix A, Fig 3.2.2.1.4	30.231314	-88.56119	Sub-angular to rounded	5Y 5/2	Olive gray	5Y 7/1	Lt. Gray
S-1-09	Sand Island (DA-10)- South shore See Appendix A, Fig 3.2.2.1.5	30.222838	-88.524765	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray
PBI-1-09	Petit Bois Island - North shore in center of island See Appendix A, Fig 3.2.2.1.5	30.204569	-88.47165	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray
PBI-2-09	Petit Bois Island - South shore in center of island See Appendix A, Fig 3.2.2.1.5	30.201675	-88.473103	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray
PBI-3-09	Petit Bois Island - East end north shore See Appendix A, Fig 3.2.2.1.5	30.210826	-88.414782	Sub-angular to rounded	2.5Y 7/2	Lt. Gray	2.5Y 7/1	Lt. Gray
PBI-4-09	Petit Bois Island - East end south shore See Appendix A, Fig 3.2.2.1.5	30.207911	-88.41232	Sub-angular to rounded	2.5Y 7/1	Lt. Gray	2.5Y 7/1	Lt. Gray

Note: Colors in Table 3.2.2.2 may differ from the colors listed on the lab reports in Appendix A because the lab did not conduct a color analysis using a Munsell Soil Color Chart and USACE personnel did the classification after receiving the lab results.

3.2.3 2010 BEACH SEDIMENT INVESTIGATIONS

Beaches are relatively high energy environments compared to the interior portions of the islands and the variation of sediment grain size across the islands was not known. Two transects were established; one on West Ship Island and another on Horn Island. Each transect had 11 sample locations spaced across the island from the Sound to the Gulf. Each location was sampled from the surface to a depth of approximately one foot. Each sample was sent to an engineering laboratory for a grain size analysis. In addition, an equal amount of sediment from each sample, from each of the islands, was composited into an additional sample for a separate analysis. The intent of the composite samples was to characterize the entire island along that transect. The location of the samples taken at West Ship Island and Horn Island are plotted on imagery in Figures 3.2.3.1 and 3.2.3.2, respectively. Native material for both islands proved to be mostly poorly graded, medium-grained, sand-sized quartz with trace fine sediments. Grain size undulates along the transect, going from finer grain in deeper water, coarsening with decreasing water depth, and then becoming finer towards the center of the island in the subaerial samples.

For West Ship Island, the sampling results show that the locations in deeper water (WSI-1-10 and WSI-11-10) had smaller grain sizes than those samples in the shallower, more active areas of the foreshore (WSI-3-10, WSI-10-10, and WSI-9-10). The smallest grain sizes were in samples located towards the center of the island (WSI-5-10 and WSI-6-10). The samples on the northern side of the island were generally larger in size as well. This may be due to the decreased wave energy on the Sound-side of the island and subsequent reduction in transport capacity of the coarser grain sizes, thus leaving the coarser sediment in place. Whereas, the south shore is subject to greater wave energy which is capable of transporting coarser material. Previous storm overwash may have also had the energy to transport and deposit the coarser grain sizes from the gulf-side of the island to the sound-side. However, these samples are from discrete locations and the depositional environment when they were deposited, along with the subsequent reworking due to coastal processes, affects the gradational consistency throughout the island. Therefore, other locations could show slightly different gradation results. Despite this variability, the majority of the island is expected to be poorly graded, medium to fine grain, sand-sized quartz with minimal (<5%) fine sediment content. Selected results of the grain size analyses are shown in Tables 3.2.3.1 and 3.2.3.2, with complete results included in Appendix A.

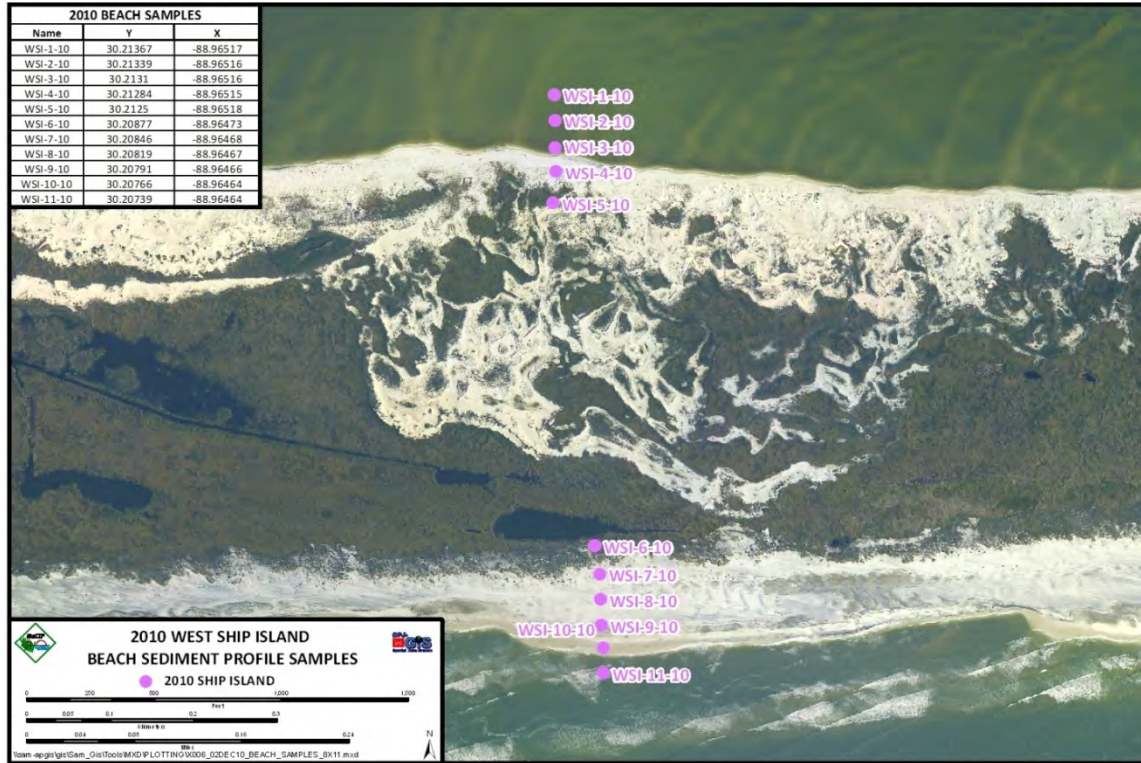


Figure 3.2.3.1 – Location of sampling locations for 2010 West Ship Island beach transect.

Table 3.2.3.1 – Results of Grain Size Analyses, Transects at West Ship Island; Depths from 0.0 to 1.0 feet

USACE Sample #	USCS	Percentages Passing Sieves					D50 mm
		#20	#40	#60	#100	#200	
BI-SIB-1-10 (a.k.a. WSI-1-10)	SP	99.8	77.6	17.6	3.9	1	0.3346
BI-SIB-2-10 (a.k.a. WSI-2-10)	SP	99.6	70.6	13.1	3.4	1.4	0.3535
BI-SIB-3-10 (a.k.a. WSI-3-10)	SP	94.4	45	7.2	0.7	0.6	0.4504
BI-SIB-4-10 (a.k.a. WSI-4-10)	SP	99.8	69	7.3	5.5	0.3	0.3638
BI-SIB-5-10 (a.k.a. WSI-5-10)	SP	99.9	97.3	53	10.7	0.9	0.2426
BI-SIB-6-10 (a.k.a. WSI-6-10)	SP	100	99	47	2.4	0.2	0.2567
BI-SIB-7-10 (a.k.a. WSI-7-10)	SP	100	95	39.4	5.6	2.7	0.2756
BI-SIB-8-10 (a.k.a. WSI-8-10)	SP	99.8	84.8	32.3	5.4	1.7	0.2983
BI-SIB-9-10 (a.k.a. WSI-9-10)	SP	100	95.8	27.8	7.6	1.3	0.2988
BI-SIB-10-10 (a.k.a. WSI-10-10)	SP	99.8	70.2	8.9	5.8	0.5	0.3596
BI-SIB-11-10 (a.k.a. WSI-11-10)	SP	99.6	95.5	68.7	5.3	1.1	0.2147
BI-SIB-10 COMP	SP	99.4	81.7	29.5	9.8	0.9	0.3095

For Horn Island, the sampling results indicated a similar pattern as the West Ship Island samples. Finer grain sizes in the deeper water (HI-1-10, HI-11-10) and coarsening shoreward as the water depth decreases. The middle of the island is slightly finer than the beaches on either side. As with West Ship Island, grain size will vary throughout the island due to natural processes, but the majority of the island is expected to consist mostly of poorly graded, medium-grained, sand-sized quartz with minimal (<5%) fine sediment content.

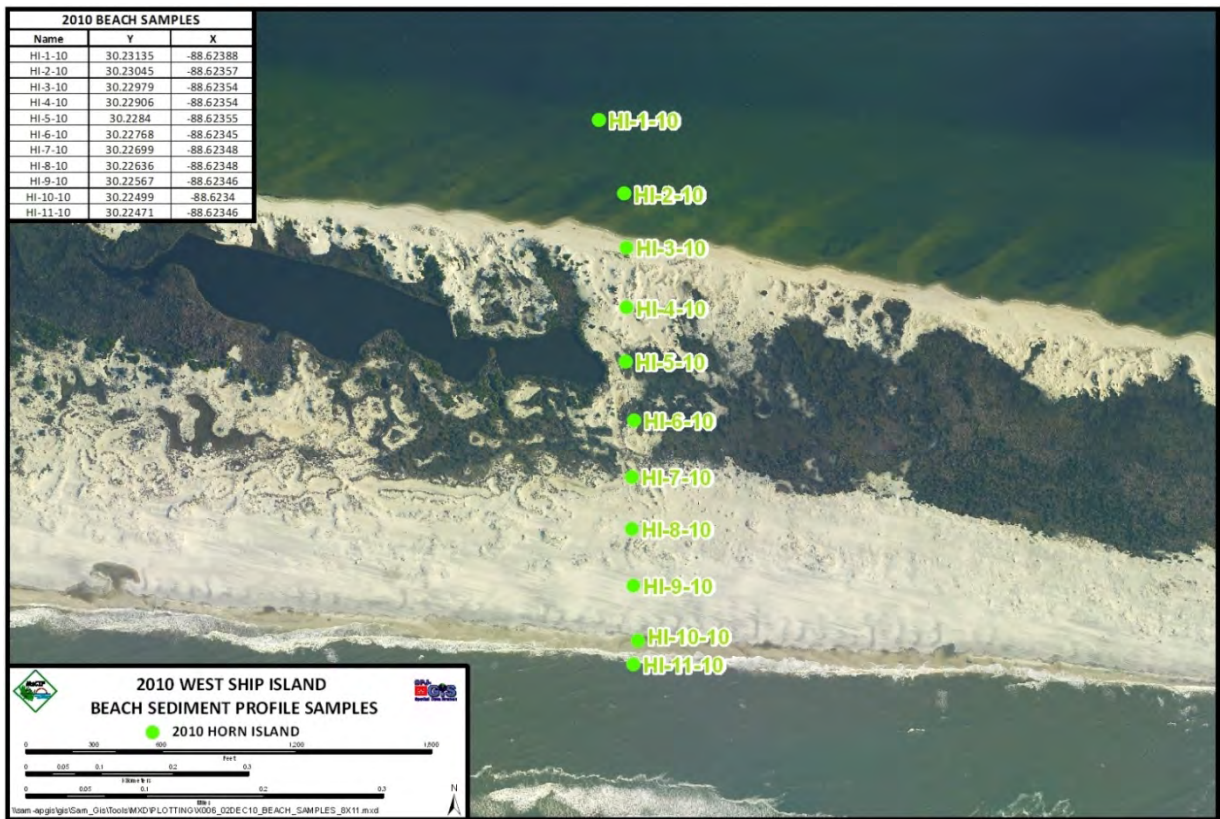


Figure 3.2.3.2 - Location of sampling locations for 2010 Horn Island beach transect.

Table 3.2.3.2 – Results of Grain Size Analyses, Transects at Horn Island with Depths from 0.0 to 1.0 feet

USACE Sample #	USCS	Percentages Passing Sieves					D50 mm
		#20	#40	#60	#100	#200	
BI-HIB-1-10 (a.k.a. HI-1-10)	SP	99.9	75.9	17.9	1.3	1	0.3362
BI-HIB-2-10 (a.k.a. HI-2-10)	SP	98.2	50	7.3	0.6	0.3	0.425
BI-HIB-3-10 (a.k.a. HI-3-10)	SP	99.1	37.8	1.2	1	0.2	0.4801
BI-HIB-4-10 (a.k.a. HI-4-10)	SP	99.7	37.8	0.9	0.7	0.3	0.4795

BI-HIB-5-10 (a.k.a. HI-5-10)	SP	99.7	55.8	5.1	0.5	0.2	0.4018
BI-HIB-6-10 (a.k.a. HI-6-10)	SP	100	79.2	13.3	0.9	0.3	0.3372
BI-HIB-7-10 (a.k.a. HI-7-10)	SP	99.5	72.5	12.5	1	0.2	0.3499
BI-HIB-8-10 (a.k.a. HI-8-10)	SP	99.7	86	19.6	6.7	0.2	0.321
BI-HIB-9-10 (a.k.a. HI-9-10)	SP	99.9	89.8	21.2	8	0.5	0.3147
BI-HIB-10-10 (a.k.a. HI-10-10)	SP	99.5	83.7	15.8	0.9	0.6	0.3275
BI-HIB-11-10 (a.k.a. HI-11-10)	SP	99.7	92.9	38.7	16.2	1	0.2809
BI-HIB-10 COMP	SP	99.5	69.2	12.3	1.1	0.6	0.3571

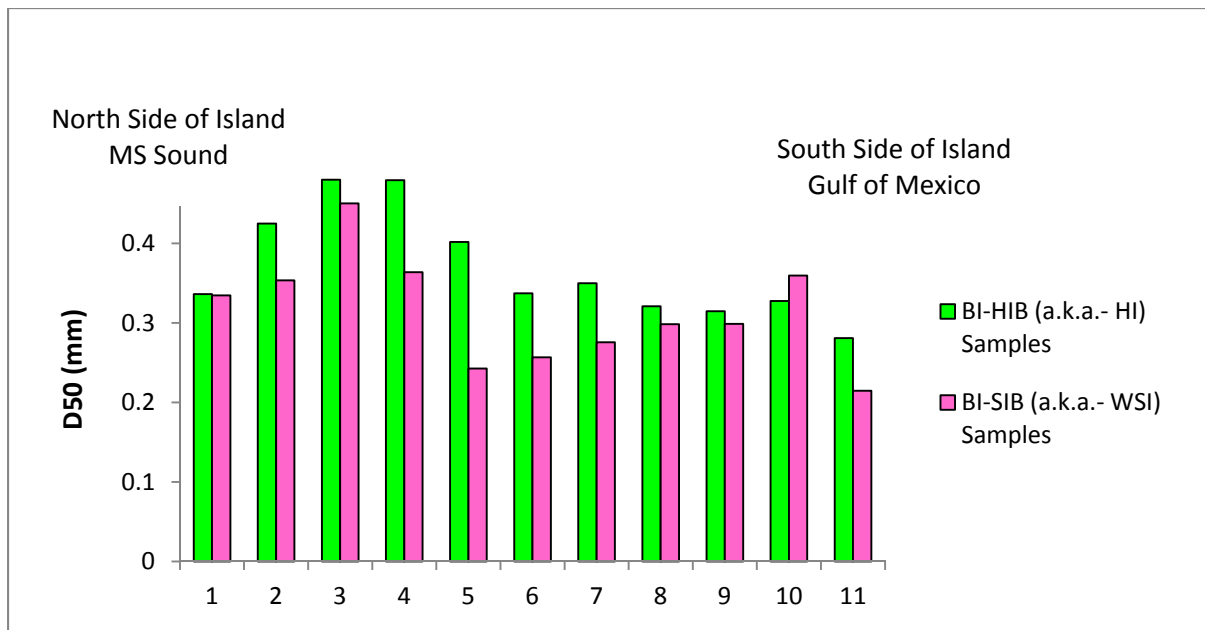


Figure 3.2.3.3 – Bar graph comparison of grain sizes for West Ship and Horn Island beach transects.

Figure 3.2.3.3 graphs the sampling results, minus the composite samples, and illustrates the undulating grain sizes based on the sample location on the transect. It must also be taken into account that the samples along each transect were not necessarily in the exact same relative location on the island as the counterpart sample (i.e. WSI-5 and HI-5 are not exactly in the center of their respective island). The graph does not model accurately these variations. Although the sample locations are not exactly the same, the general pattern of fluctuation across the transect is similar across both islands, corresponding to roughly the same geologic features of their respective island. Also of note, the West Ship Island samples were generally finer than the Horn Island samples which is indicative of it being further down drift from the sediment source feeding the island chain.

Further discussions within the Engineering team led to another round of sampling on West Ship Island (Figure 3.2.3.4). These samples were taken as composites, with total depths ranging from 4.0 to 5.0 feet below ground surface. The purpose of these samples was to determine if there were any significant differences in sediment characteristics because of the sample's stratigraphic position. The samples' coordinates and selected results of the gradation analysis are shown in Table 3.2.3.3.

The results do not indicate a significant change in material type (poorly graded quartz sand) from the surface to the target depth of 4.0 – 5.0 ft below ground surface. Results did indicate that grain size was slightly larger on the southern side of the island. However, the results are so close (range of 0.05 mm) that they do not indicate a significant variation to the overall characteristics of the island's surficial sediments.

Figure 3.2.3.4 shows the layout of the 2010 samples on West Ship Island and gradation curves are included in Appendix A.

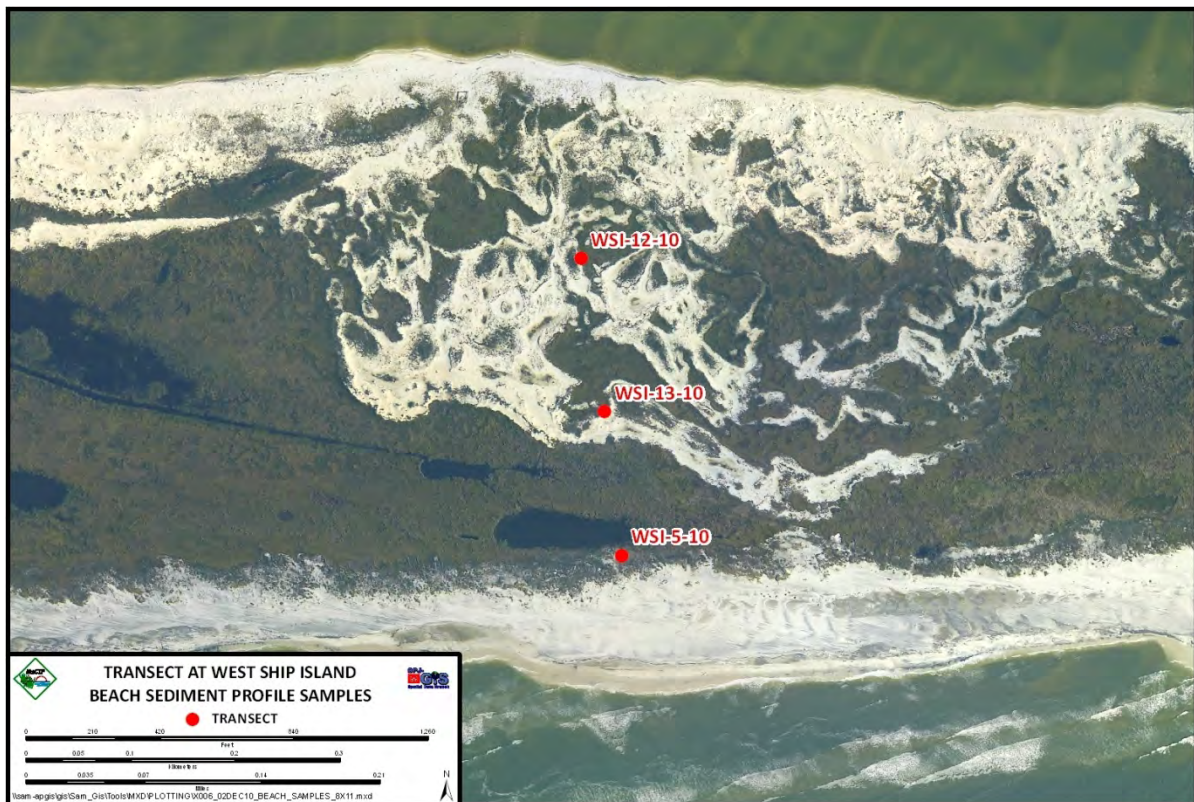


Figure 3.2.3.4 - Sampling locations for 2010 West Ship Island transect.

Table 3.2.3.3 - Results of Grain Size Analyses, Transect at West Ship Island, Depth 0.0 to 5.0 feet

USACE Sample #	Latitude	Longitude	Depth (ft)	USCS	< #200 (%)	D50 (mm)
WSI-5-10A	30.20877	-88.96473	0.0 - 1.5	SP	0.4	0.3681
WSI-5-10B	30.20877	-88.96473	1.5 - 3.0	SP	0.9	0.3369
WSI-5-10C	30.20877	-88.96473	3.0 - 4.5	SP	0.4	0.3168
WSI-12-10A	30.211333	-88.965078	1.0 - 2.0	SP	0.5	0.3287
WSI-12-10B	30.211333	-88.965078	2.0 - 3.0	SP	0.2	0.2654
WSI-12-10C	30.211333	-88.965078	3.0 - 4.0	SP	0.4	0.2786
WSI-13-10A	30.210011	-88.964875	1.0 - 2.0	SP	0.1	0.3381
WSI-13-10B	30.210011	-88.964875	2.0 - 3.0	SP	2.9	0.2661
WSI-13-10C	30.210011	-88.964875	3.0 - 4.0	SP	0.6	0.2722
WSI-13-10D	30.210011	-88.964875	4.0 - 5.0	SP	0.2	0.317

Both sampling events demonstrate that the majority of sediment on the barrier islands is poorly graded, medium to fine grained sand-sized quartz with minimal (<5%) fine sediments. However, the aerial photos illustrate that other finer grained material (clays and/or silts) can be found surficially on both islands as evidenced by the darker colors, ponded water, and more robust vegetation. These deposits are encountered mostly on the interior of the islands where wave action cannot winnow out the fines and transport them away.

3.2.4 2011 DA-10/SAND ISLAND SAMPLING

Three grab samples were taken from the DA-10 / Sand Island in 2011 to further characterize the sediment on the island. Because it is dredged sediment from the Pascagoula Shipping Channel, the island contained very clean, poorly graded, medium-grained, sand-sized quartz with less than 2% fine material. As with Horn and West Ship Island, the interior sample (BI-DA10-16-11) did contain slightly finer sand than the two samples closer to the water line. Table 3.2.4.1 shows the lab results for the samples. Figure 3.2.4.1 shows the layout of the samples on the island. Lab reports are included in Appendix A.

Table 3.2.4.1 - Results of Grain Size Analyses, Beach Grab Samples at DA-10

USACE Sample #	Latitude	Longitude	Depth (ft)	USCS	< #200 (%)	D50 (mm)
BI-DA10-15-11	30.222764	-88.524672	1	SP	1.0	0.3937
BI-DA10-16-11	30.222764	-88.519922	1	SP	1.0	0.2998
BI-DA10-17-11	30.222764	-88.515101	1	SP	1.2	0.3244

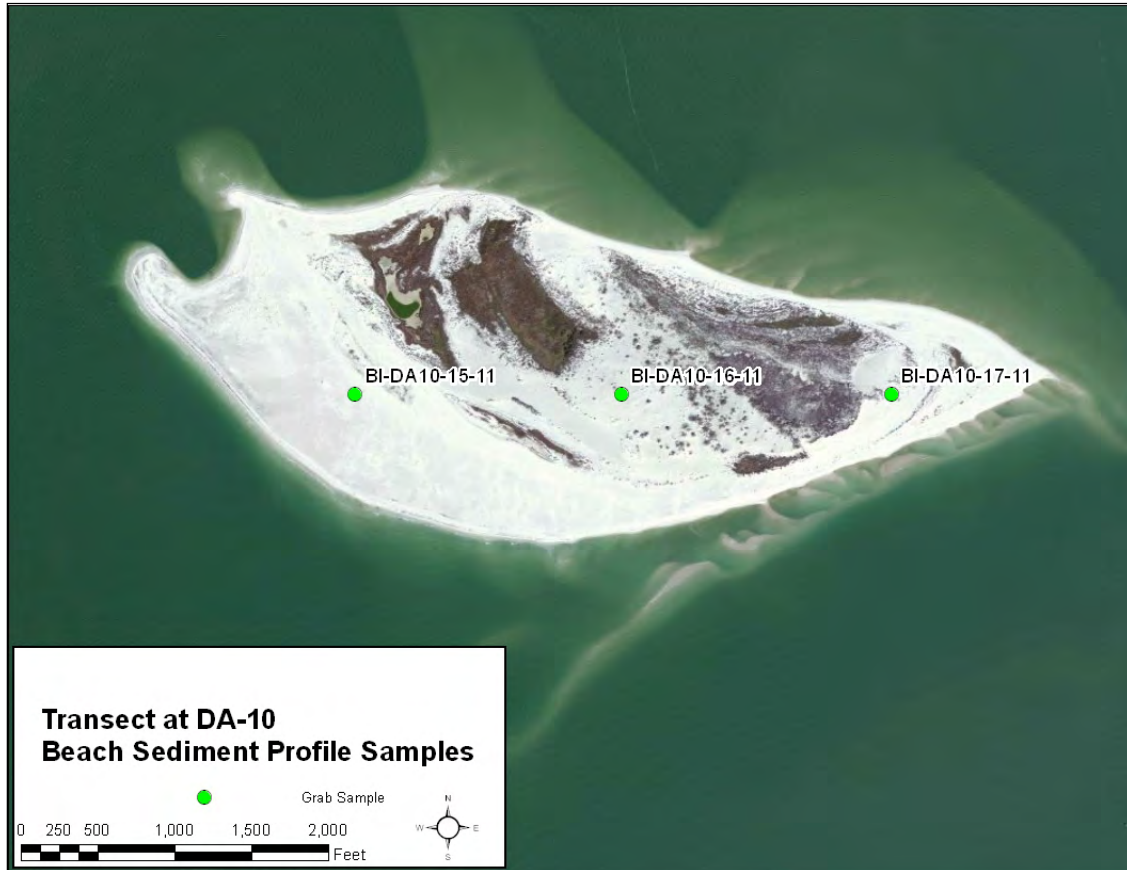


Figure 3.2.4.1 - Sampling locations for 2011 DA-10 transect.

3.2.5 BARRIER ISLAND SEDIMENT SAMPLING CONCLUSION

The island sampling events from 2006 to 2011 helped to evaluate the different sediment gradations throughout the barrier islands and characterize the different placement sites for the upcoming projects. As expected, grain size distribution is spatially variable on each island and directly affected by the geographic location of the sample. Specifically, coarser grain sizes were typically found in areas of higher energy along the beaches, while samples located in deeper waters and towards the

interiors of the islands were finer-grained. Grain sizes also typically became finer from east to west along the island chain. Table 3.2.5.1 is a summarized listing of the surficial sediments for Cat Island, West and East Ship Islands, Horn Island, DA-10, and Petit Bois Island. D₅₀ values for Cat Island, Petit Bois Island, and DA-10 were calculated using an arithmetic mean of the D₅₀s of the grab samples taken on the islands (Table 3.2.2.1 and Table 3.2.4.1). Horn Island's and West Ship Island's composite sample D₅₀s were used to represent the average D₅₀ on these islands. The Camille Cut placement site was not sampled directly to determine grain size. Rather, grain size information from the western tip of East Ship Island (ES-1-09) and the eastern tip of West Ship Island (WSI-4-09) were used as proxies. As such, Camille Cut fill should have a D₅₀ grain size of approximately 0.28 mm, ranging to as coarse as 0.34 mm, to most closely match the native material on the tips of East and West Ship Islands.

Table 3.2.5.1 – Surficial sediment information for barrier islands

Location	USCS	Average D ₅₀ (mm)	Average Dry Munsell Value	Average Shape
Cat Island	SP	0.32	7	Sub-Angular to Rounded
West Ship Island (eastern tip)	SP	0.32	6	Sub-Angular to Rounded
West Ship Island (Composite Sample)	SP	0.31	6	Sub-Angular to Rounded
East Ship Island (western tip)	SP	0.32	7	Sub-Angular to Rounded
Horn Island (Composite Sample)	SP	0.36	7	Sub-Angular to Rounded
Petit Bois Island	SP	0.36	7	Sub-Angular to Rounded
DA-10	SP	0.34	7	Sub-Angular to Rounded

4.0 GEOPHYSICAL INVESTIGATIONS

The USGS conducted geophysical surveys in 2009, 2010, and 2013 to identify offshore areas with sandy material. This section details these investigations.

4.1 2010 GEOPHYSICAL SURVEY

Since 2007, the USGS has conducted geophysical surveys in collaboration with the NPS within GUIS park boundaries as part of the USGS Northern Gulf of Mexico (NGOM) Ecosystem Change and Hazard Susceptibility project (Figure 4.1.1).

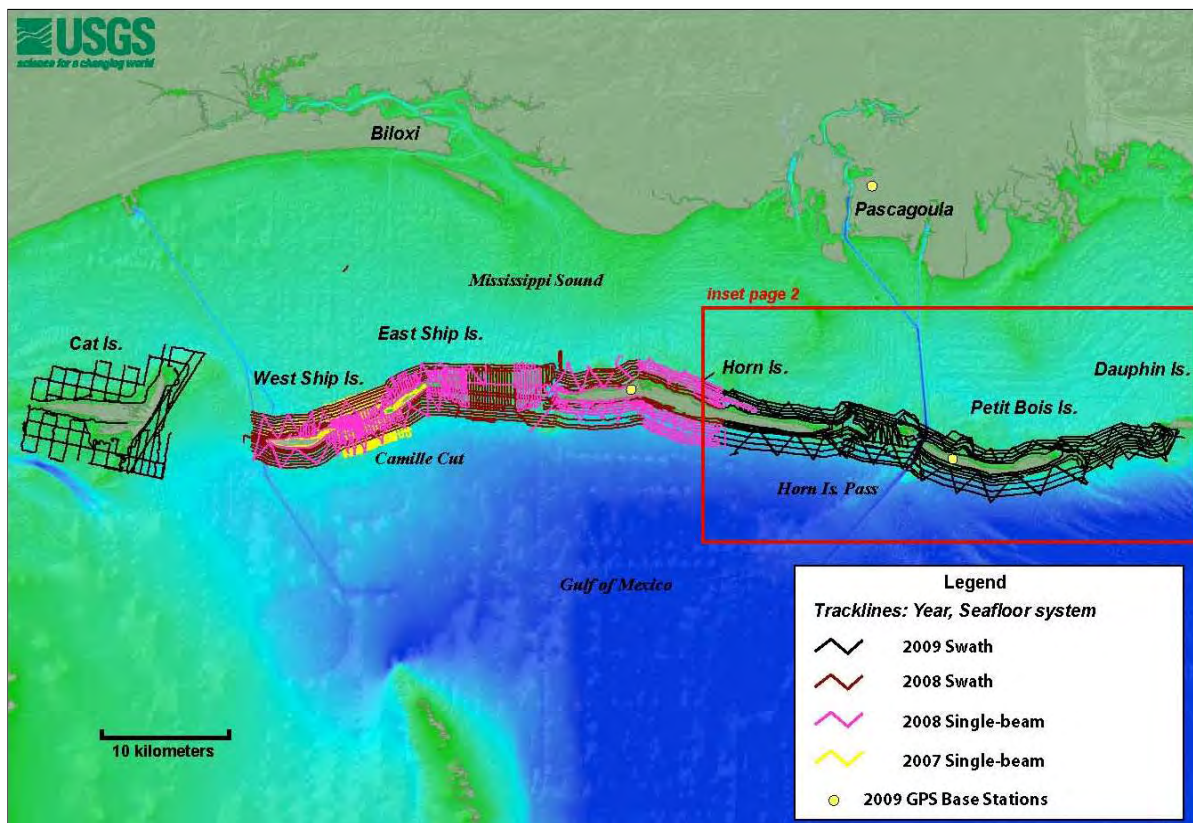


Figure 4.1.1 – Past geophysical surveys conducted by the USGS at Gulf Islands National Seashore.

In 2009, USACE entered into an Interagency Agreement with USGS to gain a better understanding of the availability of potential borrow areas containing suitable, high quality sand. This additional work would complement the ongoing USGS NGOM study effort by expanding survey data coverage beyond the Park’s boundaries while incorporating USACE vibracore textural data to further validate and refine the geophysical interpretations. The overall intent was for the geophysical survey data to be collected by USGS and integrated with the vibracores collected by USACE “to

provide a detailed understanding of the regional shallow stratigraphy and the lithology of its various units” (Twichell et al., 2011).

Meetings between USACE and USGS led to the identification of areas of interest deemed to be geologically conducive to large sand deposits. Areas within the NPS boundaries were considered off limits. Figure 4.1.2 shows the areas selected for additional geophysical investigation by the USGS. These areas were not within park boundaries, but were adjacent to previous and ongoing investigations for the NPS.

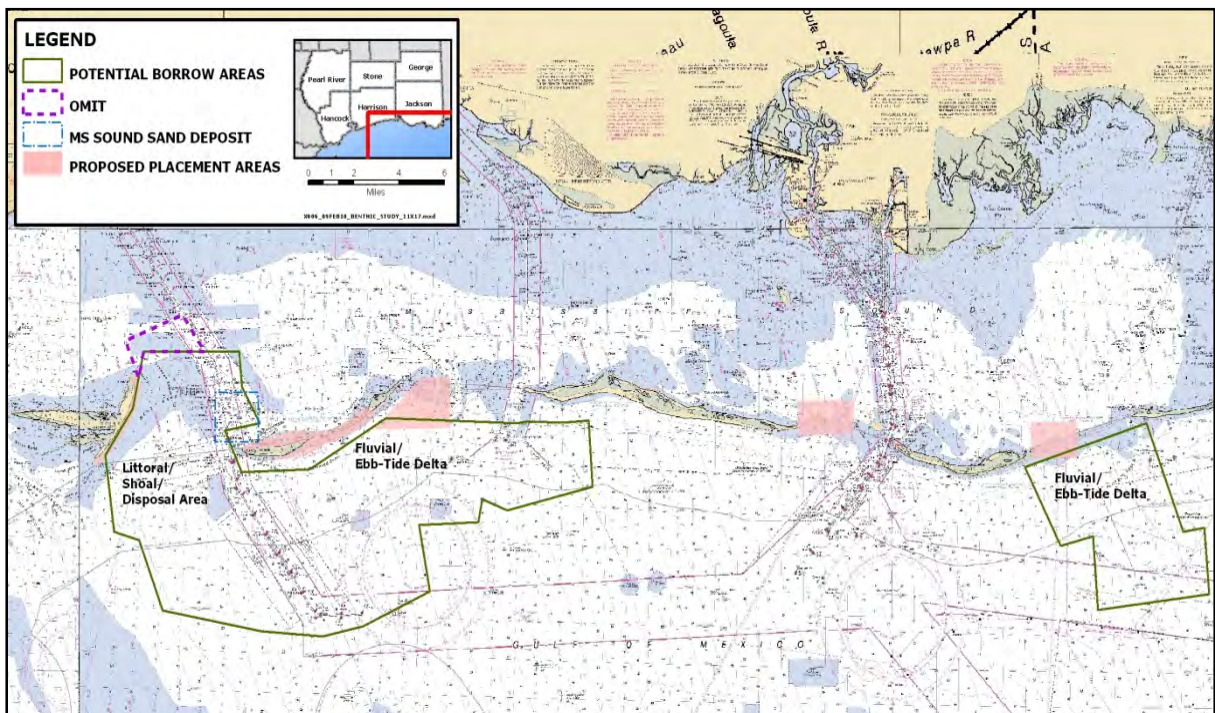


Figure 4.1.2 – Areas designated for geophysical survey to identify potential sand borrow sites.

The entire region was then divided into three general Study Areas: seaward of Ship Island and Horn Island (Study Area 1); seaward of Petit Bois Pass (Study Area 2); and within Ship Island Pass, adjacent to Cat Island (Study Area 3). Figure 4.1.3 shows the Study Areas (black outlines), the tracklines of the geophysical surveys conducted by USGS for this study and the NGOM study, and the general location of the USGS and 2010 USACE vibracores.

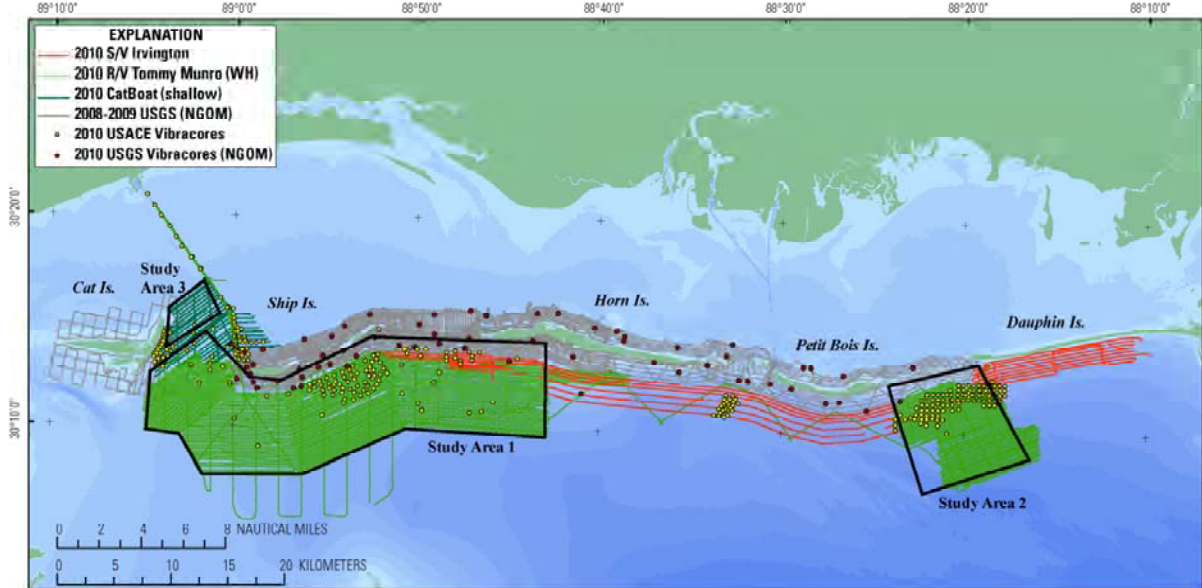


Figure 4.1.3 Map showing the tracklines for geophysical data collected. Vibracores collected by USACE for the MsCIP project and the USGS for the Northern Gulf of Mexico (NGOM) project are shown. Main features were separated into three Study Areas (From Twichell et al. 2011).

4.1.1 2010 SURVEY METHODOLOGY

In March of 2010, the USGS conducted two surveys covering approximately 300 square kilometers of the inner continental shelf offshore of the western Mississippi barrier islands, along the Gulfport Navigation Channel, portions of Mississippi Sound near Ship Island Pass, and south of Petit Bois Pass (Figure 4.1.1.1). The first survey cruise was conducted during March 3-17 and was staffed primarily by the Woods Hole Science Center. The second survey cruise was conducted March 19-29 and was staffed by USGS, St. Petersburg, FL. The University of Southern Mississippi's research vessel, *R/V Tommy Munro*, was used to collect the large offshore sections. In addition, the USGS research vessel, *R/V Gilbert*, a USGS 8-m Glacier Bay catamaran, surveyed the shallower Study Area 3, while the USACE survey vessel, *S/V Irvington*, assisted by surveying the nearshore area between Study Area 1 and 2 and east of Study Area 2. Much of this survey area abuts the seaward edge of a survey completed by the USGS in 2008 and 2009 (NGOM survey) and extends from 1 to 3 km seaward of the island chain, approximately 8 to 13 km offshore. Positions of the ship and geophysical data were determined using Differential Global Positioning System (DGPS) navigation, with an antenna mounted directly above the interferometric-sonar head on the starboard side of the vessel.

During acquisition, the survey vessels maintained speeds between 1.5 and 2.5 m/s (Twichell et al., 2011).

Study Area 1 was the largest study area. Data were collected along approximately 2,000 km of tracklines spaced approximately 150 m apart in the shore-parallel direction, and about 2 km apart in the shore-perpendicular direction as shown in Figure 4.1.1.1.

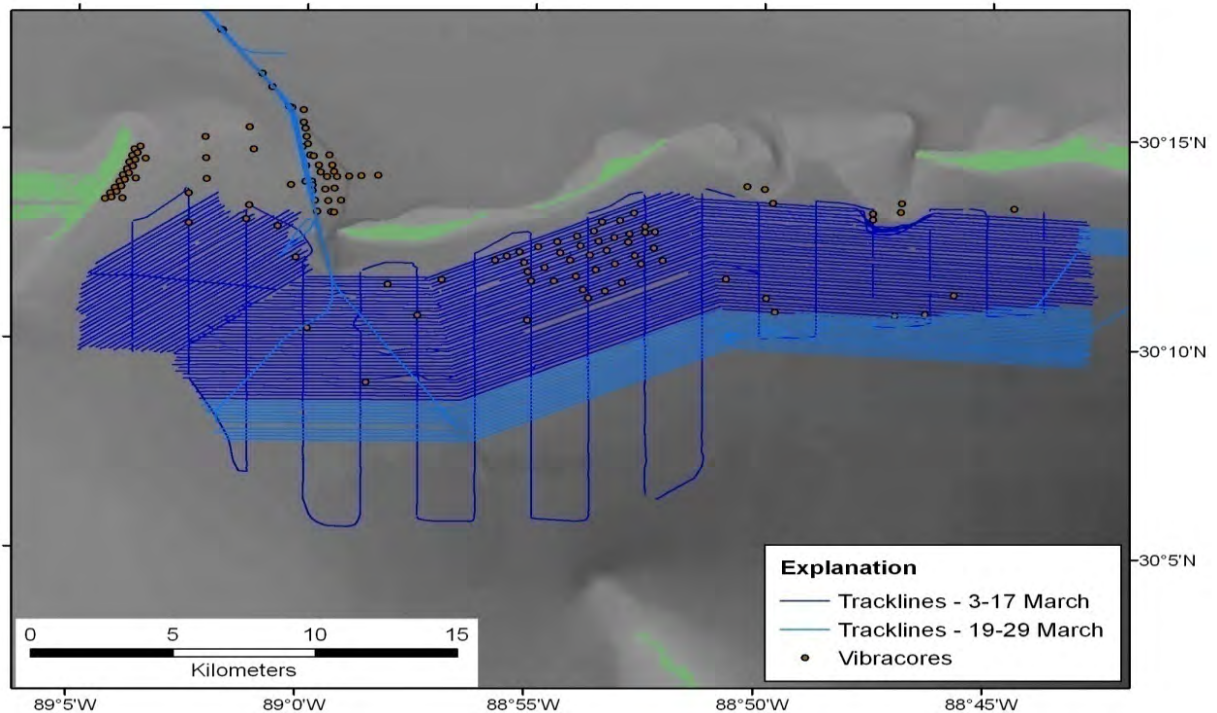


Figure 4.1.1.1 - Tracklines along which geophysical data (CHIRP seismic-reflection, swath bathymetry, and sidescan sonar) were collected. Also, locations of vibracores collected by USACE.

Shore-parallel, trackline spacing was chosen to ensure at least a 10% overlap of adjacent sidescan sonar swaths. The sidescan system produces a large swath width, typically between 150 and 200 m. Shore-perpendicular tracklines were used to facilitate internal comparison and correlation of bathymetric and CHIRP seismic-reflection data with shore-parallel versus shore-perpendicular orientations (Twichell et al., 2011). Interferometric-sonar, sidescan-sonar, and CHIRP seismic-reflection systems were deployed simultaneously during all the cruises. However, all three were not necessarily collected for the entire length of the tracklines. During the first leg of Study Area 1, interferometric-sonar, sidescan-sonar, and CHIRP seismic-reflection data were acquired along 1,321 km, 1,332 km, and 1,523 km of trackline,

respectively. During the second leg of Study Area 1, interferometric-sonar, sidescan-sonar, and CHIRP seismic-reflection data were acquired along 445 km, 455 km, and 492 km of trackline, respectively. Processed bathymetric soundings yielded a final bathymetric surface area of about 265 km², which was gridded at a resolution of 50 m per pixel. The total area imaged with sidescan sonar was approximately 260 km² with gray-scale GeoTIFF images of the mosaics produced at 1 and 5 meter resolutions. Approximately 2,015 km of high-resolution CHIRP seismic-reflection profiles were collected. A 1,500 m/s speed of sound was used to convert the vertical scale of the seismic data from milliseconds of two-way travel time to depths in meters. Grid surface calculations were used to compute the thickness and volume of different stratigraphic units (Twichell et al., 2011). Gas was extensive in the sediment under much of the western part of Study Area 1 and limited interpretation of deeper horizons. Figure 4.1.1.2 shows an example of this phenomenon.

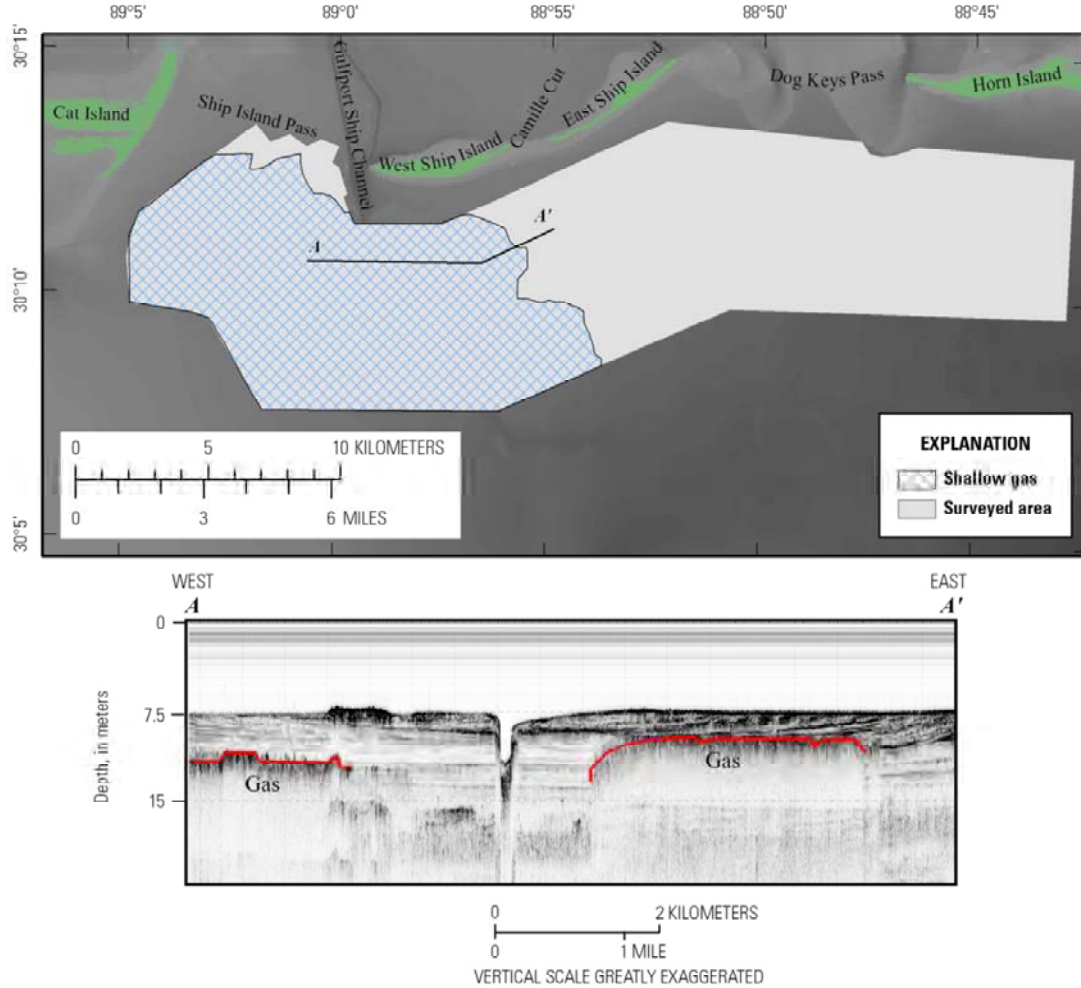


Figure 4.1.1.2. Map showing the extent of the survey area affected by shallow gas (gray polygon) and an example profile showing the blanking of the deeper stratigraphy by gas (from Twichell et al., 2011)

Data collection for Study Area 2 and 3 progressed in similar fashion. Further descriptions of the equipment, acquisition techniques, and data processing used in this survey are documented in Pendleton and others (2011), Forde and others (in press) and Pfeiffer and others (2011).

4.1.2 CONCLUSIONS AND RECOMMENDATIONS FROM 2010 GEOPHYSICAL INVESTIGATION

At the conclusion of the March 2010 geophysical surveys, the USGS provided initial field interpretations of the survey data and also identified initial vibracore locations to gather physical samples of the sediments for inspection and textural classification to

validate their field interpretations. These recommendations were based on an area having the potential for large deposits of sand that could be economically dredged and used for the Barrier Island Project. Examples of the field interpretations are shown in Figures 4.1.2.1 and 4.1.2.2.

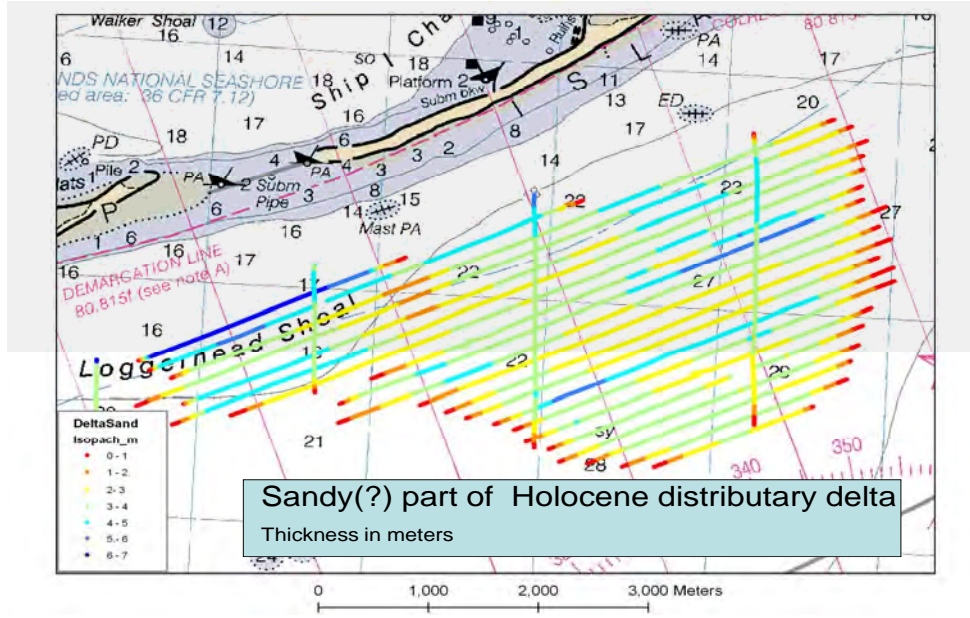


Figure 4.1.2.1 – Example isopach of area south of Camille Cut and East Ship Island designated as Ship Island study area, part of USGS’ Study Area 1.

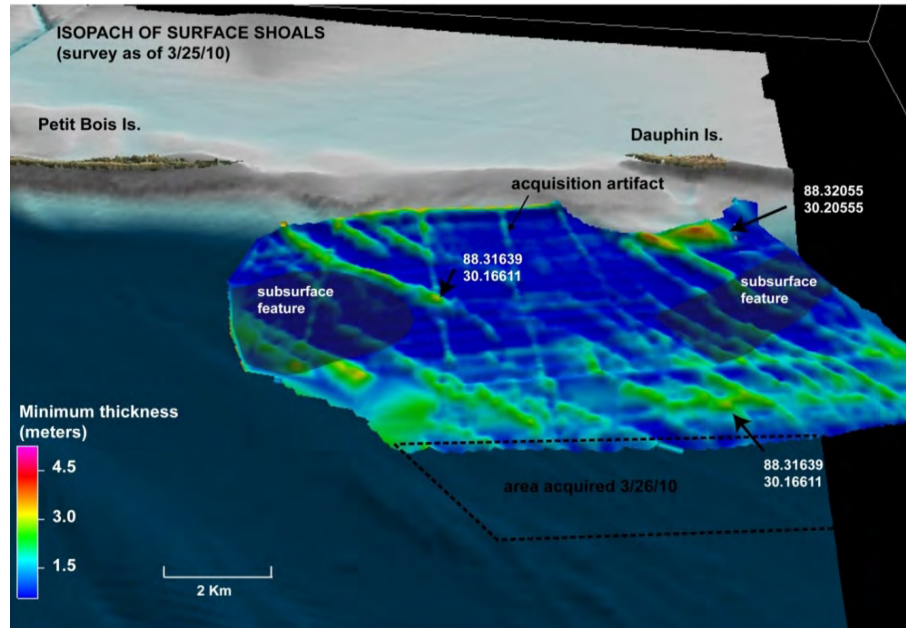


Figure 4.1.2.2 – Initial interpretation of geophysical data indicating sandy shoals south of Petit Bois Pass and designated as Petit Bois Pass study.

The USGS identified potential sand sources in the three study areas (Figure 4.1.2.3) and estimated quantities of useable sand in each one (Table 4.1.2.1).

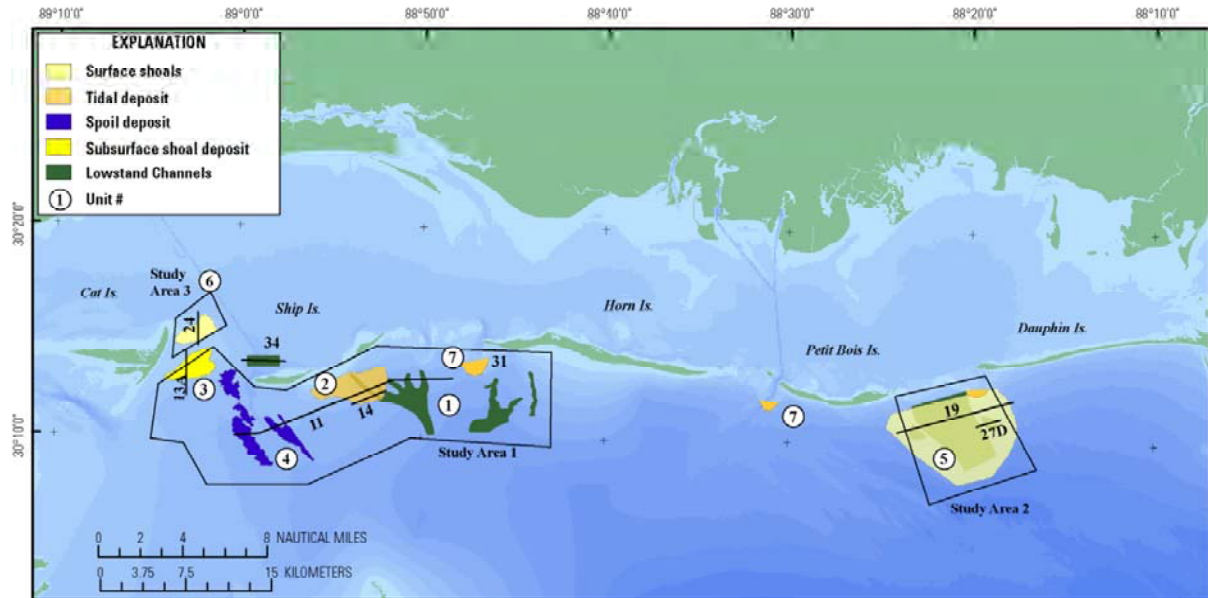


Figure 4.1.2.3 Locations of potential sand resources identified in this study. Each deposit is assigned a unit number that corresponds to textural information in Table 4.1.2.1 (from Twichell et al., 2011)

Table 4.1.2.1- Characteristics of potential sand-resource deposits located on the shelf offshore of the barrier islands south of the Mississippi coast. The unit number corresponds to the circled numbers in Figure 4.1.2.3. (Table 4.1 from Twichell et al., 2011)

Unit Number	Study Area	Deposit	Total volume ($\times 10^6 \text{ m}^3$)	Volume of deposit > 1 m thick ($\times 10^6 \text{ m}^3$)	Proximity to Camille Cut (km)	Sediment cover (m)	Median grain-size range (mm)	Estimated sand (%)
1	1	Lowstand Channels	97*	70*	3-17	>3	0.1694-0.2778	25-75
2	1	Loggerhead Shoal and Tidal Delta	40	29	1.5-6	0	0.1409-0.3360	92-95
3	1	Ship Island Pass Shoal	7*	4*	9-14	<1	0.1275-0.1992	94-97
4	1	Dredge Spoil	11	2	8-10	0	0.1991-0.2030	30-96
5	2	Petit Bois Pass Shoals	56	2-22	52	0	0.2300-0.2800	>90
6	3	Cat Island Shoal	25	20	10	0	0.1850-0.1900	88-97
7	1	Modern ebb-deltas	>6 each	>4 each	11, 33, 50	0	0.1600-0.2300	94-99

* Volumes only for the part of the deposit within the Study Area.

While several recommended areas may contain potential borrow material, three primary areas were of interest because of their location, potential volume of the

available material, and habitat designation. These areas of interest were Cat Island, Ship Island, and Petit Bois Pass.

These locations were sampled with vibracores to obtain physical samples of the material to correlate with the geophysical data. Geologists classified the sediments and made initial observations of grain size and color. These vibracore locations covered several different areas near the islands, extending from near Cat Island (not within GUI) eastward to Petit Bois Pass. This vibracore sampling is described in greater detail in Section 5.2. The westernmost area that was surveyed is shown in Figure 4.1.2.4, along with recommended vibracore locations based on initial field interpretation of the geophysical data. The recommended vibracores were used to determine textural characteristics of the different strata identified and validate the geophysical model. A separate layout of recommended vibracores was provided for the eastern portion that included the area south of Petit Bois Pass (Figure 4.1.2.5).

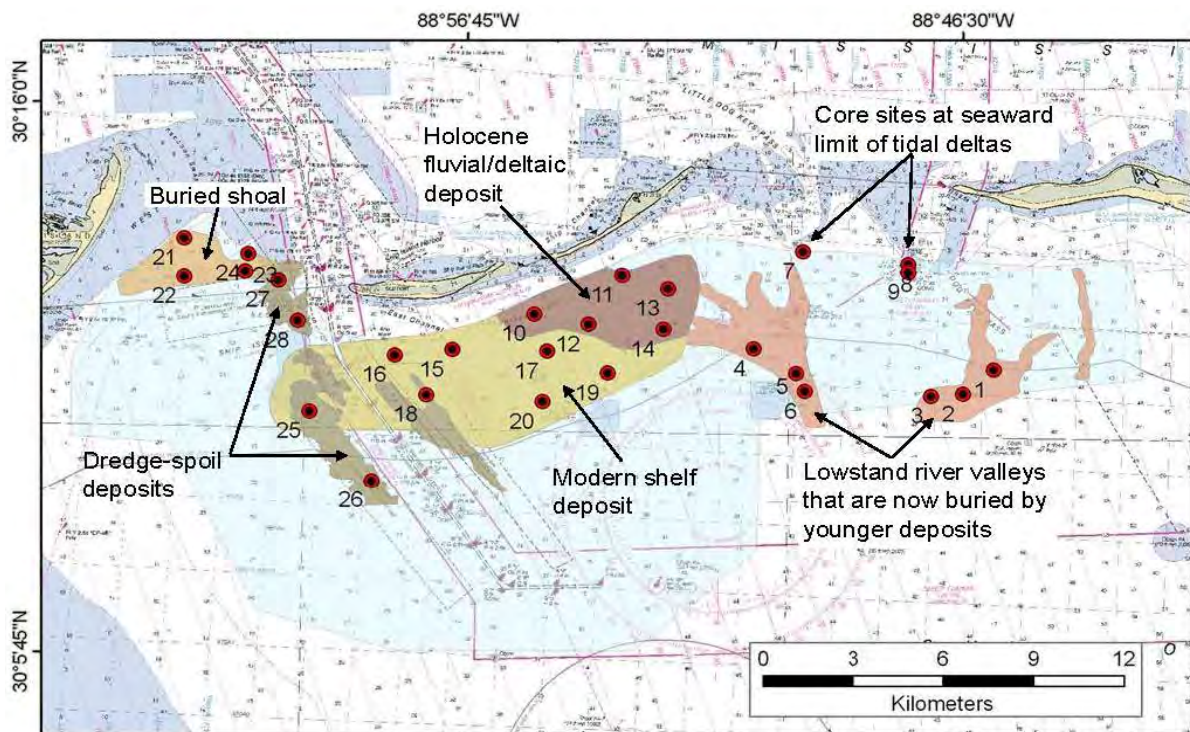


Figure 4.1.2.4 – Initial field interruptions of geophysical data with recommended proof vibracore locations, western area of investigation

The interpretations identified in Figures 4.1.2.2 and 4.1.2.3 were included in several different study areas. The buried shoal (#3) and dredge spoil deposits (#4) between Cat and West Ship Islands were included in the Ship Island Pass study area. The modern shelf (#7) and Holocene fluvial/deltaic deposits south of West Ship Island

(#2) were included in the Ship Island study area, and the remaining core sites to the east were all included in the Dog Keys Pass study area. Other study areas not identified as potential borrow sites, but falling within the limits of Figure 4.1.2.4, are Gulfport Channel, Mississippi Sound, and Dog Keys Pass. Figure 4.1.2.5 provides the recommended vibracore locations for Petit Bois Pass in Study Area 2.

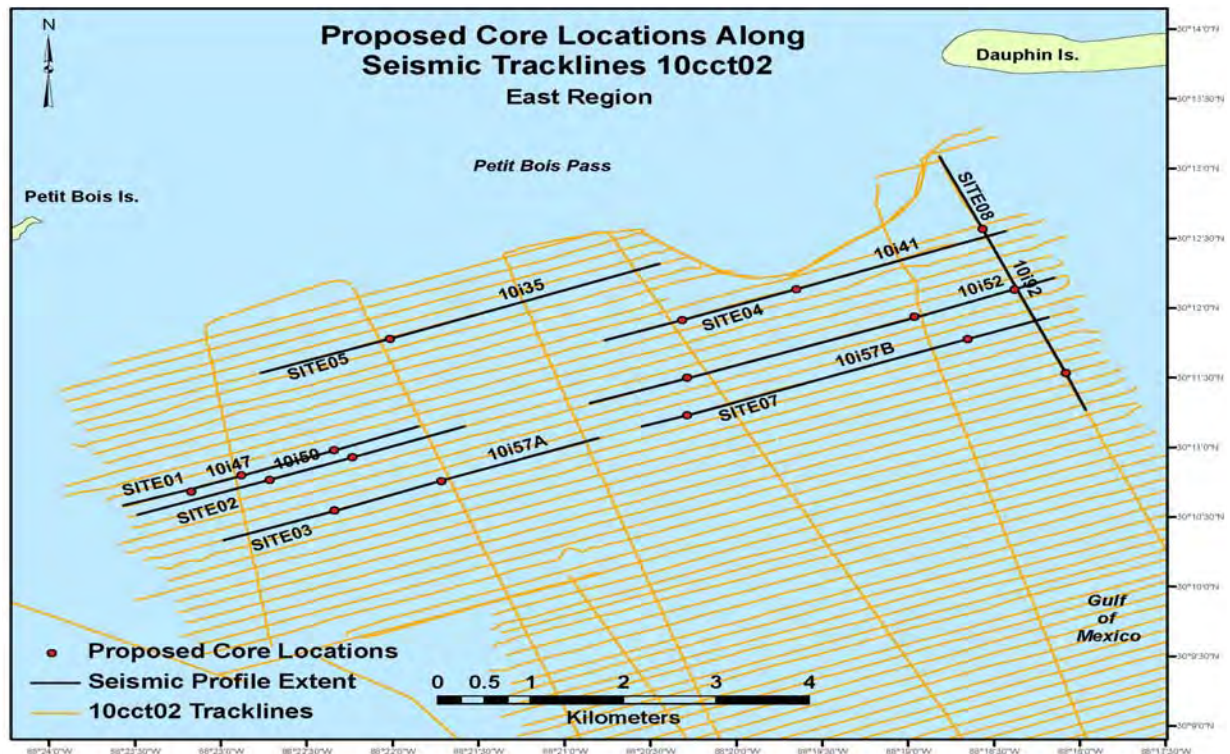


Figure 4.1.2.5 – Initial field interruptions of geophysical data with recommended vibracore proof locations, eastern area of investigation south of Petit Bois Pass.

The shoals south of Camille Cut and the fluvial/deltaic deposit that lies south of East Ship Island represented the largest target areas for useable sand in Camille Cut and at East Ship Island. The deposit stretches along the front of East Ship Island for 9 km, is up to 5 km wide, and reaches 5.7 m in thickness. The deposit is 1.5 to 6 km from the Camille Cut restoration area. Seismic data show that this sandy deposit is exposed on the sea floor for much of its extent (Twichell et al., 2011). The dimensions of this deposit indicate it contains the required quantity of sediment for the Camille Cut area, while the geophysical interpretations, vibracores, and field classification indicate the material meets most of the proper criteria for restoration use. Unfortunately, lab data from the vibracores indicates that the sand is too fine-grained to be used in the core of the Camille Cut fill project, but could possibly be used as a capping material.

Another large deposit of interest was identified as Petit Bois Pass Shoals, shown in Figures 4.1.2.2 and 4.1.2.3. Flocks (2010) has described the features in this area as a combination of ebb tidal delta overlaying lowstand channel deposits. The fluvial deposits are not considered part of the ebb tidal delta and “do not contribute significantly to the littoral system that maintains the islands.” The shoal system and ebb-tidal delta contain > 90% sand. The delta contains moderately well-sorted, medium sand with a 2.3 - 4 m thickness. Removal of sediment within the inlet would likely “disrupt the littoral system”. The shoal systems, on the other hand, “do not contribute significantly to the littoral system”. The shoals contain poorly-sorted, medium sand and range in thickness from 2 - 5 m, surrounded by a 1 - 2 m mantle of poorly-sorted, silty sand. The shoal sands “originate from the same fluvial sources and are genetically related to barrier islands.” (Flocks et al. 2011) Based on these data interpretations and dimensions, the Petit Bois Pass is potentially a suitable borrow area.

Another area of interest for borrow was offshore from the east face of Cat Island. This area is within Ship Island Pass, but was given a separate study designation as the Cat Island study area. Although the geophysical surveys could not be performed in the shallow water of the study area, survey lines as completed in Ship Island Pass and other prior work by Otvos (1975) indicated that shoals in the Pass extend westward to Cat Island. Based on these previous studies and the USGS data interpretations, offshore of the east face of Cat Island was identified as a potentially good source for further investigation as a borrow site.

A final potential borrow area was identified from bathymetry work conducted as part of a separate sediment budget study. This study identified several mounds of sediments south of Horn Island Pass (the eastern-most #7 on Figure 4.1.2.3) that were located within a permitted offshore dredged material disposal area (Byrnes, oral comm.). These mounds were mostly sediments transported by littoral zone processes from Petit Bois Island, deposited in the Pascagoula Bar Channel, and then dredged and placed in the disposal area, thus creating the mounded features. Considering the source of the dredged material, this area was added as a sample area, designated as Horn Island Pass.

For a more detailed discussion of the 2010 surveys, see the USGS Open-File Report 2011-1173, The Shallow Stratigraphy and Sand Resources Offshore of the Mississippi Barrier Islands, (Twichell et al., 2011).

4.2 2013 GEOPHYSICAL SURVEY

Bathymetry for the area south of Petit Bois Island, and adjacent to the eastern edge of the geophysical survey from 2010, indicated several large shoals that might offer suitable sediment in economical quantities. Unfortunately, there was no current geophysical data for this area to confirm this supposition. This data gap led to USACE entering into another Inter-Agency Agreement with USGS to conduct a geophysical survey similar to the 2010 surveys, with the purpose of gathering data to conduct a stratigraphic and morphologic assessment south of Petit Bois Island and to identify core locations in support of the USACE sediment sampling strategy.

The survey was conducted in August 2013 and covered a region approximately 1 km to 13 km offshore of Petit Bois Island and approximately 77 miles² (212 km²) in area (Flocks, 2014). The survey equipment used and the data collected was the same as for the 2009-2010 surveys. The University of Southern Mississippi's research vessel *Tommy Munro* was the platform used to conduct the surveys. Line spacing of the tracklines was 150 m in waters less than 15 m, and 300 m in deeper waters, oriented parallel to the shoreline. Five shore-perpendicular tracklines were collected across the survey area to tie the horizontal lines together. Data collected included DGPS navigation, high-resolution CHIRP seismic-reflection profiles for mapping the shallow stratigraphy, interferometric swath bathymetry to provide a detailed understanding of the seafloor morphology, and sidescan sonar imagery for mapping the seafloor geology (Flocks, 2014). Figure 4.2.1 shows the area surveyed and the completed survey tracklines described previously.

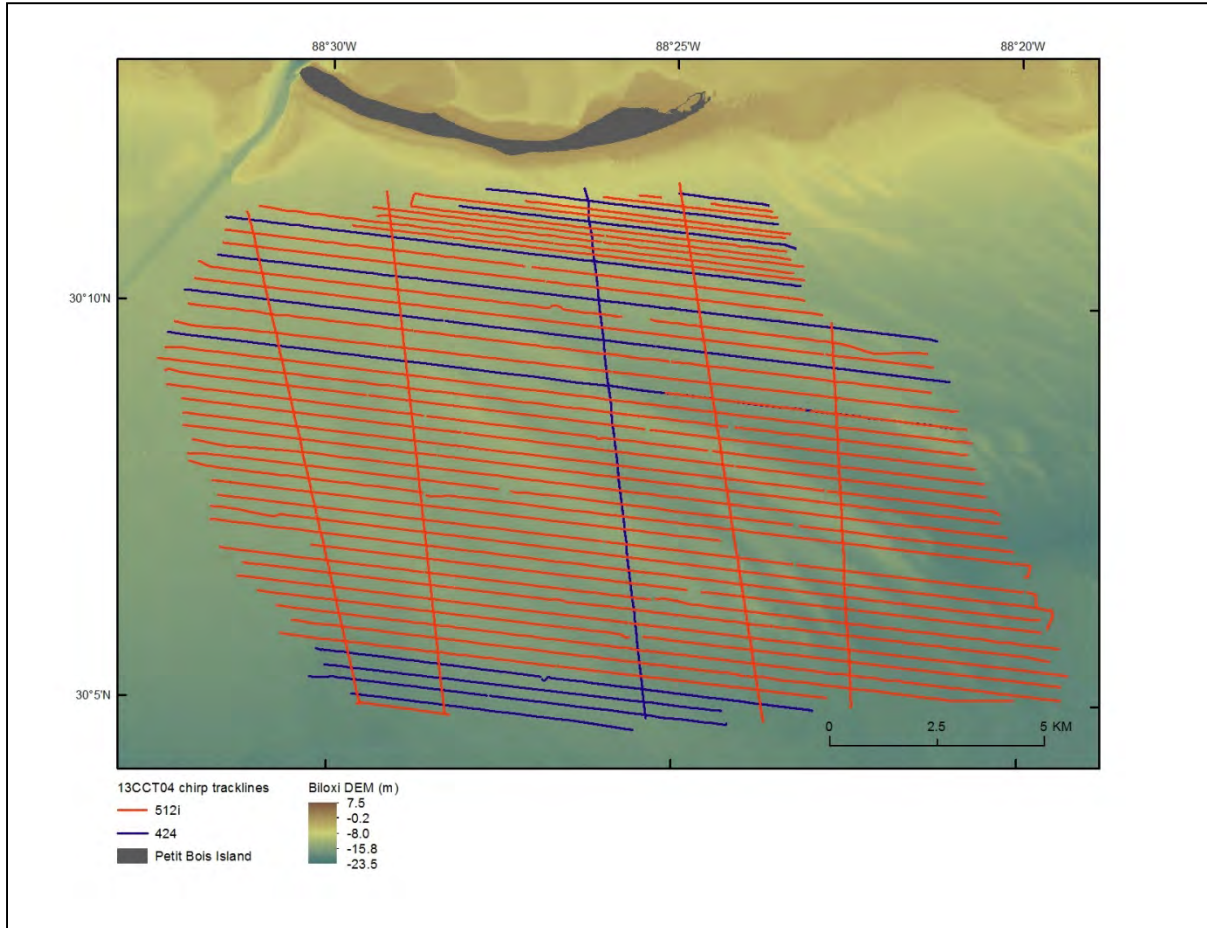


Figure 4.2.1 – 2013 Geophysical Survey tracklines. Petit Bois Island is directly to the north. (Flocks, 2014)

The USGS used the survey data to create a sand isopach map for the surveyed area, incorporating the surface and subsurface features, and outlining the thickest shoals (Figure 4.2.2) for sampling. The black dotted lines trace the shoal boundaries. The thickness of the shoals and sand sheets is represented by red (thickest deposits) and grades to blue (thinnest deposits).

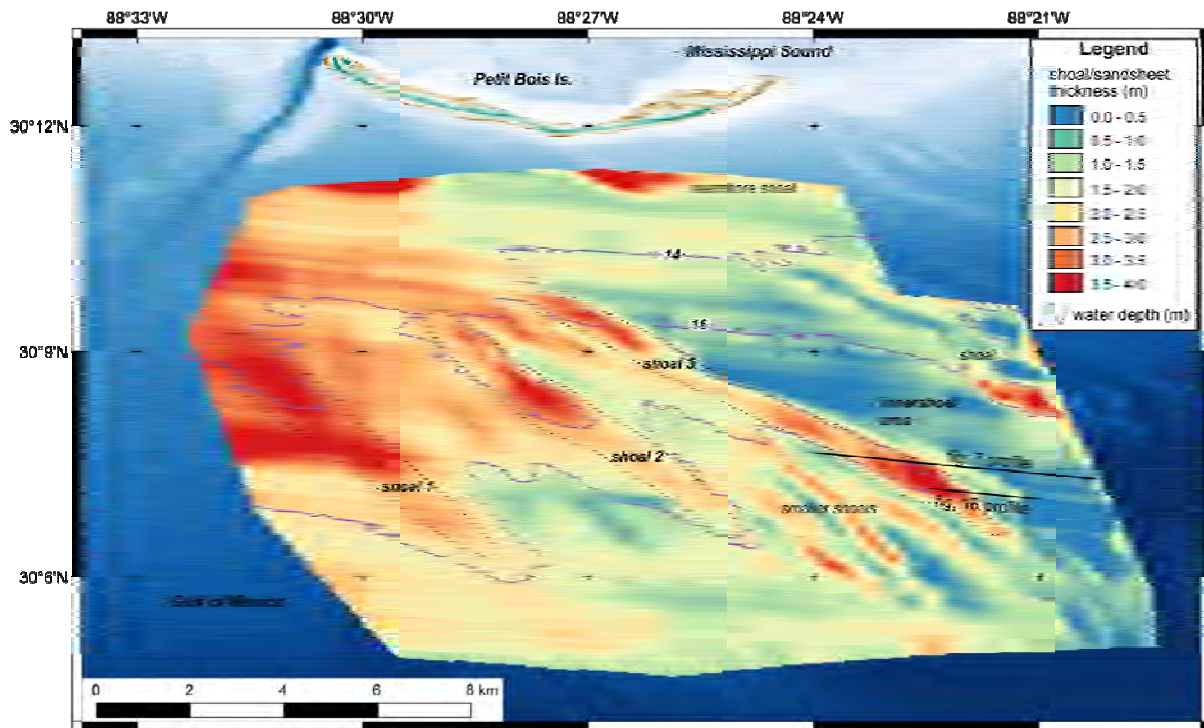


Figure 4.2.2 Isopach map of surface sediments show shoal systems extending NW-SE across study area surrounded by a thin (<1.5 m) sand sheet. Base of surface sediments is defined by the top of the Holocene transgressive deposits (Flocks, 2014).

4.2.1 Results of the 2013 Geophysical Survey

The results of the 2013 survey and subsequent study indicate that the shallow stratigraphy of this region is the product of fluvial-marine sedimentation, driven by sea-level oscillations during the late Pleistocene and into the Holocene (Flocks, 2014, and, Flocks and others, 2011b). The predominant sea floor features include shoals and shelf sand sheets of various sizes and orientations. The inner shelf is mainly covered by flat sand sheets that grade laterally into muds within the inner shoal areas. In profile, the shoals are the predominant vertical features in the area (Flocks, 2014). The seafloor within the study area slopes to the southeast with gradients generally about 0.03 degrees, which is generally consistent with the Mississippi-Alabama shelf within 20m of water (Flocks, 2014). Three major NW-SE trending shoals run through the study area (Figure 4.2.1.1), with side angles ranging from 0.07 – 0.35 degrees, with the shoals adjacent to the large inner-shoal area in the eastern half of the survey area (Figure 4.2.2) having the highest gradients (Flocks, 2014). The major subsurface geology includes Holocene and Pleistocene-

age features such as bayhead delta deposits and marine-transgressive deposits infilling older fluvial distributary systems (Flocks, 2014). Figure 4.2.1.1 shows the refined location of these major features. Because these shoals are in deeper water, they are generally more stable features than ones in shallower waters. This study area dovetails in with the 2010 geophysical survey area south of Petit Bois Pass and indicates that the area is divided between fewer larger shoals in the west and smaller, more numerous shoals in the east. The dividing intershoal area also contains sand, but in thinner, surficial deposits (Table 4.2.2). Table 4.2.1.1 contains the estimated volumes, thicknesses, grain size, and sand content for these major features.

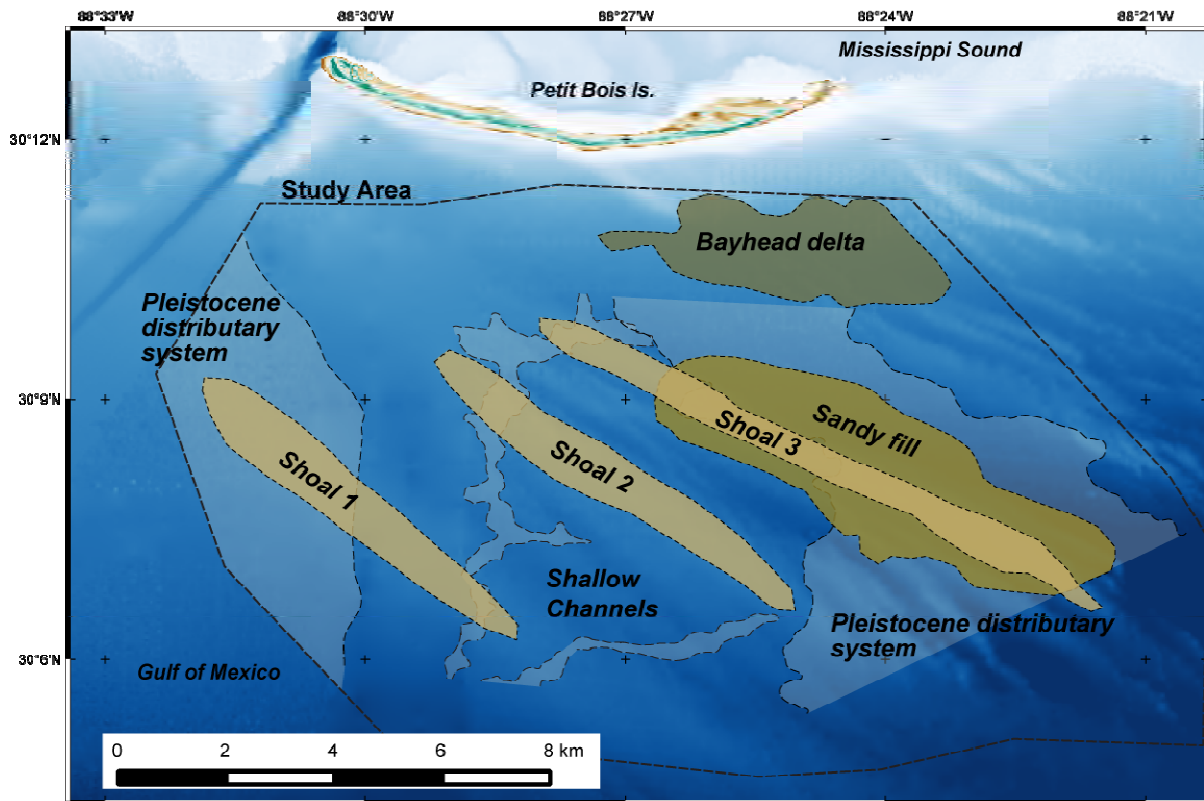


Figure 4.2.1.1 Significant features identified in the USGS's study include shoals and fluvial deposits (Flocks, 2014)

Table 4.2.1.1. Physical characteristics of features identified in the study, the study area, and neighboring Petit Bois Island for comparison (Flocks, 2014).

Deposit	Area (km ²)	Volume (x10 ⁶ m ³)	Min. thickness (m)	Max. thickness (m)	Volume per unit area (x10 ⁶ m ³ /km ²)	Overburden thickness (m)	D50 ⁴ (mm)	Sand content (%)
Shoal 01	7.1	24.2	2.5	4.0	3.40	0	0.11– 0.25	81-98
Shoal 02	7.2	20.3	2.1	3.8	2.83	0	0.13- 0.32	84-99
Shoal 03	7.6	21.7	1.4	4.0	2.84	0	0.19- 0.34	84-99
ISS ¹	15.0	14.5	0.0	1.5	0.96	0	0.17- 0.32	65-99
Sandy fill	19.7	83.5	1.0	6.8	4.23	2 - 9	0.18- 0.24	83-97
bayhead delta ²	12.6	100.4	4.0	11.0	7.94	3 - 6	0.28	91
Study Area ³	198.4	431.0	0.0	5.8	2.17	0	0.19- 0.51	80-99
Petit Bois Island. ³	4.0	5.3	0.0	5.3	1.33	0	0.36	99

¹Inner-shoal sand sheet, area east of shoal 3 (fig. 4.2.1.1). ²Portion within study area. ³Surface deposits only.

⁴Grainsize analysis from USACE 2014. Bayhead delta grain size analysis from Kelso and Flocks (2014).

USACE personnel used the shoal outlines and suggested initial vibracore locations as guides to develop a vibracore layout for the 2013 geotechnical sampling event. Because of the relatively thin sand sheets between the shoals and throughout the study area, the thickness and composition of the three shoals made them the primary targets for core sampling by USACE. Other core sites were suggested by USGS to identify potential subsurface deposits, too. The large subsurface sandy fill deposit in Figure 4.2.1.1 was not initially identified before sampling began, but the vibracore layouts were readjusted to sample this new area after it was identified by USACE vibracores and verified in the USGS's geophysics.

For a more detailed discussion of the 2013 survey, see the USGS's report, *Near-surface stratigraphy and morphology, Mississippi inner shelf, northern Gulf of Mexico*. (Flocks and others, 2014).

5.0 GEOTECHNICAL SAMPLING

Sediment sampling events were conducted in 2010, 2011, 2012, and 2013. The vibracoring method was selected to collect the sediment samples for the geotechnical investigation because it works well in unconsolidated, granular material and produces a minimally-disturbed sediment core relative to other sampling techniques. It is especially useful in a marine environment where it can be difficult to maintain a stationary position for extended periods of time for other sampling techniques. The following paragraphs provide a brief summary of each sampling event.

The 2010 sampling event included all recommended vibracore sites identified by the USGS' initial field interpretations of the geophysical survey data collected in 2010. This phase of sampling consisted of 369 vibracores and included sites from Cat Island eastward to Petit Bois Pass. A site south of Horn Island Pass was also included after results from the sediment budget study indicated that a potential deposit of sand was located there. This sand is a historical disposal site where dredged sediments from the Pascagoula Bar Channel were placed.

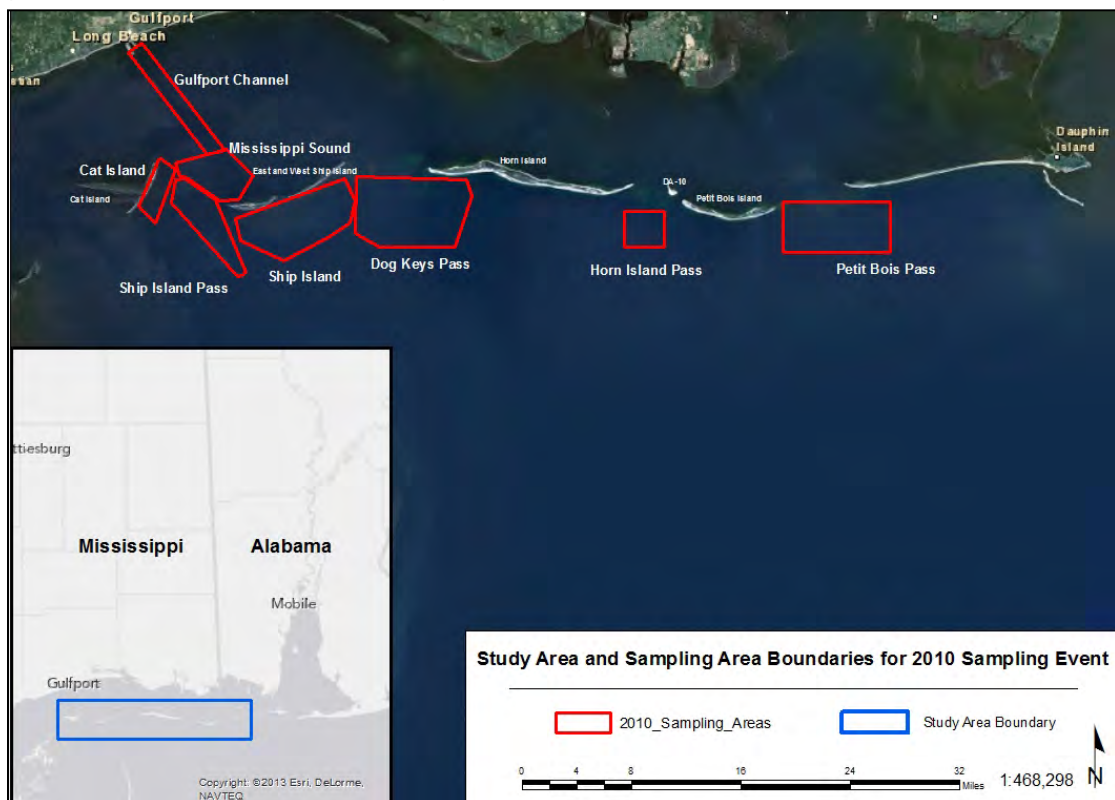


Figure 5.0.1 – 2010 Sampling Areas.

The 2011 sampling event was performed during the summer of 2011. The purpose of this sampling event was to fill data gaps for the Cat Island and Petit Bois Pass-Alabama investigation sites, and to obtain data on an active dredged material disposal site for the Pascagoula Bar Channel running through Horn Island Pass, designated as Disposal Area 10 (DA-10), and known locally as Sand Island. This phase of sampling consisted of 89 vibracores and included sites from Cat Island, DA-10, and Petit Bois Pass. The initial borrow site proposed for Cat Island had negative findings based on modeling of wave-focusing caused by the excavation of the borrow material. Three other sites were proposed, but none were recommended because of a lack of sufficient vibracore data. Vibracores were added to obtain the data needed, but then these three sites were eliminated because of the vibracore data. However, these results did lead to a revised potential borrow site designated as Cat Borrow Site 4, considered the best alternative. In the east, vibracores were added to the existing array at Petit Bois Pass-Alabama to further delineate the proposed sites identified in 2010. The last site investigated during 2011 was at DA-10 where there was no available vibracore data other than old Pascagoula Bar Channel vibracores. The results of the sediment budget modeling report (Byrnes, et al., 2011), showed that the disposed sediment was placed too far north in the pass for longshore currents to transport it downdrift to feed the other islands as initially intended when it was designed. This lack of movement made the man-made island a viable sand source because the sand was not going to be taken out of the littoral system, merely moved downdrift. Therefore, removal of the sand would not be interfering with the littoral system as a whole.

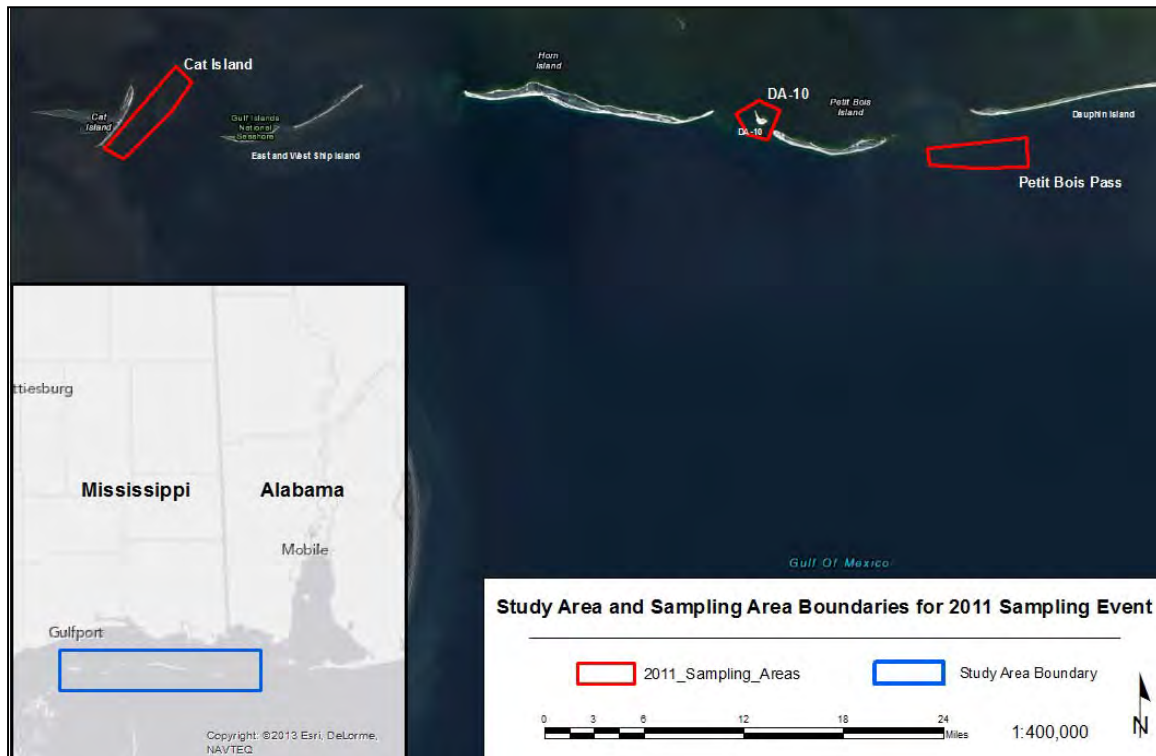


Figure 5.0.2 – 2011 Sampling Areas.

The 2012 sampling event was conducted from November 2012 to January 2013. This sampling event consisted of 230 vibracores in Horn Island Pass, Petit Bois Pass-Alabama, Petit Bois Pass-Mississippi, and Petit Bois Pass-Outer Continental Shelf (OCS). This event collected more samples in the Horn Island Pass area to further delineate the dredge-disposal mounds and to determine if the margins of the Pascagoula Bar Channel contained suitable sediment for use in this project. Sampling was conducted south of the eastern end of Petit Bois Island to determine the sediment characteristics of a large northwest-southeast-trending shoal located outside the NPS boundary in Mississippi state waters. Additional vibracores were drilled around the Petit Bois Pass-Alabama borrow areas identified in the 2010 and 2011 sampling events to determine the feasibility of expanding their boundaries out further. Vibracores were also drilled in an area 5 miles south of Petit Bois Pass, targeting several shoals identified during the 2010 geophysical survey.

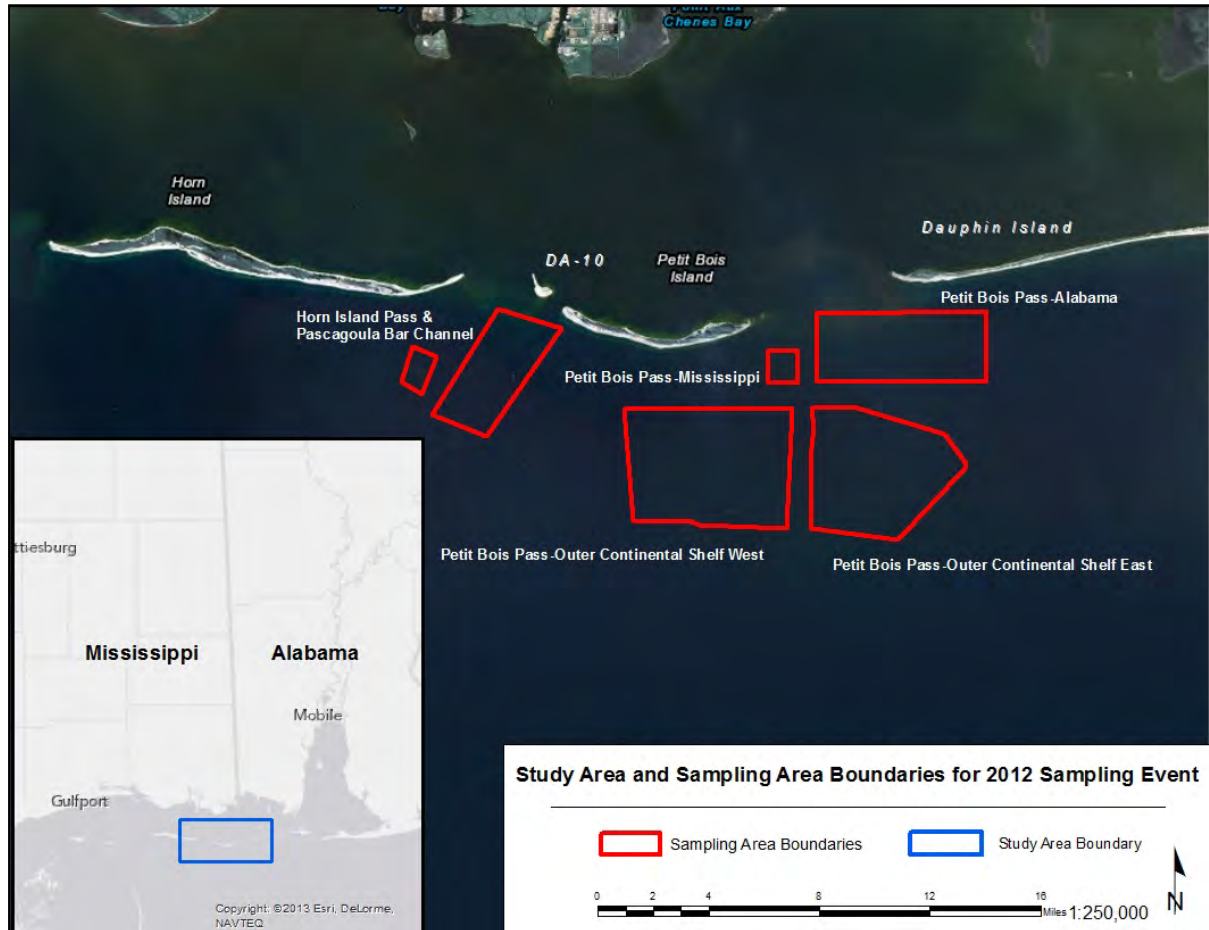


Figure 5.0.3 – 2012 Sampling Areas.

The 2013 sampling event was conducted from 22 November 2013 to 22 February 2014. It consisted of 206 vibracores in the area south of Petit Bois Island and in the southern reach of Horn Island Pass. The Horn Island Pass vibracores were conducted to further delineate borrow areas previously identified on the dredged disposal mounds during the 2012 sampling event. The Petit Bois Pass-OCS vibracores targeted the large shoals identified during the 2013 geophysical survey on the western side of the area and also augmented vibracores in the eastern portion of the area from the 2012 sampling event.

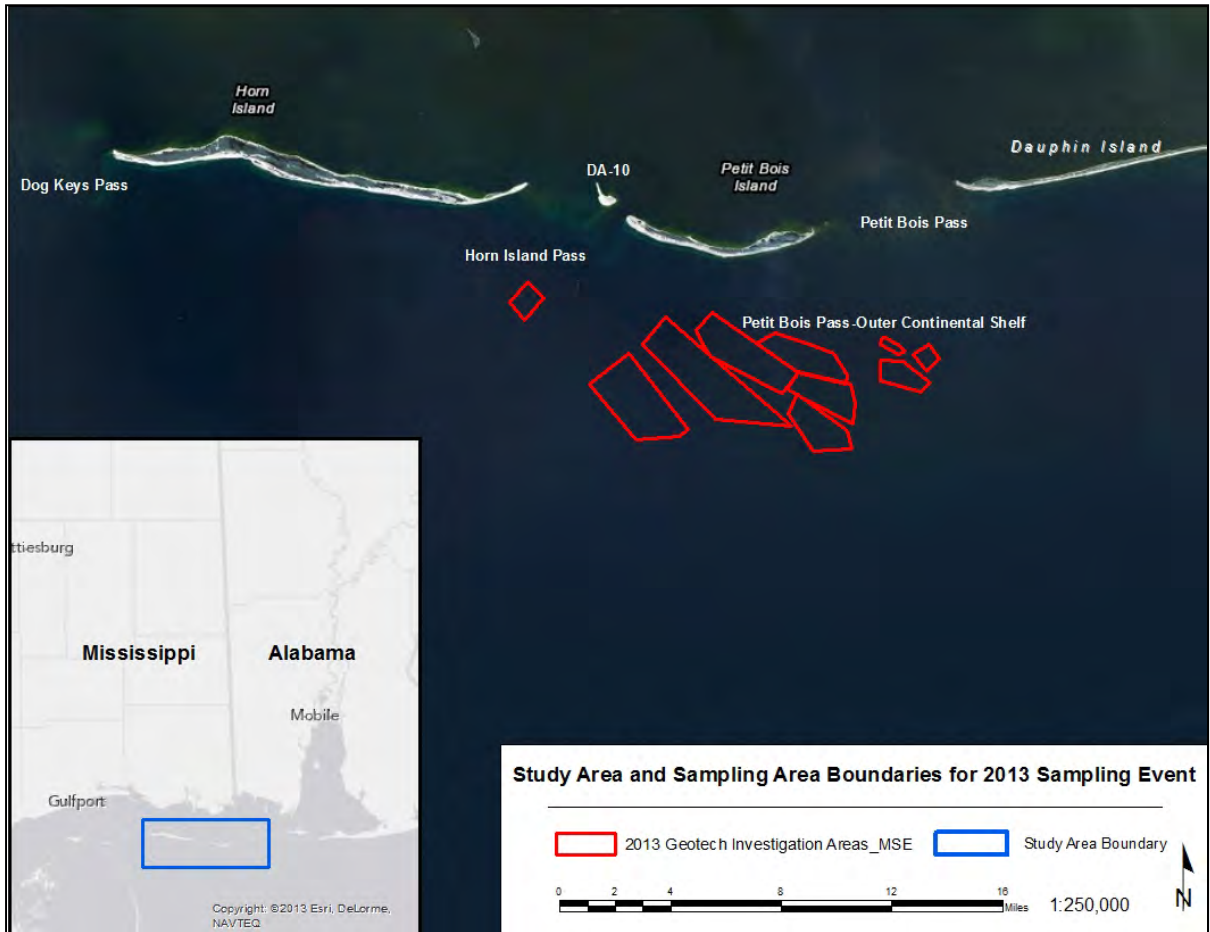


Figure 5.0.4 – 2013 Sampling Areas.

Figure 5.0.5 is a consolidated map view of the actual vibracore locations from the 2010-2013 sampling events. Each sampling event is color-coded to show the temporal and spatial extent of sampling throughout the four-year investigation.

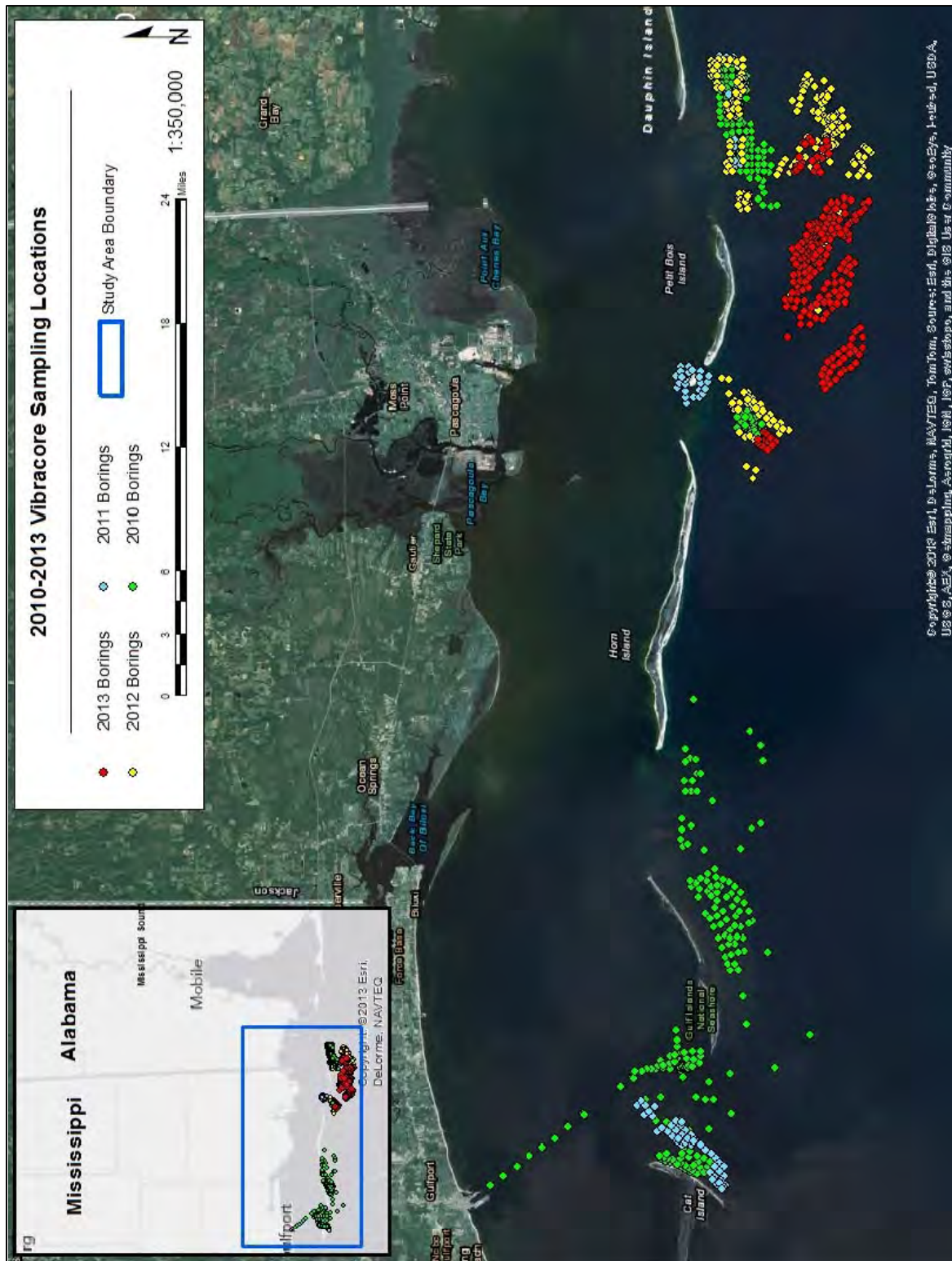


Figure 5.0.5 – Locations of vibracores completed for the 2010-2013 sampling events.

5.1 VIBRACORE SAMPLING PROCEDURES AND PROTOCOL

Geotechnical sampling was conducted using a vibracore sampler with a 20-foot core barrel. Photographs of the operation with the vibracore sampler used for the 2010, 2011, and 2013 sampling events are shown in Figures 5.1.1, 5.1.2, and 5.1.3. Figure 5.1.1 is the vibracore unit lying on its side on the deck of the vessel used during sampling in 2010, 2011, and 2013. The red unit at the top of the vibracore barrel, to the right side of the photograph, is a hydraulically-driven concentric motor. When in operation, the motor produces a high frequency, low amplitude vibration that is transmitted through the attached 20-foot core barrel, shown in the photograph. This barrel runs vertically through the center of the derrick's four legs and the center of the base plate. The vibracorer used for the 2012 sampling event was different in its design, but the same principles apply. The core barrel has an inner sleeve constructed of clear plastic that is inserted prior to sampling and is held in place by a stainless steel shoe that screws onto the bottom of the core barrel. A metal catcher is also placed in the end of the sample tube, prior to the shoe being screwed on. It prevents the sample from falling out of the barrel as the barrel is lifted from the seafloor. The entire unit is lifted from the deck by a crane, or an A-frame with winch, and lowered into the water until its four foot pads are resting on the sea floor (Figure 5.1.2).



Figure 5.1.1 Vibracore unit used for 2010, 2011, and 2013 sampling events.



Figure 5.1.2 Vibracore unit being deployed during the 2012 sampling event.

The vibratory motor is activated and the vibrations transmitted down the barrel cause liquefaction of the sediments. Gravity pulls the core barrel down through the sediment. A core of the sediment slides up into the inner sleeve as the core barrel penetrates the underlying formation. This 20-foot penetration usually takes less than 60 seconds. When full penetration is complete, or the barrel will not penetrate any further, the unit is shut down. The vibratory unit is lifted first, pulling the core barrel up with it. When the vibratory unit slides to the top of the derrick, the entire unit is then lifted back onto the deck and laid on its side. The shoe is removed and the plastic inner tube containing the sample can be removed. After the plastic sample tube is removed from the core barrel, it is laid on a table, the metal catcher is removed from the bottom end, and the plastic tube is sawed open longitudinally with a circular saw to expose the entire sediment core. The size of the sampling vessel dictated how the sample was opened. For the 2010, 2011, and 2013 sampling events, the vessel was large enough to cut the entire 20-ft tube longitudinally and keep the sample relatively intact (Figure 5.1.3). The 2012 vessel was smaller and the tubes were cut into 4 5-ft sections and then cut longitudinally for access to the sediment (Figure 5.1.4).

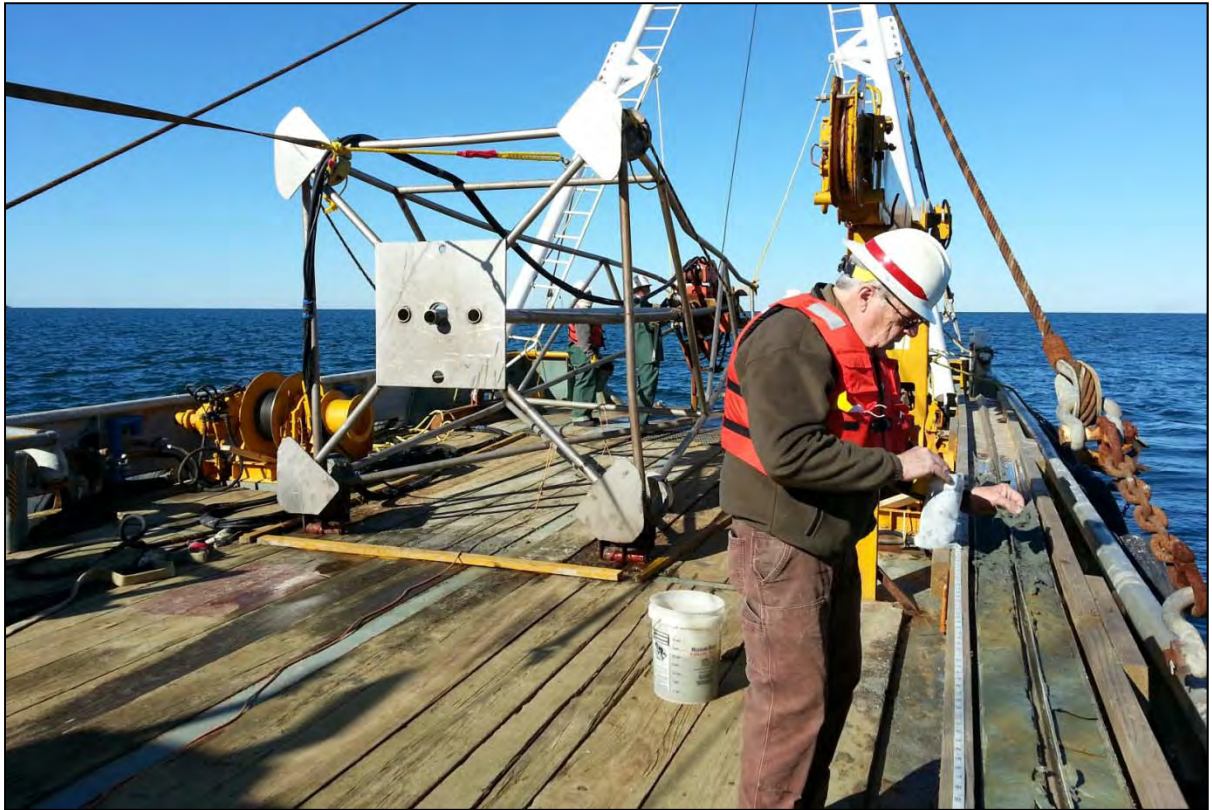


Figure 5.1.3 20-ft vibracore tube cut longitudinally for inspector to sample sediment during 2013 sampling event.

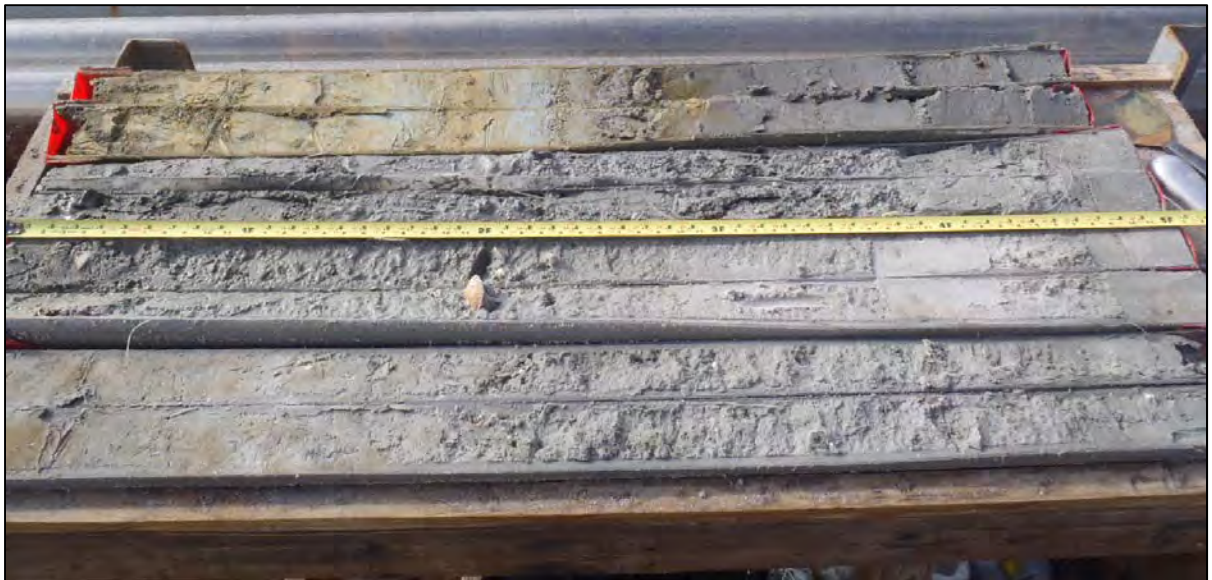


Figure 5.1.4 Vibracore tube cut into 4 5-ft sections and then longitudinally for logging during 2012 sampling event.

A USACE geologist or geotechnical engineer conducted the sampling for the 2010-2013 sampling events. During the 2010 sampling event, the NPS had geologists or geotechnical engineers on the vessel during all sampling to make field determinations of the material. A protocol was established to streamline the sampling effort as much as practicable. Each vibracore was photographed and then classified using visual-manual techniques (ASTM D2488) by the drilling inspector in its entirety. Geotechnical lab testing (ASTM D2487) was conducted only on sediment samples that were perceived by the on-site geologist to be of potentially suitable material for project use. Therefore, some vibracores did not have any geotechnical testing conducted on the recovered material other than the geologist's visual-manual field classification. Recoveries that included thick clay or silt strata were typically disregarded for sampling. Bag-samples for laboratory testing were extracted from the core at selected intervals depending on field-estimated textural characteristics. Sands, ranging from silty sands (SM) to poorly graded sands (SP), were bag-sampled, while clays (CL and CH) and silts (ML and MH) were discarded. The USACE inspector had the discretion to not sample sandy material that did not appear to be suitable either because of its dark color or because of its fines content. This eliminated some SM material and most clayey sands (SC). If a two-foot or greater thickness of clay or silt was in the vibracore, deeper material below it was generally not sampled. These thick clay or silt layers were used as a basement cutoff because of the difficulty in dredging through them and their effect on sediment quality control at the placement site.

For potentially suitable samples, a commercial laboratory conducted a mechanical sieve analysis on the sediment using the following sieve sizes: 0.375-in., Standard U.S. #4, #10, #20, #40, #60, #100, and #200. A cumulative grain size distribution curve was created by plotting the percentages of the dry weight sample retained on each sieve size (Y-axis, linear scale) versus the sieve size (X-axis, log scale) and then drawing a best-fit curve through these data points (Figure 5.1.5). Grain size distribution curves were plotted for almost all sediment samples collected on the islands and all the offshore samples. The following statistics were determined or calculated from information on the curve: the median (D50), the graphic mean, the coefficient of uniformity (C_u), and the coefficient of curvature (C_c).

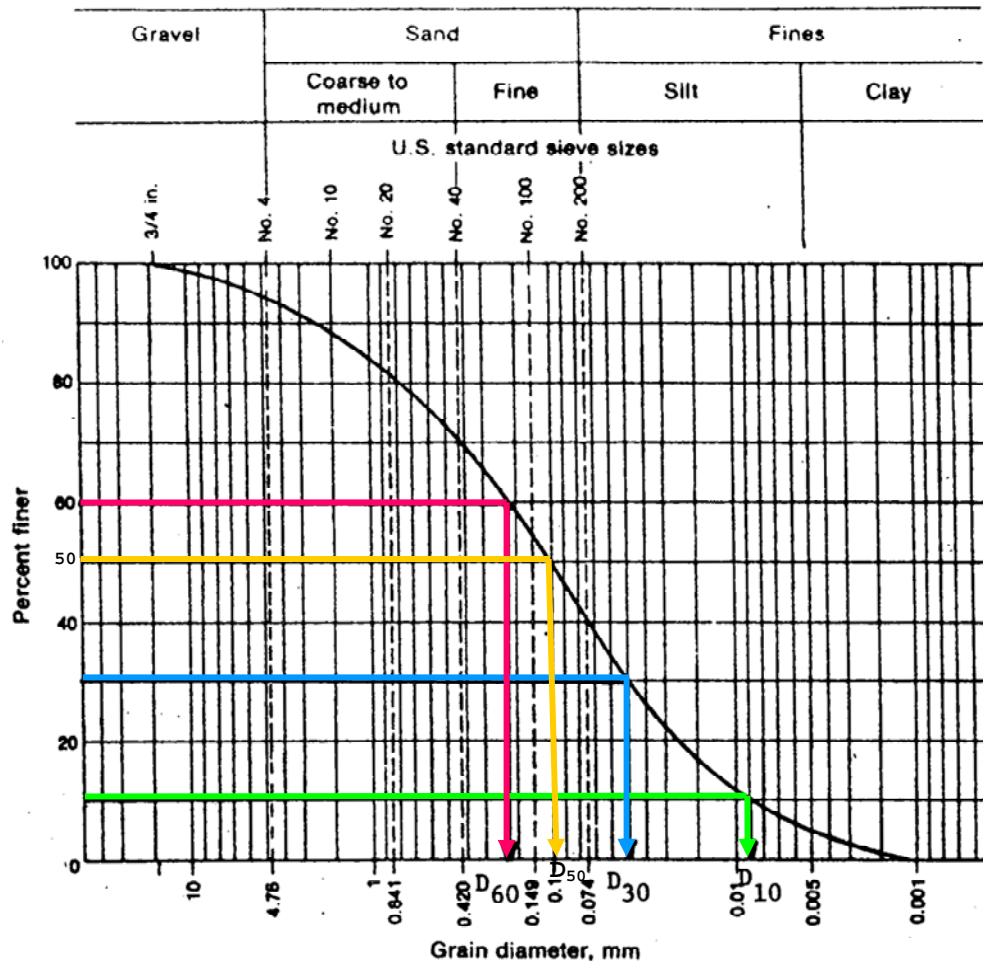


Figure 5.1.5 Example gradation curve showing the graphical determination of the D60, D50, D30, and D10 values.

The median grain size by weight, or D50, means that half of the sample is coarser and half of the sample is finer than this grain size. It is taken straight from the gradation curve. See Figure 5.1.5.

The graphic mean, $(D_{84}+D_{50}+D_{15})/3$ (substituting the D_{15} and D_{85} values for the D_{16} and D_{84} values in the formula), was calculated for each sample to compare with the D50. The graphic method of computing the mean reduces much of the sampling and testing errors associated with calculating the mean statistic because it discounts the bottom 16% fine fraction and top 16% coarse fraction of the sample curve (in this case the top 15% and the bottom 15%) which are generally susceptible to error and might otherwise skew the statistic (CEM, 2008). In a normal distribution, the median and the mean are equal. However, generally with sediments these two statistics are not the exact same because the grain size distribution is not exactly normal. For this

study, the D50 statistic for each sample was almost always slightly finer than the graphic mean statistic.

The coefficient of uniformity, $C_u = D_{60}/D_{10}$, measures the particle size range within the sample. The smaller the C_u , the steeper the gradation curve because it contains a smaller range between the D60 and D10 values (Figure 5.1.5). The smallest C_u value is 1, which would indicate a sediment with the same grain size throughout. This would be shown as a completely vertical curve on the graph. For sand, a C_u value greater than 6 indicates a non-uniform size range, or well-graded distribution, where the D10 is much smaller than the D60. This is represented on the graph with a more gentle slope (Curve 1, Figure 3.1.2.2). There were no samples collected with a C_u greater than 6.

The coefficient of curvature, $C_c = (D_{30}/D_{10}) / (D_{60}/D_{30}) = D_{30}^2 / (D_{10} \cdot D_{60})$, is a measure of the symmetry and shape of the gradation curve, and compares the slope of the curve representing the finer particles (D_{30}/D_{10}) with the slope of the curve representing the coarser particles (D_{60}/D_{30}). The minimum value of C_c is 1 and occurs when all sizes contributing to the C_u are about equally represented. As the coefficient of curvature increases, the smaller particle size content increases and becomes more influential on the engineering properties of the sediment. A value from 1 to 3 indicates a well-graded sample. A sediment sample's C_u and C_c are both used to determine if it is poorly graded or well-graded. Only poorly graded sands were found during the investigation.

The percentages of coarse, medium, and fine sand were calculated, in addition to the percentage of fine material (clays and silts) passing through the #200 sieve. A USCS classification and material description were assigned to each sample. For the 2010-2012 sampling events, qualitative wet and dry Munsell Color classification and grain angularity classification were conducted by Mobile District personnel with aid from the NPS. The 2013 sampling event was evaluated by USACE's Savannah District Materials Testing Lab during their grain size testing. The drilling inspector completed a SAM FORM 1836-MsCIP (Drilling Log) for each vibrocore using Bentley's gINT V8i software. The final logs include both the field classification and the laboratory classification for the samples, lab data (D50 and percent fines), the Munsell Color Classification, and estimated seafloor elevation.

Water depths at the site of sampling were taken using the sampling vessel's fathometer. These water depth readings were converted later to elevations using local NOAA tidal gauge data for the date/time that the sample was taken. Because of the potential for error with this method, all potential borrow areas will be surveyed by a USACE hydrographic survey vessel as part of the plans and specifications process to verify seafloor surface elevations and make adjustments to the borrow area cut elevations as necessary.

Due to the lag time between collection of samples and return of lab results, decisions had to be made as to the potential suitability of the sand for use in the project based on its initial field classification. If the quality of the sand was deemed suitable by the inspector, the limits of the area defined by the geophysical survey were gridded with holes to better delineate the deposit and to provide samples for textural classification. If the initial cores did not contain suitable sand, that area would not receive any additional coring investigation. This technique was used throughout the four sampling events to be as efficient with coring as possible.

Appendices B through L contain the gINT-generated drilling logs for each vibracore, followed by the respective laboratory testing worksheets as applicable. Each appendix also contains a consolidated listing of each sample taken from the cores for laboratory testing in that particular area, along with its relevant statistics.

Once the final drilling logs were completed, an analysis was conducted to begin delineating potential borrow areas. If the vibracore samples in an area did not show any potential for use as a borrow area, either because the material was unsuitable or the distribution of the suitable material was too thinly bedded or too widely dispersed to design an effective borrow area, that study area was discounted. For remaining borrow areas, initial rough order of magnitude volume calculations were performed to ensure that enough suitable material was available in the area to make it economical for mining. Wave modeling and hydrodynamic modeling were conducted for potential borrow sites that were in areas of shallow water or contained features that might be affected by the removal of the material. Borrow area shapes and cut depths were refined, taking into account bathymetry, sediment thickness, hydrodynamic, archaeological concerns, and potential dredge equipment types, to optimize the mining of the suitable material for the borrow areas. This refinement has led, in most cases, to a reduced quantity of available material from the initial

USGS estimates. The borrow area statistics in Section 6.0 are based on these updated borrow area designs.

5.2 INVESTIGATION AREAS AND INITIAL FINDINGS

The following sections discuss the results from the 2010-2013 sampling events organized by investigation area.

5.2.1 GULFPORT CHANNEL INVESTIGATION AREA

The sediments along the sides and below the bottom of the Gulfport Navigation Channel were sampled to determine if their material could be used as a borrow source if the channel is widened or deepened in the future. Previous investigations of the channel have included numerous vibracores to characterize the sediments as part of channel dredging operations. Twenty-nine (29) 2010 vibracores were completed along the channel alignment for this project. Of these 29 vibracores, eight (8) vibracores were initially positioned based on the results of the USGS' geophysical survey. The results of the new vibracores indicated that very limited amounts of sand were located over scattered areas. Most of the sediments observed in the samples contained silts or clays and would not be useful for the project. Another fifteen (15) vibracores were cored in one selected area based on data obtained during a geotechnical investigation for the existing channel alignment. The final six (6) vibracores were cored near the Gulfport Harbor to verify that sediment composition in that area was not suitable for beneficial use. This material was too fine-grained for the project. Unfortunately, the vibracores did not indicate suitable material in large enough quantities for use in the project. The general layout of the vibracores completed for Gulfport Channel is shown in Figure 5.2.1.1. The table in Appendix B provides the coordinates of the vibracores, the Unified Soil Classification System designation of the sample, the Munsell Color designations for wet and dry samples, and data from the laboratory gradation analyses. Additional information, including drilling logs and full gradation information, is included in Appendix B.

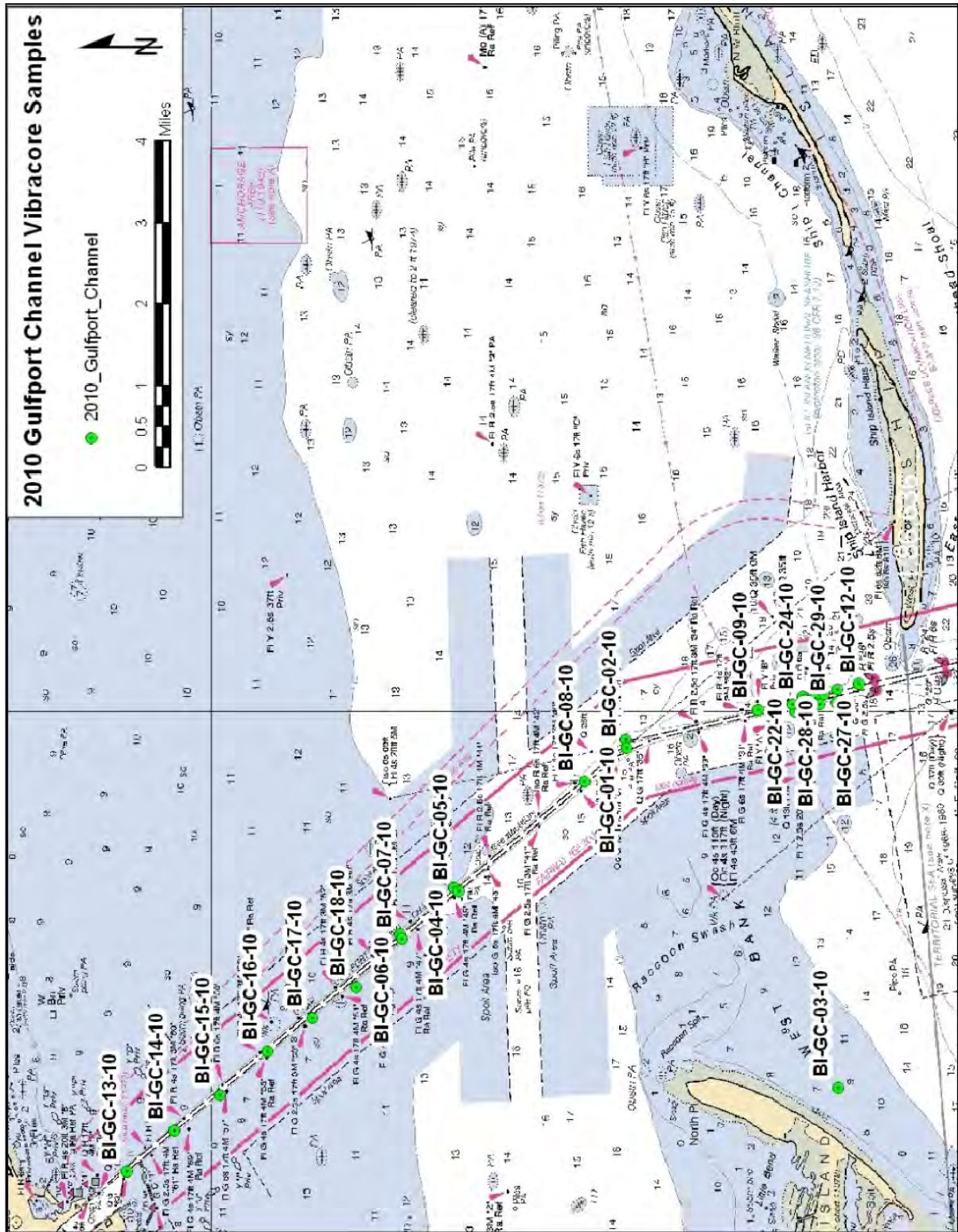


Figure 5.2.1.1 – 2010 Vibracores completed for Gulfport Channel sampling area.

5.2.2 CAT ISLAND INVESTIGATION AREA

Potential borrow sites were investigated offshore of the eastern beach at Cat Island. The USGS's geophysical surveys in 2010 indicated that extensive sand deposits were available in this area. The Cat Island shoal and the Ship Island Pass shoal were identified and estimated to contain 25 million cubic meters and 7 million cubic meters of sediment, respectively, with over 90% estimated to be sand (Flocks and others, 2011). Initially, thirty-three (33) vibracores were completed during the 2010 sampling event and confirmed the presence of the sand. These vibracores were mostly near shore, however. An additional forty-five (45) vibracores were completed during the 2011 sampling event to expand the investigation into deeper water. The 2011 sampling event was implemented after 3D modeling on all potential borrow sites showed adverse wave effects would occur if desired cut depths were used during dredging of the 2010 core sites. Although extensive sand deposits were identified, the recommended area will have an average cut depth of approximately five (5) feet to minimize effects of wave refraction over the site after excavation. Based on the 2011 vibracores, approximately 2.1 million cubic yards of sand were delineated from an area of approximately 282 acres, for dredging and placement on the beach at Cat Island. The area-weighted, average D50 grain size is 0.20 mm and the predominant color is light gray (with a Munsell Value of 6) for these samples. The vibracores indicate that the seafloor surface is predominantly poorly graded, fine-grained sand-sized quartz, with some siltier sand in the northern half of the area. Grain size grades finer with depth so dredging should be done in such a way as to produce a thicker cut to achieve the coarsest mix of the sediments. This area is also within the designated threatened species habitat for the Gulf Sturgeon. However, the volume of material to be removed will be relatively low and, due to the widespread availability of the sand in this area, a very shallow borrow excavation can help minimize disruption of the habitat. The general layout of the vibracores completed for the investigation for borrow material for Cat Island is shown in Figure 5.2.2.1. The table in Appendix C provides the coordinates of the vibracores, the Unified Soil Classification System designation of the samples, the Munsell Color designations for wet and dry samples, and grain size data from the laboratory gradation analyses. Drilling logs and full lab gradation data are included in Appendix C.

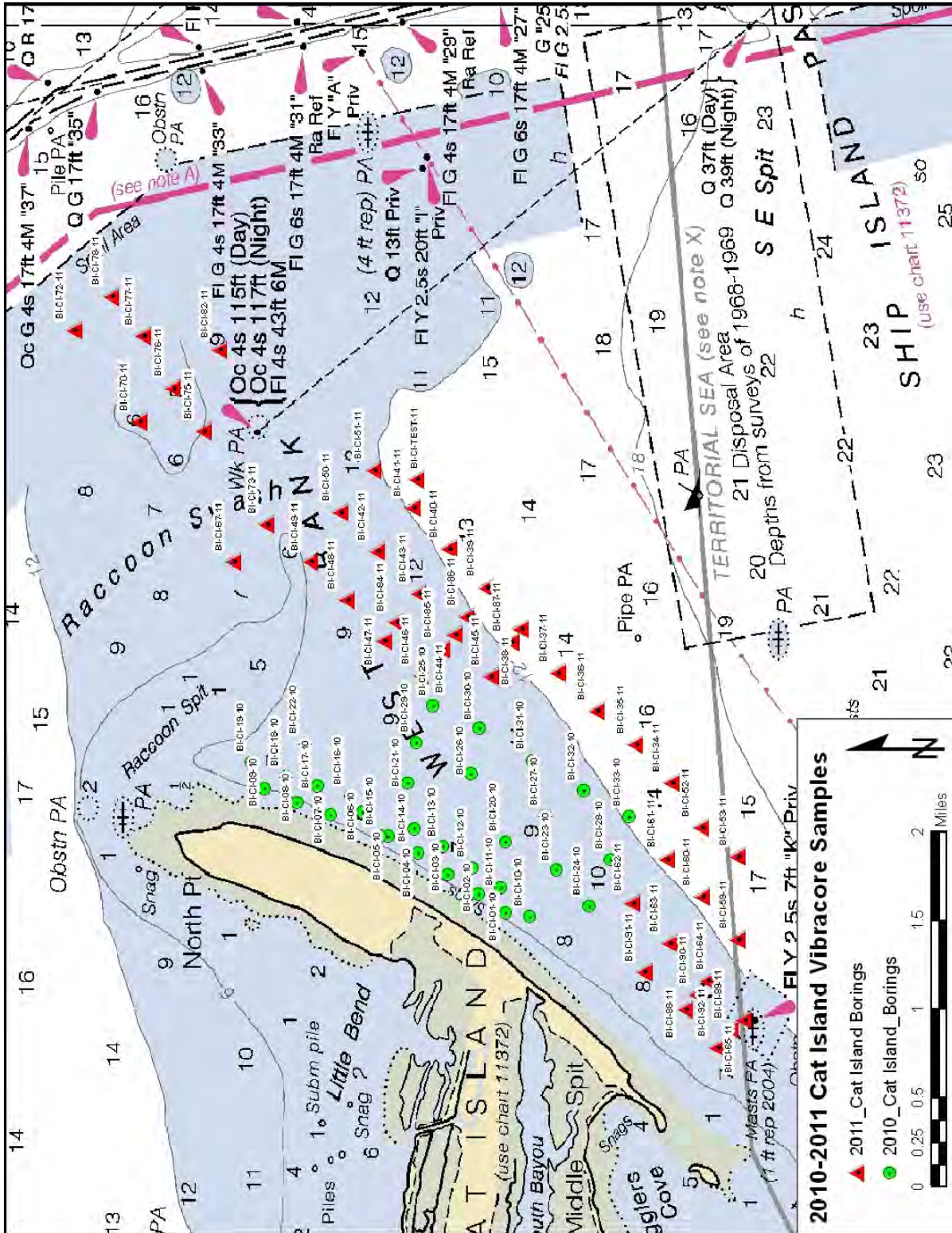


Figure 5.2.2.1 – 2010 (green circles) and 2011 vibracores (red triangles) completed for the investigation for borrow material at Cat Island.

5.2.3 MISSISSIPPI SOUND INVESTIGATION AREA

Previous investigations have revealed that some areas in Mississippi Sound, near West Ship Island, have large sand deposits at the surface suitable for beach re-nourishment (Oivanki, 1995). This same localized area was described by Otvos (1975/76) as sandy, while most of the surface sediments in this area of the Sound are described as muddy. A previous geotechnical investigation by the USACE also confirmed the presence of this sand deposit. The boundaries of the sand deposit were defined by the USGS's geophysical investigation and a series of sixteen (16) vibracores were completed in 2010 to validate the geophysical data. An additional fourteen (14) 2010 vibracores were completed to further delineate the deposit. Unfortunately, the sand from this area is finer-grained than desired for these projects. Also, it is located in a designated threatened species habitat for the Gulf Sturgeon. While this information would not preclude the use of this material, it would make it less desirable for potential borrow sites. The layout of the vibracores completed for Mississippi Sound is shown in Figure 5.2.3.1. The table in Appendix D provides the coordinates of the vibracores, the Unified Soil Classification System designation of the sample, the Munsell Color designations for wet and dry samples, and data from the laboratory gradation analyses. Drilling logs and full lab gradation information are included in Appendix D.

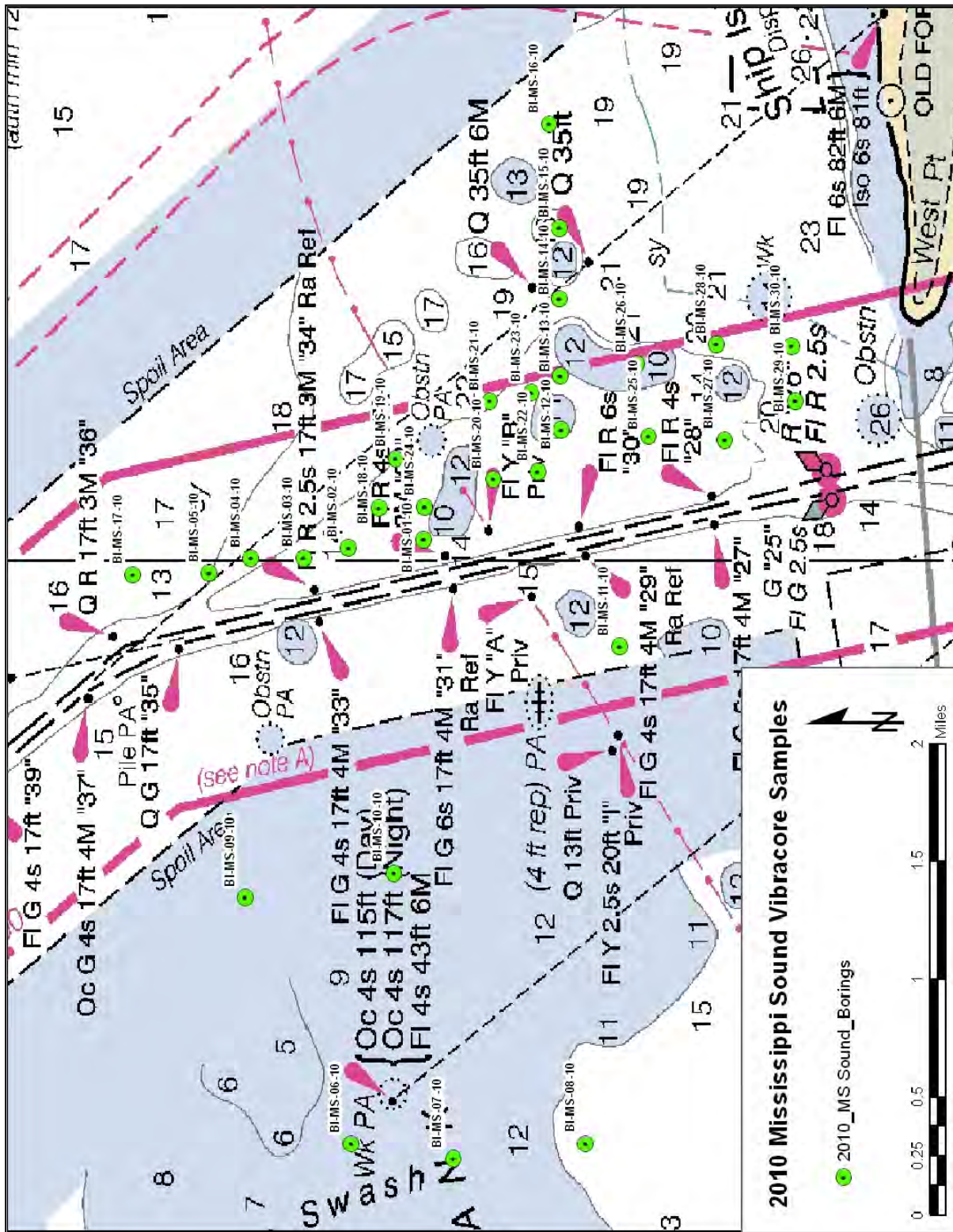


Figure 5.2.3.1 - Layout of the 2010 vibracores completed for the Mississippi Sound area.

5.2.4 SHIP ISLAND PASS INVESTIGATION AREA

The 2010 USGS geophysical survey included the area located between the western edge of the Gulfport Navigation Channel and Cat Island. The survey was expected to locate a very large deposit of sand associated with an ebb tidal delta just south of the western tip of West Ship Island. However, the vibracores did not support this expectation. Potential sand deposit locations on the northern portion of the pass were consistent with the area identified by Otvos (1975/76). The geophysical surveys also confirmed the presence of shoals in this area (Twichell et al., 2011). Ten (10) 2010 vibracores were completed to define and confirm the extent of the deposit. Unfortunately, the grain size was finer than desired for placement. The unweighted D50 for this study area was 0.16 mm. Also, like other sand deposits north of the islands, the area is within the designated threatened species habitat for the Gulf Sturgeon. The disposal site adjacent to the channel, south of Ship Island, was also sampled. The vibracores contained only thick clay, with a thin veneer of sand on the northern edge of the site. The material located adjacent to the western tip of West Ship Island (Ship Island Pass borrow area in Table 6.1) was approved for placement on the northern shore of West Ship Island by the NPS because it is composed mostly of material migrating westward from the island. The old Gulfport Channel acts as a sink and fills up as the natural longshore transport of the island's sediment moves westward. This material had been used in previous NPS beach nourishment projects on the island. No vibracores were taken in this sand body, however. Instead, a proxy sample was taken from the north side of West Ship Island. The material consists of poorly graded, medium- to fine-grained, sand-sized quartz with an unweighted D50 of 0.48 mm, with percent fines being less than 5%. Dry Munsell value is 6. This borrow area is estimated at approximately 20.8 acres in size with approximately 480,000 cy of material available. Figure 6.2 shows the approximate outline of the borrow area. The layout of the vibracores completed for Ship Island Pass is shown in Figure 5.2.4.1. The table in Appendix E provides the coordinates of the vibracores, the Unified Soil Classification System designation of the sample, the Munsell Color designations for both wet and dry samples, and the laboratory gradation analyses data. Drilling logs and full gradation information are included in Appendix E.

5.2.5 SHIP ISLAND INVESTIGATION AREA

At the completion of the geophysical surveys and the initial field interpretations, one of the primary targets identified was an area south of Camille Cut and East Ship Island identified as Loggerhead Shoal and tidal delta (Figure 4.1.2.3). Using the survey data, the USGS identified eleven (11) locations for 2010 vibracores. These vibracores indicated a large expanse of quality sand. Therefore, fifty-four (54) additional 2010 vibracores were completed to fully define the sand deposit. Initial analysis of the vibracore data indicated that approximately twenty-two (22) million cubic yards of fine-grained sand was available from two locations within that general area. This area was selected for further analyses by computer modeling to predict any adverse effects from wave refraction caused by use of the area as a borrow site because the seafloor has such a gradual slope. Wave and hydrodynamic modeling indicated that the footprint of the borrow area needed to be altered to reduce potential wave impacts on the fill placed in Camille Cut. As borrow area design progressed and modeling showed a need to reduce and reshape the borrow area, the new borrow area was whittled down to 1.2 mcy with an average D50 grain size of 0.21 mm, a dry Munsell color of light gray, and a dry Munsell value of 7. The D50 grain size of the sand is smaller than desired for a potential borrow source. The vibracores indicated that grain size grades finer with depth, so dredge cuts should be thicker to more fully composite the sediments. Potential solutions to make this borrow site more suitable could include applying overfill to mitigate erosion losses or mixing with sand from other borrow sites to increase the average D50. The layout of completed vibracores is shown in Figure 5.2.5.1. The table in Appendix F provides the coordinates of the vibracores, the Unified Soil Classification System designation of the samples, the Munsell Color designations for wet and dry samples, and data from the laboratory gradation analyses. Drilling logs and full lab gradation information is included in Appendix F.

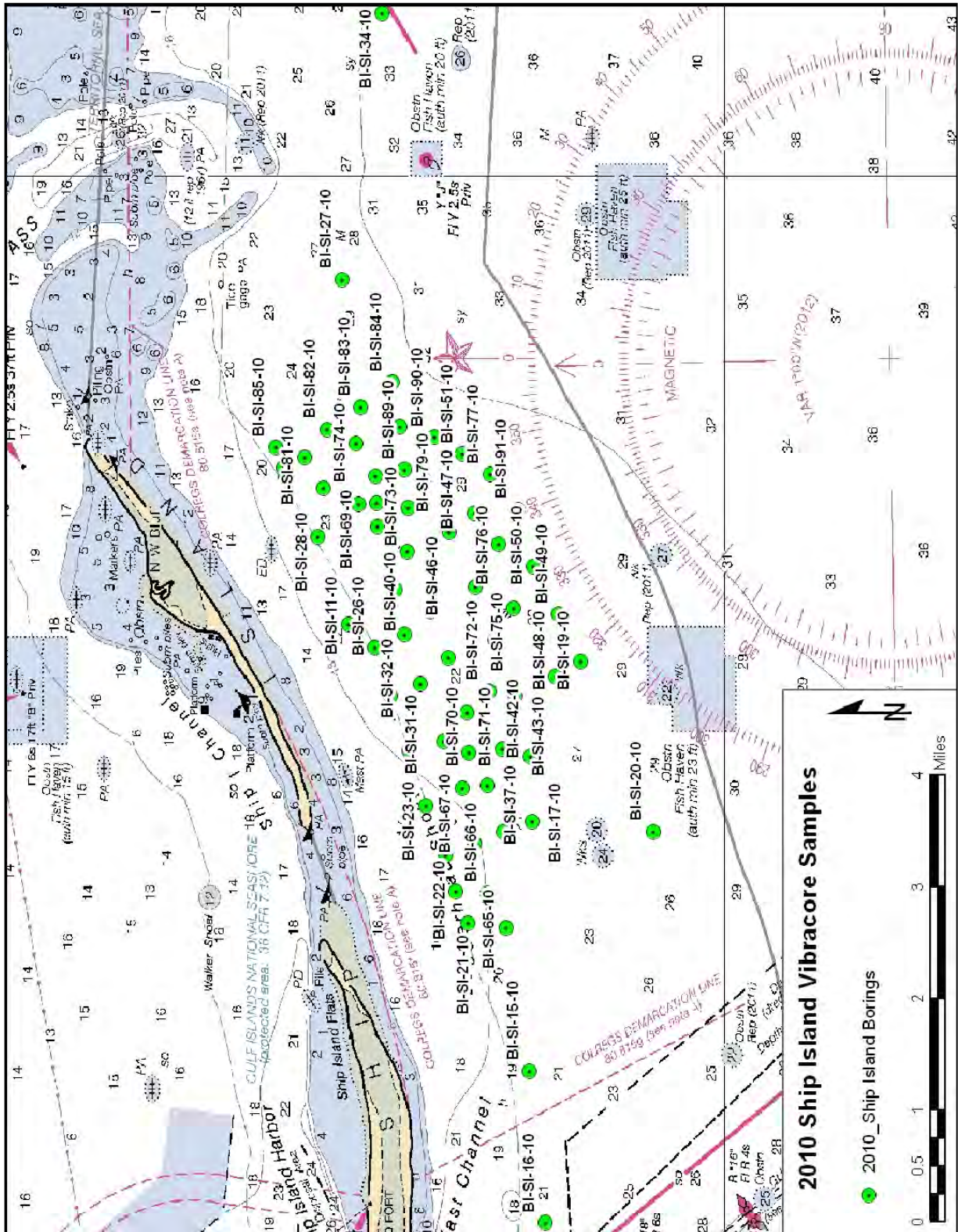


Figure 5.2.5.1 – General layout of the Ship Island vibracores completed for the investigation.

5.2.6 DOG KEYS PASS INVESTIGATION AREA

Two separate, well-defined ebb tidal deltas located east of East Ship Island and to the west of Horn Island are associated with Little Dog Keys Pass and Dog Keys Pass (Figure 4.1.2.3). Initially, the deltas were believed to contain large volumes of high quality sand, but the exact conditions of littoral sediment transport relationships were not well defined. This area was added for further investigation in an updated sediment budget to determine if sediment transport was terminating southward and extending these deltas. The geophysical survey provided updated bathymetry and information on the extent of the deposits. The survey also indicated buried lowstand channels south of the tidal deposits. The USGS located twelve (12) Phase One vibracores to validate their geophysical data. An additional twelve (12) 2010 vibracores were added to further define the limits of the sand deposit, for a total of twenty-four (24) vibracores in 2010. The vibracores in the north indicated that the sand on the delta is fairly clean SP, but too fine for the project. Only one vibracore on the delta had an acceptable grain size. Vibracores off the delta indicate that the typical sediments for the area are clays and silts which are not useful for the project. Aside from the grain size issue, this area appears to be within the active littoral system and would not be considered for borrow. South of the deltas, vibracores targeting the buried lowstand channels had thick clay overburden atop fine grain sand, which is finer than desired for this project. Therefore, it will not be considered for use as borrow. The layout of the vibracores for Dog Keys Pass is shown in Figure 5.2.6.1. The table in Appendix G provides the coordinates of the vibracores taken in the area, the Unified Soil Classification System designation of the sample, the Munsell Color designations for wet and dry samples, and select data from the laboratory gradation analyses. Drilling logs and full gradation information are included in Appendix G.

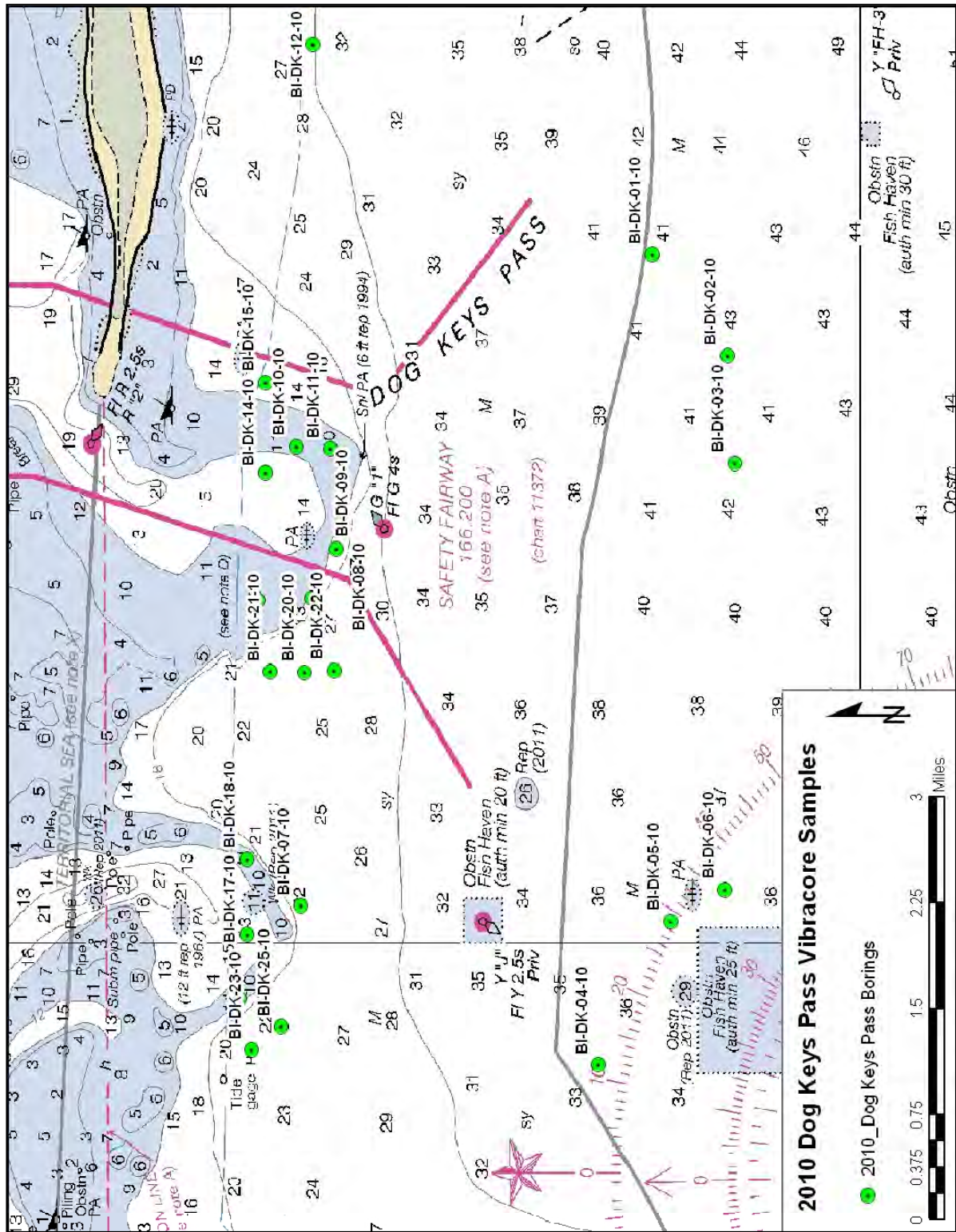


Figure 5.2.6.1 - General layout of the vibracores completed for the Dog Keys Pass area.

5.2.7 HORN ISLAND PASS INVESTIGATION AREA

Horn Island Pass is located between Petit Bois Island to the east and Horn Island to the west. Disposal Area 10, a USACE disposal area, is located in the pass between the two islands. It contains a man-made island, locally known as Sand Island. The pass also has a shipping channel (Pascagoula Bar Channel) to the east and two pipelines that run north-south through the western half of the area. The USGS geophysical survey identified a tidal deposit at the southern entrance to the pass. However, Horn Island Pass was not selected initially as an area to investigate for borrow sites because of the distance to potential placements and indications that all potential sand deposits would be in the active littoral zone. Ambient water depths in this area range from 19 to 40 feet. During the study of the sediment budget for the barrier islands, it was noted that several mounds of sediment just south of Horn Island Pass had the potential for sand resources. These mounds were created by the disposal of dredged material from the bar channel section of the Pass where much of this material was sand naturally transported from Petit Bois Pass-OCS Island and deposited in the channel.

Twenty-six (26) vibracores were completed for the 2010 sampling event, focusing on the main disposal mound to the east. The recovered cores illustrated that the mounds contain suitable sand for use in the MsCIP Barrier Island project. Because the sediment mounds are man-made, they contain discontinuous sandy layers atop the in-situ seafloor comprised mostly of sandy silts and clays. As a result, the mound's sandy veneer pinches off at the lateral margins of the mounds. This makes it difficult to design a borrow area that can be efficiently dredged near the margins without dredging up the poor sediments, or skipping large swaths because the deposits are too thin. Therefore, this area was not considered for a potential borrow area after the 2010 sampling event. However, with the potential need for additional sand, it was decided to investigate the area further. Additional vibracores were needed to determine the sand content and structure of the mounds to the west, adjacent to the pipelines, and further to the north of the 2010 vibracores. For the 2012 sampling event, fifteen (15) vibracores targeted the three major dredged sediment mounds in the area and the tip of the ebb-tidal shoal. The results correlated with the 2010 vibracores. That is, the other mounds also contain suitable sand in varying thicknesses deposited atop unsuitable in-situ material. Twenty-two (22) vibracores were also taken adjacent to the Pascagoula Bar Channel margins to determine if this material would be suitable for use. None of these vibracores

indicated the material would be suitable for use with this project because they are mostly clays, silts, and silty sands. Three borrow areas were delineated based on the combined results of the 2010 and 2012 sampling events. In 2013, USACE conducted another sampling event, with eleven (11) vibracores taken south of the 2012 samples on the dredge disposal mounds. The intent of these vibracores was to further expand the borrow area delineated following the 2012 sampling event.

Only the mounded areas are suitable for borrow material for this project. In general, vibracores that intersected the tops of the mounds recovered poorly graded, medium- to fine-grained, sand-sized quartz (SP) with very little fines and trace shell fragments throughout. Sand thicknesses on the mounds ranged from one foot to 11.8 ft, with an average thickness of 6.1 ft. D50 grain size for samples in the mounds ranged from 0.15 mm to 0.34 mm, with an average D50 of 0.28 mm. Percent fines ranged from 1.6% to 14.3%, with an average of 4.9%. Typical dry Munsell Color Value was 7, with a Munsell Color of Light Gray. Overburden was virtually non-existent on the tops of the mounds. Below the initial top sand layer, the sediments quickly grade to silty and clayey sands (SM and SC), usually underlain by intermittent layers of clay (CL and CH) and silt (ML and MH). Dry Munsell Color Value typically decreases with increasing depth. D50 grain size also typically decreases with depth. Dredge cut elevations should leave a buffer between the sand and the poorer sediments because the transition between the two occurs rapidly. In general, the sand deposits do grade finer with depth and dredge cuts should attempt to mine the full thickness with each pass to maximize mixing of the sands to create the largest composite grain size.

Vibracores paralleling the Pascagoula Bar Channel contained unsuitable sand for this project. The vibracores generally contained significant volumes of silt and clay in the northern half of the group, but did have a veneer of silty sand in the southern half of the group. For the vibracores in the south, the grain size of the sand is too small for use in this project. D50 ranges from 0.15 to 0.20 mm, with an average D50 of 0.17 mm. Percent fines ranges from 0.4% to 19.8%, with an average of 15.1%. Munsell Color Value ranges from 5 to 6, with an average of 5.05. Typical Munsell Color is Olive Gray. Based on this information, the areas paralleling the channel are not considered suitable for this project.

The layout of the 2010-2013 vibracores is shown in Figure 5.2.7.1. The table in Appendix I provides the coordinates of the vibracores, the Unified Soil Classification

System designation of the samples, the Munsell Color designations for wet and dry samples, and data from the laboratory gradation analyses. Drilling logs and full lab gradation information is included in Appendix I.

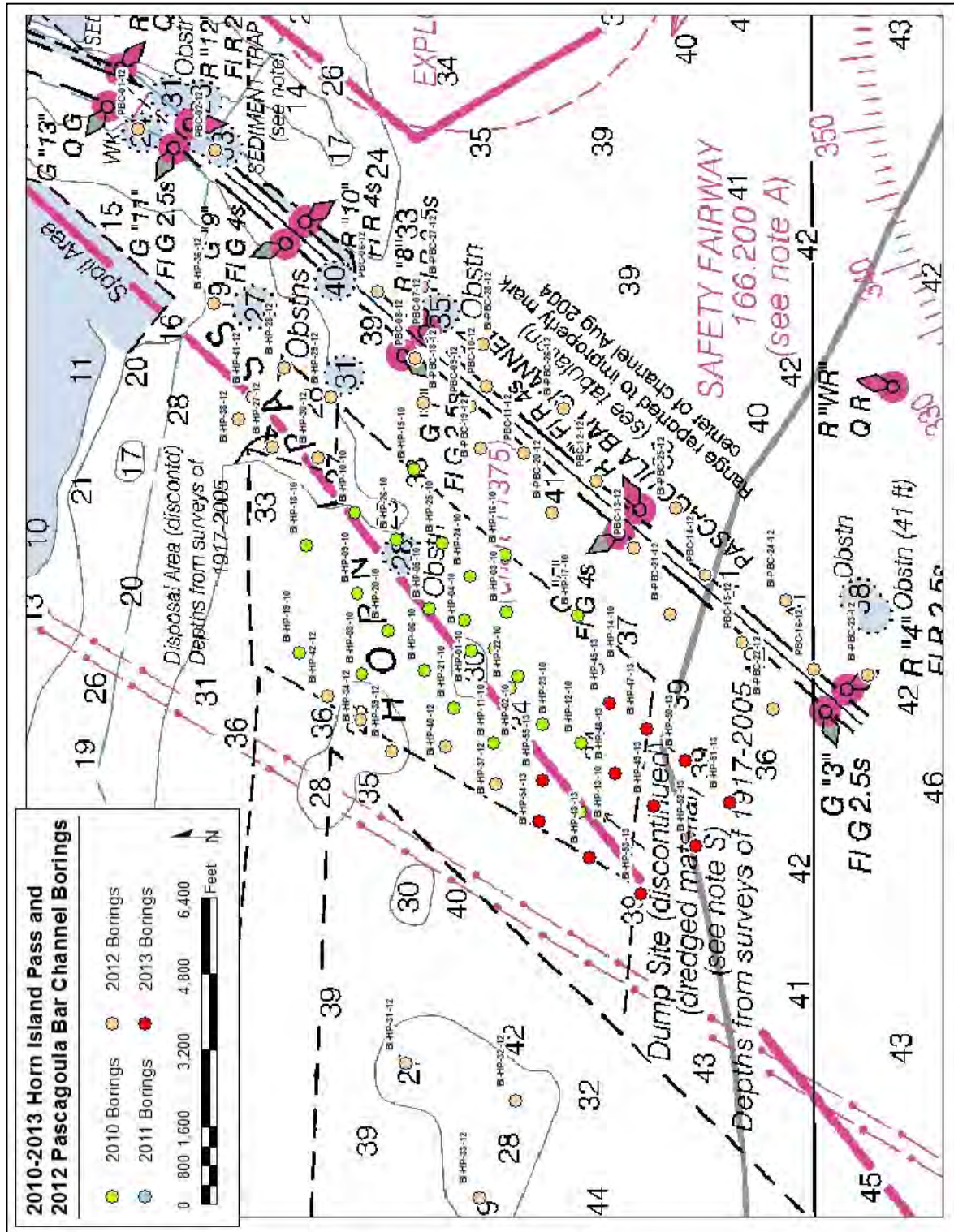


Figure 5.2.7.1 - General layout of the vibracores completed for the investigation of borrow material from Horn Island Pass area.

5.2.8 DISPOSAL AREA 10 (DA-10) INVESTIGATION AREA

Disposal Area 10 (DA-10) is a man-made island created from dredged material from the Pascagoula Bar Channel. It is located in Horn Island Pass, less than one mile northwest of the western tip of Petit Bois Island, MS. Sand placement in this area was initially intended to provide sediment to the littoral system. However, the sediment budget study (Byrnes) for the barrier islands has shown that its northern position in the pass prevents it from contributing any significant sediment quantities to the littoral system, resulting in little to no erosion of the deposited material over time and hence the accidental creation of a relatively stable island. Although not originally considered a viable option prior to the 2010 sampling event due to its location within the littoral system, DA-10 was added to the list of potential investigation sites for the 2011 sampling event following the completion of the sediment budget study by Byrnes. Hydrologic modeling of this area showed borrowing material would have minimal effects on wave action in the area.

DA-10 has good potential for a borrow source because of its location, material quality, and its minimal effect on wave action in the area. It would also take sand that is not actively moving in the littoral system and transport it downdrift. The area-weighted average D50 grain size is 0.32 mm and dry Munsell color is predominantly light gray with an average dry Munsell value of 7. There are approximately 5.1 million cubic yards available. The initial borrow area design called for 5.1 mcy of material to be removed. However, the presence of a wetland on the island prompted a new design to minimize the impacts to this area. The second design reduced the quantity of sand to be removed to 3.7 mcy. In 2013, the decision was made to not use DA-10 because NPS regulations regarding borrow areas within park boundaries would not allow this material to be used.

The layout of the vibracores completed for the investigation is shown in Figure 5.2.8.1. The table in Appendix H provides the coordinates of the vibracores, the Unified Soil Classification System designation of the sample, the Munsell Color designations for wet and dry samples, and data from the laboratory gradation analyses. Drilling logs and full lab gradation information are included in Appendix H.

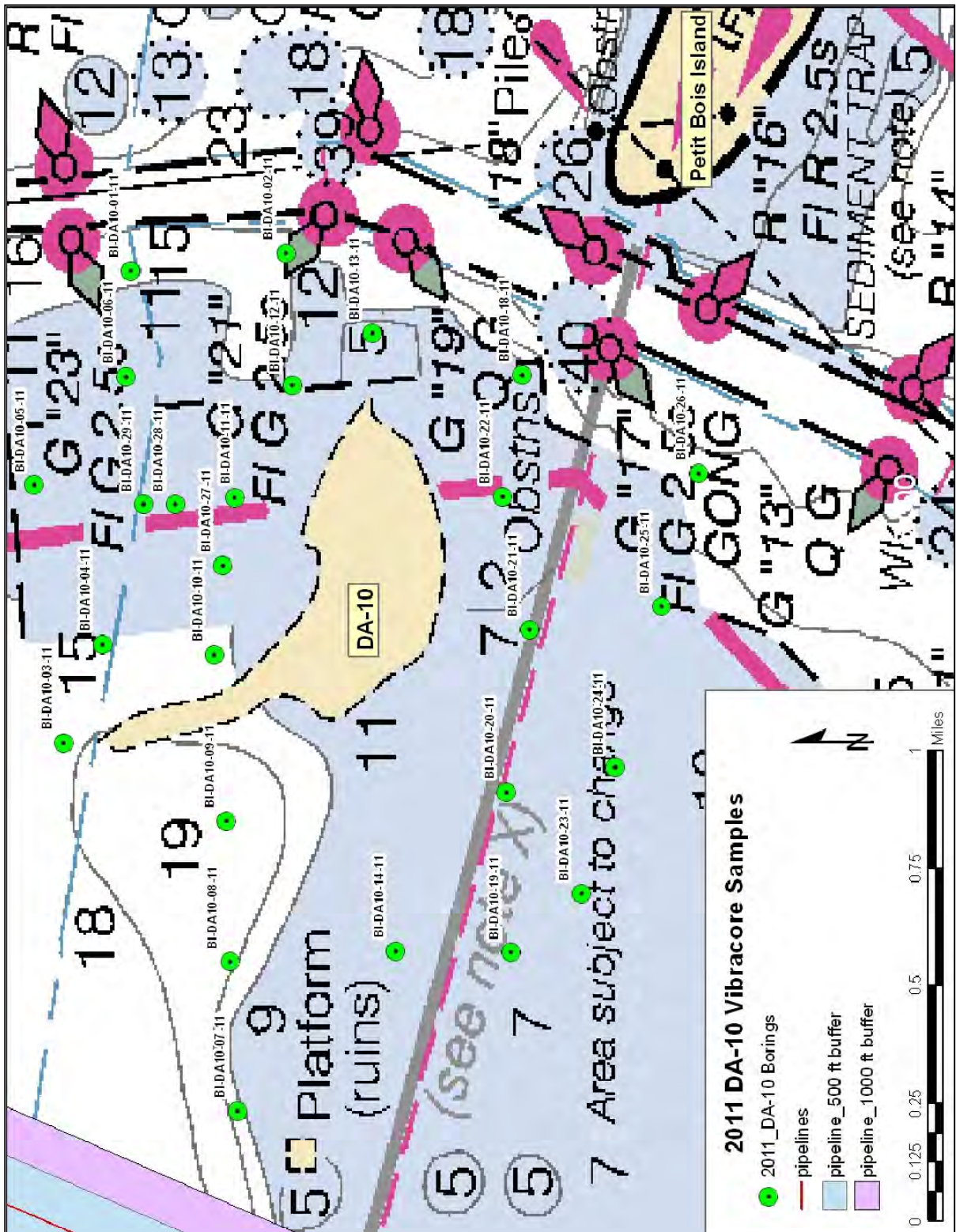


Figure 5.2.8.1 - Layout of the vibracores completed for the 2011 investigation for borrow material from Disposal Area 10.

5.2.9 PETIT BOIS PASS- ALABAMA INVESTIGATION AREA

Petit Bois Pass extends from Petit Bois Island, MS, eastward to Dauphin Island, AL. There is a natural gas pipeline running north-south through the eastern portion, and two pipelines running north-south through the western portion. The initial field interpretations of the 2010 USGS geophysical survey indicated that large deposits of sand were present south of the pass, mostly in the eastern portions in the form of shoals and infilled lowstand channels. Their initial volume estimate for these shoals was 56 million cubic meters of sediment, with >90% sand content (Twichell, 2011). These shoals are independent of the littoral processes affecting the movements of Petit Bois Island and the west end of Dauphin Island, and have remained relatively stable over the course of the last century. These shoals generally taper at the ends, with slope angles at the seaward tips up to 1.4° and flattening out with decreasing water depth. They do not appear to have a steeper shoreward or seaward side, interpreted as meaning they are not actively moving (Twichell, 2011). During the 2010 sampling event, seventeen (17) initial vibracores were completed and located very high quality sand in some areas. Then, an additional eighty-nine (89) vibracores were completed to fully outline the deposit. During the 2011 sampling event, seventeen (17) additional vibracores were completed to further delineate the sand deposits. Two potential borrow areas were identified. Petit Bois Pass-Alabama West borrow area is located approximately 3 miles east-southeast from the eastern tip of Petit Bois Island, MS, and 2.8 miles southwest from the western tip of Dauphin Island, AL. Petit Bois Pass- Alabama East borrow area is located approximately 2 miles south of the western tip of Dauphin Island.

A north/south-running natural gas pipeline bisected the Petit Bois Pass- Alabama West borrow area. The pipeline owners voiced concern about the possibility of damage to their pipeline in the future caused by the removal of borrow material on either side of it. Modeling was conducted by an independent third-party contractor, in conjunction with the pipeline company, to determine the long term effects of the borrow area excavations on the pipeline. The results of this modeling showed that given a proper buffer around the pipeline, the proposed borrow areas would have negligible effects on the pipeline. The borrow quantity for Petit Bois Pass- Alabama West was recomputed, with a one thousand-foot buffer added around the pipeline, to determine the loss of sand in the footprint of the pipeline. The pipeline and buffer footprint effectively prevents the removal of over one million cubic yards of material from the Petit Bois Pass- Alabama West borrow area.

Therefore, during the 2012 sampling event, seventy-eight (78) vibracores were taken around the perimeter of the existing borrow areas. The intent of the sampling was to determine if it was possible to expand the existing borrow area perimeters and maximize each area's potential yields in an attempt to recoup the losses due to the pipeline buffers.

Based on the vibracores from the 2010-2012 sampling events, the sand quality is very good in these areas (D50: ~0.32 mm, % Fines: <5%, Munsell Color Value: 6) with minimal to no overburden, particularly on the shoals. The Petit Bois Pass-Alabama East and West borrow areas were reconfigured to incorporate the new data from the 2012 vibracores and accommodate the pipeline buffer. The pipeline now serves as the arbitrary dividing line between the east and west sampling areas.

For Petit Bois Pass- Alabama West, the sand deposit is exposed within the perimeter of the proposed borrow area. The 2012 vibracores along the northern boundary contained suitable sand, but with some sand having a darker Munsell Value than desired. However, the ambient water depth ranges from 18 to 28 feet in this area which might be considered too close to the active littoral zone for significant expansion into this area (Figures 5.2.9.1 and 5.2.9.2). The sand body begins to be overlapped by clays and silts just south of the southern boundary and thick clay beds cover the majority of the area. Vibracores with suitable sand south of this borrow area appear to be on shoals only. Expansion to the west is limited by the pipeline and buried cable. Expansion to the east is limited by the natural gas pipeline.

Samples from suitable vibracores had a D50 range of 0.18 to 0.39 mm, with a weighted mean D50 of 0.30 mm. Percent fines ranged from 0.8% to 7.7%, with an average of 2.7%. Dry Munsell Color Value ranged from 4 to 8, with an average of 6. Typical dry Munsell Colors were White 2.5Y 8/1 (21%), Light Brownish Gray 2.5Y 6/2 (20%), and Light Gray 2.5Y 7/2 (17%). Overall, white and light gray were the two predominant colors at 25% and 29%, respectively.

For Petit Bois Pass- Alabama East, the sand deposit is exposed within the perimeter of the proposed borrow area, similar to Petit Bois Pass- Alabama West. The vibracores indicate that the sand body becomes overlapped by clays in the northeast, indicating the sand body is either buried deeper than is feasible for use or it terminates beneath the clay. In either case, further expansion of the borrow area in

this direction is limited. Along the northwestern portion of the northern boundary, vibracores contained suitable sand. However, shallower water depths may prevent expansion in this direction. The eastern vibracores indicate that limited expansion is possible in this direction, because the sand begins to be overlapped by silts and clays further east. The vibracores in the southwest indicate the sand body beginning to be overlapped by clays and silts before being completely covered or terminating. The south central vibracores indicate that the sand body begins to become covered by overburden on the southwest and southeast sides of a shoal extending south. The surficial sand begins thinning out as well on the southeastern side of this shoal. Vibracores from the southeastern corner of the borrow area indicate that the borrow area can be expanded along the shoal which extends from this corner. Vibracores did not delineate the farthest extent of the sand in this direction. There are several shoals running northwest/southeast through the southern half of the sampling area that do contain sand. But, they appear to have thinner veneers of sand than desired. Also, the troughs between the shoals appear to have significant clay layers, making the dredging of this area difficult.

Samples from suitable vibracores had a D50 range of 0.21 to 0.45 mm, with a weighted mean D50 of 0.32 mm. Percent fines ranged from 0.5% to 17.8%, with an average of 4.1%. Dry Munsell Color Value ranged from 5 to 8.5, with an average of 6.8. Typical dry Munsell Colors were White 5Y 8/1 (16%), Light Gray 2.5Y 7/2 (13.2%), and Light Brownish Gray 2.5Y 6/2 (10%). Overall, light gray and white were the two predominant colors at 33% and 24%, respectively. The vibracores in the east that are “Borderline” for color have adequate grain size and are slightly silty. It is expected that if the sand in this area is used, many of the fines would wash out during dredging and placement, thereby lightening the overall color of the sand.

Vibracores from both borrow areas indicate that the grain size of the sand does grade slightly finer with depth. However, they also indicate that dredging should be able to occur in longer, shallower runs without having an issue with inadequate mixing of grain sizes prior to placement because the finer sediments are generally still within established tolerances.

A layout of the vibracores is shown in Figures 5.2.9.1, 5.2.9.2, and 5.2.9.3. The table in Appendix L provides the coordinates of the vibracores, the Unified Soil Classification System designation of the sample, the Munsell Color designations for

wet and dry samples, and data from the laboratory gradation analyses. Drilling logs and full lab gradation information is included in Appendix L.

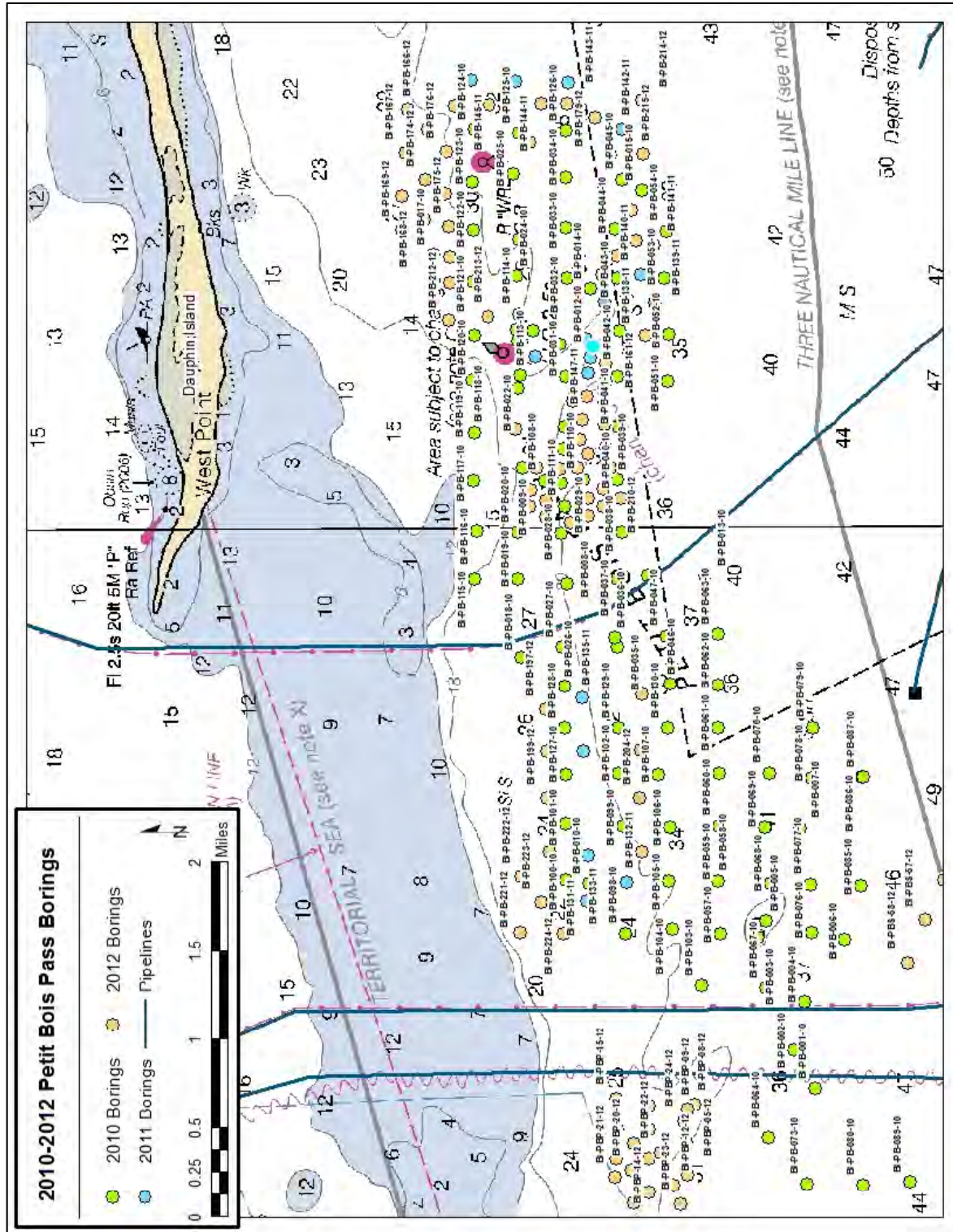


Figure 5.2.9.1 - Layout of the vibracores completed for the 2010-2012 investigation for borrow material from the Petit Bois Pass- Alabama area.

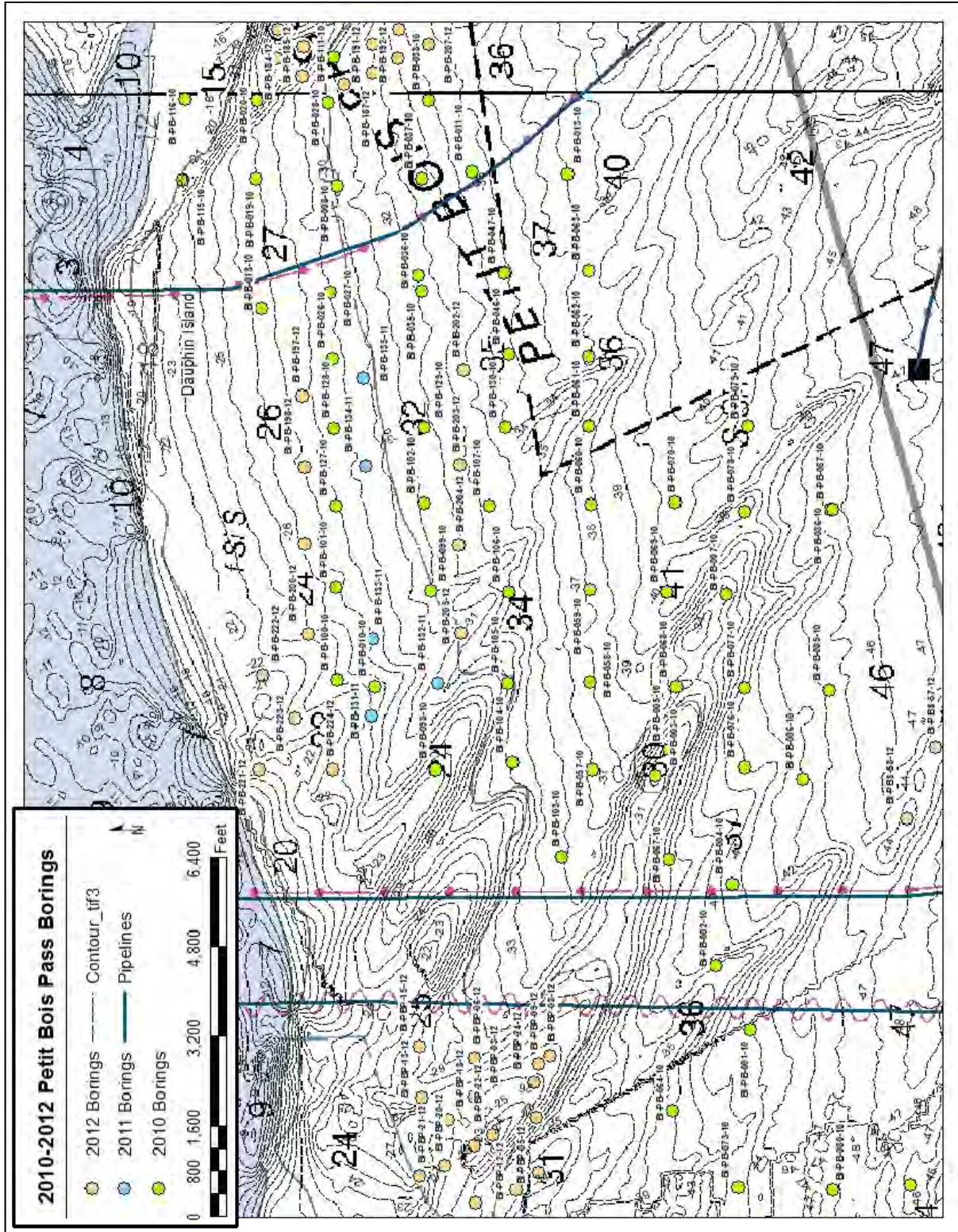


Figure 5.2.9.2 - Layout of the vibracores completed for the investigation for borrow material from the Petit Bois Pass- Alabama West area. Note the sizeable shoals in the west.

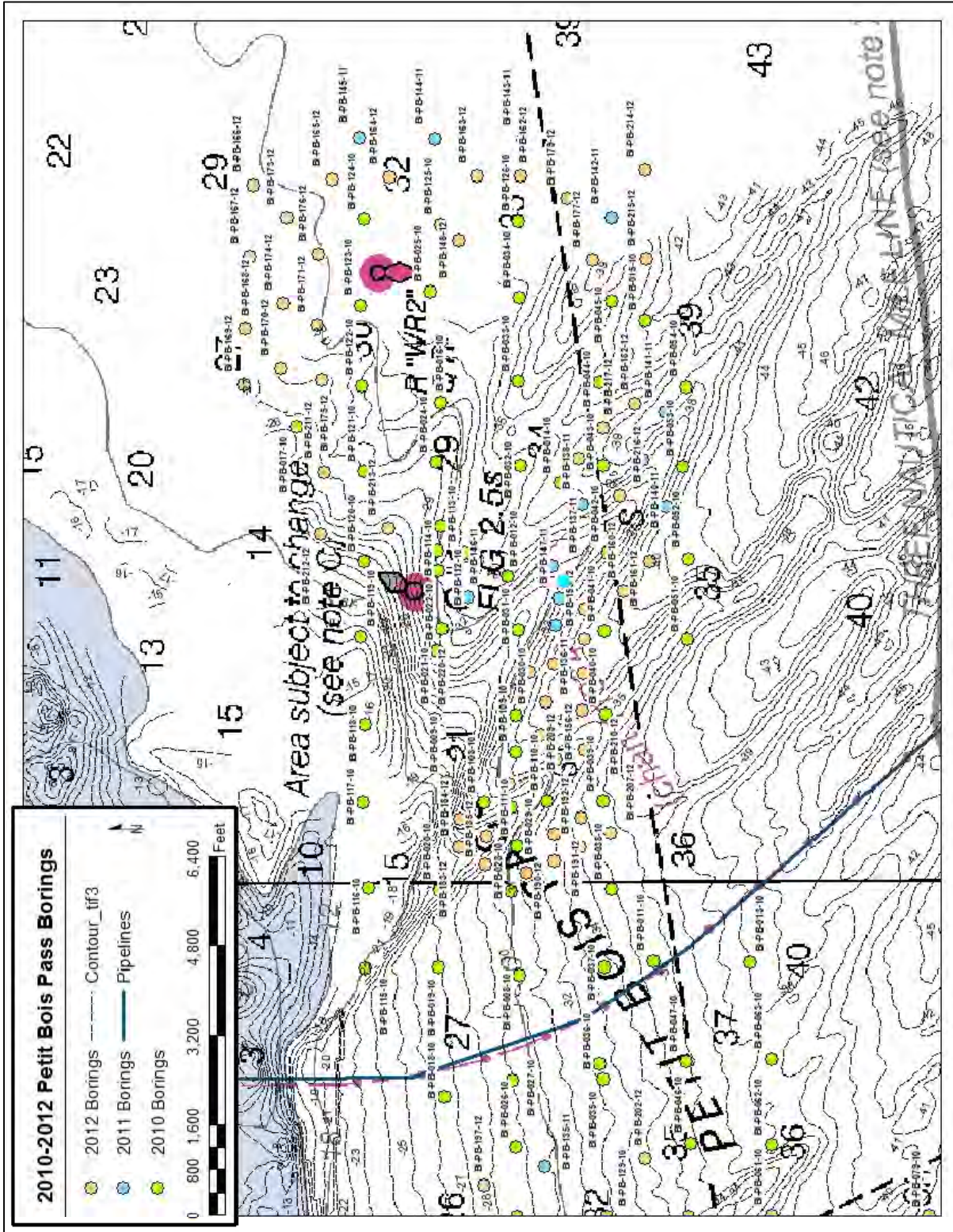


Figure 5.2.9.3 – 2010-2012 Vibracores completed for the Petit Bois Pass-Alabama East area.

5.2.10 PETIT BOIS PASS-MISSISSIPPI INVESTIGATION AREA

Petit Bois Pass- Mississippi is a sampling area located approximately 1.3 miles southeast of Petit Bois Island, in Mississippi state waters. A major shoal feature was identified in this area using bathymetry. It is approximately 2.8 miles long and runs northwest to southeast near the intersection of the NPS's Gulf Islands National Seashore boundary and a buried cable (shown on the map as a pipeline) running through Petit Bois Pass (Figure 5.2.10.1). The shoal is in ambient water depths ranging from 25 ft to 37 ft. Due to its proximity to the Pass, it was speculated that this shoal might have similar sediment characteristics to the sand found in the Petit Bois Pass- Alabama East and West borrow areas. The USGS used its geophysical survey data from the 2010 survey to assist in locating vibracores along its crest and delineate the shoal's lateral extents. Other vibracores were situated along the shoal margins to gain a better understanding of the shoal's structure and the surrounding sediments. Figure 5.2.10.1 shows the location of the sampling area and the vibracores taken there.

Sampling results indicate that the shoal crest has thick deposits of suitable sand in the northwest portion of the shoal, closer to Petit Bois Island. In general, vibracores that intersected the top of the shoal recovered poorly graded, medium- to fine-grained, sand-sized quartz (SP) with very little fines (< 5%) and trace shell fragments throughout. Cleaner sand (SP, SP-SM) thicknesses in the vibracores ranged from 2 feet to 15.2 feet, with an average thickness of 8.7 feet. Below the poorly graded sand (SP) layers, the sediments quickly grade to silty and clayey sands (SM and SC), usually underlain by intermittent layers of clay (CL/CH) and/or silt (ML/MH). Munsell Color Value typically decreases with increasing depth. D50 grain size also typically decreases with depth. Off the shoal, sand is typically only surficial, one to two feet thick, and is underlain by clays and silts. Overburden was virtually non-existent on the top of the shoal. Figure 5.2.10.2 is a Triangulated Irregular Network (TIN) map created in ArcMap using the sand thicknesses observed in the vibracores to create the isolines. It shows that the sand thins out abruptly further away from the crest of the shoal coinciding with the changing bathymetry. The USGS' geophysical data for this area also confirms that the sand thins out off the shoal. Borrow area design needs to focus on maximizing the cut into the crest of the shoal. The sand deposit is thickest and cleanest in this area, allowing for deeper dredge cuts. The southeast end of the shoal can also be mined.

The samples had a typical dry Munsell Color Value of 7 (58% of sample volume). Of the samples with suitable sand, the majority of sample volume (49% of sample volume) had a Munsell Color of 5Y 7/2 (LT Gray). 5Y 6/2 (LT Olive Gray) was the second most abundant color by volume. However, the percentage of light gray to white color was 71% for the entire sample volume. D50 grain size for samples in the shoal ranged from 0.13 mm to 0.48 mm, with a weighted mean D50 of 0.31 mm. Sand thicknesses within vibracores on the shoal ranged from 2 to 15.2 feet, with an average thickness of 8.7 feet. In several vibracores (BI-PBP-2-12, BI-PBP-6-12, BI-PBP-20-12, BI-PBP-21-12) the vibracore sampler could not penetrate the dense sand, making it difficult to assess the true thickness of the sand body from the vibracores. The penetrometer graphs in Appendix J attest to the difficulty the vibracorer had in penetrating these areas. There is also a slightly thicker mound on the southeast tip of the shoal with suitable sand, but then the sand thins out rather quickly moving away from the crest of the shoal to the northeast, east, south, and west. (Figure 5.2.10.2)

The more continuous nature of this shoal makes borrow area design and dredging less difficult than Horn Island Pass or Petit Bois Pass-OCS. Borrow areas should be constrained to the shoal to optimize sand recovery, while any dredging off the shoal will likely result in recovery of mostly poor material (SM, SC, CL, ML). The east side of the shoal, near vibracores BI-PBP-18-12, BI-PBP-13-12 and BI-PBP-06-12 should be dredged with cuts designed to maximize mixing of sediments. Other than the east side of the shoal, the grain size of the vibracores indicates that shallower cuts parallel with the long axis of the shoal would be acceptable to maintain the grain size of the placed material. The table in Appendix J contains a consolidated list of the vibracores and their respective samples. It includes select laboratory gradation data, the USCS classification, and the Munsell color classifications. Drilling logs and lab data are included in Appendix J.

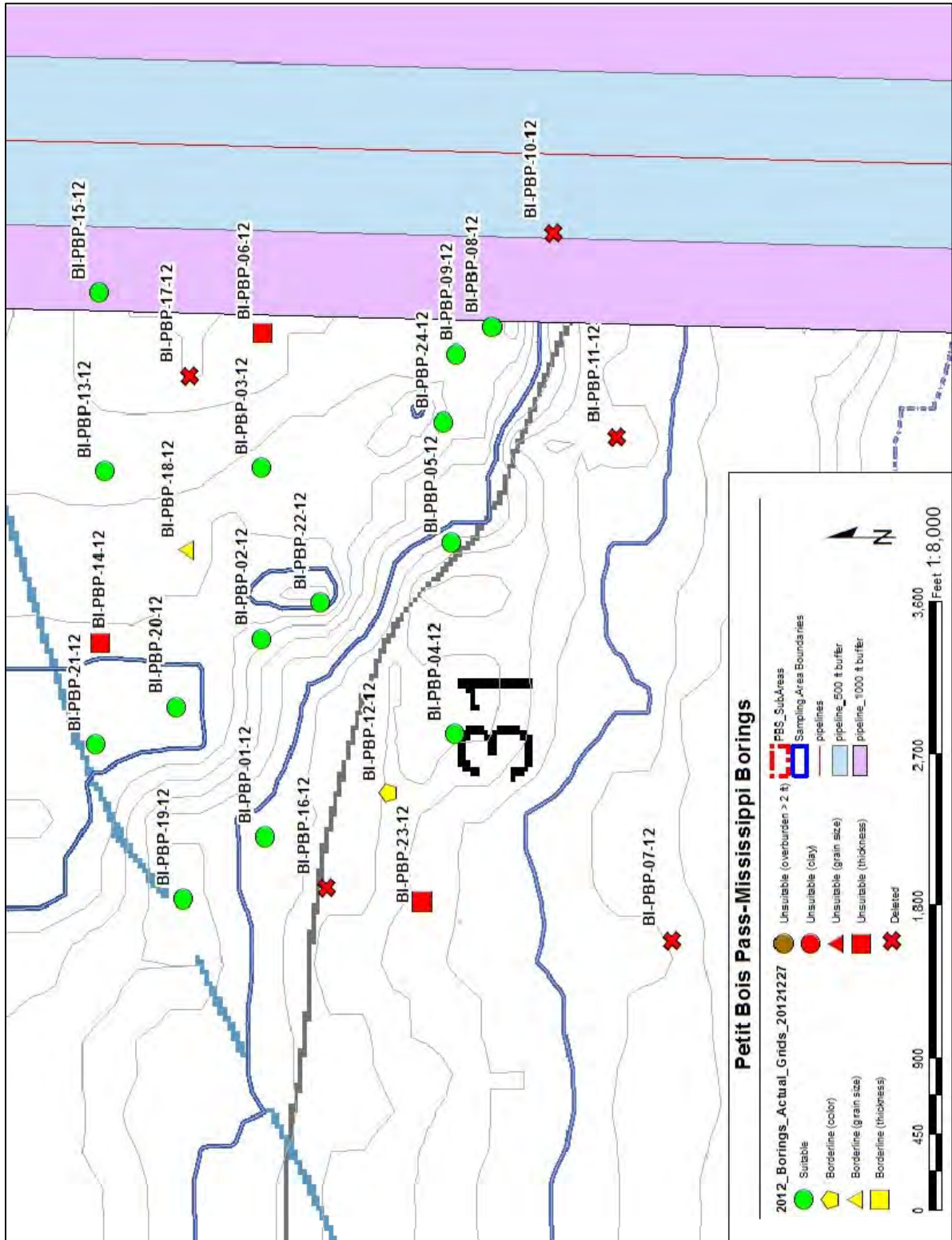


Figure 5.2.10.1 2012 Vibracores for Petit Bois Pass- Mississippi sampling area with bathymetric contours illustrating the main shoal in the area. The blue contours are at 5-ft intervals.

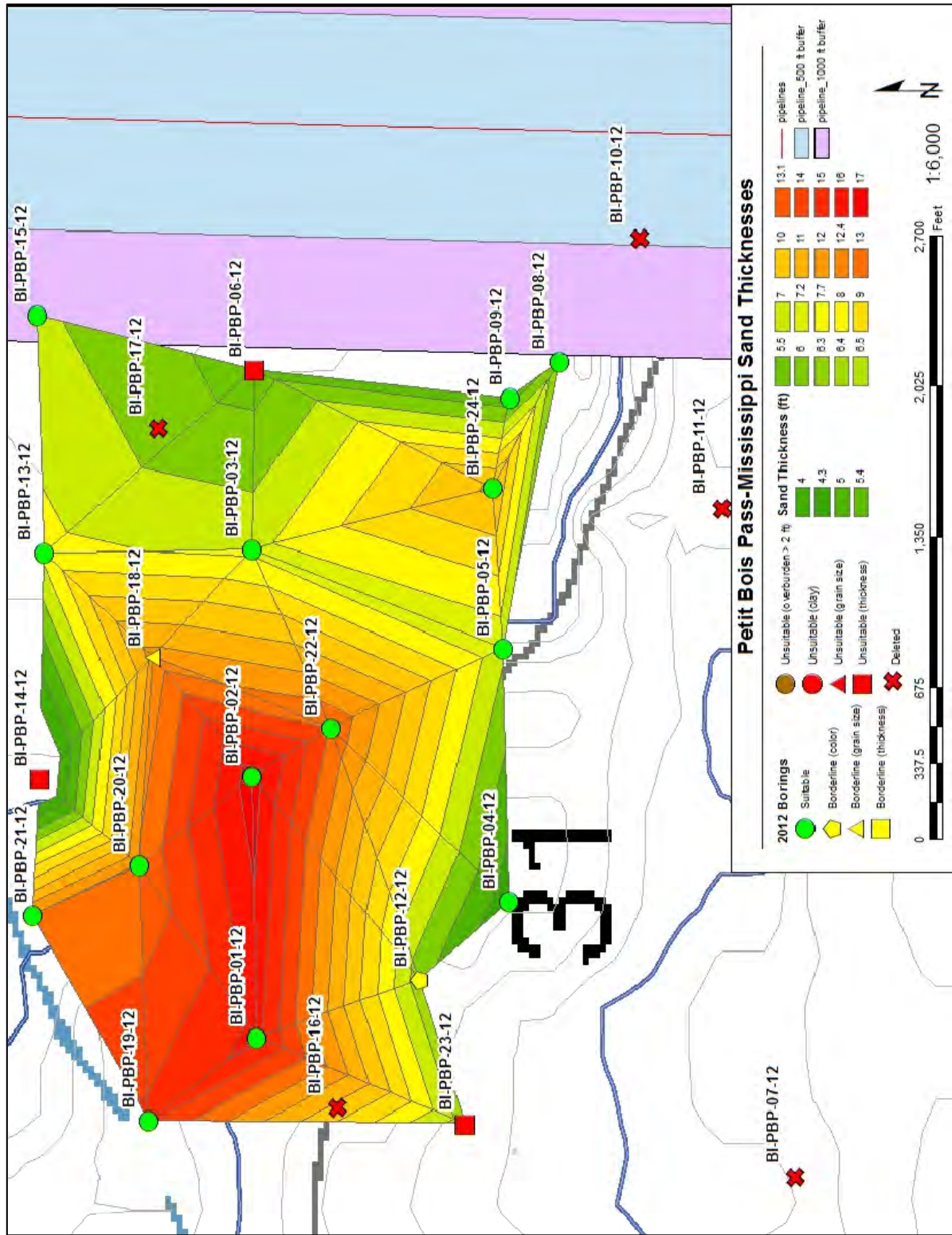


Figure 5.2.10.2 Map of sand thicknesses in the Petit Bois Pass- Mississippi sampling area.

5.2.11 PETIT BOIS PASS- OUTER CONTINENTAL SHELF (OCS) INVESTIGATION AREA

The Petit Bois Pass-Outer Continental Shelf (OCS) sampling area is located approximately 3 to 6 miles south of Petit Bois Island and Petit Bois Pass. It is divided by a pipeline and buried cable running north-south through the center of the area, and is bounded in the south by pipelines running east-west. The western area (PBP-OCS West) overlaps Mississippi and federal waters, while the eastern area (PBP-OCS East) is almost entirely in federal waters. Ambient water depths in these areas range from 40 to 68 feet (Figure 5.2.11.1). There are several shoals throughout the area. Two of the larger shoals intersect the pipeline in the southern half of the western area and extend into the eastern area. Other than the shoals, the seafloor is relatively flat in these areas, gently sloping to the southeast. The main shoals are generally oriented NW-SE with low relief in the intershoal areas.

The 2012 sampling event was limited in scope to the eastern two-thirds of PBP-OCS East due to a lack of geophysical data for PBP-OCS West. For the 2012 sampling event, one hundred (100) vibracores were cored in the PBP-OCS East area and only four (4) vibracores were cored in PBP-OCS West area. In August 2013, the USGS conducted a geophysical survey of PBP-OCS West and the unsurveyed portion of PBP-OCS East (Figure 4.2.1). It identified several large shoals that were then targeted during the 2013 sampling event. One hundred seventy-four (174) vibracores were taken in PBP-OCS West during the 2013 sampling event.

In PBP-OCS East, the more pronounced shoals are shorter, narrower, and more distributed throughout the area. Vibracores indicated that suitable thicknesses of acceptable borrow material are located along the crests of the shoals. Vibracores that are off the shoal crests indicate that the sediment typically does not meet the established standards from Section 3.0 for gradation or bedding thickness. These vibracores generally contained silty sand or a thin veneer of SP sand grading to silty sands and clays with increasing depth.

In PBP-OCS West, the results were similar to the eastern area in that the shoals tended to contain the largest concentrations of clean sand, while the off shoal areas tended to be silty sand to clay. One exception is the sandy fill deposit that extends from PBP-OCS West into PBP-OCS East, just north of large Shoal 3 (Figure 4.2.1.1) in PBP-OCS West. This deposit contains thick deposits of SP, but is covered

extensively by unsuitable overburden. There are small areas that have minimal overburden, which will be discussed further below.

Figure 5.2.11.1 shows the locations of PBP-OCS West and PBP-OCS East (solid blue outlines) and the 2012 and 2013 vibracore locations. The black dashed lines represent shoal outlines that were delineated by the USGS from their geophysical surveys. They illustrate the size and orientation of the shoals in each sampling area.

For the purposes of this report, PBP-OCS West and PBP-OCS East have been divided into smaller sub-areas because of their expansive sizes. The statistics presented are based on vibracore samples and are weighted by volume of borrow represented by samples.

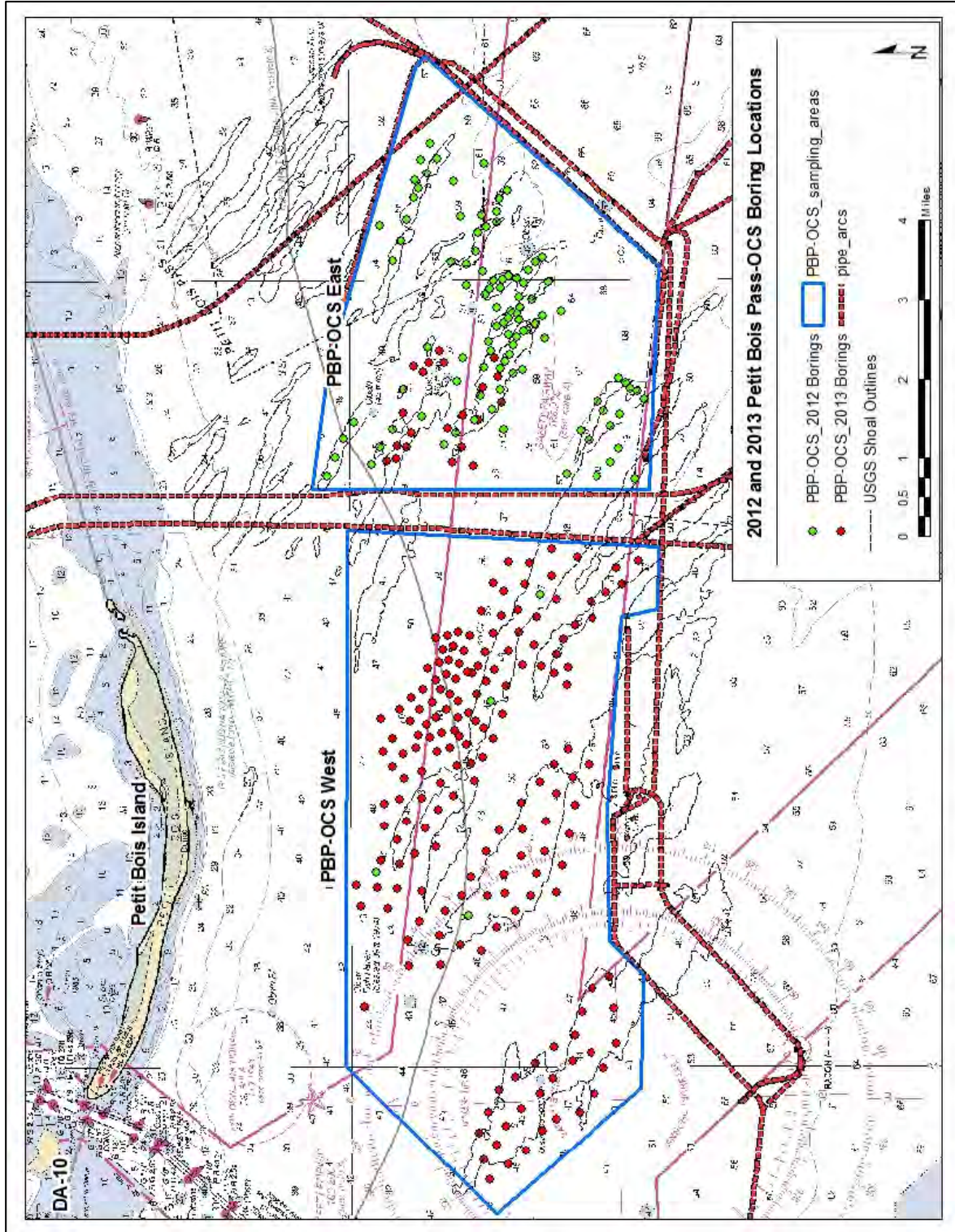


Figure 5.2.11.1 Petit Bois Pass-OCS sampling areas and vibracore locations.

5.2.11.1 PBP-OCS West Investigation Area

PBP-OCS West sampling area is approximately 4 miles south of Petit Bois Island. This sampling area is bounded by the north/south-running buried cable and pipeline to the east and the east/west-running pipelines to the south. This area contains three large shoals and a complex of smaller shoals in its southeast corner. Ambient water depths for the area range from 42 to 57 feet. Initially, the three major shoals were the focus of the 2013 sampling event because the geophysical survey data indicated they contained sandy substrates with minimal overburden. Table 4.2.1.1 contains a breakdown of the dimensions and textural characteristics of each shoal. The following sections discuss the results of the vibracore sampling during the geotechnical investigation.

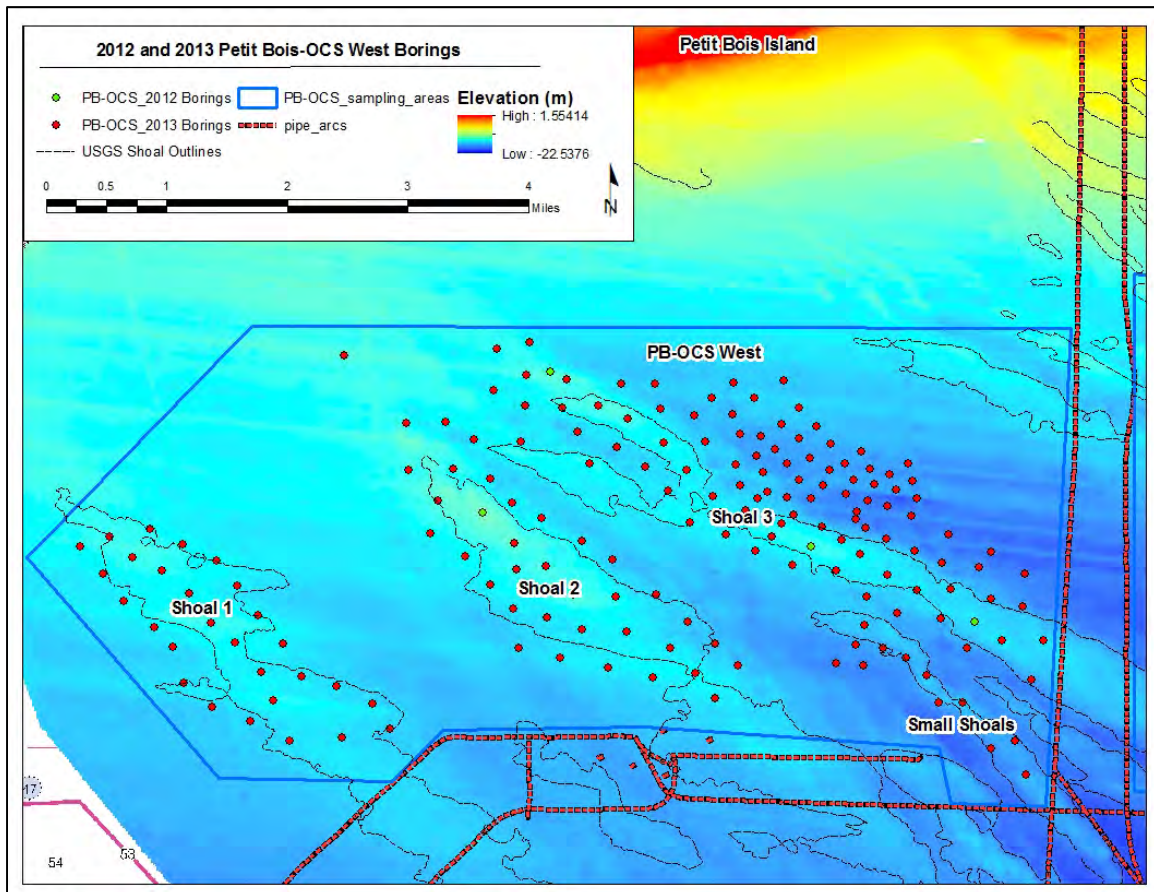


Figure 5.2.11.1.1 Petit Bois Pass-OCS West with major shoal outlines.

Shoal 1: Shoal 1 is a relatively low-relief feature (approximately 4-5 feet from shoal base to crest at the seaward end) located approximately 5.2 miles south of the western tip of Petit Bois Island (Figure 5.2.11.1.2). It is approximately 3.6 miles long, 0.7 miles wide at the northwest end, and 0.8 miles wide at the southeast end. Ambient water depths range from approximately 43 to 47 feet. The vibracores indicate that the shoal does contain significant sand deposits, ranging from 1.7 to 15.5 feet thick. However, composite D50 grain size for the vibracores in this area ranges from 0.14 mm to 0.25 mm, with an average of 0.18 mm. This grain size is too fine for the project and eliminates this area from further consideration as a borrow area.

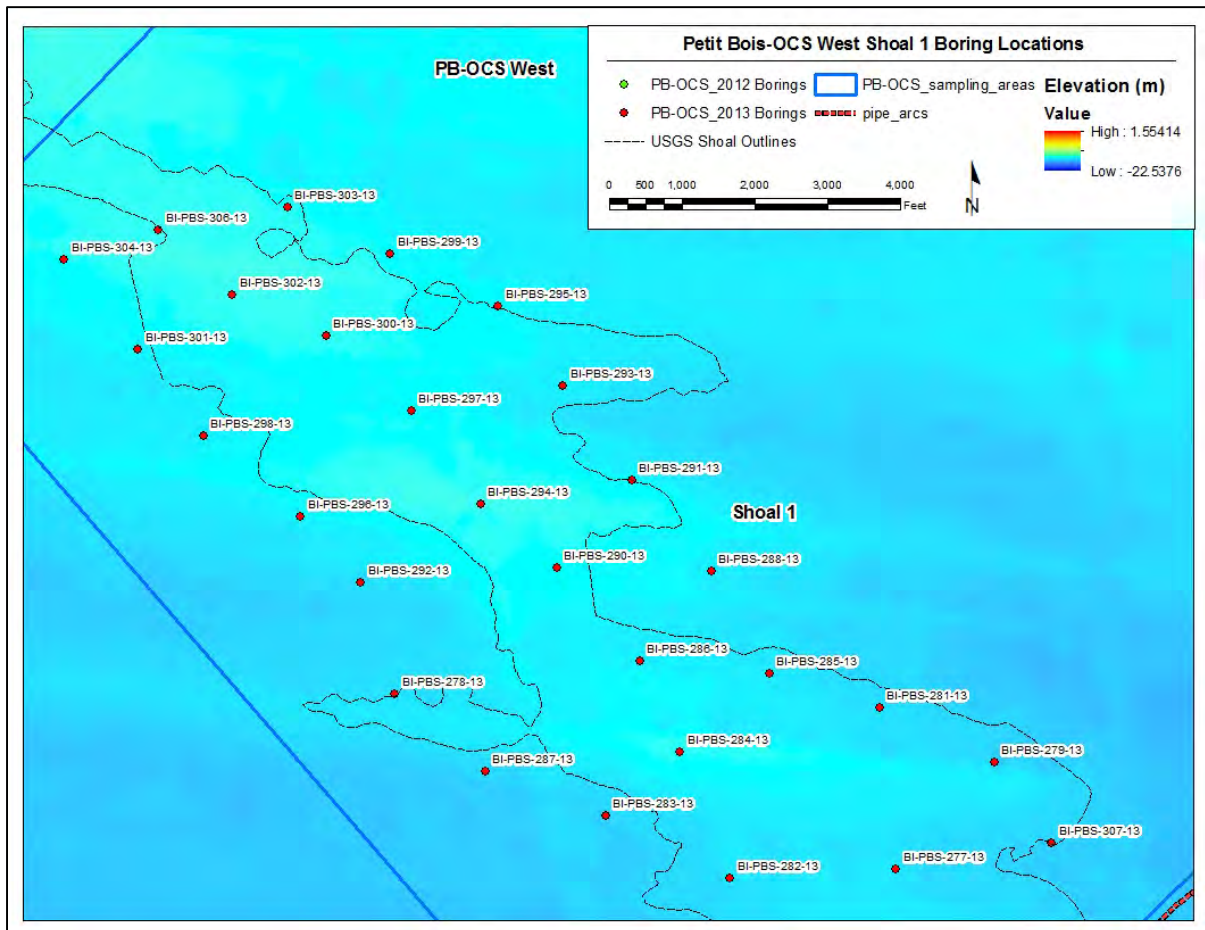


Figure 5.2.11.1.2 Petit Bois Pass-OCS West, Shoal 1 vibracores.

Shoal 2: Shoal 2 is located approximately 4 miles south of central Petit Bois Island and directly east of Shoal 1. It is approximately 3.8 miles long, 0.8 miles wide at the northwest end, and 0.7 miles wide at the southeast end. Its boundaries fluctuate throughout its length, making it appear to be composed of several smaller shoals. Ambient water depths in this area range from approximately 39 to 53 feet. It is slightly more pronounced bathymetrically than Shoal 1, ranging from 6 to 7 feet from shoal base to crest at the seaward end north of the pipeline. The shoreward face (northern side) has slightly steeper sides than the seaward face (southern side). The vibracores indicate that it has clean sand deposits with thicknesses ranging from 0.6 to 10.7 feet, and an average thickness of approximately 4 feet throughout the sampling area. The thickest exposed deposits are along the shoal crest. The composite D50 per vibracore ranged from 0.15 mm to 0.33 mm, with an average of 0.20 mm. The USGS's isopach for this area (Figure 4.2.2) does indicate that there is a thicker deposit of sand in the middle of the shoal. Two vibracores, BI-PBS-268-13 and BI-PBS-94-12, were sampled in this area and confirmed that the thickness and textural characteristics are adequate for dredging (Figure 5.2.11.1.4). A very small borrow area may be able to be designed using these vibracores as its center. D50 ranged from 0.25 to 0.26 mm and thickness ranged from approximately 8.3 to 10 feet. The area influenced by these two vibracores is approximately 85 acres, but could probably be expanded provided adequate mixing of dredged material is occurring to raise the composite grain size of the material. Cut thickness and area would need to conform to the bathymetry of the shoal. Sand deposits with suitable grain sizes surrounding these vibracores are typically only surficial and the sands tend to grade finer with depth. As a result, the cut depths required to get only the coarser sand may be too thin to be practical. Outside the two central vibracores, the majority of samples in this area indicate the sand is either too fine or too thinly-bedded for use with the project. Figure 5.2.11.1.4 outlines the location of these vibracores, which are underlain by the USGS's isopach for the shoal.

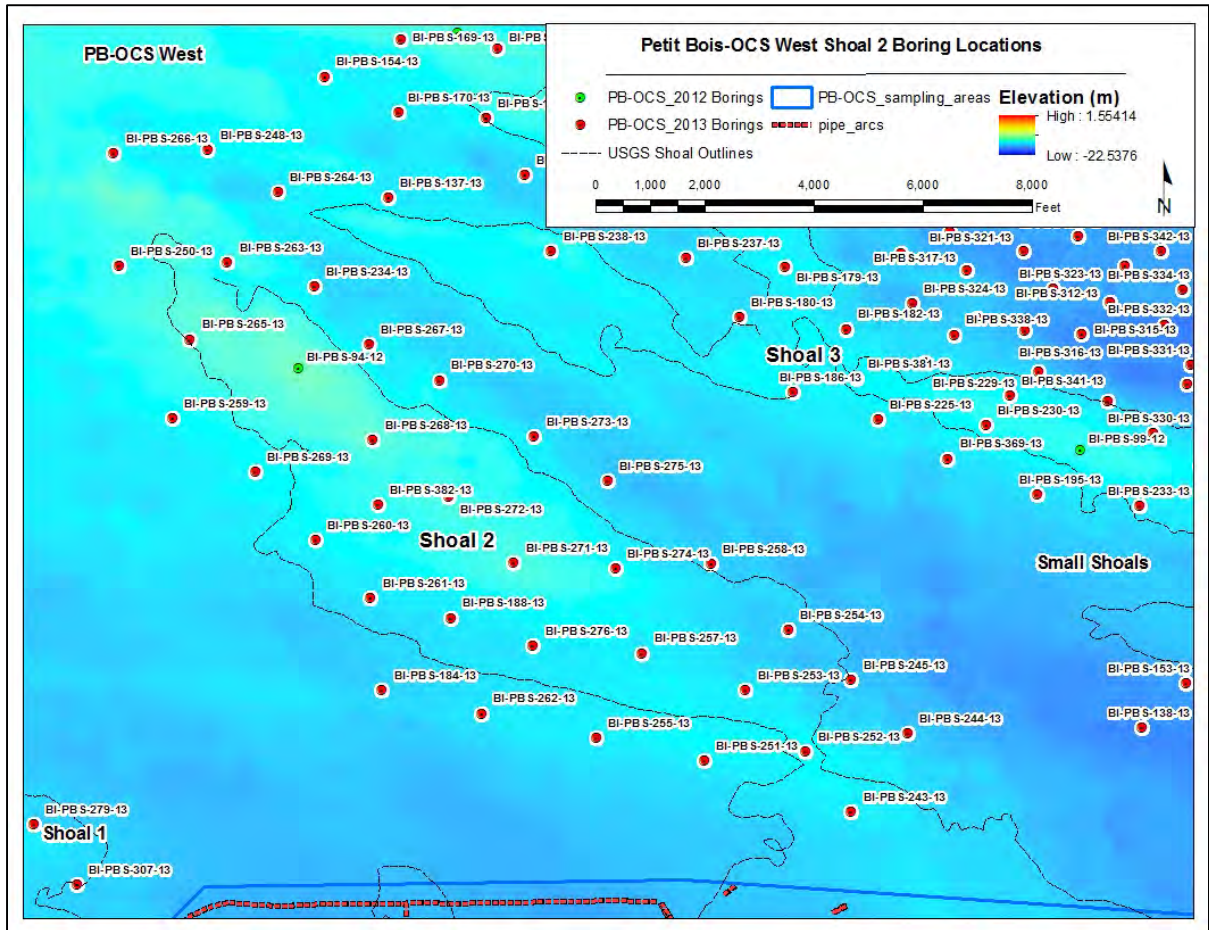


Figure 5.2.11.1.3 Petit Bois Pass-OCS West, Shoal 2 vibracores.

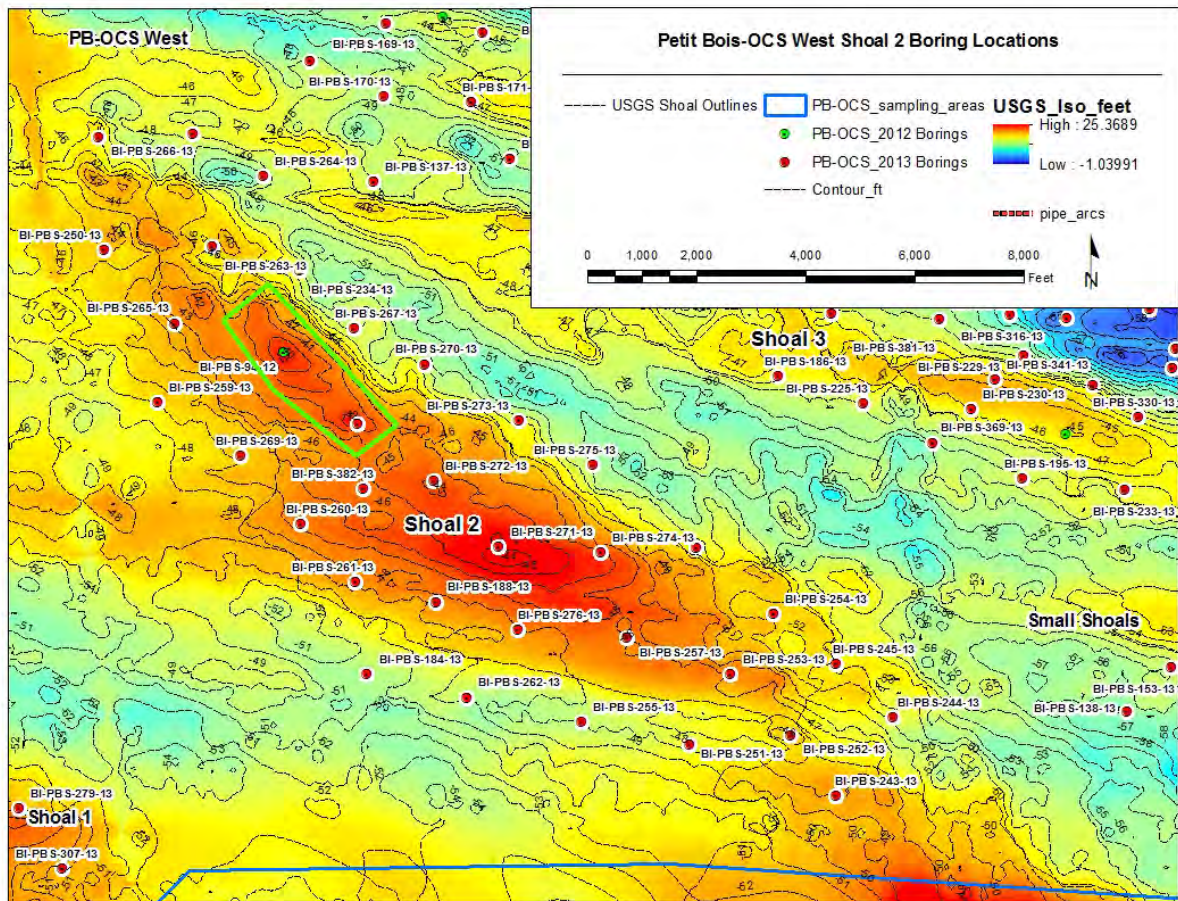


Figure 5.2.11.1.4 Petit Bois Pass-OCS West, Shoal 2 with USGS Isopach showing potential borrow material vicinity vibracores BI-PBS-94-12 and BI-PBS-268-13.

Shoal 3: Shoal 3 is located approximately 4 miles south of Petit Bois Island and less than 1 mile northeast of Shoal 2 (Figure 5.2.11.1.1). It is oriented northwest-southeast and is approximately 7 miles long, 0.9 miles wide at the northwest end, and 0.5 mile wide at the southeast end. It extends beyond the pipelines into the southwest corner of investigation area PBP-OCS East. It contains the greatest bathymetric relief of the three shoals within the sampling area, approximately 9 to 11 feet from shoal base to crest. Its landward face (north side) is steeper than the seaward face. It was initially sampled in 2012 in two locations, BI-PBS-99-12 and BI-PBS-101-12. Both vibracores indicated that the shoal has a veneer of poorly graded sand (SP) with trace shell hash underlain by silty sand that grades to clayey sand. Grain size typically grades finer with depth for the sands. The 2013 sampling event expanded on these vibracores to gain a better understanding of the shoal structure. Figure 5.2.11.1.5 shows the vibracores conducted on and around the shoal, with the majority of the shoal outlined with a pink polygon. Using the north-

south pipeline as a dividing line in the east, the western side of the shoal (in the PBP-OCS West investigation area) can be divided into three sub-sections based on its morphology.

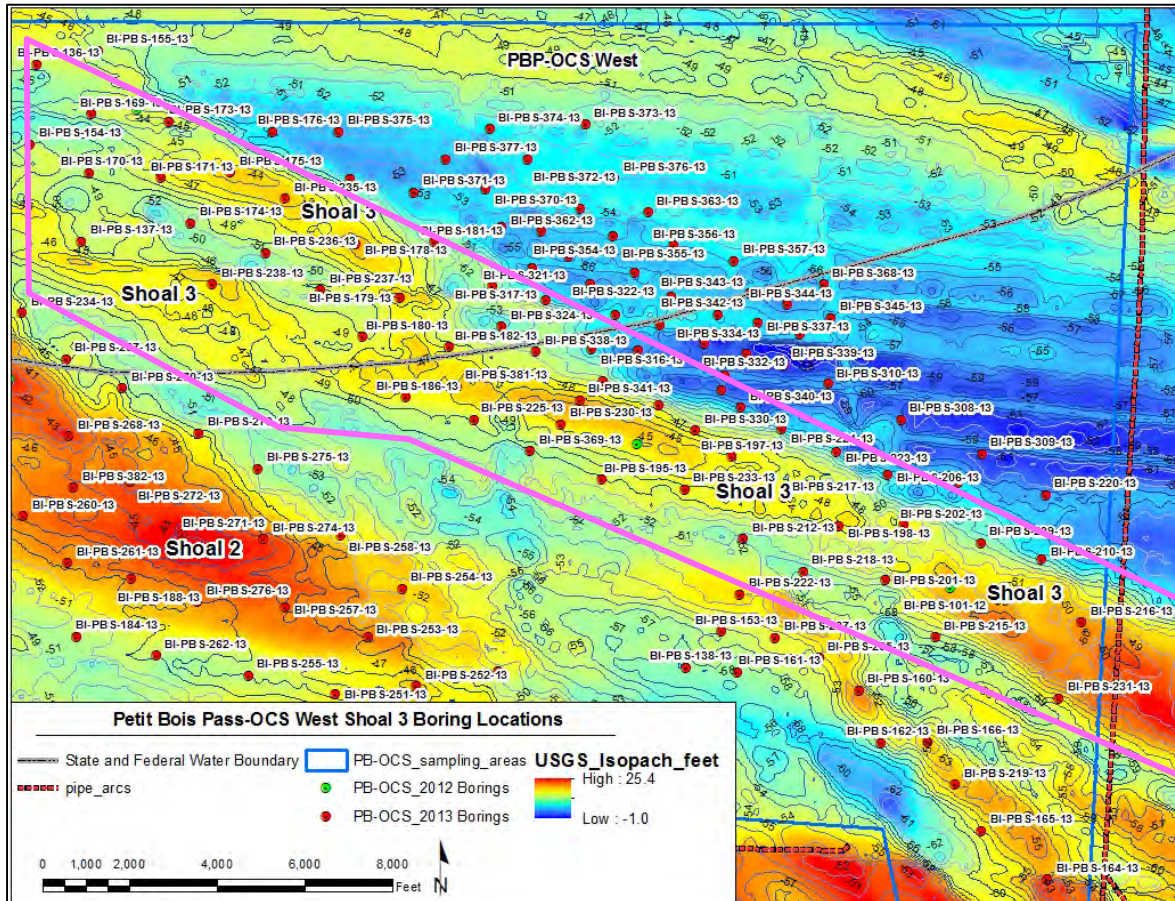


Figure 5.2.11.15 Petit Bois Pass-OCS West, Shoal 3 vibracore locations.

Within the westernmost third (Figure 5.2.11.1.6), the shoal has a large trough dividing that section into northern and southern halves. Ambient water depths range from approximately 44 to 53 feet. Sampling in the northern half indicates that the shoal consists of a sandy deposit with adequate thickness and grain size for this project. The deposit spans the area from vibracore BI-PBS-173-13 to BI-PBS-178-13 (Figure 5.2.11.1.7). Suitable sand thickness ranges from approximately 4.2 feet to 9.0 feet. The deposit is thickest at the shoal crest and tapers down at the side slopes according to the bathymetry and the USGS's isopach. Median grain size ranges from 0.26 to 0.28 mm within the vibracores. Percent fines and color are also within acceptable limits.

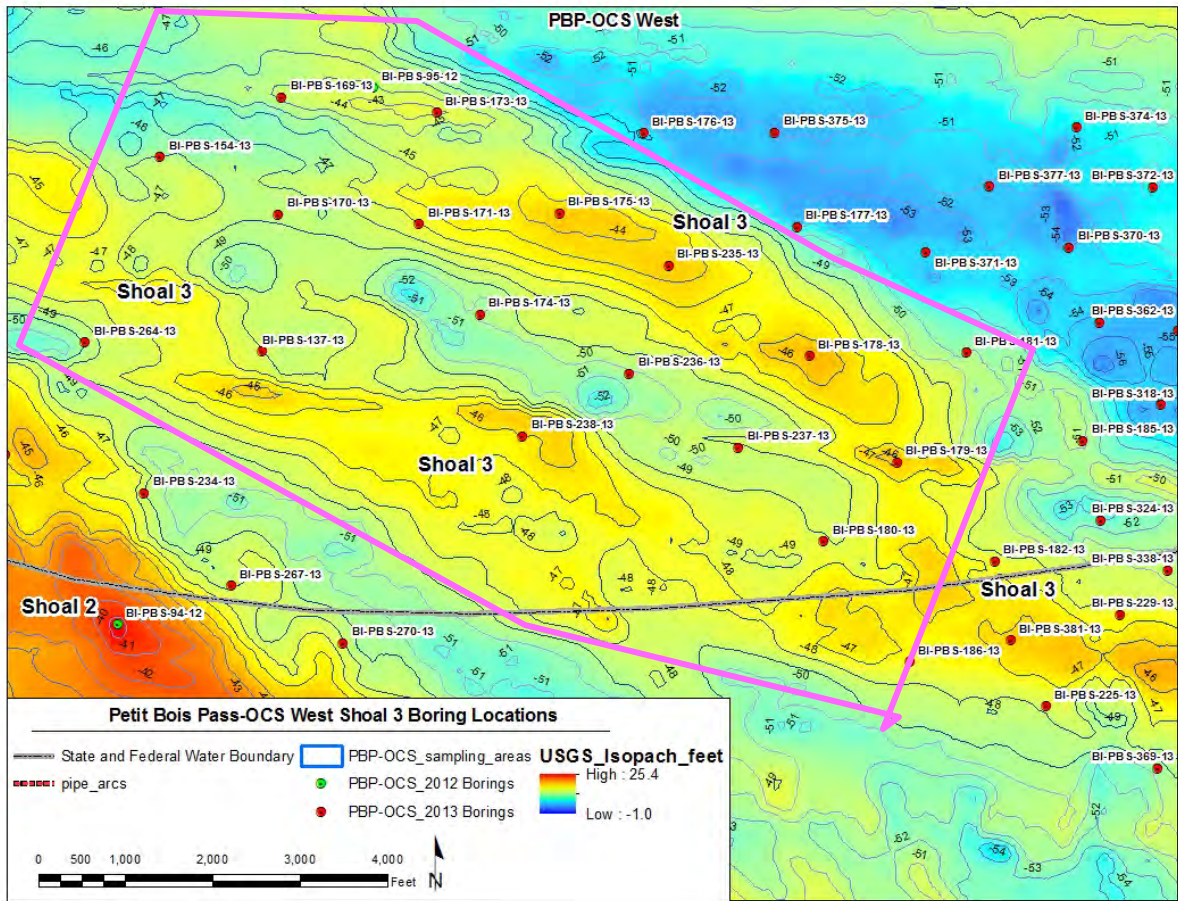


Figure 5.2.11.1.6 Western end of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses.

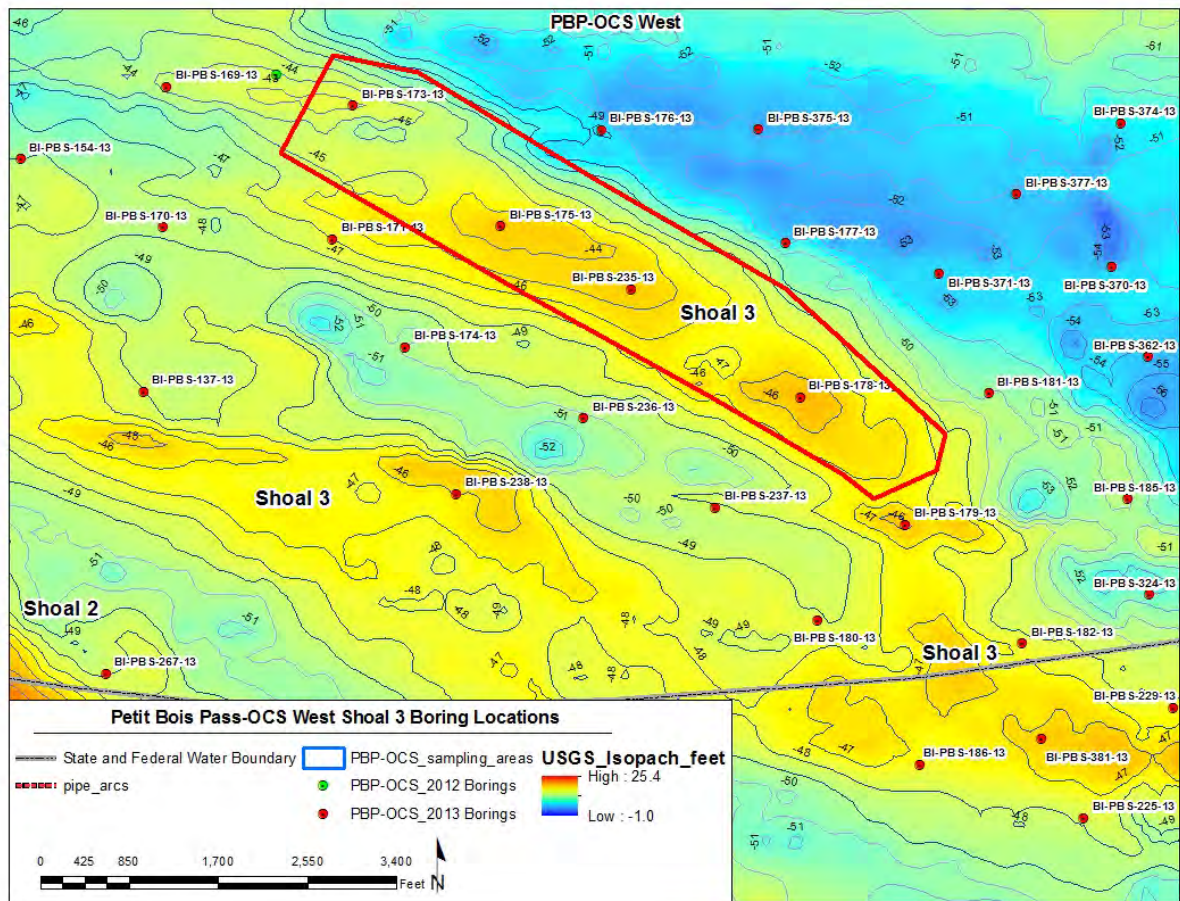


Figure 5.2.11.1.7 Petit Bois Pass-OCS West, Shoal 3 (northwest side) suitable borings outlined in red.

Suitable sand in the southern half is not as extensive. Vibracore BI-PBS-238-13 is located on the thickest portion of the southern half of the shoal and contains a 7.0 ft-thick layer of SP material. The grain size is borderline acceptable at 0.26 mm, but the color and percent fines are acceptable. The remainder of the vibracores along this portion of the shoal contain sand thicknesses ranging from less than a foot to 4.8 feet thick. However, grain size for these vibracores is too fine for use. This portion of the shoal is underlain by clay, typically at an elevation ranging from approximately -50 to -58 ft NAVD88. Geophysical data for the shoal does show that there is sandy material available, but the vibracore textural data along this portion of the shoal is too spread out to really determine whether this deposit contains suitable borrow material to make it feasible to mine.

The center area of the shoal contains more bathymetric relief than the northern third of the shoal. Figure 5.2.11.1.8 displays this portion of the shoal (pink line) with the

USGS isopach for the background. Ambient water depths range from approximately 45 to 56 feet. The isopach for the area (in feet) shows red where possible sand deposits are thickest and thins to blue. Greater sand thickness is evident on the shoal as anticipated, which correlates to the borings, but it is also thick off the northern side of the shoal (Figure 5.2.11.1.9) in the vicinity of borings BI-PBS-190-13 and BI-PBS-194-13. This thick deposit of sand, which extends to the north in this area, outlined in pink, was identified by the USGS's geophysical survey as being sandy fill in a relict Pleistocene distributary system. Ambient water depths range from approximately 50 to 59 feet. The strata consists of deposits of sand, silty sand, and clay in varying thicknesses and orientations. The clay stratum thickens to the south and west, terminating expansion in this area because, although the sand deposit on top of this clay has suitable characteristics, it thins out too much to be mined economically. Towards the north, the sand deposits become thicker and contain adequate grain size, percent fines, and color. There is a layer of overburden to the west and northwest that is too thick (>2 ft) to adequately mine the sand and still have composite textural characteristics that meet criteria (vic. BI-PBS-185-13). This overburden then thins out further north to expose an area with little overburden and adequate sand characteristics (vic. BI-PBS-361-13 to BI-PBS-334-13). Sampling indicates that the sandy deposit becomes finer grained towards the north and west, making expansion in this area not feasible due to grain size compatibility. Clay overburden thickens to the east and northeast, making it unfeasible to expand into this area. Based on these restrictions, the area directly adjacent to the shoal should be mineable, as well as the northwest-southeast sandy deposit located to the north of the shoal, extending from BI-PBS-361-13 to BI-PBS-334-13.

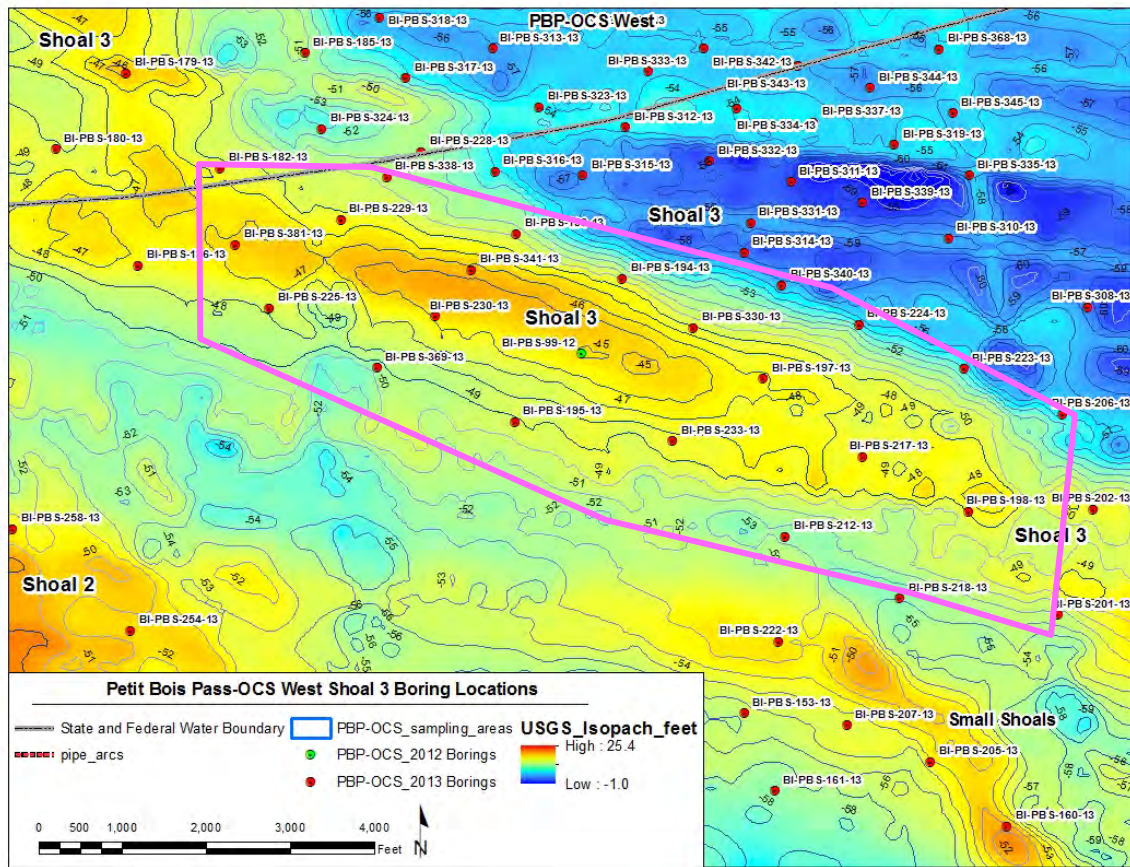


Figure 5.2.11.1.8 Central portion of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses.

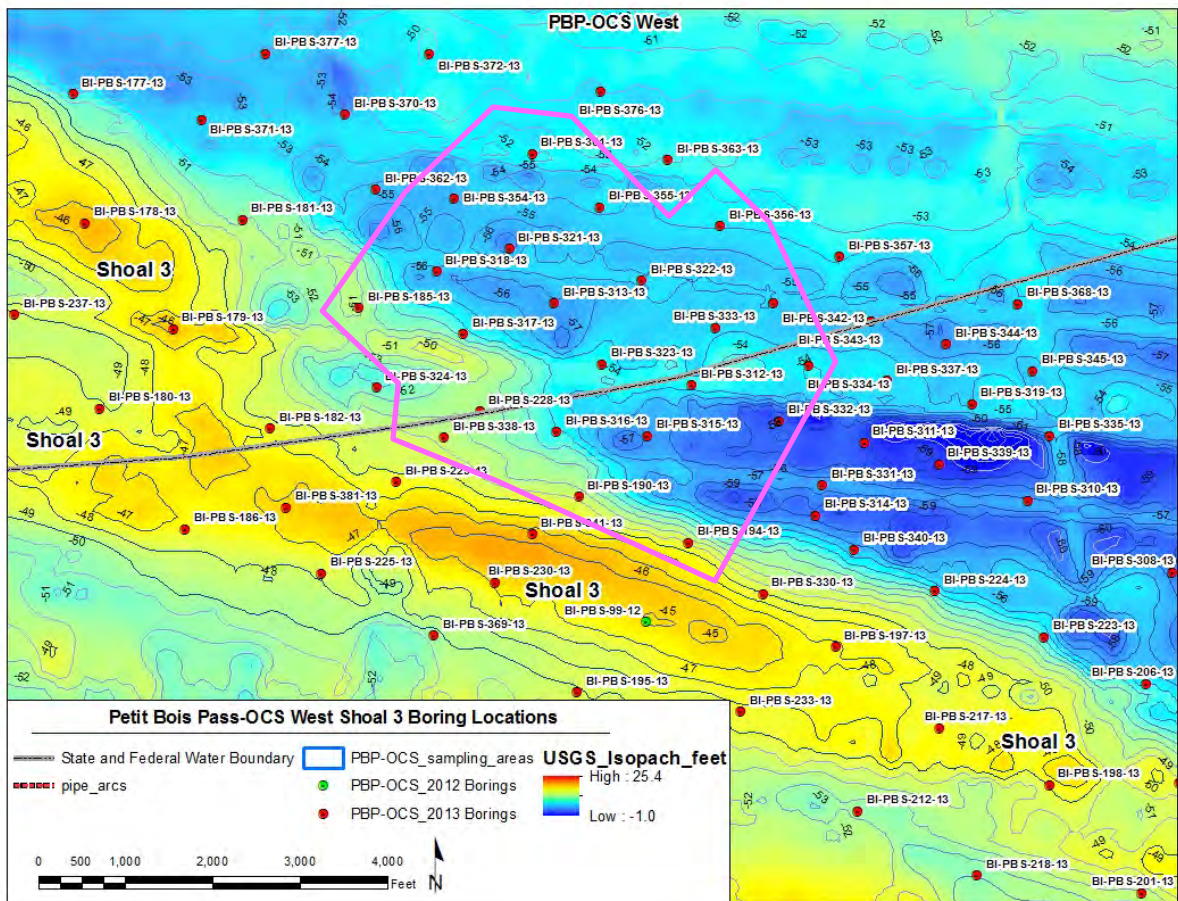


Figure 5.2.11.1.9 Sandy fill area adjacent to central portion of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses.

The eastern portion of Shoal 3 extends past the pipelines and into the PBP-OCS East investigation area (Figure 5.2.11.1.10). The portion of the shoal immediately west of the pipelines was sampled in 2012 (BI-PBS-101-12) and appeared to contain an approximately 7.0 ft thick surficial deposit of sand over an equally thick deposit of clay. However, the 2013 sampling event has shown that the surficial sand deposit ranges from 1.2 ft to 7.7 ft. thick, depending on its location along the shoal. Ambient water depths range from approximately 48 to 57 feet. The thickest deposits are located along the crest of the shoal, tapering off to the sides. D50 grain size is coarsest along the crest of the shoal, ranging in the 0.28 to 0.31 mm size. Grain size typically decreases with depth of the deposit. Color and percent of fine sediments are also within suitable limits along the shoal crest. Unfortunately, the sand deposit is underlain by a clay deposit that is too thick (>2 ft) for deeper mining potential.

The easternmost portion of Shoal 3 is located approximately 6.1 miles southeast of the eastern tip of Petit Bois Island. It is bounded by pipelines to the west and south. Ambient water depths range from approximately 48 to 68 ft. Based on the vibracores, sand (SP) thicknesses on the shoal ranged from 1.2 to 11.3 ft, with an average thickness of 4.9 ft. Three vibracores along the crest of the thickest portion of the shoal contained sand thicknesses ranging from 8.1 to 11.3 feet, and a weighted average D50 of 0.27 mm. Their percent fines range from 1.3 to 3.0%. Its average dry Munsell Color Value is 6, with a typical dry Munsell color of light olive gray. It is slightly darker than preferred, but still acceptable sand. Borrow areas in both the eastern and western portions of this section of Shoal 3 are restricted to the shoal body, as vibracores indicate poor sediments outside of the shoal boundaries.

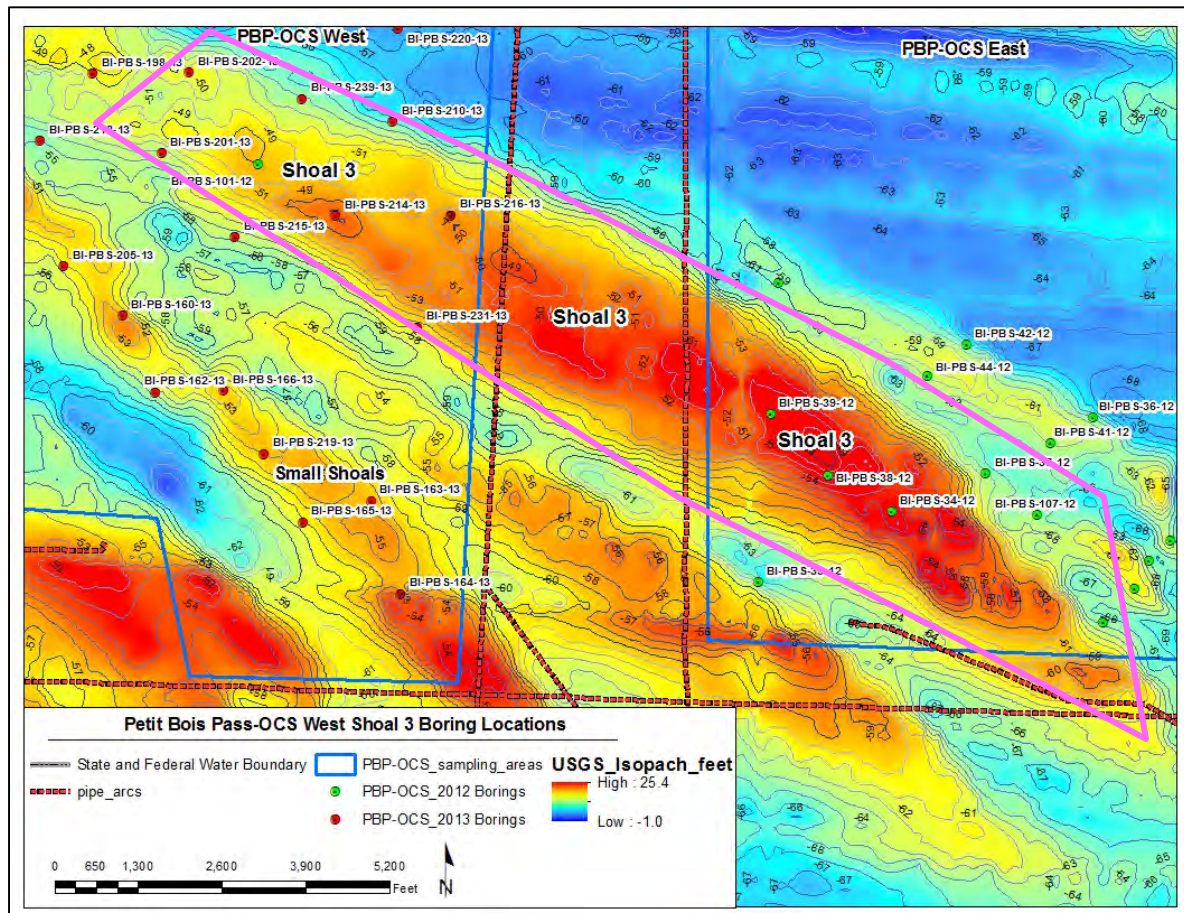


Figure 5.2.11.1.10 Eastern third of Petit Bois Pass-OCS West, Shoal 3 with USGS Isopach showing potential borrow material thicknesses. The shoal extends across two pipelines into PBP-OCS East investigation area.

5.2.11.2 PBP-OCS East Investigation Area

The PBP-OCS East investigation area is located approximately 5.5 miles south of the eastern tip of Petit Bois Island and immediately east of the two pipelines running north-south through Petit Bois Pass (Figure 5.2.11.2). This area is also bounded in the south and east by pipelines. The majority of this investigation area is located in Federal waters, with ambient water depths ranging from approximately 44 to 68 feet. There are numerous shoals located throughout the area, but the largest are located towards the center of the investigation area. Shoal 3 from the PBP-OCS West investigation area runs through the southwest corner of this investigation area. The remainder of the seafloor is relatively flat and has a gradual grade dipping to the southeast. Figure 5.2.11.2 shows the major shoals in the investigation area.

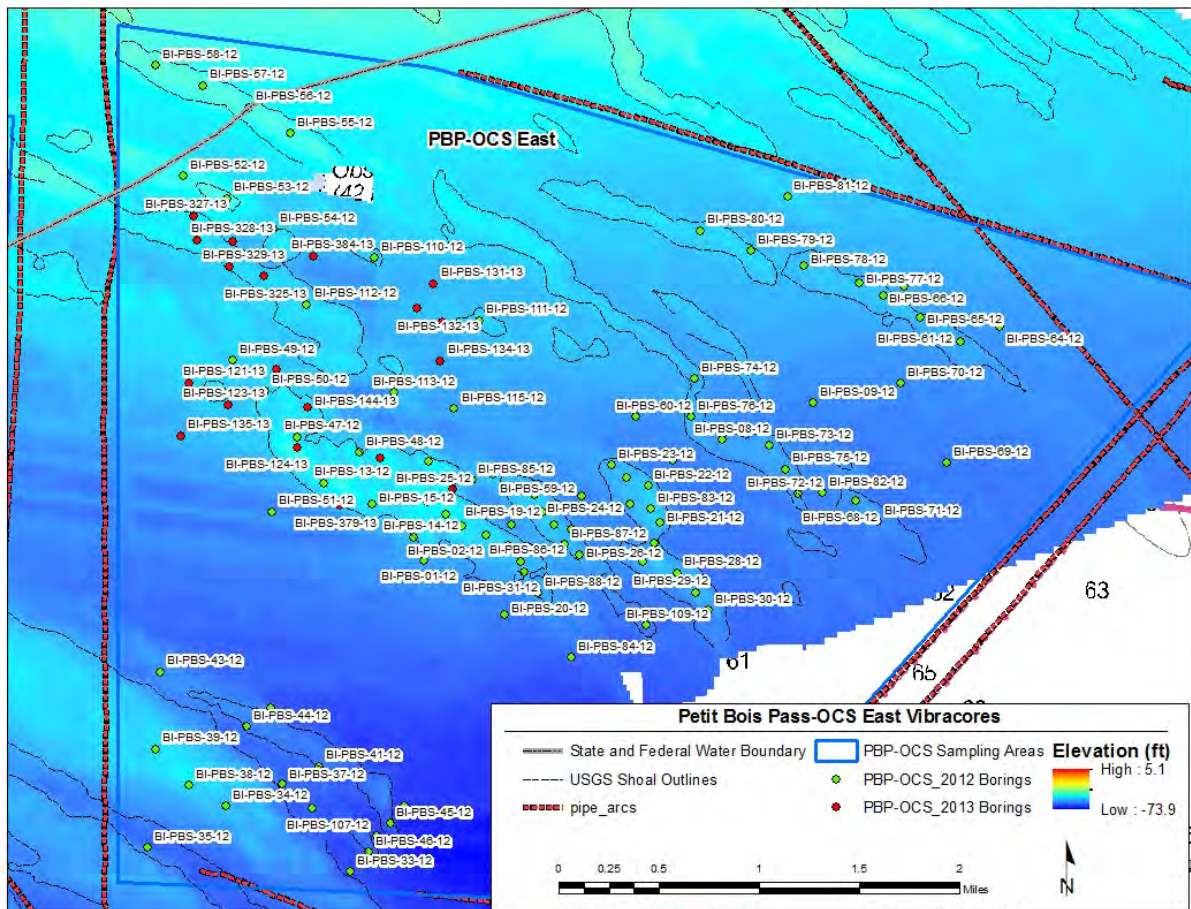


Figure 5.2.11.2 Petit Bois Pass-OCS East Investigation Area with vibracore locations.

5.2.11.2.1 PBP-OCS East, Northwest Corner

The northwest corner of the PBP-OCS East Investigation Area is located approximately 4 miles southeast of the eastern tip of Petit Bois Island (Figure 5.2.11.2.1). Ambient water depths range from approximately 43 to 60 feet. Ten (10) vibracores were completed in this area in 2012 and an additional 16 vibracores in 2013. The intent of the sampling in this area was to investigate the smaller shoals indicated by the USGS' geophysical survey from 2010 and 2013. The background of the map in Figure 5.2.11.2.1 is the USGS' sand isopach for the area.

The four vibracores along the northernmost shoal (BI-PBP-OCS-55-12 through BI-PBP-OCS-58-12) contain a surficial layer of poorly graded sand (SP), underlain by clayey sand and then clay. Thickness of the SP layer ranges from 2.6 to 3.8 ft. D50 grain size ranges from 0.33-0.34 mm. Percent fines ranges from 1.4%-2.3%. Dry Munsell Color Value is 7 for all samples. Generally, grain size decreases with depth, while percent fines increases with depth. Color also typically becomes darker with depth. This area was not considered for further evaluation because the deposits are too thin for efficient dredging and they extend into Alabama state waters.

A larger shoal complex runs through the middle of the sampling area from the west just south of the shoal mentioned previously (pink outline in Figure 5.2.11.2.1). Three of the five 2012 vibracores contained suitable thicknesses of poorly graded sand ranging from 5.5 to 9.5 ft., and composite D50s of 0.33 mm, percent fines of less than 4% and typical dry Munsell Color of Light Gray with dry Munsell Value between 6 and 7. However, additional vibracores during the 2013 sampling event showed that the sediment along the shoal from BI-PBS-327-13 through BI-PBS-325-13 was too fine grained or too thinly bedded for use with the project. Vibracores directly east of this shoal indicate similar issues with fine grain size or thin bedding. Color is also darker in this area, with Munsell values hovering around 5 and 6.

A U.S. Air Force communications tower is located between BI-PBS-326-13 and BI-PBS-54-12. It requires a specific buffer to avoid accidental damage during construction and would affect borrow area perimeter shape.

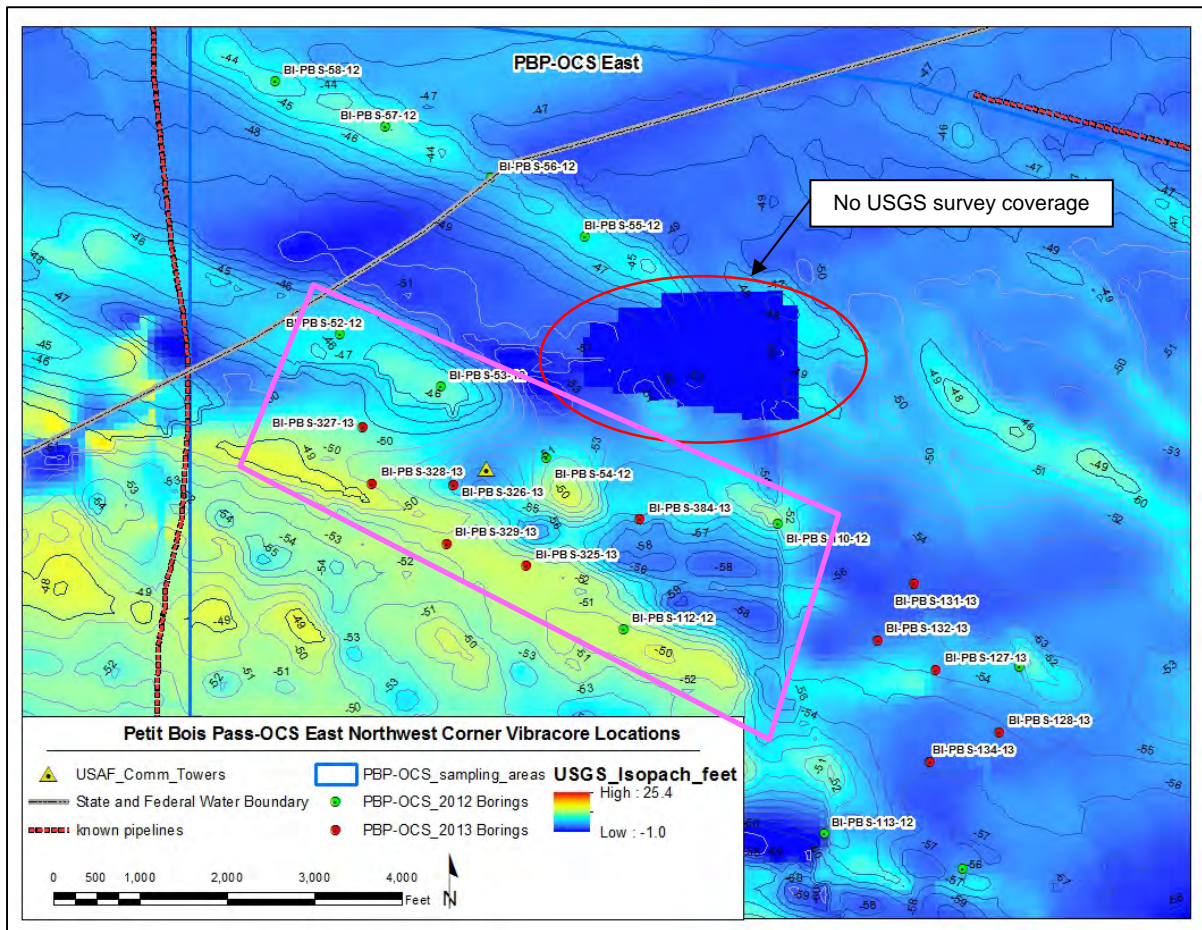


Figure 5.2.11.2.1 Completed vibracores for the northeast corner of the Petit Bois Pass-OCS East investigation area with USGS sand isopach as background. Note: there is a U.S. Air Force communications tower (yellow triangle) in the area that requires a buffer.

5.2.11.2.2 PBP-OCS East, Central Shoal Complex

The PBP-OCS East central shoal complex is located approximately 5.7 miles southeast of the eastern tip of Petit Bois Pass-OCS Island. Ambient water depths range from 44 to 63 ft. There are three major northwest/southeast-running shoals displaying significant sandy substrate thicknesses in this area based on the USGS' geophysical survey. The off-shoal area consists of gently undulating seafloor dipping generally towards the southeast. Vibracores in this area primarily targeted the four shoals, with some taken off-shoal to determine if there are any significant buried paleo channels. Within the vibracores, grain size typically decreases with depth, while percent fines increases with depth. Also, color typically becomes darker with depth, usually as a consequence of increasing fines. Sand bed

thickness decreases considerably off the shoals. Figure 5.2.11.2.2 shows the vibracores taken in the area.

Starting with the western shoal, the vibracores contained a surficial layer of poorly graded sand (SP), with thicknesses ranging from 0.4 to 10.4 ft. with an average thickness of 5.1 ft. and composite D50 grain size ranges from 0.20 to 0.37, with an average D50 of 0.26 mm. Percent fines range from 1.2% to 14.5%, with an average of 4.7%. Dry Munsell Color Value ranges from 5 to 7.5, with a typical light gray color.

The middle shoal's vibracores contained SP thicknesses ranging from 1.0 to 8.6 ft with an average thickness of 4.7 ft. Composite D50 grain size ranges from 0.21 to 0.5 mm, with an average D50 of 0.30 mm. Percent fines range from 1.7 to 3.8% with an average of 2.5%. Dry Munsell Color Value ranges from 6 to 7, with a typical light gray color.

The eastern shoal's vibracores contained SP thicknesses ranging from 2.3 to 7.7 ft., with an average thickness of 4.9 ft. Composite D50 grain size ranges from 0.17 to 0.66 mm, with a weighted average D50 of 0.30 mm. Percent fines range from 2.2 to 14.9%, with an average of 5.4%. Dry Munsell Color Value ranges from 5 to 7, with a typical light gray to light olive gray color.

The thickest portions of sand correspond with the shoal crests. Off the shoals, the vibracores indicate a drastic reduction in the thickness of sandy deposits. This corresponds with the geophysical survey results from 2010 and 2013. Typically, D50 grain size also begins to grade smaller in the more southern shoals.

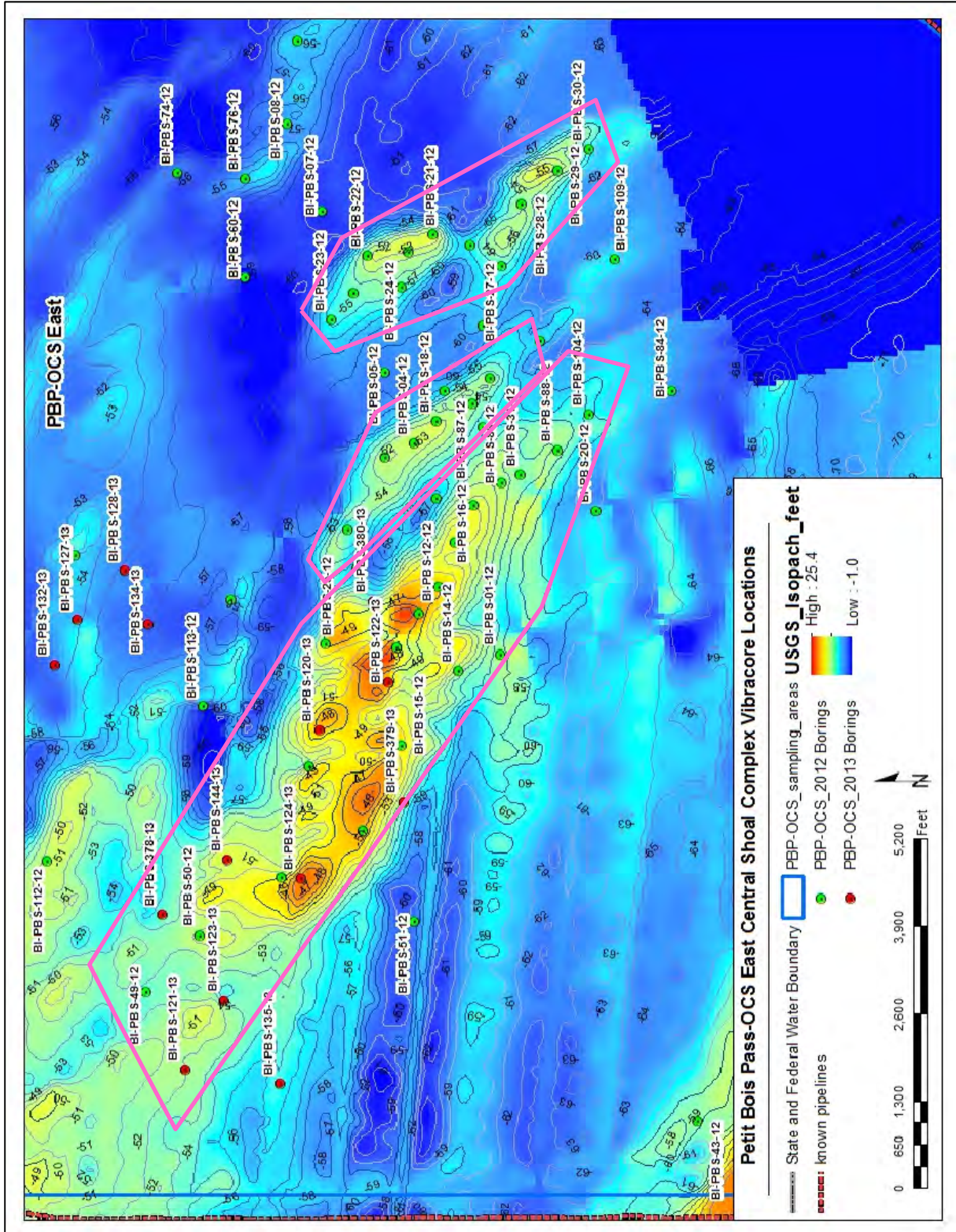


Figure 5.2.11.2.2 Completed vibracores for the Petit Bois Pass-OCS East central shoal complex with bathymetric contours illustrating the main shoals in the area.

5.2.11.2.3 PBP-OCS East, Eastern Shoals

The eastern shoals in PBP-OCS East are located approximately 5.9 miles south of the western tip of Dauphin Island. The majority of the area consists of gently sloping seafloor with a series of very small northeast-southwest oriented shoals. Of the 10 vibracores on and around the largest shoal, only two have a sand (SP) thickness greater than 4 ft (BI-PBS-76-12 and BI-PBS-68-12). Thicknesses range from 2.2 to 4.2 ft, with an average of 3.3 ft. D50 grain size ranges from 0.19 mm to 0.34 mm, with an average of 0.24 mm. Percent fines range from 2.7 to 13.3%, with an average of 8.2%. Dry Munsell color value ranges from 5 to 7 with a typical color of light gray to light olive gray.

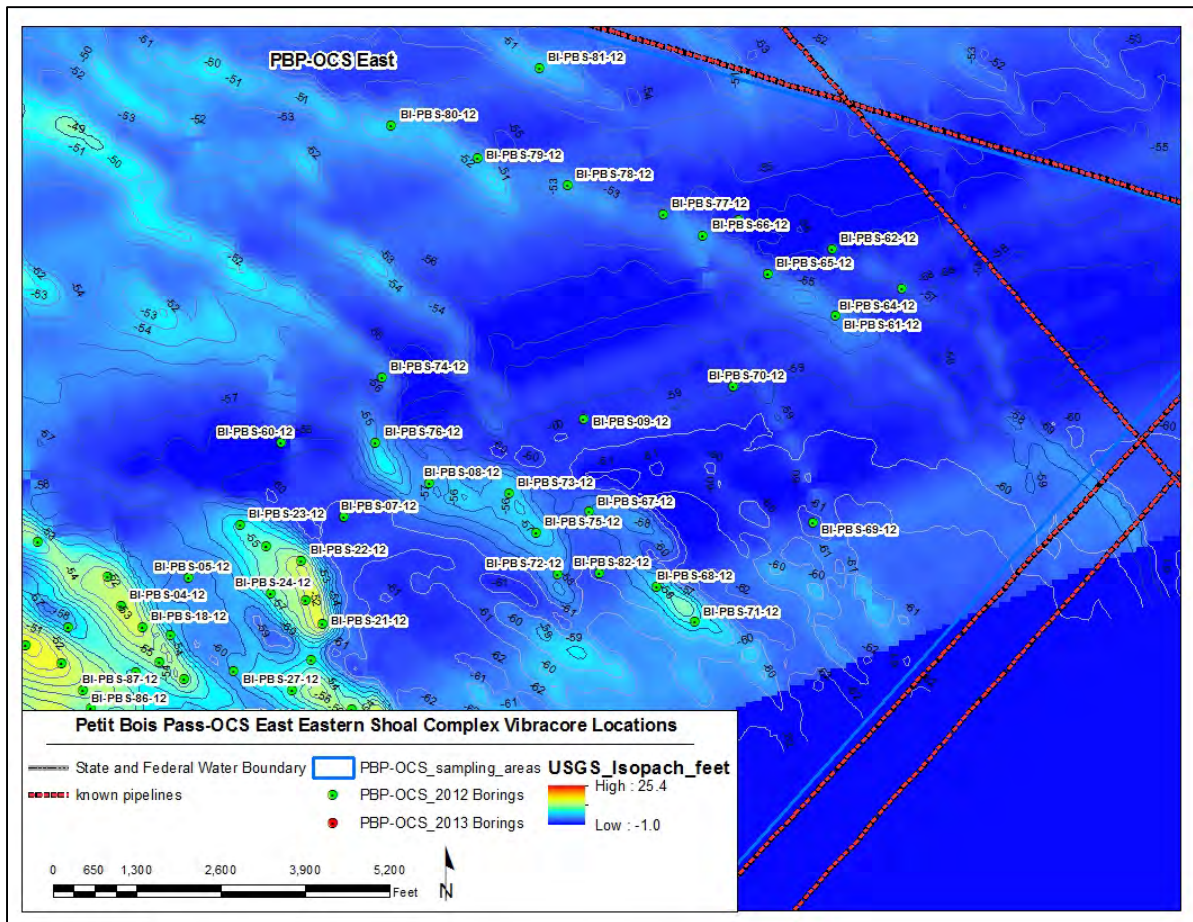


Figure 5.2.11.2.3 Completed vibracores for the Petit Bois Pass-OCS East eastern shoals investigation sub area with the USGS' isopach illustrating sandy substrate thicknesses.

There are no significant shoal features in the northeast section of PBP-OCS East, approximately 4.8 miles south of the western end of Dauphin Island. Ambient water depth ranges from 52 to 57 ft. Each of the vibrocores in this area had a surficial layer of sand (SP), ranging in thickness from 0.8 to 3.2 ft. Within this veneer, D50 ranges from 0.18 mm to 0.32 mm, with an average D50 of 0.26 mm. Percent fines ranges from 1.6% to 11.6%, with an average of 5.1%. Its average dry Munsell Color Value is 6, with a typical color of light olive gray to light gray. Two vibrocores, BI-PBS-62-12 and BI-PBS-63-12, had beach quality sand beneath silty and clayey sand layers. Unfortunately, these SM and SC layers are too thick (2.3 and 5.8 ft, respectively) for these to be considered feasible for borrow. In addition, the vibrocores in the western half of this area were underlain by clay and silt, not sand. This area is not suitable for borrow material.

6.0 BORROW AREAS

Borrow area delineation is a complex task which requires balancing all available geological, hydrological, archaeological, and environmental constraints for a given site to maximize potential yields. It is an iterative process and is not necessarily linear, but the following descriptions outline the overall processes and tasks followed for the borrow area designs.

- Geophysical surveys are conducted to provide a large scale view of the geology in a particular study area and can identify potential sand bodies. They provide a subsurface view of a potential borrow area and can indicate the areal extent, thickness, and orientation of a sand deposit. They assist with identifying the horizontal and vertical boundaries of a delineated borrow site. They are somewhat limited in that they do not always “see” clay or silt layers and sediment sampling is necessary to physically validate their models.
- Vibracore samples are used to validate and improve the geophysical survey’s stratigraphic model and provide textural data (e.g. grain size, color, angularity, and fine sediment content) for the sediments in the different strata. They provide the ground-truth of what sediments are actually there and dictate if a sand body meets the established textural requirements for borrow material. They assist with data gaps when the geophysical survey cannot see certain strata due to the material type, e.g. clays, or subsurface gas (Figure 4.1.1.2).
- Bathymetric surveys provide the actual seafloor surface elevations for use in shaping the borrow area and determining dredge cut elevations and borrow quantities. These surveys are especially important for areas of varied relief, such as the area south of Petit Bois Island, where suitable sand deposits are contained mostly within the confines of shoals and the borrow area must conform to the shape and orientation of the shoal. The bathymetry also helps to understand the effects the borrow area’s side slopes will have on the areas adjacent to them.
- Archaeological surveys identify any potential objects of anthropogenic significance that must be avoided within the proposed borrow area. This can result in the borrow area either being reconfigured with a buffer around the object, or complete elimination of the site if the buffer proves too large for the area to be economically feasible to mine.
- Modeling is conducted on potential borrow sites that may potentially affect landforms or man-made structures post-dredging through wave-focusing or other altered hydrodynamic processes. The modeling gives an indication if the borrow area needs to be repositioned or reconfigured to reduce its influence.

- Thiessen polygon analysis is used to map each boring's influence on the sediment characteristics within the borrow area. This analysis gives the designer an idea of the shape needed to statistically maximize a particular boring's textural characteristics. This analysis technique works best on low relief areas. It does not do a good job accounting for inconsistent, undulating surfaces, like shoals, because the boring could be at the base of the feature and not have any effect on the top of the feature, even though the Thiessen polygon says that it should. However, this analysis technique offers a good starting point for determining borrow area shape in the absence of distinct geomorphic features that might otherwise dictate shape.
- Areal boundaries are drawn to best fit the extent of the suitable sand deposit, given the constraints identified by the geophysical survey, the vibracores, and the bathymetric and archaeological surveys. Subareas, or cells, are designed, as necessary, to optimize the dredgeable quantity within these boundaries by altering cut elevations to fit the deposit's orientation and thicknesses. Dredge equipment capabilities are another constraint that factors into the borrow area design. In particular, the bottom cut elevation needs to be adjusted to accommodate overdepth dredging caused by human error, environmental conditions, or mechanical limitations. Overdepth dredging can result in unsuitable material being dredged. Because of the difficulty in designing a borrow area on a convex surface such as a shoal, there are areas that are considered allowable dredge material, but not required for the project. The purpose of these allowable areas is to recognize that the material is suitable for the project, but that the difficulty in dredging it could increase project costs for the contractor. By making it optional, the contractor can decide if the cost is worth the effort to ensure the required quantities for the fill specifications are met. Several borrow areas have "Allowable" borrow cells. After the boundaries are established, volumes of the sand can be calculated for each area and subarea using software such as InRoads or ArcGIS. The textural characteristics of the sediment can then be calculated for each borrow area to ensure they meet the fill requirements established at the beginning of the investigation.

Using this process, USACE Mobile identified several potential borrow areas. The shape and dimensions of the borrow areas have been configured to maximize sand recovery while minimizing environmental impacts. Dredge equipment capabilities have also been considered in the designs. The following figures do not necessarily represent the final designs for the borrow areas, as future surveying or other pre-construction data may necessitate changes. Table 6.1 contains the current borrow area statistics.

Cat Island, Ship Island, DA-10, and Petit Bois Pass-AL East and West borrow areas have been modeled and their boundaries identified. Using their updated shapes and

projected dredging cut elevations, their projected volumes have been calculated using Bentley's InRoads software program. Area dimensions do not include the footprint of the estimated fall-in of the side slopes after dredging. Table 6.1 summarizes this information.

Table 6.1 Borrow Area statistics

<i>Borrow Area</i>	<i>Template Volume (mcy)²</i>	<i>Area (Acres)³</i>	<i>D50 (mm)</i>	<i>Percent Fines</i>	<i>Dry Munsell Value</i>
Petit Bois Pass-Alabama East	14.7	885	0.33	7	6
Petit Bois Pass-Alabama West	5.1	380	0.31	4	6
Petit Bois Pass-Mississippi	2.0	175	0.31	3	7
Petit Bois Pass-Outer Continental Shelf East	4.2	464	0.29	2	7
Petit Bois Pass-Outer Continental Shelf West	15.4	1,383	0.27	3.4	6
Horn Island Pass	4.9	612	0.28	4.4	7
Ship Island	2.7	183	0.21	6	7
Ship Island Pass ¹	0.45	20.9	0.48	< 1	6
Cat Island	4.3	429	0.20	5	6
Total	53.7				

¹Ship Island Pass borrow material D50 and percent fines is derived from a proxy sample taken from the north shore of West Ship Island (see Section 5.2.4 Ship Island Pass for discussion).

²Borrow area template volume does not include estimated losses caused by dredging inefficiencies. Template volume includes the estimated required dredge volume and the estimated allowable dredge volume.

³Borrow area acreages are estimated based on cut bottom area and do not include side slopes.

Cat Island

The design for the Cat Island borrow area been an iterative process due to wave and hydrodynamic modeling, coupled with expansion for additional material. Figure 6.1 shows the latest proposed borrow area. Its location is far enough offshore and its cut depth is relatively shallow to reduce significant wave focusing on the island. The new borrow area is separated into two cells with cut elevations of -18.5 feet NAVD88 (northeast half) and -19.5 feet NAVD88 (southwest half). Areally, it is approximately 1650 feet wide (northwest-southeast) by 10,100 feet long (northeast-southwest) and covers approximately 429 acres combined with an estimated volume of 4.3 mcy at an average cut depth of 5 feet. It has an average D50 of 0.20 mm and a dry Munsell value of 6. The average percentage of fines is expected to be 5%. Its grain size is finer than the original goal of 0.28 mm, but the close proximity to the island and the fact that the sand is being placed mostly on existing land rather than an open water cut, led to the design and use of this borrow area.

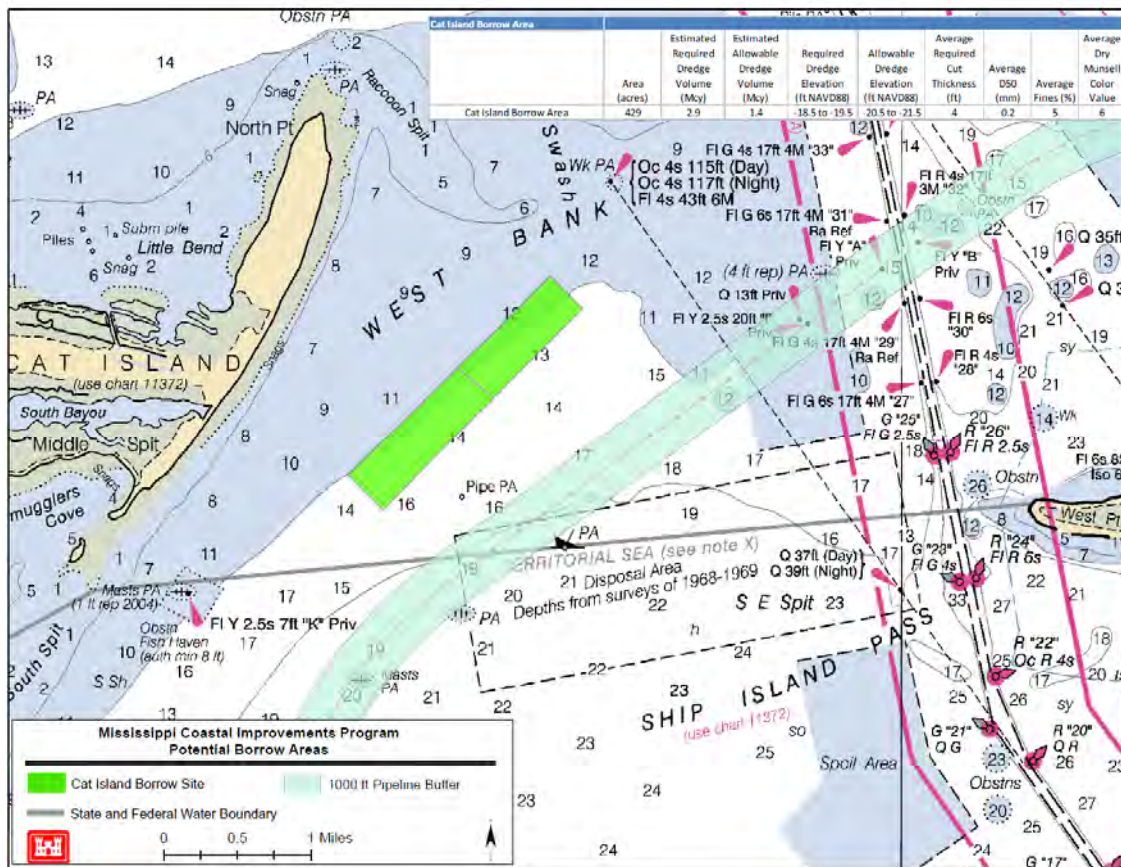


Figure 6.1 Cat Island Borrow Area

Ship Island Pass

As discussed in Section 5.2.4, material for placement on the north shore of West Ship Island was identified at the western end of the island, in the vicinity of the old Gulfport navigation channel. Figure 6.2 shows the final location, orientation, and general shape of the borrow area used for the nourishment. The borrow area volume is estimated at approximately 450,000 cy with an area of approximately 20.9 acres. The proxy D50 grain size is 0.48 mm and the dry Munsell value is 6. The average percentage of fine material was approximately 1%.

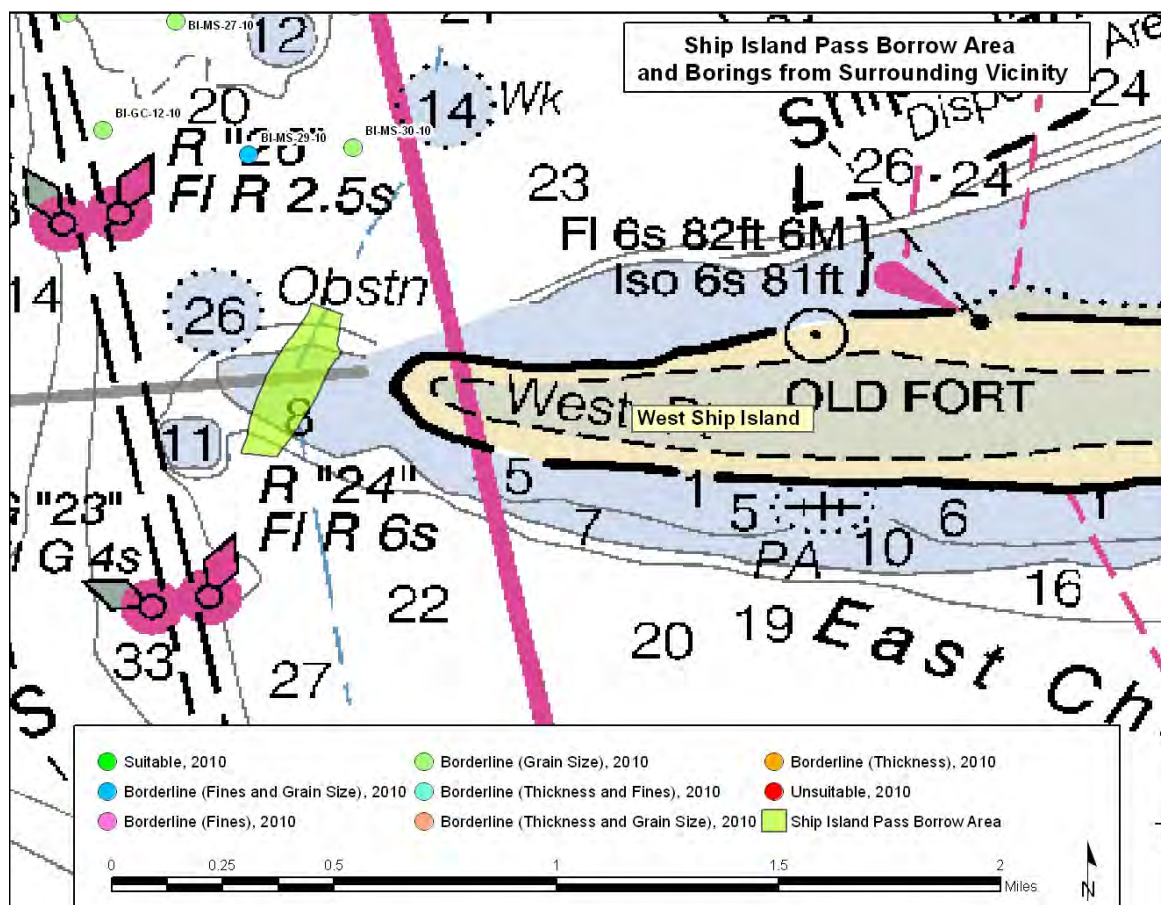


Figure 6.2 Ship Island Pass Borrow Area for north shore placement on West Ship Island

Ship Island

A potential borrow area was identified south of Ship Island. It has fine grain sand-sized sediments and thus is limited in its use within this project. Figure 6.3 shows the location, shape, and orientation of the borrow area. Despite the relatively large

sand deposit identified by the USGS' geophysics and the USACE vibracores, hydrodynamic modeling has played a role in reducing the extent and depth of the borrow area to mitigate its effects on the wave climate approaching East and West Ship Island. It is approximately 600 feet wide (north-south direction) and 6,000 feet long (east-west direction) covering a total area of approximately 96 acres with an average cut thickness of approximately 8 feet. It has an estimated volume of 2.7 million cubic yards and average D50 grain size of 0.21 mm. Dry Munsell color is expected to range from light brownish gray to light gray with an average dry Munsell value of 7. The average percentage of fines is expected to be approximately 6%.

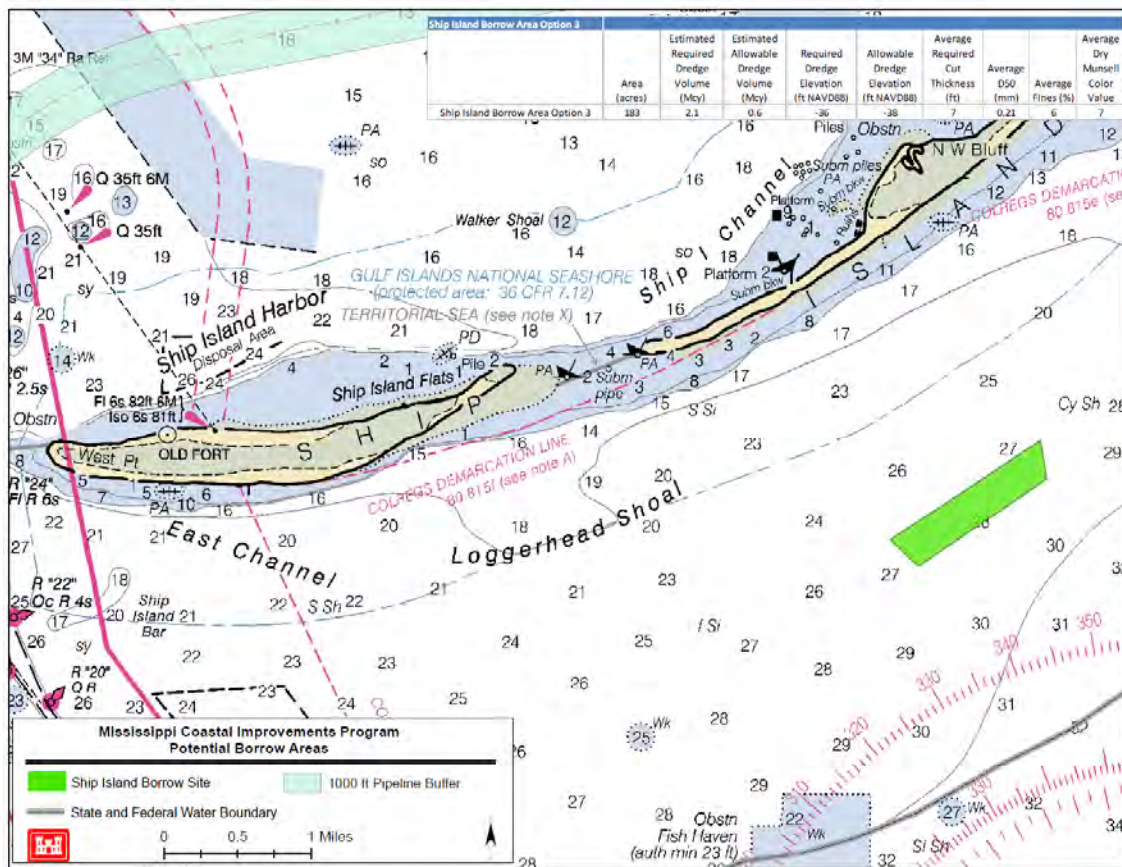


Figure 6.3 - Ship Island Borrow Area

Horn Island Pass

Three potential borrow areas have been identified within the Horn Island Pass sampling area that maximize use of the dredged sediment disposal mounds identified there (Figure 6.4). The borrow areas are located on top of the mounds,

which greatly influences their shape, size, and orientation. Because the mounded disposal sediments were mechanically placed on the seafloor, there is a fairly distinct transition between the sandy disposal sediments and the muddy in-situ sediments. The intent of the borrow area designs is to dredge down to this transition zone without dredging into the poor material. Each borrow area is split into different cells with cut elevations adjusted to the undulating bathymetry created by the mounds. Because of the difficulty in designing a borrow area on a convex surface, there is an area in HIP 3 that is considered allowable dredge material, but not required for the project. The purpose of this allowable area is to recognize that the material is suitable for the project, but that the difficulty in dredging it could increase project costs for the contractor. By making it optional, the contractor can decide if the cost is worth the effort to ensure the required quantities for the fill specifications are met.

The northernmost borrow area, HIP1, is divided into two cells with cut elevations of -33 (northern half) and -35 (southern half). The dimensions of the entire borrow area are roughly 4,700 feet long (northeast-southwest) by 1,600 feet wide (southeast-northwest). The combined area is approximately 168 acres, with an average cut depth of 4 feet. The total volume is estimated at 1.4 mcy of sand with an average D50 of 0.30 mm, fines content of 4%, and a Munsell Value of 7. The next borrow area, HIP 2, is located to the west of the southern tip of HIP 1. It contains two cells with cut elevations of -36.5 (northern half) and -39 (southern half), respectively. The dimensions of the entire borrow area are roughly 3,200 feet long (northeast-southwest) by 1,600 feet wide (southeast-northwest). The combined area is approximately 137 acres, with an average cut depth of 5 feet. The total volume is estimated at 1.3 mcy of sand with an average D50 of 0.29mm, fines content of 2%, and a dry Munsell Value of 7. The third borrow area, HIP 3, is located to the southwest of HIP 1 and south of HIP 2. It contains three cells with cut elevations of -36.5 (northern half) and -39 (southern half). The southwestern cell with cut elevation of -36.5 ft is allowable for the contractor, but not necessary. The dimensions of the entire borrow area are roughly 6,400 feet long (northeast-southwest) by 2,000 feet wide (southeast-northwest). The combined area is approximately 307 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 1.2 mcy of sand with an average D50 of 0.27 mm, fines content of 6%, and a dry Munsell Value of 7.

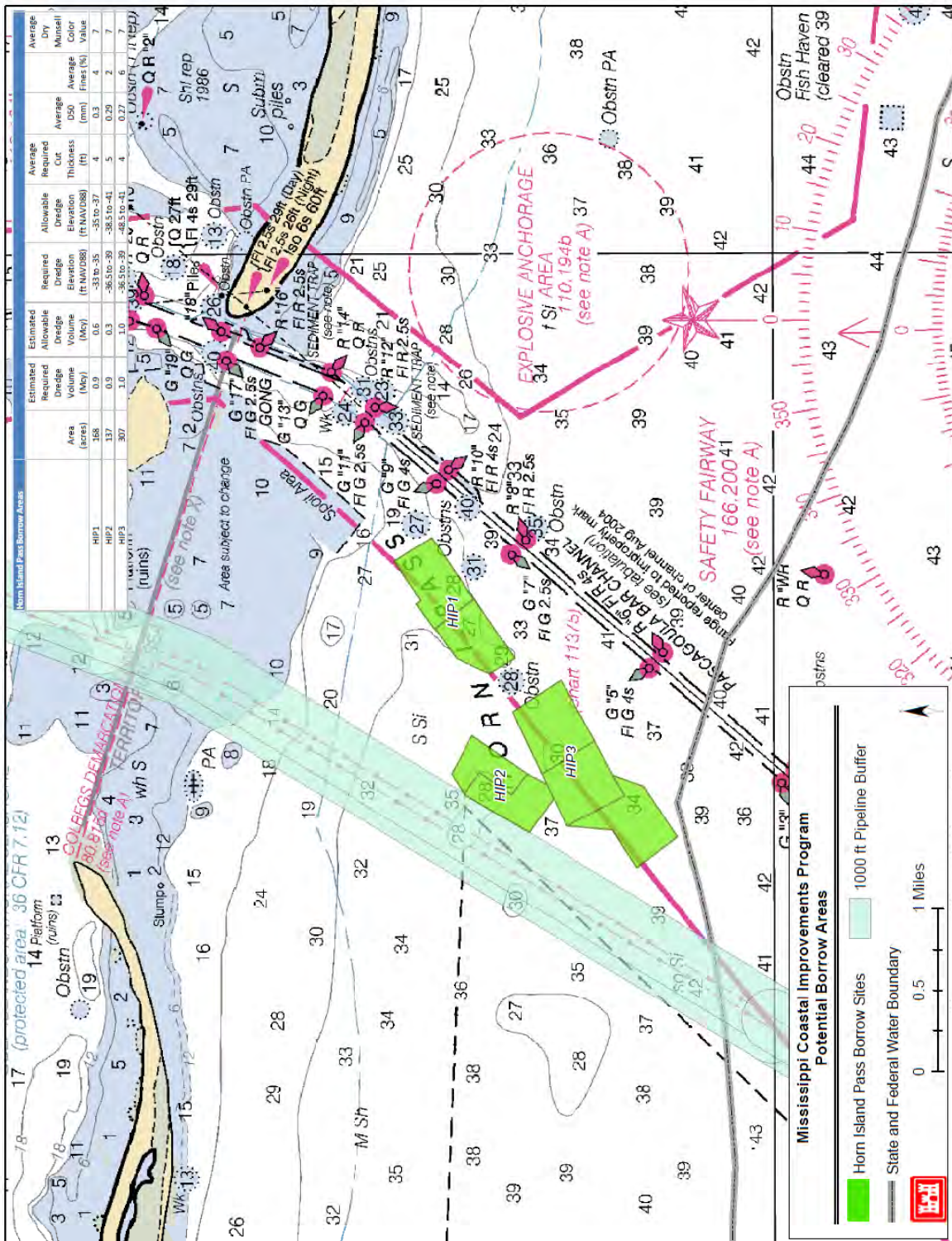


Figure 6.4 – Horn Island Pass Borrow Area

Petit Bois Pass-Outer Continental Shelf West

Six potential borrow areas were identified within the Petit Bois Pass-Outer Continental Shelf West sampling area (Figure 6.5). Because most of the suitable sand deposits are located within the confines of the shoals in the area, the borrow areas' shape, size, and orientation are highly dependent on the morphology of these shoals. There are also "Allowable" dredging cells within certain borrow areas that are the result of the deposit being too thinly bedded for a required cut, but thick enough for a contractor to dredge it, albeit most likely at a higher unit cost.

PBP-OCS West 1 is located approximately 4 miles south of Petit Bois Island on Shoal 2, described in Section 5.2.11.1. Because of the morphology of the shoal, the borrow area has one cell that is required dredging and a smaller southeastern cell that is "Allowable" dredging. The dimensions of the entire borrow area are roughly 8,800 feet long (northwest-southeast) by 2,100 feet wide (southwest-northeast). The combined area is approximately 419 acres, with an average required cut thickness of 5 feet. The total volume is estimated at 3.1 mcy of sand with an average D50 of 0.26 mm, fines content of 3%, and a dry Munsell Value of 6.

PBP-OCS West 2 is located approximately 2.7 miles south of Petit Bois Island on the western end of Shoal 3, described in Section 5.2.11.1. Because of the morphology of the shoal, there are three cells within the borrow area, and the northwestern and southeastern cells are "Allowable" for dredging. The dimensions of the entire borrow area are roughly 7,500 feet long (northwest-southeast) by 1,600 feet wide (southwest-northeast). The combined area is approximately 192 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 1.6 mcy of sand with an average D50 of 0.28 mm, fines content of 5%, and a dry Munsell Value of 6.

PBP-OCS West 3 is located approximately 1.9 miles south of Petit Bois Island to the north of Shoal 3. This borrow area is relatively flat compared with the others in PBP-OCS West, but has a much thicker subbottom deposit of sand. Based on the deposit thicknesses, three cells were identified within the borrow area. The dimensions of the entire borrow area are roughly 7,000 feet long (northwest-southeast) by 2,100 feet wide (southwest-northeast). The combined area is approximately 275 acres, with an average required cut thickness of 9 feet. The total

volume is estimated at 5.5 mcy of sand with an average D50 of 0.26 mm, fines content of 3%, and a dry Munsell Value of 6.

PBP-OCS West 4 is located approximately 3.8 miles south of Petit Bois Island on the central portion of Shoal 3, described in Section 5.2.11.1. Because of the morphology of the shoal and the sediment deposit adjacent to it, there are two cells within the borrow area that target these features. The dimensions of the entire borrow area are roughly 5,500 feet long (northwest-southeast) by 1,650 feet wide (southwest-northeast). The combined area is approximately 195 acres, with an average required cut thickness of 8 feet. The total volume is estimated at 2.4 mcy of sand with an average D50 of 0.30 mm, fines content of 4%, and a dry Munsell Value of 6.

PBP-OCS West 5 is located approximately 5.2 miles south of Petit Bois Island on the eastern portion of Shoal 3 in the PBP-OCS West sampling area, described in Section 5.2.11.1. Because of the morphology of the shoal, there is one "Required" and one "Allowable" cell within the borrow area. The Allowable cell is located on the southeastern end of the borrow area. The dimensions of the entire borrow area are roughly 5,500 feet long (northwest-southeast) by 1,800 feet wide (southwest-northeast). The combined area is approximately 190 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 1.3 mcy of sand with an average D50 of 0.28 mm, fines content of 4%, and a dry Munsell Value of 6.

PBP-OCS West 6 is located approximately 6.4 miles south of the eastern tip of Petit Bois Island on the eastern portion of Shoal 3 in the PBP-OCS East sampling area, described in Section 5.2.11.1. Because this portion of the shoal is relatively consistent in its thickness, there is only one dredge cell within this borrow area. The dimensions of the borrow area are roughly 3,600 feet long (northwest-southeast) by 1,590 feet wide (southwest-northeast). The area is approximately 146 acres, with an average cut thickness of 5 feet. The total volume is estimated at 1.5 mcy of sand with an average D50 of 0.29 mm, fines content of 2%, and a dry Munsell Value of 6.

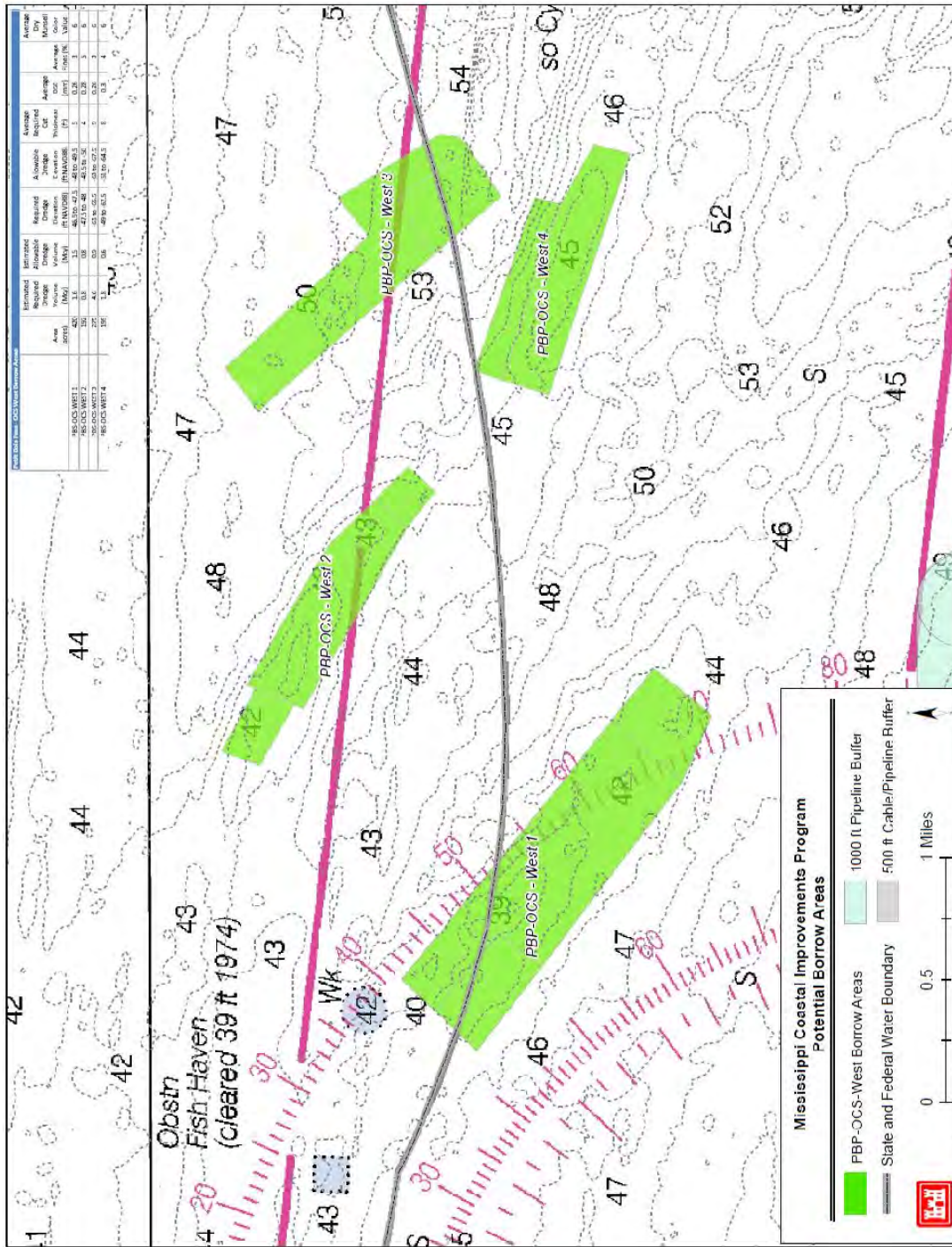


Figure 6.5 – Petit Bois Pass-OCS West Borrow Areas 1 thru 4

Petit Bois Pass-Outer Continental Shelf East

Five potential borrow areas were identified within the PBP-OCS East sampling area (Figure 6.6). Because most of the suitable sand deposits are located within the confines of the shoals in the area, the borrow areas' shape, size, and orientation are highly dependent on the morphology of these shoals. There are also "Allowable" dredging cells within certain borrow areas that are the result of the deposit being too thinly bedded for a required cut, but thick enough for a contractor to dredge it, albeit most likely at a higher unit cost.

PBP-OCS East 1 is located approximately 4 miles southeast of Petit Bois Island and 5.1 miles south-southwest of Dauphin Island, AL, in an area described in Section 5.2.11.2.1. Because of the morphology of the shoal, the borrow area has two dredge cells to maximize sediment recovery. The dimensions of the entire borrow area are roughly 2,850 feet long (northwest-southeast) by 710 feet wide (southwest-northeast). The combined area is approximately 51 acres, with an average required cut thickness of 5 feet. The total volume is estimated at 0.4 mcy of sand with an average D50 of 0.33 mm, fines content of 2%, and a dry Munsell Value of 7.

PBP-OCS East 2 is located approximately 5.5 miles south-southeast of Petit Bois Island and 6.3 miles south-southwest of Dauphin Island, AL, in an area described in Section 5.2.11.1. Because of the morphology of the shoal, there are three cells of different cut elevations within the borrow area to maximize sediment recovery. The dimensions of the entire borrow area are roughly 8,300 feet long (northwest-southeast) by 2,230 feet wide (southwest-northeast). The combined area is approximately 302 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 2.9 mcy of sand with an average D50 of 0.28 mm, fines content of 2%, and a dry Munsell Value of 7.

PBP-OCS East 3 is located approximately 6.4 miles southwest of Petit Bois Island and 6.3 miles south-southwest of Dauphin Island, AL, in an area described in Section 5.2.11.2.3. This borrow area is located on top of a shoal and contains only one cut elevation. The dimensions of the entire borrow area are roughly 2,150 feet long (northwest-southeast) by 900 feet wide (southwest-northeast). The combined area is approximately 39 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 0.3 mcy of sand with an average D50 of 0.31 mm, fines content of 2%, and a dry Munsell Value of 7.

PBP-OCS East 4 is located on a shoal approximately 6.8 miles southwest of Petit Bois Island and 6.8 miles south-southwest of Dauphin Island, AL, in an area described in Section 5.2.11.2.2. Because of the morphology of the shoal, there are two cells with different cut elevations within the borrow area that target the different thicknesses of the deposit. The dimensions of the entire borrow area are roughly 2,590 feet long (northwest-southeast) by 600 feet wide (southwest-northeast). The combined area is approximately 43 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 0.3 mcy of sand with an average D50 of 0.31 mm, fines content of 2%, and a Munsell Value of 7.

PBP-OCS East 5 is located on a shoal approximately 6.2 miles southwest of Petit Bois Island and 6.5 miles south-southwest of Dauphin Island, AL, in an area described in Section 5.2.11.2.2. Because of the morphology of the shoal, there are two dredge cut elevations within the borrow area to maximize sediment recovery. The dimensions of the entire borrow area are roughly 2,330 feet long (northwest-southeast) by 590 feet wide (southwest-northeast). The combined area is approximately 29 acres, with an average required cut thickness of 4 feet. The total volume is estimated at 0.3 mcy of sand with an average D50 of 0.28 mm, fines content of 2%, and a dry Munsell Value of 7.

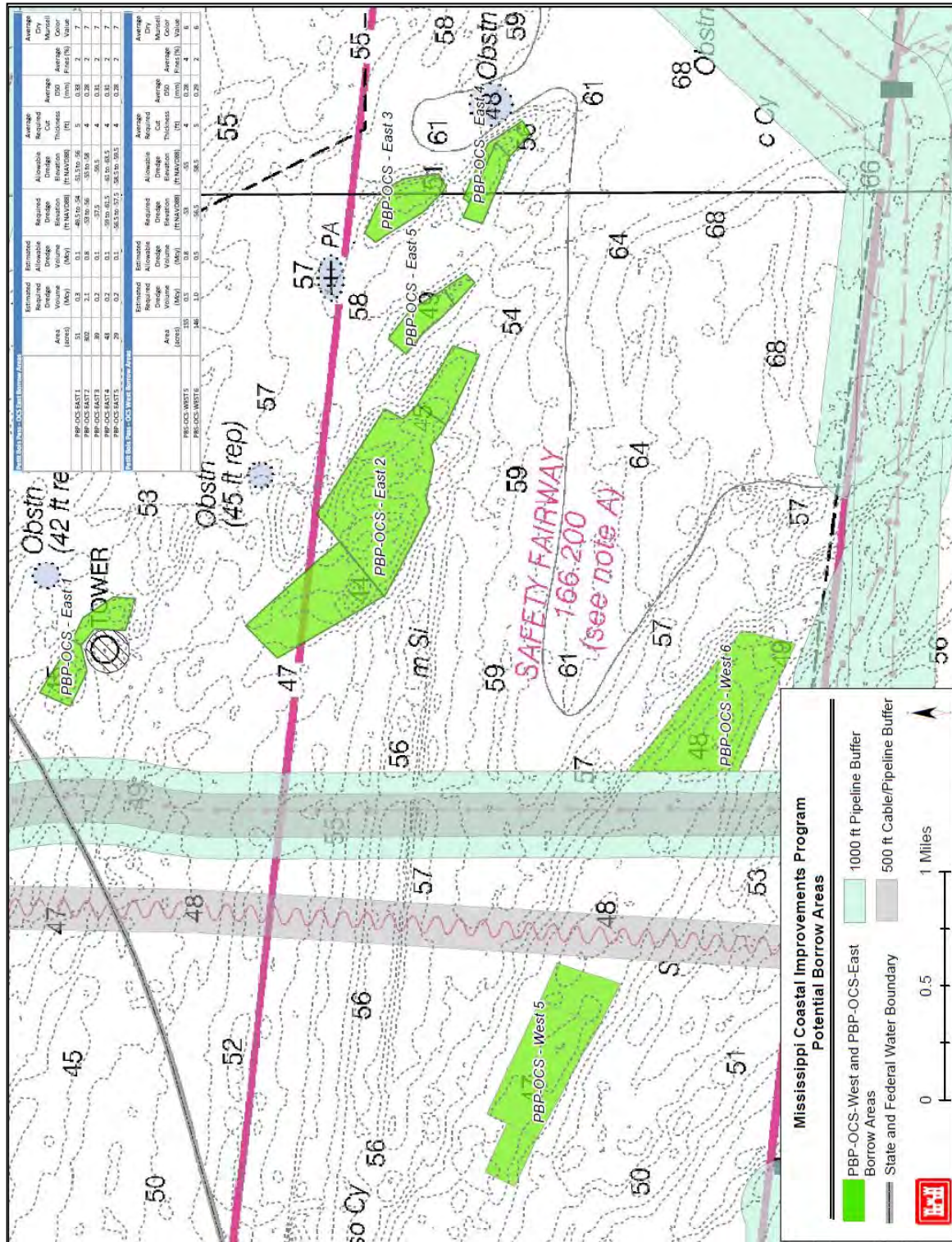


Figure 6.6 – Petit Bois Pass-OCS West Borrow Areas 5 and 6, and PBP-OCS East Borrow Areas 1 thru 4.

Petit Bois Pass-MS

The Petit Bois Pass-Mississippi borrow area is located approximately 1.4 miles southeast of the eastern end of Petit Bois Island (Figure 6.6). The borrow area covers the shoal described in Section 5.2.10. Because of the morphology of the shoal, there are five dredge cut elevations within the borrow area to maximize sediment recovery. The dimensions of the entire borrow area are roughly 3,500 feet long (northwest-southeast) by 2,370 feet wide (southwest-northeast). The combined area is approximately 175 acres, with an average required cut thickness of 6 feet. The total volume is estimated at 2.0 mcy of sand with an average D50 of 0.31 mm, fines content of 3%, and a dry Munsell Value of 7.

Petit Bois Pass-AL West and East

The Petit Bois Pass-AL borrow areas have been modified from their initial shapes to better fit the sand deposits and minimize wave refraction on Dauphin Island and surrounding pipelines (Figure 6.6).

PBP-AL East is located approximately 1.9 miles south of Dauphin Island, AL, in an area described in Section 5.2.9. There are five cells with different cut elevations targeting the different thicknesses of the deposit. The dimensions of the entire borrow area are roughly 1.9 miles long (west-east) by 5,750 feet wide (south-north). The combined area is approximately 885 acres, with an average required cut thickness of 7 feet. The total volume is estimated at 14.7 mcy of sand with an average D50 of 0.33 mm, fines content of 7%, and a dry Munsell Value of 6.

PBP-AL West is located on a shoal approximately 3 miles east-southeast of Petit Bois Island and 2.7 miles south-southwest of Dauphin Island, AL, in an area described in Section 5.2.9. There are three dredge cut elevations within the borrow area to maximize sediment recovery. The dimensions of the entire borrow area are roughly 6,800 feet long (west-east) by 2,450 feet wide (south-north). The combined area is approximately 380 acres, with an average required cut thickness of 6 feet. The total volume is estimated at 5.1 mcy of sand with an average D50 of 0.31 mm, fines content of 4%, and a dry Munsell Value of 6.

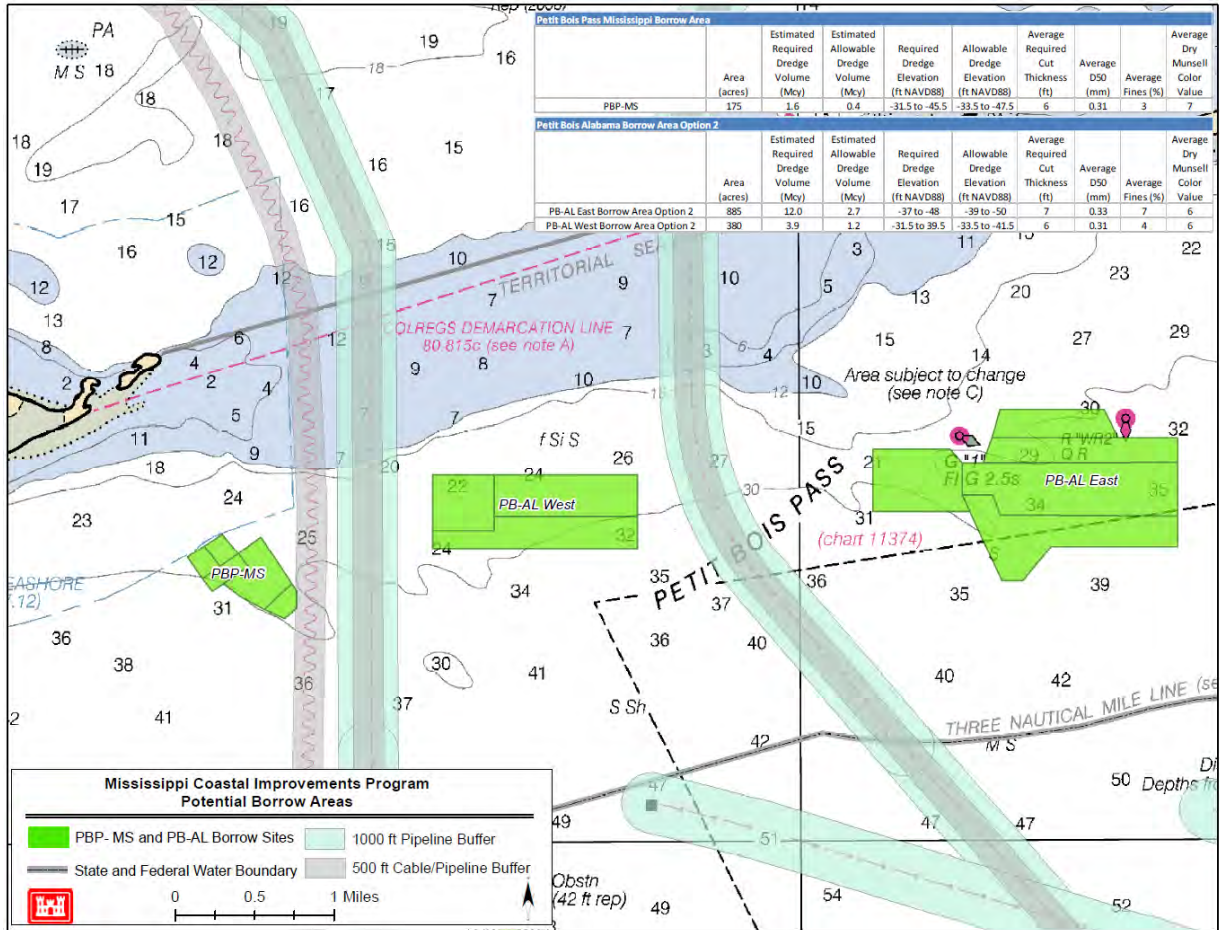


Figure 6.7 - Petit Bois Pass-AL Borrow Areas

7.0 CONCLUSION

From 2006 through 2013, Mobile District conducted geotechnical investigations of the area surrounding the Mississippi Barrier Islands and south into Federally-controlled waters with the intent of identifying sediment characteristics of the islands and locating compatible sediment for nourishment projects on and around the islands.

Beginning in 2006, grab samples were taken on each island of the barrier island chain to identify each island's sediment characteristics in order to gain an understanding of the system as a whole. This information was critical to determining the type of sediment needed for island restoration projects in the area.

This was followed up with geophysical investigations conducted in conjunction with the USGS in 2010 and 2013 to identify offshore sand bodies that had the potential to be used as borrow sources.

Geotechnical investigations in 2010, 2011, 2012, and 2013 focused on potential sand deposits identified by the geophysical surveys and previous sampling events. Vibracoring was used to sample the sediments along the Mississippi barrier islands, specifically in Gulfport Channel, Mississippi Sound, adjacent to Cat Island, Ship Island Pass, south of Ship Island, Dog Keys Pass, Horn Island Pass, south of Petit Bois Island, and Petit Bois Pass. These vibracores assisted in refining the geophysical models to better locate sand sources and helped delineate potential borrow areas.

Potential borrow areas were identified and delineated in the investigation areas of Cat Island, Ship Island, DA-10, Petit Bois Pass-MS, Petit Bois Pass-OCS, and Petit Bois Pass-AL. A seventh borrow area, adjacent to West Ship Island, has already been utilized. These areas have undergone refinement through modeling and dredging industry input, but are still subject to change as new data becomes available (e.g. preconstruction surveys). Overall, approximately 24.9 mcy of suitable sand were identified for use in the barrier island projects.

8.0 REFERENCES

ASTM Standard D2487, 2011, "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)," ASTM International, West Conshohocken, PA, 2011, DOI: 10.1520/D2487-11, www.astm.org.

ASTM Standard D2488, 2009a, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)," ASTM International, West Conshohocken, PA, 2011, DOI: 10.1520/D2488-09A, www.astm.org.

ASTM Standard D1535, 2012a, "Standard Practice for Specifying Color by the Munsell System," ASTM International, West Conshohocken, PA, 2012, DOI: 10.1520/D1535-12A, www.astm.org.

Bartek, L.R., Cabote, B.S., Young, T. And Schroeder, W., Sequence Stratigraphy of a Continental Margin Subjected to Low-Energy and Low Sediment Supply Environmental Boundary Conditions: Late Pleistocene-Holocene Deposition offshore Alabama, USA, in John B. Anderson and Richard H. Fillon eds., Late Quaternary Stratigraphic Evolution of the Northern Gulf of Mexico Margin, SEPM Special Publication, Tulsa, OK, v. 79, p. 85-109, 2004.

Dean, Robert G, Compatibility of Borrow Material for Beach Fills, Fourteenth Coastal Engineering Conference, 1974.

Dean, Robert G, Equilibrium Beach Profiles, Journal of Coastal Research, Volume 7, No. 1, 1991.

Flocks, James G; Kelso, Kyle W; Twichell, David C; Buster, Noreen A; Baehr, John N. Offshore Sandshoal Development and Evolution of Petit Bois Pass, Mississippi-Alabama Barrier Islands, Mississippi, USA, 2010.

Flocks, J., Kindinger, J., Kelso, K., Bernier, J., and DeWitt, N., 2014. Near-surface stratigraphy and morphology, Mississippi inner shelf, northern Gulf of Mexico.

Frazer, d. E., Recent Deltaic Deposits Of The Mississippi River, Their Development and Chronology, Gulf Coast Association Of Geologic Societies Transactions, v-17, 1967.

Goff, John A., 2014. Seismic and core investigation off Panama City, Florida, reveals sand ridge influence on formation of the shoreface ravinement. *Continental Shelf Research*, 88 (2014) 24-46. Amsterdam, The Netherlands, ISSN 0278-4343.

Halley, R.B., 2000. "11 Things a Geologist Thinks an Engineer Should Know About Carbonate Beaches." *Carbonate Beaches 2000*. ASCE, pp 1-14.

Hayes, M.O. and Nairn, R.B., 2004. Natural maintenance of sand ridges and linear shoals on the U.S. gulf and Atlantic continental shelves and the potential impacts of dredging. *Journal of Coastal Research*, 20(1), 138-148. West Palm Beach (Florida), ISSN 0749-0208.

Hays, G. C., Ashworth, J. S., Barnsley, M. J., Broderick, A. C., Emery, D. R., Godley, B. J., Henwood, A. and Jones, E. L. The Importance of Sand Albedo For The Thermal Conditions On Sea Turtle Nesting Beaches. – *Oikos* 93: 87–94. 2001.

McBride, RA, Anderson, LC, Tudoran, A, and Roberts, HH, 1999, Holocene stratigraphic architecture of a sand-rich shelf and the origin of linear shoals, northeastern Gulf of Mexico, *in* Bergman, KM and Snedden JW, eds., *Isolated shallow marine sand bodies: sequence stratigraphic analysis and sedimentologic interpretation*: SEPM Special Publication 64, p. 95-126.

McBride, R.A. and Moslow, T.F., 1991. Origin, evolution, and distribution of shoreface sand ridges, Atlantic inner shelf, U.S. A. *Marine Geology*, 97: 57-85. Amsterdam, The Netherlands, ISSN 0025-3227.

McGee, W. J., Encroachment of the Sea, The Forum, V-9, 1981.

Morton, Robert A., Historical Changes in the Mississippi-Alabama Barrier Islands and the Roles of Extreme Storms, Sea Level, and Human Activities, United states Geological Survey Open File Report 2007-1161, 2007.

Munsell Soil Color Charts, 2009 Year Revised, Munsell Color

Oivanki, Steven, Ship Island Project – Fort Massachusetts Erosion Control Study; Mississippi Office of Geology; 1995.

Otvos, Ervin G, Mississippi Offshore Inventory and Geological Mapping Project, Mississippi Mineral Resources Council: Coastal Zone Management Program, 1975/76.

Otvos, Ervin G, Barrier Island Formation through Nearshore Aggradation – Stratigraphic and Field Evidence, *Marine Geology*, vol 43, 1981: 195-243.

Otvos, Ervin G, Barrier Island and Lagoon Evolution, Northeastern Gulf of Mexico Coastal Elements And Interpretation Problems, Geological Society Of America abstracts with programs #14, 1982.

Otvos, Ervin G, Coastal Evolution – Louisiana to Northwest Florida, Guidebook, American Association of Petroleum Geologists Annual Meeting, New Orleans Field Trip, New Orleans Geological Society, March 27-29, 1985.

Otvos, Ervin G, A New Stratigraphic System, Geologic Evolution and Potential Economic Sand Resources in the Mississippi Sound Area, Mississippi –Alabama, Final Report to the Mississippi Mineral Resources Institute, 1985.

Rosati, Julie Dean, Byrnes, Mark R., Gravens, Mark B., Griffee, Sarah F., Mississippi Coastal Improvement Project Study, Regional Sediment Budget for Mississippi Mainland and Barrier Island Coasts, US Army Corps of Engineers, Engineer Research and Development Center, July 2009.

Stauble, Donald K., A Review of the Role of Grain Size in Beach Nourishment Projects, Coastal and Hydraulics Laboratory, U.S. Army Engineer Research and Development Center.

Sydow, J. and Roberts, H. H., Stratigraphic Framework of a Late Pleistocene Shelf-Edge Delta, Northeastern Gulf of Mexico, AAPG Bulletin 78, 1994.

Twichell, David, Pendleton, Elizabeth, Baldwin, Wayne, Foster, David, Flocks, James, Kelso, Kyle, DeWitt, Nancy, Pfeiffer, William, Forde, Amell, Krick, Jason, and Baehr, John, 2011, The Shallow Stratigraphy and Sand Resources Offshore of the Mississippi Barrier Islands: U.S. Geological Survey Open-File Report 2011-1173, at <http://pubs.usgs.gov/of/2011/1173/>.

U.S. Army Corps of Engineers, Coastal Engineering Manual, EM 1110-2-1100. Washington, D.C., 2008.

U.S. Army Corps of Engineers, Coastal Geology, EM 1110-2-1810. Washington, D.C., 1995.

US Army Corps of Engineers, Mississippi Coastal Improvements Program, Appendix H – Barrier Islands, May 2009.

Appendix A

Barrier Island Sampling Locations and Lab Results

This page was intentionally left blank for duplex printing.



2009-2011 Barrier Island Sampling Lab Results

USACE Sample #	Year	Depth (ft)	USCS	Diameter, mm						#200 %	Graphical Mean (mm)	Cu (D60/D10)	Cc (D30) ² / (D10*D60)
				D85	D60	D50	D30	D15	D10				
CI-1	2009	Surface Grab	SP	0.40	0.35	0.33	0.29	0.27	0.26	0.2	0.33	1.3	1.0
CI-2	2009	Surface Grab	SP	0.39	0.33	0.31	0.28	0.24	0.21	0.2	0.31	1.6	1.1
ES-1	2009	Surface Grab	SP	0.39	0.34	0.32	0.28	0.25	0.23	0.2	0.32	1.5	1.0
ES-2	2009	Surface Grab	SP	0.40	0.34	0.32	0.28	0.25	0.22	0.1	0.33	1.5	1.0
ES-3	2009	Surface Grab	SP	0.40	0.34	0.32	0.29	0.26	0.23	0.3	0.33	1.5	1.0
HI-1	2009	Surface Grab	SP	0.70	0.56	0.51	0.42	0.34	0.32	0.4	0.52	1.8	1.0
HI-2	2009	Surface Grab	SP	0.52	0.38	0.35	0.31	0.28	0.27	0.0	0.38	1.4	1.0
HI-3	2009	Surface Grab	SP	0.47	0.36	0.34	0.30	0.27	0.26	0.0	0.36	1.4	1.0
HI-4	2009	Surface Grab	SP	0.41	0.35	0.33	0.29	0.26	0.24	0.2	0.33	1.4	1.0
HI-5	2009	Surface Grab	SP	0.40	0.34	0.33	0.29	0.26	0.25	0.3	0.33	1.4	1.0
PBI-1	2009	Surface Grab	SP	0.59	0.43	0.39	0.33	0.28	0.26	0.6	0.42	1.6	0.9
PBI-2	2009	Surface Grab	SP	0.43	0.36	0.34	0.30	0.27	0.26	0.4	0.35	1.4	1.0
PBI-3	2009	Surface Grab	SP	0.44	0.36	0.34	0.30	0.27	0.26	0.2	0.35	1.4	1.0
PBI-4	2009	Surface Grab	SP	0.50	0.39	0.36	0.31	0.28	0.27	0.8	0.38	1.5	1.0
S-1	2009	Surface Grab	SP	0.41	0.35	0.33	0.30	0.27	0.26	0.4	0.34	1.4	1.0
WSI-1	2009	Surface Grab	SP	0.69	0.53	0.47	0.37	0.30	0.26	0.0	0.49	2.0	1.0
WSI-2	2009	Surface Grab	SP	0.39	0.33	0.32	0.28	0.25	0.23	0.0	0.32	1.5	1.0
WSI-3	2009	Surface Grab	SP	0.49	0.36	0.34	0.30	0.26	0.25	0.2	0.36	1.5	1.0
WSI-4	2009	Surface Grab	SP	0.38	0.32	0.30	0.26	0.22	0.20	0.1	0.30	1.6	1.0
BI-HIB-10	2010	Composite	SP	0.38	0.31	0.28	0.23	0.18	0.16	0.6	0.28	1.9	1.1
BI-HIB-10-10	2010	Surface Grab	SP	0.44	0.35	0.33	0.28	0.24	0.21	0.6	0.34	1.6	1.1
BI-HIB-1-10	2010	Surface Grab	SP	0.48	0.37	0.34	0.28	0.24	0.22	1.0	0.35	1.6	1.0
BI-HIB-11-10	2010	Surface Grab	SP	0.39	0.31	0.28	0.22	0.14	0.11	1.0	0.27	2.7	1.4
BI-HIB-2-10	2010	Surface Grab	SP	0.66	0.47	0.43	0.34	0.28	0.26	0.3	0.45	1.8	0.9
BI-HIB-3-10	2010	Surface Grab	SP	0.69	0.53	0.48	0.39	0.33	0.30	0.2	0.50	1.8	1.0
BI-HIB-4-10	2010	Surface Grab	SP	0.69	0.53	0.48	0.39	0.33	0.30	0.3	0.50	1.7	1.0
BI-HIB-5-10	2010	Surface Grab	SP	0.61	0.44	0.40	0.33	0.29	0.27	0.2	0.43	1.6	0.9
BI-HIB-6-10	2010	Surface Grab	SP	0.49	0.36	0.34	0.29	0.25	0.23	0.3	0.36	1.6	1.0
BI-HIB-7-10	2010	Surface Grab	SP	0.50	0.38	0.35	0.30	0.26	0.23	0.2	0.37	1.6	1.0
BI-HIB-8-10	2010	Surface Grab	SP	0.42	0.34	0.32	0.28	0.21	0.18	0.2	0.32	2.0	1.3
BI-HIB-9-10	2010	Surface Grab	SP	0.41	0.34	0.31	0.27	0.20	0.17	0.5	0.31	2.0	1.3
BI-SIB-10	2010	Composite	SP	0.47	0.34	0.31	0.25	0.19	0.15	0.9	0.32	2.2	1.2
BI-SIB-10-10	2010	Surface Grab	SP	0.51	0.39	0.36	0.31	0.27	0.25	0.5	0.38	1.5	1.0
BI-SIB-1-10	2010	Surface Grab	SP	0.47	0.36	0.33	0.28	0.24	0.22	1.0	0.35	1.6	1.0
BI-SIB-11-10	2010	Surface Grab	SP	0.31	0.23	0.21	0.19	0.16	0.16	1.1	0.23	1.5	0.9
BI-SIB-2-10	2010	Surface Grab	SP	0.51	0.38	0.35	0.30	0.26	0.22	1.4	0.37	1.8	1.1
BI-SIB-3-10	2010	Surface Grab	SP	0.71	0.51	0.45	0.36	0.29	0.27	0.6	0.48	1.9	0.9
BI-SIB-4-10	2010	Surface Grab	SP	0.51	0.39	0.36	0.31	0.27	0.26	0.3	0.38	1.5	1.0
BI-SIB-5-10	2010	Surface Grab	SP	0.35	0.27	0.24	0.20	0.16	0.14	0.9	0.25	1.9	1.0
BI-SIB-6-10	2010	Surface Grab	SP	0.35	0.28	0.26	0.21	0.18	0.17	0.2	0.26	1.6	1.0
BI-SIB-7-10	2010	Surface Grab	SP	0.38	0.30	0.28	0.23	0.18	0.17	2.7	0.28	1.8	1.0
BI-SIB-8-10	2010	Surface Grab	SP	0.43	0.33	0.30	0.24	0.19	0.17	1.7	0.31	1.9	1.0
BI-SIB-9-10	2010	Surface Grab	SP	0.38	0.32	0.30	0.26	0.21	0.18	1.3	0.30	1.8	1.1
WSI-12-10-10 A	2010	1.0 - 2.0	SP	0.46	0.35	0.33	0.28	0.23	0.20	0.5	0.34	1.8	1.1
WSI-12-10-10 B	2010	2.0 - 3.0	SP	0.37	0.29	0.27	0.22	0.18	0.17	0.2	0.27	1.7	1.0
WSI-12-10-10 C	2010	3.0 - 4.0	SP	0.37	0.30	0.28	0.23	0.19	0.18	0.4	0.28	1.7	1.0
WSI-13-10-10 A	2010	1.0 - 2.0	SP	0.49	0.36	0.34	0.29	0.26	0.22	0.1	0.36	1.6	1.1
WSI-13-10-10 B	2010	2.0 - 3.0	SP	0.38	0.29	0.27	0.21	0.17	0.16	2.9	0.27	1.9	1.0
WSI-13-10-10 C	2010	3.0 - 4.0	SP	0.37	0.30	0.27	0.22	0.18	0.17	0.6	0.27	1.8	1.0
WSI-13-10-10 D	2010	4.0 - 5.0	SP	0.42	0.34	0.32	0.27	0.23	0.21	0.2	0.32	1.6	1.0
WSI-5-10-10 A	2010	0.0 - 1.5	SP	0.53	0.40	0.37	0.32	0.28	0.26	0.4	0.39	1.5	1.0
WSI-5-10-10 B	2010	1.5 - 3.0	SP	0.50	0.36	0.34	0.29	0.25	0.22	0.9	0.36	1.7	1.1
WSI-5-10-10 C	2010	3.0 - 4.5	SP	0.49	0.35	0.32	0.26	0.22	0.20	0.4	0.34	1.8	1.0
BI-DA-10-15-11	2011	Surface Grab	SP	0.66	0.44	0.39	0.32	0.28	0.26	1.0	0.44	1.7	0.9
BI-DA-10-16-11	2011	Surface Grab	SP	0.40	0.32	0.30	0.25	0.21	0.20	1.0	0.30	1.7	1.0
BI-DA-10-17-11	2011	Surface Grab	SP	0.42	0.35	0.32	0.28	0.25	0.22	1.2	0.33	1.6	1.1

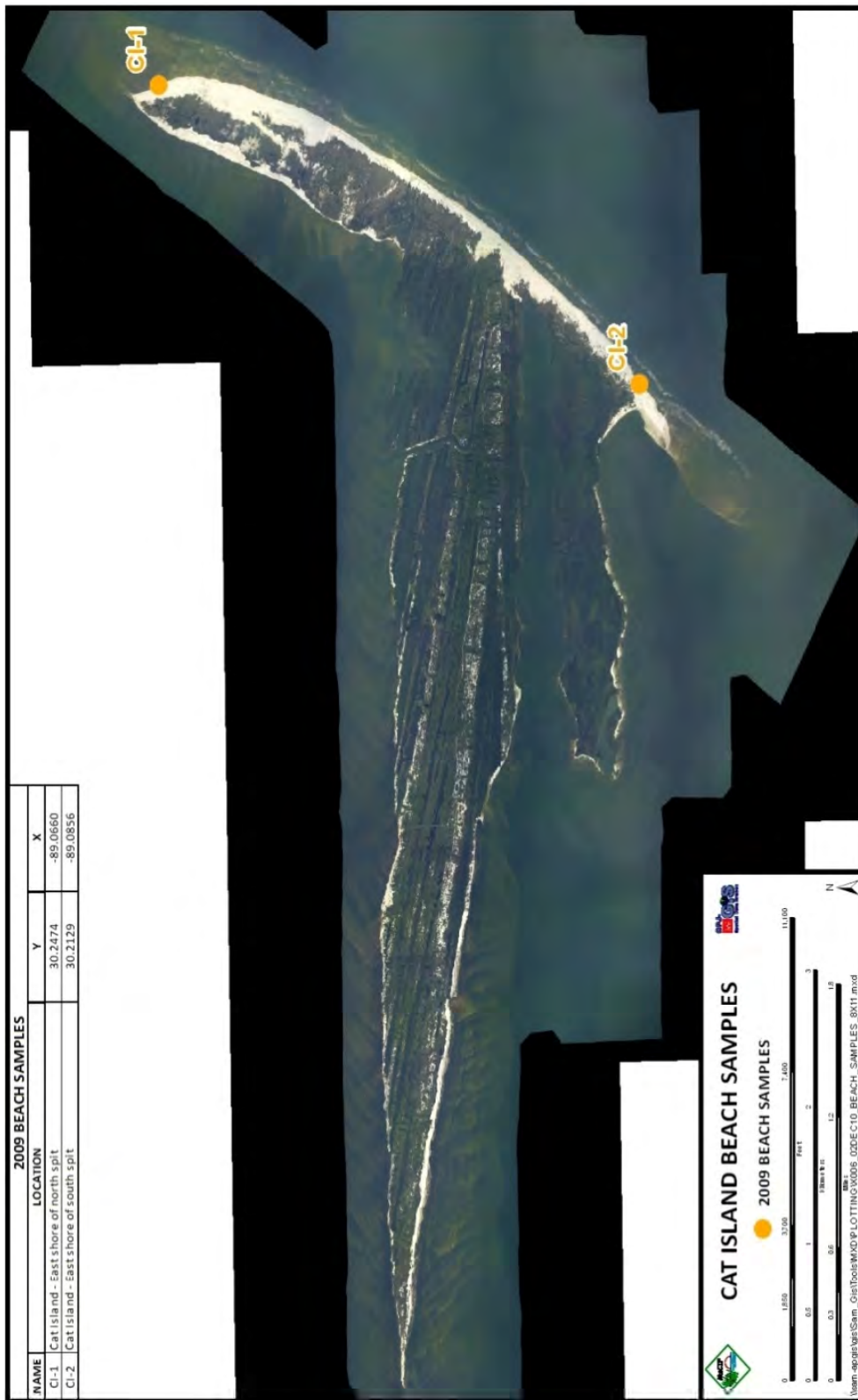
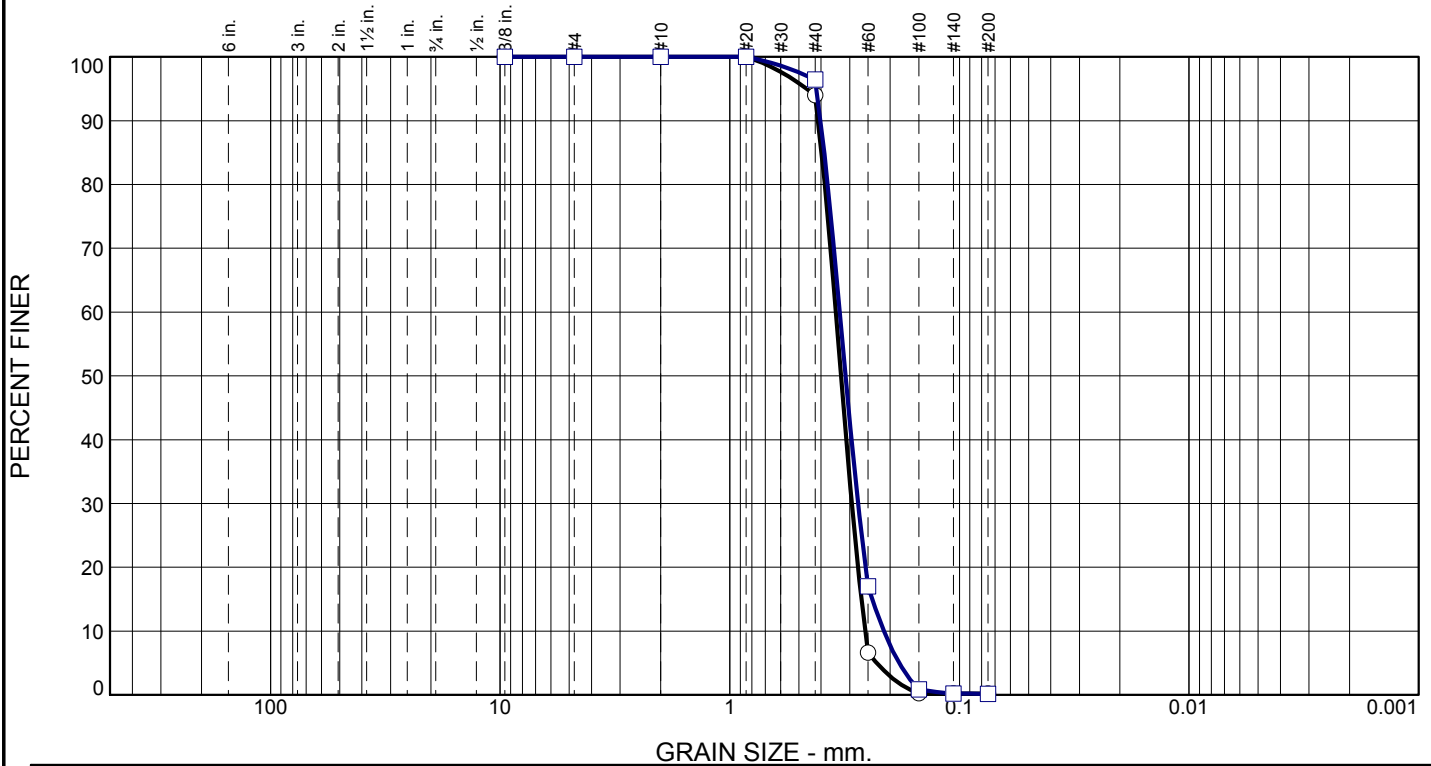


Figure 3.2.2.1.1 – Cat Island beach sampling locations, 2009

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○	0.0	0.0	0.0	0.0	6.0	93.8	0.2			
□	0.0	0.0	0.0	0.0	3.6	96.2	0.2			
⊗	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○			0.3983	0.3451	0.3275	0.2939	0.2675	0.2576	0.97	1.34
□			0.3879	0.3318	0.3129	0.2764	0.2398	0.2130	1.08	1.56

Material Description	USCS	AASHTO
○ SAND, (SP), fine grained, white, dry	SP	
□ SAND, (SP), fine grained, white, dry	SP	

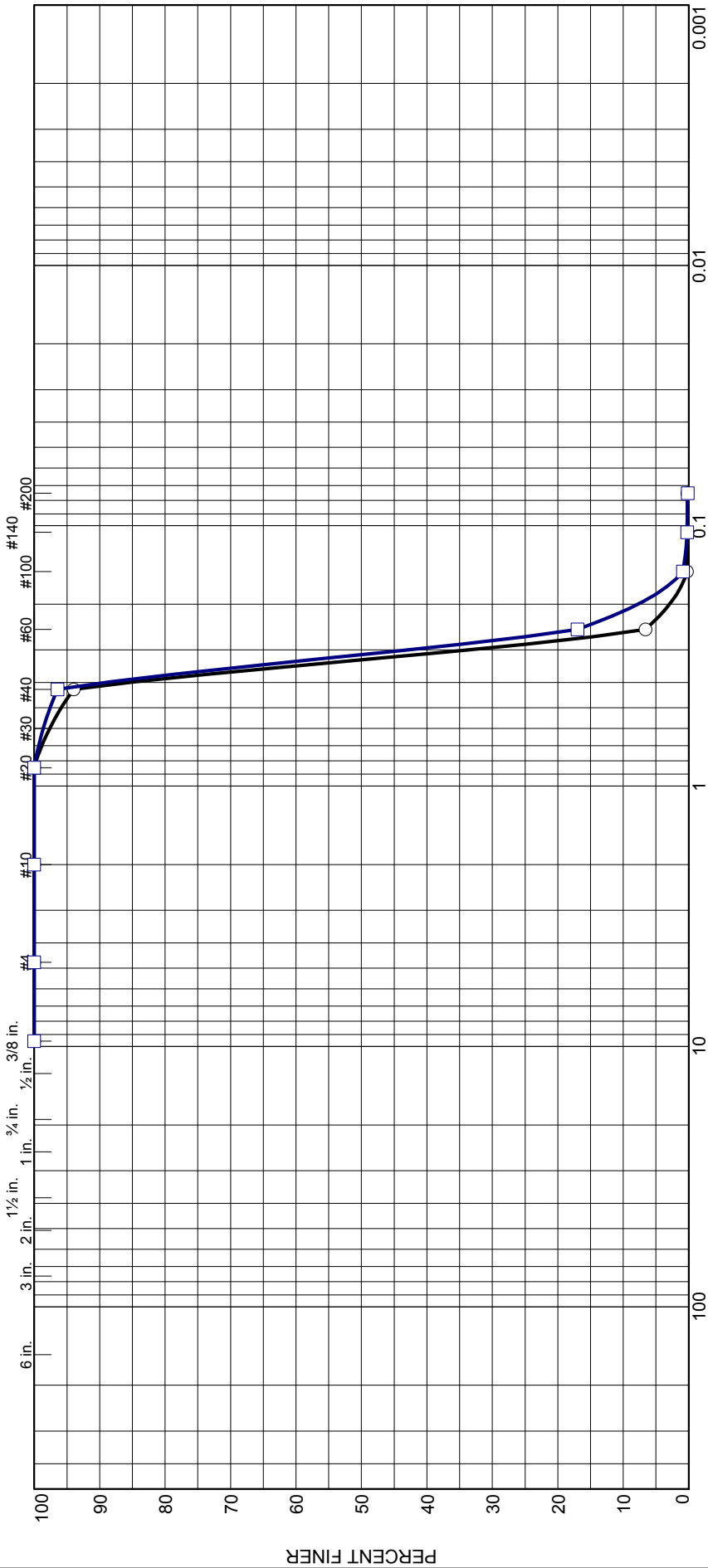
<p>Project No. 0921230023 Client: U.S. Army Corps of Engineers</p> <p>Project: Mississippi Island</p> <p>○ Location: Sample - CI-1 - East Shore Spill Sample Number: Lab # 4205</p> <p>□ Location: Sample - CI-2 - East Shore South Spill Sample Number: Lab # 4205</p>	<p>Remarks:</p> <p>○ Tested: 11/16/09</p> <p>□ Tested: 11/16/09</p>
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	
<p>Figure</p>	

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. SIEVE OPENING IN INCHES



GRAIN SIZE - mm.

% Sand

% Fines

% Gravel

% +3"

Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
--------	------	--------	--------	------	------	------

Location	Source	Sample #	Depth/Elev.	Material Description
Sample - CI-1 - East Shore Spill	CI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - CI-2 - East Shore South Spill	CI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry

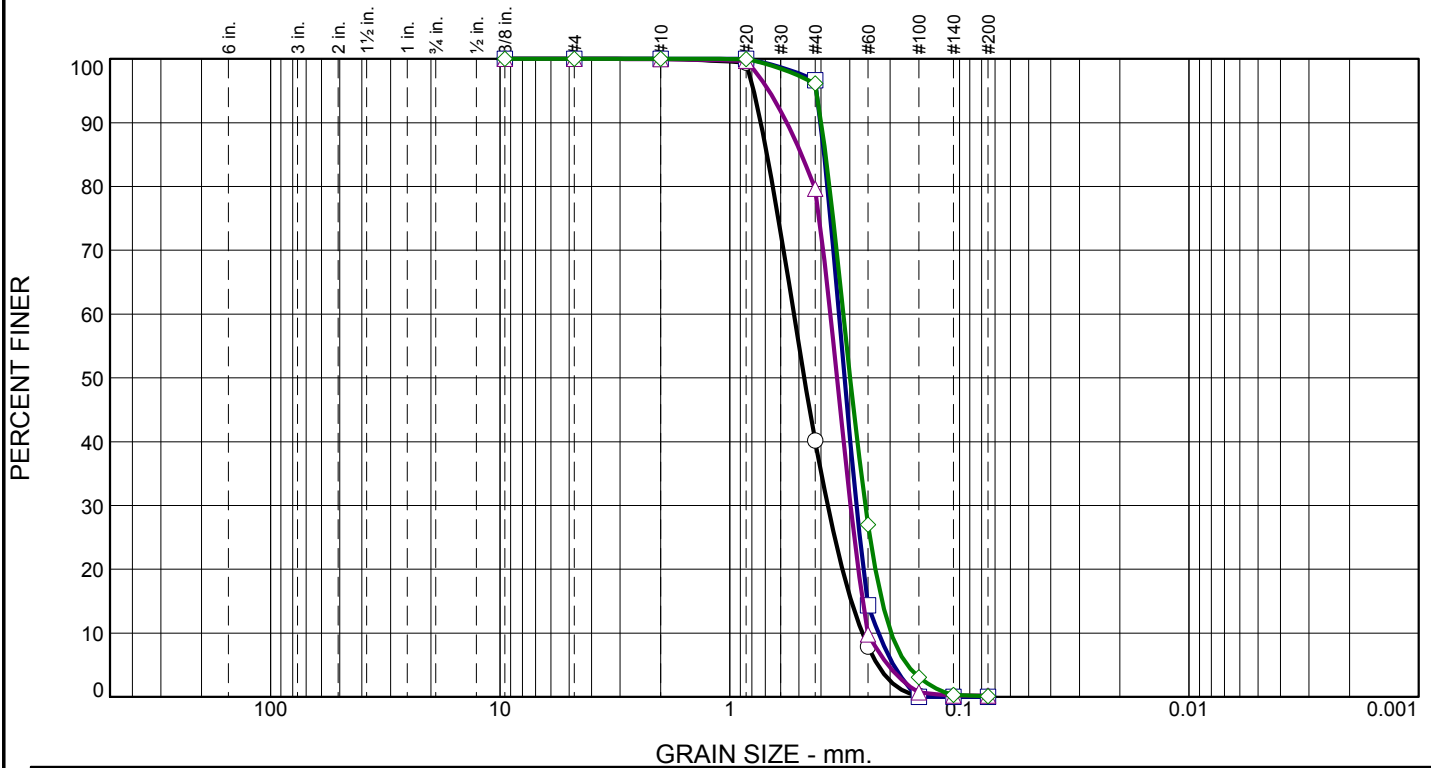
Project No. 0921230023	Client U.S. Army Corps of Engineers	Figure
Particle Size Distribution Report		
Mississippi Island		
Thompson Engineering		Mobile, Alabama

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd



Figure 3.2.2.1.2 – West Ship Island beach sampling locations, 2006 and 2009. Samples 8, 9, and 10 correspond to WS-8-06, WS-9-06, and WS-10-06 in Table 3.2.1.1.

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	59.8	40.2	0.0	
□	0.0	0.0	0.0	0.0	3.3	96.7	0.0	
△	0.0	0.0	0.0	0.0	20.3	79.5	0.2	
◇	0.0	0.0	0.0	0.0	3.9	96.0	0.1	

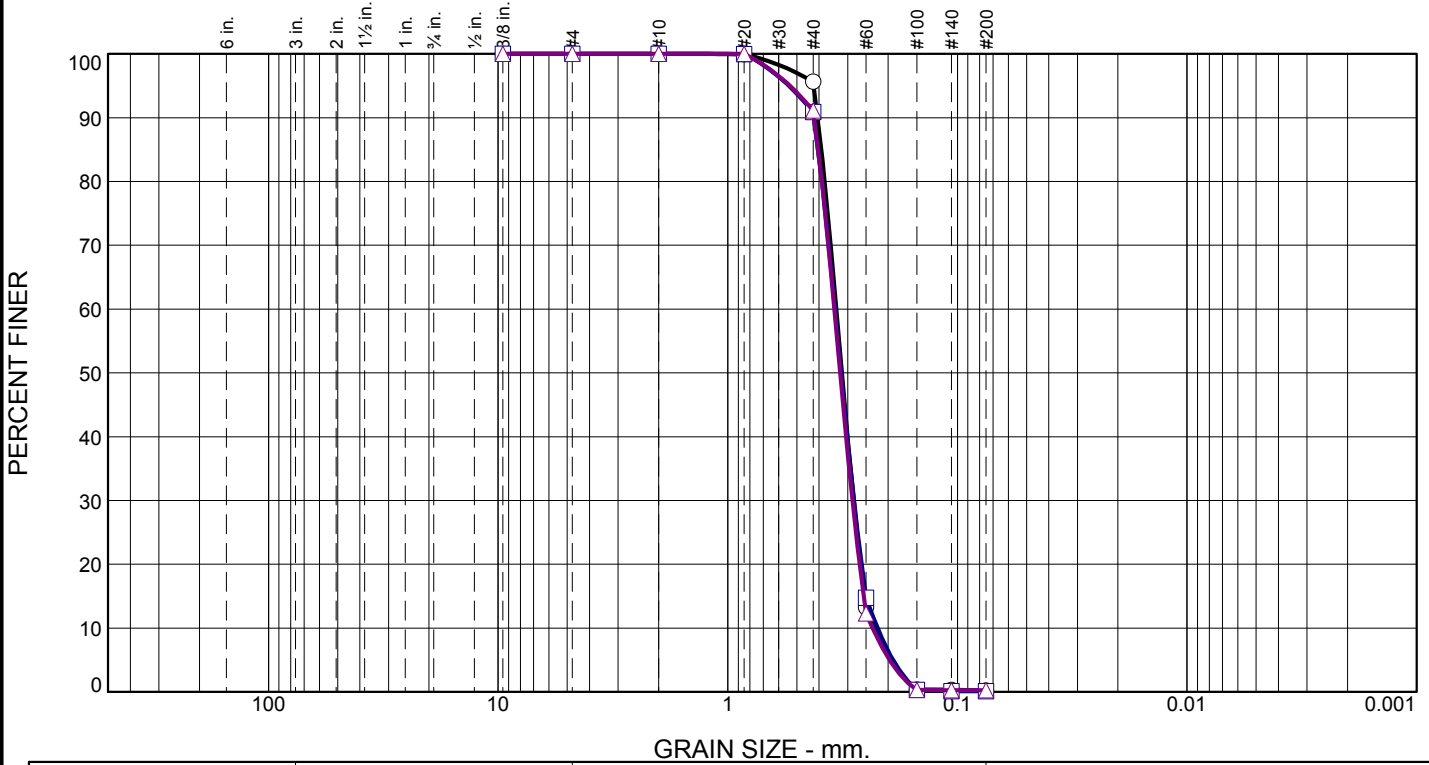
	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○			0.6880	0.5253	0.4735	0.3747	0.2953	0.2648	1.01	1.98
□			0.3886	0.3343	0.3160	0.2807	0.2515	0.2251	1.05	1.49
△			0.4871	0.3649	0.3410	0.2975	0.2639	0.2507	0.97	1.46
◇			0.3830	0.3199	0.2988	0.2569	0.2171	0.1980	1.04	1.62

Material Description	USCS	AASHTO
○ Sand, (SP), fine grained, with trace organics, white, dry	SP	
□ SAND, (SP), fine grained, white, dry	SP	
△ SAND, (SP), fine grained, with trace shell, white, dry	SP	
◇ SAND, (SP), fine grained, white, dry	SP	

<p>Project No. 0921230023 Client: U.S. Army Corps of Engineers</p> <p>Project: Mississippi Island</p> <p>○ Location: Sample - WSI-1 - Dock Sample Number: Lab # 4205</p> <p>□ Location: Sample - WSI-2 - South East Sample Number: Lab # 4205</p> <p>△ Location: Sample - WSI-3 - East North Sample Number: Lab # 4205</p> <p>◇ Location: Sample - WSI-4 - East South Sample Number: Lab # 4205</p>	<p>Remarks:</p> <p>△ Tested: 11/16/09</p> <p>◇ Tested: 11/16/09</p>
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	
<p>Figure</p>	

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○	0.0	0.0	0.0	0.0	4.3	95.5	0.2			
□	0.0	0.0	0.0	0.0	9.1	90.8	0.1			
△	0.0	0.0	0.0	0.0	8.8	90.9	0.3			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○			0.3915	0.3367	0.3183	0.2829	0.2539	0.2293	1.04	1.47
□			0.4040	0.3412	0.3209	0.2823	0.2507	0.2227	1.05	1.53
△			0.4040	0.3434	0.3237	0.2864	0.2563	0.2343	1.02	1.47

Material Description	USCS	AASHTO
○ SAND, (SP), fine grained, white, dry	SP	
□ SAND, (SP), fine grained, white, dry	SP	
△ SAND, (SP), fine grained, white, dry	SP	

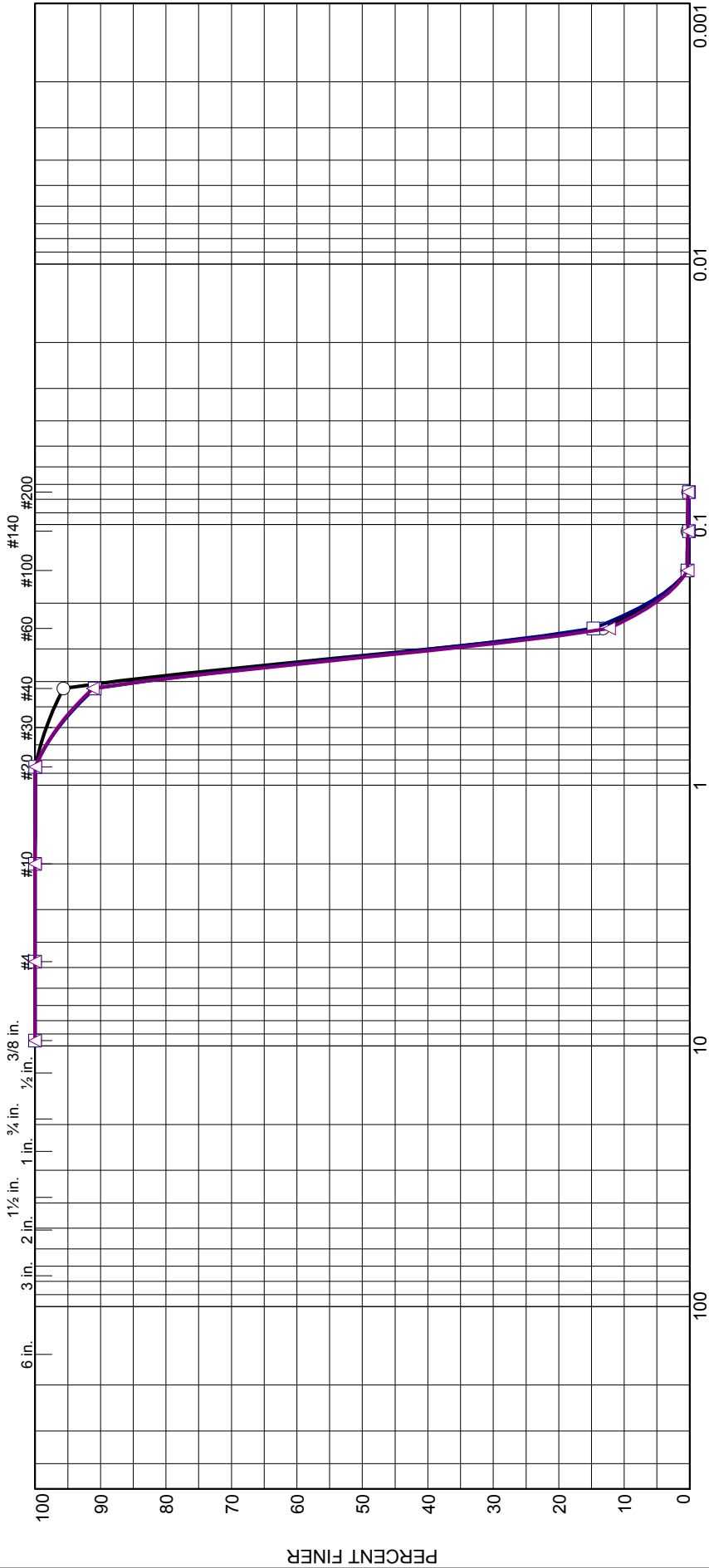
<p>Project No. 0921230023 Client: U.S. Army Corps of Engineers</p> <p>Project: Mississippi Island</p> <p>○ Location: Sample - ES-1 - West End South Sample Number: Lab # 4205</p> <p>□ Location: Sample - ES-2 - East North Sample Number: Lab # 4205</p> <p>△ Location: Sample - ES-3 - East South Sample Number: Lab # 4205</p>	<p>Remarks:</p> <p>○ Tested: 11/16/09</p> <p>□ Tested: 11/16/09</p> <p>△ Tested: 11/16/09</p>
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	
<p>Figure</p>	

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. SIEVE OPENING IN INCHES



GRAIN SIZE - mm.

% Sand

% Fines

Clay

% Gravel

Coarse

Fine

Coarse

Medium

Fine

Silt

Fine

Clay

Location	Source	Sample #	Depth/Elev.	Material Description
Sample - ES-1 - West End South	ES-Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - ES-2 - East North	ES-Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - ES-3 - East South	ES-Samples	Lab # 4205		SAND, (SP), fine grained, white, dry

Project No. 0921230023	Client U.S. Army Corps of Engineers	Figure
Particle Size Distribution Report		
Mississippi Island		
Thompson Engineering		Mobile, Alabama

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

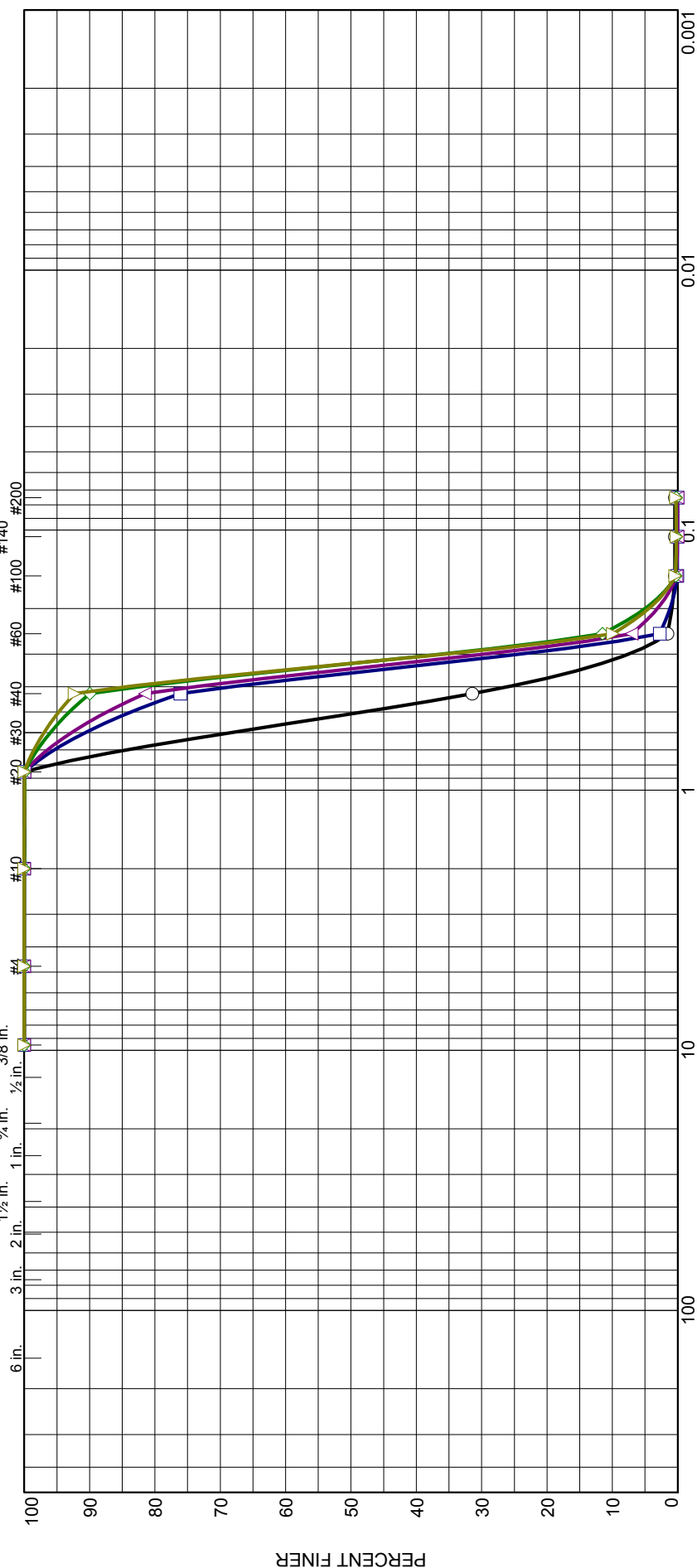


Figure 3.2.2.1.4 – Horn Island beach sampling locations, 2006 and 2009. Samples 1 and 2 correspond to HI-1-06 and HI-2-06 in Table 3.2.1.1.

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. SIEVE OPENING IN INCHES



% +3"		% Gravel		Coarse		Fine		Medium		Fine		% Fines	
				Coarse		Fine		Medium		Fine		Silt	
												Clay	

Location	Source	Sample #	Depth/Elev.	Material Description
Sample - HI-1 - Center North	HI - Samples	Lab # 4205		SAND, (SP), fine grained, with trace organics, white, dry
Sample - HI-2 - Center South	HI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - HI-3 - East North	HI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - HI-4 - East South	HI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - HI-5 -	HI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry

Project No. 0921230023 **Client** U.S. Army Corps of Engineers **Figure**

Thompson Engineering

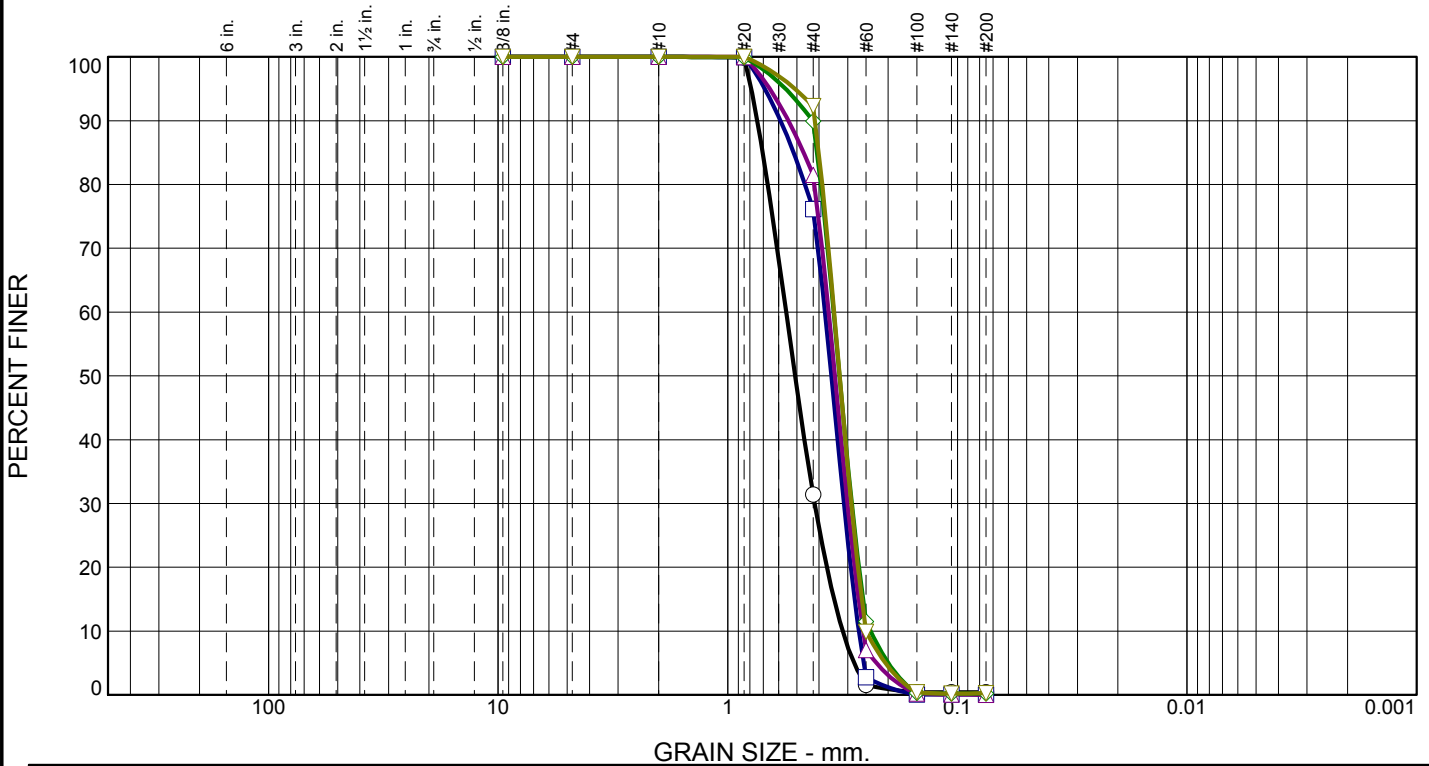
Mississippi Island

Mobile, Alabama

Particle Size Distribution Report

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
○	0.0	0.0	0.0	0.0	68.6	31.0	0.4			
□	0.0	0.0	0.0	0.0	23.9	76.1	0.0			
△	0.0	0.0	0.0	0.0	18.5	81.5	0.0			
◇	0.0	0.0	0.0	0.0	10.1	89.7	0.2			
▽	0.0	0.0	0.0	0.0	7.7	92.0	0.3			
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○			0.7042	0.5566	0.5088	0.4185	0.3445	0.3158	1.00	1.76
□			0.5167	0.3775	0.3539	0.3117	0.2805	0.2692	0.96	1.40
△			0.4672	0.3636	0.3414	0.3007	0.2696	0.2578	0.96	1.41
◇			0.4078	0.3458	0.3259	0.2883	0.2582	0.2390	1.01	1.45
▽			0.4015	0.3443	0.3255	0.2898	0.2614	0.2502	0.98	1.38

Material Description	USCS	AASHTO
○ SAND, (SP), fine grained, with trace organics, white, dry	SP	
□ SAND, (SP), fine grained, white, dry	SP	
△ SAND, (SP), fine grained, white, dry	SP	
◇ SAND, (SP), fine grained, white, dry	SP	
▽ SAND, (SP), fine grained, white, dry	SP	

<p>Project No. 0921230023 Client: U.S. Army Corps of Engineers</p> <p>Project: Mississippi Island</p> <p>○ Location: Sample - HI-1 - Center North Sample Number: Lab # 4205</p> <p>□ Location: Sample - HI-2 - Center South Sample Number: Lab # 4205</p> <p>△ Location: Sample - HI-3 - East North Sample Number: Lab # 4205</p> <p>◇ Location: Sample - HI-4 - East South Sample Number: Lab # 4205</p> <p>▽ Location: Sample - HI-5 - Sample Number: Lab # 4205</p> <p style="text-align: center;">Thompson Engineering</p> <p style="text-align: center;">Mobile, Alabama</p>	<p>Remarks:</p> <p>○ Tested: 11/16/09</p> <p>□ Tested: 11/16/09</p> <p>△ Tested: 11/16/09</p> <p>◇ Tested: 11/16/09</p> <p>▽ Tested: 11/16/09</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

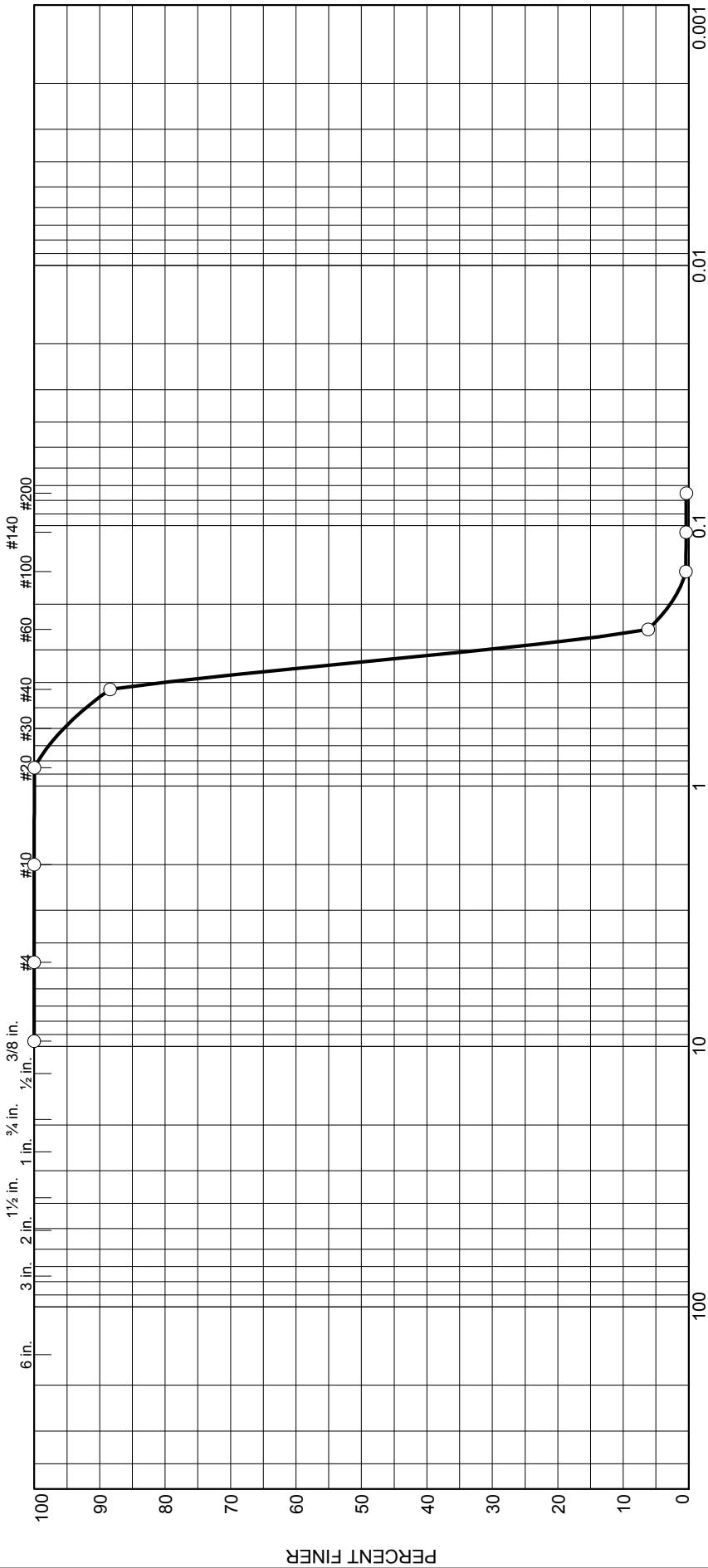


Figure 3.2.2.1.5 – Sand and Petit Bois Island beach sampling locations, 2006 and 2009. Samples 3 and 4 correspond to PB-3-06 and PB-4-06 in Table 3.2.1.1.

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. SIEVE OPENING IN INCHES



GRAIN SIZE - mm.

% Sand

% Fines

Clay

% Gravel

Coarse

Fine

Coarse

Medium

Fine

Silt

Material Description

SAND, (SP), fine grained, white, dry

Depth/Elev.

Sample #
Lab # 4205

Source

S - Samples

Location

Sample - S-1

Thompson Engineering

Figure

Client U.S. Army Corps of Engineers

Project No. 092123.0023

Particle Size Distribution Report

Mississippi Island

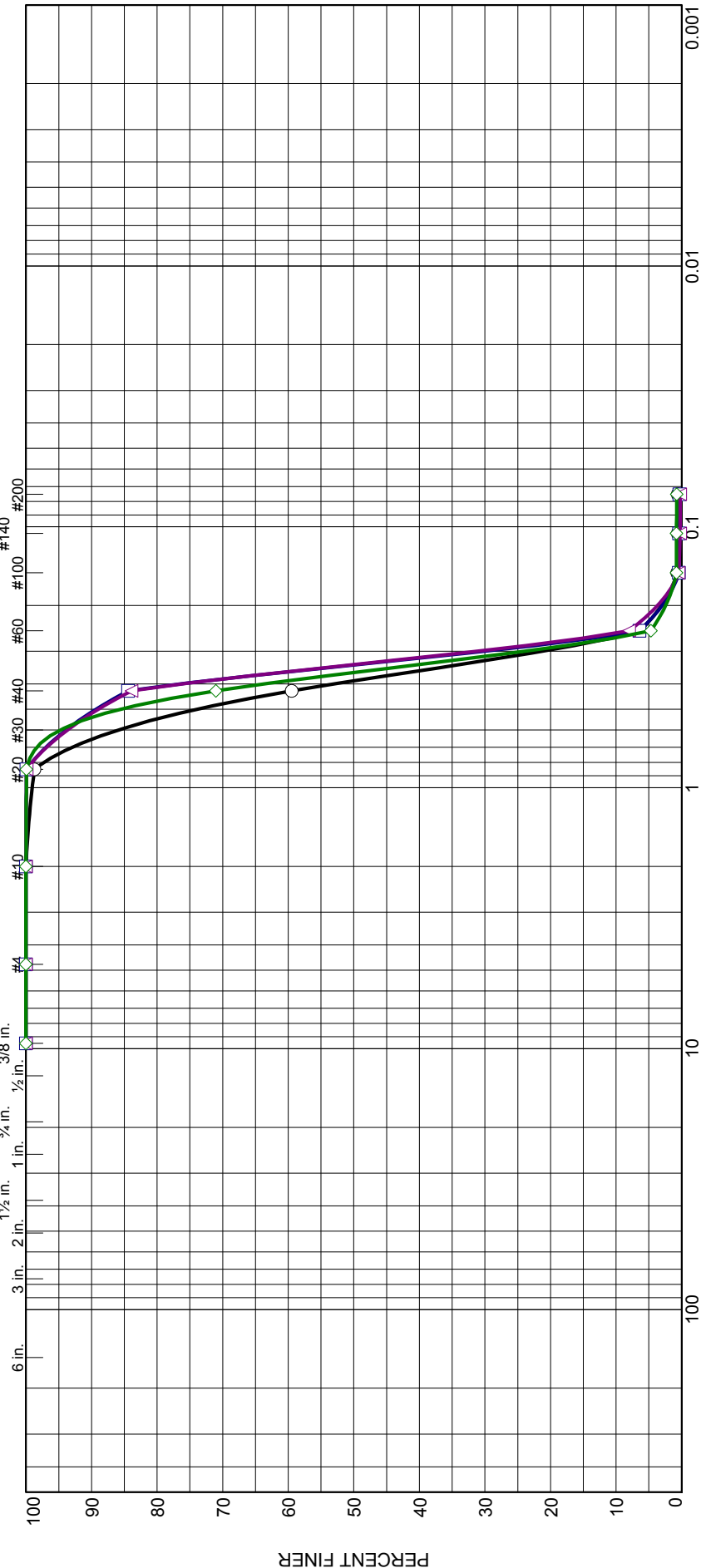
Mobile, Alabama

Tested By: J.Maddox-G.Fancher Checked By: R.Byrd

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. SIEVE OPENING IN INCHES



GRAIN SIZE - mm.

% Sand

Medium

Fine

% Fines

Silt

Clay

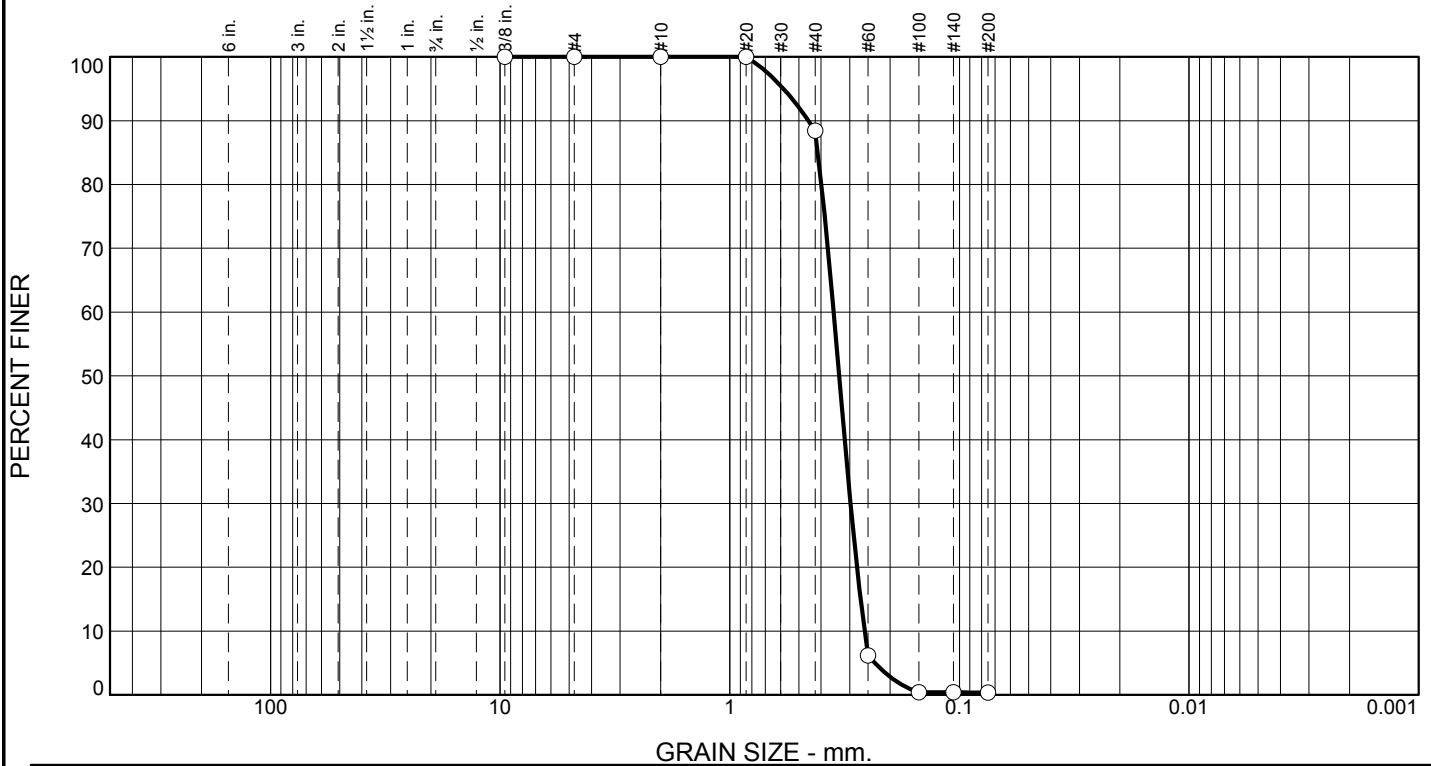
Location	Source	Sample #	Depth/Elev.	Material Description
Sample - PBI-1 - North Center	PBI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - PBI-2 - South Center	PBI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry
Sample - PBI-3 - North East	PBI - Samples	Lab # 4205		SAND, (SP), fine grained, with trace shell, white, dry
Sample - PBI-4 - South East	PBI - Samples	Lab # 4205		SAND, (SP), fine grained, white, dry

Project No. 0921230023 Client U.S. Army Corps of Engineers Figure

Particle Size Distribution Report
Mississippi Island
Thompson Engineering
Mobile, Alabama

Tested By: J.Maddox-G.Fancher Checked By: R.Byrd

Particle Size Distribution Report



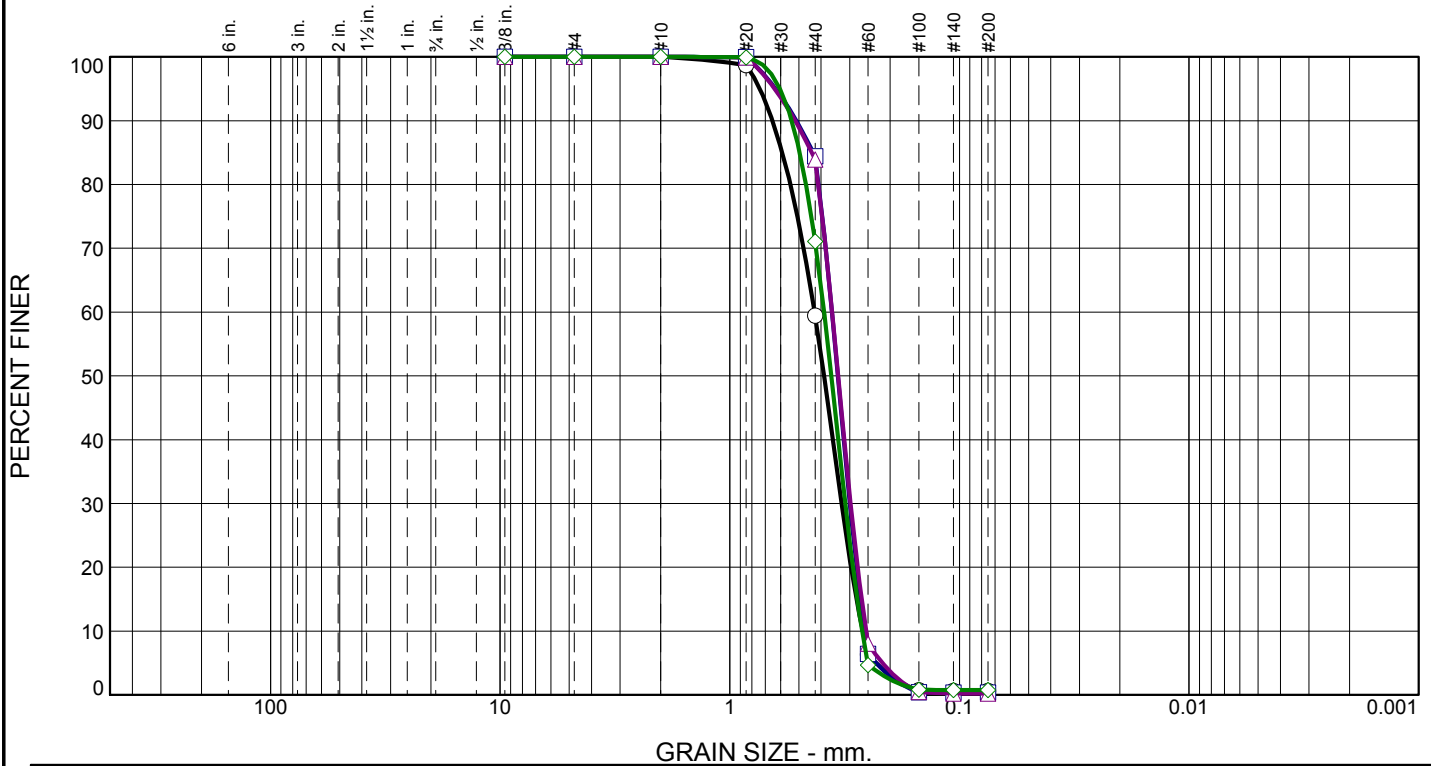
% +3"	% Gravel		% Sand			% Fines			
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay		
0.0	0.0	0.0	0.0	11.6	88.0	0.4			
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
		0.4136	0.3530	0.3337	0.2976	0.2696	0.2591	0.97	1.36

Material Description	USCS	AASHTO
○ SAND, (SP), fine grained, white, dry	SP	

<p>Project No. 0921230023 Client: U.S. Army Corps of Engineers</p> <p>Project: Mississippi Island</p> <p>○ Location: Sample - S-1 Sample Number: Lab # 4205</p>	<p>Remarks:</p> <p>○ Tested: 11/16/09</p>
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	
<p>Figure</p>	

Tested By: J.Maddox-G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	40.5	58.9	0.6	
□	0.0	0.0	0.0	0.0	15.6	84.0	0.4	
△	0.0	0.0	0.0	0.0	16.1	83.7	0.2	
◇	0.0	0.0	0.0	0.0	28.9	70.3	0.8	

⊗	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○			0.5905	0.4273	0.3888	0.3256	0.2808	0.2642	0.94	1.62
□			0.4328	0.3591	0.3382	0.2998	0.2702	0.2590	0.97	1.39
△			0.4392	0.3585	0.3371	0.2976	0.2669	0.2552	0.97	1.40
◇			0.4957	0.3885	0.3613	0.3138	0.2788	0.2659	0.95	1.46

Material Description	USCS	AASHTO
○ SAND, (SP), fine grained, white, dry	SP	
□ SAND, (SP), fine grained, white, dry	SP	
△ SAND, (SP), fine grained, with trace shell, white, dry	SP	
◇ SAND, (SP), fine grained, white, dry	SP	

<p>Project No. 0921230023 Client: U.S. Army Corps of Engineers</p> <p>Project: Mississippi Island</p> <p>○ Location: Sample - PBI-1 - North Center Sample Number: Lab # 4205</p> <p>□ Location: Sample - PBI-2 - South Center Sample Number: Lab # 4205</p> <p>△ Location: Sample - PBI-3 - North East Sample Number: Lab # 4205</p> <p>◇ Location: Sample - PBI-4 - South East Sample Number: Lab # 4205</p>	<p>Remarks:</p> <p>○ Tested: 11/16/19</p> <p>□ Tested: 11/16/09</p>
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	

Figure

Tested By: J.Maddox-G.Fancher Checked By: R.Byrd

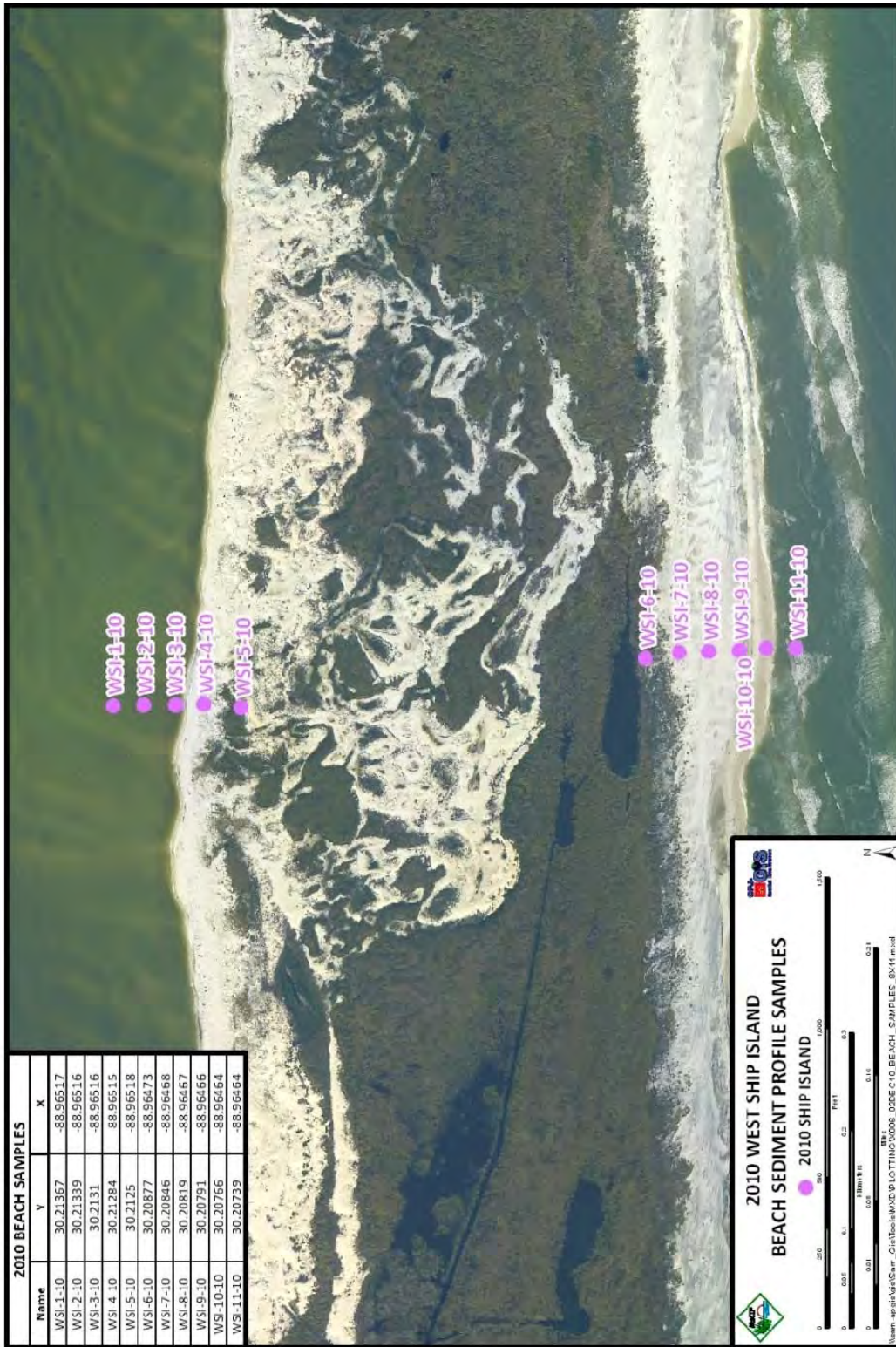
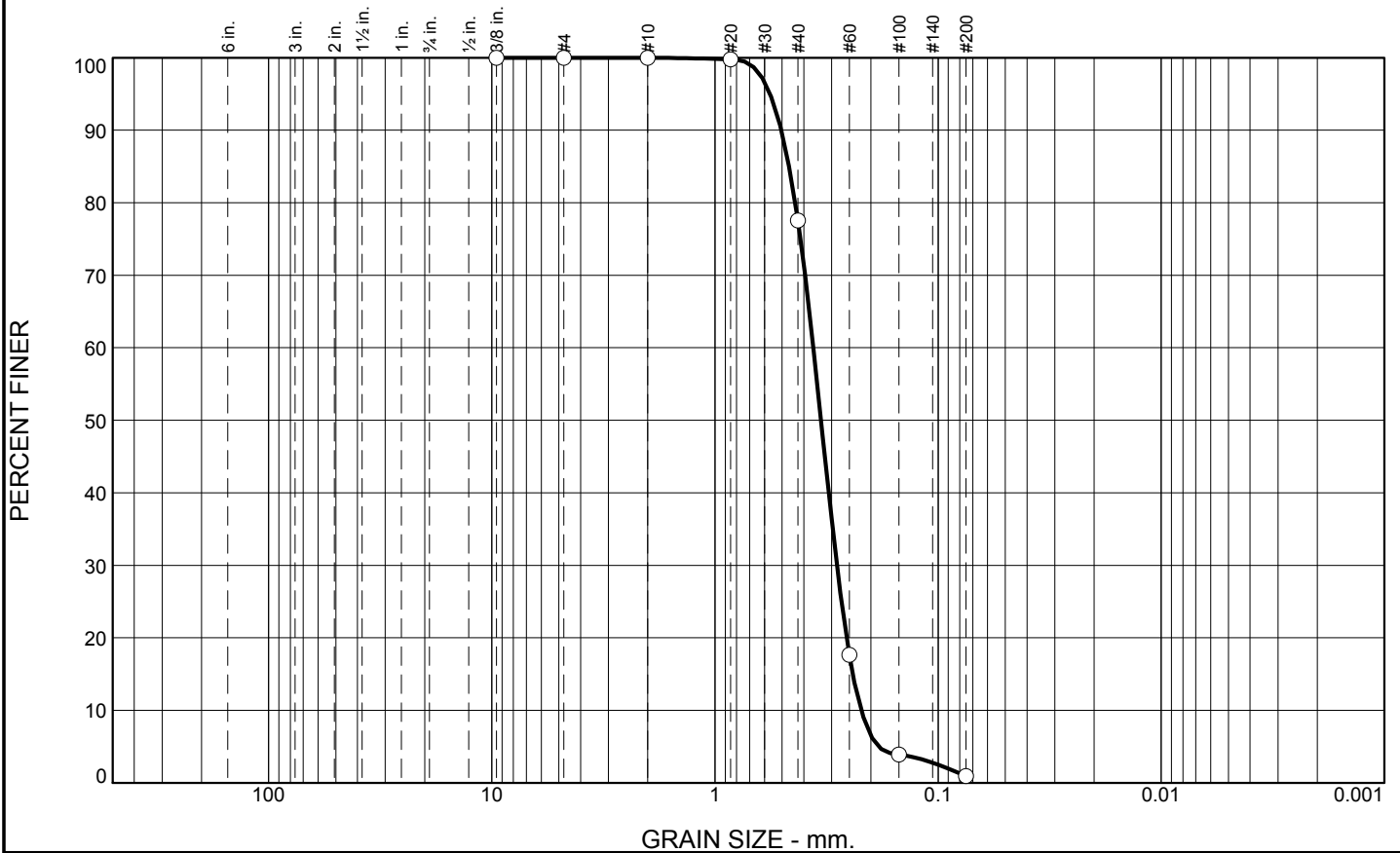


Figure 3.2.3.1 – Sampling locations for 2010 West Ship Island beach transect. These samples are labeled with the prefix BI-SIB in Table 3.2.3.1.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	22.4	76.6	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	77.6		
#60	17.6		
#100	3.9		
#200	1.0		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5040 D₈₅= 0.4652 D₆₀= 0.3626
D₅₀= 0.3346 D₃₀= 0.2838 D₁₅= 0.2413
D₁₀= 0.2211 C_u= 1.64 C_c= 1.00

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-1-10
Sample Number: TE Lab ID: 4607.01

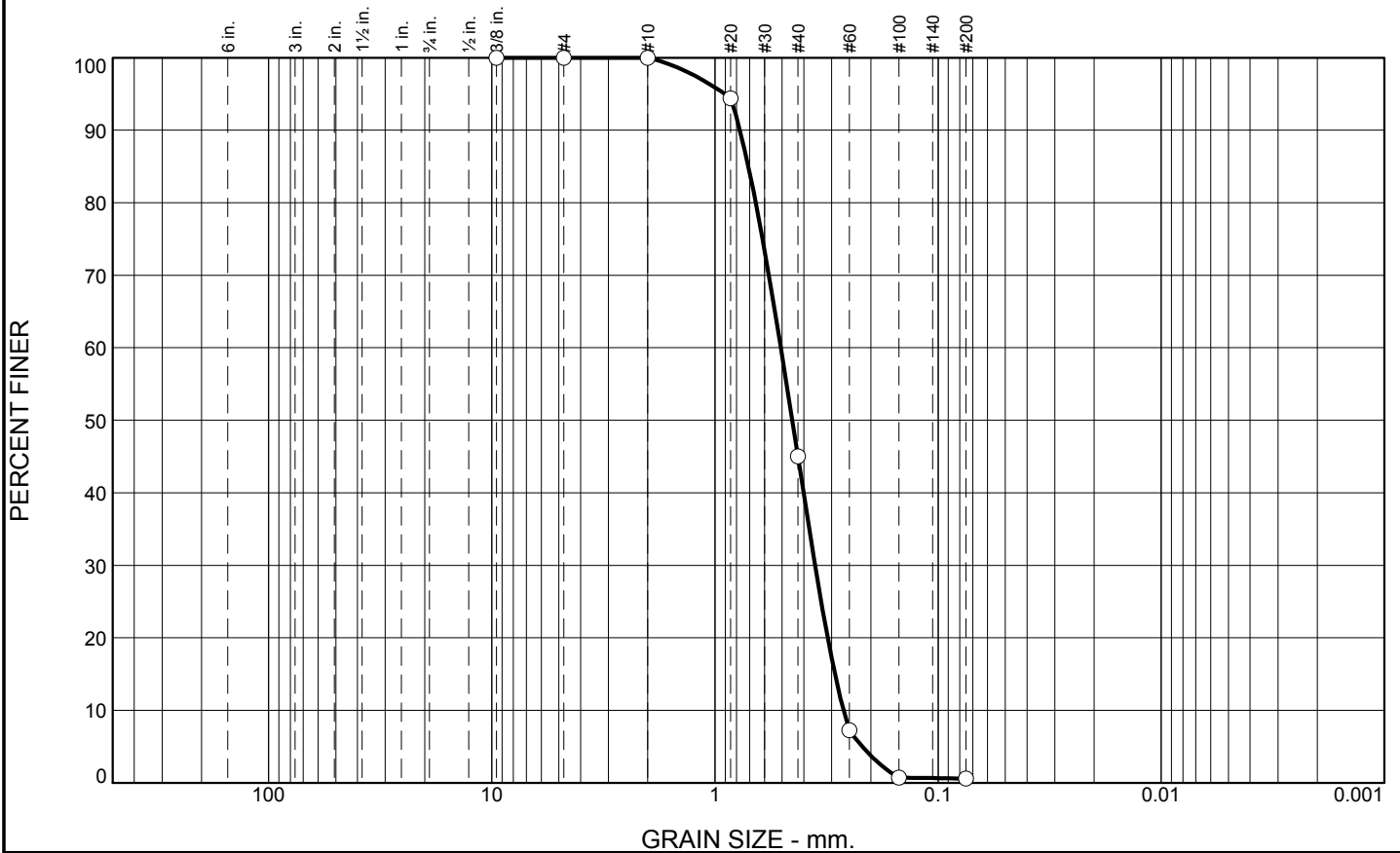
Date: 8/4/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No. Revised 8/18</p>
----------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	55.0	44.4	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	94.4		
#40	45.0		
#60	7.2		
#100	0.7		
#200	0.6		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.7735 D₈₅= 0.7088 D₆₀= 0.5066
D₅₀= 0.4504 D₃₀= 0.3559 D₁₅= 0.2898
D₁₀= 0.2655 C_u= 1.91 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-3-10
Sample Number: TE Lab ID: 4607.03

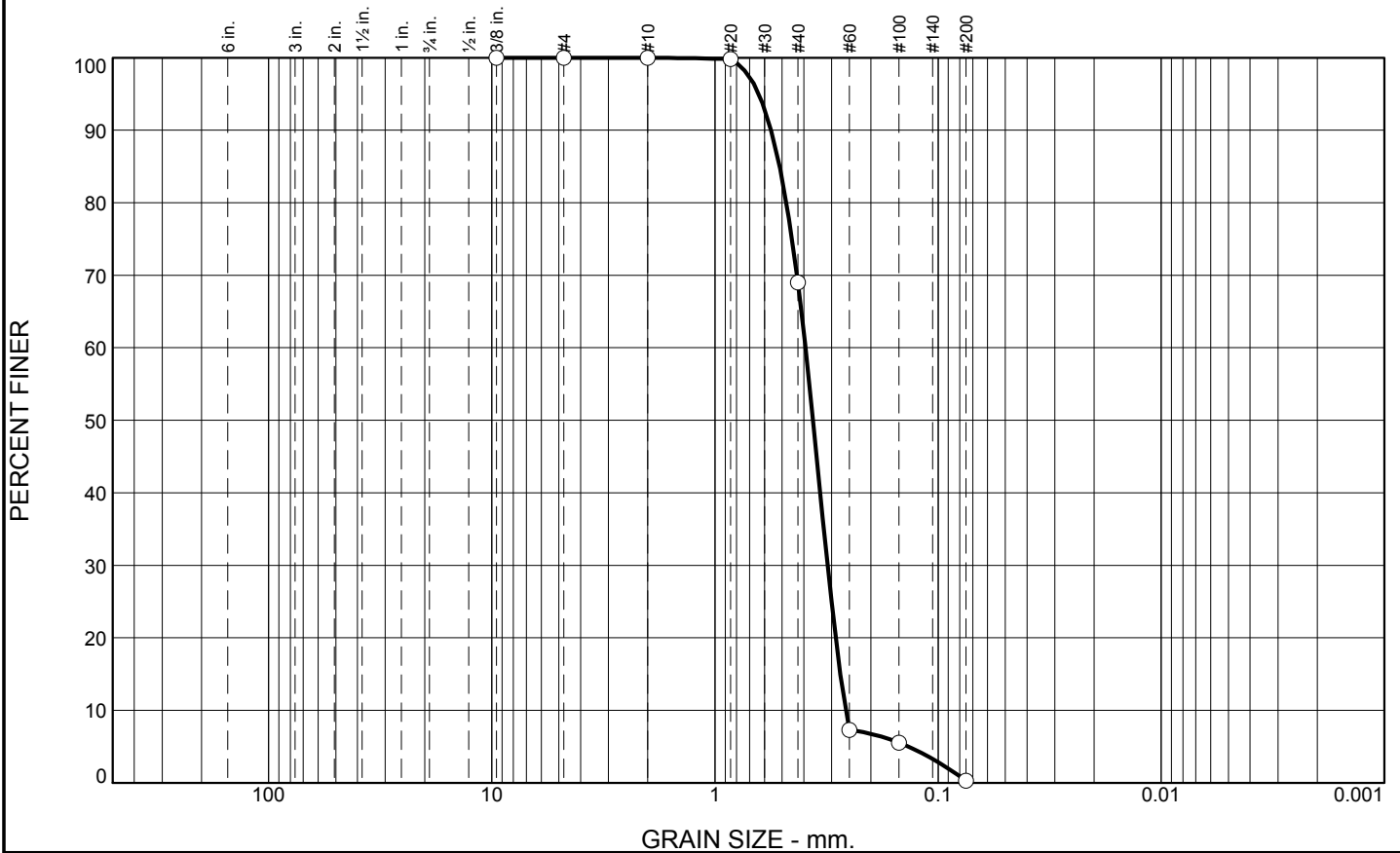
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	31.0	68.7	0.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	69.0		
#60	7.3		
#100	5.5		
#200	0.3		

Material Description

SAND, (SP), medium to fine grained, with trace organics

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5602 D₈₅= 0.5129 D₆₀= 0.3933
D₅₀= 0.3638 D₃₀= 0.3126 D₁₅= 0.2742
D₁₀= 0.2594 C_u= 1.52 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-4-10
Sample Number: TE Lab ID: 4607.04

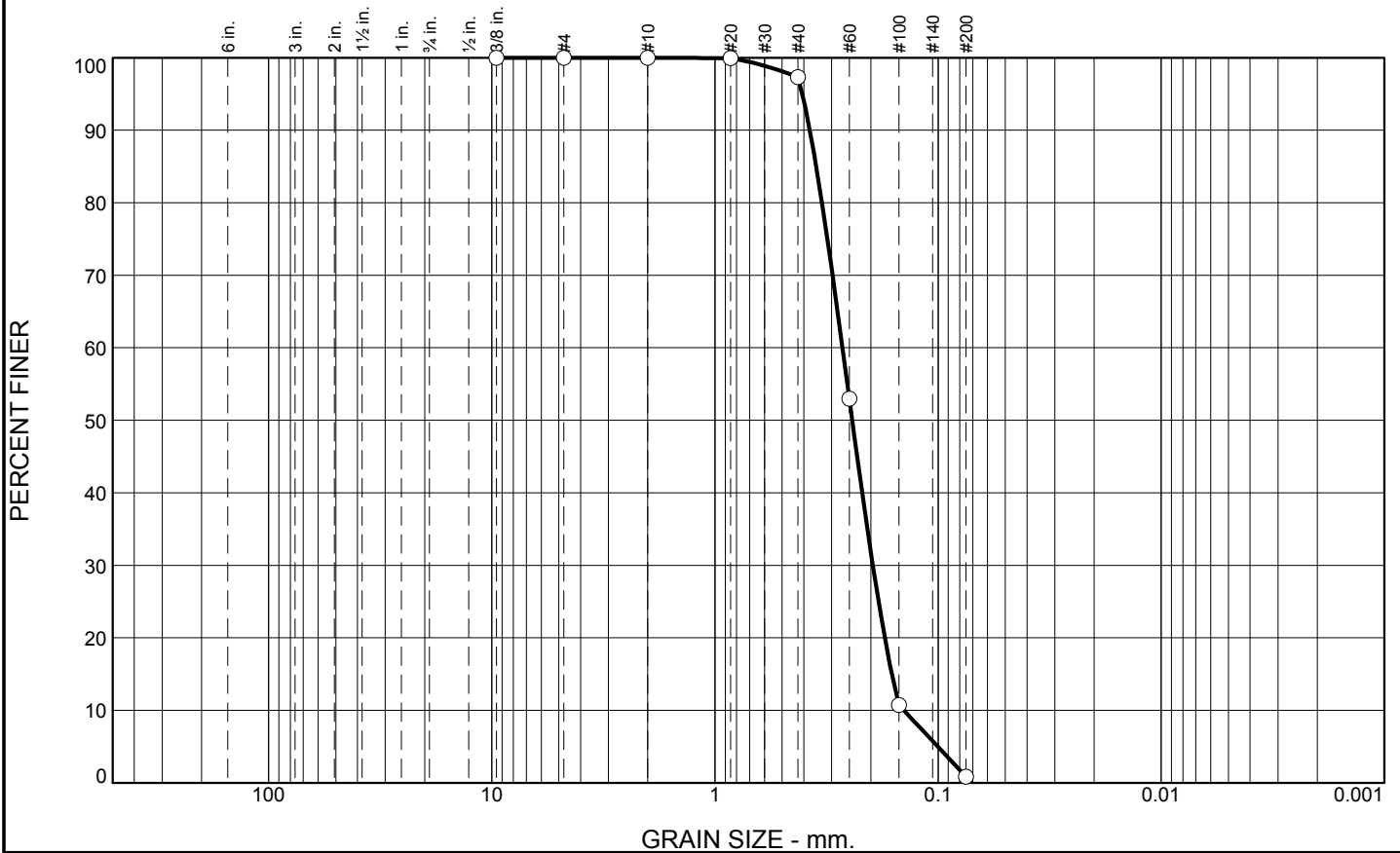
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.7	96.4	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	97.3		
#60	53.0		
#100	10.7		
#200	0.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3759 D₈₅= 0.3517 D₆₀= 0.2683
D₅₀= 0.2426 D₃₀= 0.1962 D₁₅= 0.1613
D₁₀= 0.1425 C_u= 1.88 C_c= 1.01

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-5-10
Sample Number: TE Lab ID: 4607.05

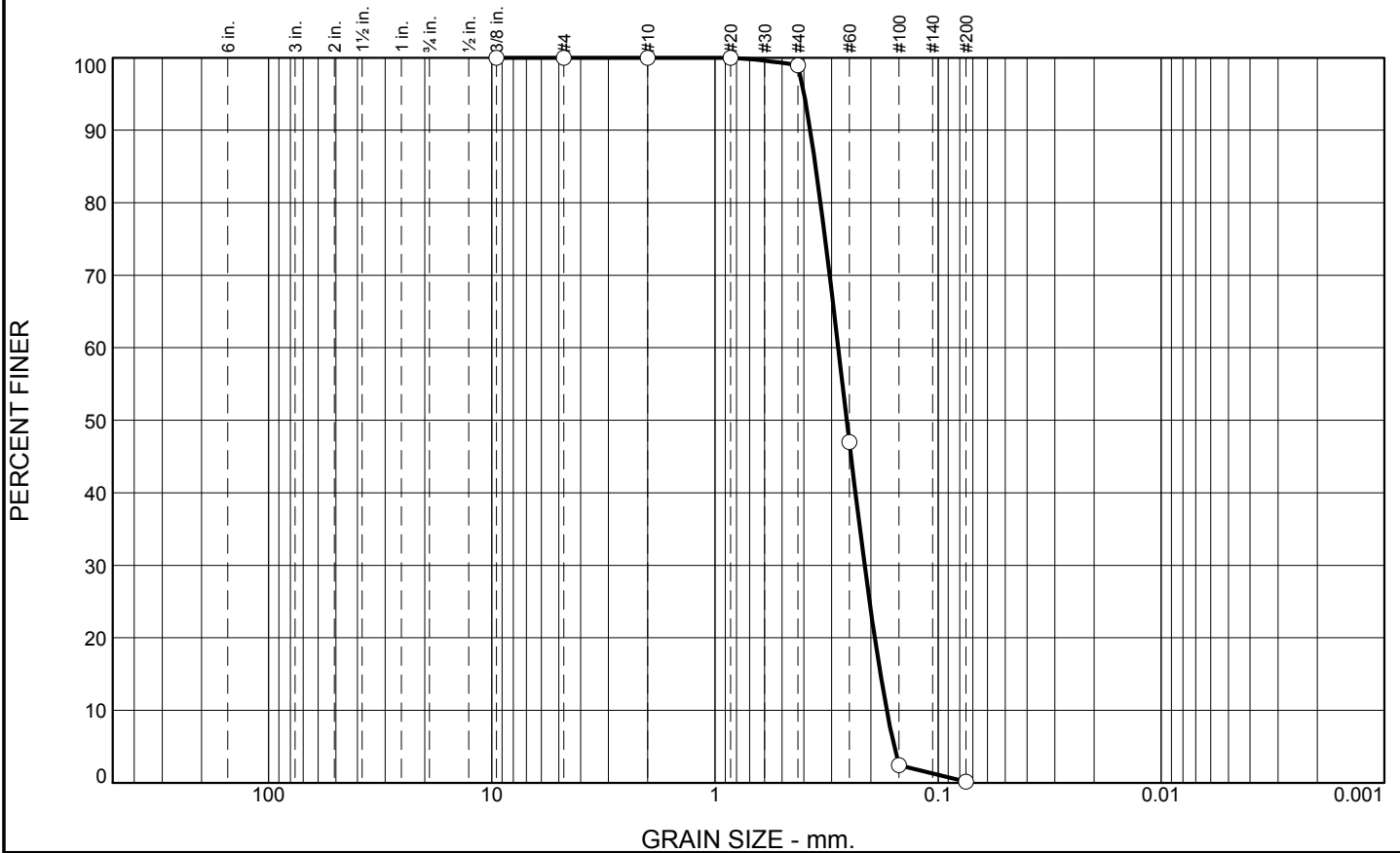
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.0	98.8	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.0		
#60	47.0		
#100	2.4		
#200	0.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3744 D₈₅= 0.3540 D₆₀= 0.2801
D₅₀= 0.2567 D₃₀= 0.2134 D₁₅= 0.1813
D₁₀= 0.1699 C_u= 1.65 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-6-10
Sample Number: TE Lab ID: 4607.06

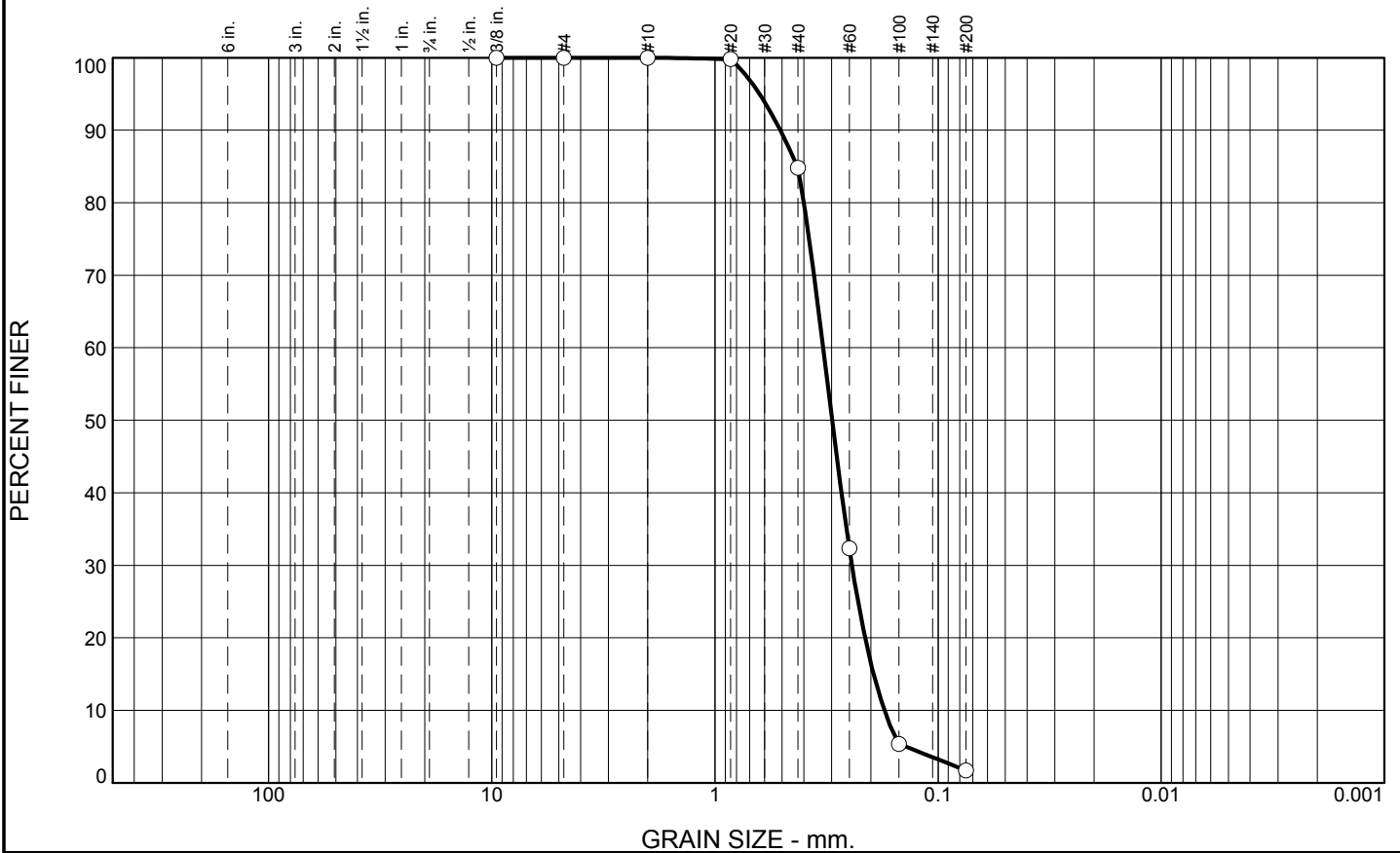
Date: 8/4/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No. Revised 8/18</p>
------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	15.2	83.1	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	84.8		
#60	32.3		
#100	5.4		
#200	1.7		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5093 D₈₅= 0.4276 D₆₀= 0.3272
D₅₀= 0.2983 D₃₀= 0.2434 D₁₅= 0.1947
D₁₀= 0.1741 C_u= 1.88 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

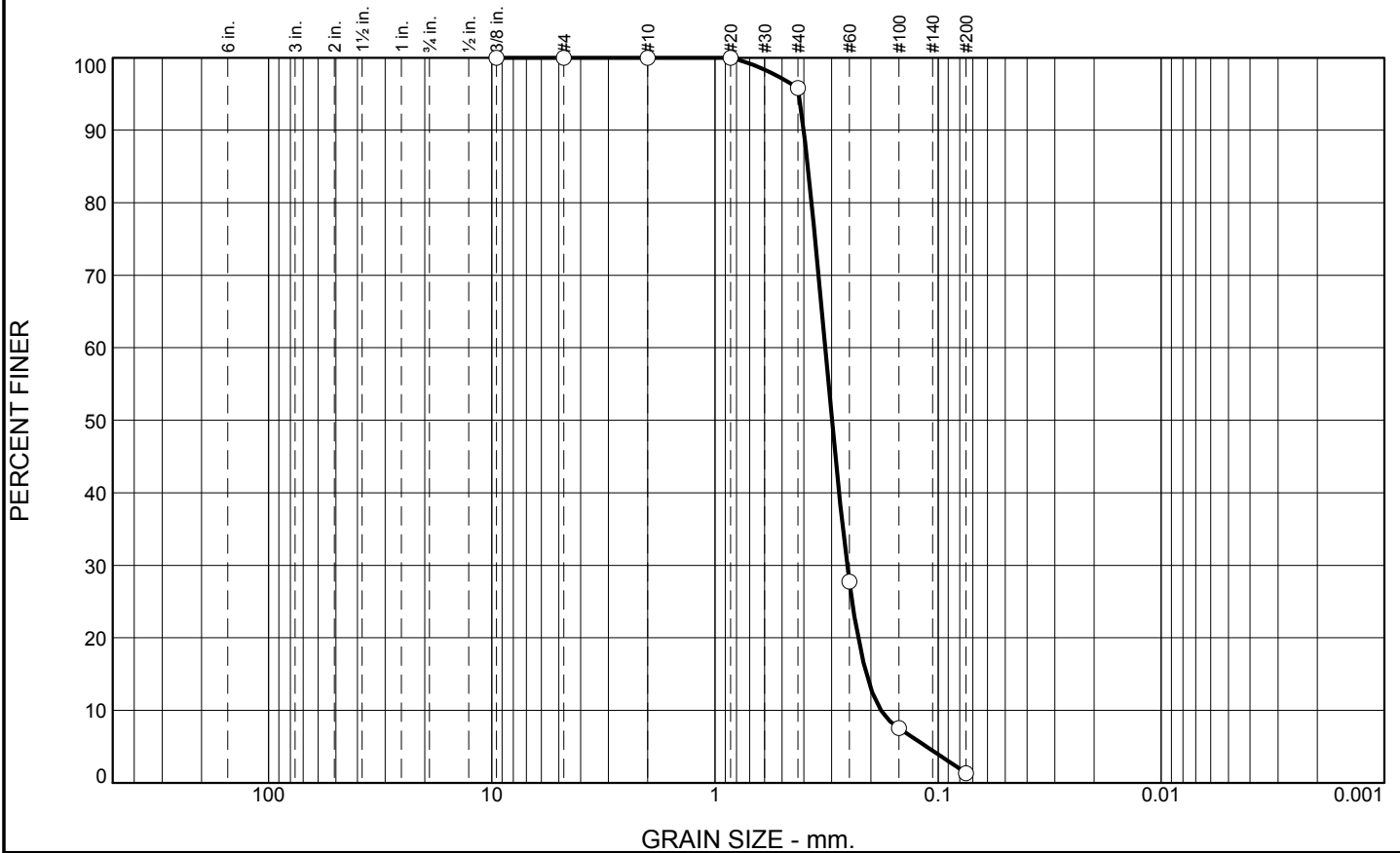
Location: USACE Sample # BI-SIB-8-10
Sample Number: TE Lab ID: 4607.08

Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	4.2	94.5	1.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	95.8		
#60	27.8		
#100	7.6		
#200	1.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4009 D₈₅= 0.3840 D₆₀= 0.3203
D₅₀= 0.2988 D₃₀= 0.2554 D₁₅= 0.2097
D₁₀= 0.1806 C_u= 1.77 C_c= 1.13

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-9-10
Sample Number: TE Lab ID: 4607.09

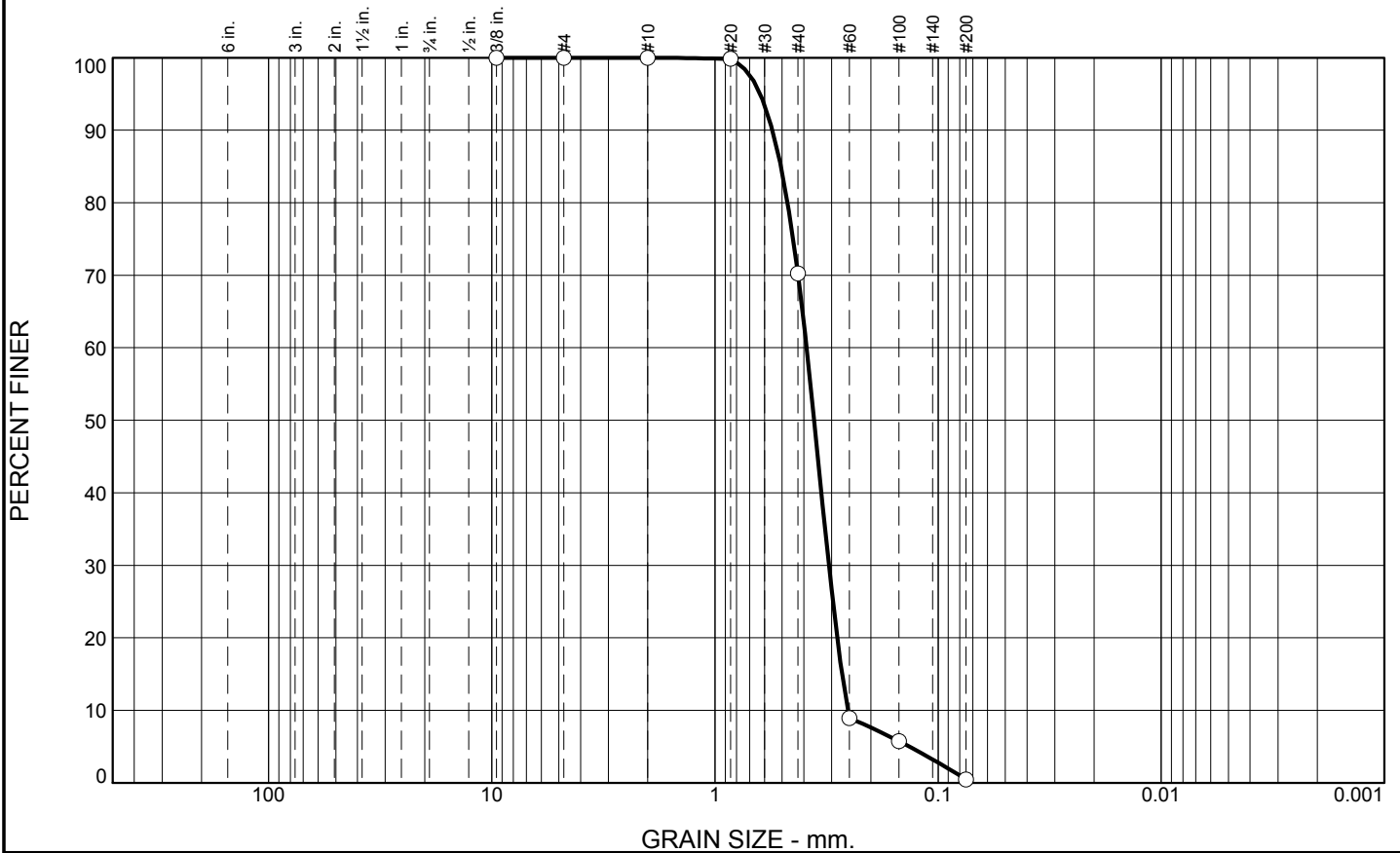
Date: 78/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	29.8	69.7	0.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	70.2		
#60	8.9		
#100	5.8		
#200	0.5		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5523 D₈₅= 0.5060 D₆₀= 0.3888
D₅₀= 0.3596 D₃₀= 0.3084 D₁₅= 0.2694
D₁₀= 0.2538 C_u= 1.53 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-10-10
Sample Number: TE Lab ID: 4607.10

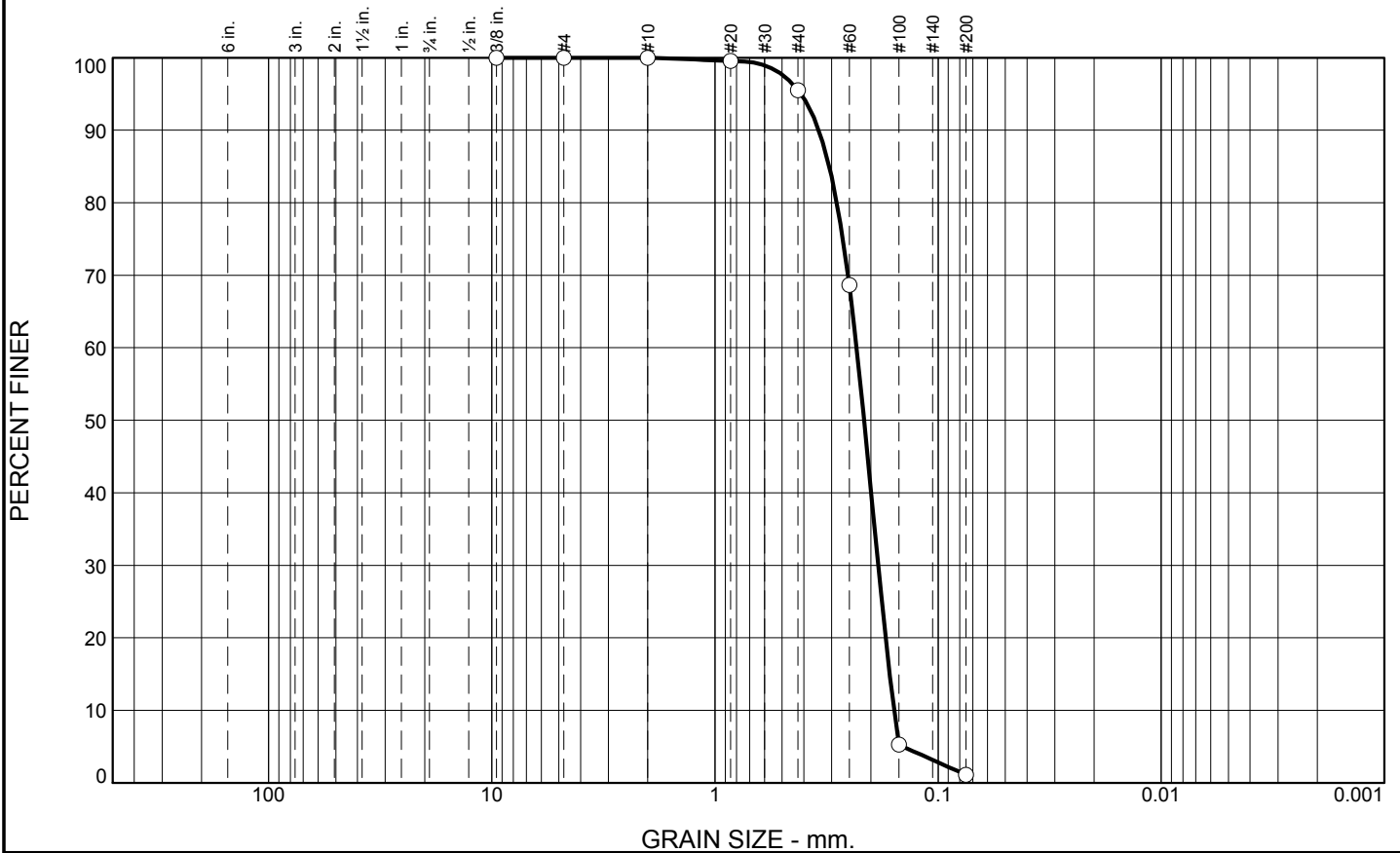
Date: 8/4/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18</p>
------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	4.5	94.4	1.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.6		
#40	95.5		
#60	68.7		
#100	5.3		
#200	1.1		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3422 D₈₅= 0.3073 D₆₀= 0.2319
D₅₀= 0.2147 D₃₀= 0.1856 D₁₅= 0.1649
D₁₀= 0.1576 C_u= 1.47 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-11-10
Sample Number: TE Lab ID: 4607.11

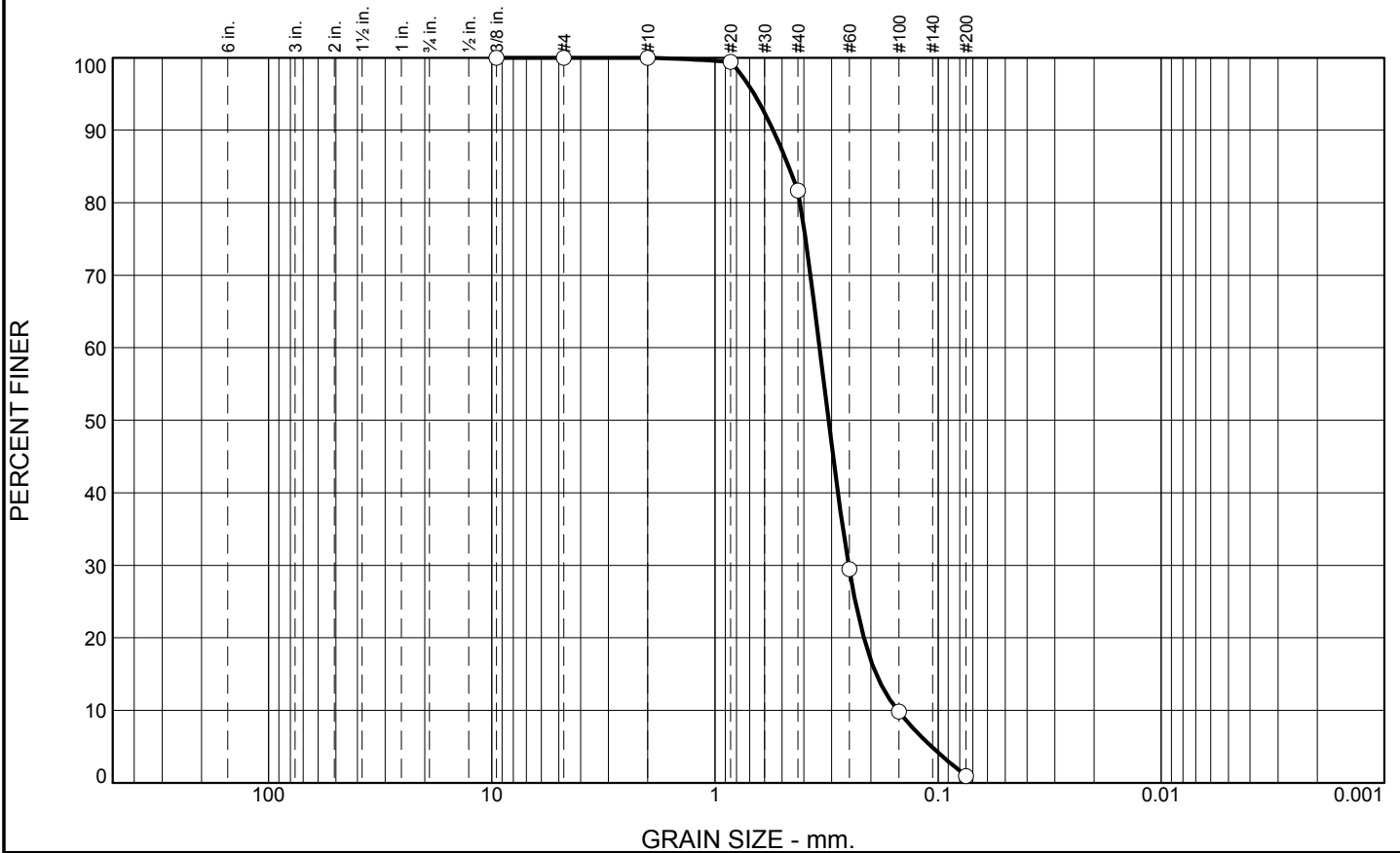
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	18.3	80.8	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.4		
#40	81.7		
#60	29.5		
#100	9.8		
#200	0.9		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5485 D₈₅= 0.4670 D₆₀= 0.3395
D₅₀= 0.3095 D₃₀= 0.2517 D₁₅= 0.1896
D₁₀= 0.1517 C_u= 2.24 C_c= 1.23

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-SIB-10 - Composite Samples
Sample Number: TE Lab ID: 4607.12

Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

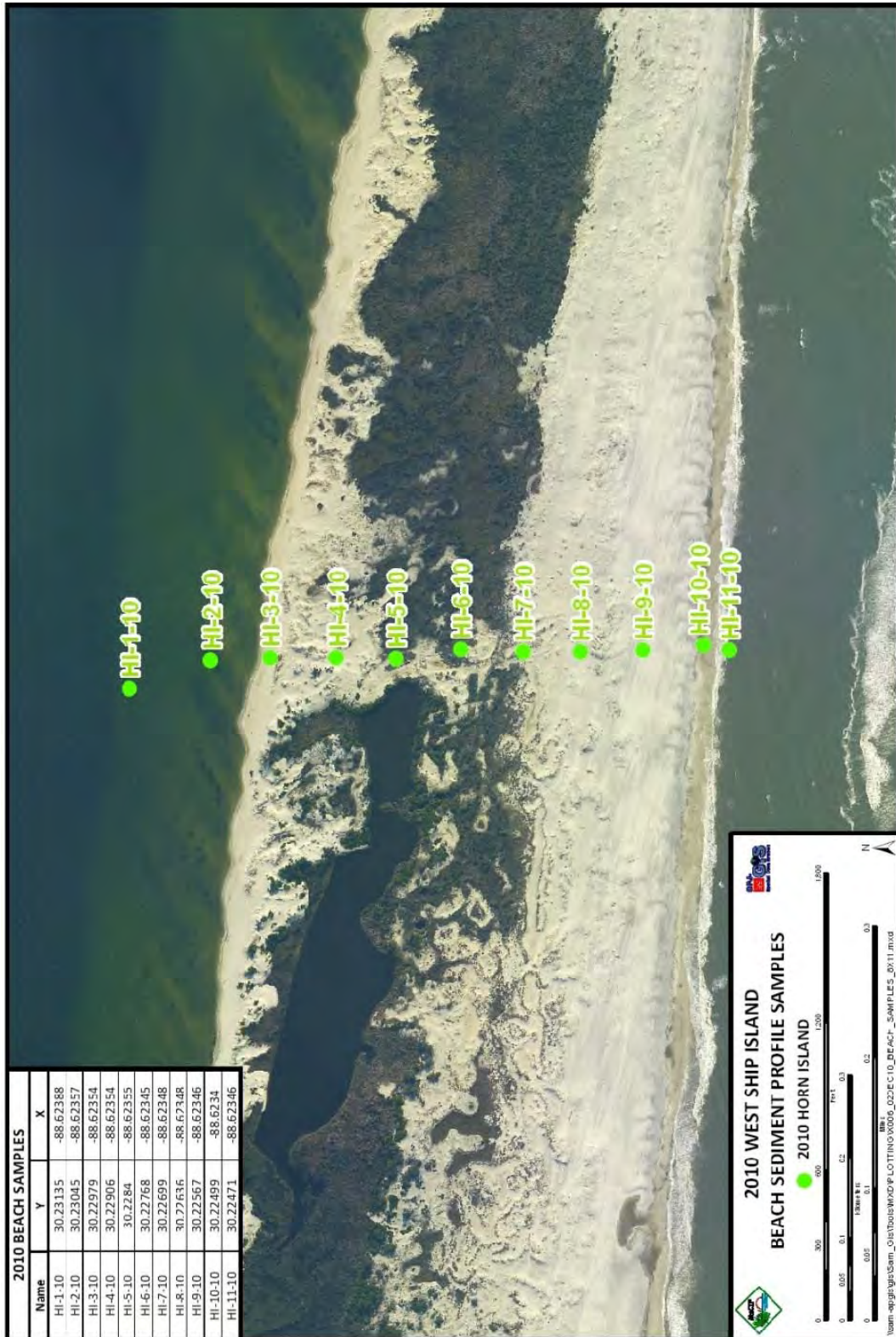
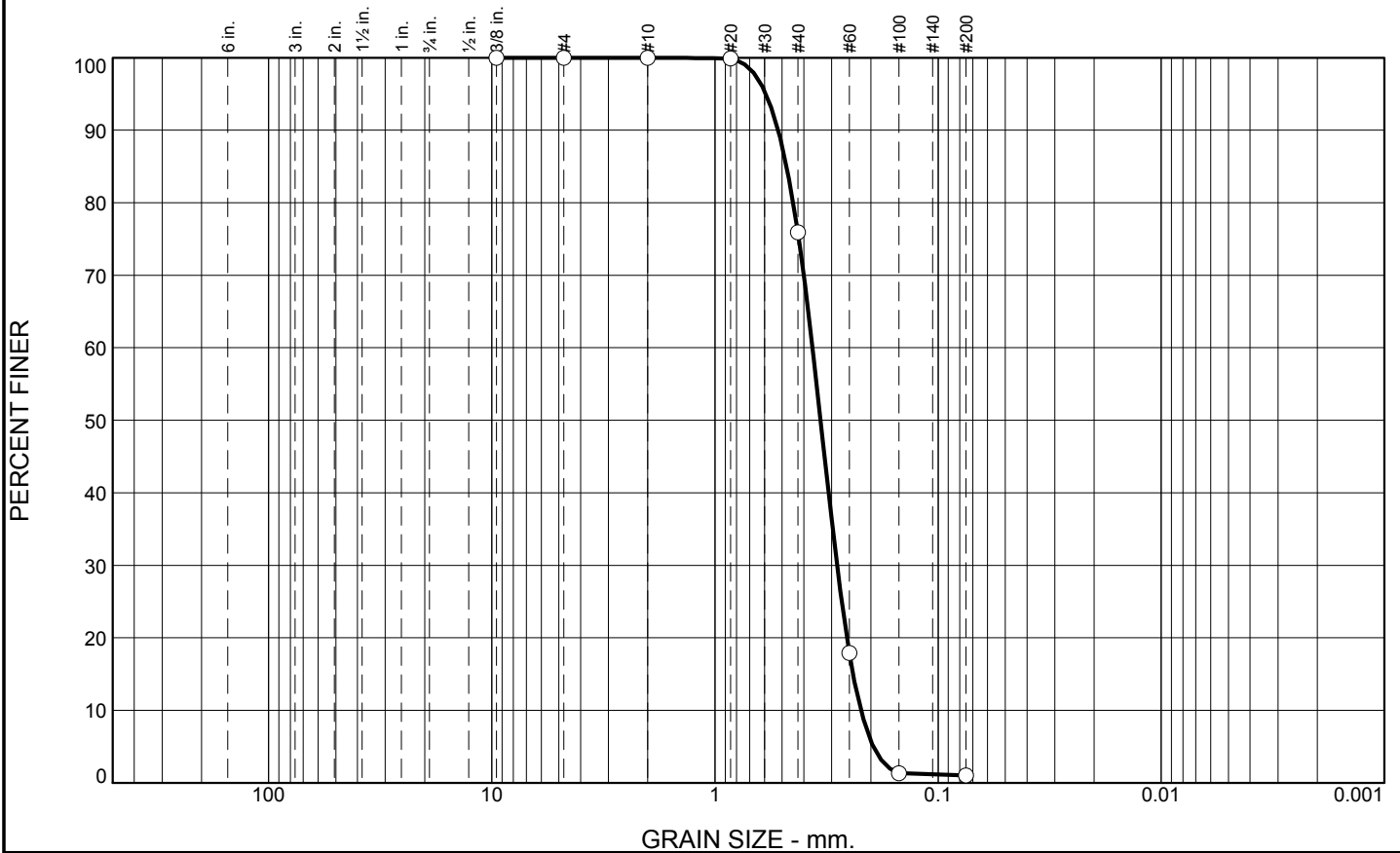


Figure 3.2.3.2 - Sampling locations for 2010 Horn Island beach transect. These samples are labeled with the prefix BI-HIB in Table 3.2.3.2.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	24.1	74.9	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	75.9		
#60	17.9		
#100	1.3		
#200	1.0		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5205 D₈₅= 0.4773 D₆₀= 0.3657
D₅₀= 0.3362 D₃₀= 0.2834 D₁₅= 0.2406
D₁₀= 0.2217 C_u= 1.65 C_c= 0.99

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

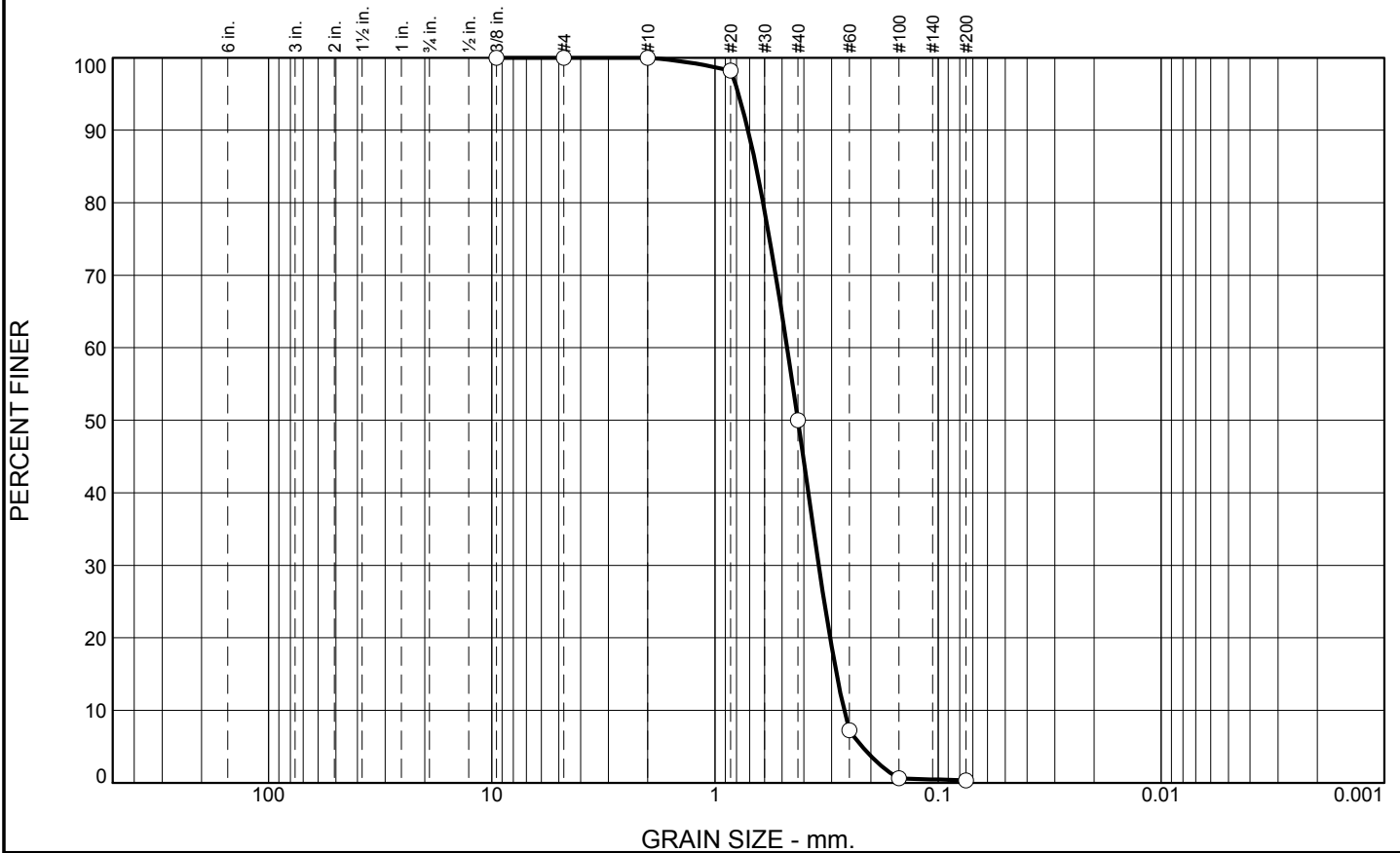
Location: USACE Sample # BI-HIB-1-10
Sample Number: TE Lab ID: 4607.13

Date: 8/4/10

Thompson Engineering Mobile, Alabama	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No. Revised 8/18</p>
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	50.0	49.7	0.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	98.2		
#40	50.0		
#60	7.3		
#100	0.6		
#200	0.3		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.7112 D₈₅= 0.6550 D₆₀= 0.4746
D₅₀= 0.4250 D₃₀= 0.3427 D₁₅= 0.2849
D₁₀= 0.2635 C_u= 1.80 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-2-10
Sample Number: TE Lab ID: 4607.14

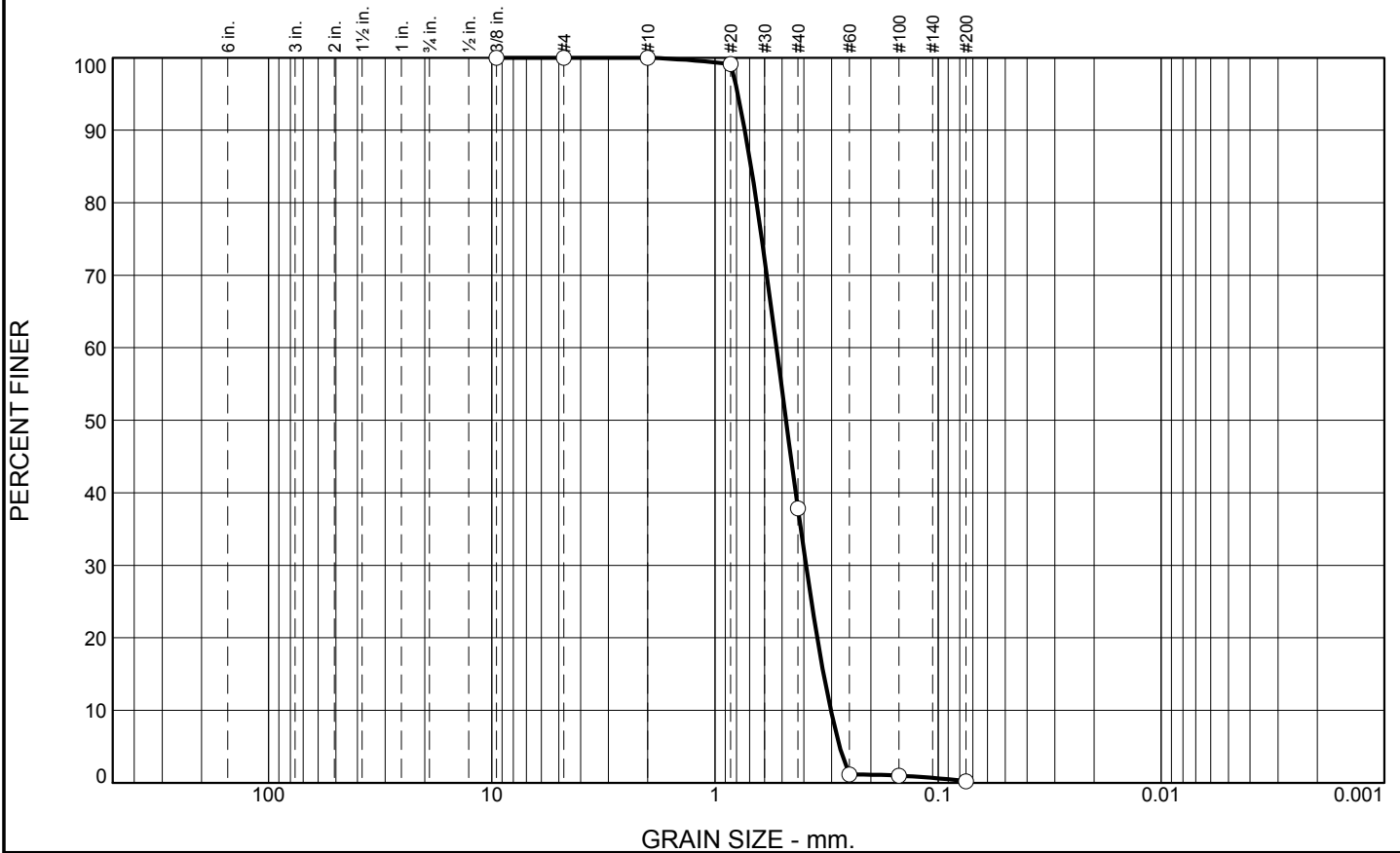
Date: 8/4/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No. Revised 8/18</p>
----------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	62.2	37.6	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.1		
#40	37.8		
#60	1.2		
#100	1.0		
#200	0.2		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.7353 D₈₅= 0.6902 D₆₀= 0.5296
D₅₀= 0.4801 D₃₀= 0.3911 D₁₅= 0.3258
D₁₀= 0.3024 C_u= 1.75 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-3-10
Sample Number: TE Lab ID: 4607.15

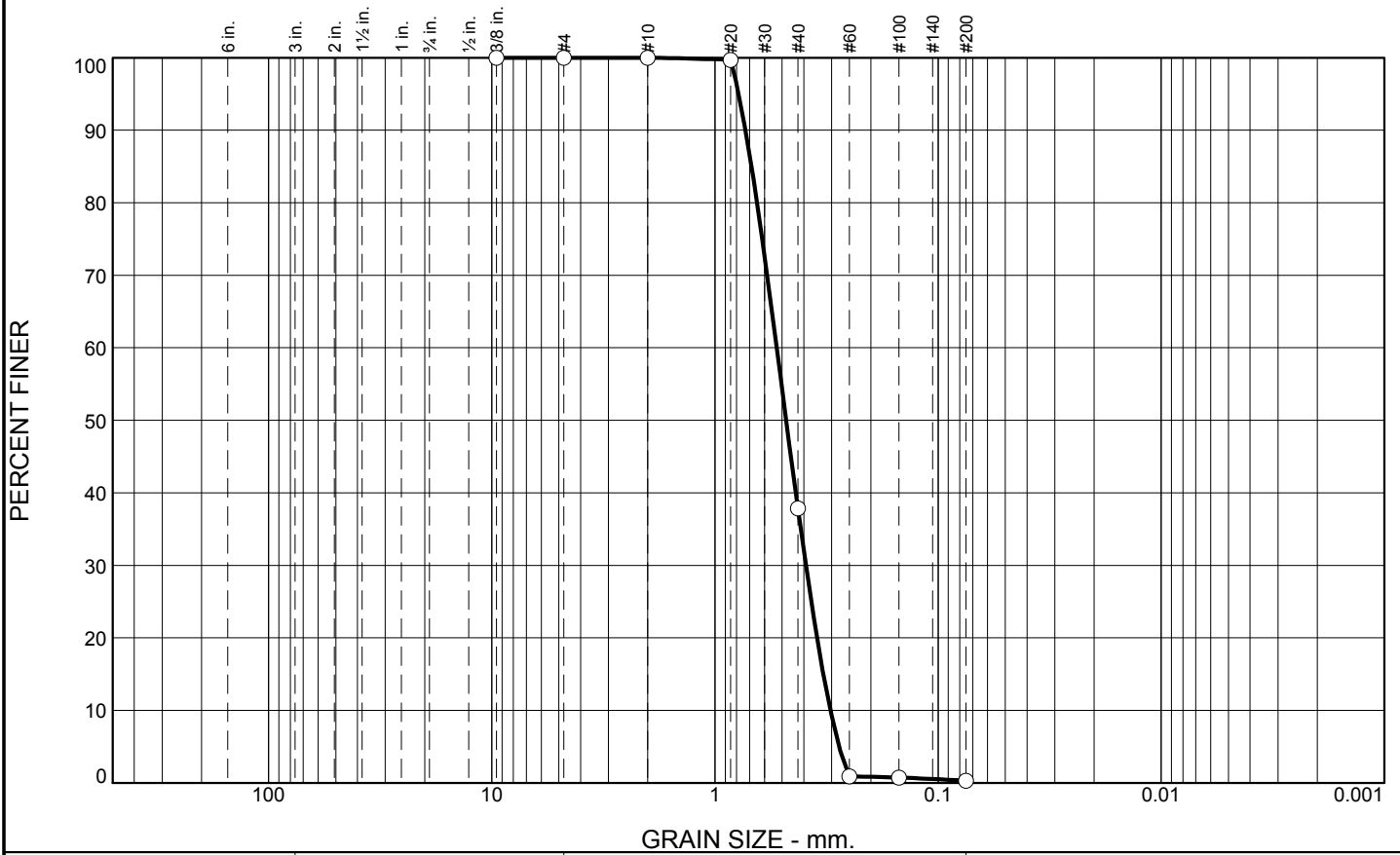
Date: 8/4/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18</p>
------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	62.2	37.5	0.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	37.8		
#60	0.9		
#100	0.7		
#200	0.3		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.7302 D₈₅= 0.6862 D₆₀= 0.5284
D₅₀= 0.4795 D₃₀= 0.3914 D₁₅= 0.3267
D₁₀= 0.3035 C_u= 1.74 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

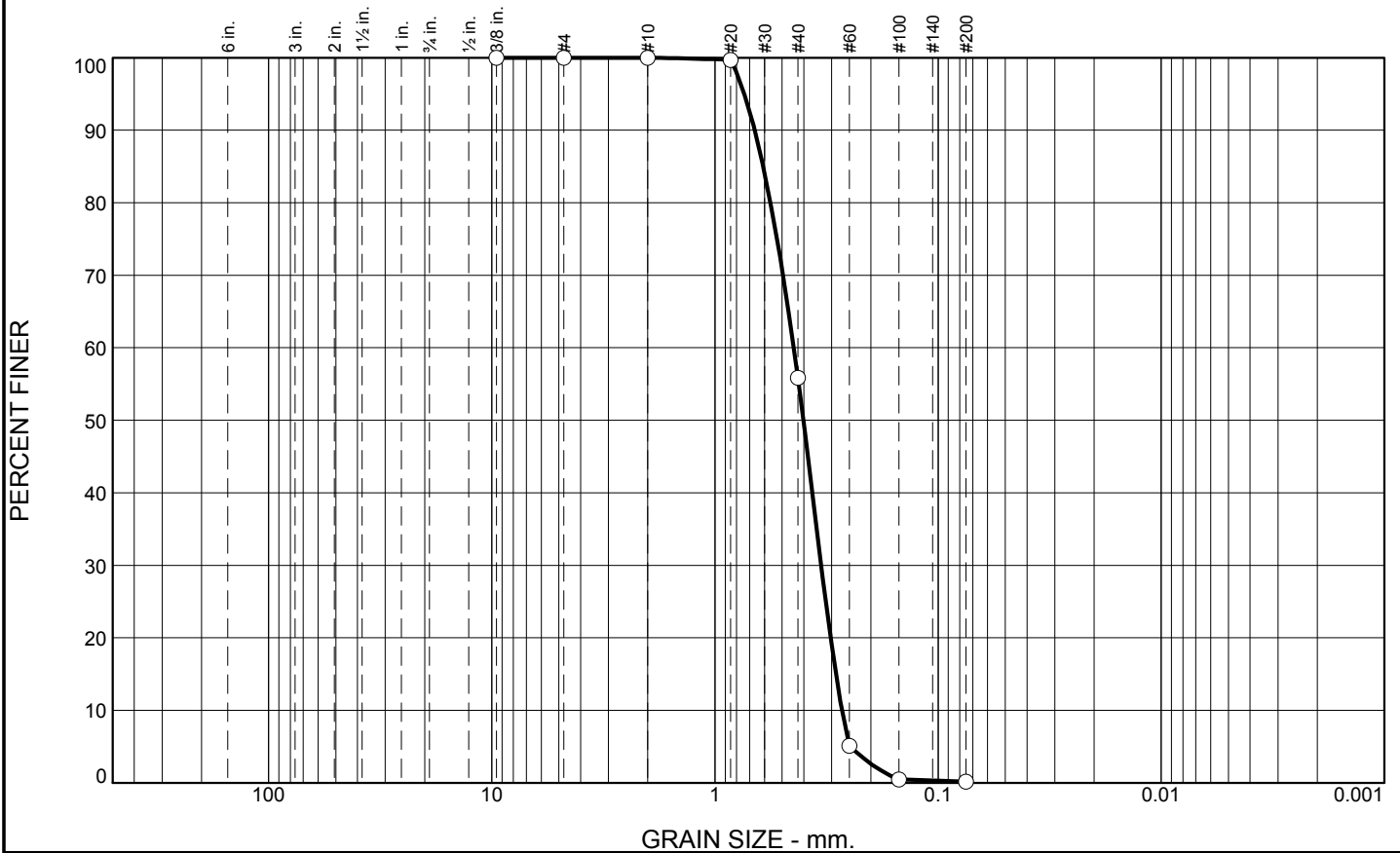
Location: USACE Sample # BI-HIB-4-10
Sample Number: TE Lab ID: 4607.16

Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Martin

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	44.2	55.6	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	55.8		
#60	5.1		
#100	0.5		
#200	0.2		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.6638 D₈₅= 0.6081 D₆₀= 0.4433
D₅₀= 0.4018 D₃₀= 0.3342 D₁₅= 0.2868
D₁₀= 0.2697 C_u= 1.64 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

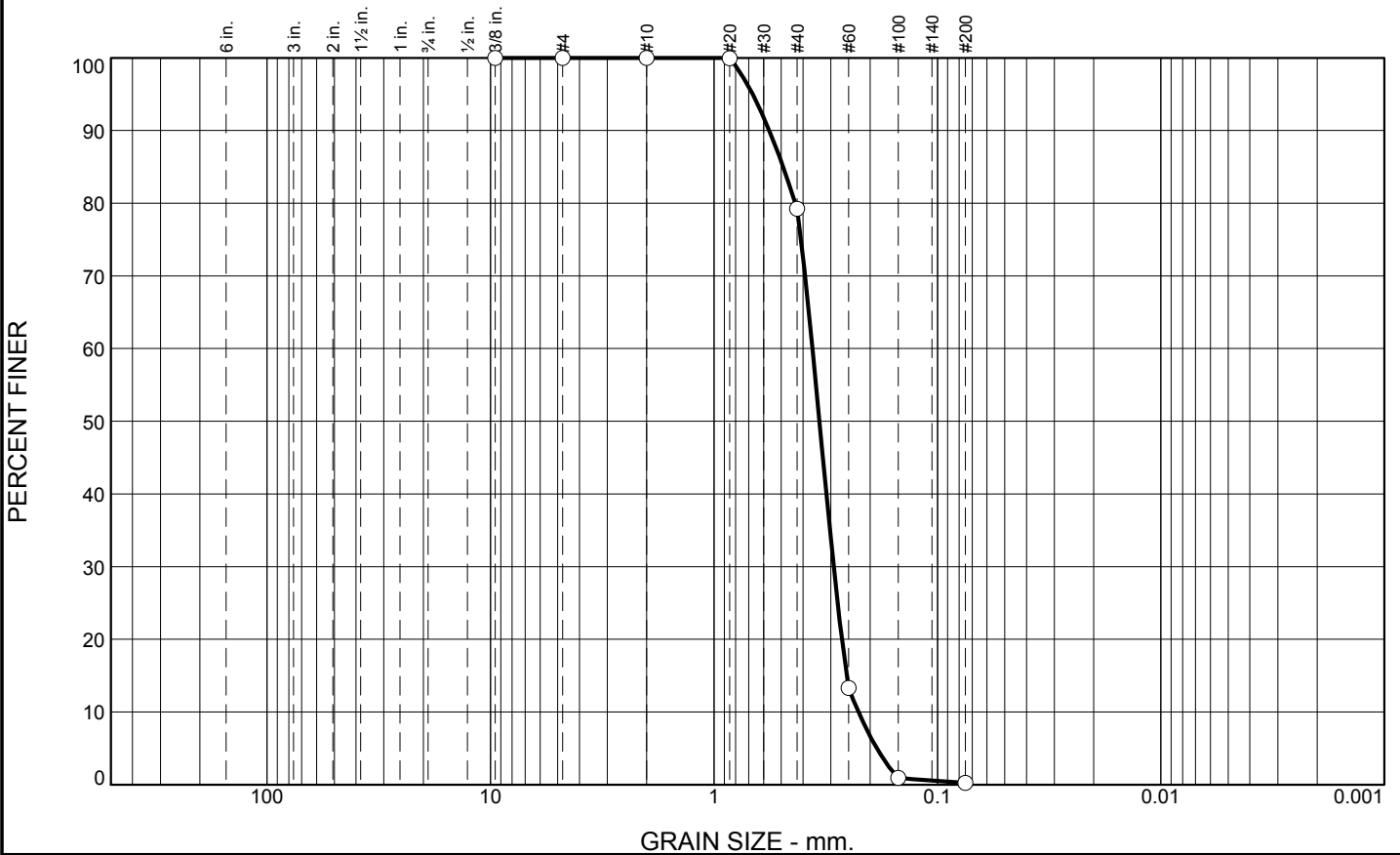
Location: USACE Sample # BI-HIB-5-10
Sample Number: TE Lab ID: 4607.17

Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	20.8	78.9	0.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	79.2		
#60	13.3		
#100	0.9		
#200	0.3		

Material Description

SAND, (SP), medium to fine grained, with trace organics

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5655 D₈₅= 0.4903 D₆₀= 0.3626
D₅₀= 0.3372 D₃₀= 0.2912 D₁₅= 0.2548
D₁₀= 0.2255 C_u= 1.61 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

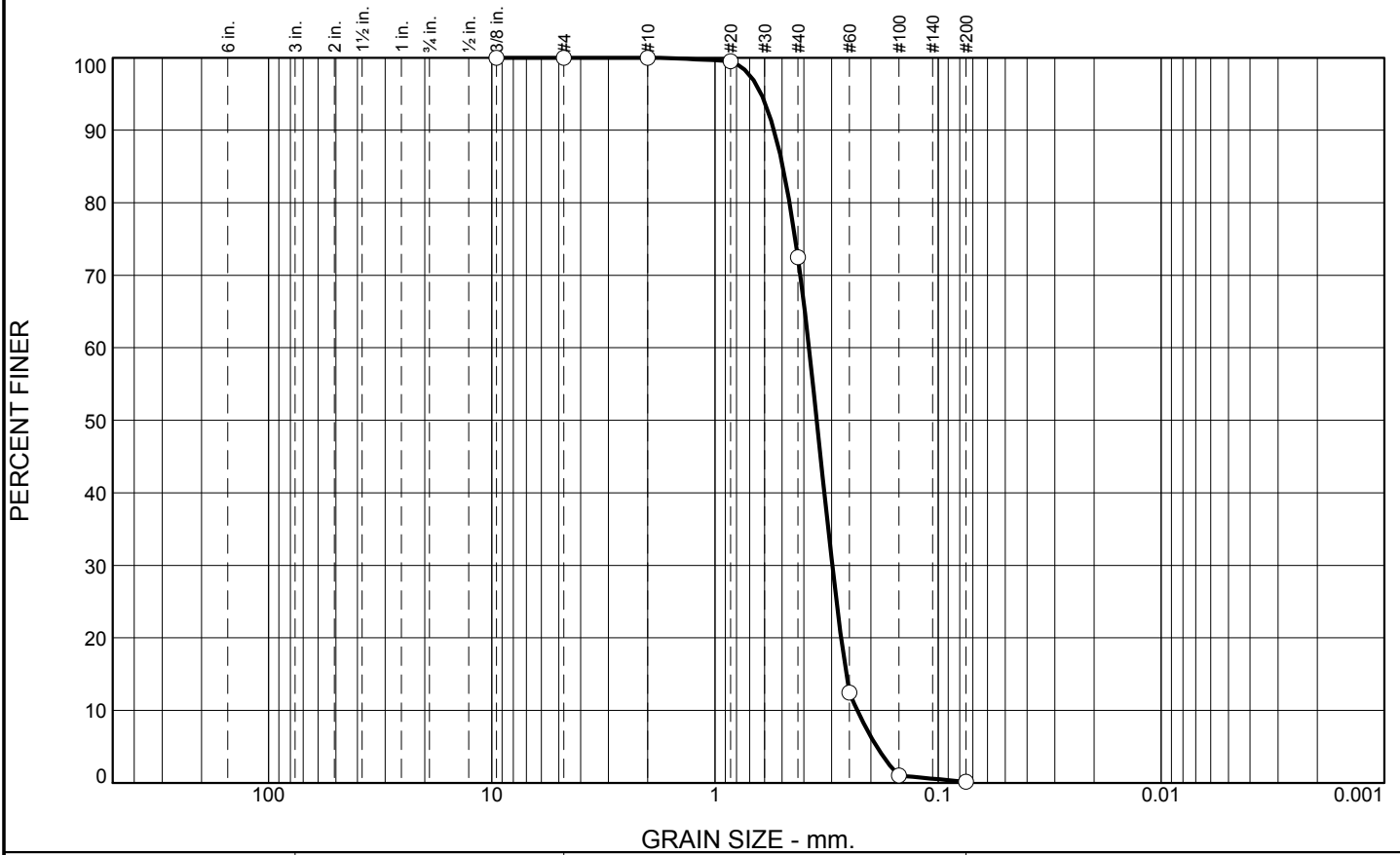
Location: USACE Sample # BI-HIB-6-10
Sample Number: TE Lab ID: 4607.18

Date: 8/4/10

<p style="font-size: 1.2em; font-weight: bold; margin: 0;">Thompson Engineering</p> <p style="font-size: 1.2em; font-weight: bold; margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No. Revised 8/18</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	27.5	72.3	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.5		
#40	72.5		
#60	12.5		
#100	1.0		
#200	0.2		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5429 D₈₅= 0.4963 D₆₀= 0.3794
D₅₀= 0.3499 D₃₀= 0.2978 D₁₅= 0.2579
D₁₀= 0.2302 C_u= 1.65 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

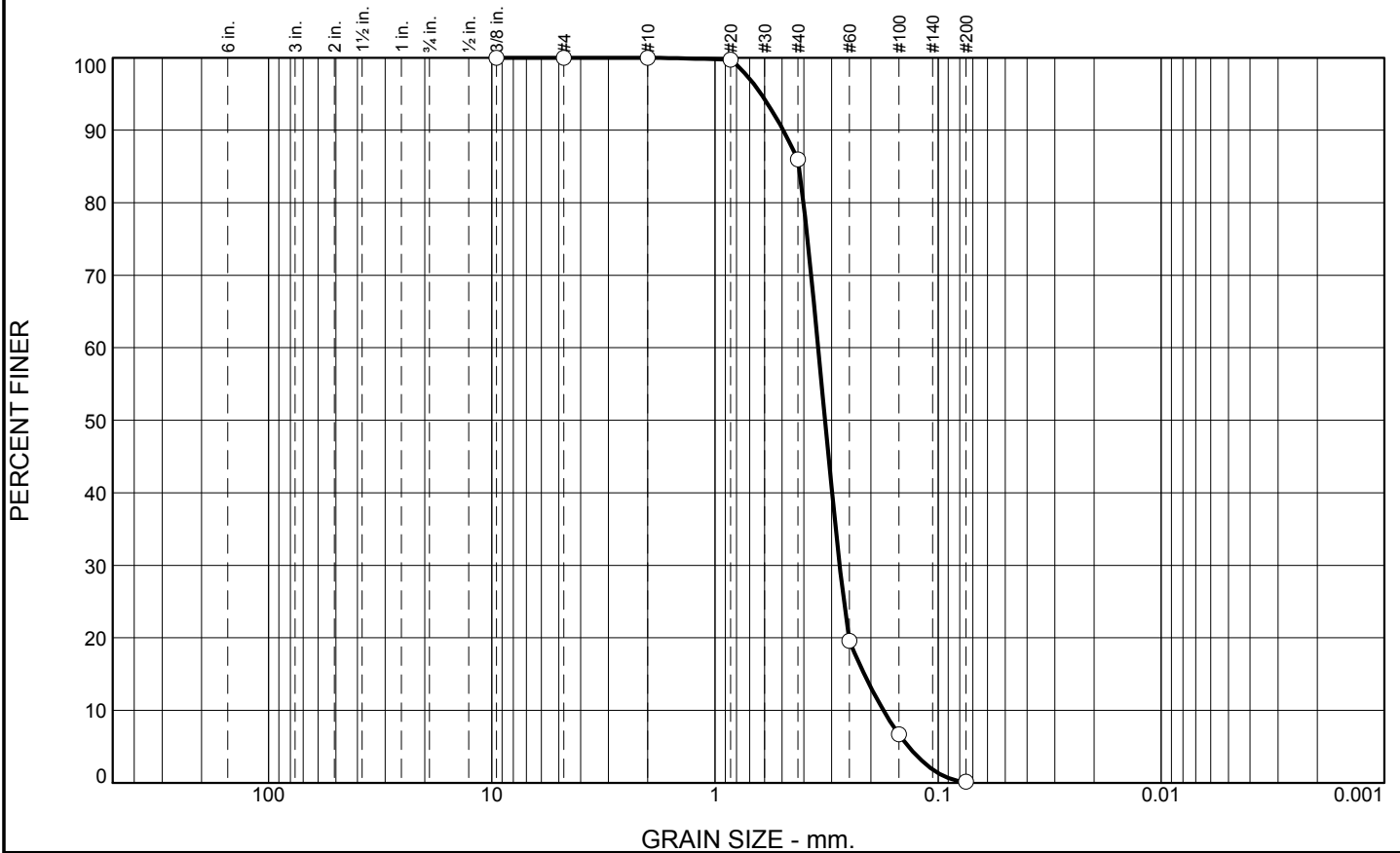
Location: USACE Sample # BI-HIB-7-10
Sample Number: TE Lab ID: 4607.19

Date: 8/4/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No. Revised 8/18</p>
------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	14.0	85.8	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	86.0		
#60	19.6		
#100	6.7		
#200	0.2		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4946 D₈₅= 0.4209 D₆₀= 0.3445
D₅₀= 0.3210 D₃₀= 0.2761 D₁₅= 0.2144
D₁₀= 0.1759 C_u= 1.96 C_c= 1.26

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-8-10
Sample Number: TE Lab ID: 4607.20

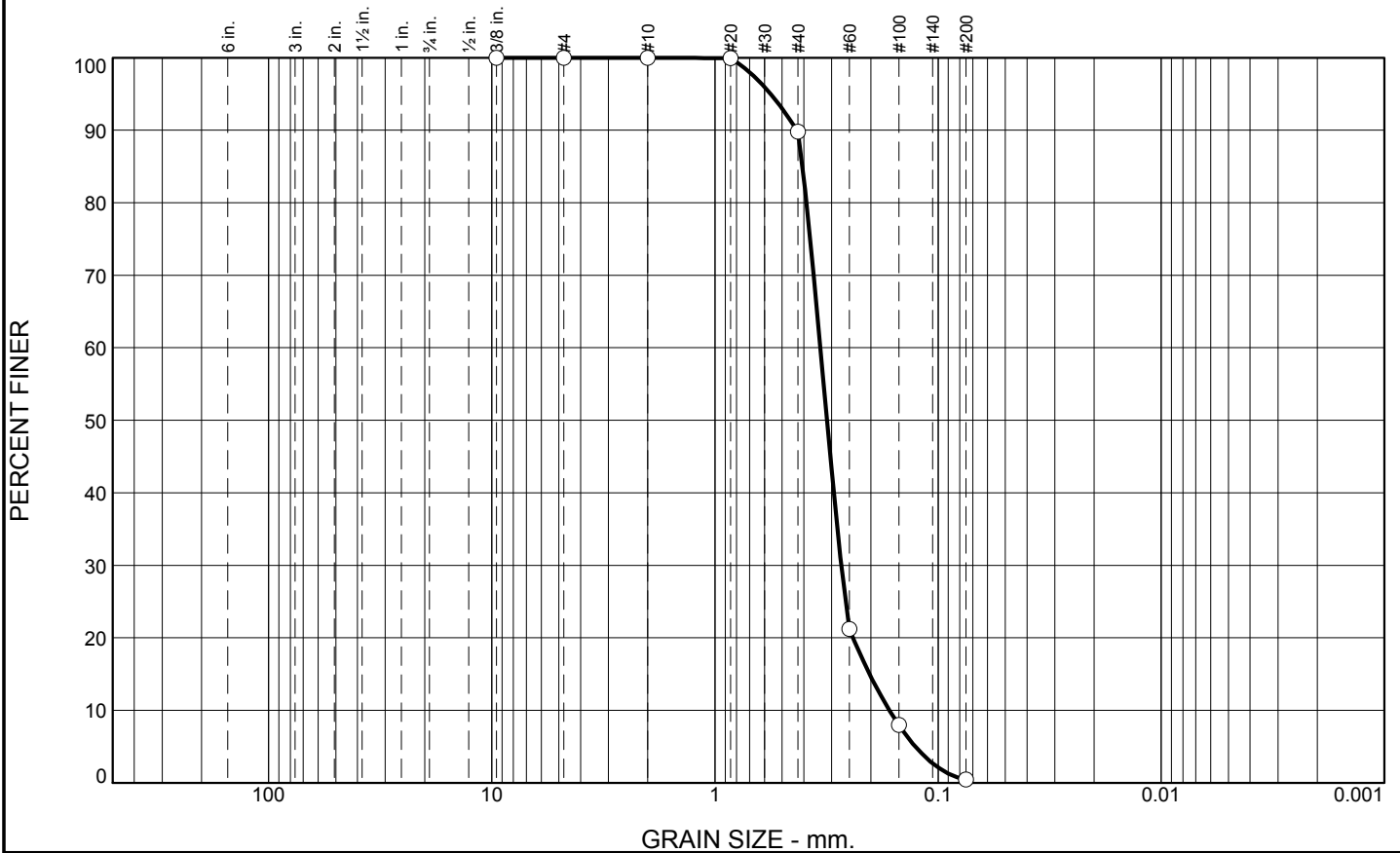
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	10.2	89.3	0.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	89.8		
#60	21.2		
#100	8.0		
#200	0.5		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4288 D₈₅= 0.4060 D₆₀= 0.3369
D₅₀= 0.3147 D₃₀= 0.2715 D₁₅= 0.2028
D₁₀= 0.1655 C_u= 2.04 C_c= 1.32

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-9-10
Sample Number: TE Lab ID: 4607.21

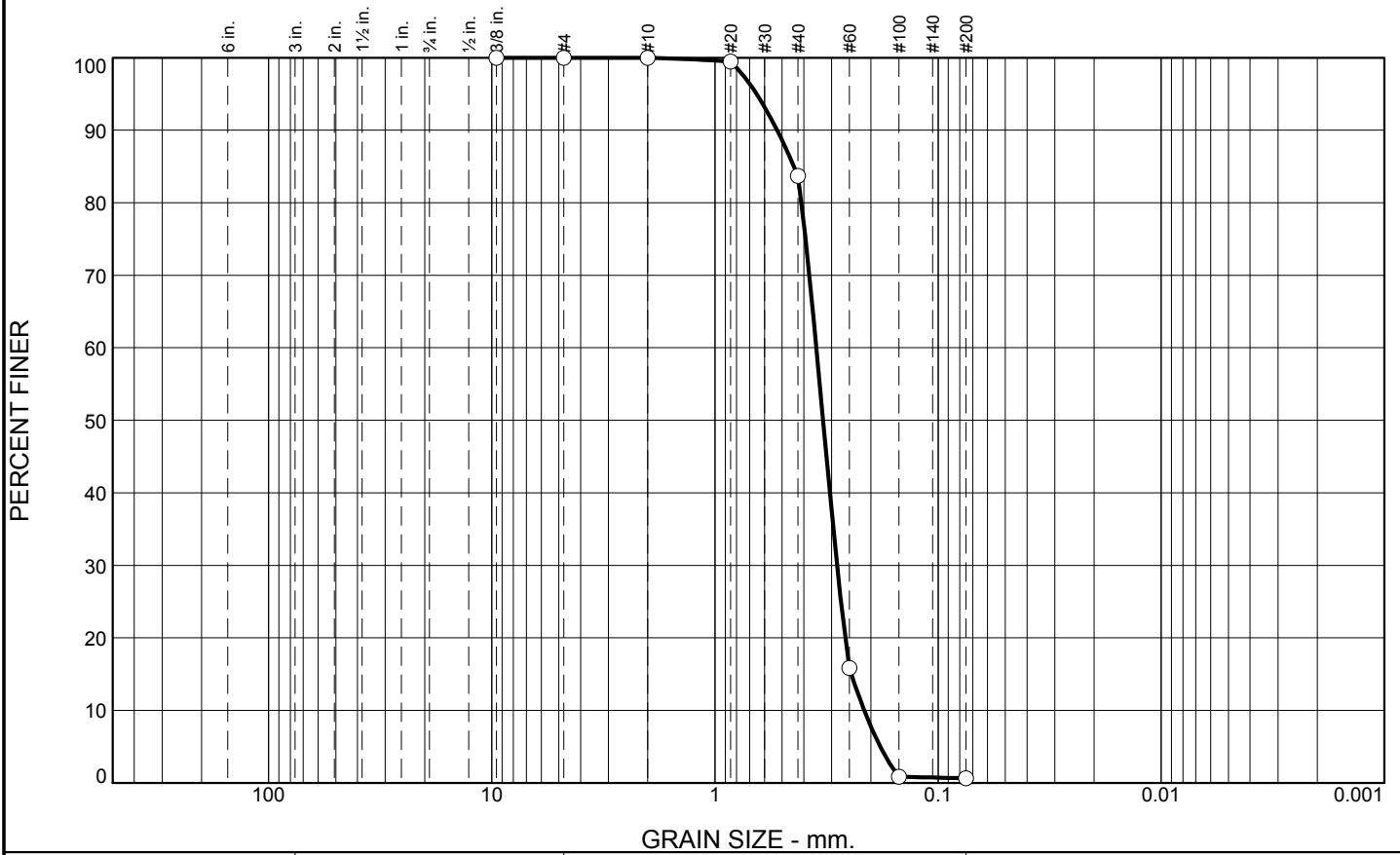
Date: 8/4/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18</p>
------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	16.3	83.1	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.5		
#40	83.7		
#60	15.8		
#100	0.9		
#200	0.6		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5260 D₈₅= 0.4428 D₆₀= 0.3512
D₅₀= 0.3275 D₃₀= 0.2835 D₁₅= 0.2449
D₁₀= 0.2143 C_u= 1.64 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-10-10
Sample Number: TE Lab ID: 4607.22

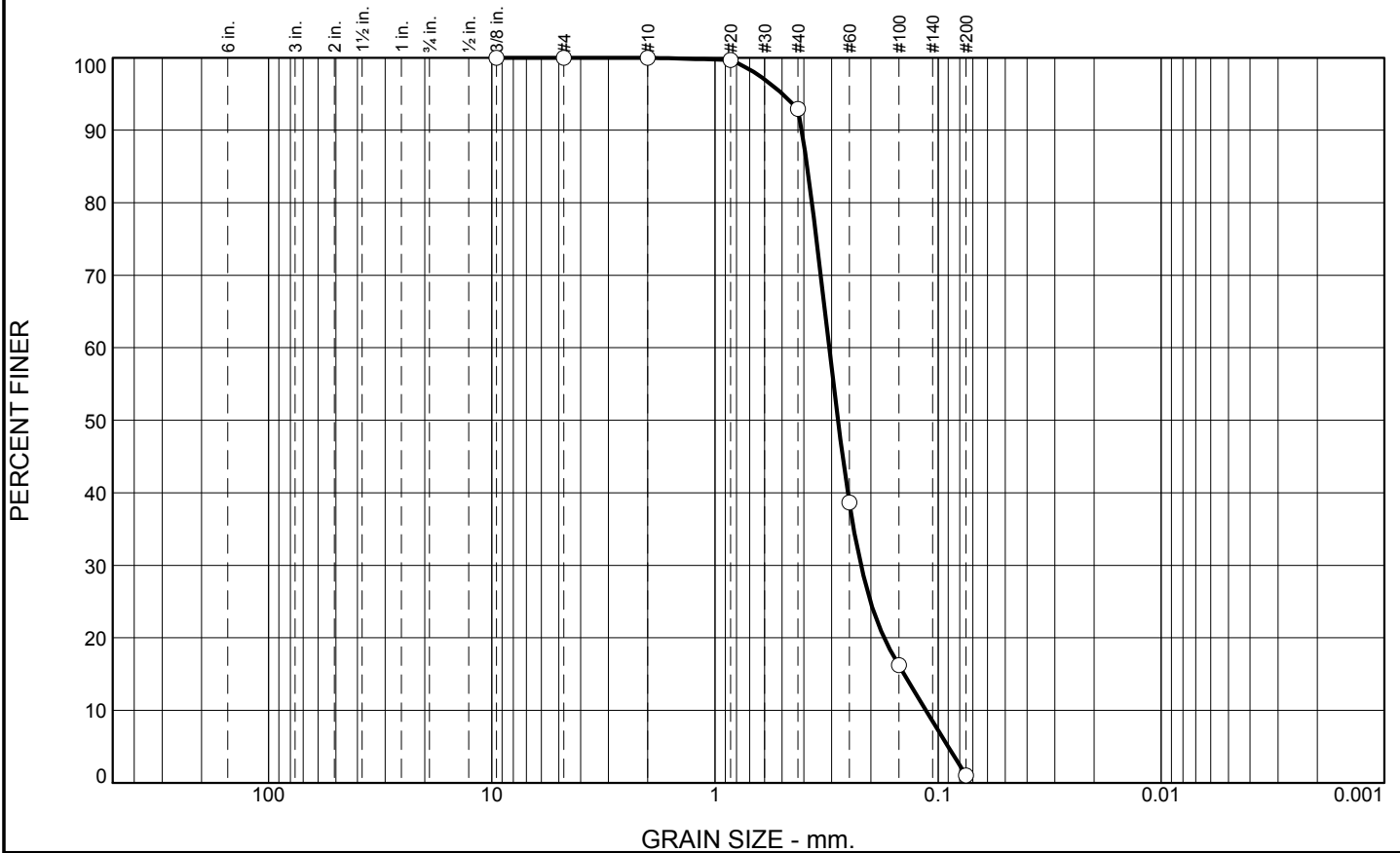
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	7.1	91.9	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	92.9		
#60	38.7		
#100	16.2		
#200	1.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4091 D₈₅= 0.3867 D₆₀= 0.3074
D₅₀= 0.2809 D₃₀= 0.2217 D₁₅= 0.1421
D₁₀= 0.1134 C_u= 2.71 C_c= 1.41

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-11-10
Sample Number: TE Lab ID: 4607.23

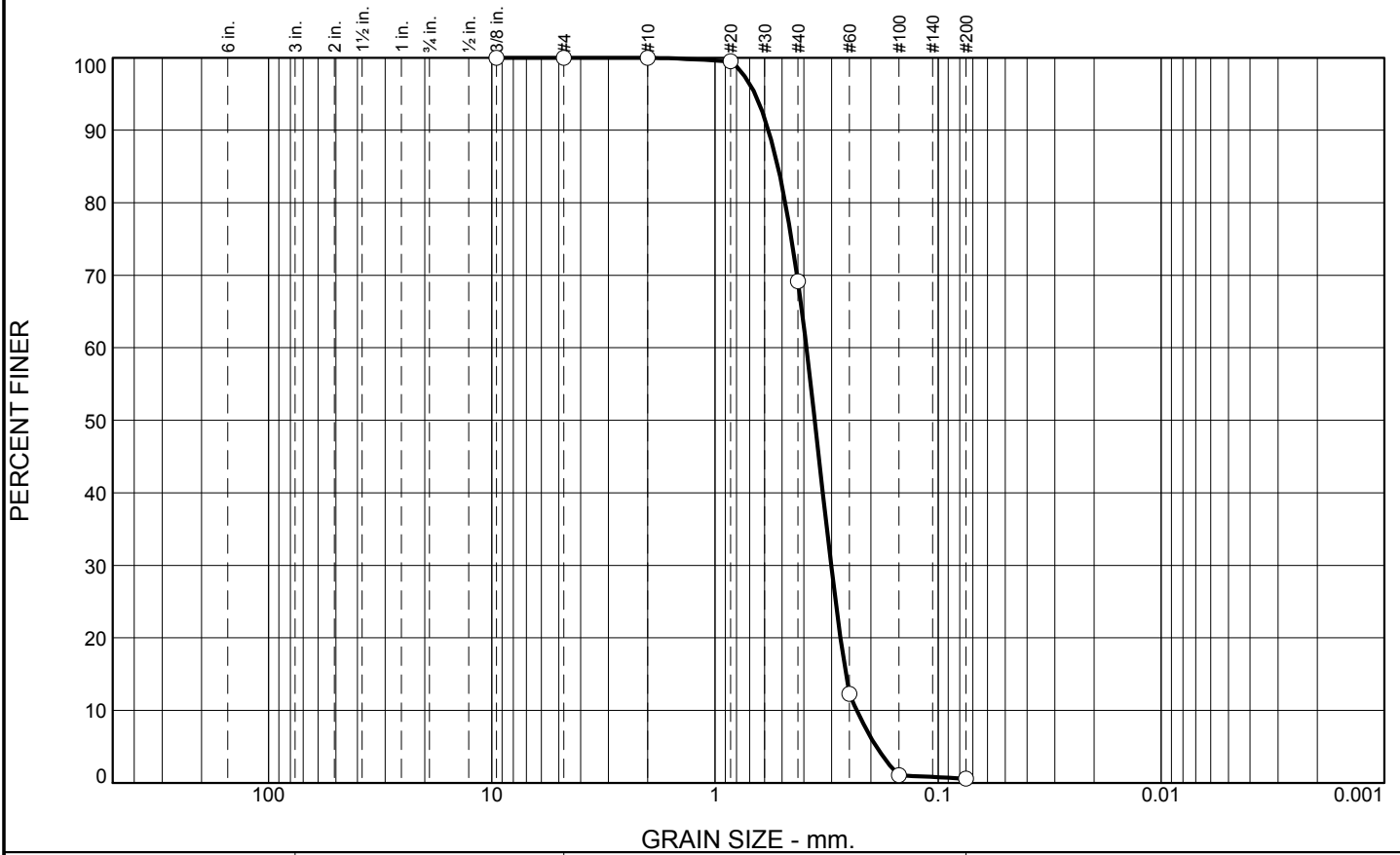
Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	30.8	68.6	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.5		
#40	69.2		
#60	12.3		
#100	1.1		
#200	0.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5754 D₈₅= 0.5221 D₆₀= 0.3894
D₅₀= 0.3571 D₃₀= 0.3013 D₁₅= 0.2589
D₁₀= 0.2315 C_u= 1.68 C_c= 1.01

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-HIB-10 - Composite Samples
Sample Number: TE Lab ID: 4607.24

Date: 8/4/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No. Revised 8/18
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

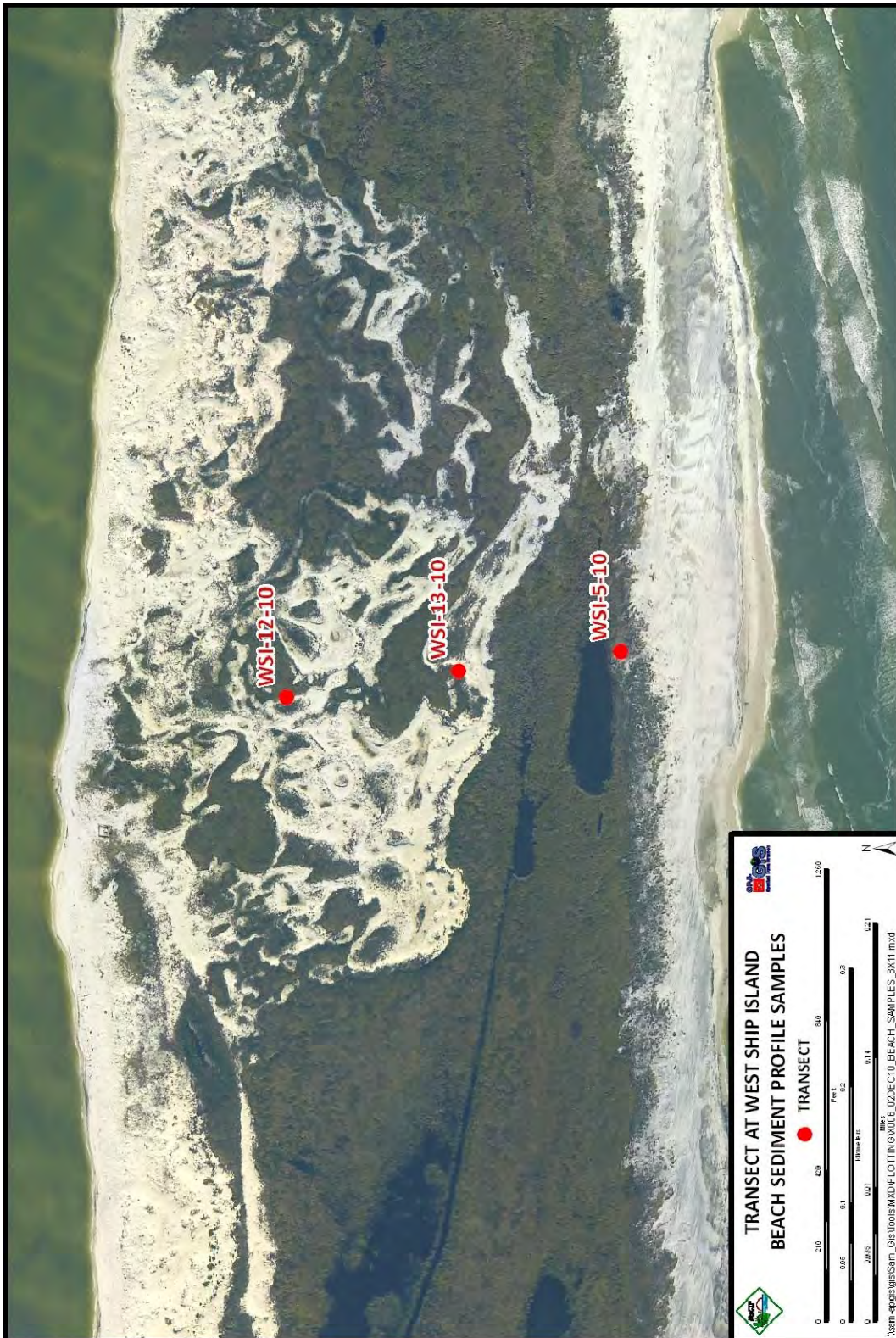
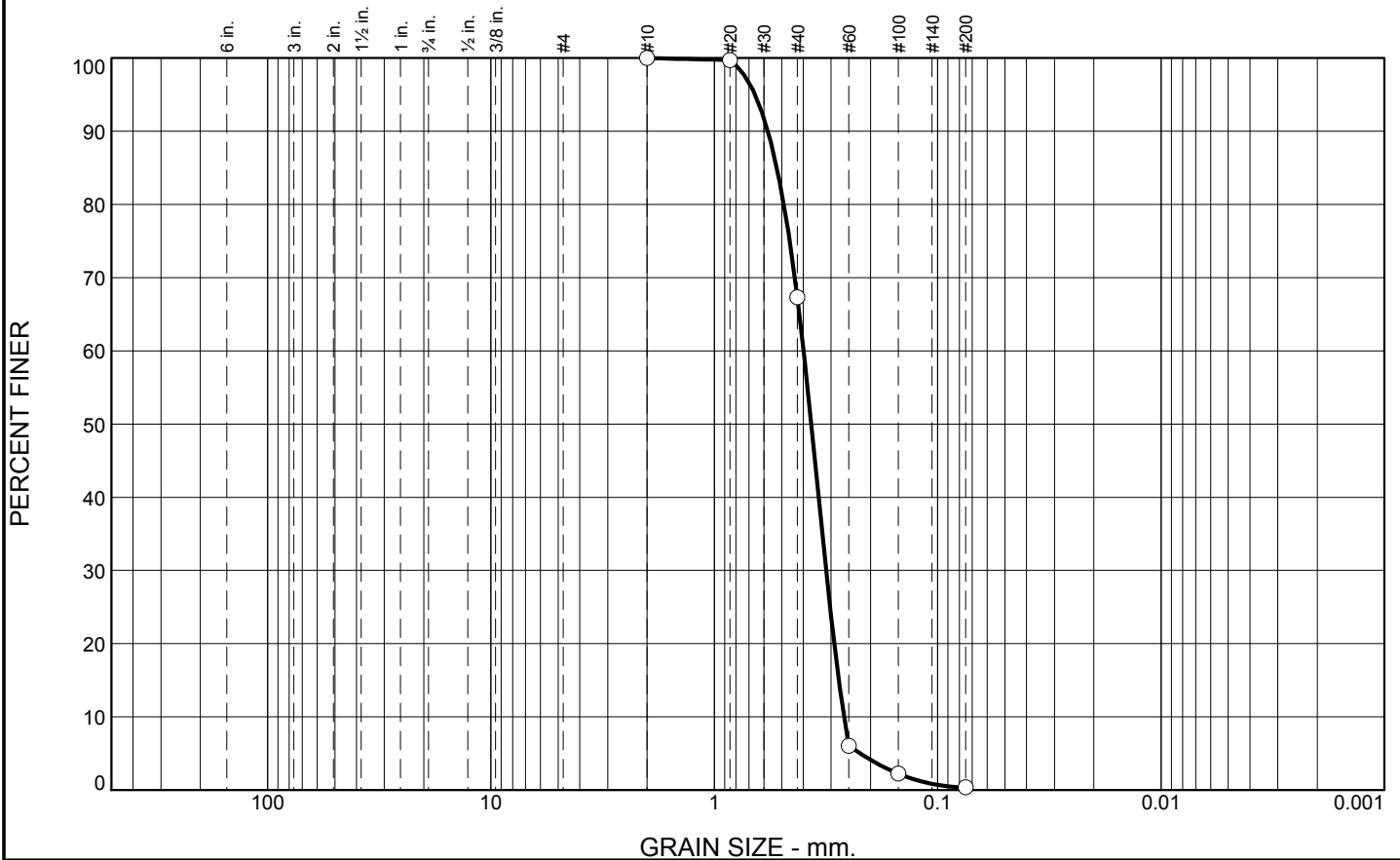


Figure 3.2.3.3 - Sampling locations for 2010 West Ship Island transect.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	32.7	66.9	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.7		
#40	67.3		
#60	6.0		
#100	2.3		
#200	0.4		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5758 D₈₅= 0.5253 D₆₀= 0.3986
D₅₀= 0.3681 D₃₀= 0.3157 D₁₅= 0.2774
D₁₀= 0.2631 C_u= 1.51 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-5-10-10 A
Sample Number: TE Lab ID: 4737.01

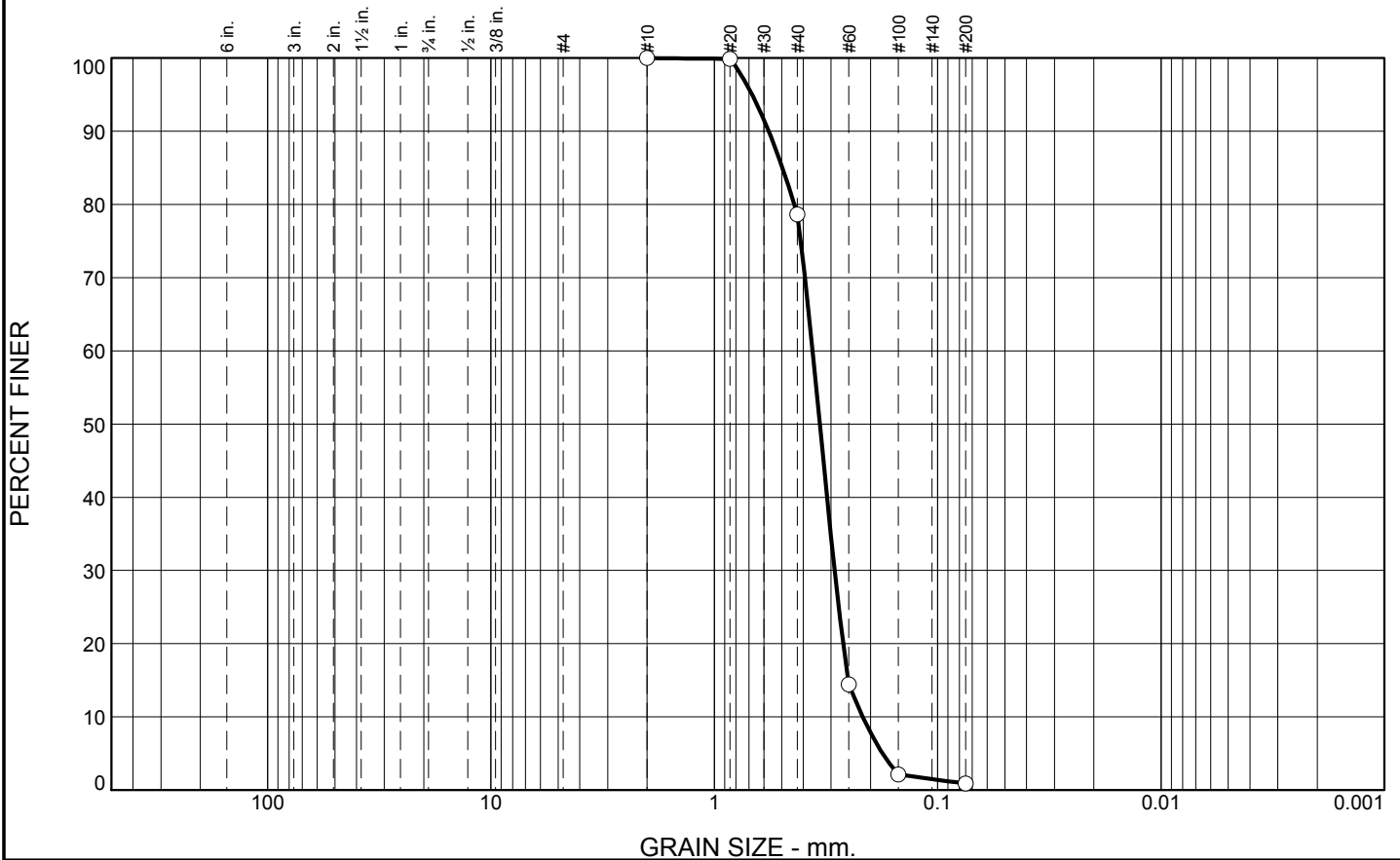
Depth: 0.0 - 1.5 (ft.)

Date: 10/14/10

Thompson Engineering
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	21.4	77.7	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	78.6		
#60	14.5		
#100	2.1		
#200	0.9		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5710 D₈₅= 0.4959 D₆₀= 0.3630
 D₅₀= 0.3369 D₃₀= 0.2896 D₁₅= 0.2516
 D₁₀= 0.2165 C_u= 1.68 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-5-10-10 B
Sample Number: TE Lab ID: 4737.02

Depth: 1.5 - 3.0 (ft.)

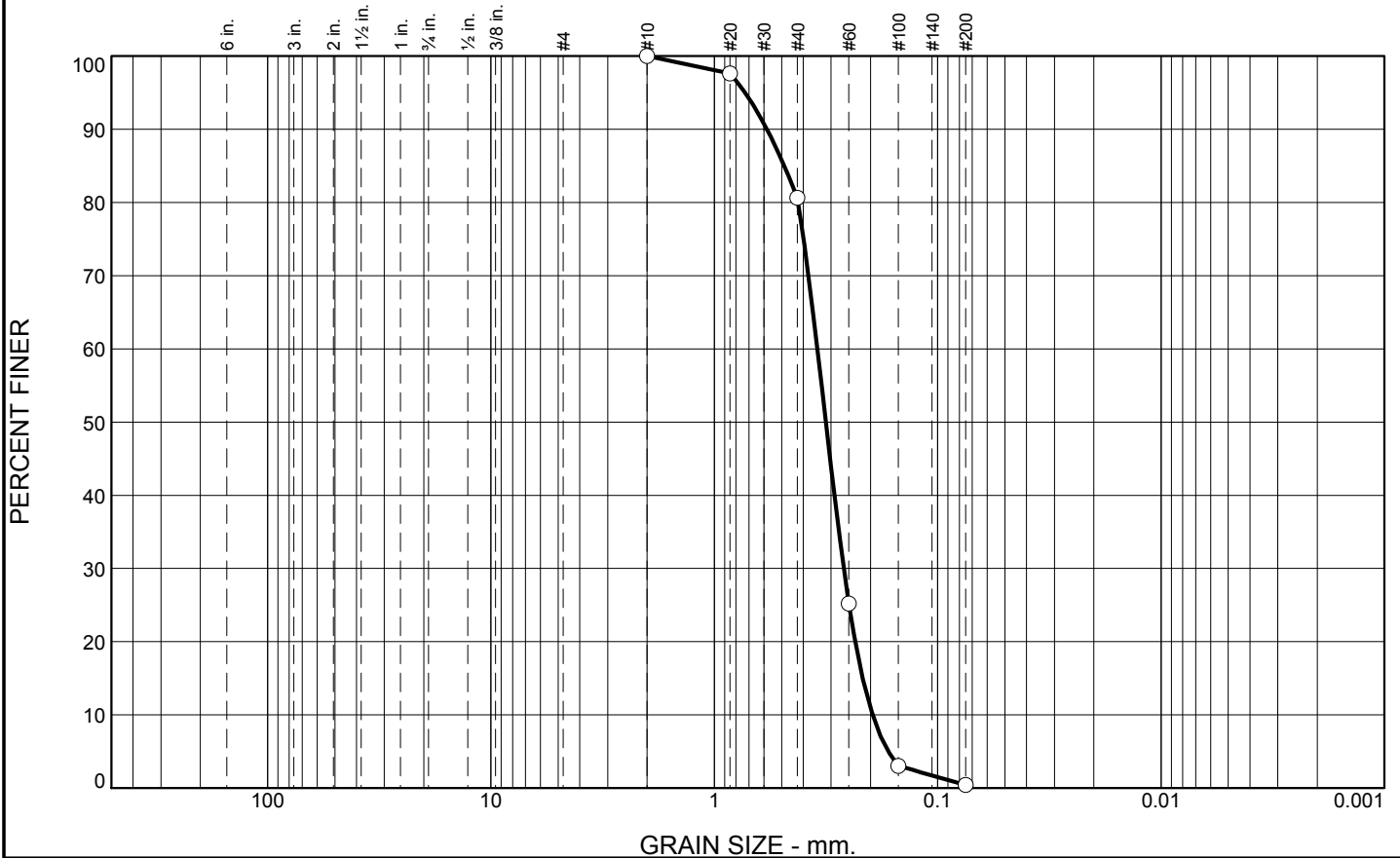
Date: 10/14/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
 Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	19.4	80.2	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	97.6		
#40	80.6		
#60	25.2		
#100	3.0		
#200	0.4		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5820 D₈₅= 0.4866 D₆₀= 0.3457
D₅₀= 0.3168 D₃₀= 0.2634 D₁₅= 0.2167
D₁₀= 0.1956 C_u= 1.77 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-5-10-10 C
Sample Number: TE Lab ID: 4737.03

Depth: 3.0 - 4.5 (ft.)

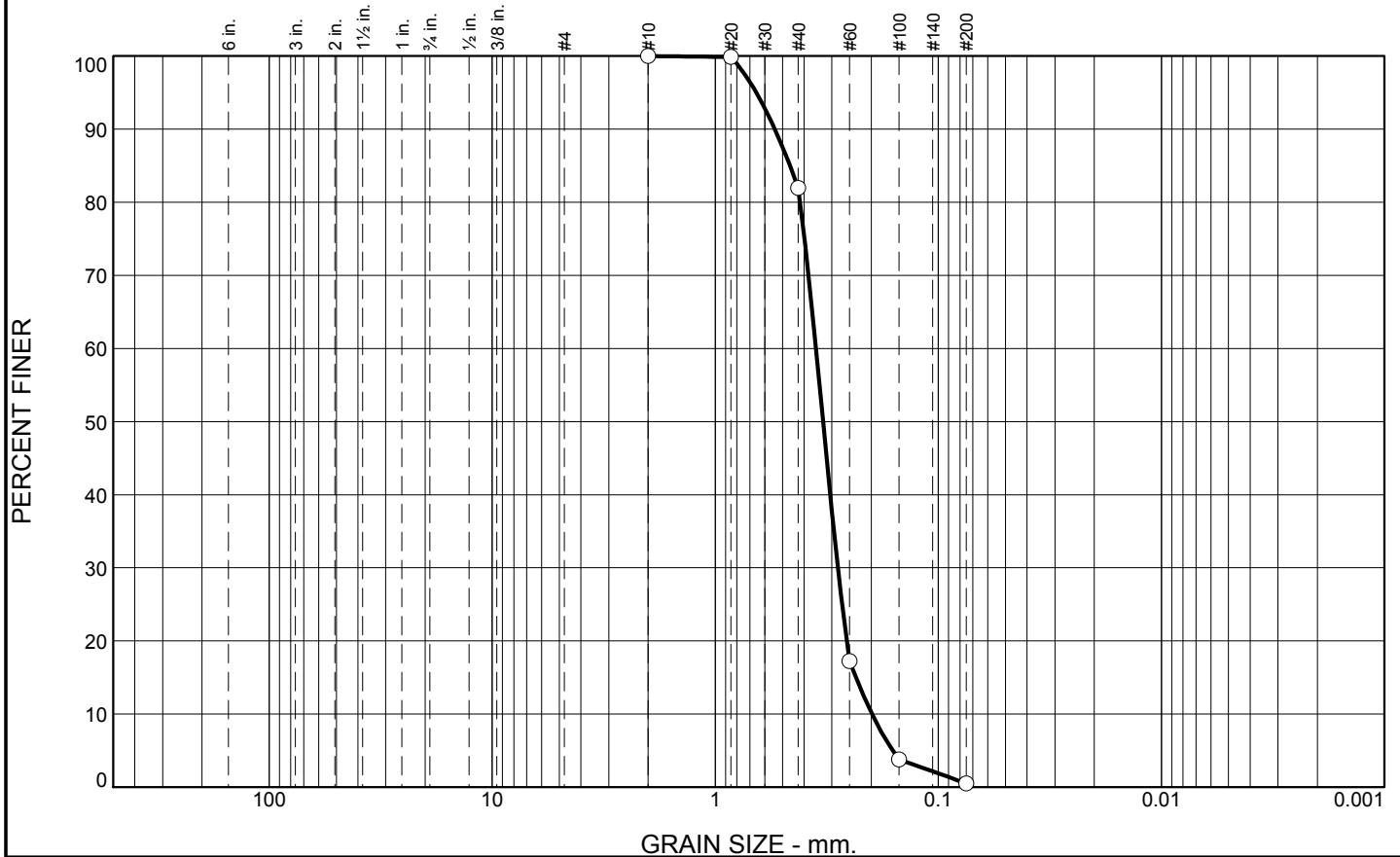
Date: 10/14/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	18.1	81.4	0.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	81.9		
#60	17.3		
#100	3.8		
#200	0.5		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5411 D₈₅= 0.4627 D₆₀= 0.3537
D₅₀= 0.3287 D₃₀= 0.2823 D₁₅= 0.2341
D₁₀= 0.1983 C_u= 1.78 C_c= 1.14

Classification

USCS= SP AASHTO=

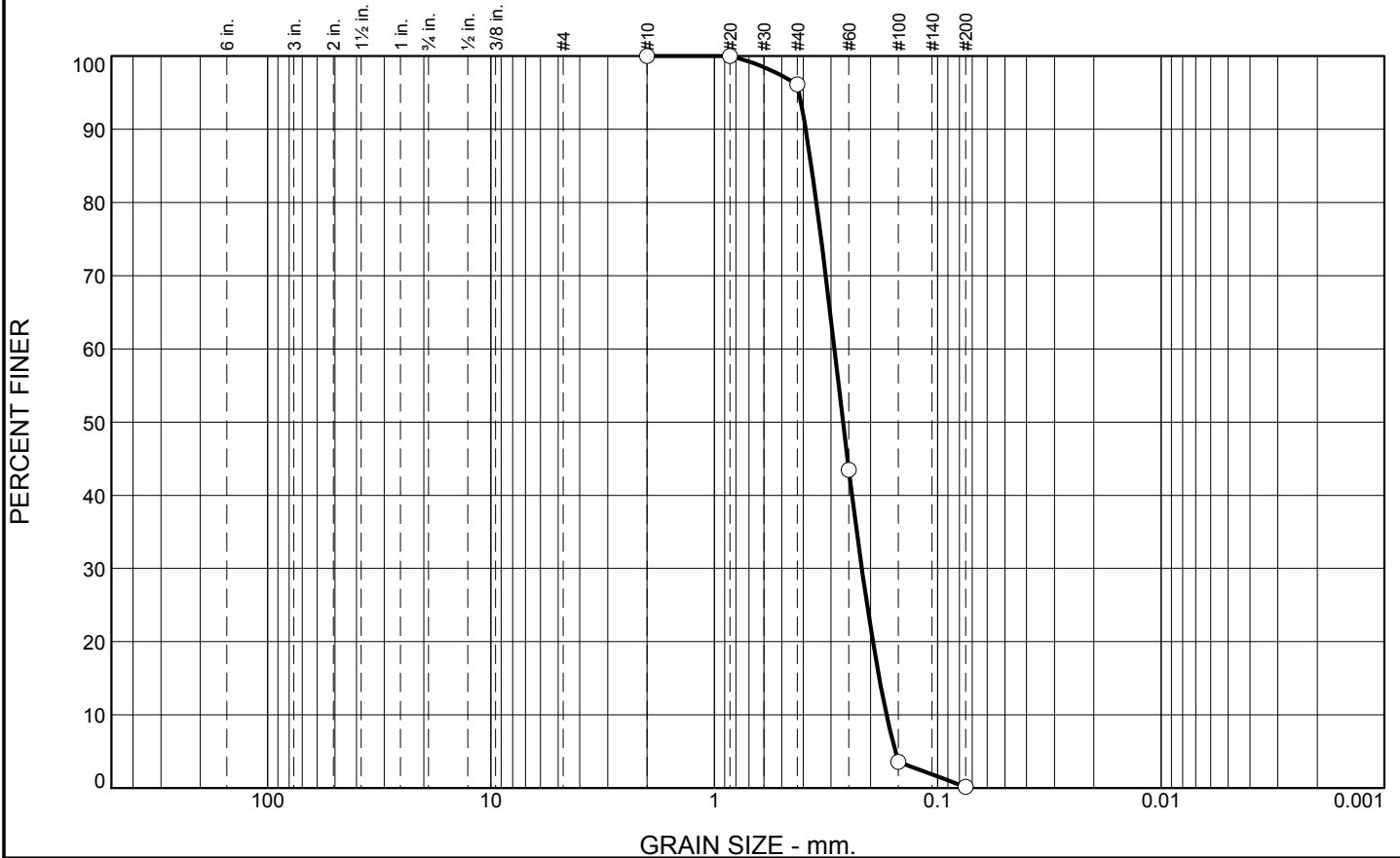
Remarks

* (no specification provided)

Location: USACE Sample # WSI-12-10-10 A **Sample Number:** TE Lab ID: 4737.04 **Depth:** 1.0 - 2.0 (ft.) **Date:** 10/14/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.9	95.9	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	96.1		
#60	43.5		
#100	3.6		
#200	0.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3899 D₈₅= 0.3680 D₆₀= 0.2901
D₅₀= 0.2654 D₃₀= 0.2187 D₁₅= 0.1827
D₁₀= 0.1696 C_u= 1.71 C_c= 0.97

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-12-10-10 B
Sample Number: TE Lab ID: 4737.05

Depth: 2.0 - 3.0 (ft.)

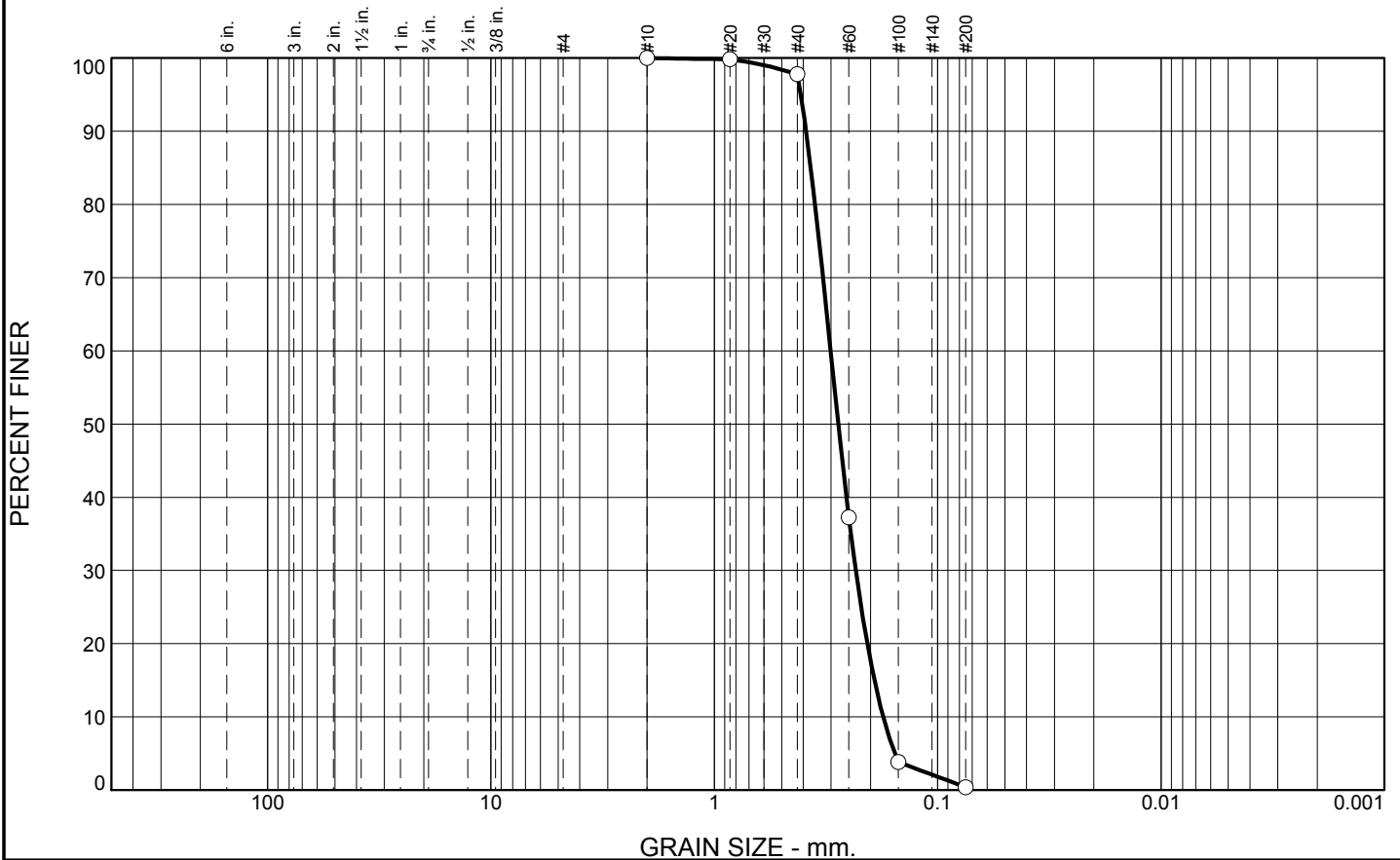
Date: 10/14/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.2	97.4	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.8		
#40	97.8		
#60	37.3		
#100	3.8		
#200	0.4		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D ₉₀ = 0.3882	D ₈₅ = 0.3700	D ₆₀ = 0.3015
D ₅₀ = 0.2786	D ₃₀ = 0.2327	D ₁₅ = 0.1920
D ₁₀ = 0.1755	C _u = 1.72	C _c = 1.02

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-12-10-10 C
Sample Number: TE Lab ID: 4737.06

Depth: 3.0 - 4.0 (ft.)

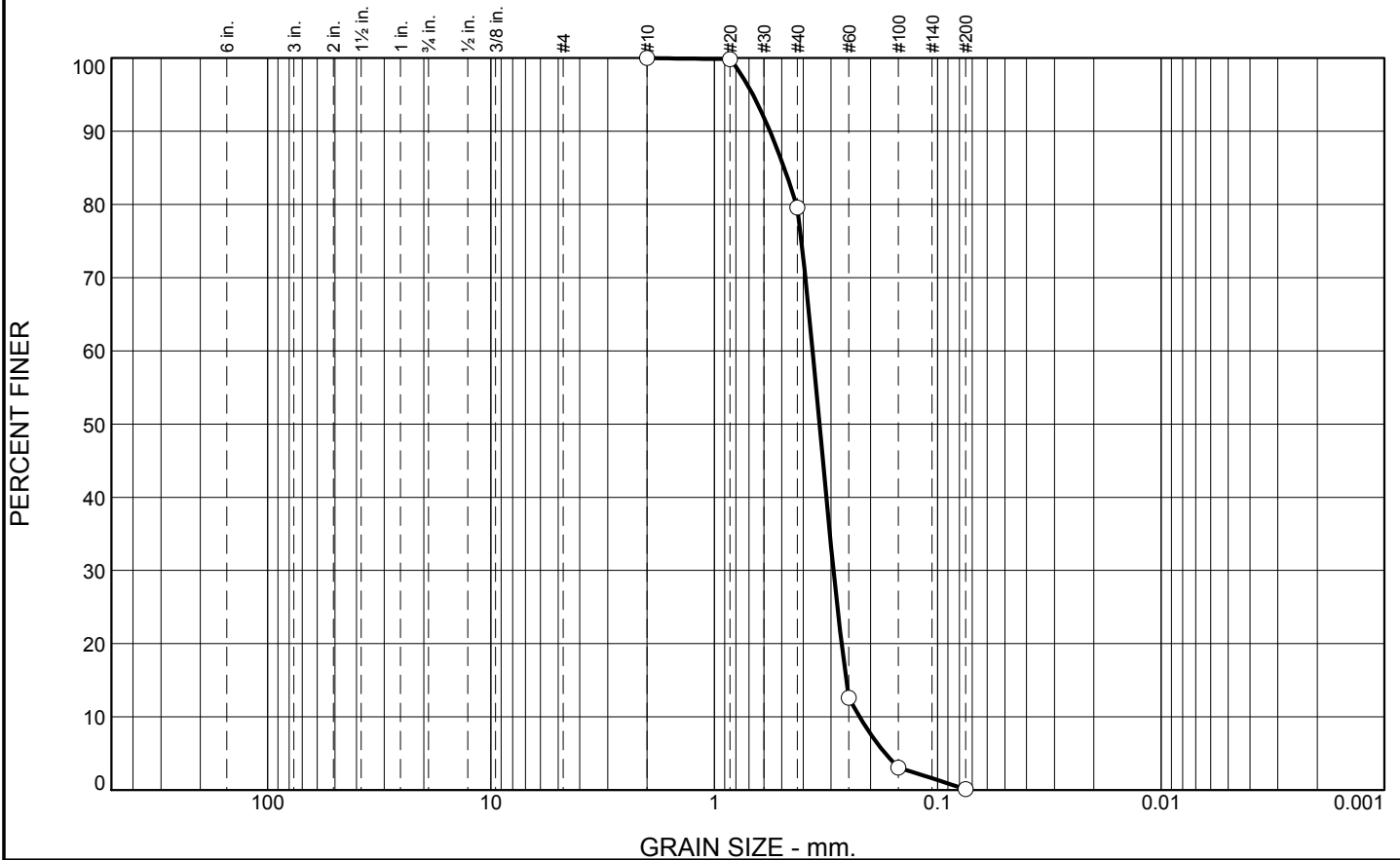
Date: 10/14/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
 Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	20.4	79.5	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	79.6		
#60	12.6		
#100	3.1		
#200	0.1		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5635 D₈₅= 0.4873 D₆₀= 0.3629
D₅₀= 0.3381 D₃₀= 0.2929 D₁₅= 0.2568
D₁₀= 0.2237 C_u= 1.62 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-13-10-10 A
Sample Number: TE Lab ID: 4737.07

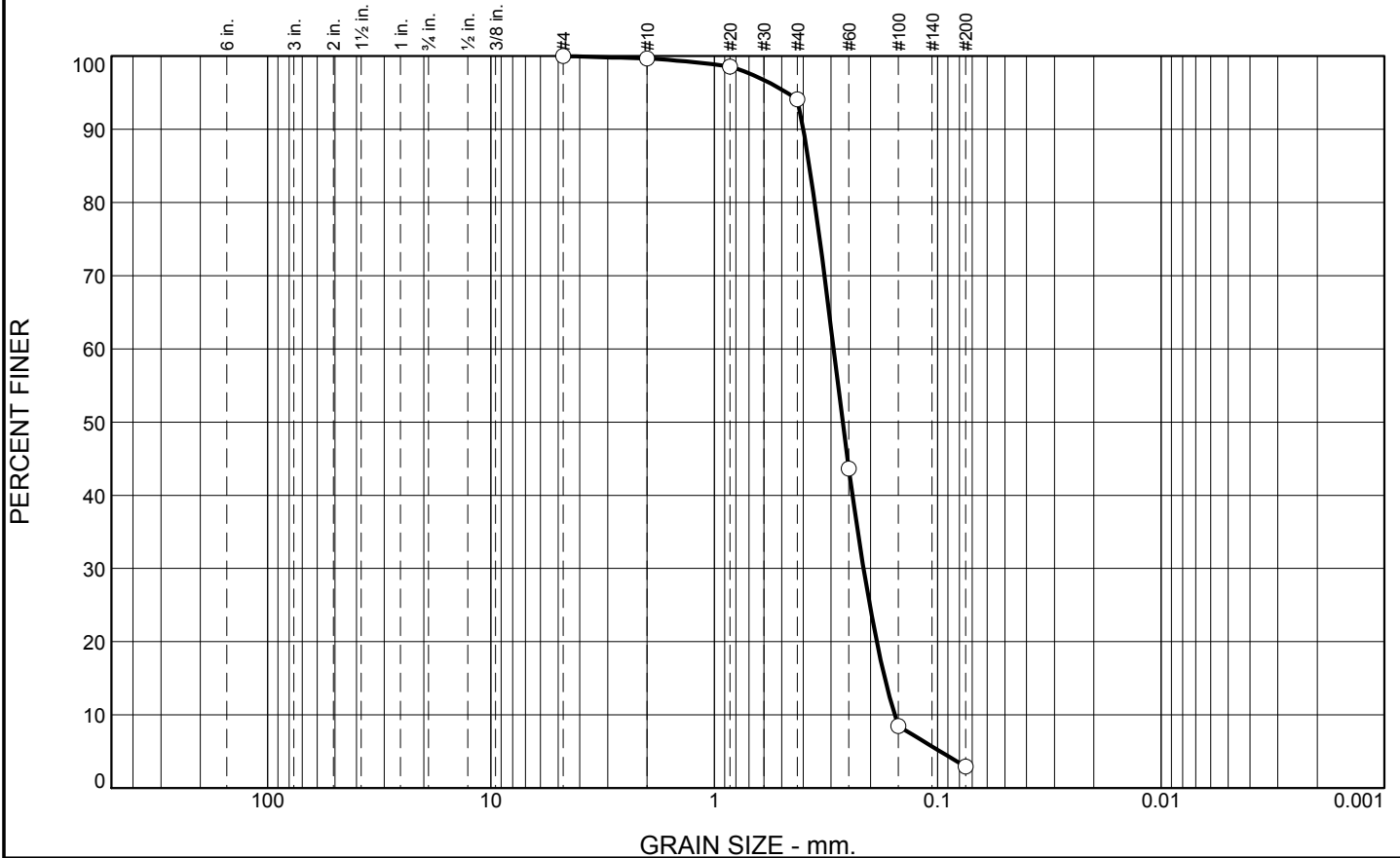
Depth: 1.0 - 2.0 (ft.)

Date: 10/14/10

Thompson Engineering
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	5.6	91.2	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.7		
#20	98.6		
#40	94.1		
#60	43.7		
#100	8.5		
#200	2.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3997 D₈₅= 0.3755 D₆₀= 0.2925
D₅₀= 0.2661 D₃₀= 0.2148 D₁₅= 0.1726
D₁₀= 0.1559 C_u= 1.88 C_c= 1.01

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-13-10-10 B
Sample Number: TE Lab ID: 4737.08

Depth: 2.0 - 3.0 (ft.)

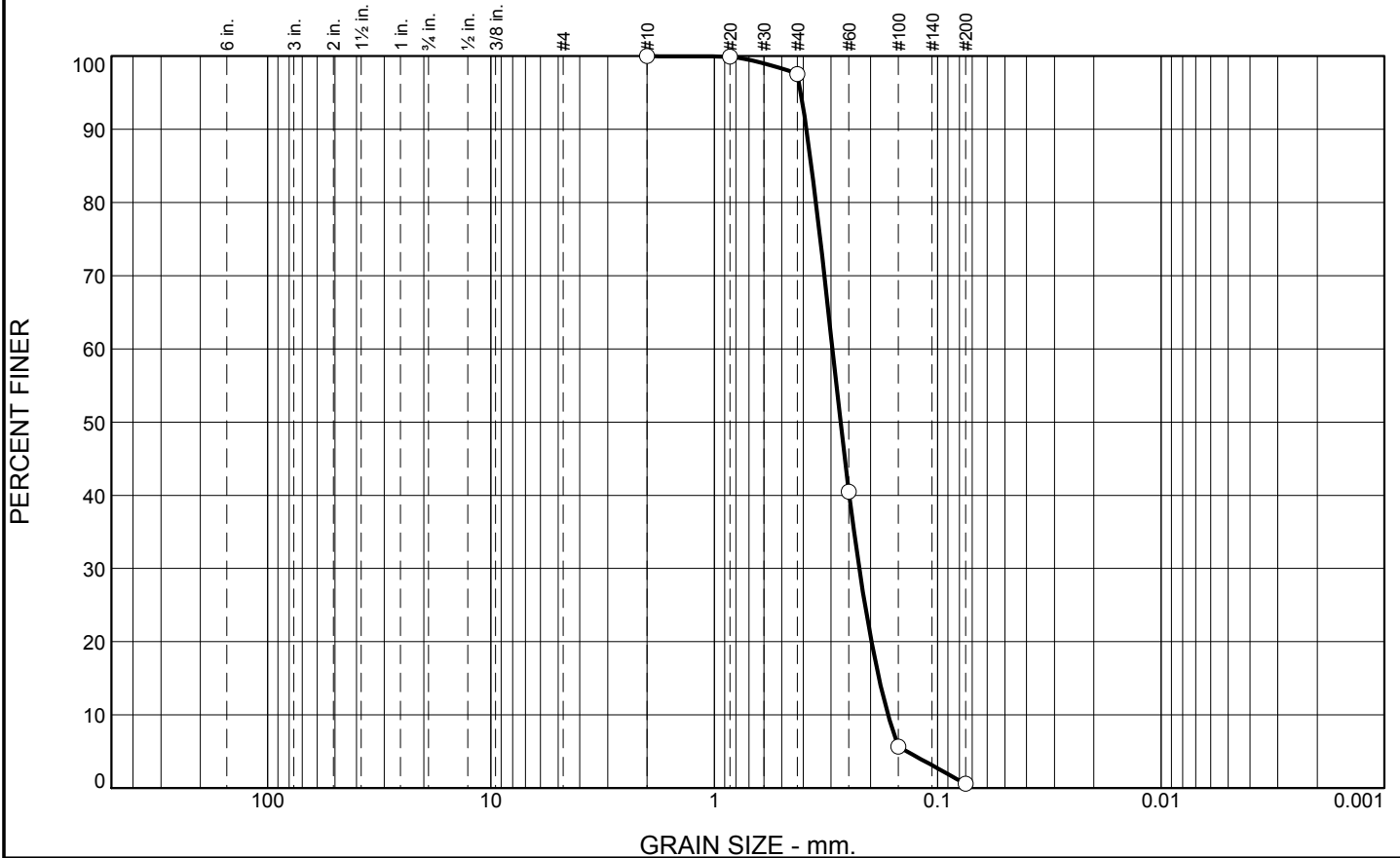
Date: 10/14/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.4	97.0	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	97.6		
#60	40.5		
#100	5.6		
#200	0.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3870 D₈₅= 0.3677 D₆₀= 0.2960
 D₅₀= 0.2722 D₃₀= 0.2245 D₁₅= 0.1833
 D₁₀= 0.1669 C_u= 1.77 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-13-10-10 C
Sample Number: TE Lab ID: 4737.09

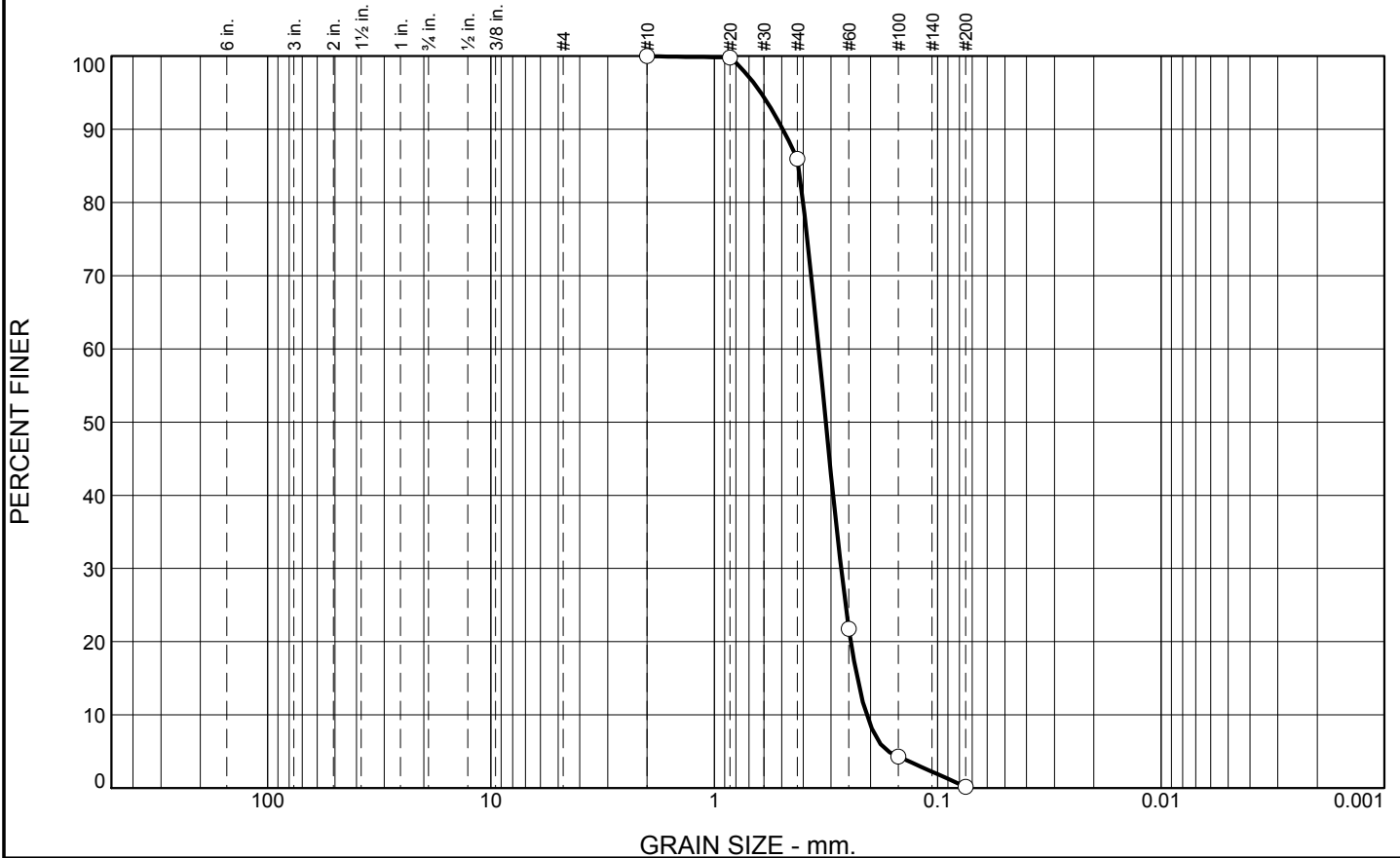
Depth: 3.0 - 4.0 (ft.)

Date: 10/14/10

Thompson Engineering
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
 Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	14.0	85.8	0.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.8		
#40	86.0		
#60	21.7		
#100	4.3		
#200	0.2		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4939 D₈₅= 0.4207 D₆₀= 0.3413
D₅₀= 0.3170 D₃₀= 0.2708 D₁₅= 0.2291
D₁₀= 0.2082 C_u= 1.64 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # WSI-13-10-10 D
Sample Number: TE Lab ID: 4737.10

Depth: 4.0 - 5.0 (ft.)

Date: 10/14/10

Thompson Engineering

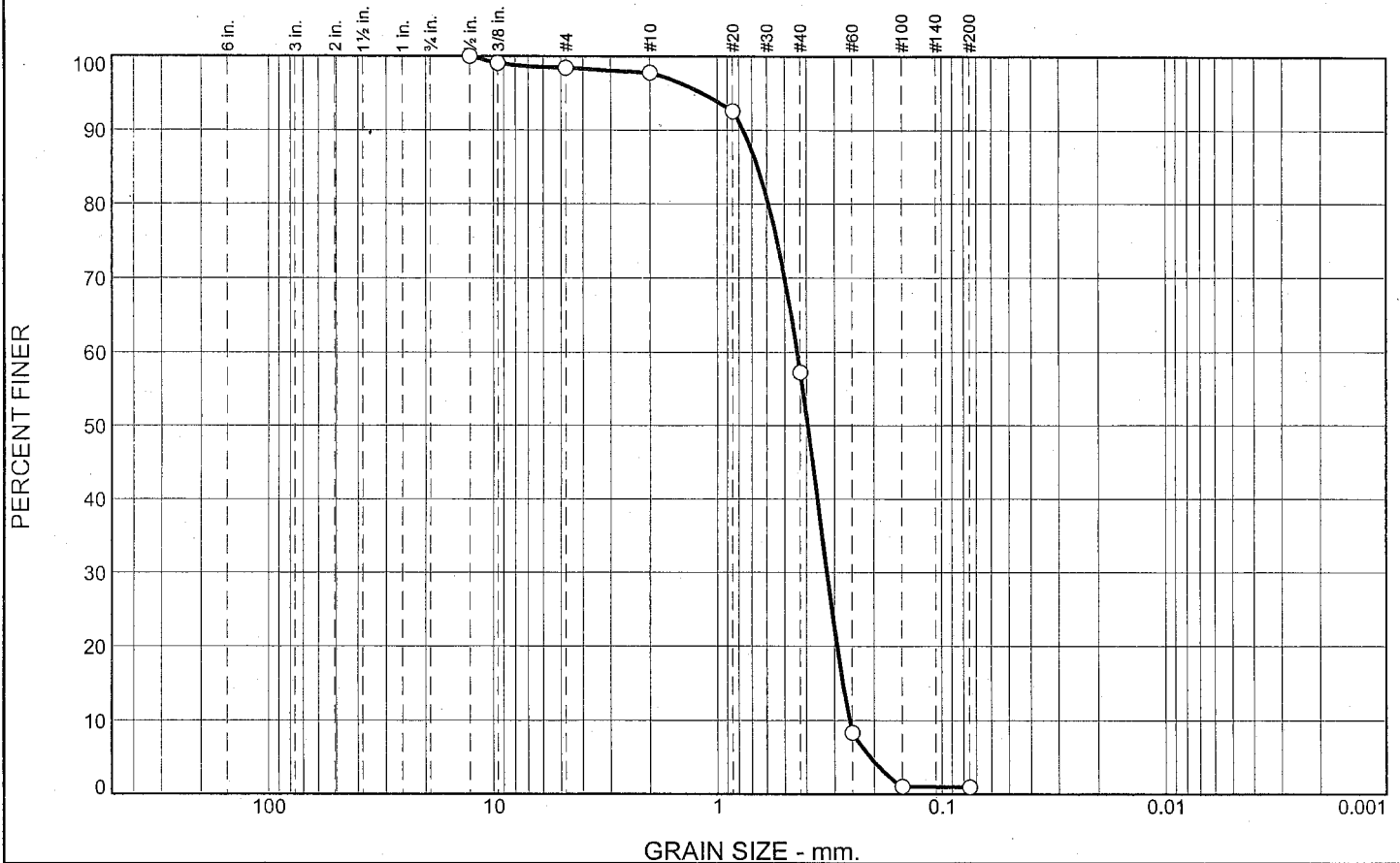
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**



Figure 3.2.4.1 – Grab Sample locations for 2011 DA-10 sampling transect.

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	0.6	40.5	56.3	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.1		
#4	98.4		
#10	97.8		
#20	92.6		
#40	57.3		
#60	8.4		
#100	1.0		
#200	1.0		

Material Description

Medium to fine SAND, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.7646 D₈₅= 0.6592 D₆₀= 0.4383
D₅₀= 0.3937 D₃₀= 0.3238 D₁₅= 0.2751
D₁₀= 0.2567 C_u= 1.71 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

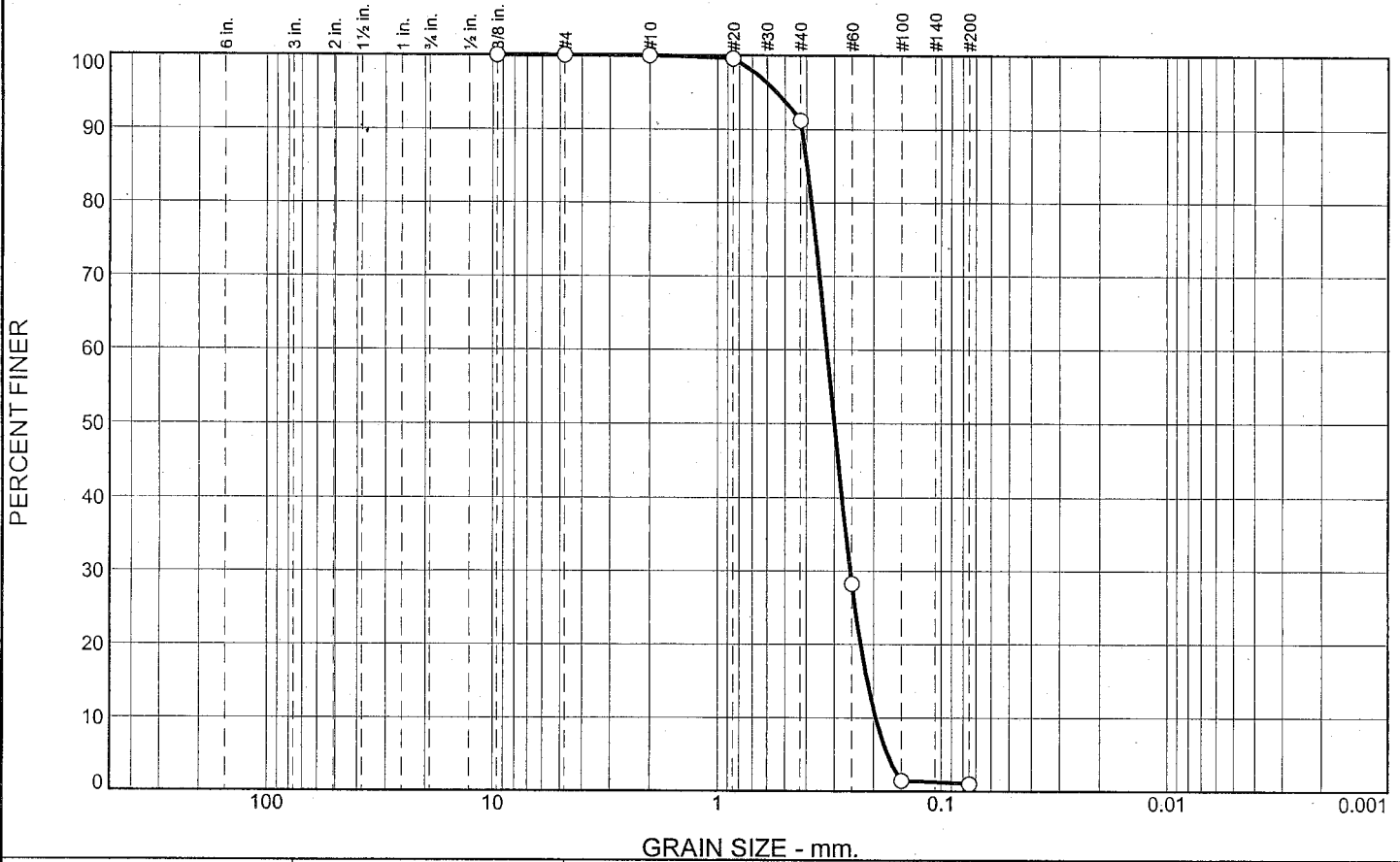
* (no specification provided)

Location: BI-DA-10-15-11
Sample Number: 4981.01

Date: 4/26/11

<p style="font-size: 1.2em; font-weight: bold; margin: 0;">Thompson Engineering</p> <p style="font-size: 1.2em; font-weight: bold; margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	8.8	90.2	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.6		
#40	91.2		
#60	28.2		
#100	1.5		
#200	1.0		

* (no specification provided)

Material Description

Fine SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4188 D₈₅= 0.3974 D₆₀= 0.3233
 D₅₀= 0.2998 D₃₀= 0.2543 D₁₅= 0.2135
 D₁₀= 0.1959 C_u= 1.65 C_c= 1.02

Classification

USCS= SP AASHTO=

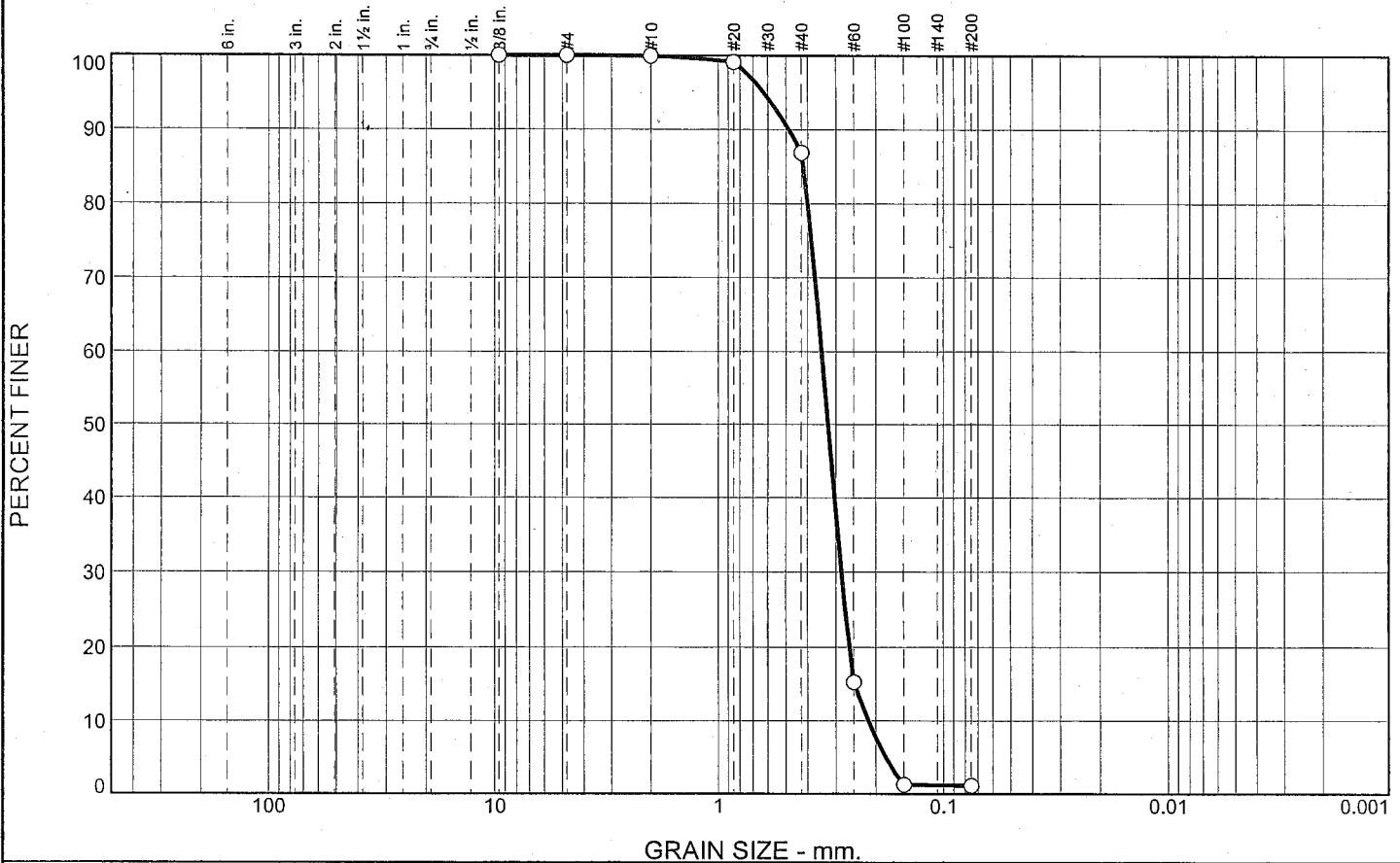
Remarks

Location: BI-DA-10-16-11
 Sample Number: 4981.02

Date: 4/26/11

<p style="font-size: 1.2em; font-weight: bold;">Thompson Engineering</p> <p style="font-size: 1.2em; font-weight: bold;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
----------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	13.0	85.7	1.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.1		
#40	86.9		
#60	15.3		
#100	1.3		
#200	1.2		

* (no specification provided)

Material Description

Medium to fine SAND

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4850 D₈₅= 0.4175 D₆₀= 0.3465
D₅₀= 0.3244 D₃₀= 0.2831 D₁₅= 0.2482
D₁₀= 0.2156 C_u= 1.61 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

Location: BI-DA-10-17-11
Sample Number: 4981.03

Date: 4/26/11

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

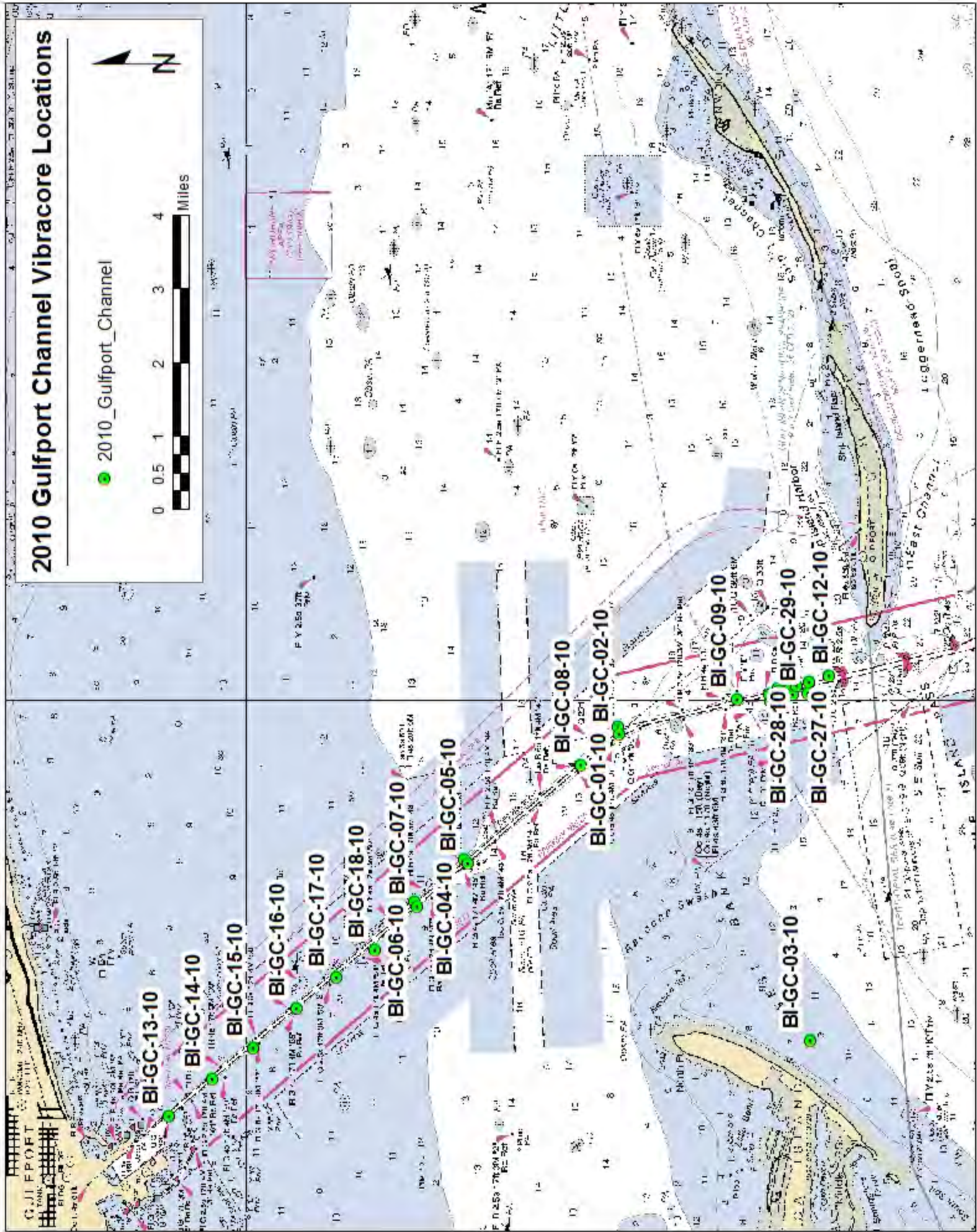
Appendix B

Gulfport Channel Vibracores and Lab Results

This page was intentionally left blank for duplex printing.

2010 Gulfport Channel Vibracore Locations

● 2010_Gulfport_Channel



This page was intentionally left blank for duplex printing.

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10 ² *D60)	
BI-GC-1-10	GULFPORT CHANNEL	2010	6/22/2010	7:50 AM	30.26019	-89.00484	276494.27800	930103.49220	20-ft Vibracore	22.0	15.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-2-10	GULFPORT CHANNEL	2010	5/7/2010	1:17 PM	30.25991	-89.00628	276393.13470	929648.71310	20-ft Vibracore	40.0	20.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-3-10	GULFPORT CHANNEL	2010	5/21/2010	1:20 PM	30.27306	-89.01620	281180.50470	926524.54120	20-ft Vibracore	22.0	19.1																		
BI-GC-3-10A	GULFPORT CHANNEL	2010	5/21/2010	1:20 PM	30.27306	-89.01620	281180.50470	926524.54120	20-ft Vibracore	22.0	19.1	15.0 - 17.0	2.0	SM	SM	CLAY FINES	DK GRAYISH BROWN	10YR 4/2	4	BROWN	10YR 5/3	5	NO	0.11	#VALUE!	18.1	#VALUE!	#VALUE!	
BI-GC-3-10B	GULFPORT CHANNEL	2010	5/21/2010	1:20 PM	30.27306	-89.01620	281180.50470	926524.54120	20-ft Vibracore	22.0	19.1	17.0 - 19.0	2.0	SM	SM	SUBANGULAR TO ROUNDED	DK GRAYISH BROWN	2.5Y 4/2	4	DK GRAYISH BROWN	10YR 4/2	4	NO	0.10	#VALUE!	17.3	#VALUE!	#VALUE!	
BI-GC-4-10	GULFPORT CHANNEL	2010	6/22/2010	8:20 AM	30.29052	-89.03094	287538.26620	921882.60490	20-ft Vibracore	18.0	19.1	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-5-10	GULFPORT CHANNEL	2010	5/7/2010	2:50 PM	30.28971	-89.03165	287244.07000	921658.00440	20-ft Vibracore	36.0	17.8	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-6-10	GULFPORT CHANNEL	2010	6/22/2010	8:40 AM	30.30010	-89.03927	291027.06470	919259.85360	20-ft Vibracore	17.0	18.5	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-7-10	GULFPORT CHANNEL	2010	5/7/2010	4:10 PM	30.29972	-89.04005	290889.31040	919013.44670	20-ft Vibracore	36.0	19.5	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-8-10	GULFPORT CHANNEL	2010	5/7/2010	2:00 PM	30.26748	-89.01228	279149.16680	927758.77330	20-ft Vibracore	35.0	19.2																		
BI-GC-8-10A	GULFPORT CHANNEL	2010	5/7/2010	2:00 PM	30.26748	-89.01228	279149.16680	927758.77330	20-ft Vibracore	35.0	19.2	10.4 - 15.4	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	WHITE	WHITE PAGE 2.5Y/8	8	LT GRAY	10YR 7/1	7	NO	0.24	0.25	5.2	1.8	1.0	
BI-GC-8-10B	GULFPORT CHANNEL	2010	5/7/2010	2:00 PM	30.26748	-89.01228	279149.16680	927758.77330	20-ft Vibracore	35.0	19.2	15.4 - 19.2	3.8	SP	SP	SUBANGULAR TO ROUNDED	WHITE	WHITE PAGE 2.5Y/8.5	9	WHITE	WHITE PAGE 10YR 9/1	9	NO	0.29	0.29	1.7	1.7	1.1	
BI-GC-9-10	GULFPORT CHANNEL	2010	5/5/2010	9:45 AM	30.23676	-88.99945	267970.61810	931792.73060	20-ft Vibracore	19.5	19.5																		
BI-GC-9-10A	GULFPORT CHANNEL	2010	5/5/2010	9:45 AM	30.23676	-88.99945	267970.61810	931792.73060	20-ft Vibracore	19.5	19.5	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	2.5Y 6/1	6	NO	0.19	0.20	2.9	1.9	1.0	
BI-GC-9-10B	GULFPORT CHANNEL	2010	5/5/2010	9:45 AM	30.23676	-88.99945	267970.61810	931792.73060	20-ft Vibracore	19.5	19.5	5.0 - 9.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LT. GRAY	5Y 7/1	7	NO	0.16	0.16	7.7	2.2	1.1	
BI-GC-9-10C	GULFPORT CHANNEL	2010	5/5/2010	9:45 AM	30.23676	-88.99945	267970.61810	931792.73060	20-ft Vibracore	19.5	19.5	9.1 - 10.0	0.9	CL	CL	SUBANGULAR TO ROUNDED	DK GRAY	5Y 4/1	4	GRAY	5Y 5/1	5	YES	0.00	#VALUE!	58.8	#VALUE!	#VALUE!	
BI-GC-9-10D	GULFPORT CHANNEL	2010	5/5/2010	9:45 AM	30.23676	-88.99945	267970.61810	931792.73060	20-ft Vibracore	19.5	19.5	10.0 - 14.0	4.0	SM	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	5Y 6/1	6	YES	0.15	0.15	7.3	2.1	1.0	
BI-GC-10-10	GULFPORT CHANNEL	2010	5/5/2010	11:00 AM	30.23017	-88.99987	265574.13500	931656.59270	20-ft Vibracore	18.5	15.0																		
BI-GC-10-10A	GULFPORT CHANNEL	2010	5/5/2010	11:00 AM	30.23017	-88.99987	265574.13500	931656.59270	20-ft Vibracore	18.5	15.0	0.0 - 4.3	4.3	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	5Y 6/1	6	NO	0.18	0.19	7.0	1.8	1.1	
BI-GC-10-10B	GULFPORT CHANNEL	2010	5/5/2010	11:00 AM	30.23017	-88.99987	265574.13500	931656.59270	20-ft Vibracore	18.5	15.0	5.8 - 11.8	6.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT. GRAY	5Y 7/1	7	NO	0.19	0.19	4.8	2.3	1.4	
BI-GC-11-10	GULFPORT CHANNEL	2010	5/5/2010	12:22 PM	30.22261	-88.99595	262822.89760	932890.62850	20-ft Vibracore	21.0	19.5																		
BI-GC-11-10A	GULFPORT CHANNEL	2010	5/5/2010	12:22 PM	30.22261	-88.99595	262822.89760	932890.62850	20-ft Vibracore	21.0	19.5	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT. GRAY	5Y 7/1	7	NO	0.21	0.22	1.9	1.6	1.0	
BI-GC-11-10B	GULFPORT CHANNEL	2010	5/5/2010	12:22 PM	30.22261	-88.99595	262822.89760	932890.62850	20-ft Vibracore	21.0	19.5	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5.5/1	6	LT. GRAY	5Y 7.5/1	8	NO	0.19	0.19	2.0	1.9	1.3	
BI-GC-11-10C	GULFPORT CHANNEL	2010	5/5/2010	12:22 PM	30.22261	-88.99595	262822.89760	932890.62850	20-ft Vibracore	21.0	19.5	10.0 - 15.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LT. GRAY	5Y 7/1	7	NO	0.19	0.20	2.3	1.8	1.2	
BI-GC-12-10	GULFPORT CHANNEL	2010	5/5/2010	1:43 PM	30.21882	-88.99483	261444.03480	933242.40410	20-ft Vibracore	23.0	15.0																		
BI-GC-12-10-A	GULFPORT CHANNEL	2010	5/5/2010	1:43 PM	30.21882	-88.99483	261444.03480	933242.40410	20-ft Vibracore	23.0	15.0	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT. GRAY	2.5Y 7/1	7	NO	0.23	0.28	3.7	1.8	1.0	
BI-GC-12-10B	GULFPORT CHANNEL	2010	5/5/2010	1:43 PM	30.21882	-88.99483	261444.03480	933242.40410	20-ft Vibracore	23.0	15.0	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	5Y 6.5/1	7	NO	0.17	0.18	3.6	1.9	1.1	
BI-GC-12-10C	GULFPORT CHANNEL	2010	5/5/2010	1:43 PM	30.21882	-88.99483	261444.03480	933242.40410	20-ft Vibracore	23.0	15.0	10.0 - 14.0	4.0	SP-SM	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	GRAY	2.5Y 6.5/1	7	NO	0.19	0.18	6.8	2.3	1.5	
BI-GC-13-10	GULFPORT CHANNEL	2010	5/7/2010	10:07 AM	30.34838	-89.08134	308612.54710	906021.60640	20-ft Vibracore	34.0	18.3	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-14-10	GULFPORT CHANNEL	2010	5/7/2010	9:25 AM	30.33999	-89.07405	305556.22550	908314.61120	20-ft Vibracore	35.0	15.8	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-15-10	GULFPORT CHANNEL	2010	5/7/2010	8:25 AM	30.33186	-89.06784	302595.31920	910267.48270	20-ft Vibracore	23.0	17.5	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-16-10	GULFPORT CHANNEL	2010	5/7/2010	11:47 AM	30.32342	-89.06004	299520.77570	912722.11210	20-ft Vibracore	36.0	20.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-17-10	GULFPORT CHANNEL	2010	5/8/2010	9:06 AM	30.31556	-89.05412	296658.49550	914584.36640	20-ft Vibracore	24.0	13.2																		
BI-GC-17-10 (CLAY LENS)	GULFPORT CHANNEL	2010	5/8/2010	9:06 AM	30.31556	-89.05412	296658.49550	914584.36640	20-ft Vibracore	24.0	13.2	0.0-10.7	10.7	CL	Not Tested	CLAY FINES	VERY DK GREEN GRAY	GLEY1 3/5GY	3	VERY DK GREEN GRAY	GLEY1 3/5GY	3							
BI-GC-17-10A	GULFPORT CHANNEL	2010	5/8/2010	9:06 AM	30.31556	-89.05412	296658.49550	914584.36640	20-ft Vibracore	24.0	13.2	10.7 - 13.2	2.5	SM	SP-SM	SUBANGULAR TO ROUNDED	GRAY	10YR 5/1	5	GRAY	10YR 5/1	5	NO	0.13	0.13	9.4	1.9	0.9	
BI-GC-18-10	GULFPORT CHANNEL	2010	5/8/2010	8:24 AM	30.30768	-89.04685	293788.23980	916872.91160	20-ft Vibracore	36.0	20.0																		
BI-GC-18-10A	GULFPORT CHANNEL	2010	5/8/2010	8:24 AM	30.30768	-89.04685	293788.23980	916872.91160	20-ft Vibracore	36.0	20.0	13.8 - 19.0	5.2	SP	SP-SM	SUBANGULAR TO ROUNDED	DK GRAY	10YR 4/1	4	GRAY	10YR 6/1	6	NO	0.19	0.19	5.5	2.3	1.4	
BI-GC-19-10	GULFPORT CHANNEL	2010	5/21/2010	9:15 AM	30.22645	-88.99714	264219.98070	932516.79910	20-ft Vibracore	21.5	19.5																		
BI-GC-19-10A	GULFPORT CHANNEL	2010	5/21/2010	9:15 AM	30.22645	-88.99714	264219.98070	932516.79910	20-ft Vibracore	21.5	19.5	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	LT BROWNISH GRAY	2.5Y 6/2	6	LT GRAY	2.5Y 7/2	7	NO	0.27	0.28	2.8	2.2	1.0	
BI-GC-19-10B	GULFPORT CHANNEL	2010	5/21/2010	9:15 AM	30.22645	-88.99714	264219.98070	932516.79910	20-ft Vibracore	21.5	19.5	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 6/1	6	LT GRAY	2.5Y 7/1	7	NO	0.28	0.28	2.3	2.6	1.2	
BI-GC-19-10C	GULFPORT CHANNEL	2010	5/21/2010	9:15 AM	30.22645	-88.99714	264219.98070	932516.79910	20-ft Vibracore	21.5	19.5	10.0 - 15.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 6/1	6	LT GRAY	2.5Y 7.5/1	8	NO	0.30	0.31	2.4	2.1	1.1	
BI-GC-19-10D	GULFPORT CHANNEL	2010	5/21/2010	9:15 AM	30.22645	-88.99714	264219.98070	932516.79910	20-ft Vibracore	21.5	19.5	15.0 - 19.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	2.5Y 7/1	7	NO	0.25	0.25	3.6	2.7	1.2	
BI-GC-20-10	GULFPORT CHANNEL	2010	6/1/2010	12:00 PM	30.22853	-88.99733	264976.52890	932457.88350	20-ft Vibracore	20.0	19.5																		
BI-GC-20-10A	GULFPORT CHANNEL	2010	6/1/2010	12:00 PM	30.22853	-88.99733	264976.52890	932457.88350	20-ft Vibracore	20.0	19.5	5.0-9.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LT GRAY	2.5Y 7/2	7	NO	0.18	0.19	8.4	2.5	1.1	
BI-GC-20-10B	GULFPORT CHANNEL	2010	6/1/2010	12:00 PM	30.22853	-88.99733	264976.52890	932457.88350	20-ft Vibracore	20.0	19.5	9.0-13.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LT GRAY	2.5Y 7/2	7	NO	0.17	0.19	3.6	2.3	1.0	
BI-GC-21-10	GULFPORT CHANNEL	2010	6/1/2010	11:26 AM	30.22879	-88.99724	265071.04570	932486																					

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10*P60)	
BI-GC-24-10	GULFPORT CHANNEL	2010	6/10/2010	12:45 PM	30.22847	-88.99781	264954.92660	932306.26200	20-ft Vibracore	34.0	13.6																		
BI-GC-24-10A	GULFPORT CHANNEL	2010	6/10/2010	12:45 PM	30.22847	-88.99781	264954.92660	932306.26200	20-ft Vibracore	34.0	13.6	5.4-9.5	4.1	SM	SM	CLAY FINES	DK GRAY	2.5Y 5.5/1	4	GRAYISH BROWN	2.5Y 5.5/2	6	NO	0.12	#VALUE!	18.8	#VALUE!	#VALUE!	
BI-GC-25-10	GULFPORT CHANNEL	2010	6/10/2010	1:40 PM	30.22733	-88.99844	264540.61550	932106.69860	20-ft Vibracore	19.0	19.9																		
BI-GC-25-10A	GULFPORT CHANNEL	2010	6/10/2010	1:40 PM	30.22733	-88.99844	264540.61550	932106.69860	20-ft Vibracore	19.0	19.9	4.4-10.0	5.6	SM	SM	SUBANGULAR TO ROUNDED	DK GRAY	5Y 4/1	4	LT BROWNISH GRAY	2.5Y 6/2	6	YES	0.14	0.14	14.7	#VALUE!	#VALUE!	
BI-GC-25-10B	GULFPORT CHANNEL	2010	6/10/2010	1:40 PM	30.22733	-88.99844	264540.61550	932106.69860	20-ft Vibracore	19.0	19.9	10.0-16.0	6.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	2.5Y 7/1	7	YES	0.19	0.19	3.7	1.8	1.1	
BI-GC-26-10	GULFPORT CHANNEL	2010	6/10/2010	1:15 PM	30.22664	-88.99749	264289.23980	932406.36210	20-ft Vibracore	43.0	16.3	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-GC-27-10	GULFPORT CHANNEL	2010	6/11/2010	10:20 AM	30.22578	-88.99845	263976.91060	932102.72260	20-ft Vibracore	21.0	16.9																		
BI-GC-27-10A	GULFPORT CHANNEL	2010	6/11/2010	10:20 AM	30.22578	-88.99845	263976.91060	932102.72260	20-ft Vibracore	21.0	16.9	0.0 - 6.0	6.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	2.5Y 7/1	7	NO	0.24	0.28	3.1	2.5	1.1	
BI-GC-27-10B	GULFPORT CHANNEL	2010	6/11/2010	10:20 AM	30.22578	-88.99845	263976.91060	932102.72260	20-ft Vibracore	21.0	16.9	6.0 - 11.8	5.8	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	5Y 7/1	7	NO	0.25	0.27	5.5	2.3	1.0	
BI-GC-28-10	GULFPORT CHANNEL	2010	6/11/2010	9:50 AM	30.22504	-88.99672	263706.99640	932648.70700	20-ft Vibracore	20.0	19.3																		
BI-GC-28-10A	GULFPORT CHANNEL	2010	6/11/2010	9:50 AM	30.22504	-88.99672	263706.99640	932648.70700	20-ft Vibracore	20.0	19.3	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	2.5Y 7/1	7	YES	0.25	0.26	2.3	2.0	1.0	
BI-GC-28-10B	GULFPORT CHANNEL	2010	6/11/2010	9:50 AM	30.22504	-88.99672	263706.99640	932648.70700	20-ft Vibracore	20.0	19.3	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	5Y 7/1	7	YES	0.22	0.23	1.5	2.1	1.2	
BI-GC-28-10C	GULFPORT CHANNEL	2010	6/11/2010	9:50 AM	30.22504	-88.99672	263706.99640	932648.70700	20-ft Vibracore	20.0	19.3	10.0 - 15.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LT GRAY	2.5Y 7/1	7	YES	0.24	0.27	8.4	2.5	1.3	
BI-GC-28-10D	GULFPORT CHANNEL	2010	6/11/2010	9:50 AM	30.22504	-88.99672	263706.99640	932648.70700	20-ft Vibracore	20.0	19.3	15.0 - 19.3	4.3	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 6.5/1	7	LT GRAY	2.5Y 7/1	7	NO	0.20	0.21	6.4	2.3	1.4	
BI-GC-29-10	GULFPORT CHANNEL	2010	6/11/2010	9:10 AM	30.22294	-88.99812	262943.89870	932205.44820	20-ft Vibracore	21.0	19.7																		
BI-GC-29-10A	GULFPORT CHANNEL	2010	6/11/2010	9:10 AM	30.22294	-88.99812	262943.89870	932205.44820	20-ft Vibracore	21.0	19.7	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 6/1	6	LT GRAY	5Y 7/1	7	YES	0.22	0.24	2.3	1.7	1.0	
BI-GC-29-10B	GULFPORT CHANNEL	2010	6/11/2010	9:10 AM	30.22294	-88.99812	262943.89870	932205.44820	20-ft Vibracore	21.0	19.7	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	5Y 7/1	7	YES	0.21	0.22	1.7	1.9	1.1	
BI-GC-29-10C	GULFPORT CHANNEL	2010	6/11/2010	9:10 AM	30.22294	-88.99812	262943.89870	932205.44820	20-ft Vibracore	21.0	19.7	10.0 - 15.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5.5/1	6	LT GRAY	2.5Y 7/1	7	NO	0.21	0.22	6.9	2.0	1.3	

Cu: Coefficient of Uniformity

Cc: Coefficient of Curvature

The "#Value!" error message indicates that data was not available for that calculation.

Boring Designation BI-GC-01-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District		SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-01-10		LOCATION COORDINATES E = 930,103 N = 276,494		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83 VERTICAL NAVD88
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
4. NAME OF DRILLER Construction Solutions International, Inc.			12. TOTAL SAMPLES		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	DISTURBED 0	UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		13. TOTAL NUMBER CORE BOXES		14. WATER DEPTH 22 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-22-10	COMPLETED 06-22-10
8. TOTAL DEPTH OF BORING 15.0 Ft.		16. ELEVATION TOP OF BORING -20.2 Ft.		17. TOTAL RECOVERY FOR BORING 100%	
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist					

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-20.2	0.0		CLAY, lean, dark gray (CL)		
				NS	
-35.2	15.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-GC-02-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-02-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 40 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -39.6 Ft.		STARTED 05-07-10
8. TOTAL DEPTH OF BORING 20.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-07-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-39.6	0.0		CLAY, lean, dark gray (CL)		
		[Hatched Pattern]		NS	
-59.6	20.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 929,649 Y = 276,393			ELEVATION TOP OF BORING -39.6 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

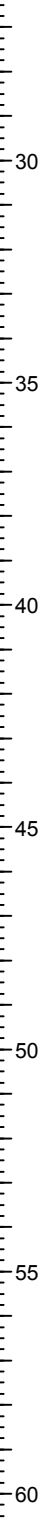


Boring Designation BI-GC-03-10

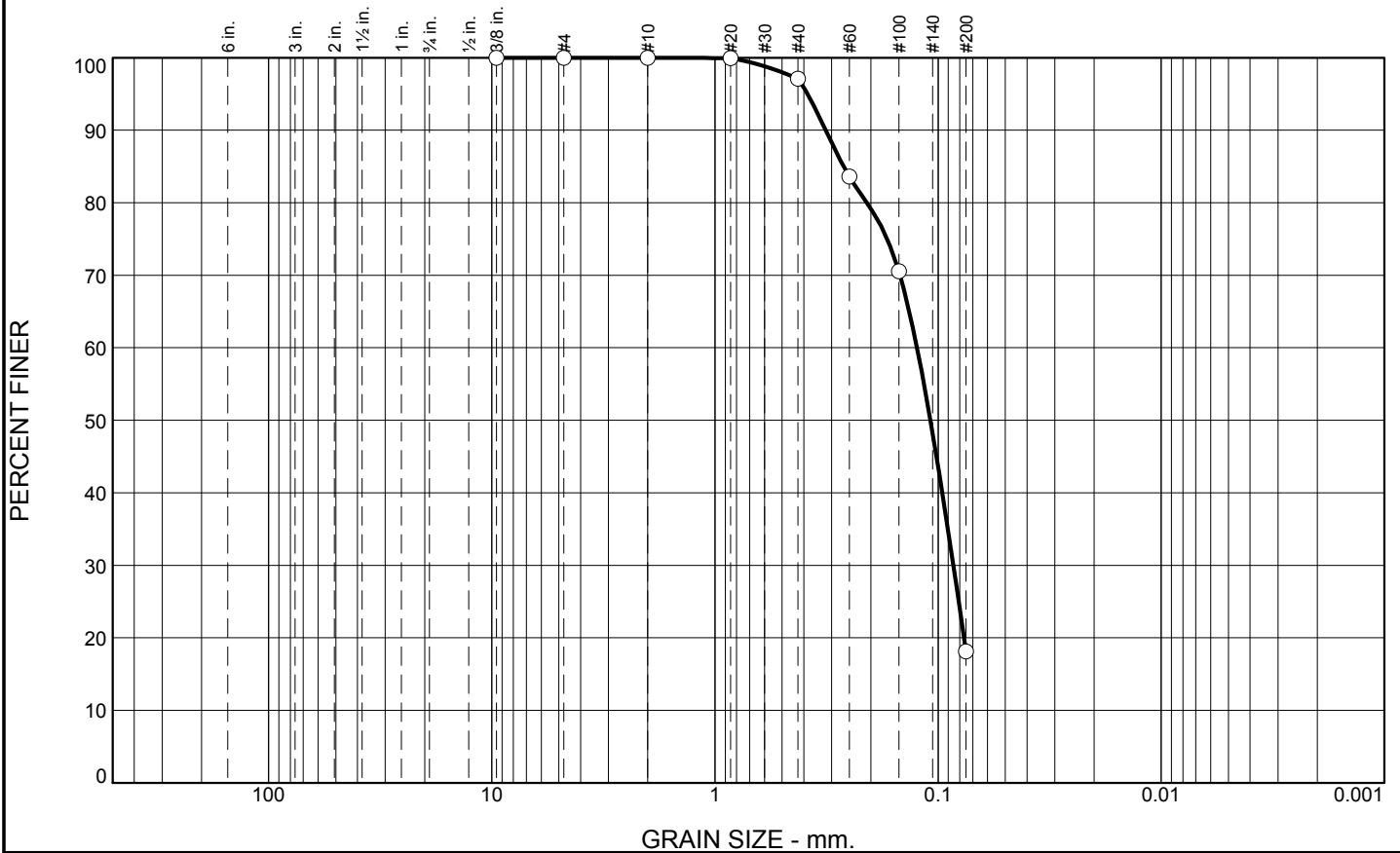
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-03-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 22 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 05-21-10		
8. TOTAL DEPTH OF BORING 19.1 Ft.		16. ELEVATION TOP OF BORING -21.2 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-21.2	0.0		CLAY, lean, very soft, little fine-grained sand-sized quartz, greenish gray (CL)		
		▨		NS	
-35.2	14.0		SAND, silty, mostly fine-grained sand-sized quartz, trace clay, lt. Green/gray (SM) At El. -36.2 Ft., mostly fine-grained sand-sized quartz, trace clay, trace organic matter, yellowish orange and brown mottled	A	Classification: SM Color: 10YR 5/3-brown D50: 0.1083 mm % Fines: 18.1
		▧		B	Classification: SM Color: 10YR 4/2-dark grayish brown D50: 0.0995 mm % Fines: 17.3
-40.3	19.1		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 926,525 Y = 281,181			ELEVATION TOP OF BORING -21.2 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.9	79.0	18.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	97.1		
#60	83.6		
#100	70.5		
#200	18.1		

Material Description

SILTY SAND, (SM), medium to fine grained, with clay pockets

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3188 D₈₅= 0.2651 D₆₀= 0.1243
D₅₀= 0.1083 D₃₀= 0.0855 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-03-10A
Sample Number: TE Lab ID: 4489.15

Depth: 15.0 - 17.0 (ft.)

Date: 5/30/10

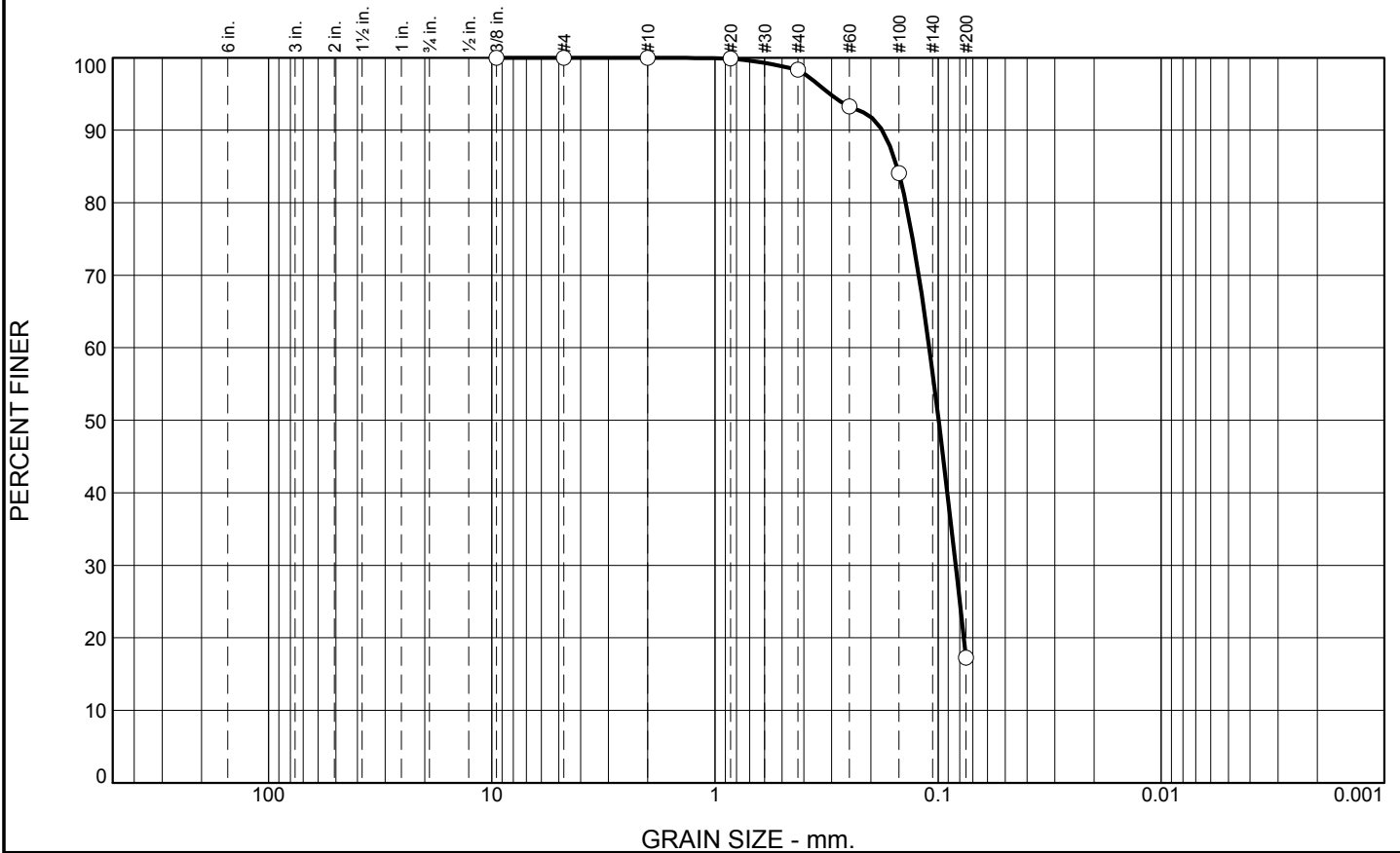
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.7	81.0	17.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.3		
#60	93.3		
#100	84.1		
#200	17.3		

Material Description

SILTY SAND, (SM), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.1780 D₈₅= 0.1530 D₆₀= 0.1096
D₅₀= 0.0995 D₃₀= 0.0835 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-03-10B
Sample Number: TE Lab ID: 4489.16

Depth: 17.0 - 19.0 (ft.)

Date: 5/30/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: G.Fancher

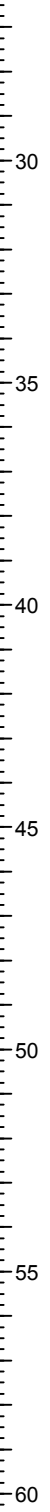
Checked By: R.Byrd

Boring Designation BI-GC-04-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-04-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 18 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-22-10
8. TOTAL DEPTH OF BORING 19.1 Ft.		16. ELEVATION TOP OF BORING -16.2 Ft.		COMPLETED 06-22-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-16.2	0.0		CLAY, lean, dark gray (CL)		
-27.2	11.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, gray (SM)	NS	
-35.3	19.1		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2
						OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88	
LOCATION COORDINATES X = 921,883 Y = 287,538			ELEVATION TOP OF BORING -16.2 Ft.			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS	
			factor.			



Boring Designation BI-GC-05-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-05-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 36 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -35.6 Ft.		STARTED 05-07-10
8. TOTAL DEPTH OF BORING 17.8 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-07-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-35.6	0.0		CLAY, lean, dark gray (CL)	NS	0
-45.4	9.8	▨	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, some shell fragments, gray (SM)		10
-50.8	15.2	▨	CLAY, lean, dark gray (CL)		15
-53.4	17.8	▨	NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		20
					25

Boring Designation BI-GC-06-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-06-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 17 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-22-10 COMPLETED 06-22-10
8. TOTAL DEPTH OF BORING 18.5 Ft.		16. ELEVATION TOP OF BORING -15.2 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

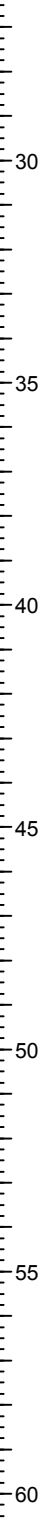
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-15.2	0.0		CLAY, lean, dark gray (CL)		
-32.4	17.2			NS	
-33.7	18.5		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, gray (SM)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-GC-07-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-07-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES DISTURBED: 0 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		14. WATER DEPTH 36 Ft.
6. THICKNESS OF OVERBURDEN N/A		15. DATE BORING STARTED: 05-07-10 COMPLETED: 05-07-10		
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -35.6 Ft.		
8. TOTAL DEPTH OF BORING 19.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-35.6	0.0		CLAY, lean, dark gray (CL)	NS	
-55.1	19.5				
NOTES:					
1. Soils are field visually classified in accordance with the Unified Soils Classification System.					
2. NS = Sample not submitted for laboratory analysis from this interval.					
3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and					

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 919,013 Y = 290,889			ELEVATION TOP OF BORING -35.6 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			applying NOAA tidal gauge data conversion factor.		



Boring Designation BI-GC-08-10

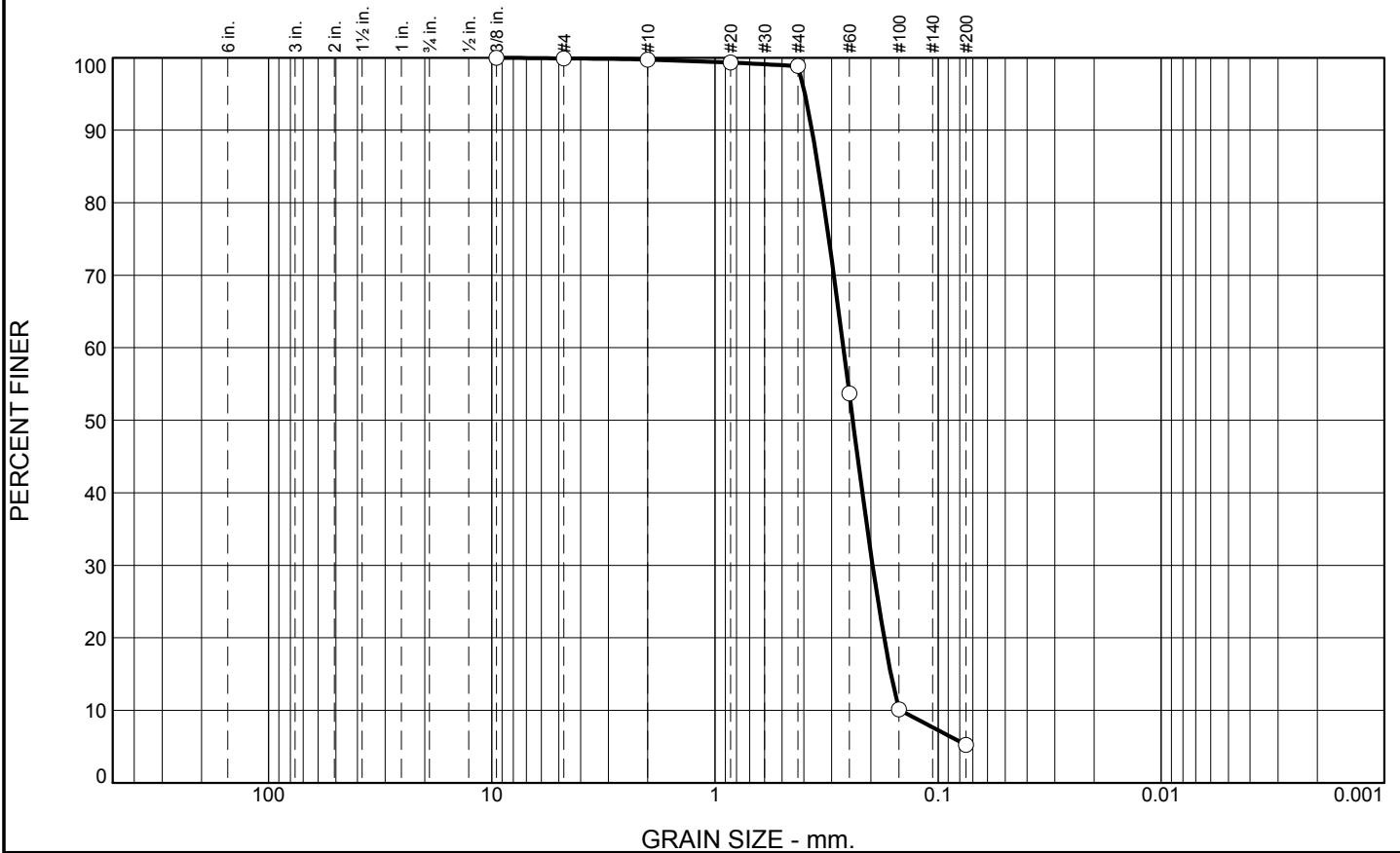
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-08-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 35 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-07-10
8. TOTAL DEPTH OF BORING 19.2 Ft.		16. ELEVATION TOP OF BORING -34.6 Ft.		COMPLETED 05-07-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-34.6	0.0		CLAY, lean, dark gray (CL)	NS	
-44.4	9.8				
-45.5	10.9		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, some shell fragments (SM)	A	Classification: SP-SM Color: 10YR 7/1-light gray D50: 0.2412 mm % Fines: 5.2
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, tan (SP)	B	Classification: SP Color: 10YR 9/1-white D50: 0.2889 mm % Fines: 1.7
-53.8	19.2				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2
						OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88	
LOCATION COORDINATES X = 927,759 Y = 279,149			ELEVATION TOP OF BORING -34.6 Ft.			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS	
			factor.			



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	0.9	93.6	5.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	99.3		
#40	98.8		
#60	53.7		
#100	10.1		
#200	5.2		

Material Description

SAND, (SP-SM), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3676 D₈₅= 0.3450 D₆₀= 0.2657
D₅₀= 0.2412 D₃₀= 0.1966 D₁₅= 0.1629
D₁₀= 0.1474 C_u= 1.80 C_c= 0.99

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-8-10A
Sample Number: TE Lab ID: 4461.08

Depth: 10.42 - 15.42 (ft)

Date: 5/13/10

Thompson Engineering

Mobile, Alabama

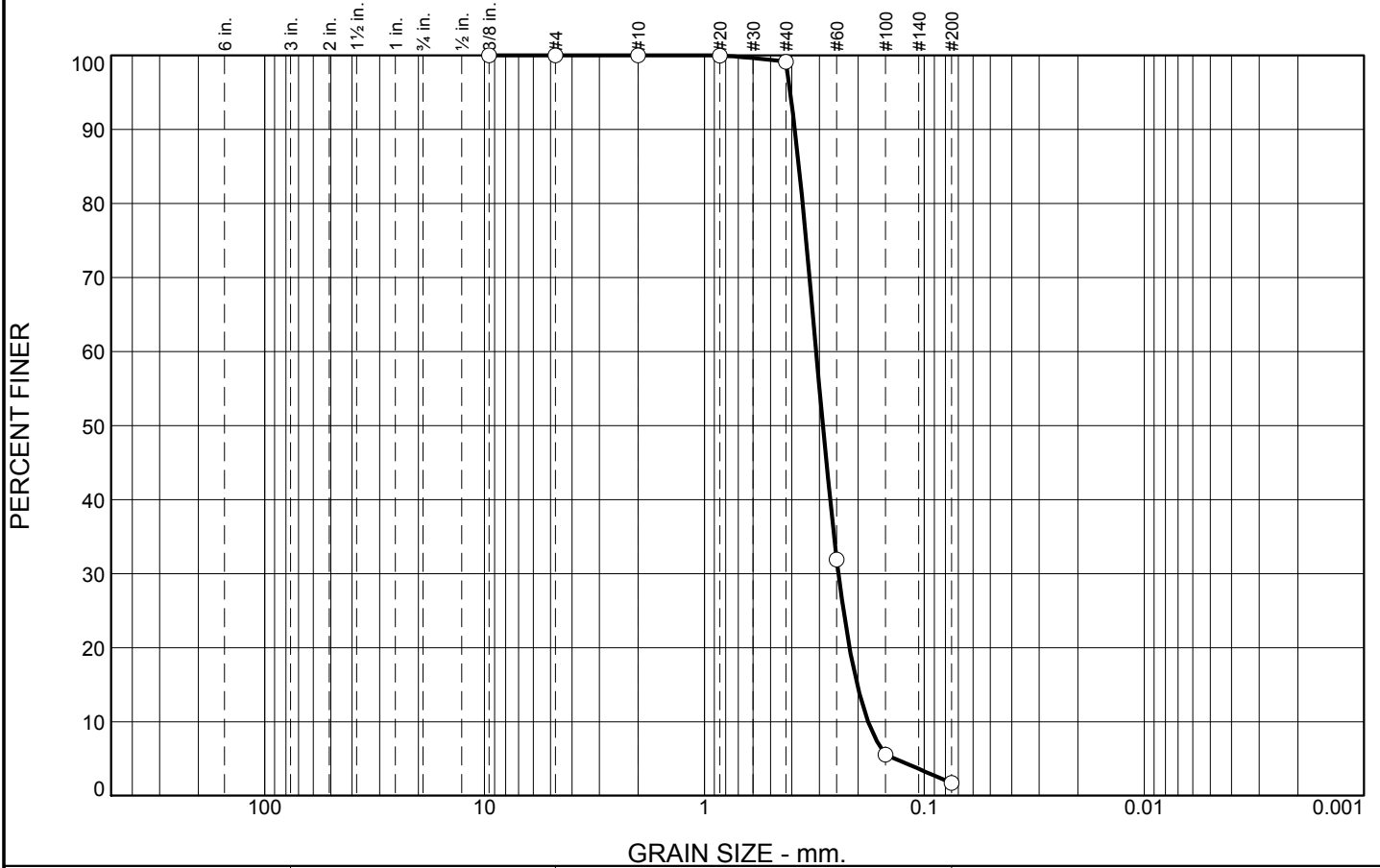
Client: US Army Corps of Engineers
Project: Mississippi Barrier Island Restoration Project
Contract No. W91278-10-D-0026 - Task 03
Project No: 1021230009

Figure

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.9	97.4	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.1		
#60	31.9		
#100	5.6		
#200	1.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3877 D₈₅= 0.3719 D₆₀= 0.3100
D₅₀= 0.2889 D₃₀= 0.2456 D₁₅= 0.2019
D₁₀= 0.1801 C_u= 1.72 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-8-10B
Sample Number: TE Lab ID: 4461.09

Depth: 15.42 - 19.17 (ft)

Date:

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Mississippi Barrier Island Restoration Project
Contract No. W91278-10-D-0026 - Task 03
Project No: 1021230009

Figure

Boring Designation BI-GC-09-10

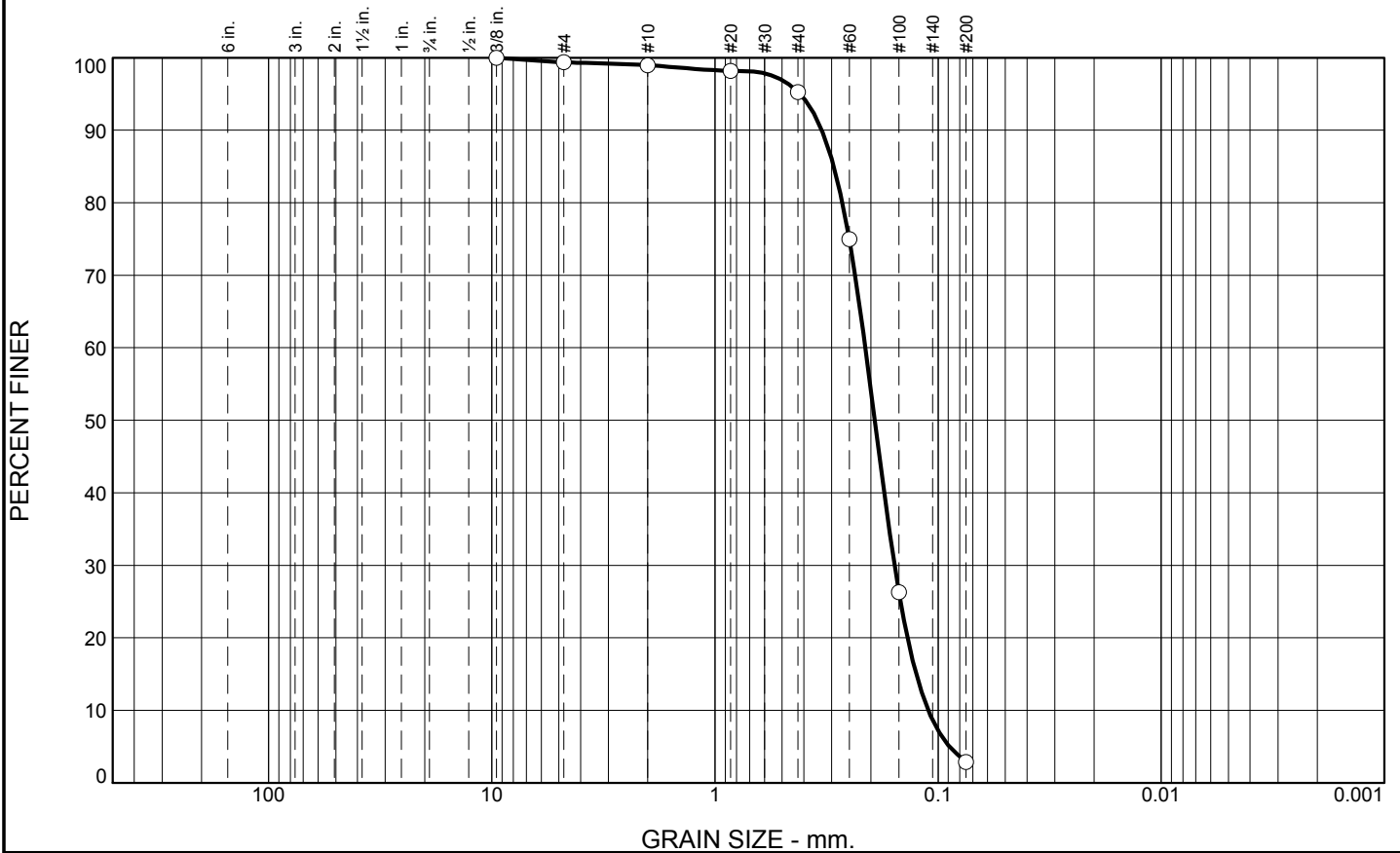
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-09-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 4
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 19.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -18.6 Ft.		STARTED 05-05-10
8. TOTAL DEPTH OF BORING 19.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-05-10
18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.6	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, gray (SP)	A	Classification: SP Color: 2.5Y 6/1-gray D50: 0.1923 mm % Fines: 2.9
-27.1	8.5		CLAY, fat, high plasticity, trace fine-grained sand-sized quartz, gray (CH)	B	Classification: SP-SM Color: 5Y 7/1-light gray D50: 0.1612 mm % Fines: 7.7
-29.6	11.0		CLAY, fat, high plasticity, trace fine-grained sand-sized quartz, gray (CH)	C	Classification: CL Color: 5Y 5/1-gray D50: mm % Fines: 58.8
-30.5	11.9		SAND, silty, some clay, gray (SM)	D	Classification: SP-SM Color: 5Y 6/1-gray D50: 0.1477 mm % Fines: 7.3
-36.6	18.0		SAND, clayey, mostly fine-grained sand-sized quartz, trace shell fragments, gray (SC)	NS	
-37.6	19.0		CLAY, fat, little fine-grained sand-sized quartz, tan and gray (CH)		
-38.1	19.5		SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p>					

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 931,793 Y = 267,971			ELEVATION TOP OF BORING -18.6 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.4	3.7	92.4	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.4		
#10	99.0		
#20	98.2		
#40	95.3		
#60	75.0		
#100	26.3		
#200	2.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3320 D₈₅= 0.2933 D₆₀= 0.2119
D₅₀= 0.1923 D₃₀= 0.1568 D₁₅= 0.1254
D₁₀= 0.1107 C_u= 1.91 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-9-10A
Sample Number: TE Lab ID: 4461.04

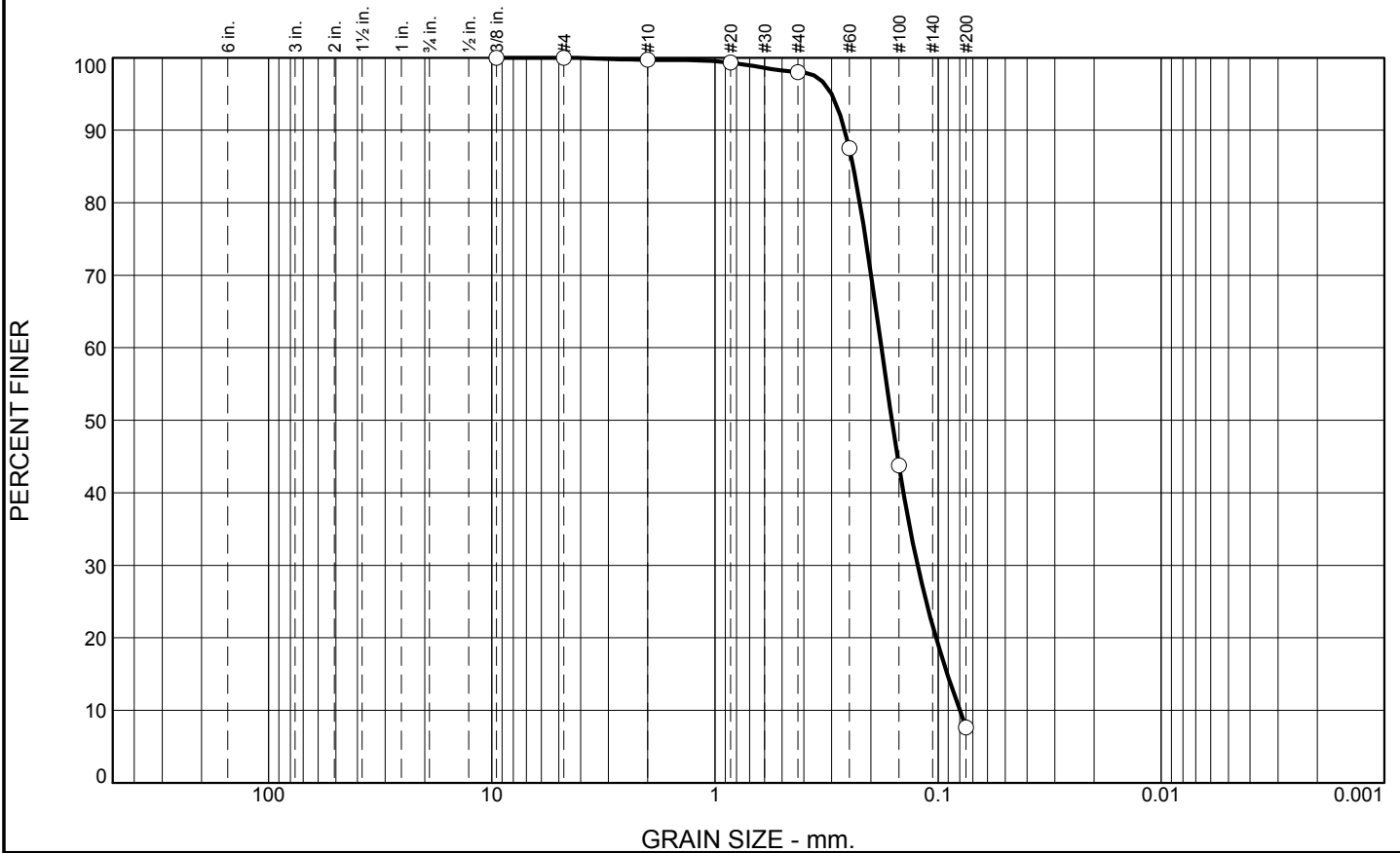
Depth: 0.0 - 5.0 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.7	90.3	7.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.3		
#40	98.0		
#60	87.5		
#100	43.8		
#200	7.7		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2617 D₈₅= 0.2402 D₆₀= 0.1795
D₅₀= 0.1612 D₃₀= 0.1235 D₁₅= 0.0909
D₁₀= 0.0799 C_u= 2.25 C_c= 1.06

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-9-10B
Sample Number: TE Lab ID: 4461.05

Depth: 5.0 - 9.0 (ft)

Date: 5/13/10

Thompson Engineering

Mobile, Alabama

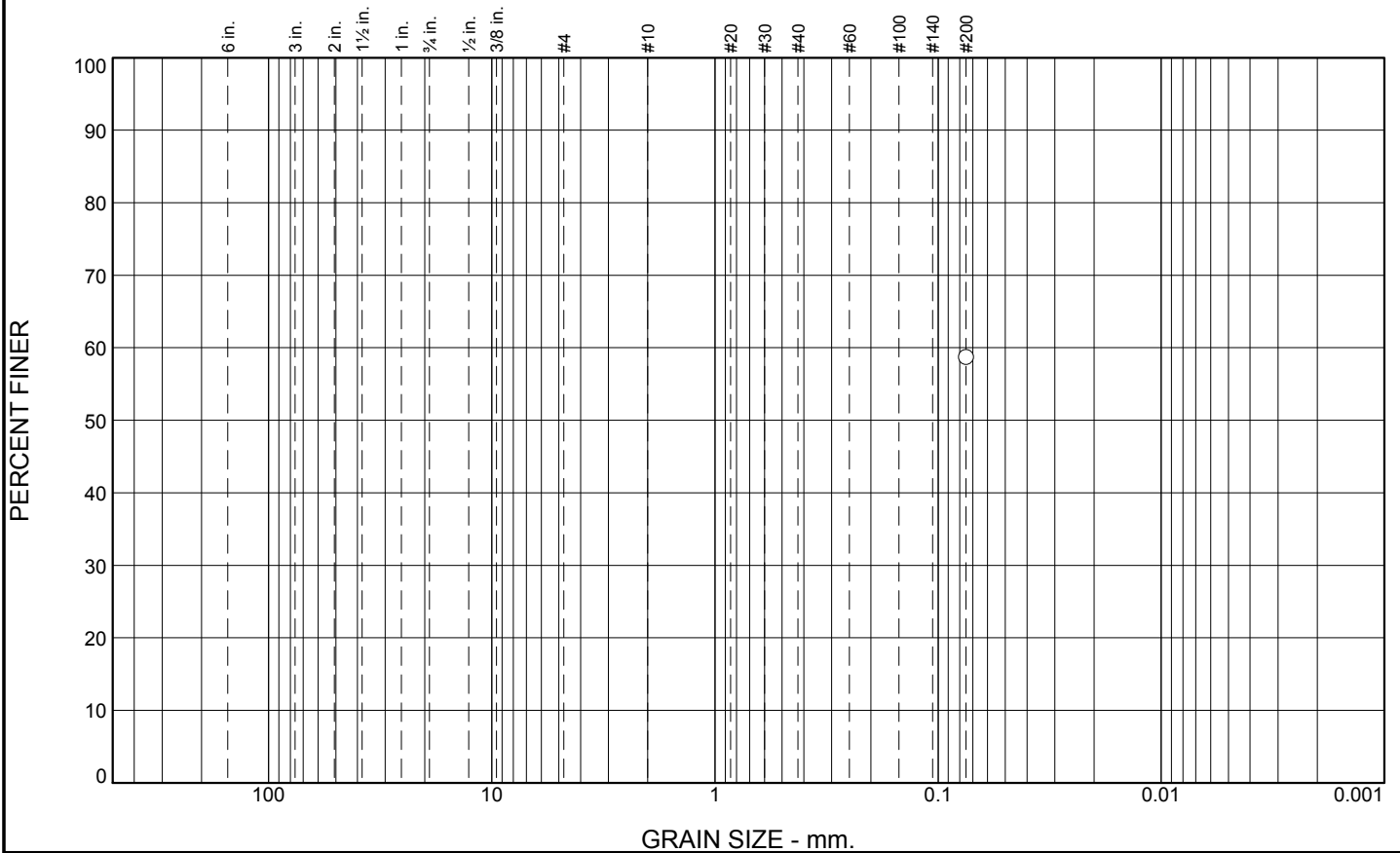
Client: US Army Corps of Engineers
Project: Mississippi Barrier Island Restoration Project
Contract No. W91278-10-D-0026 - Task 03
Project No: 1021230009

Figure

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
						58.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	58.8		

Material Description
SANDY CLAY, (CL)

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= D₈₅= D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= CL AASHTO=

Remarks
 CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-9-10C
Sample Number: TE Lab ID: 4461.06

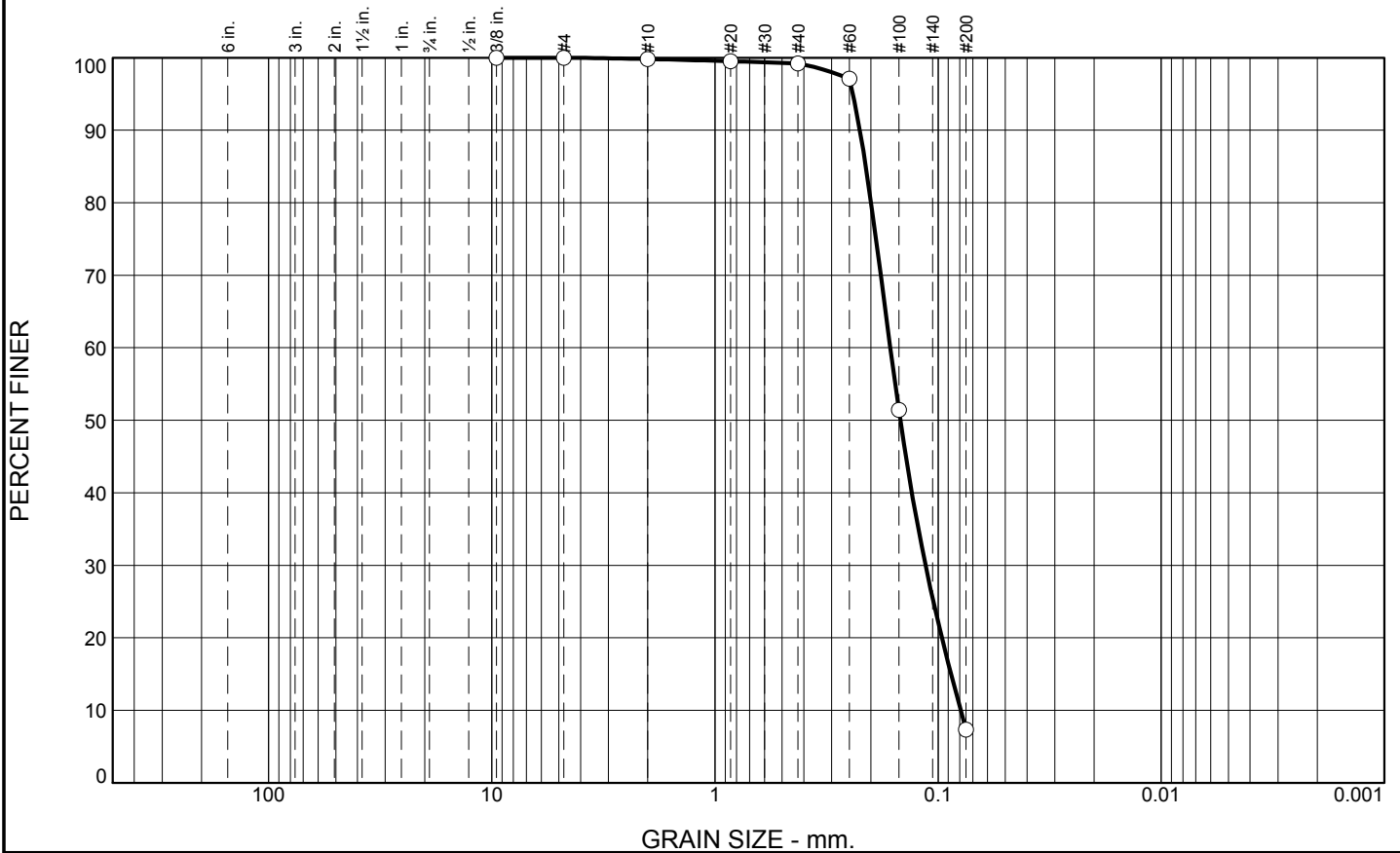
Depth: 9.08 - 10.0 (ft)

Date: 5/13/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009</p>
<p>Figure</p>	

Tested By: J.Maddox/R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	0.6	91.9	7.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.5		
#40	99.2		
#60	97.1		
#100	51.4		
#200	7.3		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2241 D₈₅= 0.2110 D₆₀= 0.1638
D₅₀= 0.1477 D₃₀= 0.1139 D₁₅= 0.0875
D₁₀= 0.0792 C_u= 2.07 C_c= 1.00

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-9-10D
Sample Number: TE Lab ID: 4461.07

Depth: 10.0 - 14.0 (ft)

Date: 5/13/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009</p>
<p>Figure</p>	

Tested By: J.Maddox/L.Stokes

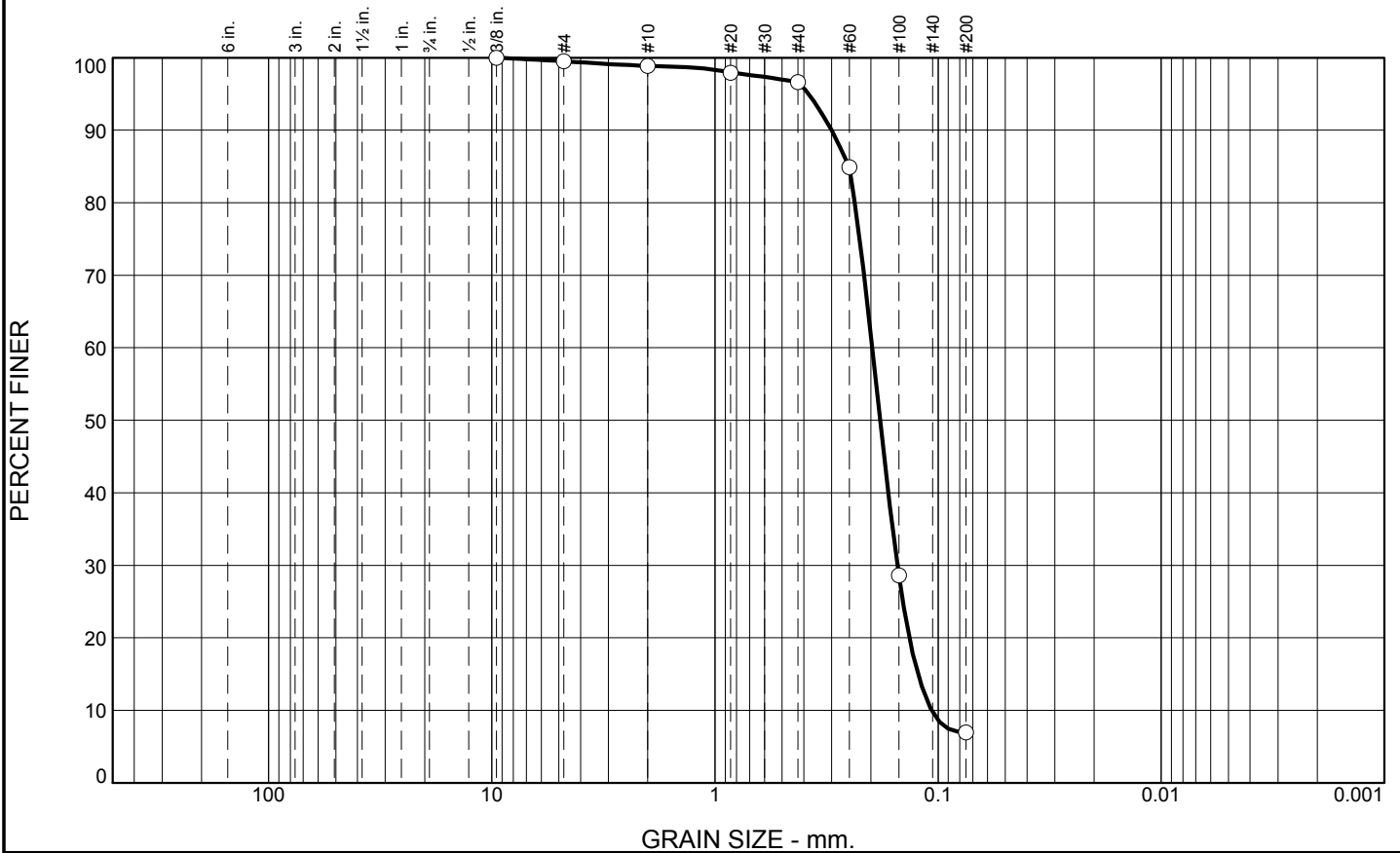
Checked By: R.Byrd

Boring Designation BI-GC-10-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-10-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 18.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -17.5 Ft.		STARTED 05-05-10
8. TOTAL DEPTH OF BORING 15.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-05-10
18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-17.5	0.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt and shell fragments, gray (SP)	A	Classification: SP-SM Color: 5Y 6/1-gray D50: 0.1819 mm % Fines: 7
-21.9	4.4		CLAY, fat, high plasticity, trace sand and shell fragments, gray (CH)		
-22.7	5.2		SAND, silty, mostly fine-grained sand-sized quartz, little clay, trace shell fragments, gray (SM)	B	Classification: SP Color: 5Y 7/1-light gray D50: 0.1921 mm % Fines: 4.8
-23.0	5.5				
-23.4	5.9		CLAY, fat, high plasticity, trace sand and shell fragments, gray (CH)		
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, gray (SP)		
-29.4	11.9		CLAY, fat, high plasticity, trace fine-grained sand-sized quartz, gray (CH)	NS	
-29.7	12.2				
-32.5	15.0		SAND, silty, mostly fine-grained sand-sized quartz, with clay lenses (1/2 inch) every 0.5 ft. intervals, gray (SM)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.6	2.3	89.6	7.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.5		
#10	98.9		
#20	97.9		
#40	96.6		
#60	84.9		
#100	28.6		
#200	7.0		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3003 D₈₅= 0.2509 D₆₀= 0.1973
D₅₀= 0.1819 D₃₀= 0.1522 D₁₅= 0.1231
D₁₀= 0.1069 C_u= 1.85 C_c= 1.10

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-10-10A
Sample Number: TE Lab ID: 4461.10

Depth: 0.0 - 4.33 (ft)

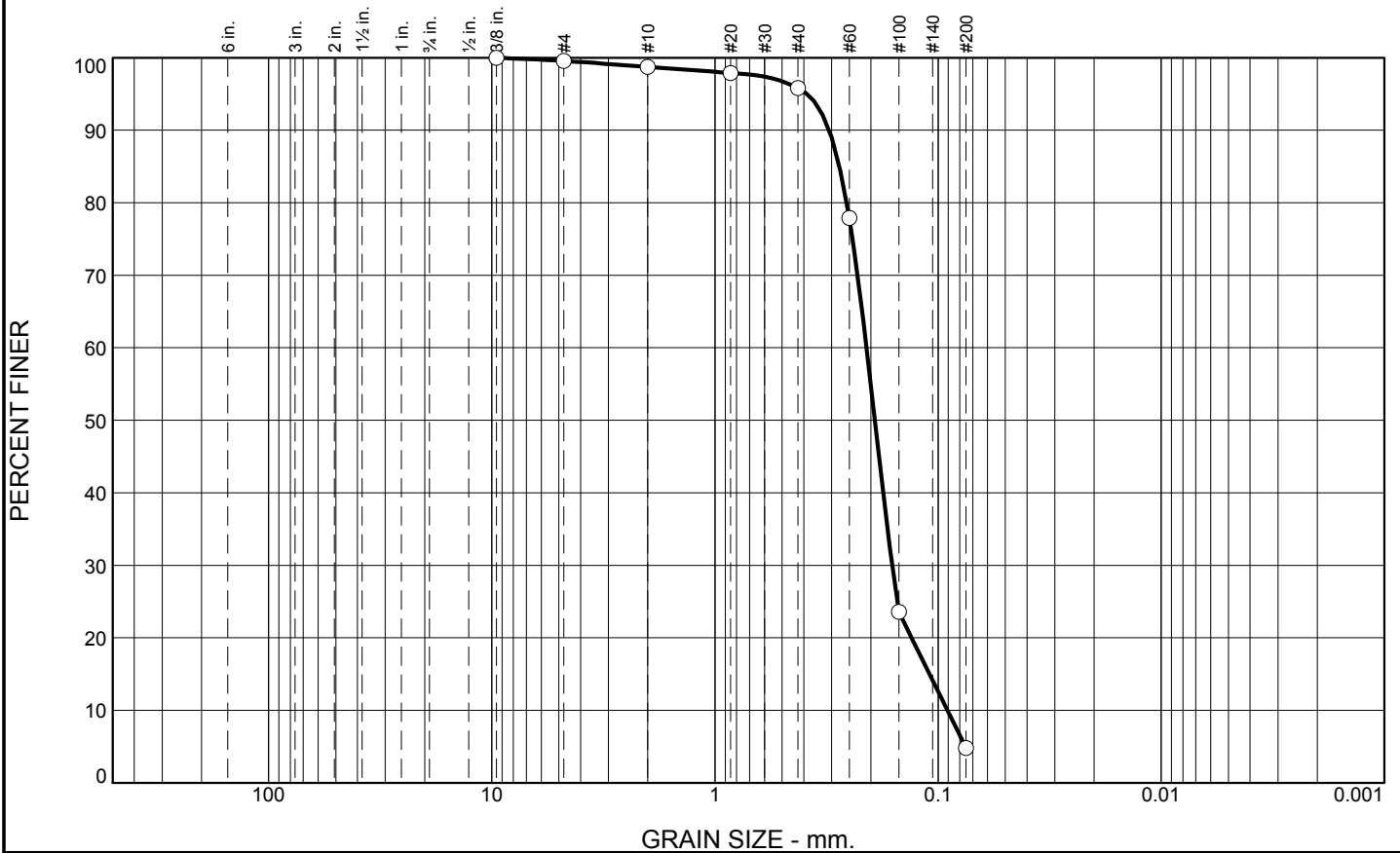
Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.9	2.9	91.0	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	98.7		
#20	97.9		
#40	95.8		
#60	77.9		
#100	23.6		
#200	4.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3079 D₈₅= 0.2769 D₆₀= 0.2094
D₅₀= 0.1921 D₃₀= 0.1607 D₁₅= 0.1093
D₁₀= 0.0908 C_u= 2.30 C_c= 1.36

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-10-10B
Sample Number: TE Lab ID: 4461.11

Depth: 5.75 - 11.75 (ft)

Date: 5/13/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009</p>
Figure	

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Boring Designation BI-GC-11-10

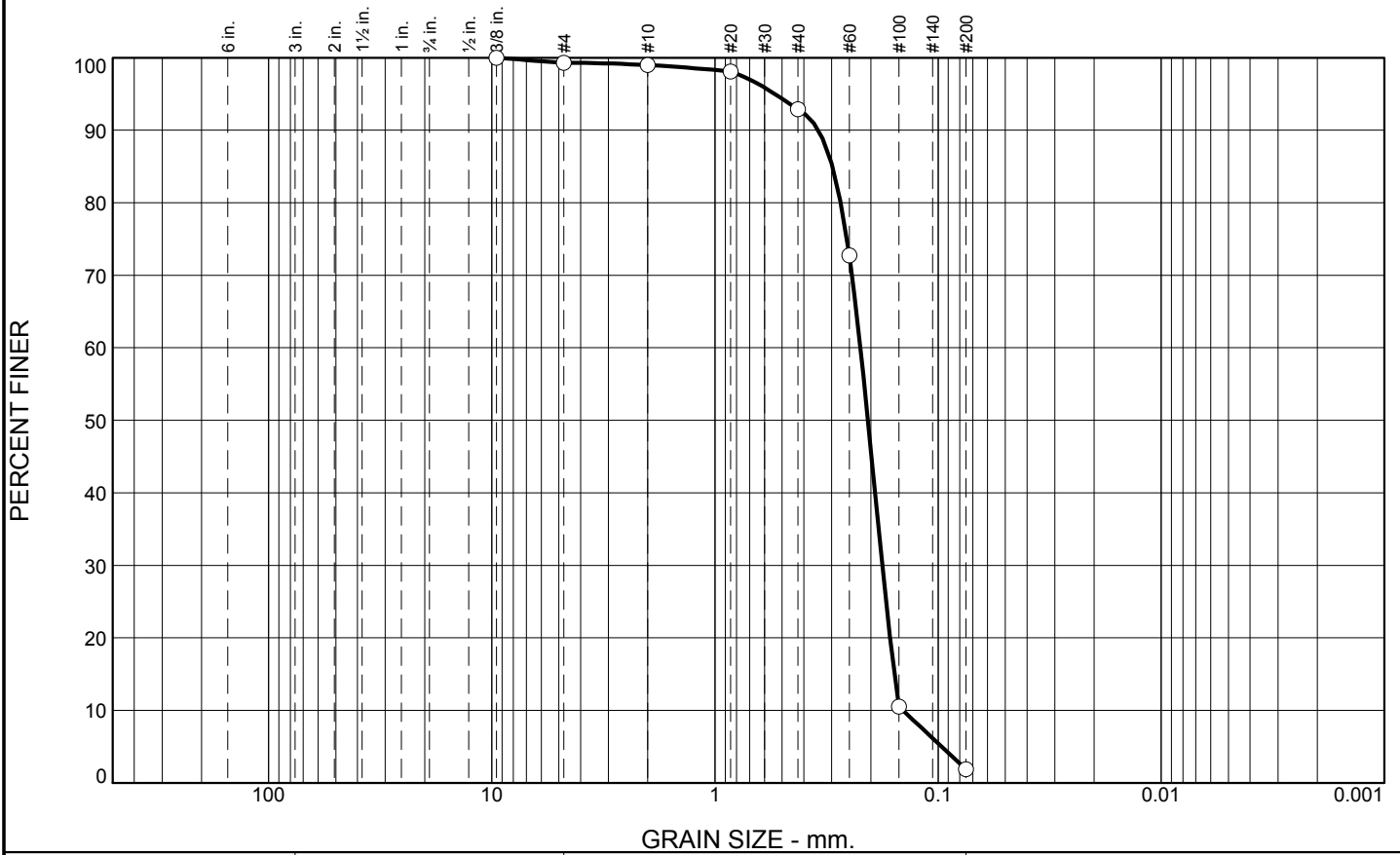
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-11-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-05-10
8. TOTAL DEPTH OF BORING 19.5 Ft.		16. ELEVATION TOP OF BORING -20.0 Ft.		COMPLETED 05-05-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-20.0	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little shell fragments, gray (SP)	A	Classification: SP Color: 5Y 7/1-light gray D50: 0.2064 mm % Fines: 1.9
		•••••		B	Classification: SP Color: 5Y 2.5/1-black D50: 0.1909 mm % Fines: 2
		•••••		C	Classification: SP Color: 5Y 7.5/1-light gray D50: 0.1929 mm % Fines: 2.3
-35.4	15.4	•••••	At El. -34.2 Ft., woody material to El. -35.5 ft.		
		//	CLAY, fat, high plasticity, trace fine-grained sand-sized quartz, gray (CH)	NS	
-39.5	19.5	//			
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 932,891 Y = 262,823			ELEVATION TOP OF BORING -20.0 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	0.3	6.1	91.0	1.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.3		
#10	99.0		
#20	98.1		
#40	92.9		
#60	72.8		
#100	10.5		
#200	1.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3440 D₈₅= 0.2976 D₆₀= 0.2229
D₅₀= 0.2064 D₃₀= 0.1779 D₁₅= 0.1570
D₁₀= 0.1438 C_u= 1.55 C_c= 0.99

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-11-10A
Sample Number: TE Lab ID: 4461.01

Depth: 0.0 - 5.0 (ft)

Date: 5/13/10

Thompson Engineering

Mobile, Alabama

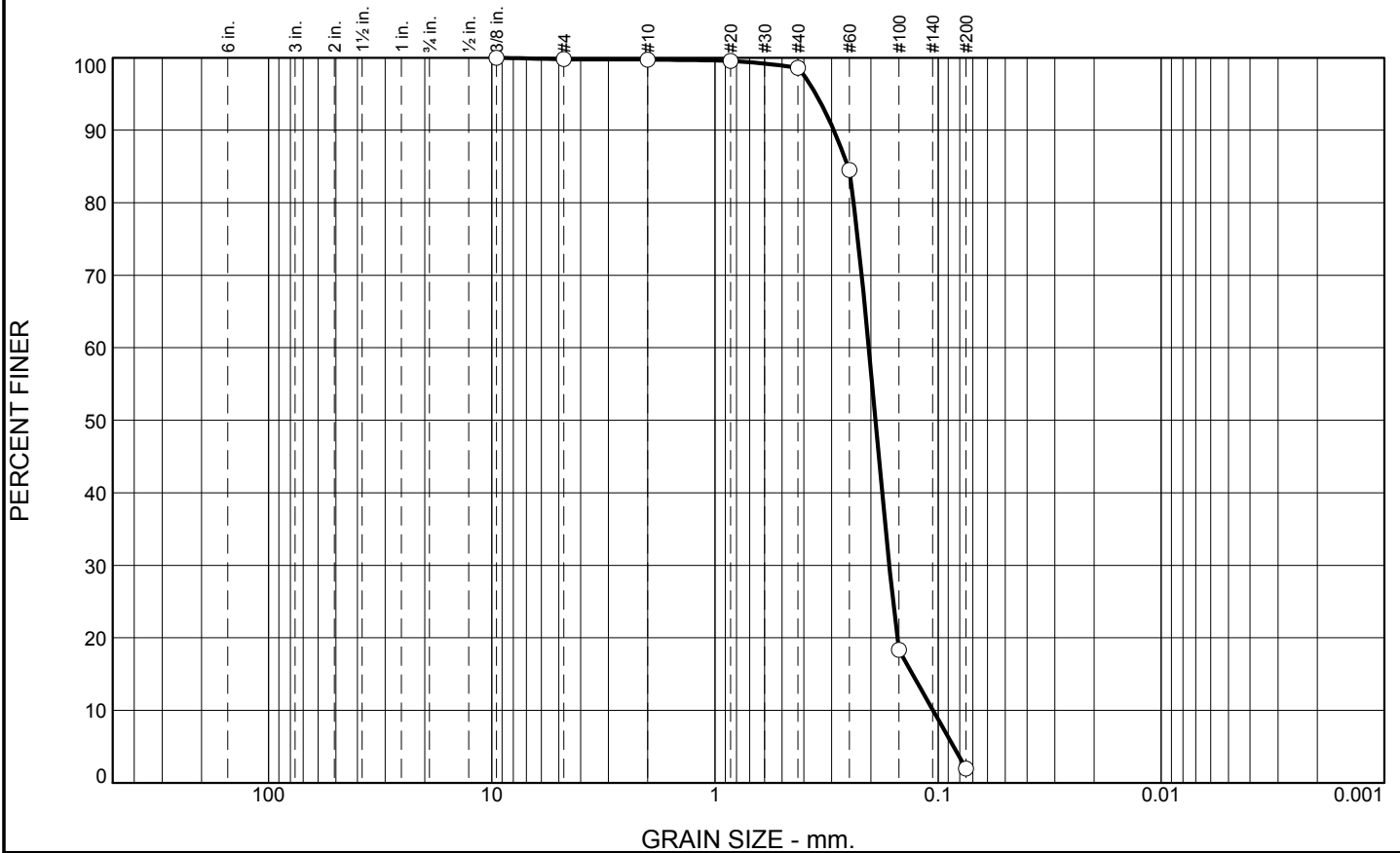
Client: US Army Corps of Engineers
Project: Mississippi Barrier Island Restoration Project
Contract No. W91278-10-D-0026 - Task 03
Project No: 1021230009

Figure

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.1	1.1	96.6	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.7		
#20	99.6		
#40	98.6		
#60	84.5		
#100	18.3		
#200	2.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2934 D₈₅= 0.2532 D₆₀= 0.2046
D₅₀= 0.1909 D₃₀= 0.1655 D₁₅= 0.1303
D₁₀= 0.1054 C_u= 1.94 C_c= 1.27

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-11-10B
Sample Number: TE Lab ID: 4461.02

Depth: 5.0 - 10.0 (ft)

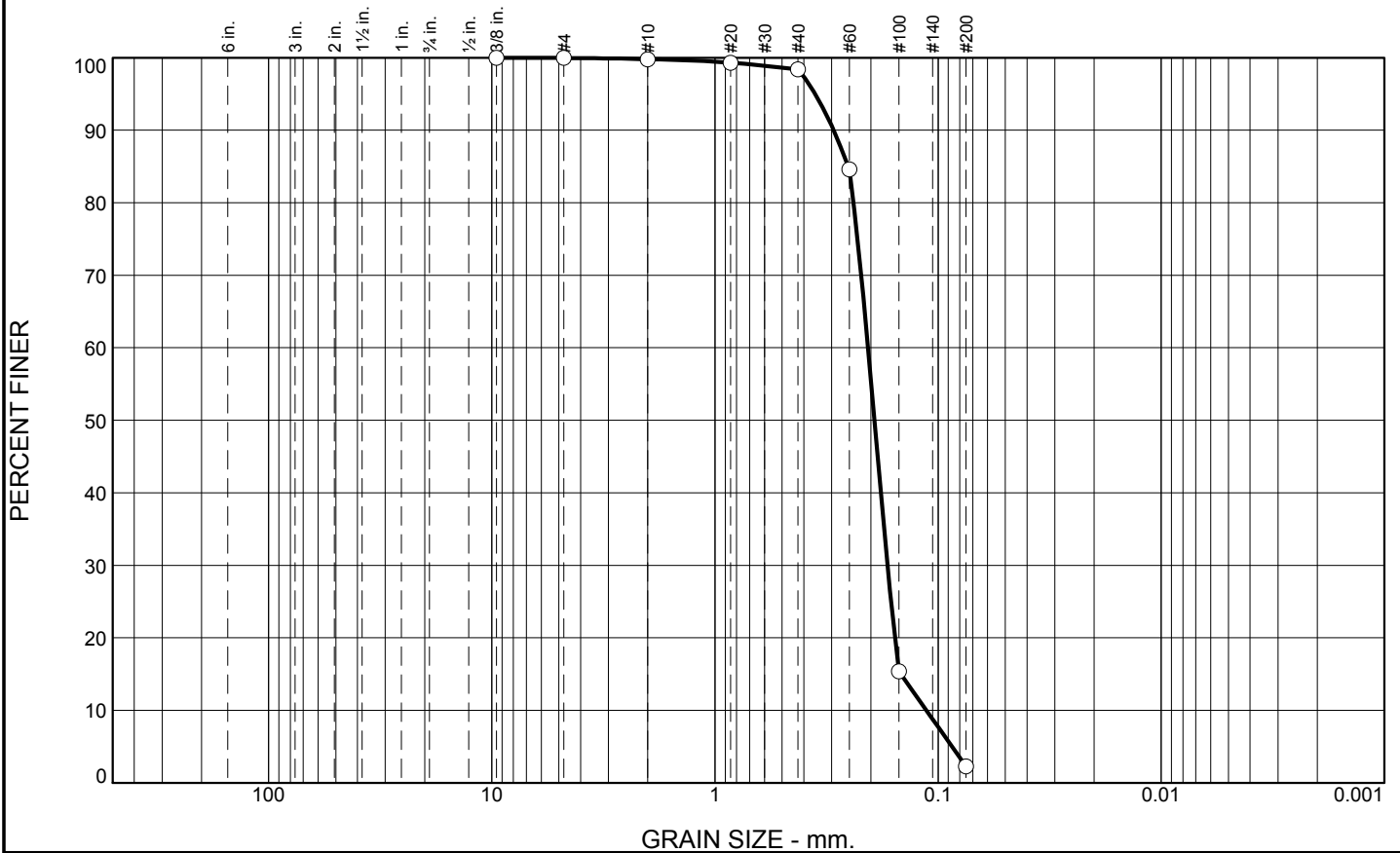
Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.4	96.1	2.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.3		
#40	98.4		
#60	84.6		
#100	15.4		
#200	2.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2938 D₈₅= 0.2526 D₆₀= 0.2061
D₅₀= 0.1929 D₃₀= 0.1686 D₁₅= 0.1471
D₁₀= 0.1129 C_u= 1.83 C_c= 1.22

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-11-10C
Sample Number: TE Lab ID: 4461.03

Depth: 10.0 - 15.0 (ft)

Date: 5/13/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

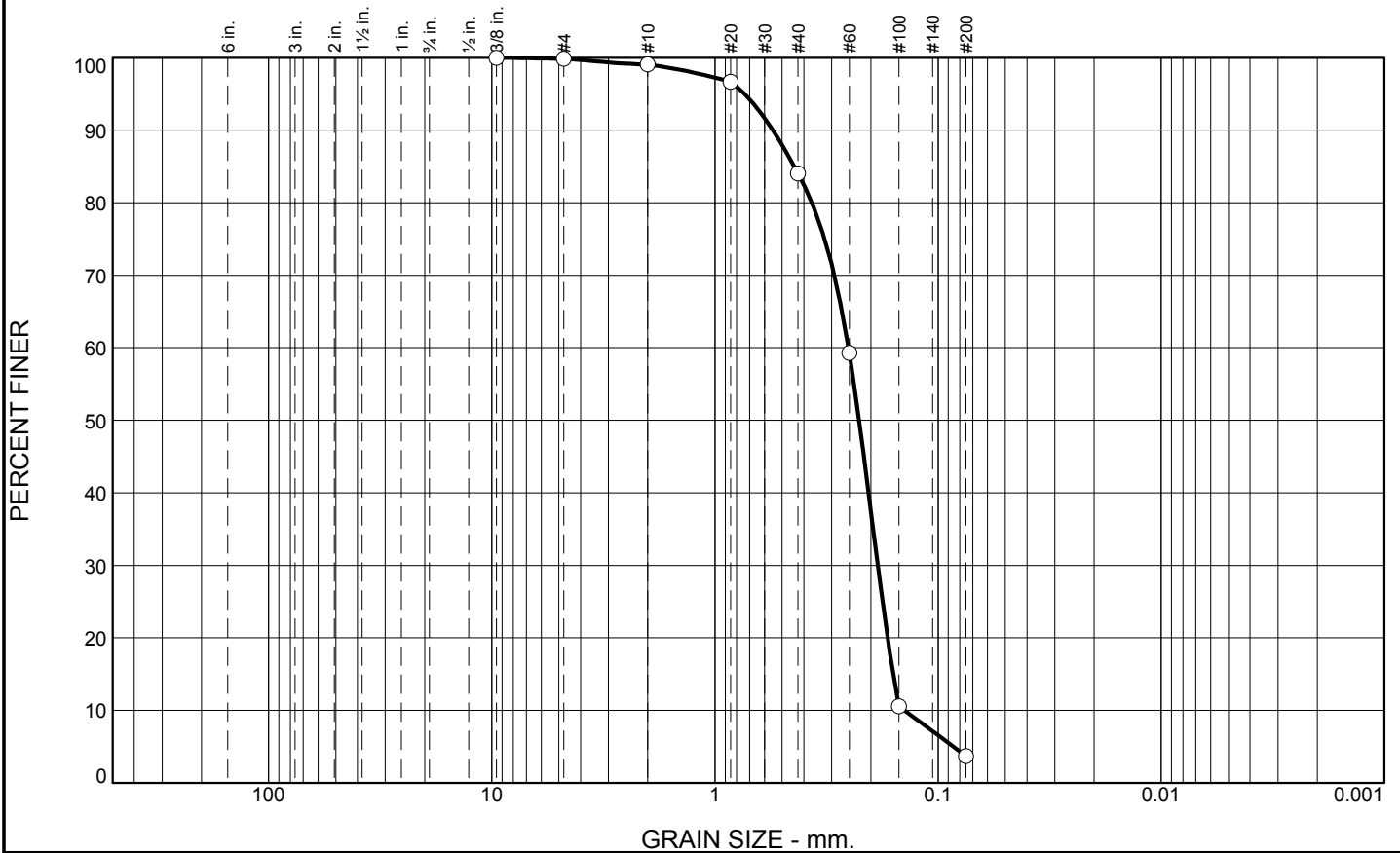
Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Boring Designation BI-GC-12-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-12-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 23 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -21.9 Ft.		STARTED 05-05-10
8. TOTAL DEPTH OF BORING 15.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-05-10
18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-21.9	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell, gray (SP)	A	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.226 mm % Fines: 3.7
		•••••		B	Classification: SP Color: 5Y 6.5/1-gray D50: 0.1738 mm % Fines: 3.6
		•••••		C	Classification: SP-SM Color: 2.5Y 6.5/1-gray D50: 0.1867 mm % Fines: 6.8
-35.9	14.0	|||||			
-36.9	15.0	|||||	SAND, silty, mostly fine-grained sand-sized quartz, gray (SM)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.7	15.0	80.4	3.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.1		
#20	96.7		
#40	84.1		
#60	59.3		
#100	10.6		
#200	3.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5495 D₈₅= 0.4410 D₆₀= 0.2522
D₅₀= 0.2260 D₃₀= 0.1864 D₁₅= 0.1591
D₁₀= 0.1418 C_u= 1.78 C_c= 0.97

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-12-10A
Sample Number: TE Lab ID: 4461.12

Depth: 0.0 - 5.0 (ft)

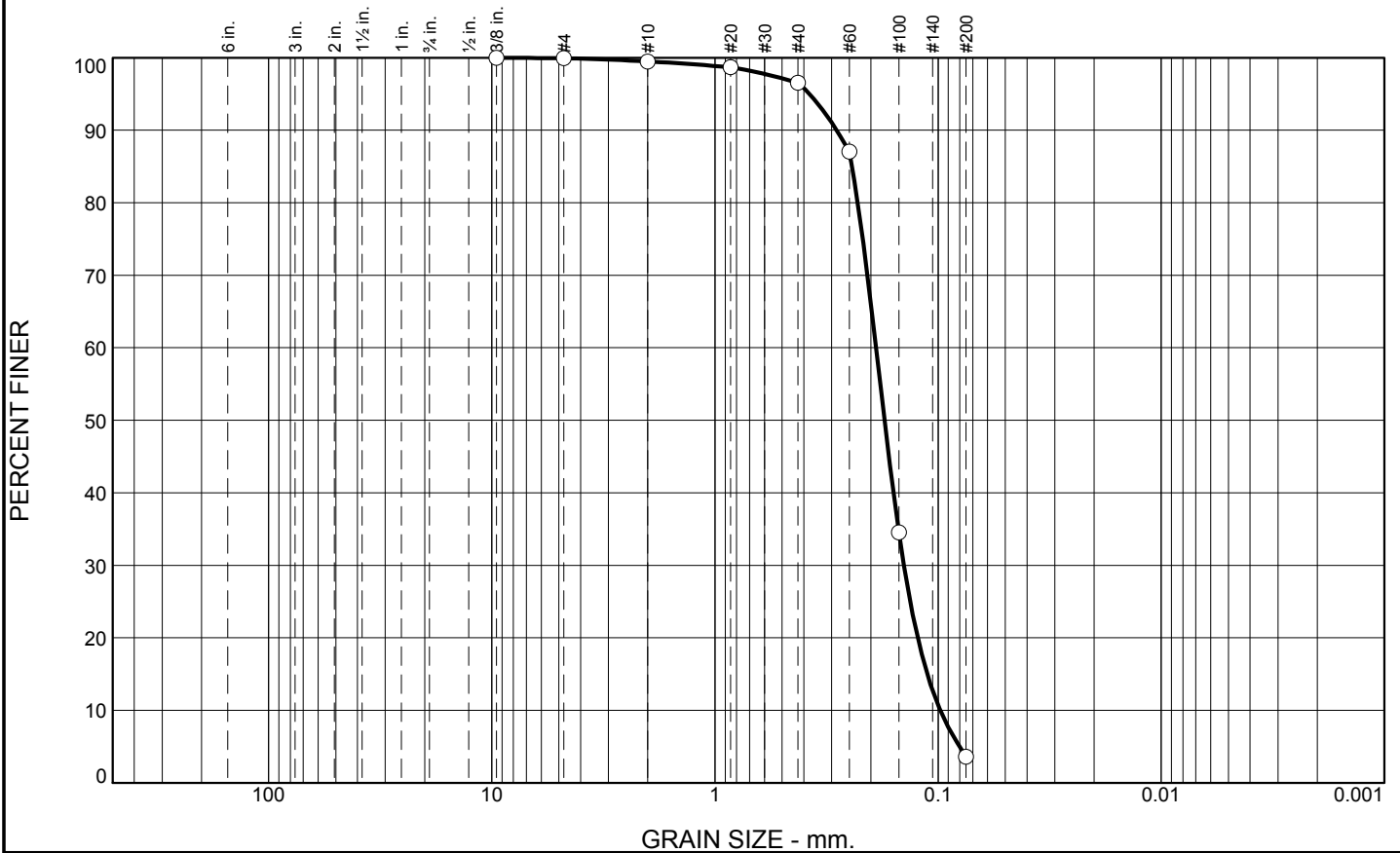
Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
-----------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	3.0	92.9	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.5		
#20	98.7		
#40	96.5		
#60	87.1		
#100	34.5		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2847 D₈₅= 0.2431 D₆₀= 0.1897
D₅₀= 0.1738 D₃₀= 0.1424 D₁₅= 0.1119
D₁₀= 0.0979 C_u= 1.94 C_c= 1.09

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-12-10B
Sample Number: TE Lab ID: 4461.13

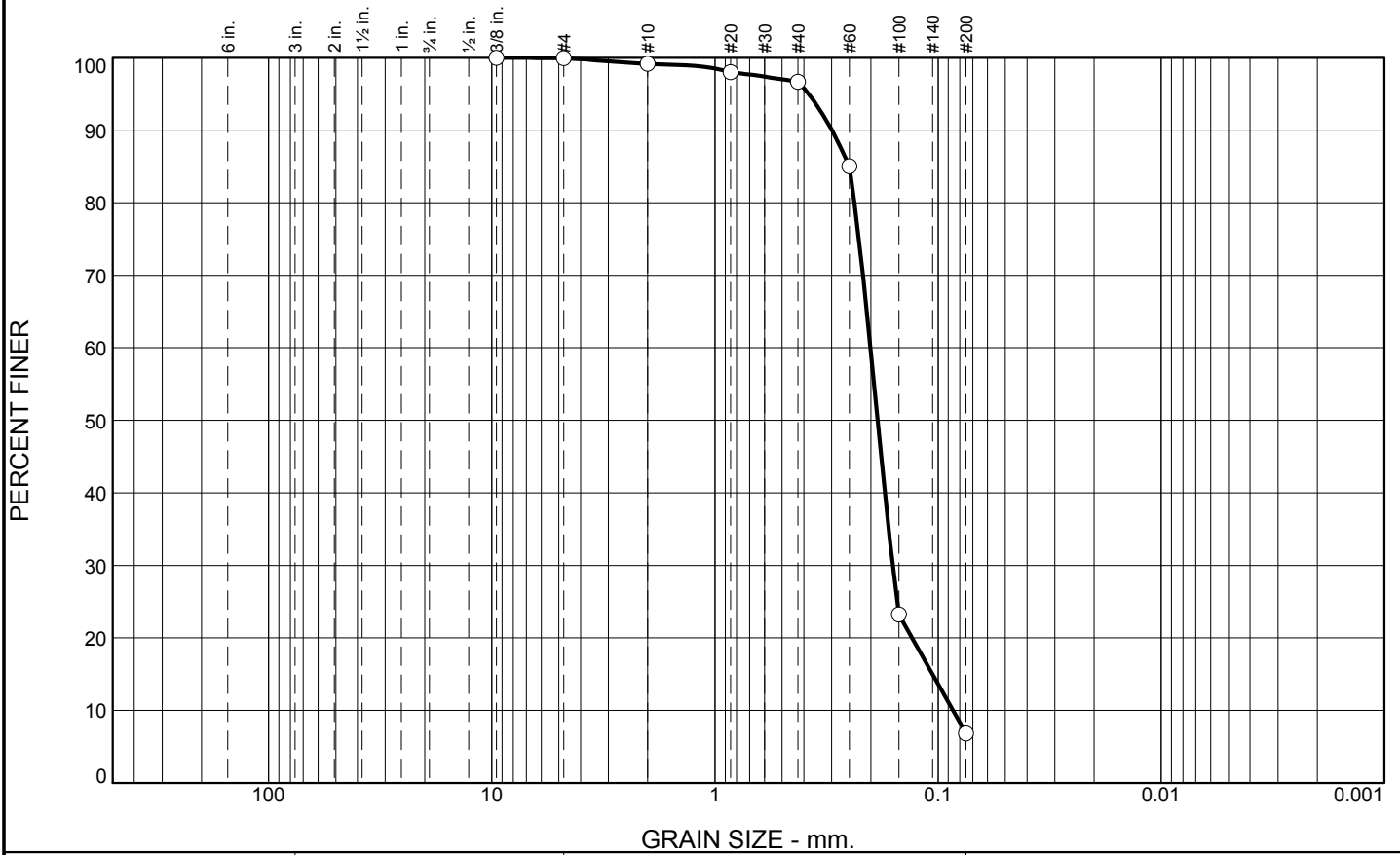
Depth: 5.0 - 10.0 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.8	2.4	89.9	6.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.1		
#20	98.0		
#40	96.7		
#60	85.0		
#100	23.2		
#200	6.8		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2992 D₈₅= 0.2499 D₆₀= 0.2010
D₅₀= 0.1867 D₃₀= 0.1598 D₁₅= 0.1059
D₁₀= 0.0858 C_u= 2.34 C_c= 1.48

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-12-10C
Sample Number: TE Lab ID: 4461.14

Depth: 10.0 - 14.0 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009 Figure
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Boring Designation BI-GC-13-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-13-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES DISTURBED: 0 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		14. WATER DEPTH 34 Ft.
6. THICKNESS OF OVERBURDEN N/A		15. DATE BORING STARTED: 05-07-10 COMPLETED: 05-07-10		
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -33.6 Ft.		
8. TOTAL DEPTH OF BORING 18.3 Ft.		17. TOTAL RECOVERY FOR BORING 100%		
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-33.6	0.0		CLAY, lean, dark gray (CL)		
-45.6	12.0			NS	
-48.4	14.8		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt (SP) At El. -46.9 Ft., mostly coarse-grained sand-sized quartz, some fine gravel-sized quartz, trace clay		
-51.9	18.3		SAND, silty, mostly fine-grained sand-sized quartz, some silt (SM)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-GC-14-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-14-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES DISTURBED: 0 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		14. WATER DEPTH 35 Ft.
6. THICKNESS OF OVERBURDEN N/A		15. DATE BORING STARTED: 05-07-10 COMPLETED: 05-07-10		
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -34.7 Ft.		
8. TOTAL DEPTH OF BORING 15.8 Ft.		17. TOTAL RECOVERY FOR BORING 100%		
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-34.7	0.0	[Hatched Box]	CLAY, lean, dark gray (CL)	NS	
-45.2	10.5	[Dotted Box]	SAND, clayey, mostly fine-grained sand-sized quartz, some clay, little silt (SC)		
-48.7	14.0	[Vertical Lines Box]	SAND, silty, mostly fine-grained sand-sized quartz, some silt (SM)		
-50.5	15.8	[Vertical Lines Box]			
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					


Boring Designation BI-GC-15-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-15-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 23 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -22.7 Ft.		STARTED 05-07-10
8. TOTAL DEPTH OF BORING 17.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-07-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

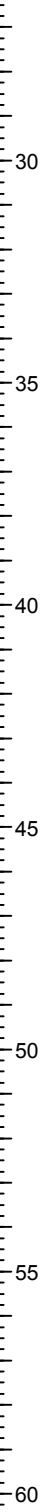
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-22.7	0.0		CLAY, lean, dark gray (CL)		
				NS	
-40.2	17.5				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-GC-16-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-16-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 36 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-07-10 COMPLETED 05-07-10
8. TOTAL DEPTH OF BORING 20.0 Ft.		16. ELEVATION TOP OF BORING -35.5 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-35.5	0.0		CLAY, lean, dark gray (CL)	NS	
-52.2	16.7				
-53.2	17.7		CLAY, organic-L, brown (OL)		
-55.5	20.0		SILT, inorganic-L, lt. gray (ML)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling</p>					

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 912,722 Y = 299,521			ELEVATION TOP OF BORING -35.5 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

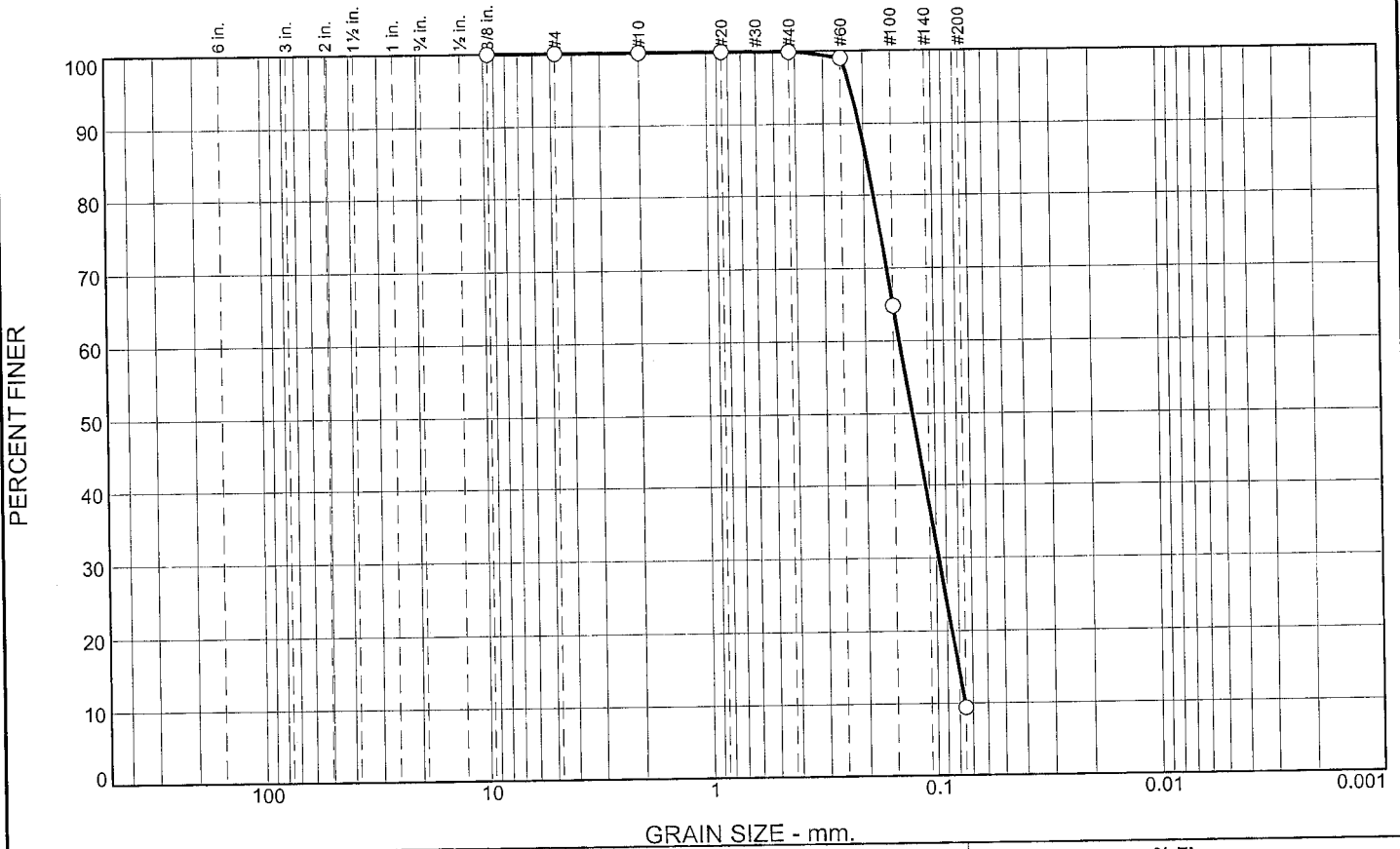


Boring Designation BI-GC-17-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-17-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 24 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-08-10
8. TOTAL DEPTH OF BORING 13.2 Ft.		16. ELEVATION TOP OF BORING -24.1 Ft.		COMPLETED 05-08-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-24.1	0.0		CLAY, lean, dark gray (CL)	NS	
-34.8	10.7				
-37.3	13.2		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, little clay, trace organic matter (SM)	A	Classification: SP-SM Color: 10YR 5/1-gray D50: 0.125 mm % Fines: 9.4
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	90.5	9.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.9		
#60	99.0		
#100	64.8		
#200	9.4		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2084 D₈₅= 0.1935 D₆₀= 0.1414
D₅₀= 0.1250 D₃₀= 0.0973 D₁₅= 0.0805
D₁₀= 0.0756 C_u= 1.87 C_c= 0.89

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-17-10A
Sample Number: TE Lab ID: 4473.12

Depth: 10.7 - 13.2 (ft)

Date: 5/17/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes Checked By: R.Byrd

Boring Designation BI-GC-18-10

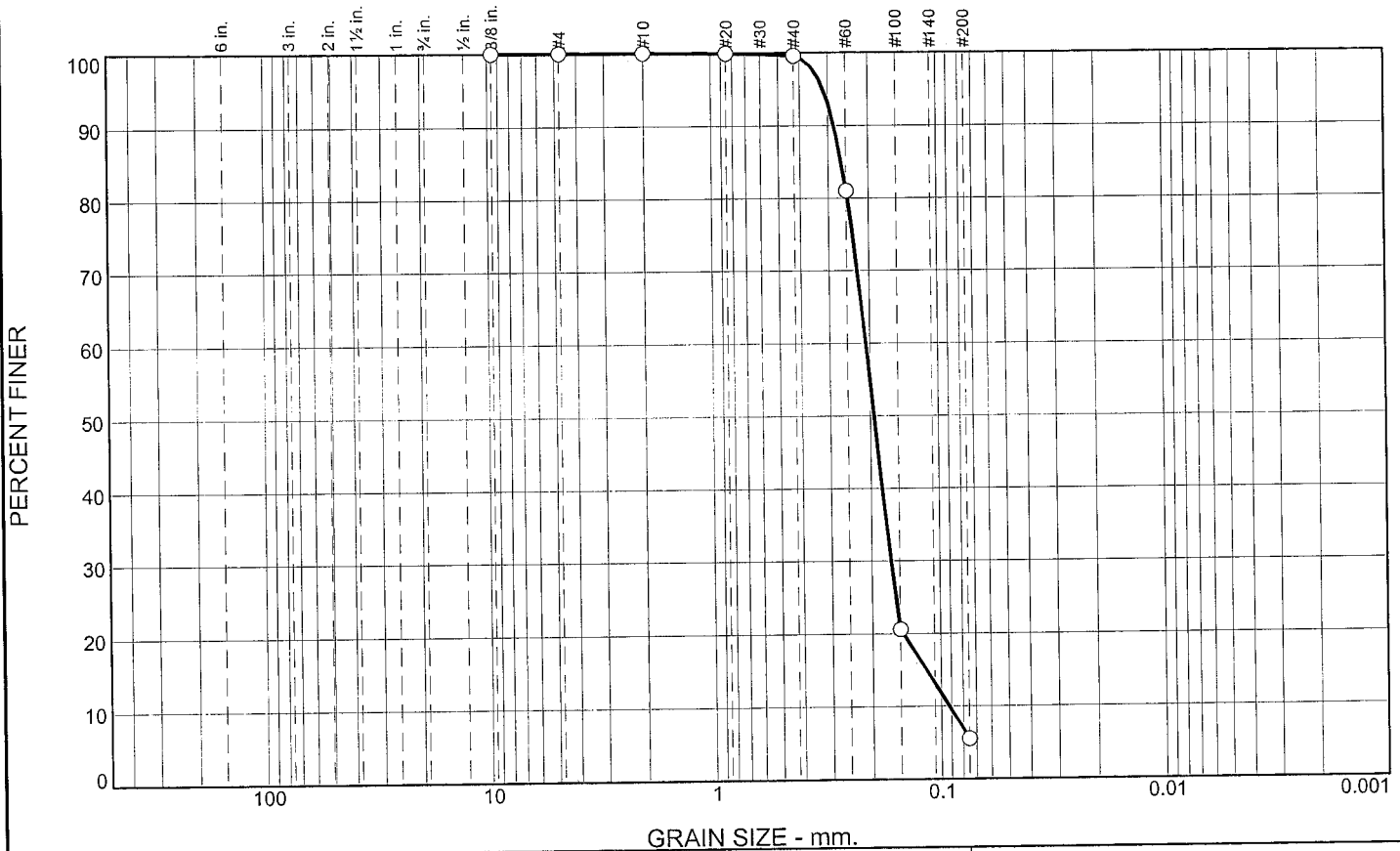
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-18-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 36 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-08-10
8. TOTAL DEPTH OF BORING 20.0 Ft.		16. ELEVATION TOP OF BORING -36.1 Ft.		COMPLETED 05-08-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-36.1	0.0		CLAY, lean, dark gray (CL)		
-49.9	13.8			NS	
-55.1	19.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt (SP)	A	Classification: SP-SM Color: 10YR 6/1-gray D50: 0.1924 mm % Fines: 5.5
-56.1	20.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, little clay (SM)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval.		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 916,873 Y = 293,788			ELEVATION TOP OF BORING -36.1 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	94.1	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.6		
#60	81.0		
#100	20.6		
#200	5.5		

Material Description

SAND, (SP-SM), fine grained, trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2823 D₈₅= 0.2621 D₆₀= 0.2077
D₅₀= 0.1924 D₃₀= 0.1641 D₁₅= 0.1160
D₁₀= 0.0921 C_u= 2.25 C_c= 1.41

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-18-10A
Sample Number: TE Lab ID: 4473.13

Depth: 13.8 19.0 (ft)

Date: 5/17/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
Figure	

Tested By: L.Stokes Checked By: R.Byrd

Boring Designation BI-GC-19-10

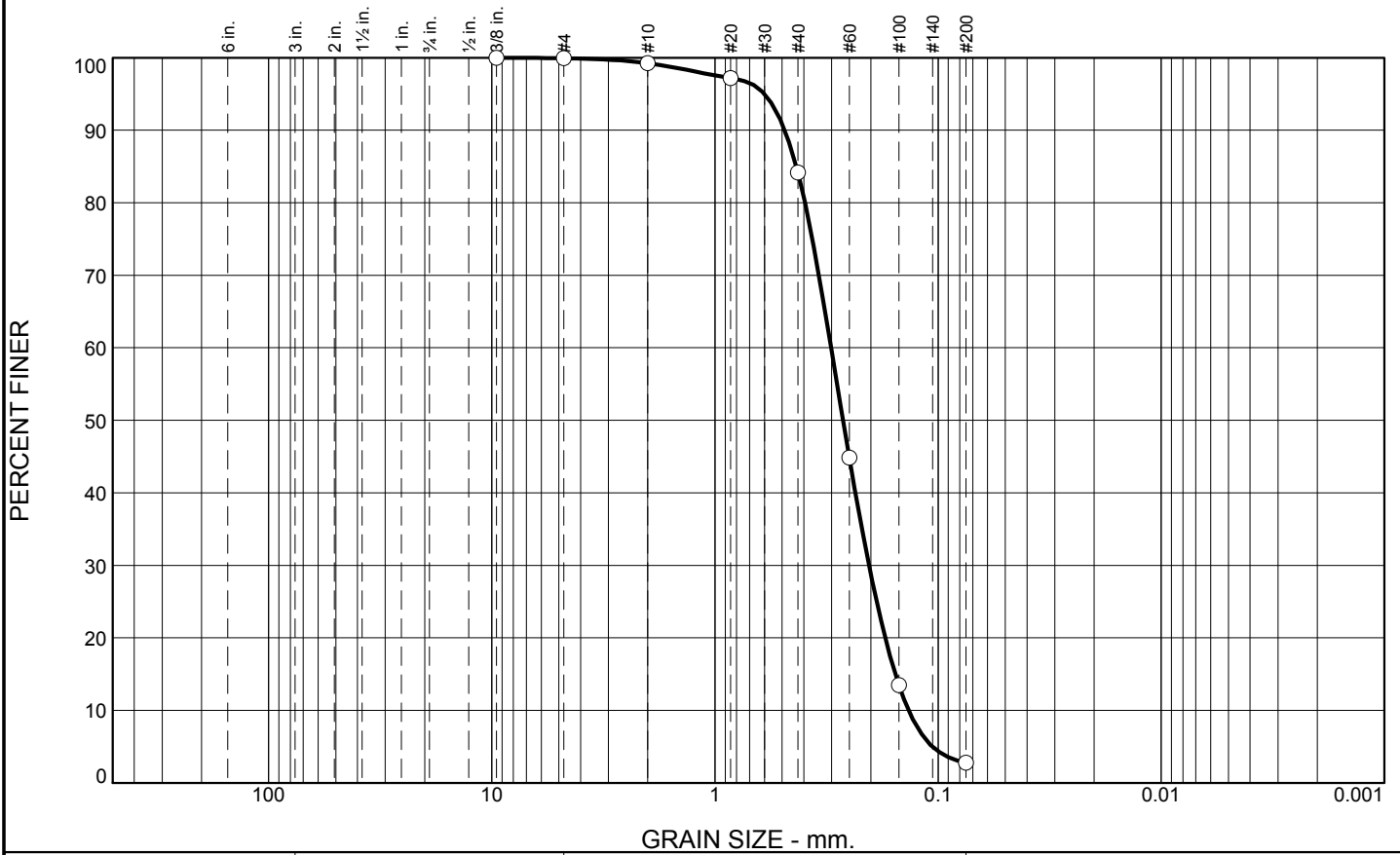
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-19-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 4
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-21-10
8. TOTAL DEPTH OF BORING 19.5 Ft.		16. ELEVATION TOP OF BORING -20.5 Ft.		COMPLETED 05-21-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-20.5	0.0				
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, little shell fragments, trace silt, gray and greenish gray (SP)	A	Classification: SP Color: 2.5Y 7/2-light gray D50: 0.2667 mm % Fines: 2.8
-25.5	5.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, gray (SP)	B	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2753 mm % Fines: 2.3
-30.5	10.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, lt. gray (SP)	C	Classification: SP Color: 2.5Y 7.5/1-light gray D50: 0.2955 mm % Fines: 2.4
-35.5	15.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray to gray (SP)	D	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2526 mm % Fines: 3.6
-39.5	19.0		At El. -39.0 Ft., trace silt	NS	
-40.0	19.5		SAND, silty, with clay lenses (SM)		
NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling					

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 932,517 Y = 264,220			ELEVATION TOP OF BORING -20.5 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.7	15.0	81.4	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.2		
#20	97.2		
#40	84.2		
#60	44.8		
#100	13.5		
#200	2.8		

Material Description

SAND, (SP), medium to fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D ₉₀ = 0.4864	D ₈₅ = 0.4319	D ₆₀ = 0.3015
D ₅₀ = 0.2667	D ₃₀ = 0.2039	D ₁₅ = 0.1556
D ₁₀ = 0.1356	C _u = 2.22	C _c = 1.02

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

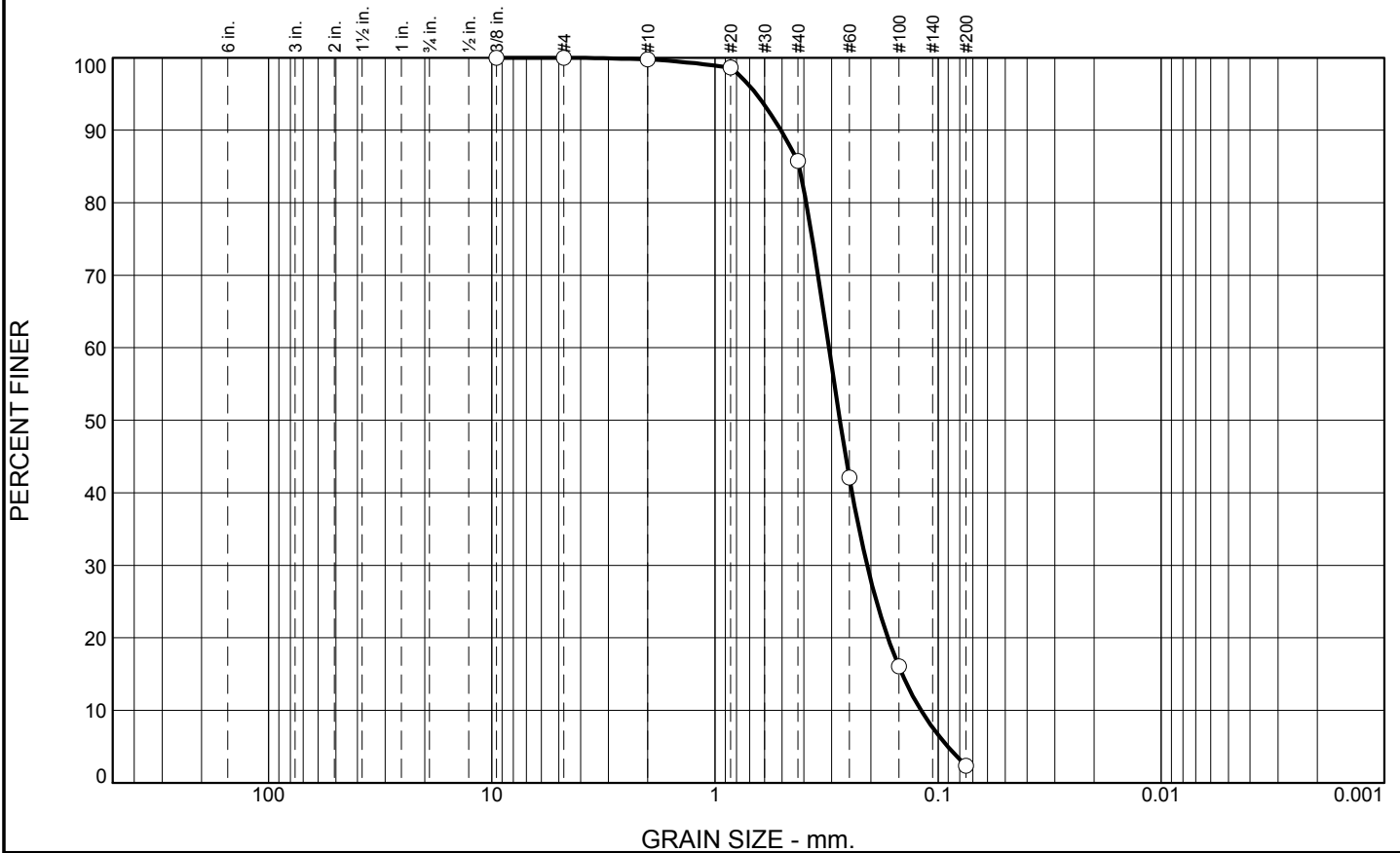
* (no specification provided)

Location: USACE Sample # BI-GC-19-10A **Sample Number:** TE Lab ID: 4489.01 **Depth:** 0.0 - 5.0 (ft.) **Date:** 5/28/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	14.1	83.4	2.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	98.6		
#40	85.7		
#60	42.1		
#100	16.1		
#200	2.3		

Material Description

SAND, (SP), medium to fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5061 D₈₅= 0.4199 D₆₀= 0.3083
D₅₀= 0.2753 D₃₀= 0.2081 D₁₅= 0.1450
D₁₀= 0.1193 C_u= 2.58 C_c= 1.18

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10B965

* (no specification provided)

Location: USACE Sample # BI-GC-19-10B
Sample Number: TE Lab ID: 4489.02

Depth: 5.0 - 10.0 (ft.)

Date: 5/28/10

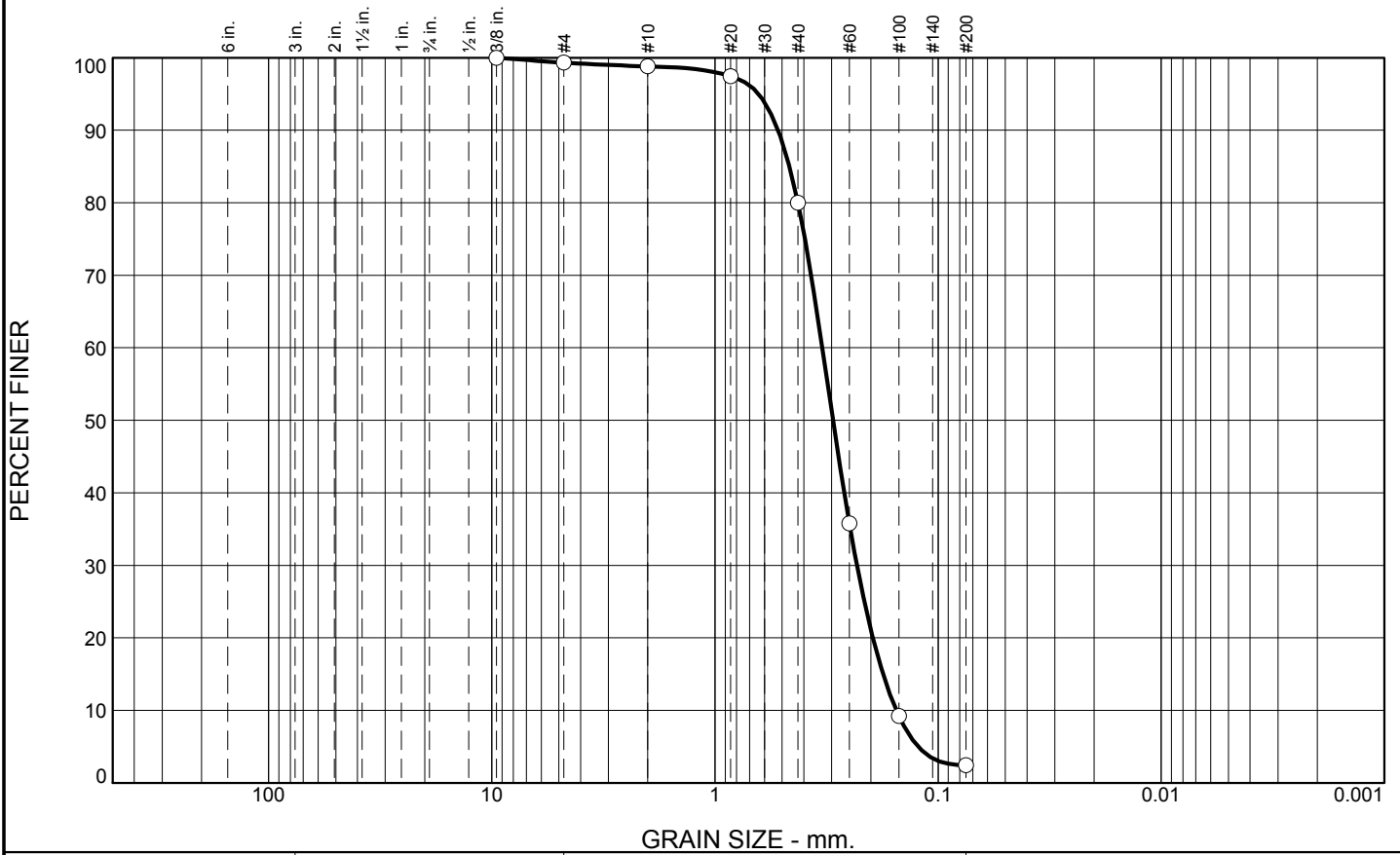
<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	0.5	18.8	77.6	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.3		
#10	98.8		
#20	97.4		
#40	80.0		
#60	35.8		
#100	9.2		
#200	2.4		

Material Description

SAND, (SP), medium to fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5212 D₈₅= 0.4637 D₆₀= 0.3303
D₅₀= 0.2955 D₃₀= 0.2311 D₁₅= 0.1764
D₁₀= 0.1539 C_u= 2.15 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-19-10C
Sample Number: TE Lab ID: 4489.03

Depth: 10.0 - 15.0 (ft.)

Date: 5/28/10

Thompson Engineering

Mobile, Alabama

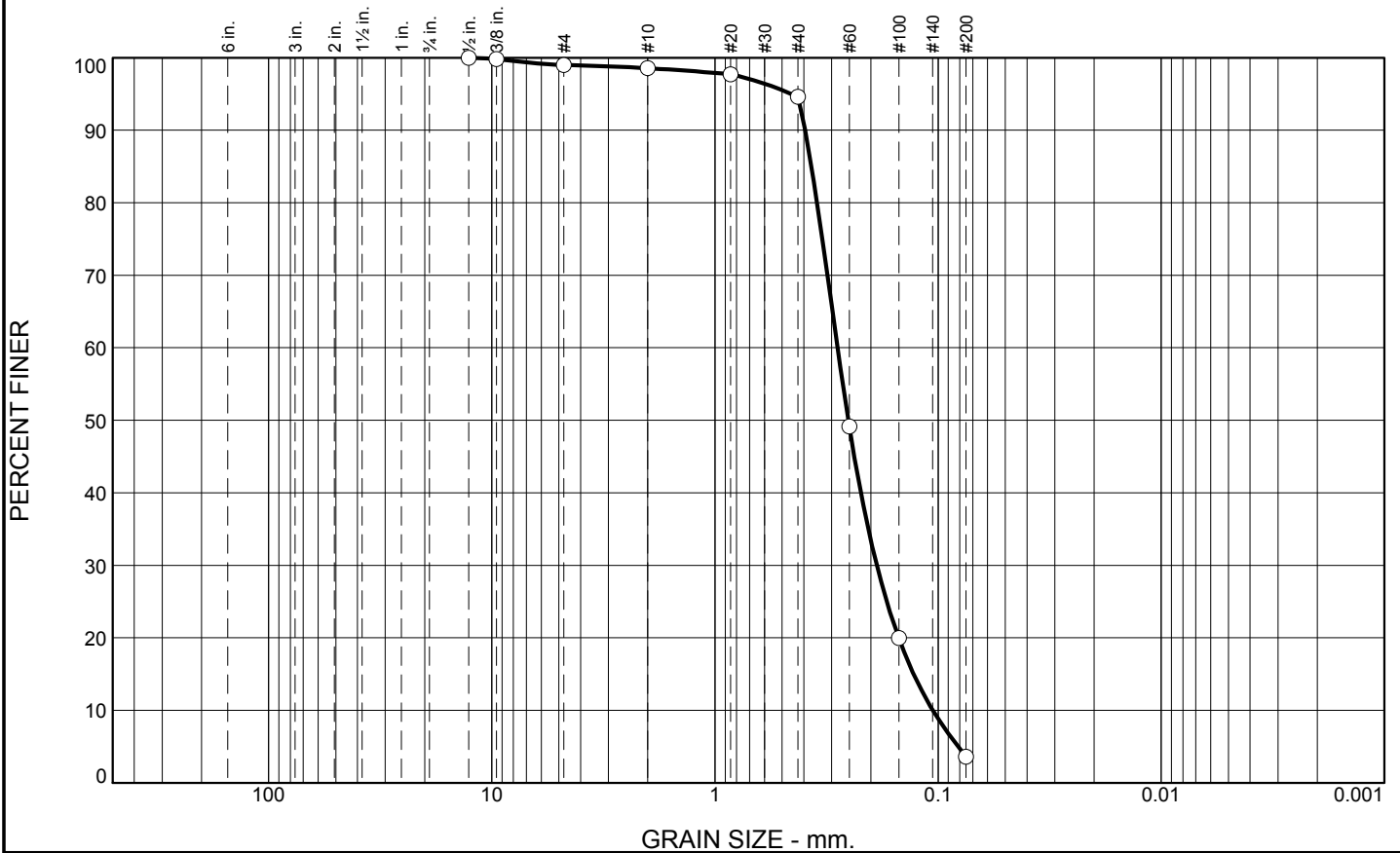
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	0.5	3.9	91.0	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.8		
#4	99.0		
#10	98.5		
#20	97.7		
#40	94.6		
#60	49.1		
#100	20.0		
#200	3.6		

Material Description

SAND, (SP), fine grained, with shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3949 D₈₅= 0.3698 D₆₀= 0.2820
D₅₀= 0.2526 D₃₀= 0.1883 D₁₅= 0.1288
D₁₀= 0.1056 C_u= 2.67 C_c= 1.19

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-19-10D
Sample Number: TE Lab ID: 4489.04

Depth: 15.0 - 19.0 (ft.)

Date: 5/28/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: G.Fancher

Checked By: R.Byrd

Boring Designation BI-GC-20-10

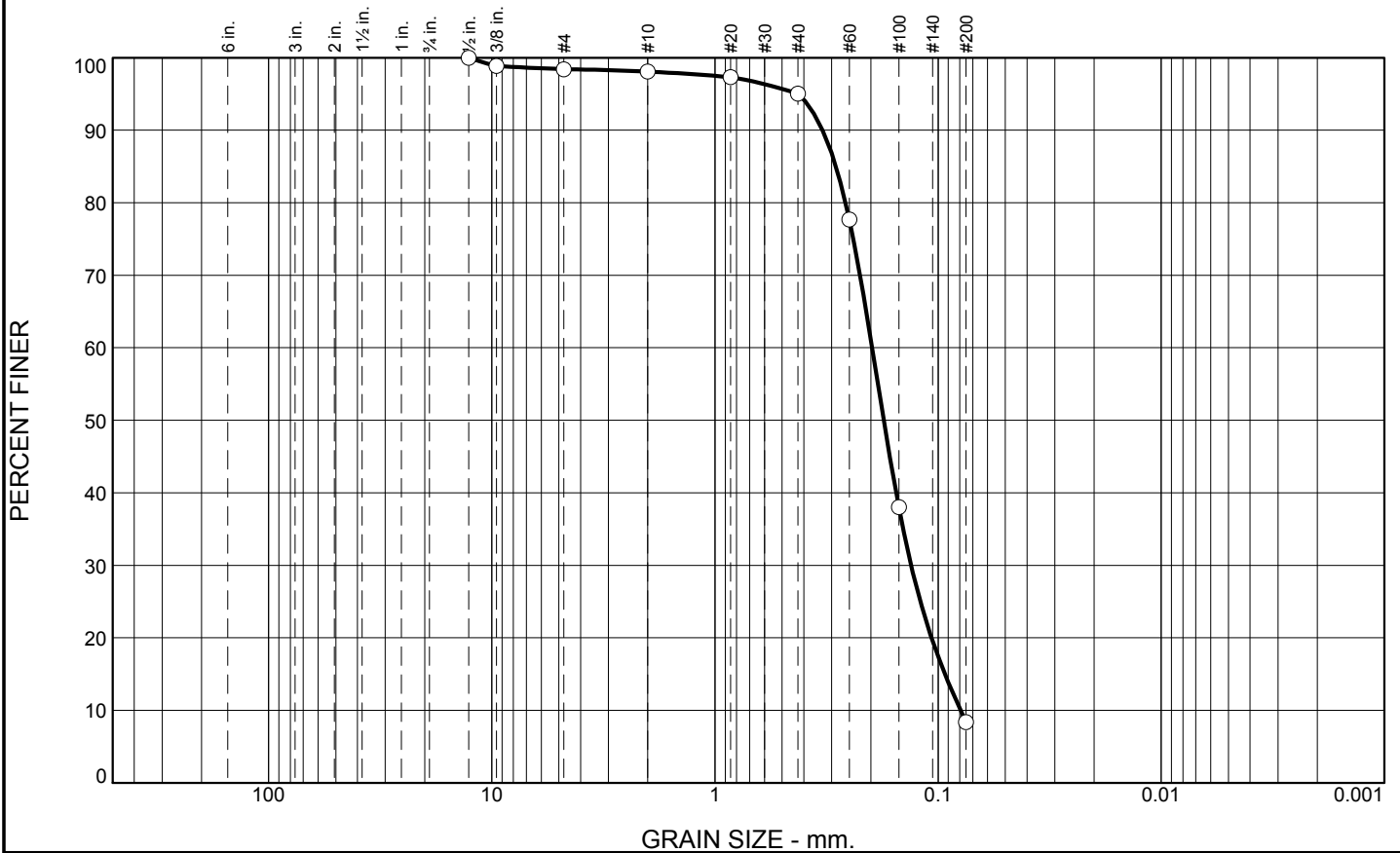
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-20-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 20 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -18.7 Ft.		STARTED 06-01-10
8. TOTAL DEPTH OF BORING 19.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-01-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.7	0.0		CLAY, lean, dark gray (CL)	NS	
-23.7	5.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, trace shell fragments, lt. gray (SP)	A	Classification: SP-SM Color: 2.5Y 7/2-light gray D50: 0.1752 mm % Fines: 8.4
-31.7	13.0		CLAY, lean, dark gray (CL)	B	Classification: SP Color: 2.5Y 7/2-light gray D50: 0.1744 mm % Fines: 3.6
-38.2	19.5		CLAY, lean, dark gray (CL)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 932,458 Y = 264,977			ELEVATION TOP OF BORING -18.7 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	0.3	3.1	86.6	8.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	98.9		
#4	98.4		
#10	98.1		
#20	97.3		
#40	95.0		
#60	77.7		
#100	38.0		
#200	8.4		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3293 D₈₅= 0.2870 D₆₀= 0.1976
D₅₀= 0.1752 D₃₀= 0.1321 D₁₅= 0.0932
D₁₀= 0.0793 C_u= 2.49 C_c= 1.11

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-20-10A
Sample Number: TE Lab ID: 4519.17

Depth: 5.0 - 9.0 (ft.)

Date: 6/12/10

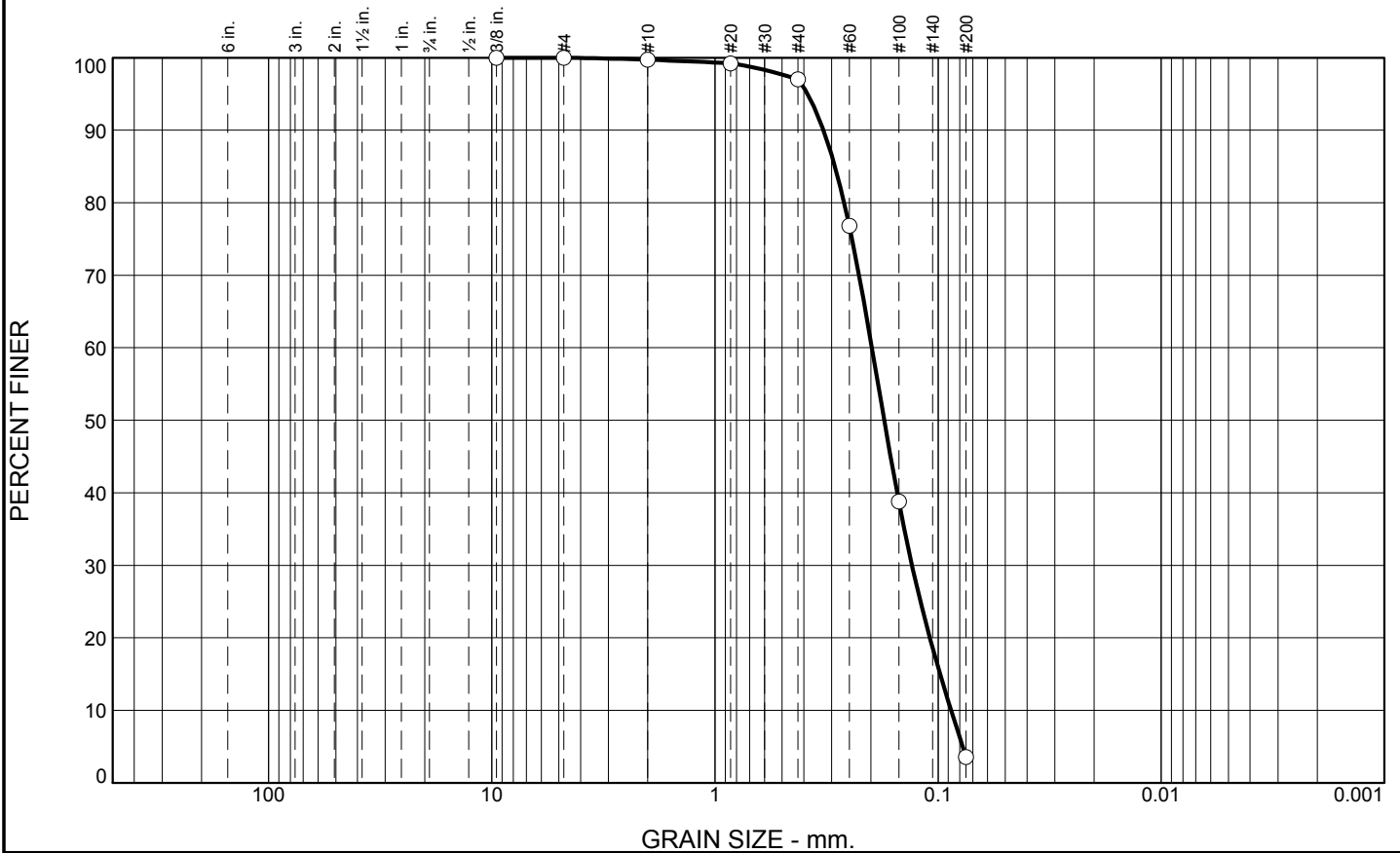
<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	2.7	93.4	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.2		
#40	97.0		
#60	76.8		
#100	38.8		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3263 D₈₅= 0.2899 D₆₀= 0.1981
D₅₀= 0.1744 D₃₀= 0.1309 D₁₅= 0.0980
D₁₀= 0.0875 C_u= 2.26 C_c= 0.99

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-20-10B
Sample Number: TE Lab ID: 4519.18

Depth: 9.0 - 13.0 (ft.)

Date: 6/12/10






<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: R.Martin

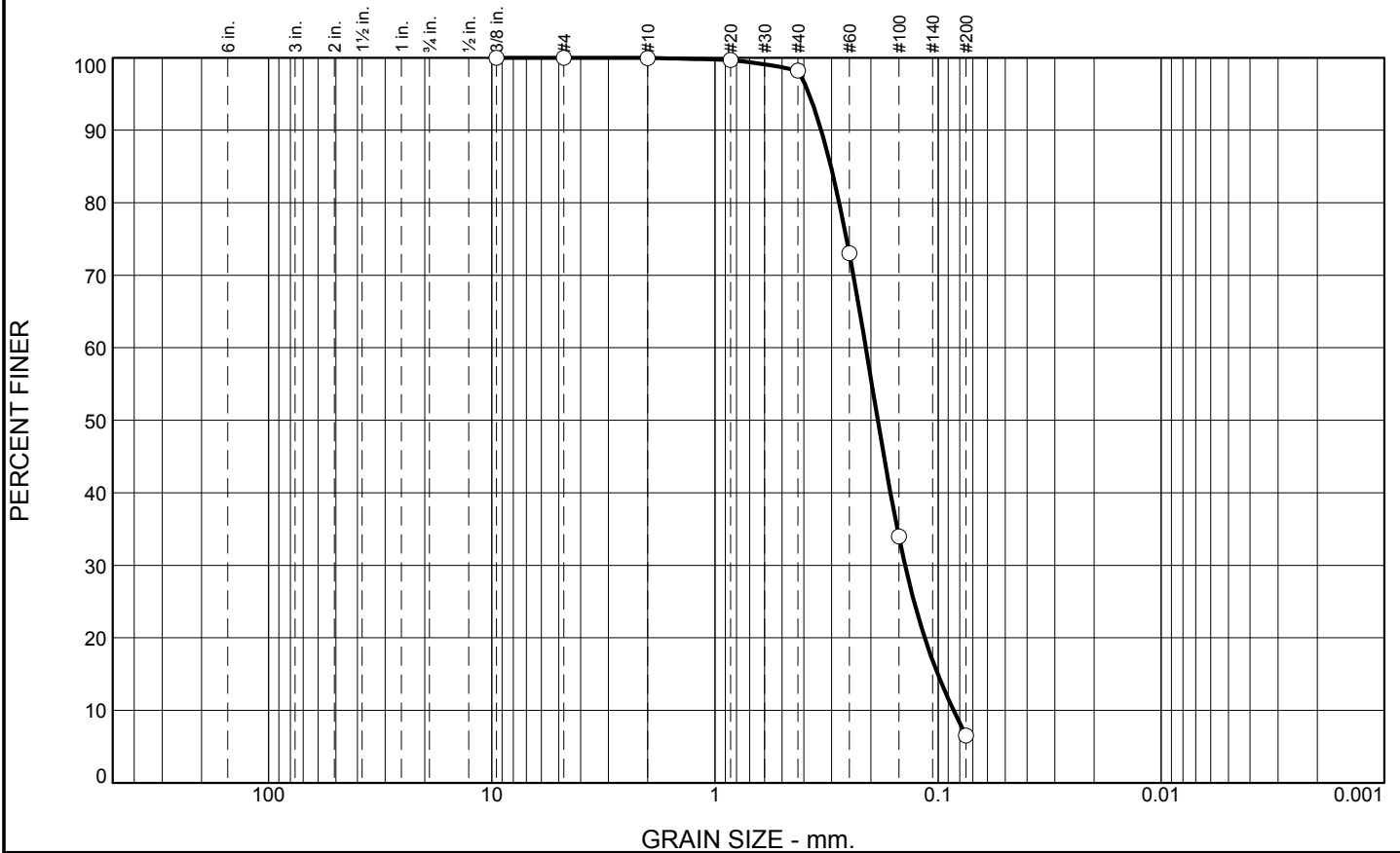
Checked By: R.Byrd

Boring Designation BI-GC-21-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-21-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 20 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -18.8 Ft.		STARTED 06-01-10
8. TOTAL DEPTH OF BORING 16.7 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-01-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.8	0.0				
-21.8	3.0		CLAY, lean, dark gray (CL)	NS	
-23.8	5.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, gray (SM)	A	Classification: SP-SM Color: 2.5Y 7/2-light gray D50: 0.1863 mm % Fines: 6.5
-25.3	6.5		CLAY, lean, dark gray (CL)	NS	
-29.3	10.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, trace shell fragments, lt. gray (SP)	B	Classification: SP-SM Color: 2.5Y 7/2-light gray D50: 0.1848 mm % Fines: 8.1
-35.5	16.7		CLAY, lean, dark gray (CL)	NS	
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.8	91.7	6.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	98.2		
#60	73.0		
#100	34.0		
#200	6.5		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3340 D₈₅= 0.3022 D₆₀= 0.2109
D₅₀= 0.1863 D₃₀= 0.1406 D₁₅= 0.1004
D₁₀= 0.0852 C_u= 2.47 C_c= 1.10

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-21-10A
Sample Number: TE Lab ID: 4519.15

Depth: 3.0 - 5.0 (ft.)

Date: 6/12/10

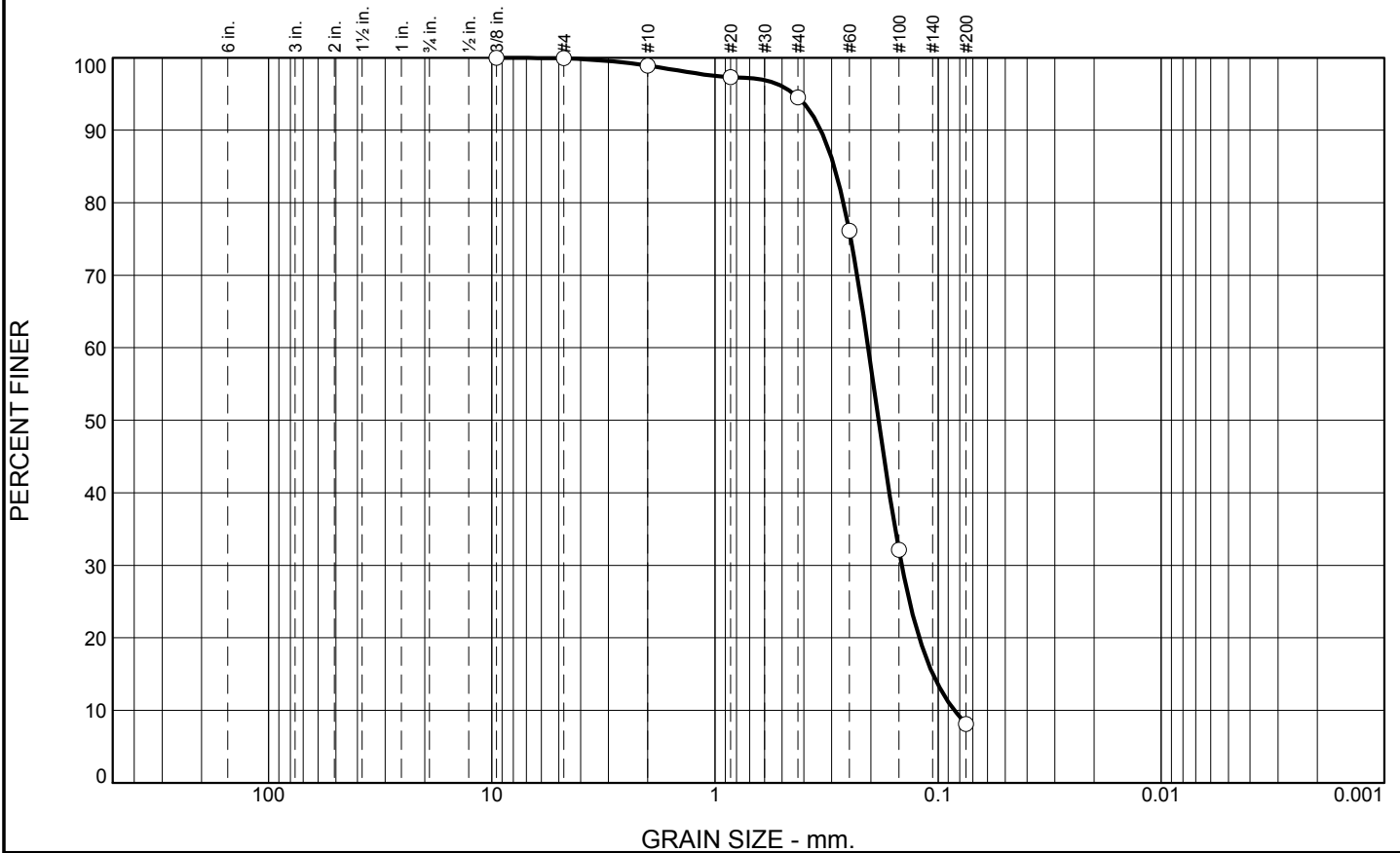
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	1.0	4.4	86.4	8.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	98.9		
#20	97.3		
#40	94.5		
#60	76.1		
#100	32.1		
#200	8.1		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3351 D₈₅= 0.2921 D₆₀= 0.2058
D₅₀= 0.1848 D₃₀= 0.1456 D₁₅= 0.1056
D₁₀= 0.0844 C_u= 2.44 C_c= 1.22

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-21-10B
Sample Number: TE Lab ID: 4519.16

Depth: 6.5 - 10.5 (ft.)

Date: 6/12/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009




Figure

Tested By: R.Martin

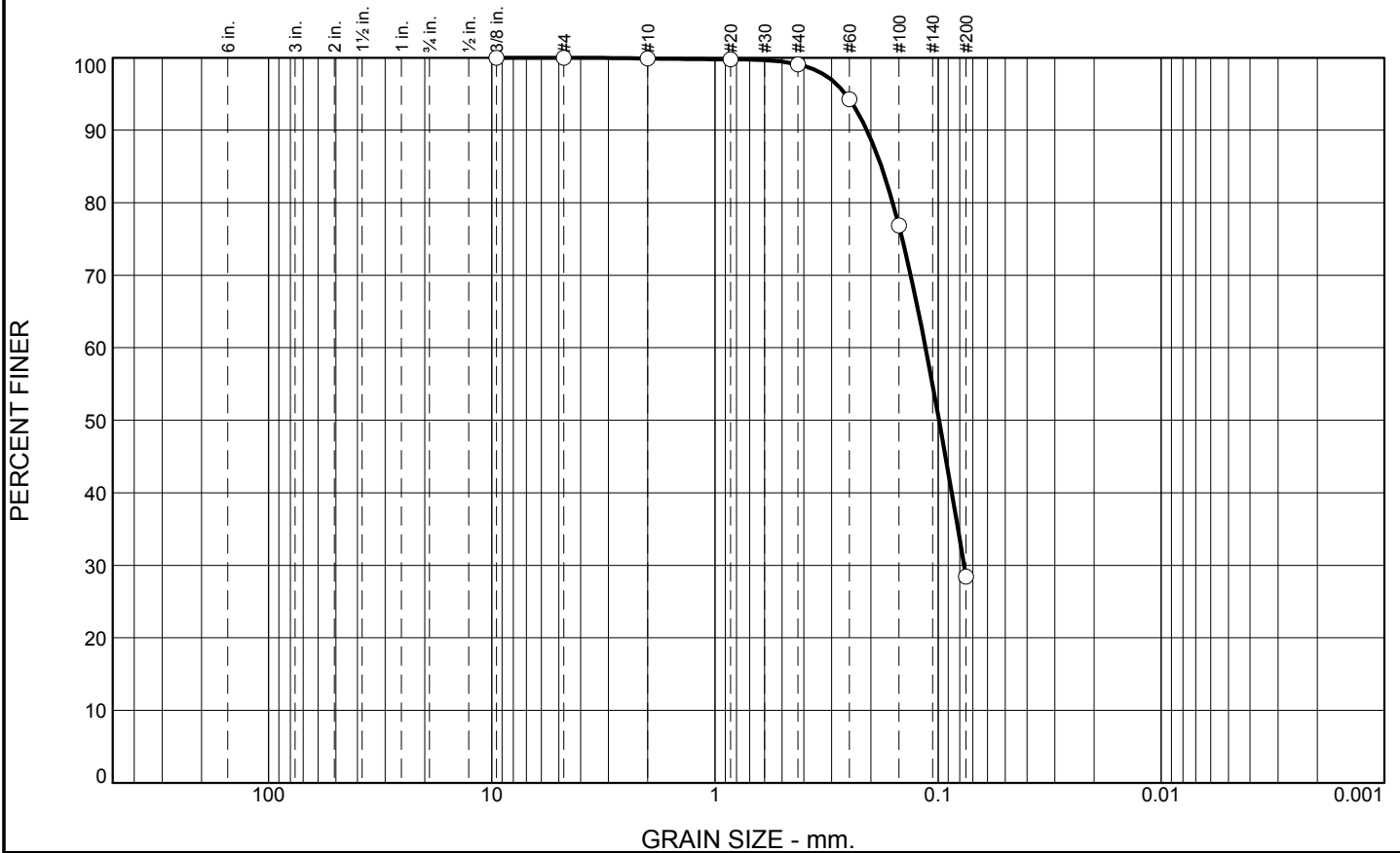
Checked By: R.Byrd

Boring Designation BI-GC-22-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-22-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 932,102 N = 265,712	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 42 Ft.		UNDISTURBED (UD) 0
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-10-10
8. TOTAL DEPTH OF BORING 15.1 Ft.		16. ELEVATION TOP OF BORING -41.4 Ft.		COMPLETED 06-10-10
		17. TOTAL RECOVERY FOR BORING 100%		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-41.4	0.0				
-43.9	2.5		CLAY, lean, dark gray (CL)	NS	
-48.4	7.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace organic matter, lt. gray (SM)	A	Classification: SM Color: 2.5Y 5/2-grayish brown D50: 0.0991 mm % Fines: 28.4
-56.5	15.1		CLAY, lean, dark gray (CL)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.8	70.7	28.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.1		
#60	94.3		
#100	76.9		
#200	28.4		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2086 D₈₅= 0.1797 D₆₀= 0.1138
D₅₀= 0.0991 D₃₀= 0.0765 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-22-10A
Sample Number: TE Lab ID: 4538.36

Depth: 5.0 - 7.0 (ft.)

Date: 6/19/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

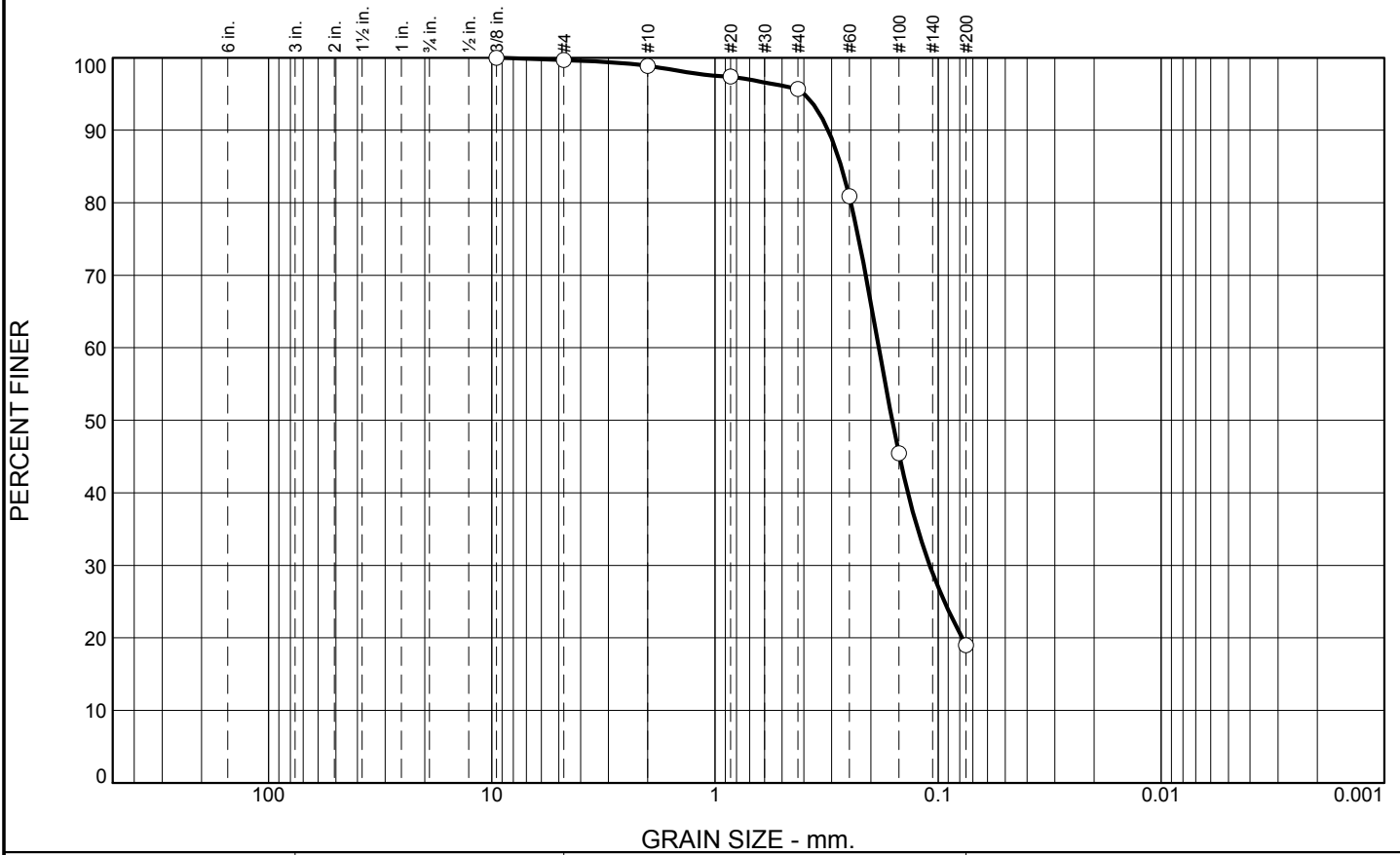
Checked By: R.Byrd

Boring Designation BI-GC-23-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-23-10		LOCATION COORDINATES E = 932,022 N = 265,043		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		HORIZONTAL NAD83
4. NAME OF DRILLER Construction Solutions International, Inc.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		VERTICAL NAVD88
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
6. THICKNESS OF OVERBURDEN N/A		12. TOTAL SAMPLES		DISTURBED 3
7. DEPTH DRILLED INTO ROCK N/A		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
8. TOTAL DEPTH OF BORING 13.9 Ft.		14. WATER DEPTH 32 Ft.		15. DATE BORING
		16. ELEVATION TOP OF BORING -31.3 Ft.		STARTED 06-10-10
		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-10-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-31.3	0.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	A	Classification: SM Color: 2.5Y 5.5/2-brownish gray D50: 0.1607 mm % Fines: 19
			At El. -35.4 Ft., brown	B	Classification: SM Color: 2.5Y 6/2-light brownish gray D50: 0.1085 mm % Fines: 27.9
-38.3	7.0		CLAY, lean, dark gray (CL)	NS	
-40.3	9.0		SAND, silty, mostly fine to medium-grained sand-sized quartz (SM)	C	Classification: SM Color: 2.5Y 6/2-light brownish gray D50: 0.0874 mm % Fines: 39.7
-42.3	11.0		CLAY, lean, dark gray (CL)	NS	
-45.2	13.9		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.8	3.2	76.7	19.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	98.9		
#20	97.4		
#40	95.7		
#60	80.9		
#100	45.4		
#200	19.0		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3108 D₈₅= 0.2714 D₆₀= 0.1844
D₅₀= 0.1607 D₃₀= 0.1091 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-23-10A
Sample Number: TE Lab ID: 4538.33

Depth: 0.0 - 4.1 (ft.)

Date: 6/19/10

Thompson Engineering

Mobile, Alabama

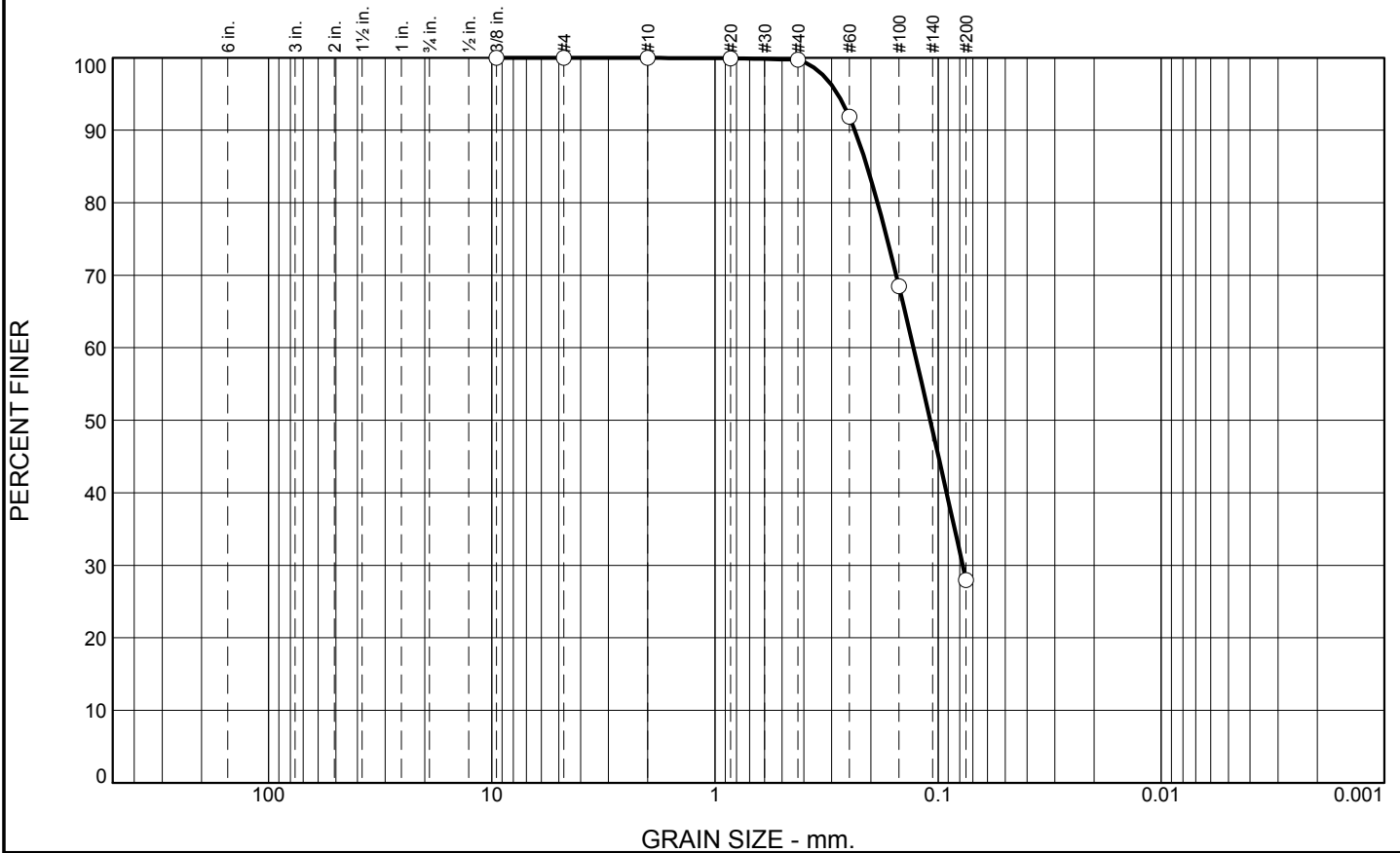
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	71.8	27.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.7		
#60	91.8		
#100	68.5		
#200	27.9		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2364 D₈₅= 0.2082 D₆₀= 0.1289
D₅₀= 0.1085 D₃₀= 0.0776 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

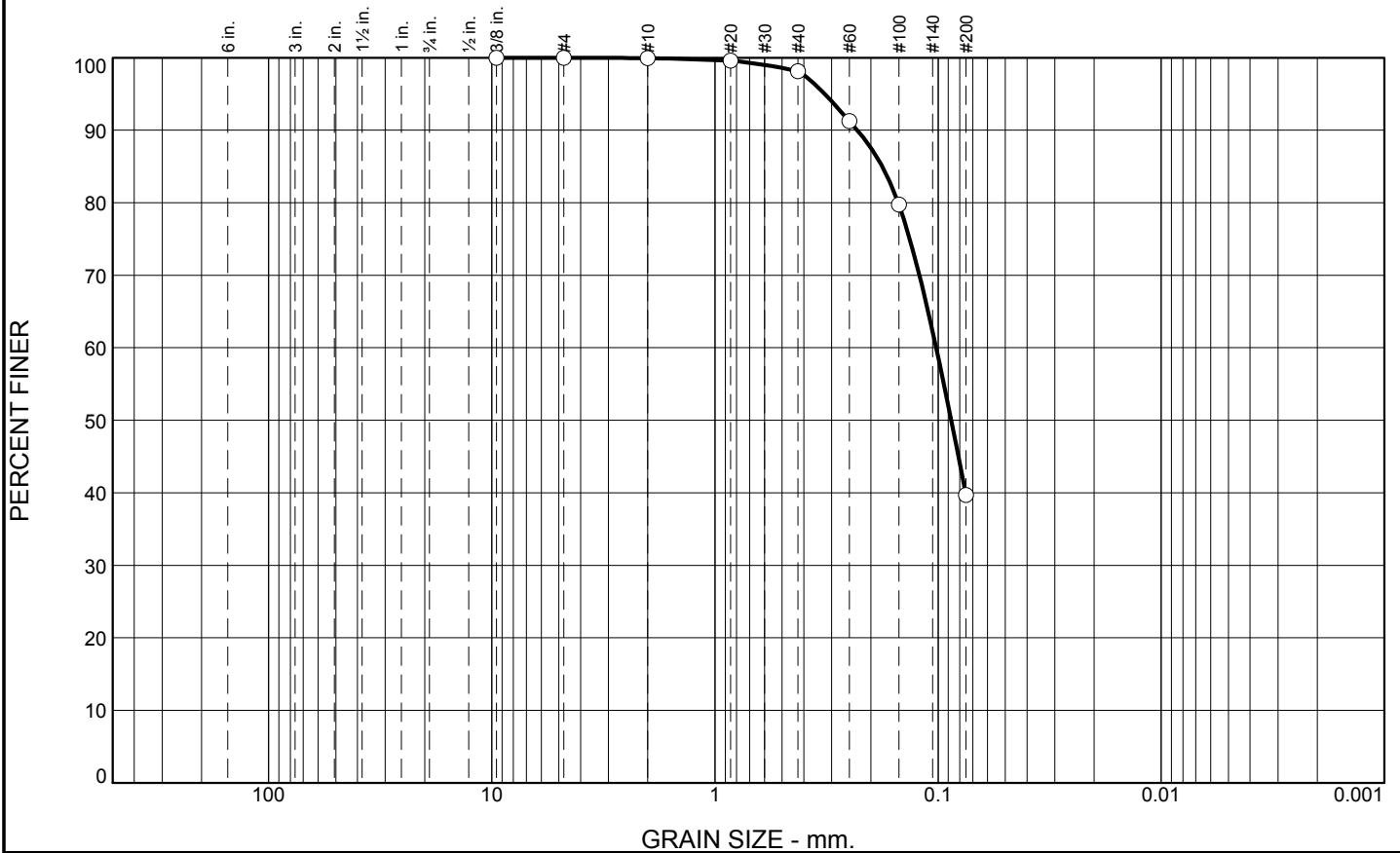
* (no specification provided)

Location: USACE Sample # BI-GC-23-10B **Sample Number:** TE Lab ID: 4538.34 **Depth:** 4.1 - 7.0 (ft.) **Date:** 6/19/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Figure</p>
----------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.8	58.4	39.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.6		
#40	98.1		
#60	91.2		
#100	79.8		
#200	39.7		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2306 D₈₅= 0.1779 D₆₀= 0.1020
D₅₀= 0.0874 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-23-10C
Sample Number: TE Lab ID: 4538.35

Depth: 9.0 - 11.0 (ft.)

Date: 6/19/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------




Figure

Tested By: R.Martin

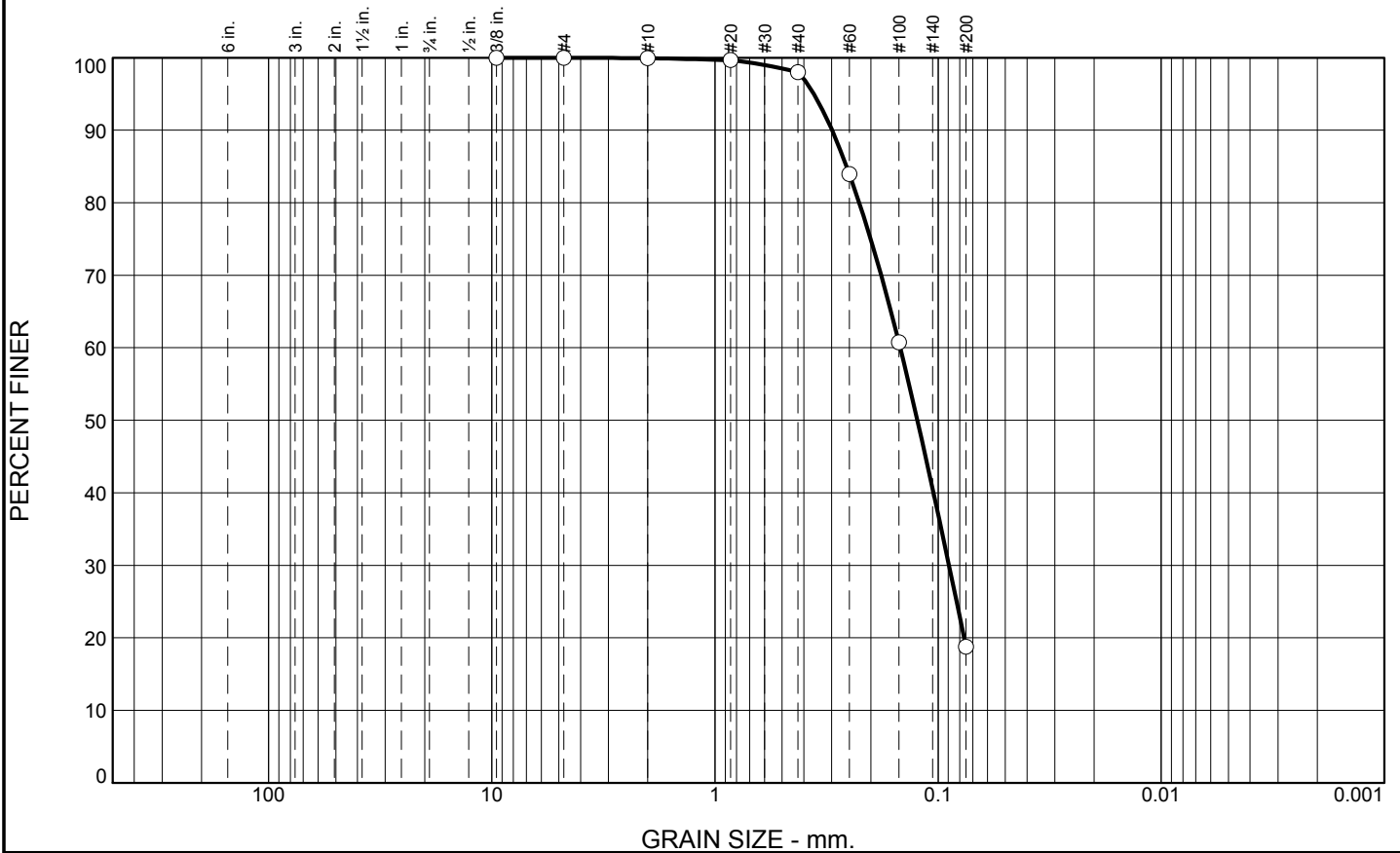
Checked By: R.Byrd

Boring Designation BI-GC-24-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-24-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 34 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-10-10
8. TOTAL DEPTH OF BORING 13.6 Ft.		16. ELEVATION TOP OF BORING -32.8 Ft.		COMPLETED 06-10-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-32.8	0.0				
			CLAY, lean, dark gray (CL)	NS	
-38.2	5.4				
			SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	A	Classification: SM Color: 2.5Y 5.5/2-brownish gray D50: 0.1239 mm % Fines: 18.8
-42.3	9.5				
			CLAY, lean, dark gray (CL)	NS	
-46.4	13.6				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.9	79.2	18.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	98.0		
#60	84.0		
#100	60.7		
#200	18.8		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2986 D₈₅= 0.2572 D₆₀= 0.1479
D₅₀= 0.1239 D₃₀= 0.0894 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-24-10A
Sample Number: TE Lab ID: 4538.30

Depth: 5.4 - 9.5 (ft.)

Date: 6/19/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: R.Martin

Checked By: R.Byrd

Boring Designation BI-GC-25-10

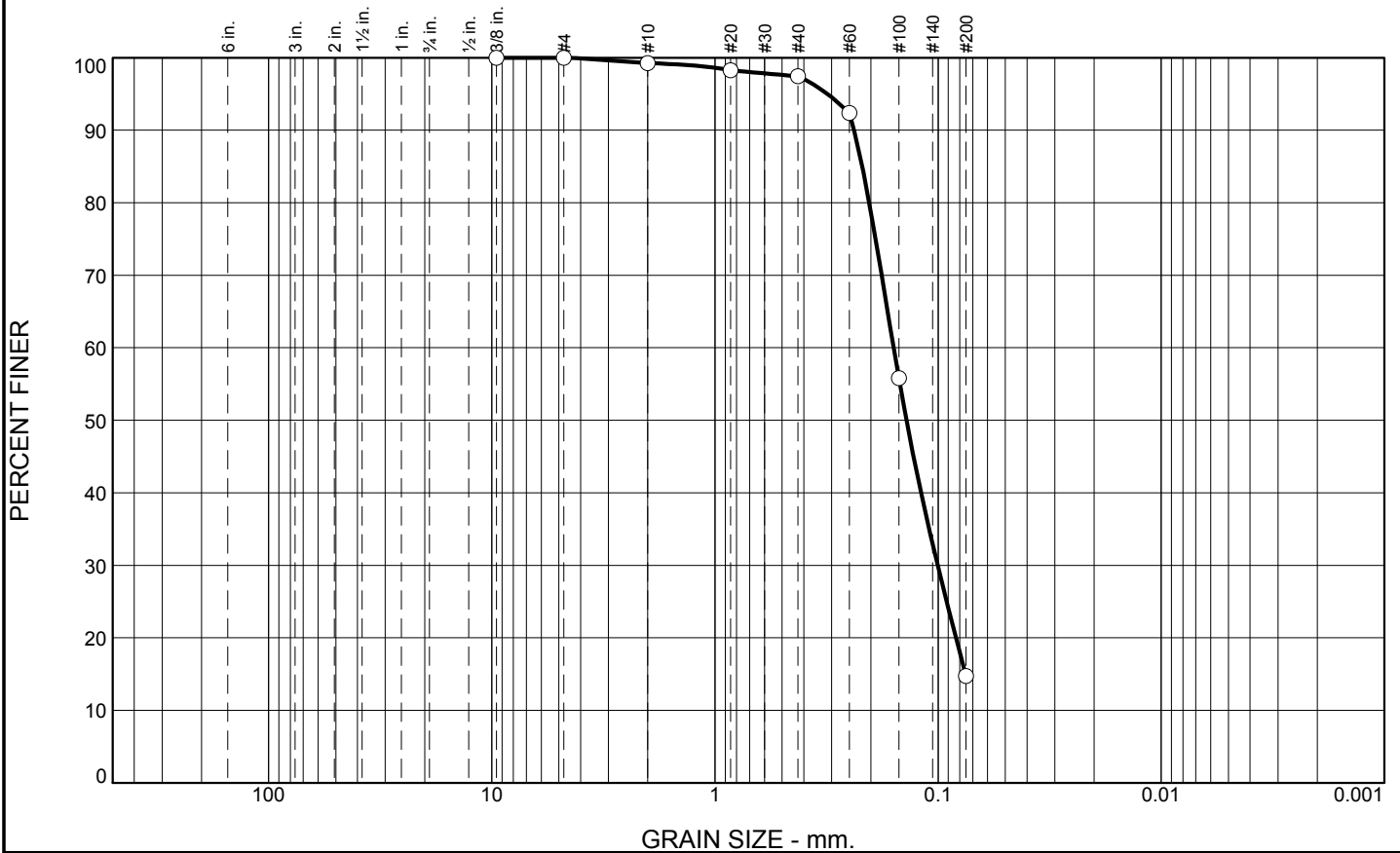
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-GC-25-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 19 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-10-10
8. TOTAL DEPTH OF BORING 19.9 Ft.		16. ELEVATION TOP OF BORING -18.0 Ft.		COMPLETED 06-10-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.0	0.0				
		▨	CLAY, lean, dark gray (CL)	NS	
-22.4	4.4				
		▧	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	A	Classification: SM Color: 2.5Y 6/2-light brownish gray D50: 0.1386 mm % Fines: 14.7
-28.0	10.0				
		▧	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, trace shell fragments, lt. gray (SP)	B	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1877 mm % Fines: 3.7
-34.0	16.0				
		▨	CLAY, lean, dark gray (CL)	NS	
-37.9	19.9				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 932,107 Y = 264,541			ELEVATION TOP OF BORING -18.0 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	1.9	82.7	14.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.3		
#20	98.2		
#40	97.4		
#60	92.4		
#100	55.8		
#200	14.7		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2380 D₈₅= 0.2188 D₆₀= 0.1583
D₅₀= 0.1386 D₃₀= 0.1004 D₁₅= 0.0754
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-25-10A
Sample Number: TE Lab ID: 4538.31

Depth: 4.4 - 10.0 (ft.)

Date: 6/19/10

Thompson Engineering

Mobile, Alabama

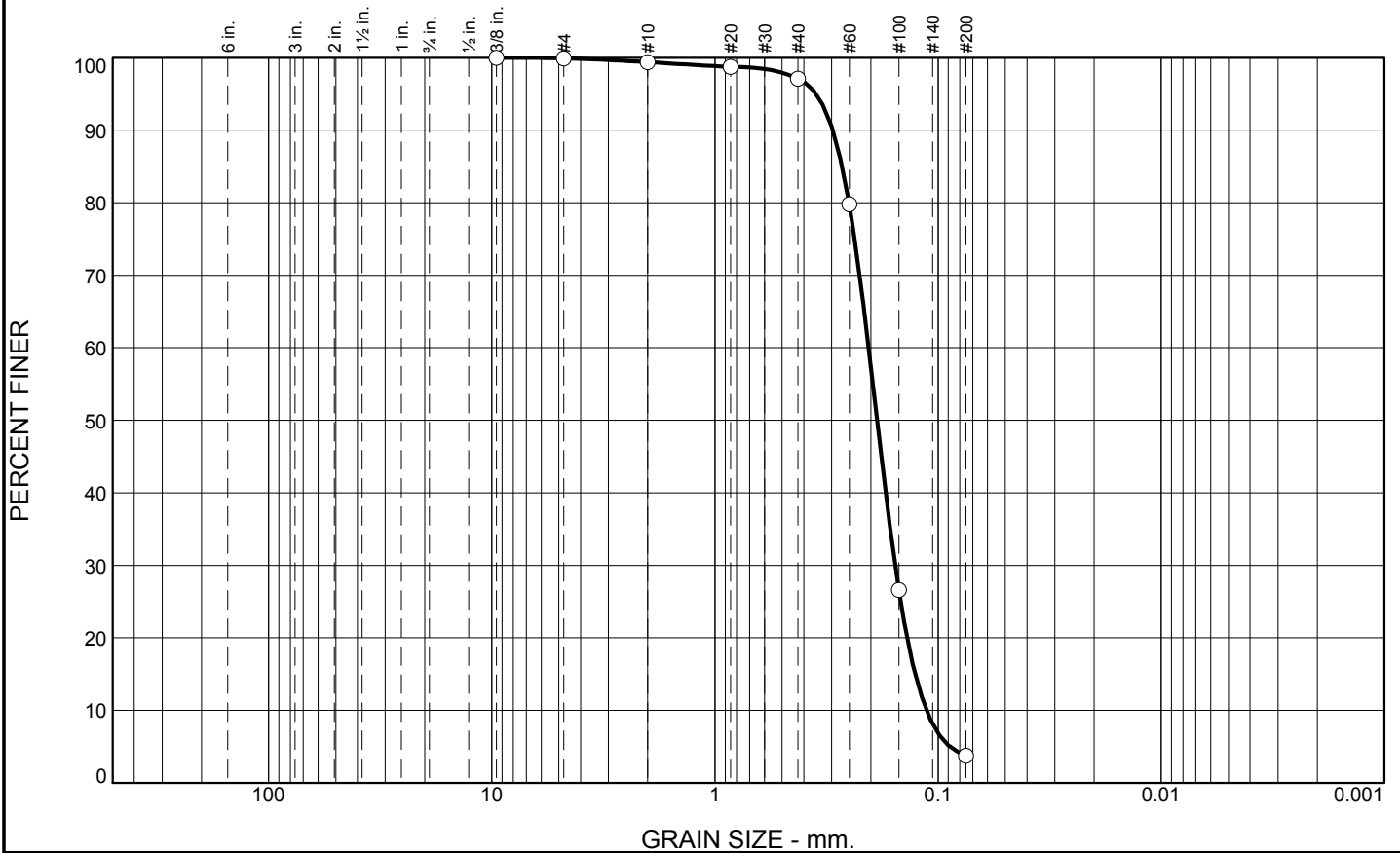
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.5	2.3	93.4	3.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.4		
#20	98.8		
#40	97.1		
#60	79.8		
#100	26.6		
#200	3.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2963 D₈₅= 0.2692 D₆₀= 0.2049
D₅₀= 0.1877 D₃₀= 0.1558 D₁₅= 0.1267
D₁₀= 0.1127 C_u= 1.82 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-25-10B
Sample Number: TE Lab ID: 4538.32

Depth: 10.0 - 16.0 (ft.)

Date: 6/19/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

Checked By: R.Byrd

Boring Designation BI-GC-26-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-26-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 43 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 06-10-10 COMPLETED 06-10-10		
8. TOTAL DEPTH OF BORING 16.3 Ft.		16. ELEVATION TOP OF BORING -41.9 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

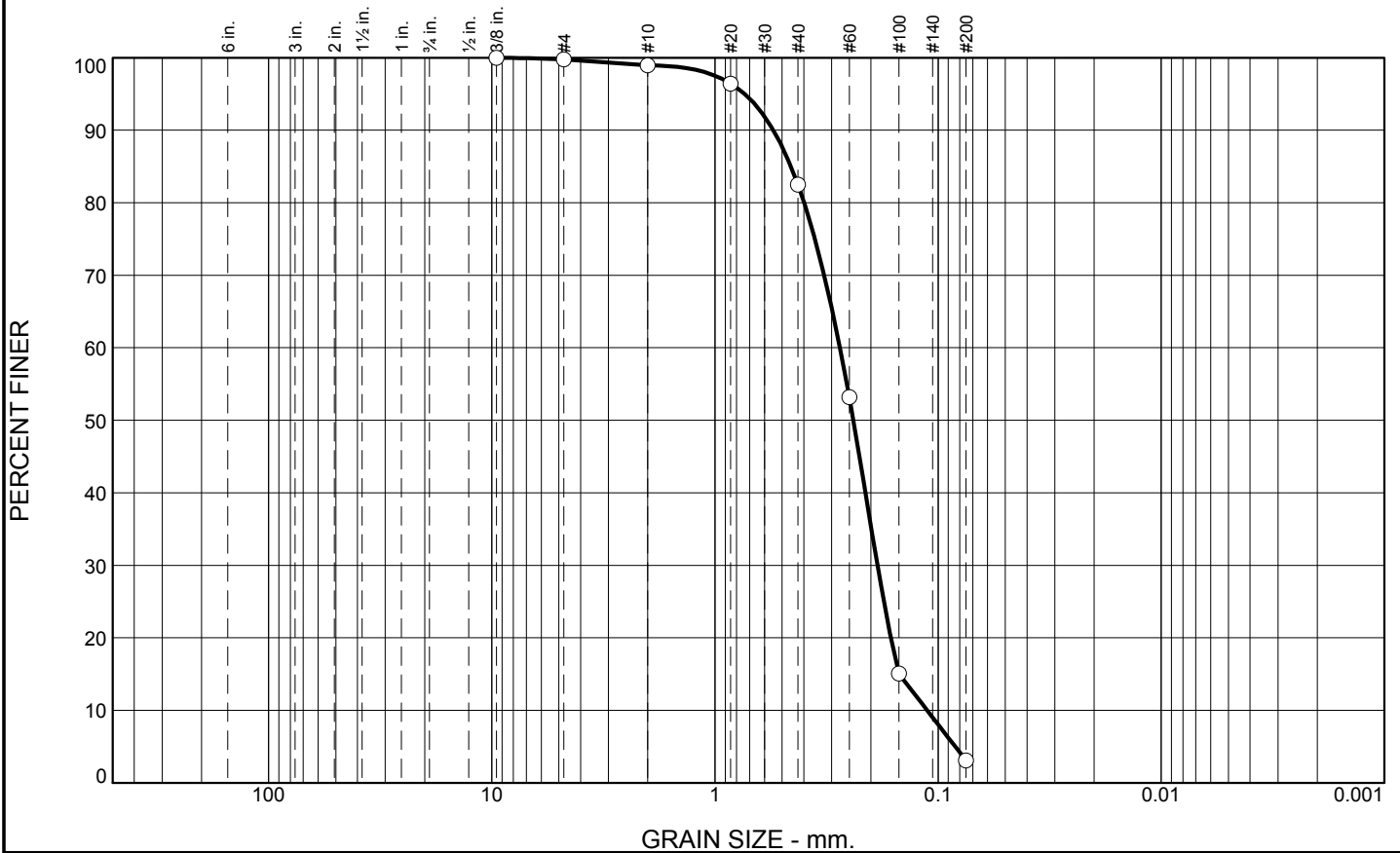
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-41.9	0.0		CLAY, lean, dark gray (CL)	NS	
-58.2	16.3				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-GC-27-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-27-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-11-10
8. TOTAL DEPTH OF BORING 16.9 Ft.		16. ELEVATION TOP OF BORING -18.9 Ft.		COMPLETED 06-11-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.9	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2398 mm % Fines: 3.1
				B	Classification: SP-SM Color: 5Y 7/1-light gray D50: 0.2513 mm % Fines: 5.5
-30.7	11.8		CLAY, lean, dark gray (CL)	NS	
-35.8	16.9				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.7	16.5	79.4	3.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.0		
#20	96.4		
#40	82.5		
#60	53.2		
#100	15.1		
#200	3.1		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5474 D₈₅= 0.4567 D₆₀= 0.2752
D₅₀= 0.2398 D₃₀= 0.1869 D₁₅= 0.1495
D₁₀= 0.1120 C_u= 2.46 C_c= 1.13

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-27-10A
Sample Number: TE Lab ID: 4538.44

Depth: 0.0 - 6.0 (ft.)

Date: 6/19/10

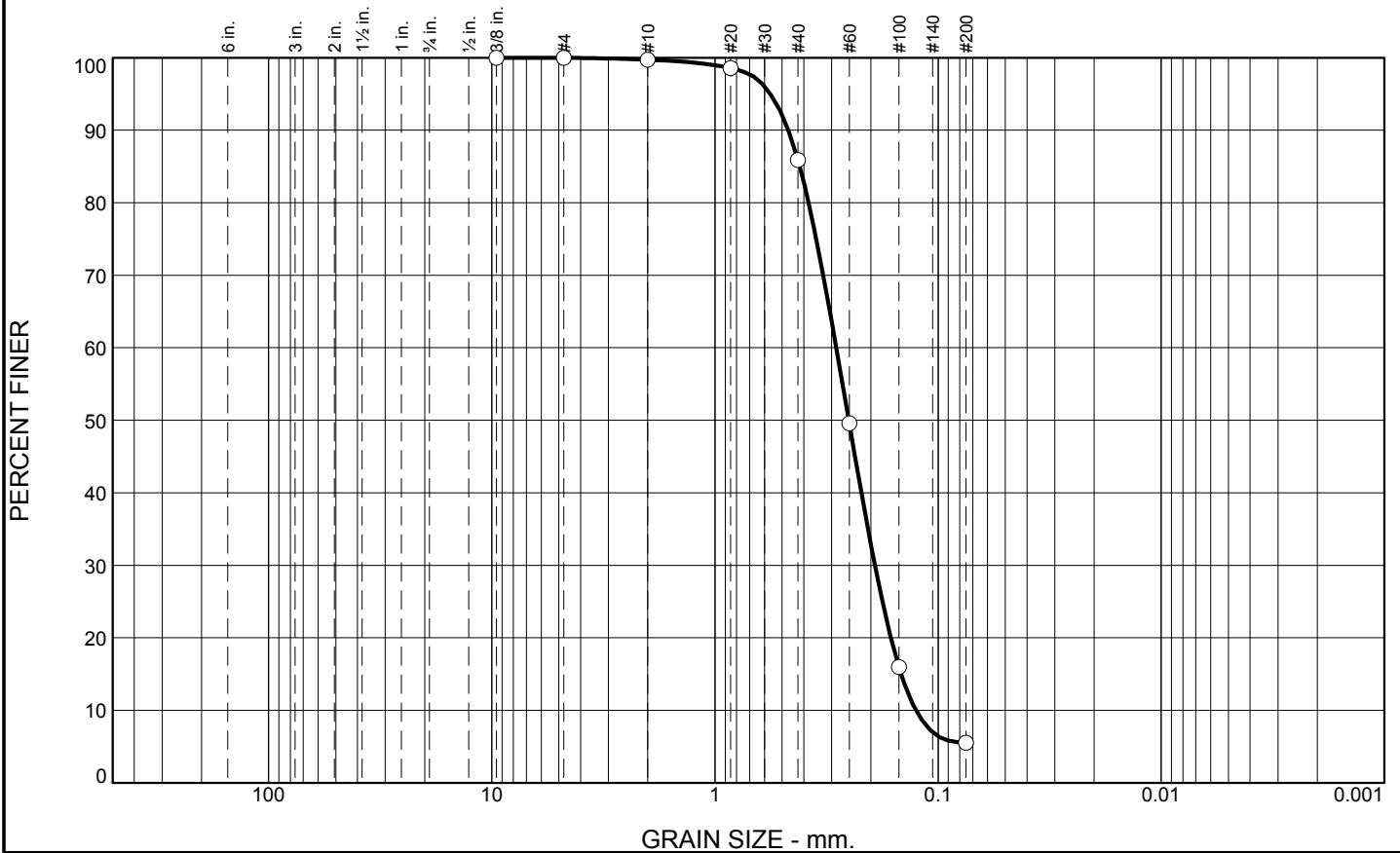
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	13.8	80.4	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	98.6		
#40	85.9		
#60	49.6		
#100	16.0		
#200	5.5		

Material Description

SAND, (SP-SM), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4691 D₈₅= 0.4172 D₆₀= 0.2859
D₅₀= 0.2513 D₃₀= 0.1919 D₁₅= 0.1466
D₁₀= 0.1257 C_u= 2.27 C_c= 1.02

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-27-10B **Depth:** 6.0 - 11.8 (ft.) **Date:** 6/19/10
Sample Number: TE Lab ID: 4538.45

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Boring Designation BI-GC-28-10

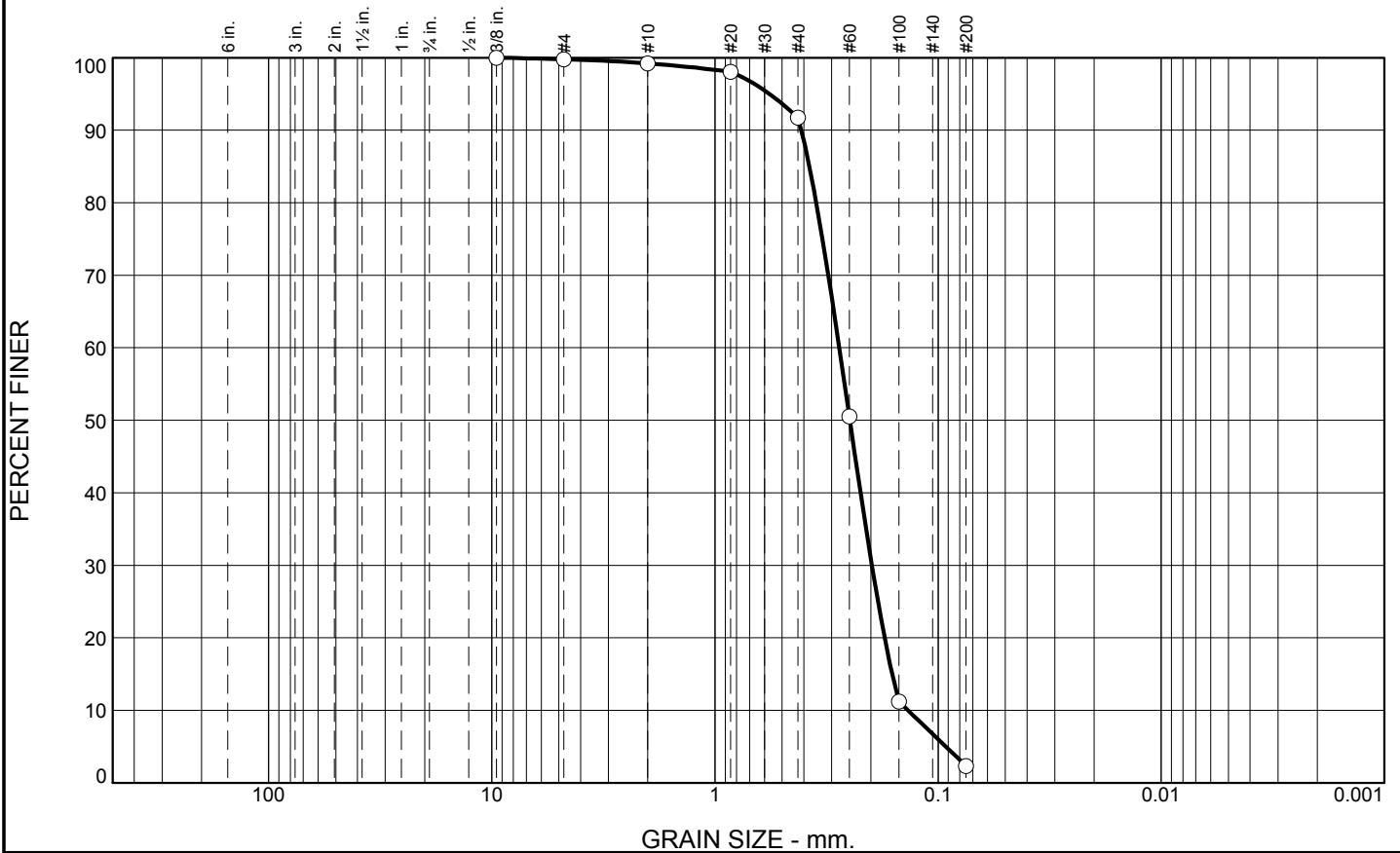
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-28-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 4
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 20 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-11-10
8. TOTAL DEPTH OF BORING 19.3 Ft.		16. ELEVATION TOP OF BORING -17.8 Ft.		COMPLETED 06-11-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-17.8	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell (SP)	A	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2485 mm % Fines: 2.3
				B	Classification: SP Color: 5Y 7/1-light gray D50: 0.2168 mm % Fines: 1.5
				C	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.2365 mm % Fines: 8.4
				D	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1994 mm % Fines: 6.4
-37.1	19.3		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2
						OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88	
LOCATION COORDINATES X = 932,649 Y = 263,707			ELEVATION TOP OF BORING -17.8 Ft.			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS	
			factor.			



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.6	7.5	89.4	2.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.2		
#20	98.1		
#40	91.7		
#60	50.5		
#100	11.2		
#200	2.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4106 D₈₅= 0.3774 D₆₀= 0.2772
D₅₀= 0.2485 D₃₀= 0.1981 D₁₅= 0.1607
D₁₀= 0.1364 C_u= 2.03 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-28-10A
Sample Number: TE Lab ID: 4538.40

Depth: 0.0 - 5.0 (ft.)

Date: 6/19/10

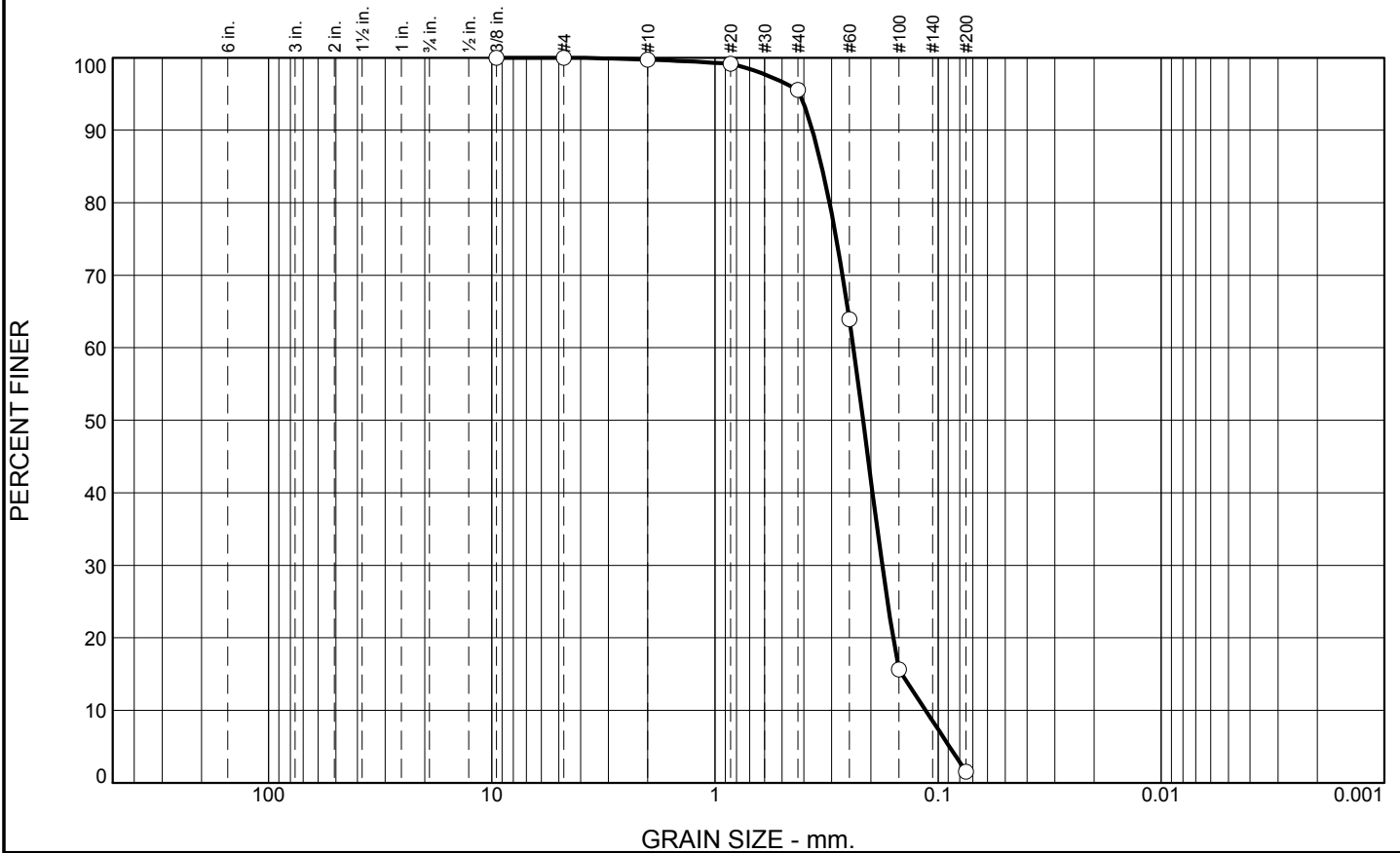
<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	4.1	94.1	1.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.2		
#40	95.6		
#60	63.9		
#100	15.6		
#200	1.5		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3661 D₈₅= 0.3322 D₆₀= 0.2397
D₅₀= 0.2168 D₃₀= 0.1780 D₁₅= 0.1454
D₁₀= 0.1138 C_u= 2.11 C_c= 1.16

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-28-10B
Sample Number: TE Lab ID: 4538.41

Depth: 5.0 - 10.0 (ft.)

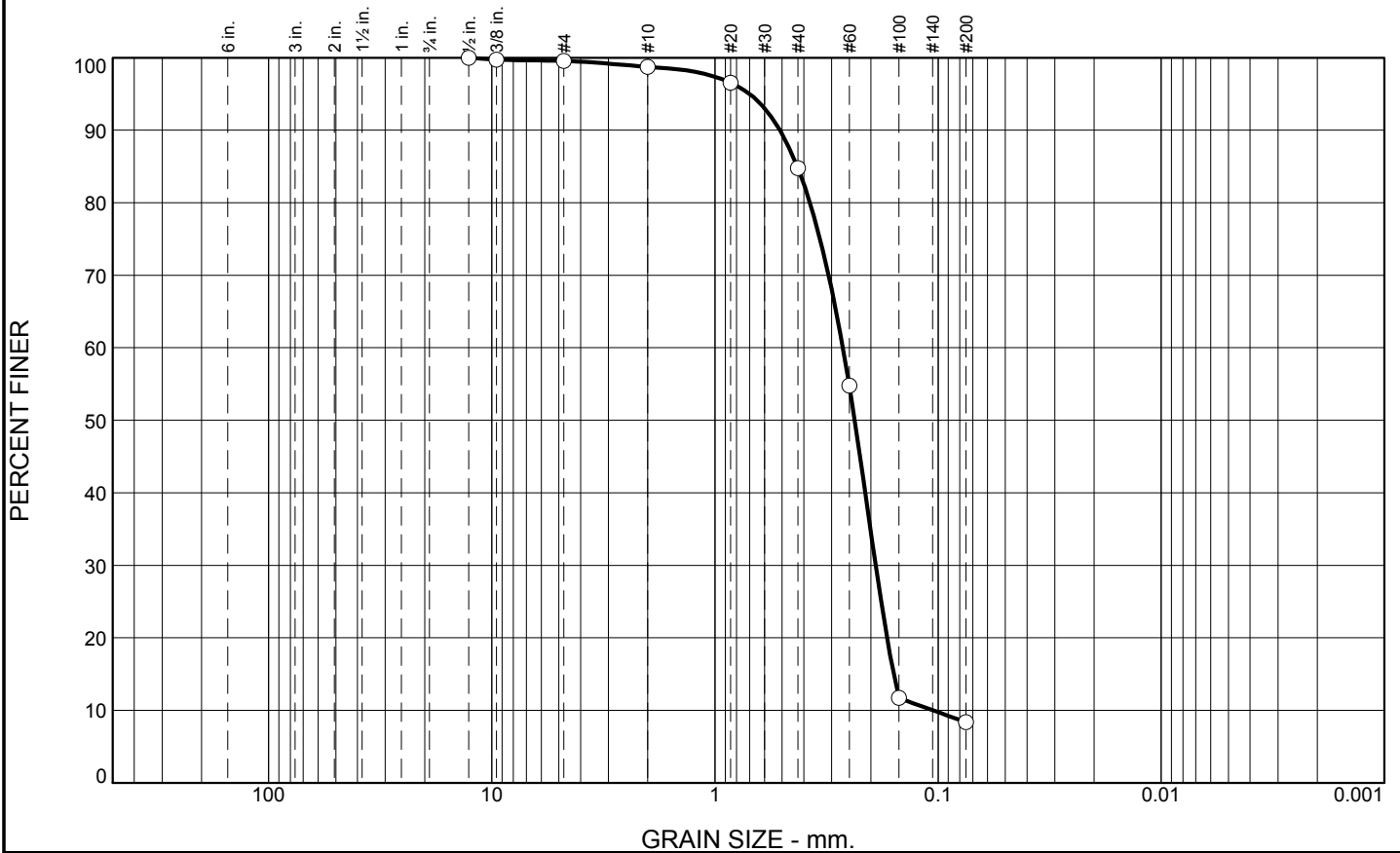
Date: 6/19/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.9	13.9	76.4	8.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.7		
#4	99.6		
#10	98.7		
#20	96.5		
#40	84.8		
#60	54.8		
#100	11.7		
#200	8.4		

Material Description

SAND, (SP-SM), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5114 D₈₅= 0.4280 D₆₀= 0.2670
D₅₀= 0.2365 D₃₀= 0.1904 D₁₅= 0.1582
D₁₀= 0.1053 C_u= 2.53 C_c= 1.29

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

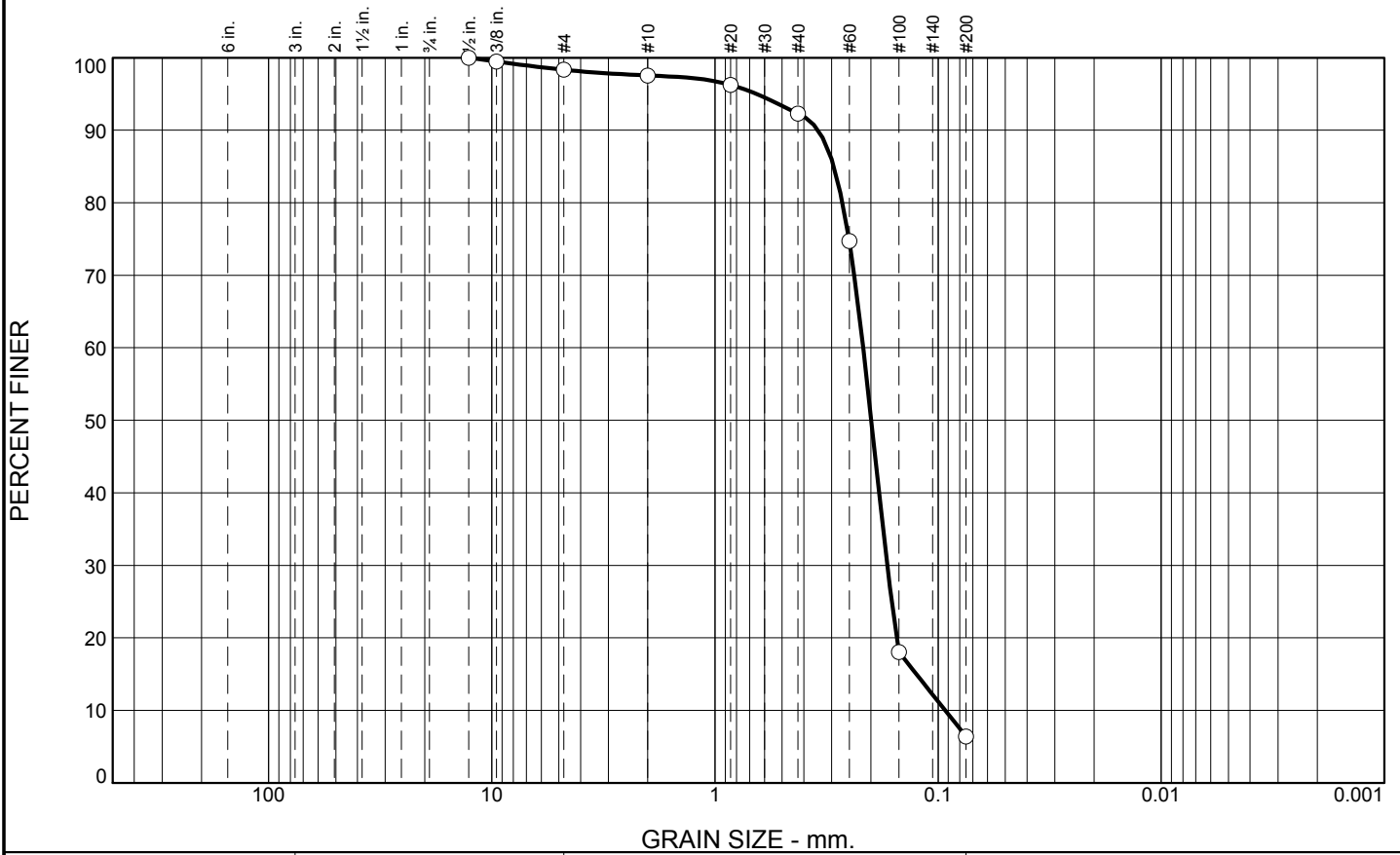
* (no specification provided)

Location: USACE Sample # BI-GC-28-10C **Depth:** 10.0 - 15.0 (ft.) **Date:** 6/19/10
Sample Number: TE Lab ID: 4538.42

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	0.8	5.2	85.9	6.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.5		
#4	98.3		
#10	97.5		
#20	96.2		
#40	92.3		
#60	74.7		
#100	18.0		
#200	6.4		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3446 D₈₅= 0.2933 D₆₀= 0.2167
D₅₀= 0.1994 D₃₀= 0.1690 D₁₅= 0.1252
D₁₀= 0.0929 C_u= 2.33 C_c= 1.42

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-28-10D **Sample Number:** TE Lab ID: 4538.43 **Depth:** 15.0 - 19.3 (ft.) **Date:** 6/19/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: R.Martin **Checked By:** R.Byrd

Boring Designation BI-GC-29-10

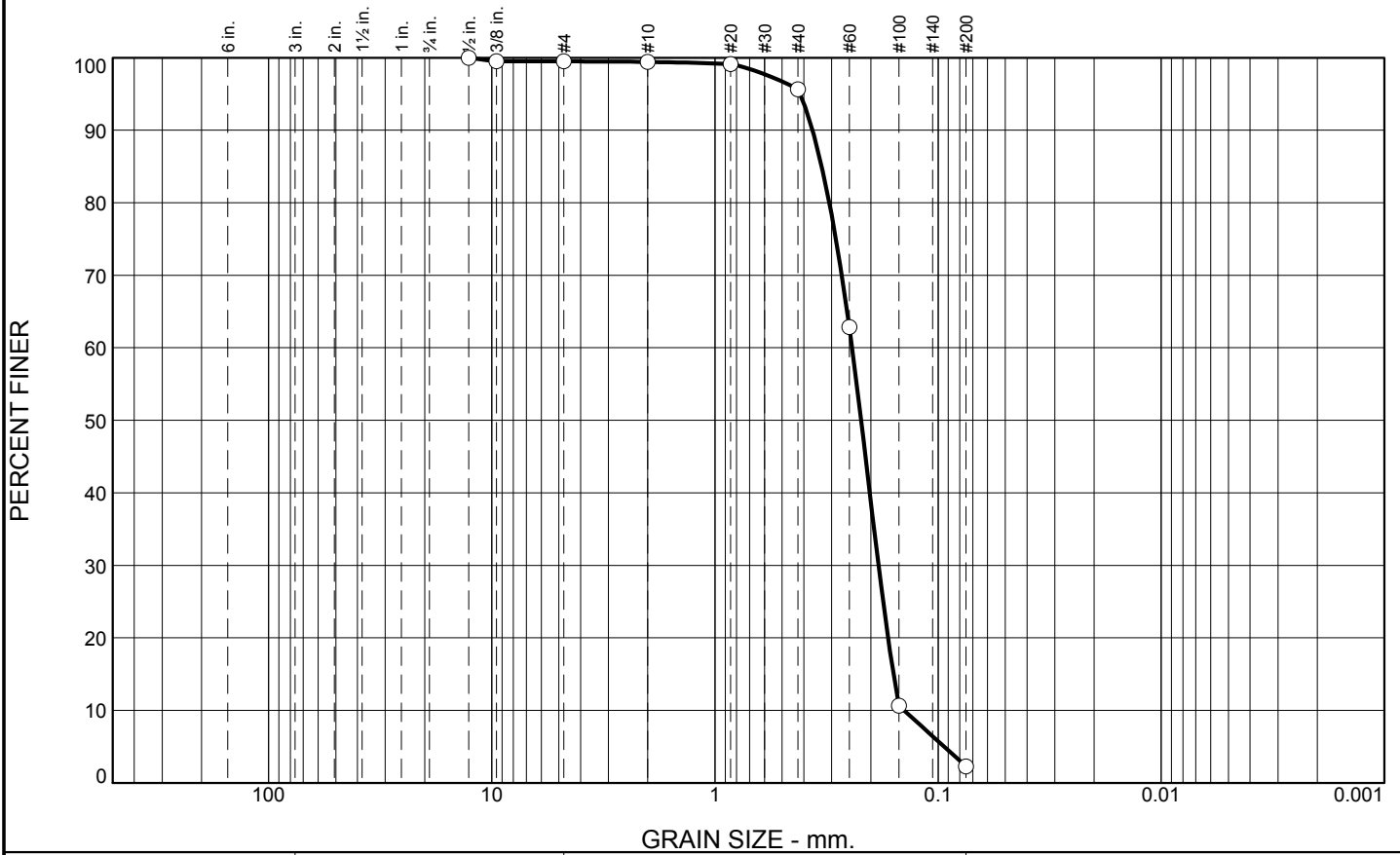
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Gulfport Channel		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-GC-29-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-11-10
8. TOTAL DEPTH OF BORING 19.7 Ft.		16. ELEVATION TOP OF BORING -18.7 Ft.		COMPLETED 06-11-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.7	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 5Y 7/1-light gray D50: 0.2213 mm % Fines: 2.3
		•••••		B	Classification: SP Color: 5Y 7/1-light gray D50: 0.21 mm % Fines: 1.7
		•••••		C	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.2088 mm % Fines: 6.9
-33.7	15.0	•••••			
		/ / / / /	CLAY, lean, dark gray (CL)	NS	
-38.4	19.7	/ / / / /			
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 932,205 Y = 262,944			ELEVATION TOP OF BORING -18.7 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.1	3.8	93.3	2.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.5		
#4	99.5		
#10	99.4		
#20	99.1		
#40	95.6		
#60	62.9		
#100	10.6		
#200	2.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3655 D₈₅= 0.3322 D₆₀= 0.2430
D₅₀= 0.2213 D₃₀= 0.1849 D₁₅= 0.1586
D₁₀= 0.1422 C_u= 1.71 C_c= 0.99

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-29-10A
Sample Number: TE Lab ID: 4538.37

Depth: 0.0 - 5.0 (ft.)

Date: 6/19/10

Thompson Engineering

Mobile, Alabama

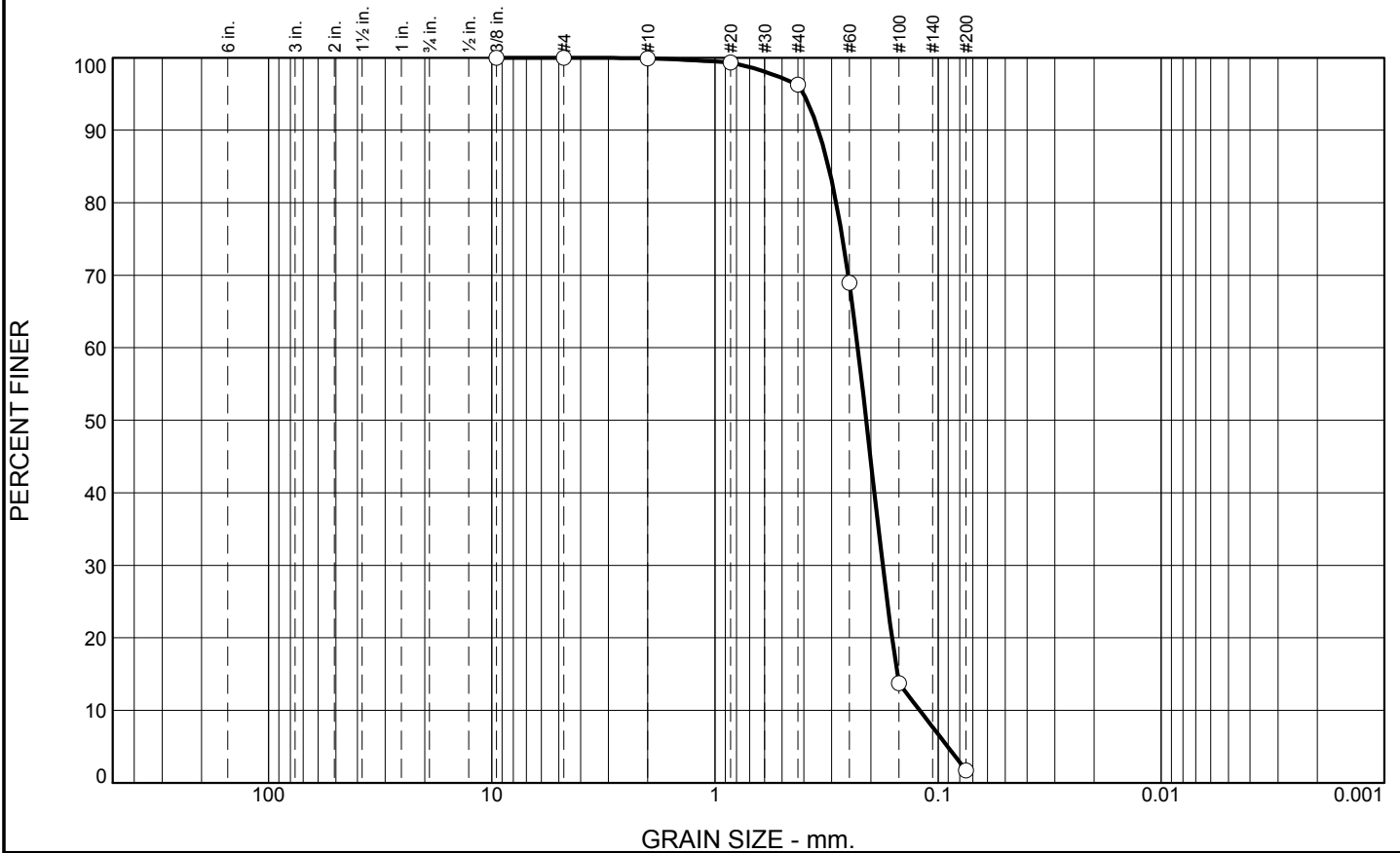
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	3.6	94.6	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.3		
#40	96.3		
#60	69.0		
#100	13.8		
#200	1.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3438 D₈₅= 0.3100 D₆₀= 0.2292
D₅₀= 0.2100 D₃₀= 0.1770 D₁₅= 0.1523
D₁₀= 0.1208 C_u= 1.90 C_c= 1.13

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-29-10B
Sample Number: TE Lab ID: 4538.38

Depth: 5.0 - 10.0 (ft.)

Date: 6/19/10

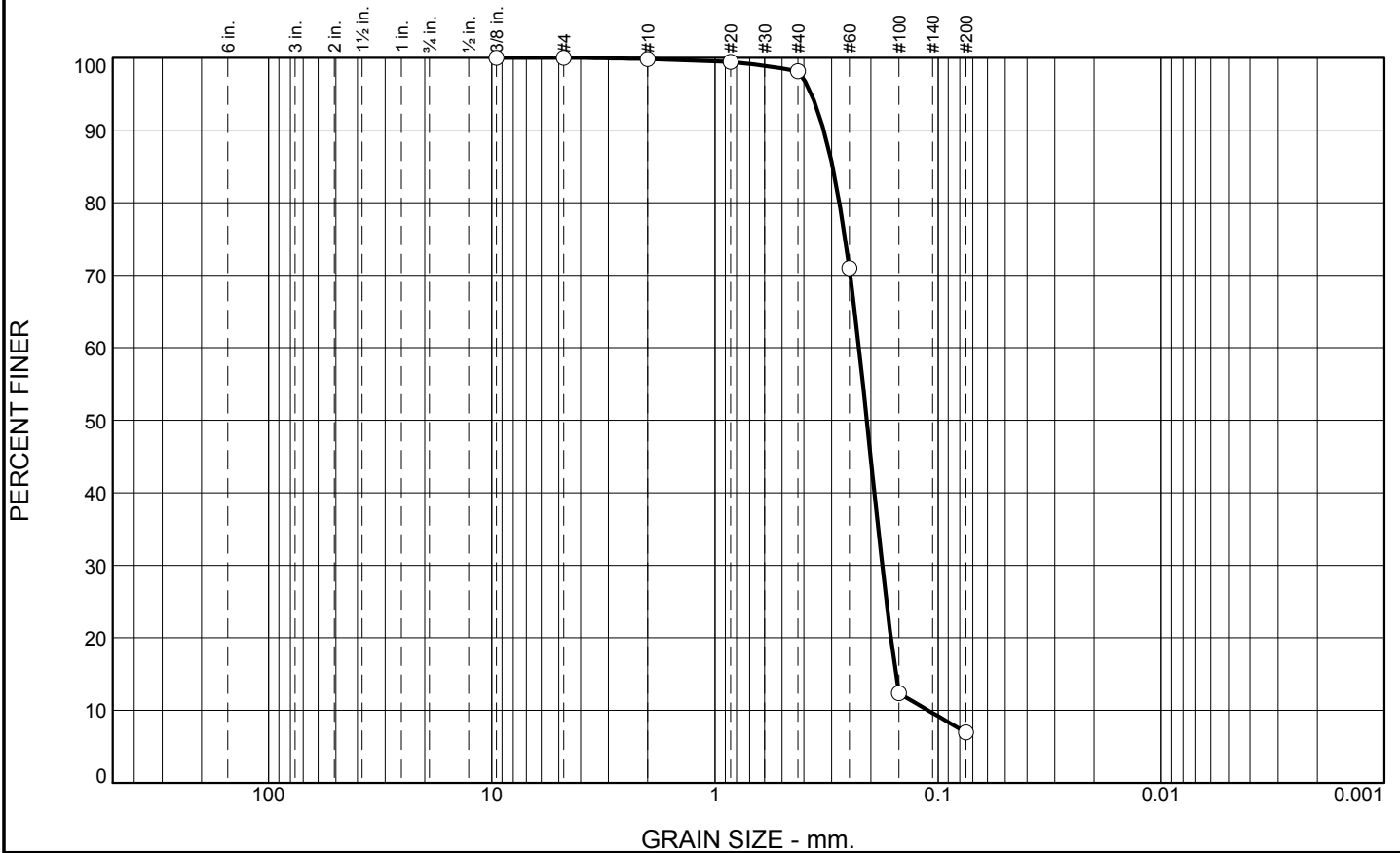
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: R.Martin

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.7	91.2	6.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.4		
#40	98.1		
#60	71.0		
#100	12.4		
#200	6.9		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3252 D₈₅= 0.2972 D₆₀= 0.2264
D₅₀= 0.2088 D₃₀= 0.1780 D₁₅= 0.1547
D₁₀= 0.1109 C_u= 2.04 C_c= 1.26

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-GC-29-10C
Sample Number: TE Lab ID: 4538.39

Depth: 10.0 - 15.0 (ft.)

Date: 6/19/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: R.Martin

Checked By: R.Byrd

This page was intentionally left blank for duplex printing.

Appendix C

Cat Island Vibracores and Lab Results

This page was intentionally left blank for duplex printing.

This page was intentionally left blank for duplex printing.

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10*D60)
BI-CI-1-10	CAT ISLAND	2010	5/19/2010	10:02 AM	30.22249	-89.07220	262821.72640	908808.37100	20-ft Vibracore	9.5	15.1																	
BI-CI-1-10A	CAT ISLAND	2010	5/19/2010	10:02 AM	30.22249	-89.07220	262821.72640	908808.37100	20-ft Vibracore	9.5	15.1	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.22	0.24	2.2	2.0	1.1
BI-CI-1-10B	CAT ISLAND	2010	5/19/2010	10:02 AM	30.22249	-89.07220	262821.72640	908808.37100	20-ft Vibracore	9.5	15.1	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.23	0.25	3.6	2.0	1.0
BI-CI-1-10C	CAT ISLAND	2010	5/19/2010	10:02 AM	30.22249	-89.07220	262821.72640	908808.37100	20-ft Vibracore	9.5	15.1	10.0 - 15.1	5.1	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	GRAY	2.5Y 6/1	6	NO	0.20	0.22	5.1	2.9	0.9
BI-CI-2-10	CAT ISLAND	2010	5/19/2010	11:51 AM	30.22467	-89.07064	263613.52730	909302.72260	20-ft Vibracore	10.0	11.1																	
BI-CI-2-10A	CAT ISLAND	2010	5/19/2010	11:51 AM	30.22467	-89.07064	263613.52730	909302.72260	20-ft Vibracore	10.0	11.1	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.21	0.22	3.3	2.2	1.1
BI-CI-2-10B	CAT ISLAND	2010	5/19/2010	11:51 AM	30.22467	-89.07064	263613.52730	909302.72260	20-ft Vibracore	10.0	11.1	5.0 - 11.1	6.1	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAY	2.5Y 4/1	4	LIGHT GRAY	2.5Y 7/1	7	NO	0.18	0.18	5.7	2.2	1.1
BI-CI-3-10	CAT ISLAND	2010	5/19/2010	12:50 PM	30.22721	-89.06908	264536.26150	909797.32370	20-ft Vibracore	10.0	13.6																	
BI-CI-3-10A	CAT ISLAND	2010	5/19/2010	12:50 PM	30.22721	-89.06908	264536.26150	909797.32370	20-ft Vibracore	10.0	13.6	0.0 - 4.5	4.5	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.21	0.22	4.9	2.0	1.0
BI-CI-3-10B	CAT ISLAND	2010	5/19/2010	12:50 PM	30.22721	-89.06908	264536.26150	909797.32370	20-ft Vibracore	10.0	13.6	4.5 - 9.0	4.5	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 6/1	6	LIGHT GRAY	2.5Y 6.5/1	7	NO	0.18	0.18	1.6	1.8	1.1
BI-CI-3-10C	CAT ISLAND	2010	5/19/2010	12:50 PM	30.22721	-89.06908	264536.26150	909797.32370	20-ft Vibracore	10.0	13.6	9.0 - 13.5	4.5	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LIGHT GRAY	2.5Y 6.5/1.5	7	NO	0.12	0.13	7.7	1.7	0.9
BI-CI-4-10	CAT ISLAND	2010	5/19/2010	1:48 PM	30.22964	-89.06734	265418.88040	910348.66300	20-ft Vibracore	10.0	11.0																	
BI-CI-4-10A	CAT ISLAND	2010	5/19/2010	1:48 PM	30.22964	-89.06734	265418.88040	910348.66300	20-ft Vibracore	10.0	11.0	0.0 - 5.5	5.5	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.20	0.21	4.3	2.2	1.3
BI-CI-4-10B	CAT ISLAND	2010	5/19/2010	1:48 PM	30.22964	-89.06734	265418.88040	910348.66300	20-ft Vibracore	10.0	11.0	5.5 - 11.0	5.5	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LIGHT GRAY	2.5Y 6.5/1	7	NO	0.16	0.17	7.2	2.2	1.0
BI-CI-5-10	CAT ISLAND	2010	5/19/2010	2:47 PM	30.23206	-89.06596	266298.10340	910786.27930	20-ft Vibracore	10.5	10.6																	
BI-CI-5-10A	CAT ISLAND	2010	5/19/2010	2:47 PM	30.23206	-89.06596	266298.10340	910786.27930	20-ft Vibracore	10.5	10.6	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DK GRAYISH BROWN	2.5Y 4/1.5	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.21	0.21	4.7	2.3	1.3
BI-CI-5-10B	CAT ISLAND	2010	5/19/2010	2:47 PM	30.23206	-89.06596	266298.10340	910786.27930	20-ft Vibracore	10.5	10.6	5.0 - 10.6	5.6	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NO	0.14	0.15	8.5	2.1	0.9
BI-CI-6-10	CAT ISLAND	2010	5/20/2010	1:32 PM	30.23415	-89.06401	267056.95050	911403.63370	20-ft Vibracore	11.0	13.2																	
BI-CI-6-10A	CAT ISLAND	2010	5/20/2010	1:32 PM	30.23415	-89.06401	267056.95050	911403.63370	20-ft Vibracore	11.0	13.2	0.0 - 3.0	3.0	SM	SP-SM	SUBANGULAR TO ROUNDED	DK GRAYISH BROWN	2.5Y 4/1.5	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.22	0.23	5.3	2.1	1.1
BI-CI-6-10B	CAT ISLAND	2010	5/20/2010	1:32 PM	30.23415	-89.06401	267056.95050	911403.63370	20-ft Vibracore	11.0	13.2	3.0 - 7.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	VERY DARK GRAYISH BROWN	2.5Y 3/2	3	LIGHT BROWNISH GRAY	2.5Y 5.5/2	6	NO	0.19	0.21	3.1	2.1	1.1
BI-CI-6-10C	CAT ISLAND	2010	5/20/2010	1:32 PM	30.23415	-89.06401	267056.95050	911403.63370	20-ft Vibracore	11.0	13.2	7.0 - 12.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5.5/1	6	LIGHT GRAY	2.5Y 7/1	7	NO	0.18	0.19	5.4	2.2	1.1
BI-CI-7-10	CAT ISLAND	2010	5/20/2010	12:46 PM	30.23680	-89.06425	268020.86880	911329.79880	20-ft Vibracore	11.0	12.6																	
BI-CI-7-10A	CAT ISLAND	2010	5/20/2010	12:46 PM	30.23680	-89.06425	268020.86880	911329.79880	20-ft Vibracore	11.0	12.6	2.5 - 6.0	3.5	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.19	0.20	3.4	2.1	1.1
BI-CI-7-10B	CAT ISLAND	2010	5/20/2010	12:46 PM	30.23680	-89.06425	268020.86880	911329.79880	20-ft Vibracore	11.0	12.6	6.0 - 9.0	3.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT GRAY	2.5Y 6.5/1.5	7	NO	0.19	0.20	1.0	2.0	1.2
BI-CI-7-10C	CAT ISLAND	2010	5/20/2010	12:46 PM	30.23680	-89.06425	268020.86880	911329.79880	20-ft Vibracore	11.0	12.6	9.0 - 12.6	3.6	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NO	0.17	0.18	6.6	2.3	1.1
BI-CI-8-10	CAT ISLAND	2010	5/20/2010	11:10 AM	30.23953	-89.06321	269013.06340	911660.22300	20-ft Vibracore	11.0	12.5																	
BI-CI-8-10A	CAT ISLAND	2010	5/20/2010	11:10 AM	30.23953	-89.06321	269013.06340	911660.22300	20-ft Vibracore	11.0	12.5	0.0 - 2.0	2.0	SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.19	0.20	11.8	#VALUE!	#VALUE!
BI-CI-8-10B	CAT ISLAND	2010	5/20/2010	11:10 AM	30.23953	-89.06321	269013.06340	911660.22300	20-ft Vibracore	11.0	12.5	2.0 - 4.0	2.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAY	2.5Y 4/1	4	GRAY	2.5Y 5/1	5	NO	0.18	0.19	6.9	2.4	1.2
BI-CI-8-10C	CAT ISLAND	2010	5/20/2010	11:10 AM	30.23953	-89.06321	269013.06340	911660.22300	20-ft Vibracore	11.0	12.5	4.0 - 8.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	2.5Y 6/1	6	NO	0.19	0.19	3.0	1.7	1.0
BI-CI-8-10D	CAT ISLAND	2010	5/20/2010	11:10 AM	30.23953	-89.06321	269013.06340	911660.22300	20-ft Vibracore	11.0	12.5	8.0 - 12.5	4.5	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LIGHT GRAY	2.5Y 7/1	7	NO	0.19	0.20	3.9	1.7	1.0
BI-CI-9-10	CAT ISLAND	2010	5/20/2010	10:17 AM	30.24217	-89.06210	269972.48520	912012.66720	20-ft Vibracore	10.5	10.9																	
BI-CI-9-10A	CAT ISLAND	2010	5/20/2010	10:17 AM	30.24217	-89.06210	269972.48520	912012.66720	20-ft Vibracore	10.5	10.9	0.0 - 2.0	2.0	SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 5/2	5	GRAYISH BROWN	2.5Y 5/2	5	NO	0.22	0.22	8.0	#VALUE!	#VALUE!
BI-CI-9-10B	CAT ISLAND	2010	5/20/2010	10:17 AM	30.24217	-89.06210	269972.48520	912012.66720	20-ft Vibracore	10.5	10.9	2.0 - 6.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.21	0.22	10.7	2.6	1.1
BI-CI-9-10C	CAT ISLAND	2010	5/20/2010	10:17 AM	30.24217	-89.06210	269972.48520	912012.66720	20-ft Vibracore	10.5	10.9	6.0 - 10.9	4.9	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 6/1	6	LIGHT GRAY	2.5Y 7/1	7	NO	0.17	0.18	6.0	2.2	1.0
BI-CI-10-10	CAT ISLAND	2010	5/19/2010	9:42 AM	30.22046	-89.07259	262083.70650	908683.64460	20-ft Vibracore	10.0	11.9																	
BI-CI-10-10A	CAT ISLAND	2010	5/19/2010	9:42 AM	30.22046	-89.07259	262083.70650	908683.64460	20-ft Vibracore	10.0	11.9	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.25	0.25	4.6	2.2	1.1
BI-CI-10-10B	CAT ISLAND	2010	5/19/2010	9:42 AM	30.22046	-89.07259	262083.70650	908683.64460	20-ft Vibracore	10.0	11.9	5.0 - 11.9	6.9	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 6/1	6	LIGHT GRAY	2.5Y 7/1	7	NO	0.22	0.24	3.3	2.3	1.2
BI-CI-11-10	CAT ISLAND	2010	5/19/2010	10:47 AM	30.22286	-89.07017	262954.94980	909449.79080	20-ft Vibracore	11.0	14.4																	
BI-CI-11-10A	CAT ISLAND	2010	5/19/2010	10:47 AM	30.22286	-89.07017	262954.94980	909449.79080	20-ft Vibracore	11.0	14.4	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.24	0.25	2.8	2.4	1.1
BI-CI-11-10B	CAT ISLAND	2010	5/19/2010	10:47 AM	30.22286	-89.07017	262954.94980	909449.79080	20-ft Vibracore	11.0	14.4	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.21	0.23	2.6	2.5	1.0
BI-CI-11-10C	CAT ISLAND	2010	5/19/2010	10:47 AM	30.22286	-89.07017	262954.94980	909449.79080	20-ft Vibracore	11.0	14.4	10.0 - 14.4	4.4	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	2.5Y 6.5/1	7	NO	0.14	0.16	8.6	2.1	0.8
BI-CI-12-10	CAT ISLAND	2010	5/19/2010	12:47 PM	30.22521	-89.06856	263808.55310	909960.04540	20-ft Vibracore	10.5	10.8																	
BI-CI-12-10A	CAT ISLAND	2010	5/19/2010	12:47 PM	30.22521	-89.06856	263808.55310	909960.04540	20-ft Vibracore	10.5	10.8	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT GRAY	2.5Y 6.5/1	7	NO	0.22	0.23	3.2	2.2	1.0
BI-CI-12-10B	CAT ISLAND	2010	5/19/2010	12:47 PM	30.22521	-89.																						

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10*D60)
BI-CI-16-10	CAT ISLAND	2010	5/20/2010	1:12 PM	30.23521	-89.06267	267441.60090	911827.57620	20-ft Vibracore	11.0	13.1																	
BI-CI-16-10A	CAT ISLAND	2010	5/20/2010	1:12 PM	30.23521	-89.06267	267441.60090	911827.57620	20-ft Vibracore	11.0	13.1	0.0 - 3.0	3.0	SP-SM	SP-SM	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT OLIVE BROWN	2.5Y 5/3	5	NO	0.21	0.22	5.7	2.5	1.1
BI-CI-16-10B	CAT ISLAND	2010	5/20/2010	1:12 PM	30.23521	-89.06267	267441.60090	911827.57620	20-ft Vibracore	11.0	13.1	3.0 - 7.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.22	0.23	2.1	2.0	1.0
BI-CI-16-10C	CAT ISLAND	2010	5/20/2010	1:12 PM	30.23521	-89.06267	267441.60090	911827.57620	20-ft Vibracore	11.0	13.1	7.0 - 12.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DK GRAYISH BROWN	2.5Y 4/1.5	4	GRAY	2.5Y 6/1	6	NO	0.20	0.20	3.6	2.2	1.3
BI-CI-17-10	CAT ISLAND	2010	5/20/2010	11:38 AM	30.23788	-89.06188	268412.13720	912079.00210	20-ft Vibracore	11.0	11.1																	
BI-CI-17-10A	CAT ISLAND	2010	5/20/2010	11:38 AM	30.23788	-89.06188	268412.13720	912079.00210	20-ft Vibracore	11.0	11.1	0.0 - 3.0	3.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/1.5	5	GRAYISH BROWN	2.5Y 5/2	5	NO	0.20	0.21	8.0	2.5	1.2
BI-CI-17-10B	CAT ISLAND	2010	5/20/2010	11:38 AM	30.23788	-89.06188	268412.13720	912079.00210	20-ft Vibracore	11.0	11.1	3.0 - 8.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	LT BROWNISH GRAY	2.5Y 6/2	6	LIGHT BROWNISH GRAY	10YR 6.5/2	7	NO	0.20	0.20	2.7	2.1	1.3
BI-CI-17-10C	CAT ISLAND	2010	5/20/2010	11:38 AM	30.23788	-89.06188	268412.13720	912079.00210	20-ft Vibracore	11.0	11.1	8.0 - 11.1	3.1	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NO	0.18	0.18	3.5	2.0	1.1
BI-CI-18-10	CAT ISLAND	2010	5/20/2010	10:43 AM	30.24044	-89.06111	269342.68290	912324.01920	20-ft Vibracore	10.5	10.6																	
BI-CI-18-10A	CAT ISLAND	2010	5/20/2010	10:43 AM	30.24044	-89.06111	269342.68290	912324.01920	20-ft Vibracore	10.5	10.6	0.0 - 3.0	3.0	SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.22	0.22	9.4	3.2	1.6
BI-CI-18-10B	CAT ISLAND	2010	5/20/2010	10:43 AM	30.24044	-89.06111	269342.68290	912324.01920	20-ft Vibracore	10.5	10.6	3.0 - 8.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.20	0.21	3.2	2.0	1.2
BI-CI-18-10C	CAT ISLAND	2010	5/20/2010	10:43 AM	30.24044	-89.06111	269342.68290	912324.01920	20-ft Vibracore	10.5	10.6	8.0 - 10.6	2.6	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	2.5Y 7/1.5	7	NO	0.17	0.17	3.7	2.0	1.1
BI-CI-19-10	CAT ISLAND	2010	5/20/2010	9:42 AM	30.24325	-89.05994	270363.90000	912695.51160	20-ft Vibracore	10.0	11.5																	
BI-CI-19-10A	CAT ISLAND	2010	5/20/2010	9:42 AM	30.24325	-89.05994	270363.90000	912695.51160	20-ft Vibracore	10.0	11.5	0.0 - 2.0	2.0	SP-SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.20	0.22	7.0	2.1	1.1
BI-CI-19-10B	CAT ISLAND	2010	5/20/2010	9:42 AM	30.24325	-89.05994	270363.90000	912695.51160	20-ft Vibracore	10.0	11.5	2.0 - 6.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.21	0.22	5.8	2.4	1.4
BI-CI-19-10C	CAT ISLAND	2010	5/20/2010	9:42 AM	30.24325	-89.05994	270363.90000	912695.51160	20-ft Vibracore	10.0	11.5	6.0 - 11.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NO	0.18	0.18	3.3	2.0	1.1
BI-CI-20-10	CAT ISLAND	2010	5/21/2010	11:50 AM	30.22249	-89.06643	262817.94840	910630.72410	20-ft Vibracore	11.0	13.4																	
BI-CI-20-10A	CAT ISLAND	2010	5/21/2010	11:50 AM	30.22249	-89.06643	262817.94840	910630.72410	20-ft Vibracore	11.0	13.4	0.0 - 3.0	3.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.26	0.27	3.3	2.3	1.1
BI-CI-20-10B	CAT ISLAND	2010	5/21/2010	11:50 AM	30.22249	-89.06643	262817.94840	910630.72410	20-ft Vibracore	11.0	13.4	3.0 - 8.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.21	0.22	2.0	2.2	1.2
BI-CI-20-10C	CAT ISLAND	2010	5/21/2010	11:50 AM	30.22249	-89.06643	262817.94840	910630.72410	20-ft Vibracore	11.0	13.4	8.0 - 13.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAY	2.5Y 4/1	4	GRAY	2.5Y 6/1	6	NO	0.16	0.17	6.2	2.2	1.1
BI-CI-21-10	CAT ISLAND	2010	5/21/2010	11:20 AM	30.23053	-89.06167	265738.92210	912139.95250	20-ft Vibracore	11.0	10.4																	
BI-CI-21-10A	CAT ISLAND	2010	5/21/2010	11:20 AM	30.23053	-89.06167	265738.92210	912139.95250	20-ft Vibracore	11.0	10.4	0.0 - 2.0	2.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.23	0.25	5.5	2.3	1.2
BI-CI-21-10B	CAT ISLAND	2010	5/21/2010	11:20 AM	30.23053	-89.06167	265738.92210	912139.95250	20-ft Vibracore	11.0	10.4	3.0 - 5.0	2.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT GRAY	2.5Y 7/2	7	NO	0.21	0.22	2.7	2.3	1.2
BI-CI-21-10C	CAT ISLAND	2010	5/21/2010	11:20 AM	30.23053	-89.06167	265738.92210	912139.95250	20-ft Vibracore	11.0	10.4	5.0 - 9.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NO	0.18	0.18	2.4	2.0	1.3
BI-CI-22-10	CAT ISLAND	2010	5/21/2010	11:00 AM	30.23886	-89.05849	268766.41380	913150.21230	20-ft Vibracore	10.0	11.0																	
BI-CI-22-10A	CAT ISLAND	2010	5/21/2010	11:00 AM	30.23886	-89.05849	268766.41380	913150.21230	20-ft Vibracore	10.0	11.0	0.0 - 4.0	4.0	SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.28	0.28	5.7	2.0	1.2
BI-CI-22-10B	CAT ISLAND	2010	5/21/2010	11:00 AM	30.23886	-89.05849	268766.41380	913150.21230	20-ft Vibracore	10.0	11.0	4.0 - 6.0	2.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.18	0.19	2.7	2.1	1.1
BI-CI-22-10C	CAT ISLAND	2010	5/21/2010	11:00 AM	30.23886	-89.05849	268766.41380	913150.21230	20-ft Vibracore	10.0	11.0	6.0 - 11.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NO	0.22	0.22	5.5	2.7	1.1
BI-CI-23-10	CAT ISLAND	2010	8/21/2010	1:10 PM	30.21826	-89.06871	261281.04720	909907.44520	20-ft Vibracore	11.0	11.5																	
BI-CI-23-10A	CAT ISLAND	2010	8/21/2010	1:10 PM	30.21826	-89.06871	261281.04720	909907.44520	20-ft Vibracore	11.0	11.5	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE	5Y 4/3	4	LIGHT OLIVE GRAY	5Y 6/2	6	NO	0.24	0.26	2.9	1.7	0.9
BI-CI-23-10B	CAT ISLAND	2010	8/21/2010	1:10 PM	30.21826	-89.06871	261281.04720	909907.44520	20-ft Vibracore	11.0	11.5	4.0 - 8.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.27	0.28	1.8	1.7	1.0
BI-CI-23-10C	CAT ISLAND	2010	8/21/2010	1:10 PM	30.21826	-89.06871	261281.04720	909907.44520	20-ft Vibracore	11.0	11.5	8.0 - 11.5	3.5	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.25	0.27	5.2	1.9	1.0
BI-CI-24-10	CAT ISLAND	2010	8/21/2010	12:30 PM	30.21563	-89.07166	260326.49730	908973.69730	20-ft Vibracore	11.3	13.0																	
BI-CI-24-10A	CAT ISLAND	2010	8/21/2010	12:30 PM	30.21563	-89.07166	260326.49730	908973.69730	20-ft Vibracore	11.3	13.0	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT OLIVE GRAY	5Y 6/2	6	NO	0.24	0.26	2.9	1.7	0.9
BI-CI-24-10B	CAT ISLAND	2010	8/21/2010	12:30 PM	30.21563	-89.07166	260326.49730	908973.69730	20-ft Vibracore	11.3	13.0	4.0 - 8.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT GRAY	2.5Y 7/1	7	NO	0.28	0.29	1.8	1.8	1.0
BI-CI-24-10C	CAT ISLAND	2010	8/21/2010	12:30 PM	30.21563	-89.07166	260326.49730	908973.69730	20-ft Vibracore	11.3	13.0	8.0 - 11.8	3.8	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT GRAY	2.5Y 7/1	7	YES	0.19	0.20	9.3	2.4	1.3
BI-CI-25-10	CAT ISLAND	2010	8/21/2010	11:50 AM	30.21386	-89.06791	259680.31740	910156.82490	20-ft Vibracore	13.0	13.0																	
BI-CI-25-10A	CAT ISLAND	2010	8/21/2010	11:50 AM	30.21386	-89.06791	259680.31740	910156.82490	20-ft Vibracore	13.0	13.0	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE BROWN	2.5Y 4/3	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NO	0.21	0.22	3.6	1.5	0.9
BI-CI-25-10B	CAT ISLAND	2010	8/21/2010	11:50 AM	30.21386	-89.06791	259680.31740	910156.82490	20-ft Vibracore	13.0	13.0	4.0 - 8.0	4.0	SP														

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10 ² *D60)	
BI-CI-30-10A	CAT ISLAND	2010	8/22/2010	8:10 AM	30.22459	-89.05715	263575.80220	913563.15000	20-ft Vibracore	13.3	7.9	0.0 - 2.0	2.0	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	GRAYISH BROWN	2.5Y 5/2	5	NO	0.21	0.22	8.1	2.5	1.5	
BI-CI-30-10B	CAT ISLAND	2010	8/22/2010	8:10 AM	30.22459	-89.05715	263575.80220	913563.15000	20-ft Vibracore	13.3	7.9	2.0 - 5.0	3.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	GRAY	5Y 5/1	5	NO	0.20	0.20	3.8	1.8	1.2	
BI-CI-30-10C	CAT ISLAND	2010	8/22/2010	8:10 AM	30.22459	-89.05715	263575.80220	913563.15000	20-ft Vibracore	13.3	7.9	5.0 - 7.9	2.9	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.19	0.18	3.6	2.0	1.3	
BI-CI-31-10	CAT ISLAND	2010	8/22/2010	7:10 AM	30.22030	-89.05978	262017.24100	912729.42480	20-ft Vibracore	13.3	7.3																		
BI-CI-31-10A	CAT ISLAND	2010	8/23/2010	7:10 AM	30.22030	-89.05978	262017.24100	912729.42480	20-ft Vibracore	13.3	7.3	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	GRAY	5Y 6/1	6	NO	0.24	0.26	4.0	1.7	0.9	
BI-CI-31-10B	CAT ISLAND	2010	8/24/2010	7:10 AM	30.22030	-89.05978	262017.24100	912729.42480	20-ft Vibracore	13.3	7.3	4.0 - 7.3	3.3	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.23	0.26	3.9	2.0	1.0	
BI-CI-32-10	CAT ISLAND	2010	8/21/2010	2:35 PM	30.21610	-89.06225	260491.32970	911946.23010	20-ft Vibracore	13.3	12.2																		
BI-CI-32-10A	CAT ISLAND	2010	8/21/2010	2:35 PM	30.21610	-89.06225	260491.32970	911946.23010	20-ft Vibracore	13.3	12.2	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT OLIVE GRAY	5Y 6/2	6	NO	0.25	0.27	2.8	1.7	0.9	
BI-CI-32-10B	CAT ISLAND	2010	8/21/2010	2:35 PM	30.21610	-89.06225	260491.32970	911946.23010	20-ft Vibracore	13.3	12.2	5.0 - 8.3	3.3	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	5Y 7/1	7	NO	0.21	0.22	4.0	2.2	1.3	
BI-CI-32-10C	CAT ISLAND	2010	8/21/2010	2:35 PM	30.21610	-89.06225	260491.32970	911946.23010	20-ft Vibracore	13.3	12.2	8.3 - 9.5	1.2	SP	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT OLIVE GRAY	5Y 6/2	6	YES	0.17	0.17	5.5	2.1	1.1	
BI-CI-32-10D	CAT ISLAND	2010	8/21/2010	2:35 PM	30.21610	-89.06225	260491.32970	911946.23010	20-ft Vibracore	13.3	12.2	9.5 - 12.2	2.7	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	YES	0.17	0.17	6.6	2.1	1.2	
BI-CI-33-10	CAT ISLAND	2010	8/21/2010	10:45 AM	30.21239	-89.06438	259143.42270	911270.72560	20-ft Vibracore	14.5	11.9																		
BI-CI-33-10A	CAT ISLAND	2010	8/21/2010	10:45 AM	30.21239	-89.06438	259143.42270	911270.72560	20-ft Vibracore	14.5	11.9	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.20	0.21	3.8	1.7	1.1	
BI-CI-33-10B	CAT ISLAND	2010	8/21/2010	10:45 AM	30.21239	-89.06438	259143.42270	911270.72560	20-ft Vibracore	14.5	11.9	4.0 - 8.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.19	0.19	3.6	2.0	1.3	
BI-CI-33-10C	CAT ISLAND	2010	8/21/2010	10:45 AM	30.21239	-89.06438	259143.42270	911270.72560	20-ft Vibracore	14.5	11.9	8.0 - 8.8	0.8	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAY	2.5Y 6/1	6	NO	0.18	0.17	4.6	2.1	1.4	
BI-CI-34-11	CAT ISLAND	2011	6/27/2011	11:22 AM	30.20893	-89.06174	257883.39600	912102.08410	20-ft Vibracore	17.8	15.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-35-11	CAT ISLAND	2011	6/27/2011	10:48 AM	30.21189	-89.05862	258957.93520	913089.74600	20-ft Vibracore	17.2	15.0																		
BI-CI-35-11A	CAT ISLAND	2011	6/27/2011	10:48 AM	30.21189	-89.05862	258957.93520	913089.74600	20-ft Vibracore	17.2	15.0	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	5Y 6/1	6	NA	0.19	0.20	3.8	2.1	1.3	
BI-CI-35-11B	CAT ISLAND	2011	6/27/2011	10:48 AM	30.21189	-89.05862	258957.93520	913089.74600	20-ft Vibracore	17.2	15.0	4.0 - 7.8	3.8	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT GRAY	2.5Y 7/2	7	NA	0.19	0.20	2.8	1.8	1.2	
BI-CI-36-11	CAT ISLAND	2011	6/24/2011	2:45 PM	30.21504	-89.05586	260101.82350	913963.77560	20-ft Vibracore	15.5	13.8																		
BI-CI-36-11A	CAT ISLAND	2011	6/24/2011	2:45 PM	30.21504	-89.05586	260101.82350	913963.77560	20-ft Vibracore	15.5	13.8	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 5/2	5	LIGHT OLIVE GRAY	5Y 6/2	6	NA	0.19	0.20	4.0	2.2	1.3	
BI-CI-36-11B	CAT ISLAND	2011	6/24/2011	2:45 PM	30.21504	-89.05586	260101.82350	913963.77560	20-ft Vibracore	15.5	13.8	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 5/2	5	LIGHT GRAY	5Y 7/1	7	NA	0.18	0.18	3.4	1.8	1.1	
BI-CI-36-11C	CAT ISLAND	2011	6/24/2011	2:45 PM	30.21504	-89.05586	260101.82350	913963.77560	20-ft Vibracore	15.5	13.8	10.0 - 12.3	2.3	SP	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 5/2	5	GRAY	5Y 6/1	6	NA	0.16	0.16	8.2	2.2	1.2	
BI-CI-37-11	CAT ISLAND	2011	6/24/2011	3:31 PM	30.21820	-89.05270	261249.12650	914964.09520	20-ft Vibracore	15.0	11.3																		
BI-CI-37-11A	CAT ISLAND	2011	6/24/2011	3:31 PM	30.21820	-89.05270	261249.12650	914964.09520	20-ft Vibracore	15.0	11.3	0.0 - 5.0	5.0	SM	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.22	0.25	4.2	1.6	0.9	
BI-CI-37-11B	CAT ISLAND	2011	6/24/2011	3:31 PM	30.21820	-89.05270	261249.12650	914964.09520	20-ft Vibracore	15.0	11.3	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 5/2	5	LIGHT GRAY	5Y 7/1	7	NA	0.25	0.29	3.4	1.9	0.9	
BI-CI-38-11	CAT ISLAND	2011	6/24/2011	4:06 PM	30.22127	-89.04916	262363.49820	916084.30660	20-ft Vibracore	14.0	13.1																		
BI-CI-38-11A	CAT ISLAND	2011	6/24/2011	4:06 PM	30.22127	-89.04916	262363.49820	916084.30660	20-ft Vibracore	14.0	13.1	0.0 - 4.8	4.8	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.21	0.23	4.4	2.1	1.2	
BI-CI-38-11B	CAT ISLAND	2011	6/24/2011	4:06 PM	30.22127	-89.04916	262363.49820	916084.30660	20-ft Vibracore	14.0	13.1	5.6 - 10.5	4.9	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAY	5Y 4/1	4	LIGHT GRAY	5Y 7/1	7	NA	0.19	0.19	3.6	1.9	1.3	
BI-CI-39-11	CAT ISLAND	2011	6/25/2011	10:35 AM	30.22410	-89.04576	263390.70330	917160.07010	20-ft Vibracore	15.2	12.5																		
BI-CI-39-11A	CAT ISLAND	2011	6/25/2011	10:35 AM	30.22410	-89.04576	263390.70330	917160.07010	20-ft Vibracore	15.2	12.5	1.0 - 6.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT OLIVE GRAY	5Y 6/2	6	NA	0.20	0.21	5.0	2.0	1.3	
BI-CI-39-11B	CAT ISLAND	2011	6/25/2011	10:35 AM	30.22410	-89.04576	263390.70330	917160.07010	20-ft Vibracore	15.2	12.5	6.0 - 10.5	4.5	SP	SP	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	LIGHT OLIVE GRAY	5Y 6/2	6	NA	0.18	0.17	4.3	2.1	1.4	
BI-CI-40-11	CAT ISLAND	2011	6/25/2011	10:05 AM	30.22714	-89.04259	264494.44790	918163.27440	20-ft Vibracore	15.0	14.6																		
BI-CI-40-11A	CAT ISLAND	2011	6/25/2011	10:05 AM	30.22714	-89.04259	264494.44790	918163.27440	20-ft Vibracore	15.0	14.6	2.0 - 7.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 5/2	5	LIGHT GRAY	2.5Y 7/1	7	NA	0.21	0.22	3.1	1.6	1.0	
BI-CI-41-11	CAT ISLAND	2011	6/25/2011	9:44 AM	30.23011	-89.03926	265572.67120	919216.90040	20-ft Vibracore	15.2	10.9																		
BI-CI-41-11A	CAT ISLAND	2011	6/25/2011	9:44 AM	30.23011	-89.03926	265572.67120	919216.90040	20-ft Vibracore	15.2	10.9	0.0 - 2.1	2.1	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	OLIVE GRAY	5Y 4/2	4	NA	0.20	0.20	8.9	2.5	1.6	
BI-CI-41-11B	CAT ISLAND	2011	6/25/2011	9:44 AM	30.23011	-89.03926	265572.67120	919216.90040	20-ft Vibracore	15.2	10.9	2.1 - 4.3	2.2	SM	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.22	0.23	3.9	1.5	0.9	
BI-CI-41-11C	CAT ISLAND	2011	6/25/2011	9:44 AM	30.23011	-89.03926	265572.67120	919216.90040	20-ft Vibracore	15.2	10.9	4.3 - 10.9	6.6	SP	SP	SUBANGULAR TO ROUNDED	OLIVE BROWN	2.5Y 4/3	4	LIGHT GRAY	2.5Y 7/2	7	NA	0.21	0.22	3.1	1.6	1.0	
BI-CI-42-11	CAT ISLAND	2011	6/24/2011	9:17 AM	30.23301	-89.04282	266629.40750	918094.56630	20-ft Vibracore	14.0	15.1																		
BI-CI-42-11A	CAT ISLAND	2011																											

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10*P60)	
BI-CI-46-11C	CAT ISLAND	2011	6/23/2011	2:48 PM	30.22945	-89.05294	265340.71690	914896.18610	20-ft Vibracore	12.5	18.0	9.0 - 13.4	4.4	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT GRAY	2.5Y 7/1	7	NA	0.21	0.23	2.0	1.5	0.9	
BI-CI-47-11	CAT ISLAND	2011	6/23/2011	2:15 PM	30.23249	-89.05011	266444.60360	915792.03450	20-ft Vibracore	12.0	14.8	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-48-11	CAT ISLAND	2011	6/23/2011	1:40 PM	30.23553	-89.04676	267548.20450	916852.03900	20-ft Vibracore	12.0	17.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-49-11	CAT ISLAND	2011	6/23/2011	1:03 PM	30.23849	-89.04367	268622.89370	917829.82180	20-ft Vibracore	9.3	9.3																		
BI-CI-49-11A	CAT ISLAND	2011	6/23/2011	1:03 PM	30.23849	-89.04367	268622.89370	917829.82180	20-ft Vibracore	9.3	9.3	0.0 - 4.4	4.4	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	OLIVE GRAY	5Y 5/2	5	NA	0.24	0.28	8.5	3.0	1.4	
BI-CI-49-11B	CAT ISLAND	2011	6/23/2011	1:03 PM	30.23849	-89.04367	268622.89370	917829.82180	20-ft Vibracore	9.3	9.3	4.4 - 9.3	4.9	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT OLIVE GRAY	5Y 6/2	6	NA	0.18	0.18	4.4	1.7	1.1	
BI-CI-50-11	CAT ISLAND	2011	6/24/2011	8:40 AM	30.23602	-89.03962	267722.25130	919107.10610	20-ft Vibracore	14.0	13.9																		
BI-CI-50-11A	CAT ISLAND	2011	6/24/2011	8:40 AM	30.23602	-89.03962	267722.25130	919107.10610	20-ft Vibracore	14.0	13.9	0.0 - 1.5	1.5	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	OLIVE GRAY	5Y 5/2	5	NA	0.20	0.20	10.4	#VALUE!	#VALUE!	
BI-CI-50-11B	CAT ISLAND	2011	6/24/2011	8:40 AM	30.23602	-89.03962	267722.25130	919107.10610	20-ft Vibracore	14.0	13.9	2.0 - 4.0	2.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE BROWN	2.5Y 3/3	3	DARK OLIVE BROWN	2.5Y 3/3	3	NA	0.20	0.20	7.8	2.5	1.5	
BI-CI-50-11C	CAT ISLAND	2011	6/24/2011	8:40 AM	30.23602	-89.03962	267722.25130	919107.10610	20-ft Vibracore	14.0	13.9	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.20	0.20	3.5	2.0	1.3	
BI-CI-51-11	CAT ISLAND	2011	6/25/2011	8:21 AM	30.23331	-89.03622	266734.73610	920179.03090	20-ft Vibracore	15.0	14.6																		
BI-CI-51-11A	CAT ISLAND	2011	6/25/2011	8:21 AM	30.23331	-89.03622	266734.73610	920179.03090	20-ft Vibracore	15.0	14.6	0.0 - 1.7	1.7	SM	SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	OLIVE GRAY	5Y 5/2	5	NA	0.19	0.18	13.5	#VALUE!	#VALUE!	
BI-CI-51-11B	CAT ISLAND	2011	6/25/2011	8:21 AM	30.23331	-89.03622	266734.73610	920179.03090	20-ft Vibracore	15.0	14.6	1.7 - 6.7	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT OLIVE GRAY	5Y 6/2	6	NA	0.19	0.18	4.2	2.1	1.4	
BI-CI-51-11C	CAT ISLAND	2011	6/25/2011	8:21 AM	30.23331	-89.03622	266734.73610	920179.03090	20-ft Vibracore	15.0	14.6	6.7 - 12.6	5.9	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.18	0.18	7.0	1.9	1.1	
BI-CI-52-11	CAT ISLAND	2011	6/27/2011	11:44 AM	30.20650	-89.06538	257001.97050	910950.49580	20-ft Vibracore	18.0	17.4	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-53-11	CAT ISLAND	2011	6/28/2011	9:46 AM	30.20350	-89.06773	255912.44150	910205.92410	20-ft Vibracore	19.8	13.3	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-59-11	CAT ISLAND	2011	6/28/2011	9:18 AM	30.20318	-89.07452	255800.54130	908060.76350	20-ft Vibracore	15.5	12.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-60-11	CAT ISLAND	2011	6/28/2011	8:52 AM	30.20644	-89.07098	256983.79740	909181.50270	20-ft Vibracore	15.9	12.9																		
BI-CI-60-11A	CAT ISLAND	2011	6/28/2011	8:52 AM	30.20644	-89.07098	256983.79740	909181.50270	20-ft Vibracore	15.9	12.9	0.0 - 3.5	3.5	SP-SM	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.22	0.24	4.8	1.6	0.9	
BI-CI-60-11B	CAT ISLAND	2011	6/28/2011	8:52 AM	30.20644	-89.07098	256983.79740	909181.50270	20-ft Vibracore	15.9	12.9	3.5 - 7.5	4.0	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	LIGHT GRAY	2.5Y 7/2	7	NA	0.20	0.21	5.4	1.5	1.0	
BI-CI-61-11	CAT ISLAND	2011	6/28/2011	12:30 PM	30.20931	-89.06792	258025.56420	910150.25700	20-ft Vibracore	14.6	12.4																		
BI-CI-61-11A	CAT ISLAND	2011	6/28/2011	12:30 PM	30.20931	-89.06792	258025.56420	910150.25700	20-ft Vibracore	14.6	12.4	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	VERY DARK GRAYISH BROWN	2.5Y 3/2	3	GRAYISH BROWN	2.5Y 5/2	5	NA	0.21	0.22	4.8	1.7	1.1	
BI-CI-61-11B	CAT ISLAND	2011	6/28/2011	12:30 PM	30.20931	-89.06792	258025.56420	910150.25700	20-ft Vibracore	14.6	12.4	4.0 - 7.2	3.2	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.19	0.20	3.3	1.9	1.3	
BI-CI-62-11	CAT ISLAND	2011	6/28/2011	12:55 PM	30.21210	-89.07150	259042.58840	909021.54850	20-ft Vibracore	11.9	10.3																		
BI-CI-62-11A	CAT ISLAND	2011	6/28/2011	12:55 PM	30.21210	-89.07150	259042.58840	909021.54850	20-ft Vibracore	11.9	10.3	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.23	0.25	1.6	1.6	0.9	
BI-CI-62-11B	CAT ISLAND	2011	6/28/2011	12:55 PM	30.21210	-89.07150	259042.58840	909021.54850	20-ft Vibracore	11.9	10.3	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.19	0.18	4.1	2.1	1.4	
BI-CI-63-11	CAT ISLAND	2011	6/28/2011	1:47 PM	30.20911	-89.07479	257957.36350	907980.04460	20-ft Vibracore	11.8	12.3																		
BI-CI-63-11A	CAT ISLAND	2011	6/28/2011	1:47 PM	30.20911	-89.07479	257957.36350	907980.04460	20-ft Vibracore	11.8	12.3	0.0 - 4.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.40	0.42	7.8	2.6	1.2	
BI-CI-63-11B	CAT ISLAND	2011	6/28/2011	1:47 PM	30.20911	-89.07479	257957.36350	907980.04460	20-ft Vibracore	11.8	12.3	4.0 - 8.2	4.2	SP	SP	SUBANGULAR TO ROUNDED	GRAYISH BROWN	2.5Y 5/2	5	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.20	0.21	2.8	1.6	1.0	
BI-CI-63-11C	CAT ISLAND	2011	6/28/2011	1:47 PM	30.20911	-89.07479	257957.36350	907980.04460	20-ft Vibracore	11.8	12.3	8.2 - 9.0	0.8	SP	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 5.5/2	6	NA	0.16	0.16	8.2	2.2	1.1	
BI-CI-64-11	CAT ISLAND	2011	6/28/2011	2:13 PM	30.20597	-89.07787	256817.47390	907004.69670	20-ft Vibracore	12.6	10.9	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-65-11	CAT ISLAND	2011	6/28/2011	2:35 PM	30.20299	-89.08102	255735.84830	906007.30090	20-ft Vibracore	11.6	11.7	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-CI-67-11	CAT ISLAND	2011	6/23/2011	12:20 PM	30.24479	-89.04367	270914.10800	917834.05810	20-ft Vibracore	10.0	14.5																		
BI-CI-67-11A	CAT ISLAND	2011	6/23/2011	12:20 PM	30.24479	-89.04367	270914.10800	917834.05810	20-ft Vibracore	10.0	14.5	0.0 - 2.0	2.0	SP	SP	SUBANGULAR TO ROUNDED	LIGHT OLIVE GRAY	5Y 6/2	6	LIGHT OLIVE GRAY	5Y 6/2	6	NA	0.21	0.23	2.7	1.5	0.9	
BI-CI-67-11B	CAT ISLAND	2011	6/23/2011	12:20 PM	30.24479	-89.04367	270914.10800	917834.05810	20-ft Vibracore	10.0	14.5	2.0 - 6.5	4.5	SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	OLIVE GRAY	5Y 5/2	5	NA	0.20	0.20	9.4	2.7	1.7	
BI-CI-67-11C	CAT ISLAND	2011	6/23/2011	12:20 PM	30.24479	-89.04367	270914.10800	917834.05810	20-ft Vibracore	10.0	14.5	6.5 - 11.5	5.0	SP	SP	SUBANGULAR TO ROUNDED	BLACK	2.5Y 2.5/1	3	GRAYISH BROWN	2.5Y 5/2	5	NA	0.20	0.22	3.0	2.0	1.2	
BI-CI-67-11D	CAT ISLAND	2011	6/23/2011	12:20 PM	30.24479	-89.04367	270914.10800	917834.05810	20-ft Vibracore	10.0	14.5	11.5 - 14.5	3.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAY	2.5Y 4/1	4	GRAY	2.5Y 6/1	6	NA	0.19	0.19	2.3	2.1	1.3	
BI-CI-70-11	CAT ISLAND	2011	6/23/2011	9:47 AM	30.25251	-89.03226	273715.27550	921441.79960	20-ft Vibracore	9.0	11.4																		
BI-CI-70-11A	CAT ISLAND	2011	6/23/2011	9:47 AM	30.25251	-89.03226	273715.27550	921441.79960	20-ft Vibracore	9.0	11.4	0.0 - 2.9	2.9	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.20	0.21	1.7	1.4	1.0	
BI-CI-70-11B	CAT ISLAND	2011	6/23/2011	9:47 AM	30.25251	-89.03226	273715.27550	921441.79960	20-ft Vibracore	9.0	11.4	2.9 - 6.0	3.1	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	GRAYISH BROWN	2.5Y 5/2								

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results


Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10*P60)
BI-CI-76-11C	CAT ISLAND	2011	6/22/2011	2:30 PM	30.24972	-89.02946	272699.05830	922324.11080	20-ft Vibracore	8.5	11.6	9.0 - 11.6	2.6	SM	SP-SM	SUBANGULAR TO ROUNDED	VERY DARK GRAYISH BROWN	2.5Y 3/2	3	GRAYISH BROWN	2.5Y 5/2	5	NA	0.18	0.18	5.8	2.3	1.4
BI-CI-77-11	CAT ISLAND	2011	6/22/2011	4:26 PM	30.25215	-89.02521	273580.52420	923667.51780	20-ft Vibracore	9.3	13.3																	
BI-CI-77-11A	CAT ISLAND	2011	6/22/2011	4:26 PM	30.25215	-89.02521	273580.52420	923667.51780	20-ft Vibracore	9.3	13.3	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	GRAY	5Y 6/1	6	NA	0.19	0.20	2.4	1.4	1.0
BI-CI-78-11	CAT ISLAND	2011	6/22/2011	5:02 PM	30.25479	-89.02200	274538.95750	924682.62700	20-ft Vibracore	11.0	11.9																	
BI-CI-78-11A	CAT ISLAND	2011	6/22/2011	5:02 PM	30.25479	-89.02200	274538.95750	924682.62700	20-ft Vibracore	11.0	11.9	0.0 - 3.5	3.5	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAYISH BROWN	2.5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.18	0.18	4.1	2.0	1.4
BI-CI-82-11	CAT ISLAND	2011	6/23/2011	10:30 AM	30.24591	-89.02634	271311.73330	923306.88370	20-ft Vibracore	11.5	16.1																	
BI-CI-82-11A	CAT ISLAND	2011	6/23/2011	10:30 AM	30.24591	-89.02634	271311.73330	923306.88370	20-ft Vibracore	11.5	16.1	0.0 - 3.0	3.0	SM	SP-SM	SUBANGULAR TO ROUNDED	DARK OLIVE GRAY	5Y 3/2	3	GRAYISH BROWN	2.5Y 5/2	5	NA	0.19	0.19	7.1	2.5	1.5
BI-CI-82-11B	CAT ISLAND	2011	6/23/2011	10:30 AM	30.24591	-89.02634	271311.73330	923306.88370	20-ft Vibracore	11.5	16.1	6.5 - 11.5	5.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.20	0.20	4.3	2.2	1.3
BI-CI-82-11C	CAT ISLAND	2011	6/23/2011	10:30 AM	30.24591	-89.02634	271311.73330	923306.88370	20-ft Vibracore	11.5	16.1	11.5 - 16.1	4.6	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NA	0.18	0.18	2.8	2.0	1.3
BI-CI-84-11	CAT ISLAND	2011	6/28/2011	3:43 PM	30.23149	-89.04862	266080.02600	916261.88880	20-ft Vibracore	12.3	11.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED													
BI-CI-85-11	CAT ISLAND	2011	6/28/2011	3:25 PM	30.22764	-89.05079	264681.14470	915573.91980	20-ft Vibracore	13.0	11.8	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED													
BI-CI-86-11	CAT ISLAND	2011	6/28/2011	3:06 PM	30.22569	-89.04816	263970.38340	916403.17660	20-ft Vibracore	14.6	6.9																	
BI-CI-86-11A	CAT ISLAND	2011	6/28/2011	3:06 PM	30.22569	-89.04816	263970.38340	916403.17660	20-ft Vibracore	14.6	6.9	0.0 - 3.0	3.0	SM	SP-SM	SUBANGULAR TO ROUNDED	BLACK	5Y 2.5/1	3	GRAY	5Y 6/1	6	NA	0.18	0.19	10.7	#VALUE!	#VALUE!
BI-CI-86-11B	CAT ISLAND	2011	6/28/2011	3:06 PM	30.22569	-89.04816	263970.38340	916403.17660	20-ft Vibracore	14.6	6.9	3.0 - 6.9	3.9	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.20	0.20	3.3	1.6	1.1
BI-CI-87-11	CAT ISLAND	2011	6/28/2011	2:37 PM	30.22199	-89.05019	262625.96880	915759.49430	20-ft Vibracore	13.2	7.5																	
BI-CI-87-11A	CAT ISLAND	2011	6/28/2011	2:37 PM	30.22199	-89.05019	262625.96880	915759.49430	20-ft Vibracore	13.2	7.5	0.0 - 4.0	4.0	SP	SP	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	LIGHT BROWNISH GRAY	2.5Y 6/2	6	NA	0.20	0.20	4.1	2.1	1.3
BI-CI-87-11B	CAT ISLAND	2011	6/28/2011	2:37 PM	30.22199	-89.05019	262625.96880	915759.49430	20-ft Vibracore	13.2	7.5	4.0 - 7.5	3.5	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAY	5Y 4/1	4	GRAY	2.5Y 6/1	6	NA	0.19	0.18	3.5	2.1	1.4
BI-CI-88-11	CAT ISLAND	2011	6/28/2011	10:32 AM	30.20780	-89.08019	257484.59560	906273.28540	20-ft Vibracore	11.9	11.2																	
BI-CI-88-11A	CAT ISLAND	2011	6/28/2011	10:32 AM	30.20780	-89.08019	257484.59560	906273.28540	20-ft Vibracore	11.9	11.2	0.0 - 4.0	4.0	SP-SM	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.23	0.24	8.5	2.4	1.3
BI-CI-88-11B	CAT ISLAND	2011	6/28/2011	10:32 AM	30.20780	-89.08019	257484.59560	906273.28540	20-ft Vibracore	11.9	11.2	4.0 - 9.5	5.5	SP-SM	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NA	0.20	0.21	4.5	1.4	1.0
BI-CI-89-11	CAT ISLAND	2011	6/28/2011	11:10 AM	30.20408	-89.08185	256132.83410	905745.97320	20-ft Vibracore	11.6	10.0	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED													
BI-CI-90-11	CAT ISLAND	2011	6/28/2011	12:46 PM	30.20678	-89.07899	257112.81880	906651.54060	20-ft Vibracore	11.6	11.7	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED													
BI-CI-91-11	CAT ISLAND	2011	6/28/2011	1:30 PM	30.21116	-89.07715	258704.50310	907236.17550	20-ft Vibracore	11.3	7.8																	
BI-CI-91-11A	CAT ISLAND	2011	6/28/2011	1:30 PM	30.21116	-89.07715	258704.50310	907236.17550	20-ft Vibracore	11.3	7.8	0.0 - 3.0	3.0	SP	SP-SM	SUBANGULAR TO ROUNDED	OLIVE GRAY	5Y 4/2	4	GRAYISH BROWN	2.5Y 5/2	5	NA	0.22	0.23	5.2	1.7	1.0
BI-CI-91-11B	CAT ISLAND	2011	6/28/2011	1:30 PM	30.21116	-89.07715	258704.50310	907236.17550	20-ft Vibracore	11.3	7.8	3.0 - 6.0	3.0	SP	SP	SUBANGULAR TO ROUNDED	DARK GRAY	5Y 4/1	4	GRAY	5Y 6/1	6	NA	0.21	0.22	2.6	1.4	1.0
BI-CI-91-11C	CAT ISLAND	2011	6/28/2011	1:30 PM	30.21116	-89.07715	258704.50310	907236.17550	20-ft Vibracore	11.3	7.8	6.0 - 7.8	1.8	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	LIGHT GRAY	2.5Y 7/1	7	NA	0.21	0.22	1.7	1.5	0.9
BI-CI-92-11	CAT ISLAND	2011	6/28/2011	2:00 PM	30.20521	-89.08334	256544.82640	905276.19720	20-ft Vibracore	10.6	9.4	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED													
BI-CI-TEST-11	CAT ISLAND	2011	6/22/2011	3:42 PM	30.22976	-89.03699	265444.09170	919933.55620	20-ft Vibracore	8.5	18.0																	
BI-CI-TEST-11A	CAT ISLAND	2011	6/22/2011	3:42 PM	30.22976	-89.03699	265444.09170	919933.55620	20-ft Vibracore	8.5	18.0	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	NA	NA	NA	NA	NA	NA	NA	0.20	0.21	4.4	1.9	1.2
BI-CI-TEST-11B	CAT ISLAND	2011	6/22/2011	3:42 PM	30.22976	-89.03699	265444.09170	919933.55620	20-ft Vibracore	8.5	18.0	5.0-10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	NA	NA	NA	NA	NA	NA	NA	0.20	0.21	3.2	1.4	1.0

Cu: Coefficient of Uniformity
Cc: Coefficient of Curvature
The "#Value!" error message indicates that data was not available for that calculation.

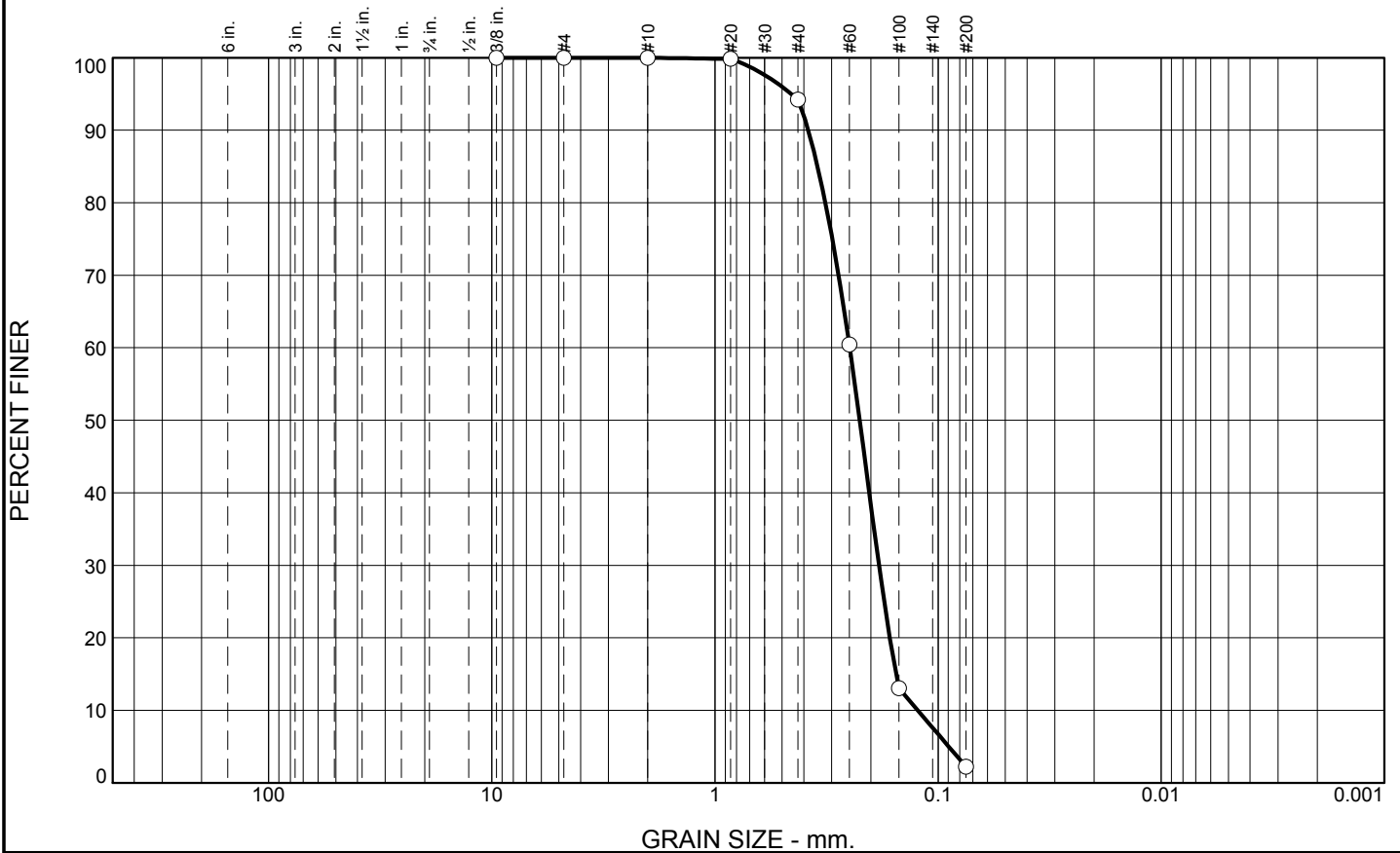
This page was intentionally left blank for duplex printing.

Boring Designation BI-CI-01-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-01-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 9.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 15.1 Ft.		16. ELEVATION TOP OF BORING -8.6 Ft.		COMPLETED 05-19-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.6	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. brown (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2246 mm % Fines: 2.2
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2306 mm % Fines: 3.6
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, gray (SP)	C	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.2049 mm % Fines: 5.1
-19.6	11.0				
-22.6	14.0				
-23.7	15.1				
NOTES:					
1. Soils are field visually classified in accordance with the Unified Soils Classification System.					
2. NS = Sample not submitted for laboratory analysis from this interval.					
3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	5.8	92.0	2.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	94.2		
#60	60.4		
#100	13.1		
#200	2.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3821 D₈₅= 0.3468 D₆₀= 0.2488
D₅₀= 0.2246 D₃₀= 0.1840 D₁₅= 0.1543
D₁₀= 0.1233 C_u= 2.02 C_c= 1.10

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-1-10A
Sample Number: TE Lab ID: 4488.56

Depth: 0.0 - 5.0 (ft.)

Date: 5/27/10

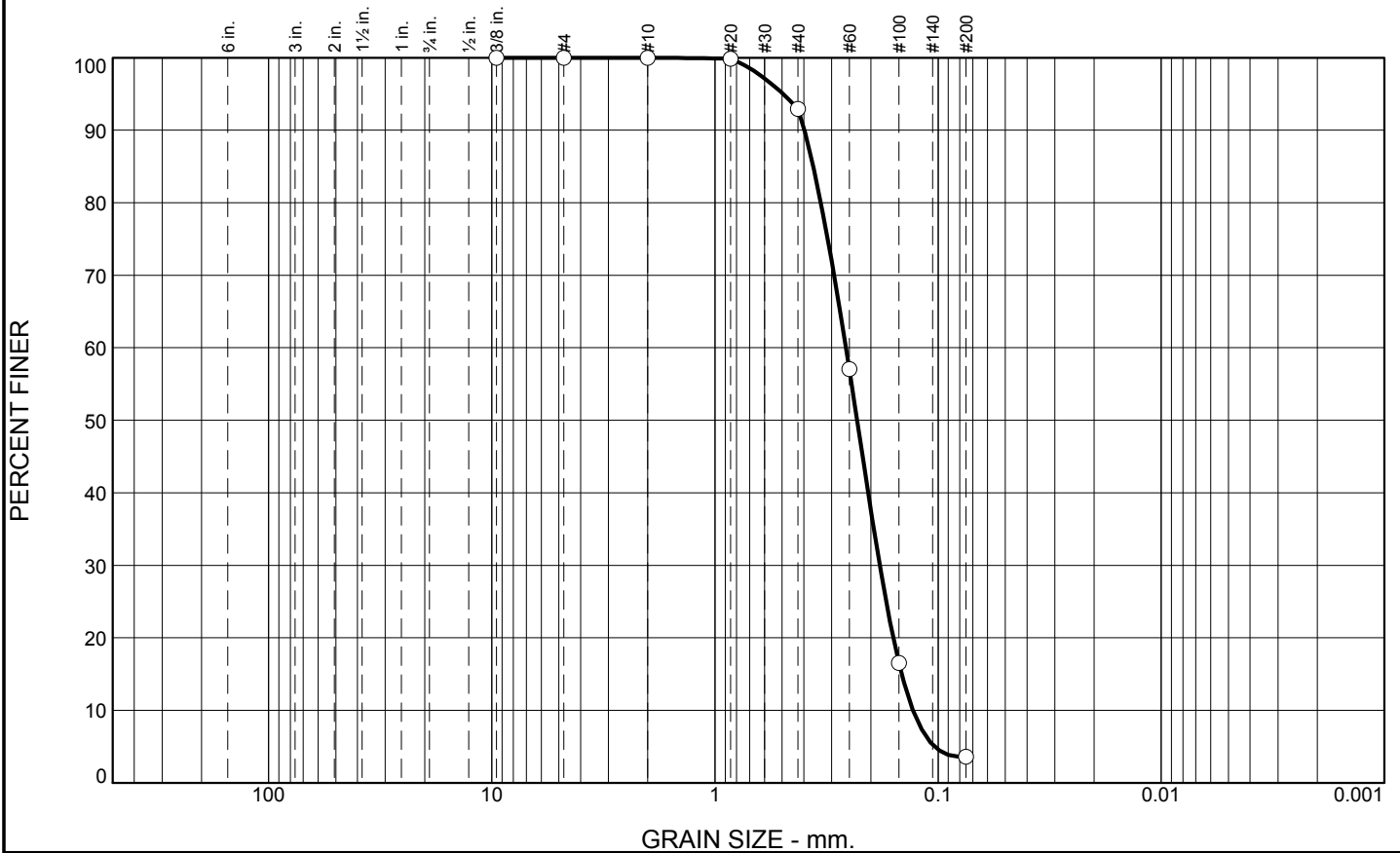
<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	7.0	89.4	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	93.0		
#60	57.1		
#100	16.5		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3977 D₈₅= 0.3627 D₆₀= 0.2587
D₅₀= 0.2306 D₃₀= 0.1825 D₁₅= 0.1457
D₁₀= 0.1295 C_u= 2.00 C_c= 0.99

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-1-10B
Sample Number: TE Lab ID: 4488.57

Depth: 5.0 - 10.0 (ft.)

Date: 5/27/10

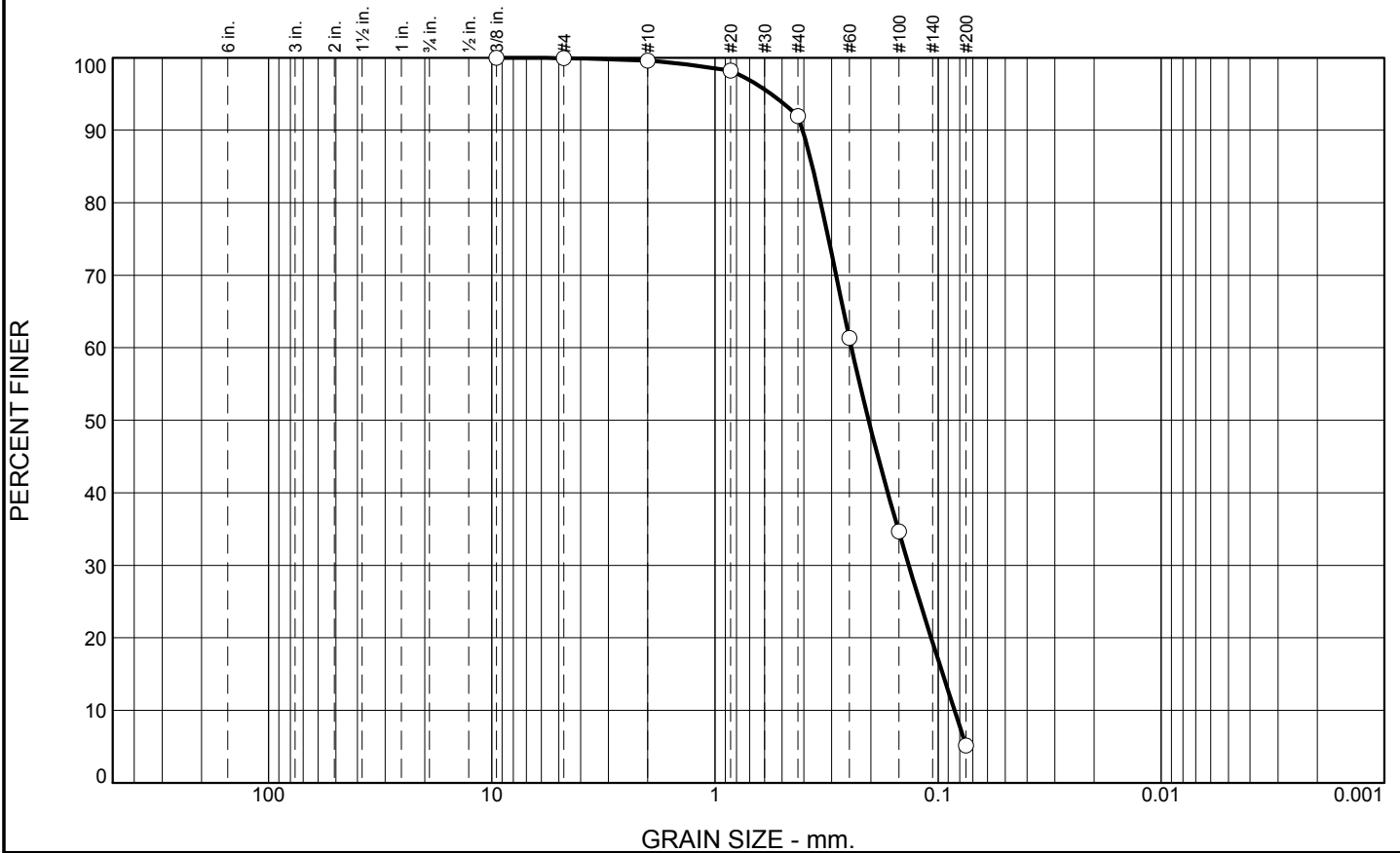
<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	7.6	86.9	5.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.6		
#20	98.2		
#40	92.0		
#60	61.4		
#100	34.7		
#200	5.1		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4052 D₈₅= 0.3662 D₆₀= 0.2444
D₅₀= 0.2049 D₃₀= 0.1353 D₁₅= 0.0953
D₁₀= 0.0845 C_u= 2.89 C_c= 0.89

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-1-10C
Sample Number: TE Lab ID: 4488.58

Depth: 10.0 - 15.1 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

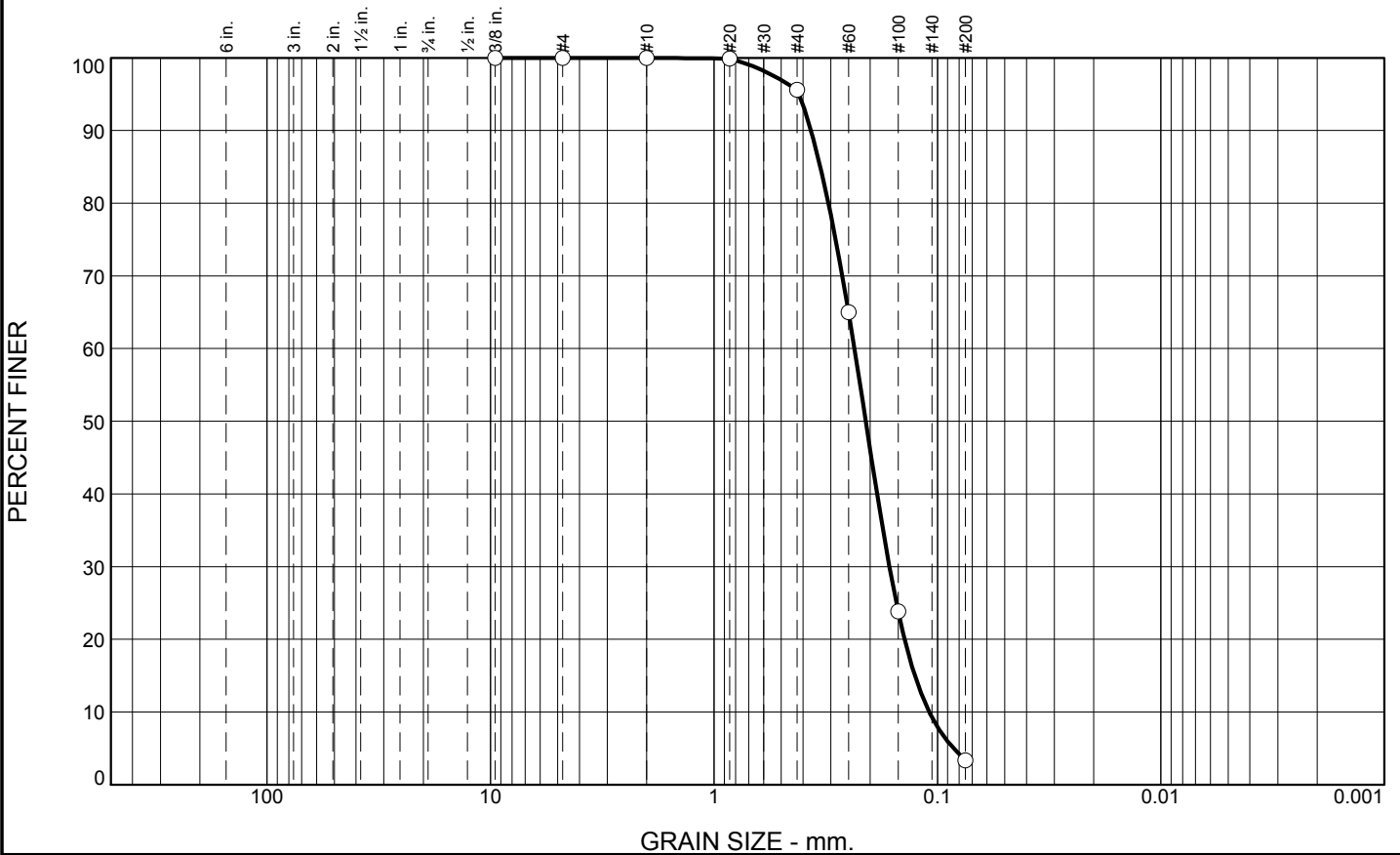
Checked By: R.Byrd

Boring Designation BI-CI-02-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-02-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 11.1 Ft.		16. ELEVATION TOP OF BORING -8.8 Ft.		COMPLETED 05-19-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.8	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. brown (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2094 mm % Fines: 3.3
-16.8	8.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	B	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1761 mm % Fines: 5.7
-19.2	10.4				
-19.9	11.1		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, trace shell fragments, gray (SP)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	4.4	92.3	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	95.6		
#60	65.0		
#100	23.8		
#200	3.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3682 D₈₅= 0.3341 D₆₀= 0.2353
D₅₀= 0.2094 D₃₀= 0.1642 D₁₅= 0.1262
D₁₀= 0.1089 C_u= 2.16 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-2-10A
Sample Number: TE Lab ID: 4488.62

Depth: 0.0 - 5.0 (ft.)

Date: 5/27/10

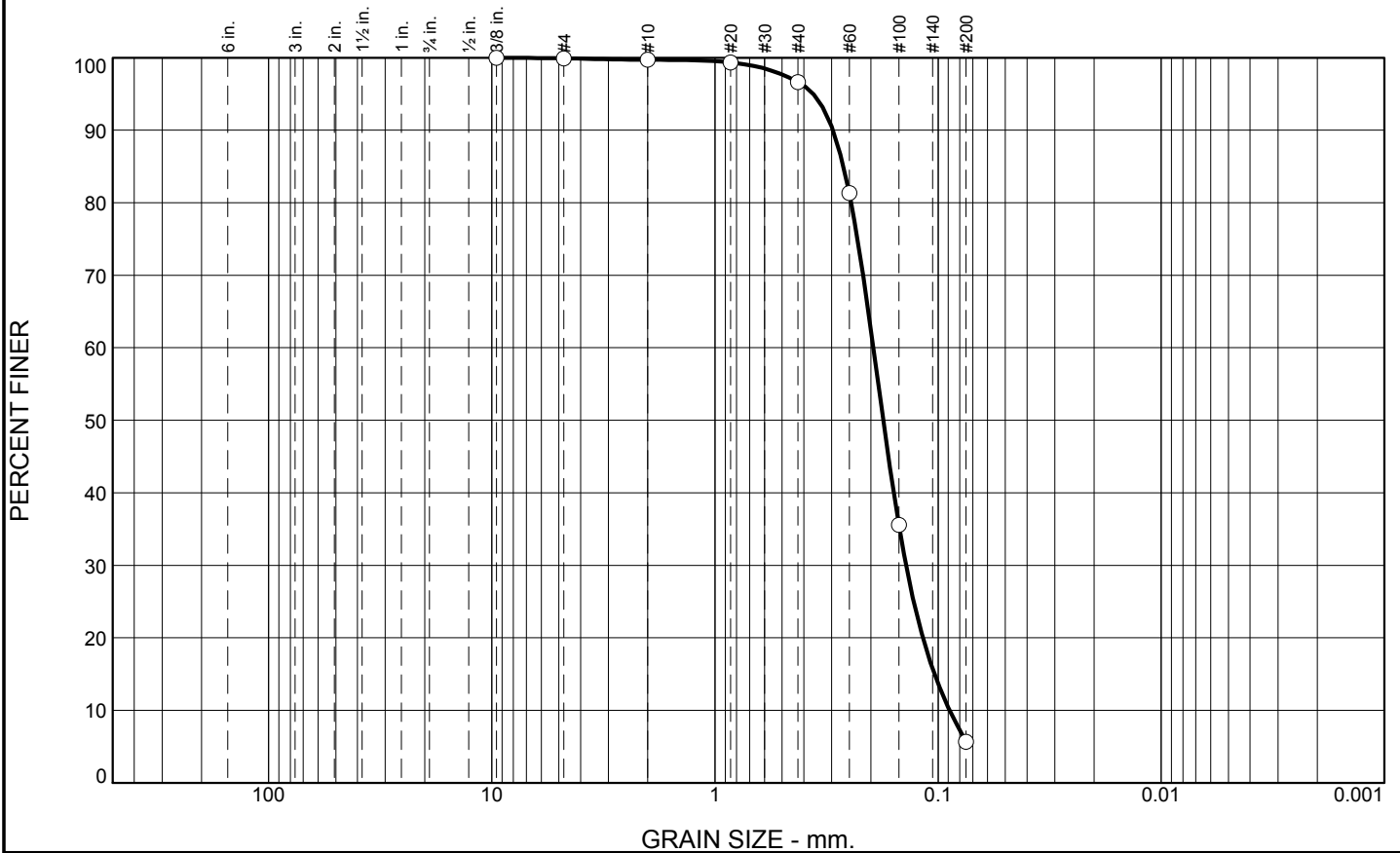
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	3.1	90.9	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	99.3		
#40	96.6		
#60	81.3		
#100	35.6		
#200	5.7		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2959 D₈₅= 0.2653 D₆₀= 0.1951
D₅₀= 0.1761 D₃₀= 0.1392 D₁₅= 0.1039
D₁₀= 0.0888 C_u= 2.20 C_c= 1.12

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-2-10B
Sample Number: TE Lab ID: 4488.63

Depth: 5.0 - 11.1 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

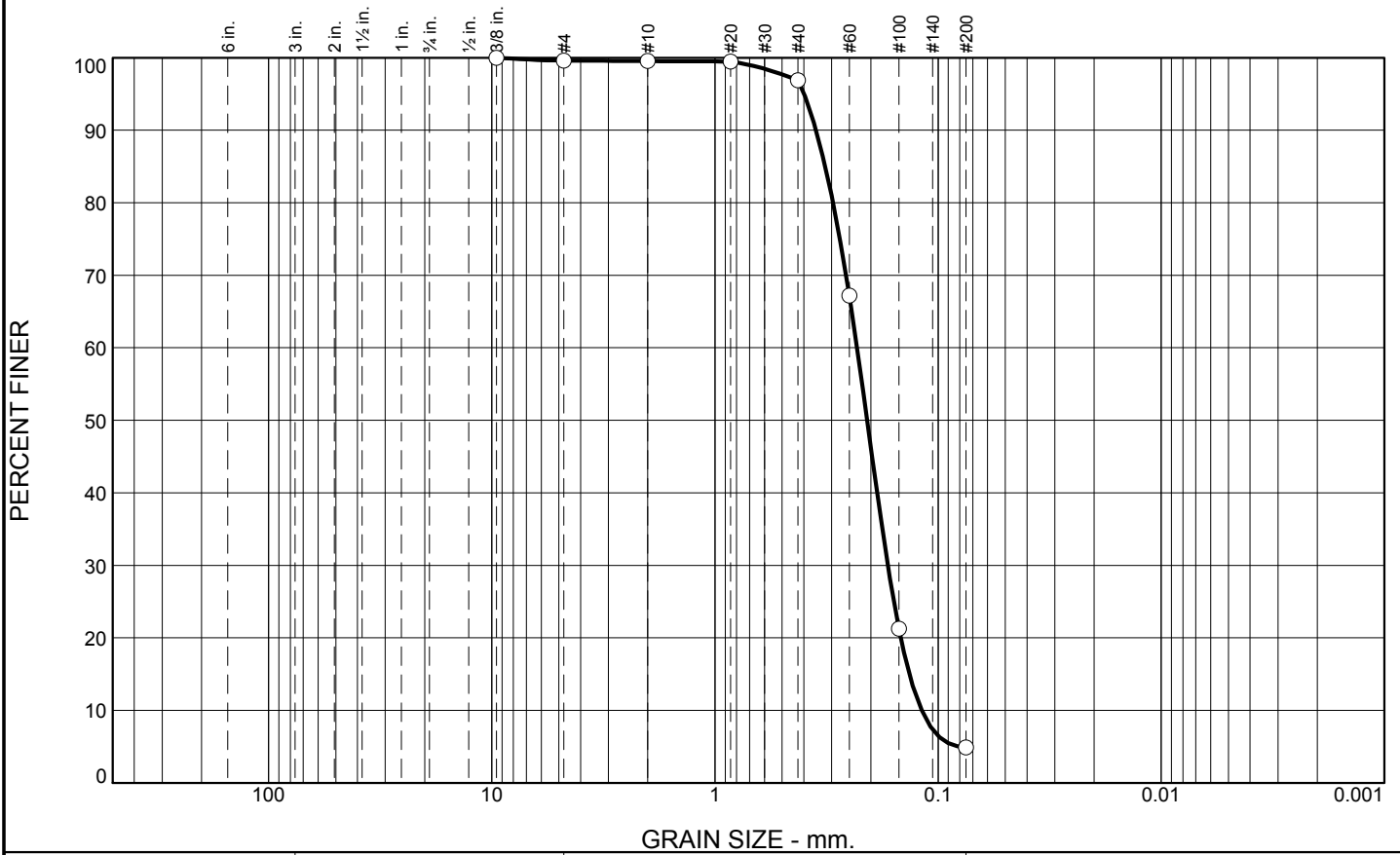
Checked By: R.Byrd

Boring Designation BI-CI-03-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-03-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -8.6 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 13.6 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.6	0.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. brown (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.208 mm % Fines: 4.9
				B	Classification: SP Color: 2.5Y 6.5/1-gray D50: 0.1782 mm % Fines: 1.6
-18.3	9.7			C	Classification: SP-SM Color: 2.5Y 6.5/1.5-light gray D50: 0.115 mm % Fines: 7.7
-22.2	13.6		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)		
NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.1	2.6	92.0	4.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	99.5		
#20	99.5		
#40	96.9		
#60	67.2		
#100	21.3		
#200	4.9		

Material Description

SAND, (SP), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3524 D₈₅= 0.3203 D₆₀= 0.2309
D₅₀= 0.2080 D₃₀= 0.1680 D₁₅= 0.1346
D₁₀= 0.1184 C_u= 1.95 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-3-10A
Sample Number: TE Lab ID: 4488.66

Depth: 0.0 - 4.5 (ft.)

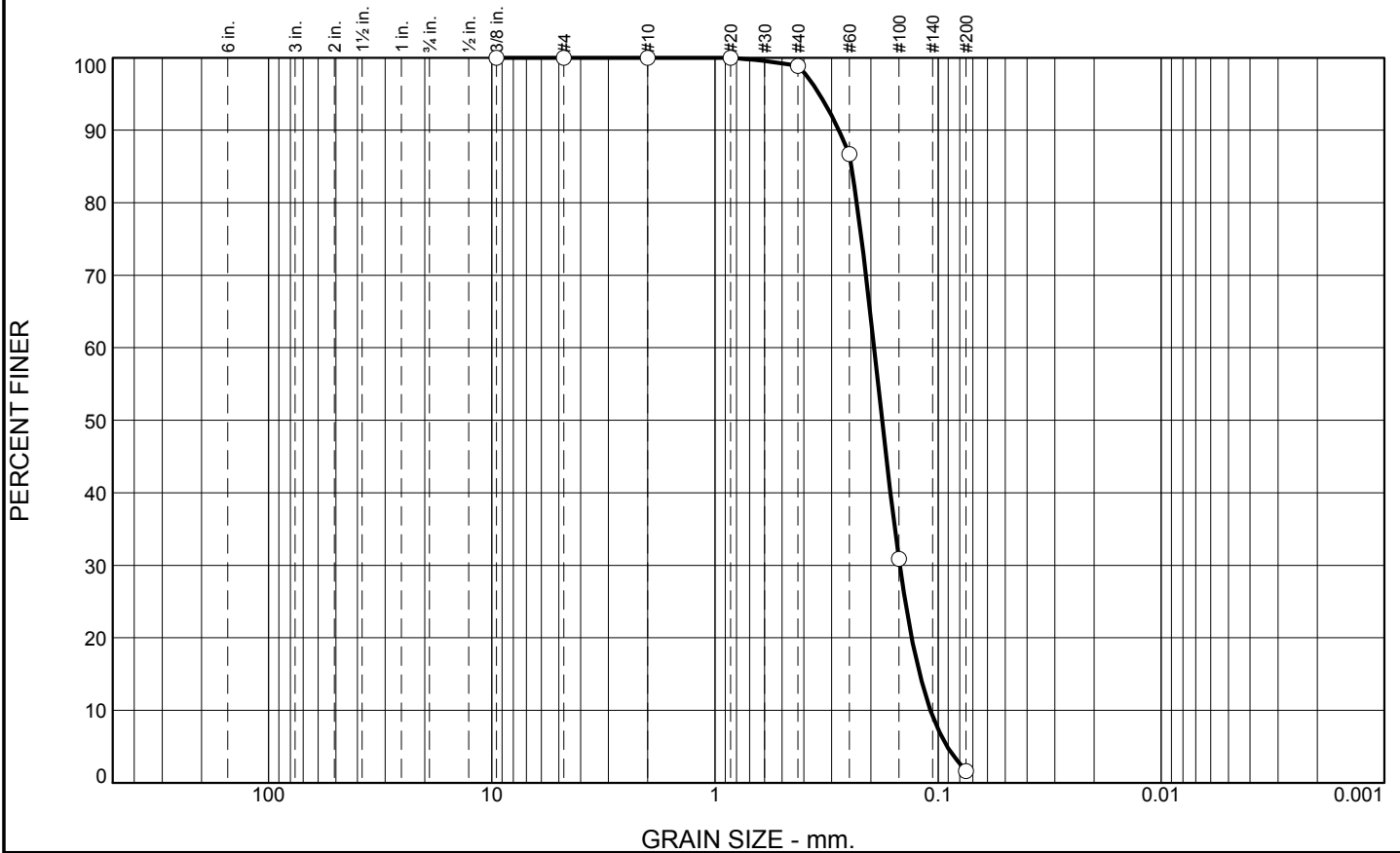
Date: 5/27/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.1	97.3	1.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.9		
#60	86.7		
#100	30.9		
#200	1.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2786 D₈₅= 0.2447 D₆₀= 0.1936
D₅₀= 0.1782 D₃₀= 0.1486 D₁₅= 0.1209
D₁₀= 0.1083 C_u= 1.79 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-3-10B
Sample Number: TE Lab ID: 4488.67

Depth: 4.5 - 9.0 (ft.)

Date: 5/27/10

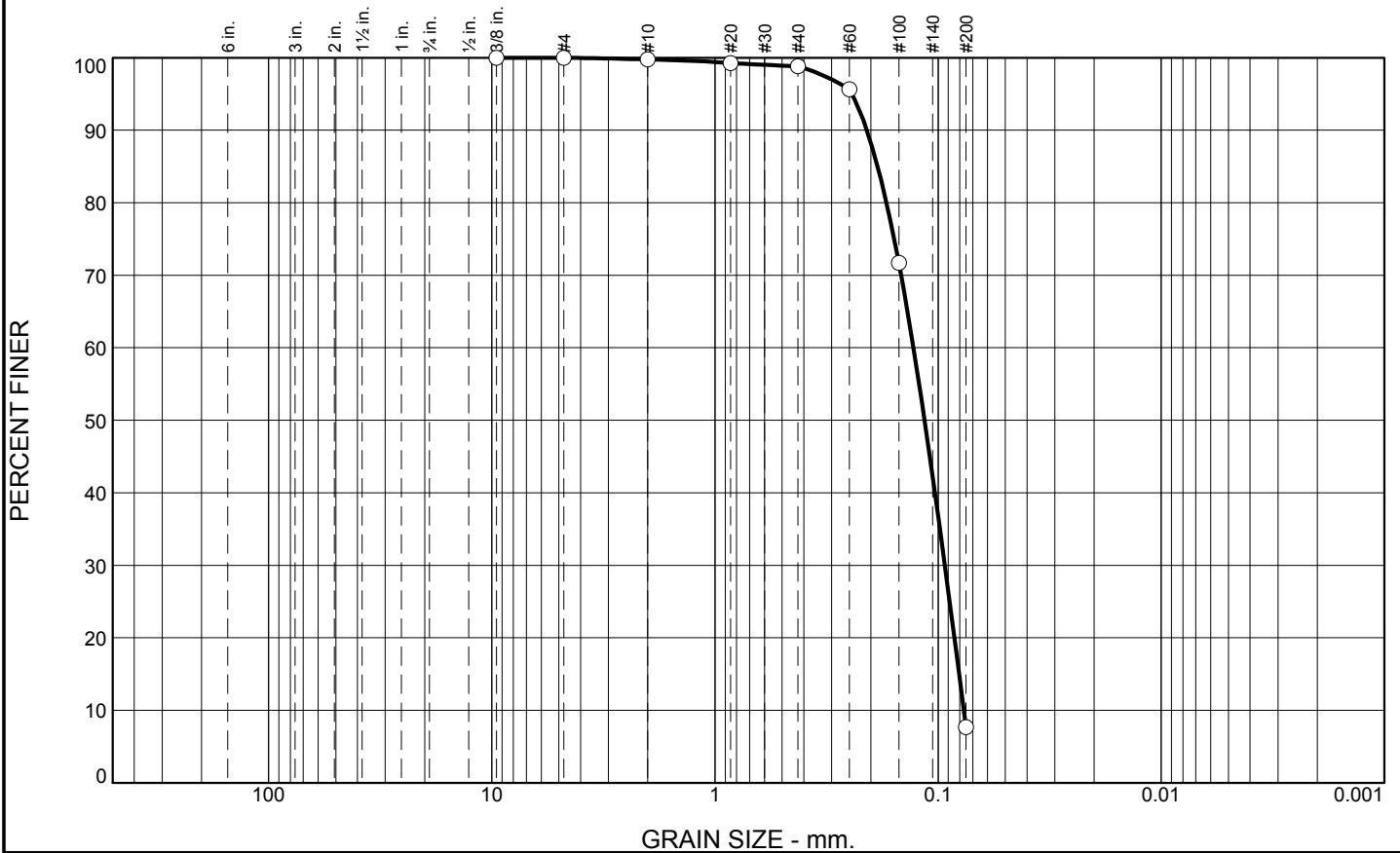
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.0	91.1	7.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.2		
#40	98.8		
#60	95.6		
#100	71.7		
#200	7.7		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2087 D₈₅= 0.1867 D₆₀= 0.1289
D₅₀= 0.1150 D₃₀= 0.0933 D₁₅= 0.0805
D₁₀= 0.0767 C_u= 1.68 C_c= 0.88

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-3-10C
Sample Number: TE Lab ID: 4488.68

Depth: 9.0 - 13.5 (ft.)

Date: 5/27/10




<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

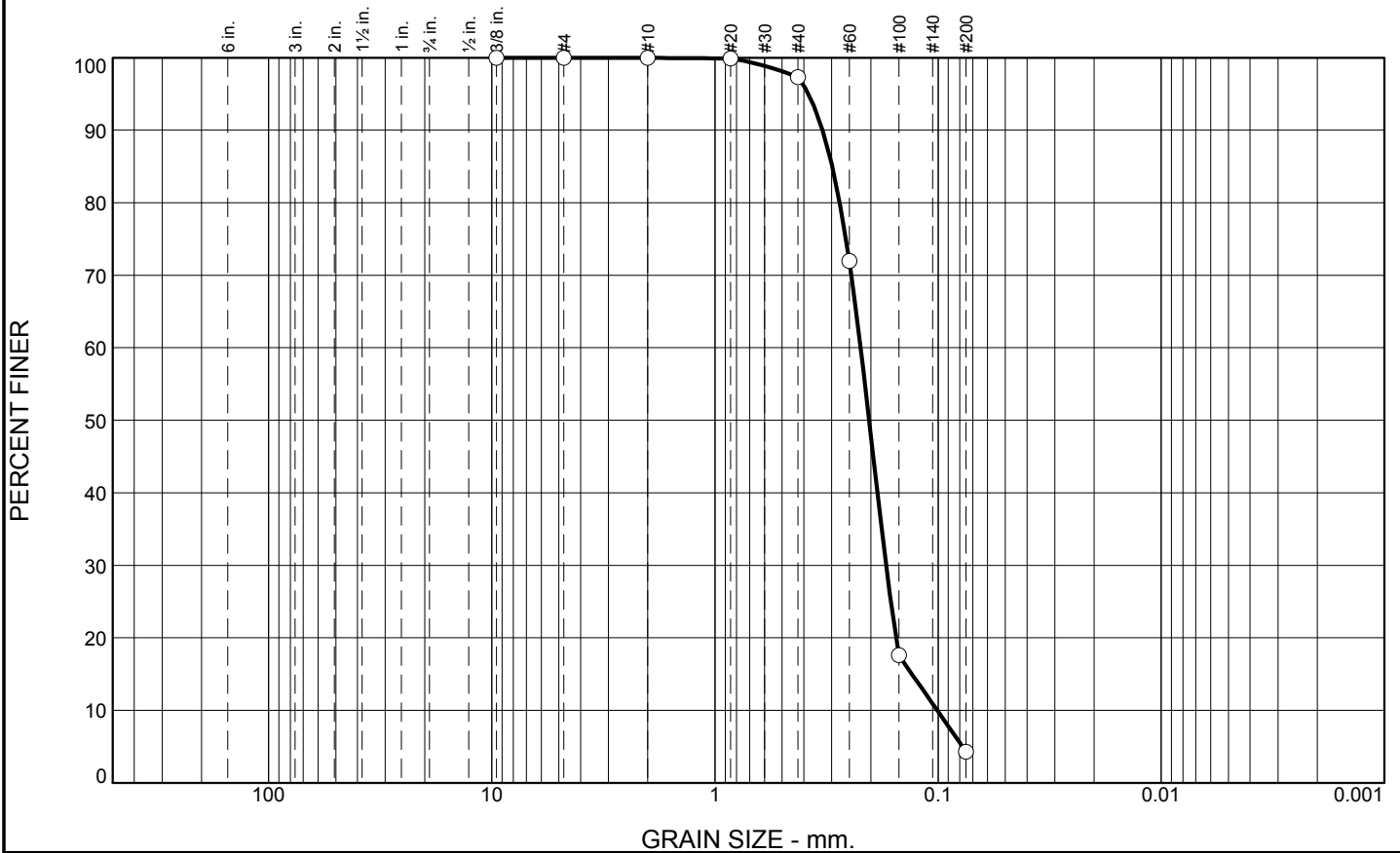
Checked By: R.Byrd

Boring Designation BI-CI-04-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-04-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -8.6 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 11.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.6	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. brown (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2038 mm % Fines: 4.3
-15.4	6.8		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	B	Classification: SP-SM Color: 2.5Y 6.5/1-gray D50: 0.161 mm % Fines: 7.2
-19.6	11.0		At El. -18.3 Ft., mostly fine to medium-grained sand-sized quartz, little clay, trace shell fragments, gray		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.7	93.0	4.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	97.3		
#60	72.0		
#100	17.6		
#200	4.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D ₉₀ = 0.3291	D ₈₅ = 0.2980	D ₆₀ = 0.2224
D ₅₀ = 0.2038	D ₃₀ = 0.1710	D ₁₅ = 0.1310
D ₁₀ = 0.1010	C _u = 2.20	C _c = 1.30

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-4-10A
Sample Number: TE Lab ID: 4488.74

Depth: 0.0 - 5.5 (ft.)

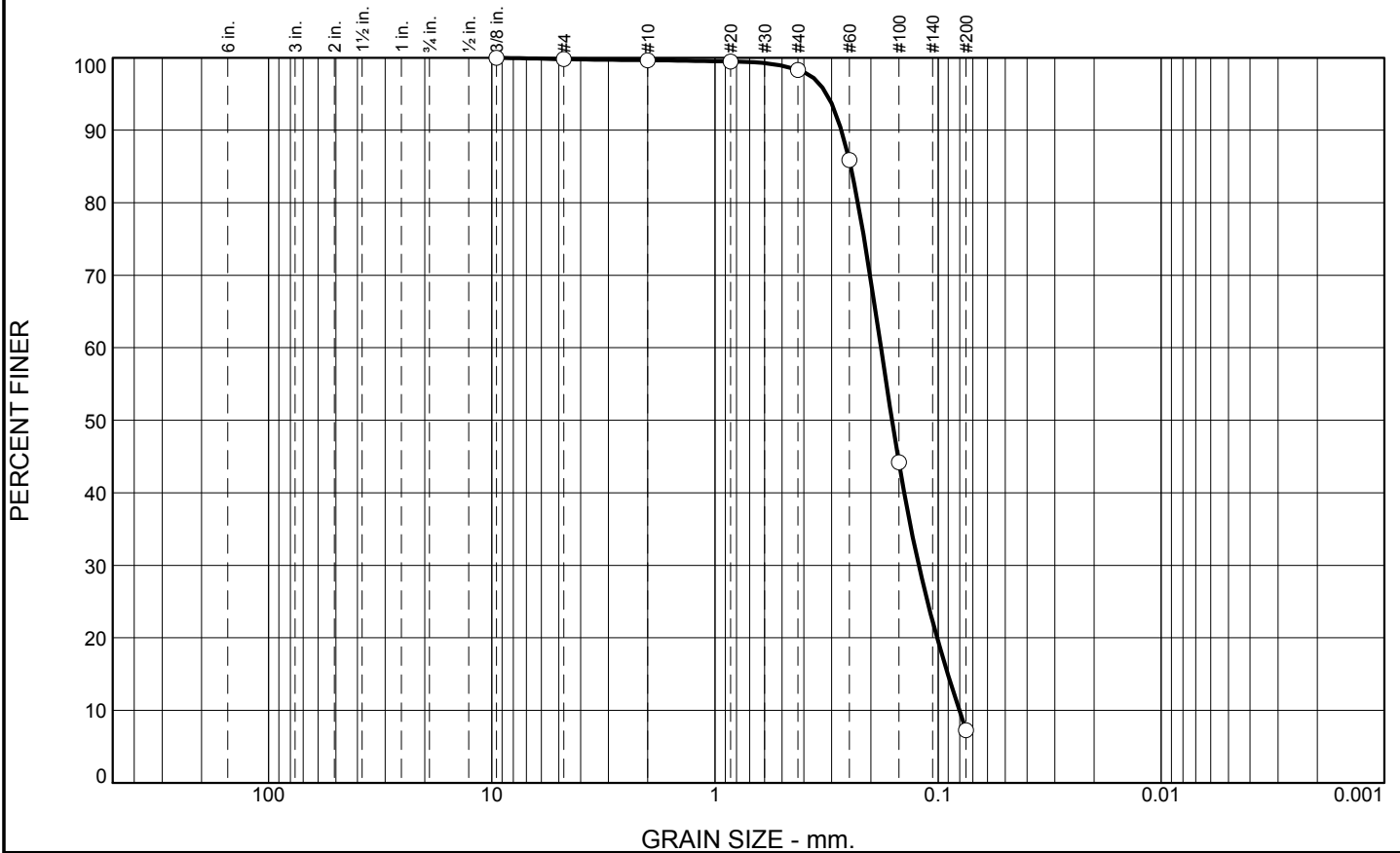
Date: 5/27/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.1	1.4	91.1	7.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.7		
#20	99.5		
#40	98.3		
#60	85.9		
#100	44.2		
#200	7.2		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2711 D₈₅= 0.2464 D₆₀= 0.1803
D₅₀= 0.1610 D₃₀= 0.1220 D₁₅= 0.0905
D₁₀= 0.0803 C_u= 2.25 C_c= 1.03

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-4-10B
Sample Number: TE Lab ID: 4488.75

Depth: 5.5 - 11.0 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: L.Stokes

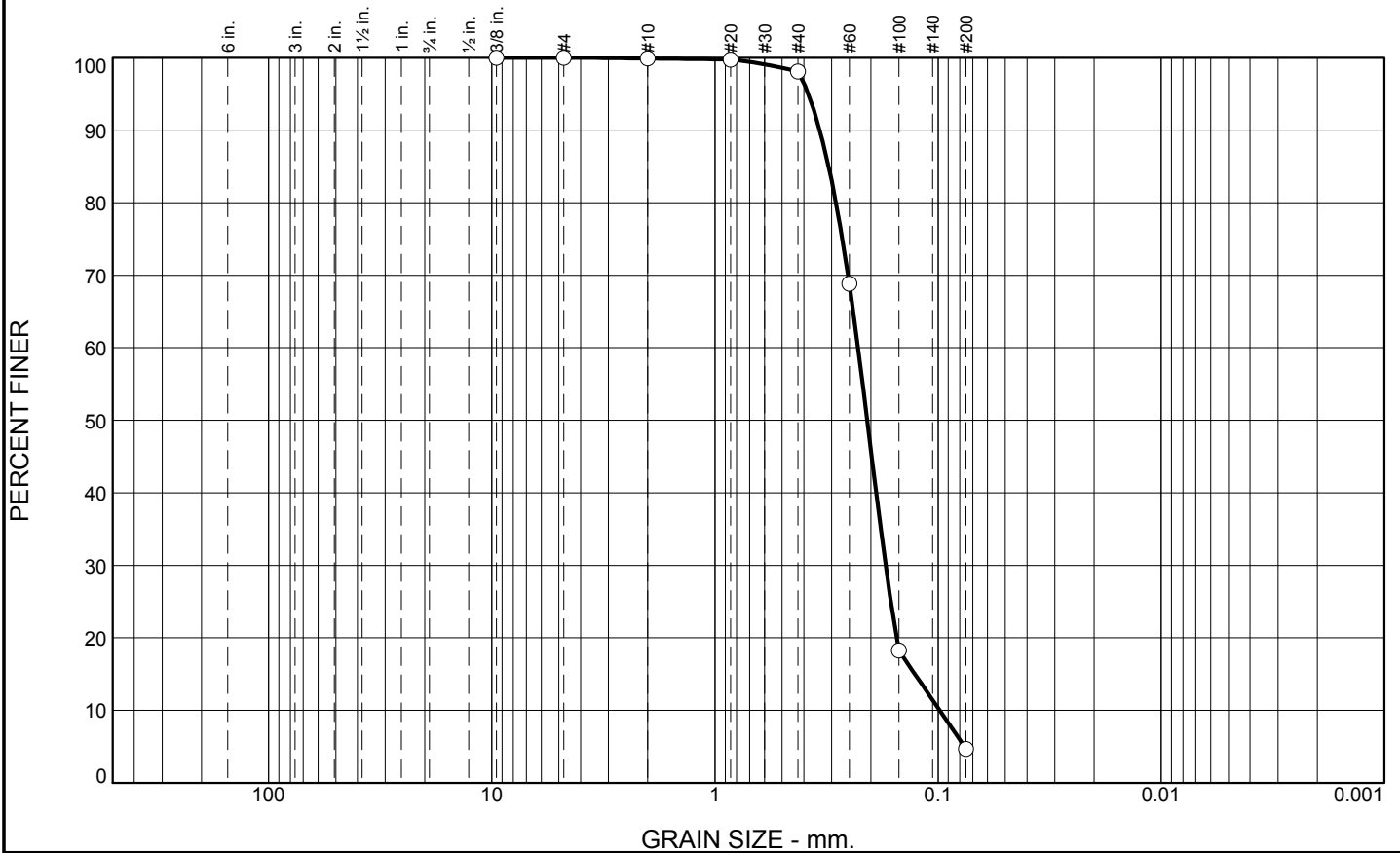
Checked By: R.Byrd

Boring Designation BI-CI-05-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-05-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.0 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 10.6 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.0	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. brown (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2079 mm % Fines: 4.7
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	B	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1401 mm % Fines: 8.5
-16.9	7.9				
-18.0	9.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, trace shell fragments, gray (SP)	NS	
-19.6	10.6				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.8	93.4	4.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	98.1		
#60	68.8		
#100	18.3		
#200	4.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3388 D₈₅= 0.3093 D₆₀= 0.2284
D₅₀= 0.2079 D₃₀= 0.1718 D₁₅= 0.1270
D₁₀= 0.0984 C_u= 2.32 C_c= 1.31

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-5-10A
Sample Number: TE Lab ID: 4488.76

Depth: 0.0 - 5.0 (ft.)

Date: 5/27/10

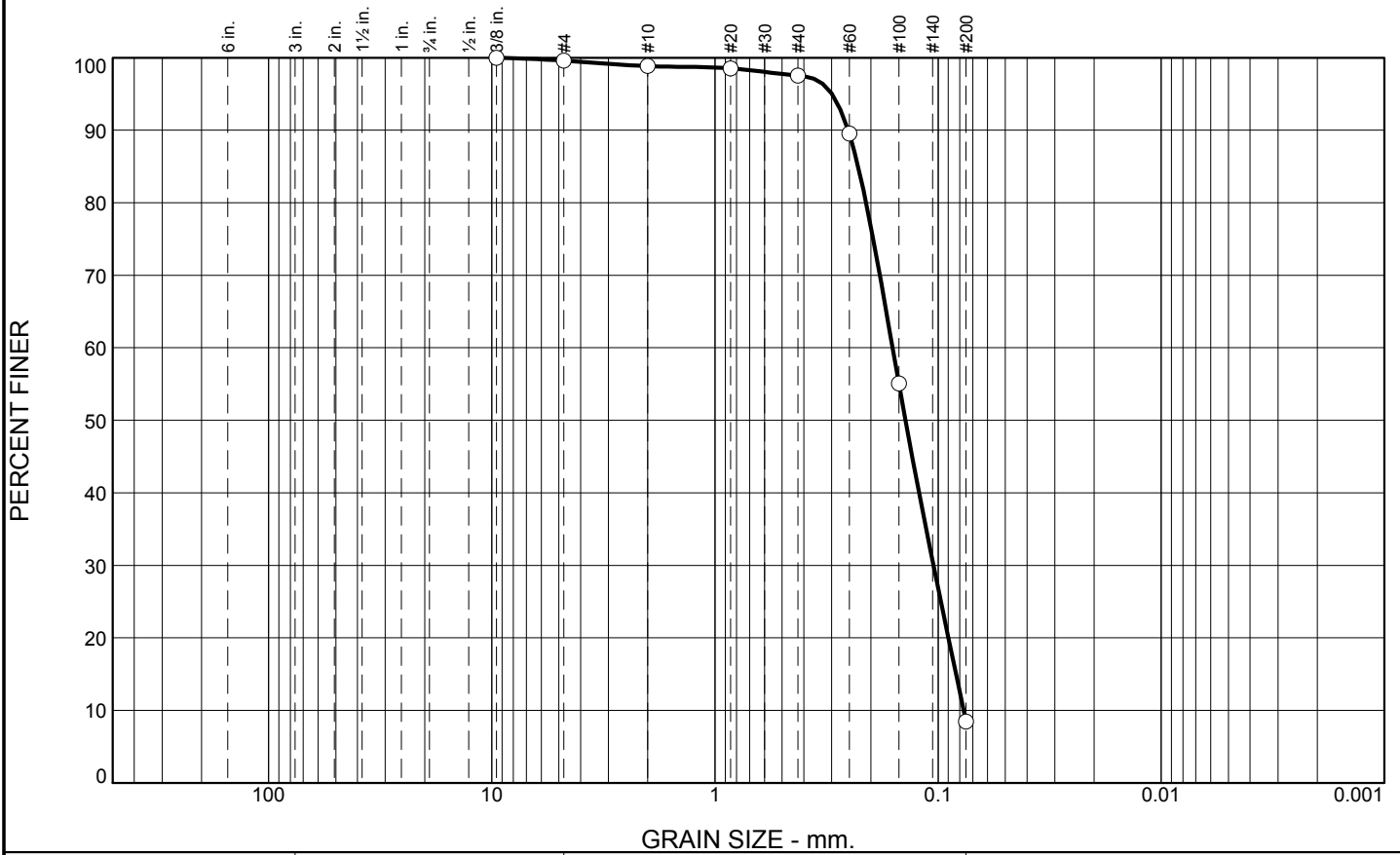
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.8	1.3	89.0	8.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	98.8		
#20	98.5		
#40	97.5		
#60	89.5		
#100	55.1		
#200	8.5		

Material Description

SAND, (SP-SM), fine grained, with clay nodules

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2527 D₈₅= 0.2282 D₆₀= 0.1600
D₅₀= 0.1401 D₃₀= 0.1049 D₁₅= 0.0832
D₁₀= 0.0768 C_u= 2.08 C_c= 0.89

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-5-10B
Sample Number: TE Lab ID: 4488.77

Depth: 5.0 - 10.6 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009



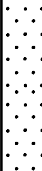

Figure

Tested By: L.Stokes

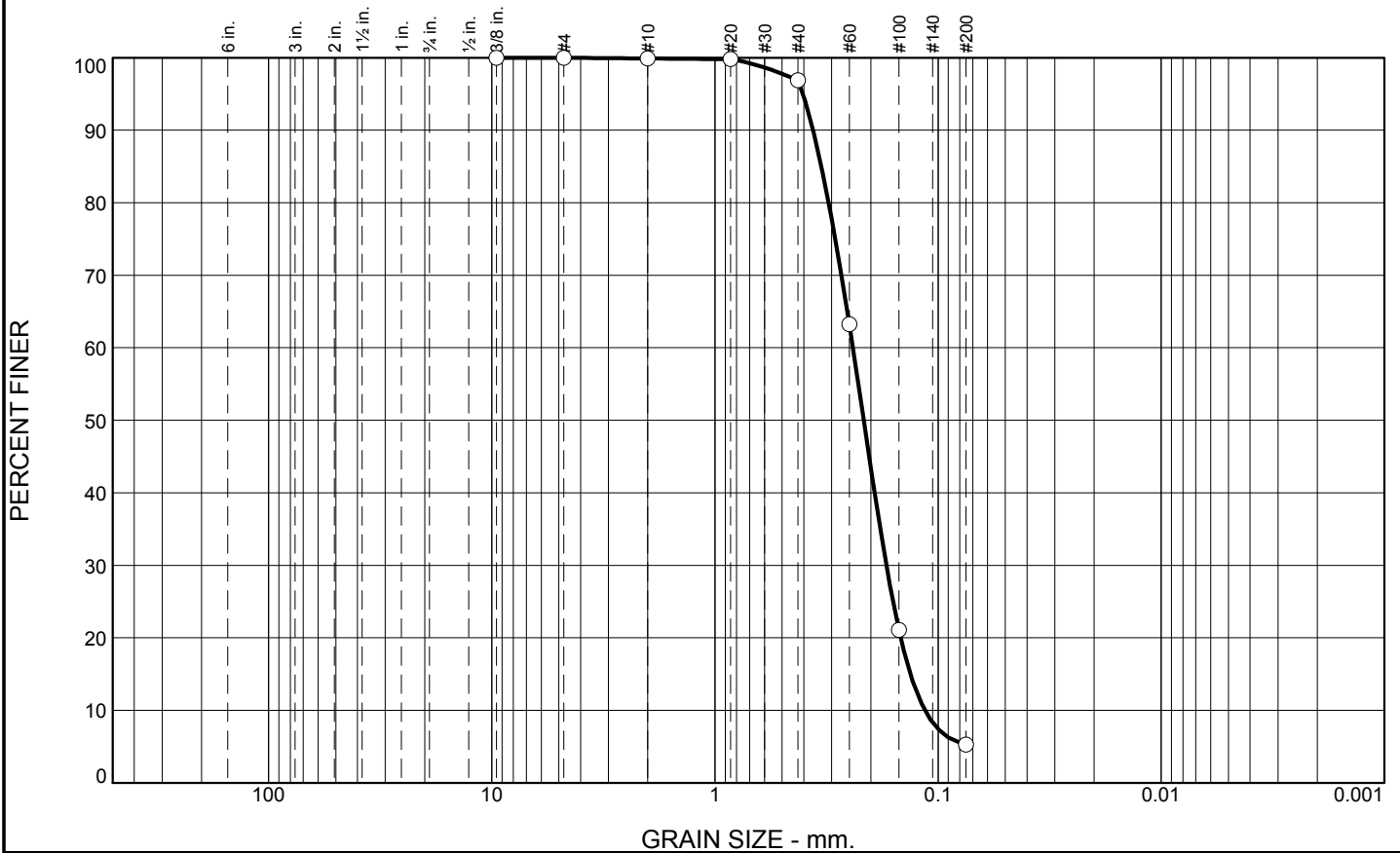
Checked By: R.Byrd

Boring Designation BI-CI-06-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-06-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-20-10
8. TOTAL DEPTH OF BORING 13.2 Ft.		16. ELEVATION TOP OF BORING -9.8 Ft.		COMPLETED 05-20-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.8	0.0				
			SAND, silty, mostly fine-grained sand-sized quartz, trace shell fragments, gray (SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2154 mm % Fines: 5.3
-12.8	3.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, gray and tan/brown (SP)	B	Classification: SP Color: 2.5Y 5.5/2-brownish gray D50: 0.193 mm % Fines: 3.1
			At El. -16.8 Ft., mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray to greenish gray	C	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1824 mm % Fines: 5.4
-21.8	12.0				
-23.0	13.2		SILT, inorganic-L, trace fine-grained sand-sized quartz, lt. green to gray (ML)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	3.0	91.6	5.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	96.9		
#60	63.2		
#100	21.1		
#200	5.3		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3633 D₈₅= 0.3334 D₆₀= 0.2409
D₅₀= 0.2154 D₃₀= 0.1706 D₁₅= 0.1331
D₁₀= 0.1145 C_u= 2.10 C_c= 1.05

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-6-10A
Sample Number: TE Lab ID: 4488.102

Depth: 0.0 - 3.0 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

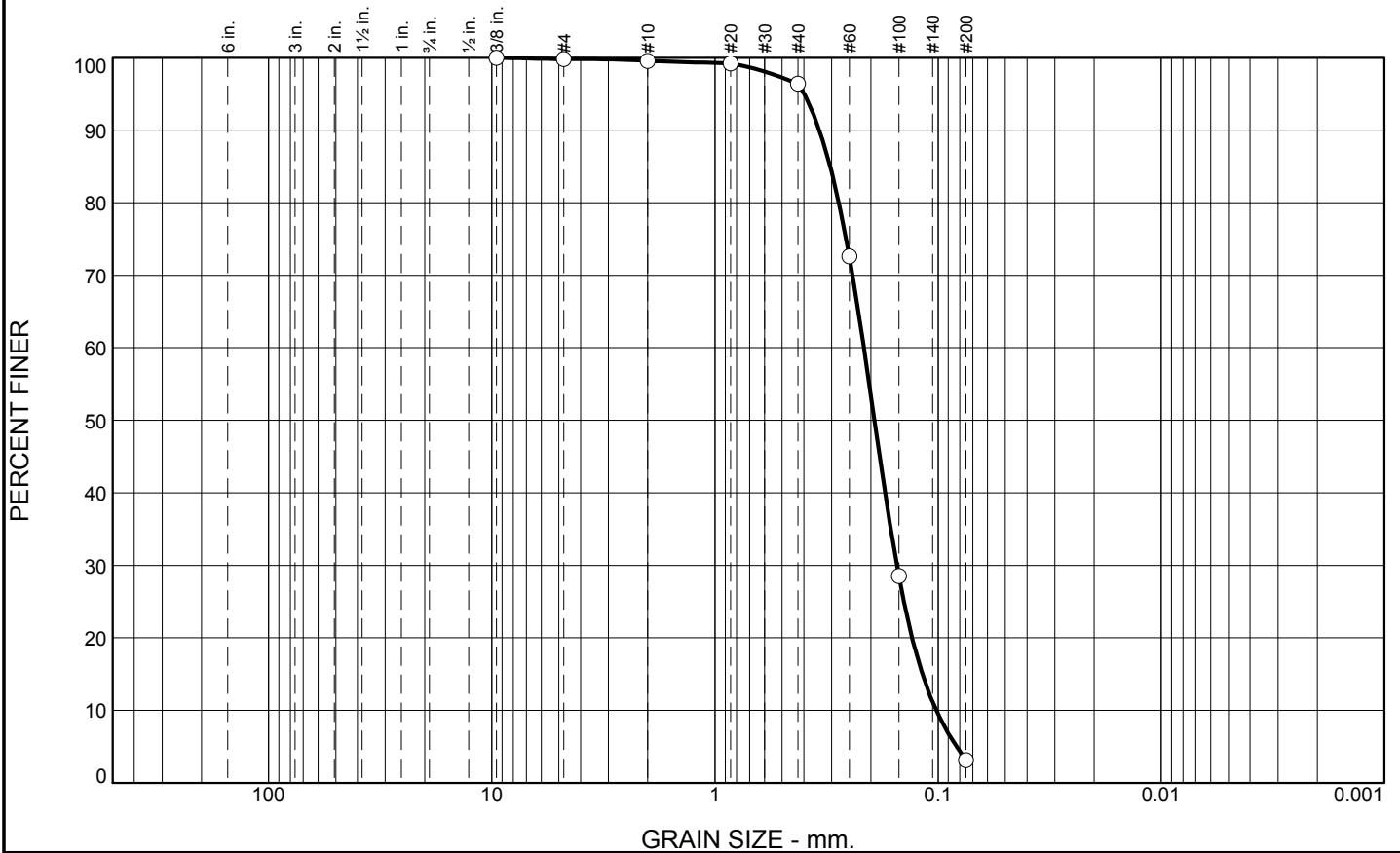
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.3	3.1	93.3	3.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.5		
#20	99.2		
#40	96.4		
#60	72.6		
#100	28.5		
#200	3.1		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3403 D₈₅= 0.3044 D₆₀= 0.2152
D₅₀= 0.1930 D₃₀= 0.1530 D₁₅= 0.1176
D₁₀= 0.1019 C_u= 2.11 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-6-10B
Sample Number: TE Lab ID: 4488.103

Depth: 3.0 - 7.0 (ft.)

Date: 5/27/10

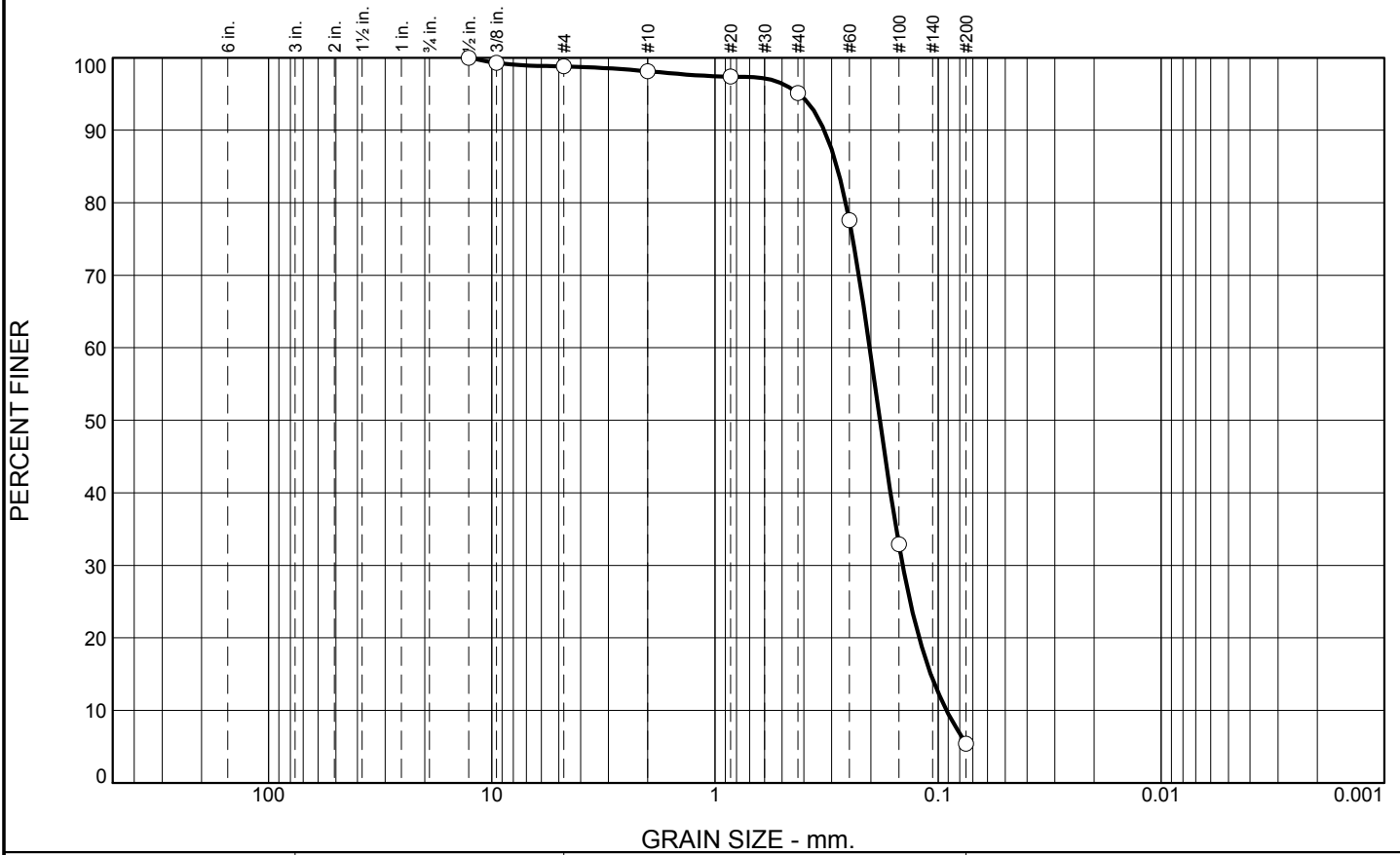
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	0.7	3.0	89.7	5.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.3		
#4	98.8		
#10	98.1		
#20	97.4		
#40	95.1		
#60	77.6		
#100	32.9		
#200	5.4		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3234 D₈₅= 0.2841 D₆₀= 0.2027
D₅₀= 0.1824 D₃₀= 0.1442 D₁₅= 0.1079
D₁₀= 0.0917 C_u= 2.21 C_c= 1.12

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-6-10C
Sample Number: TE Lab ID: 4488.104

Depth: 7.0 - 12.0 (ft.)

Date: 5/27/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

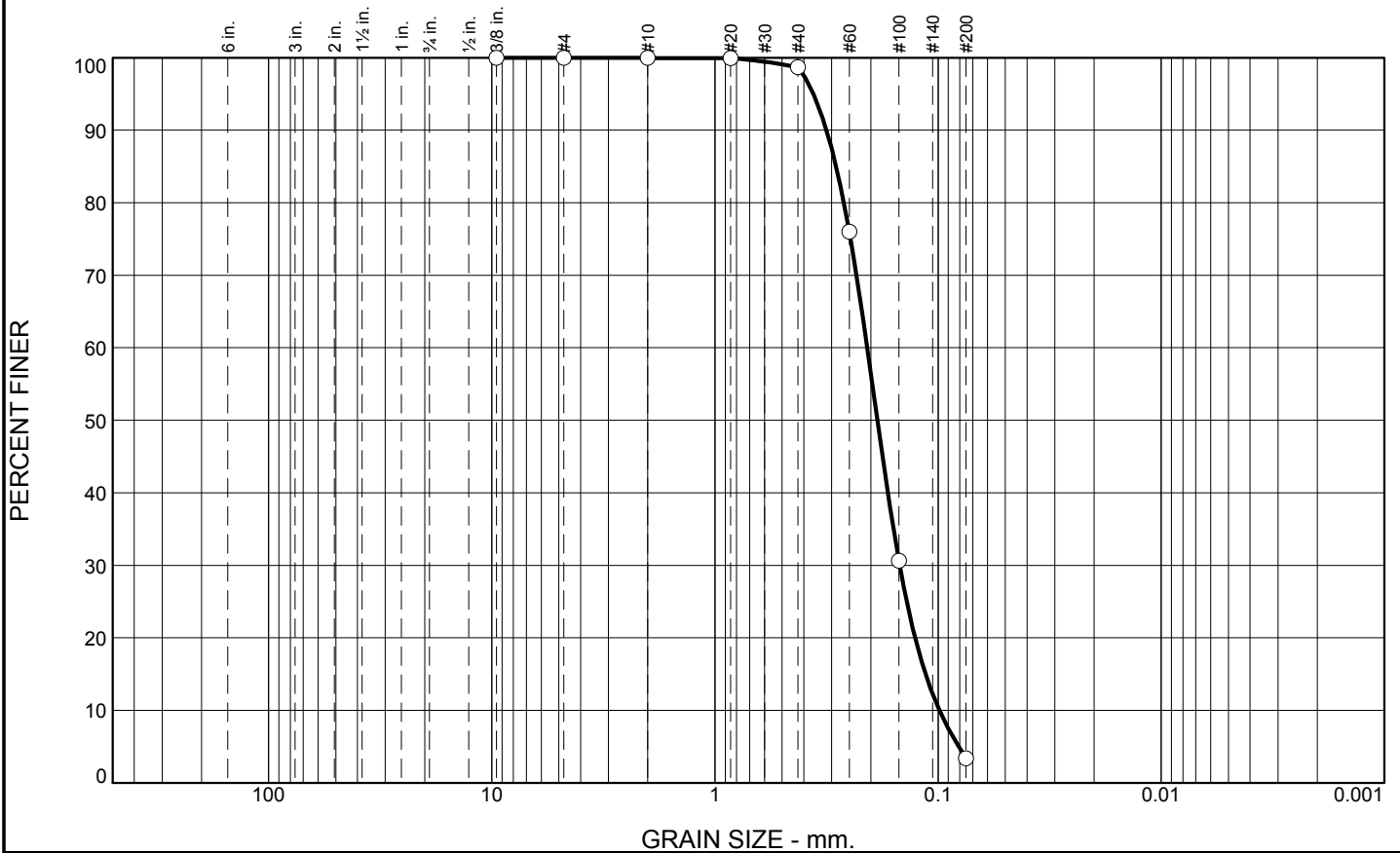
Checked By: R.Byrd

Boring Designation BI-CI-07-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-07-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-20-10
8. TOTAL DEPTH OF BORING 12.6 Ft.		16. ELEVATION TOP OF BORING -9.8 Ft.		COMPLETED 05-20-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.8	0.0				
		↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, trace shell, dark gray and greenish gray (SM)	NS	
	-12.3		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, tan and gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1871 mm % Fines: 3.4
			At El. -15.8 Ft., mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, tan, gray, and brown	B	Classification: SP Color: 2.5Y 6.5/1.5-light gray D50: 0.1949 mm % Fines: 1
			At El. -18.8 Ft., mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray	C	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1709 mm % Fines: 6.6
	-22.4		12.6		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	95.3	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.7		
#60	76.0		
#100	30.6		
#200	3.4		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3162 D₈₅= 0.2863 D₆₀= 0.2078
D₅₀= 0.1871 D₃₀= 0.1487 D₁₅= 0.1139
D₁₀= 0.0987 C_u= 2.11 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-7-10A
Sample Number: TE Lab ID: 4488.96

Depth: 2.5 - 6.0 (ft.)

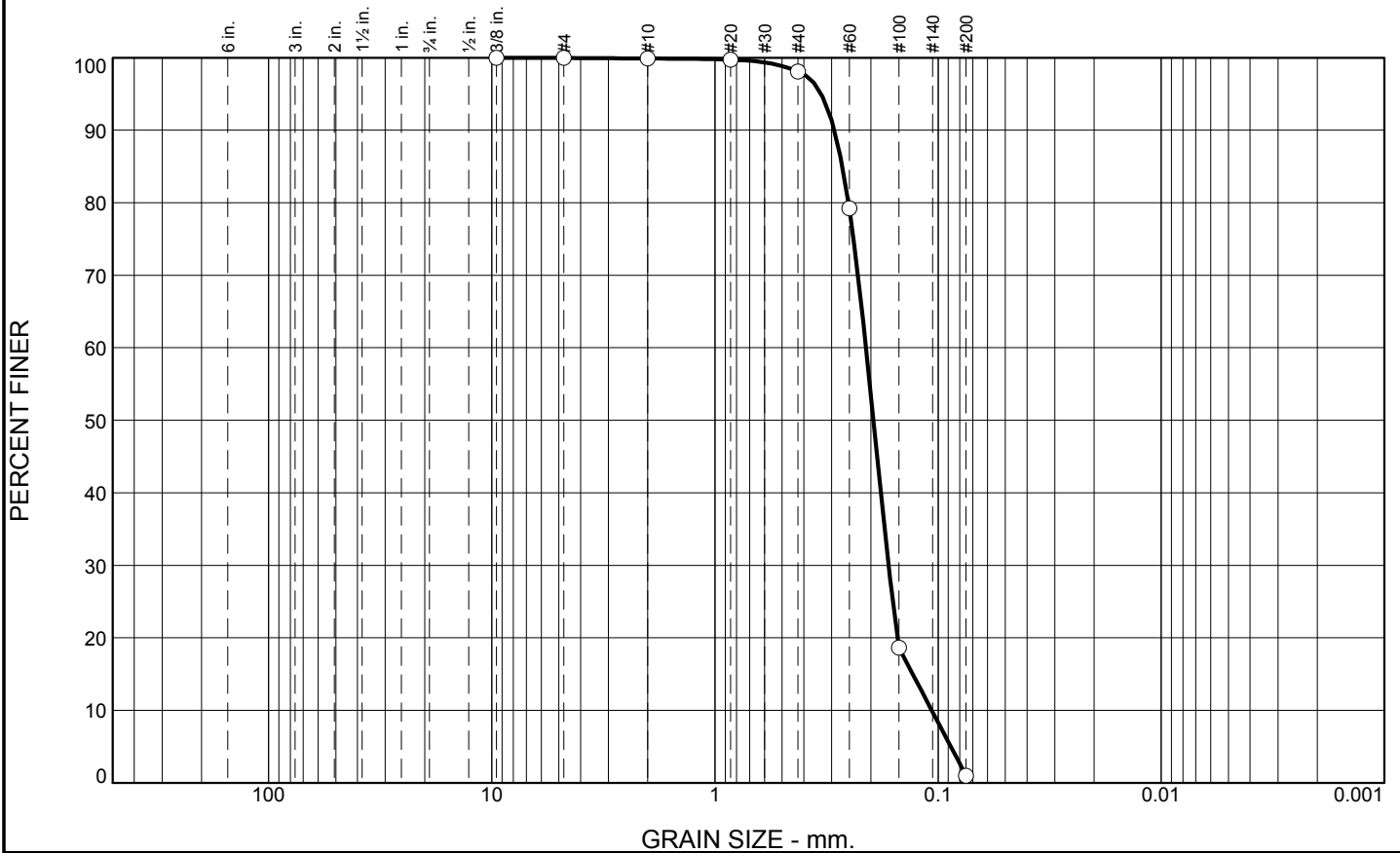
Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.8	97.1	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	98.1		
#60	79.2		
#100	18.6		
#200	1.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2916 D₈₅= 0.2684 D₆₀= 0.2106
D₅₀= 0.1949 D₃₀= 0.1667 D₁₅= 0.1300
D₁₀= 0.1068 C_u= 1.97 C_c= 1.24

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-7-10B
Sample Number: TE Lab ID: 4488.97

Depth: 6.0 - 9.0 (ft.)

Date: 5/27/10

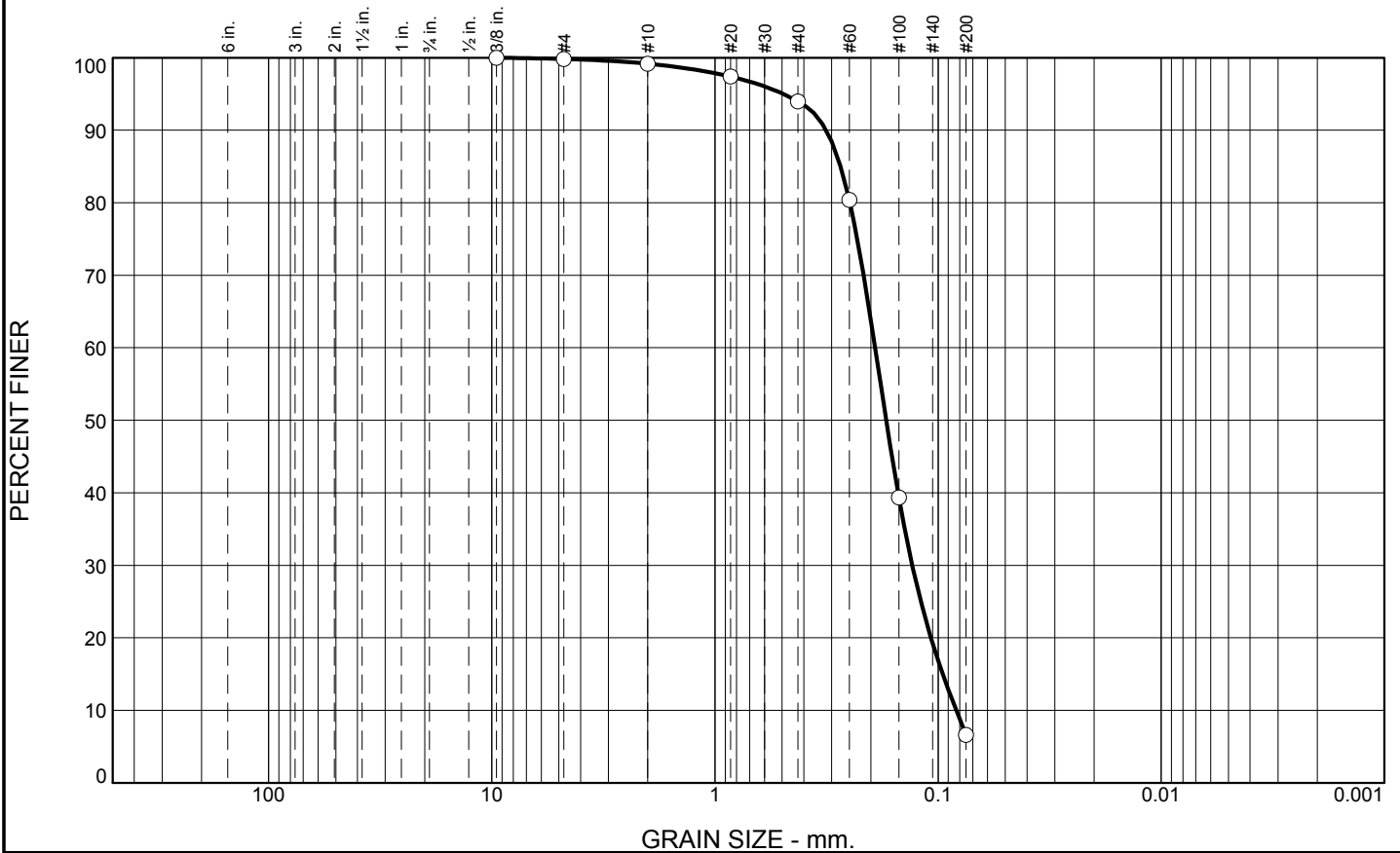
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.6	5.2	87.4	6.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.2		
#20	97.4		
#40	94.0		
#60	80.4		
#100	39.4		
#200	6.6		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3173 D₈₅= 0.2734 D₆₀= 0.1916
D₅₀= 0.1709 D₃₀= 0.1306 D₁₅= 0.0954
D₁₀= 0.0830 C_u= 2.31 C_c= 1.07

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-7-10C
Sample Number: TE Lab ID: 4488.98

Depth: 9.0 - 12.6 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

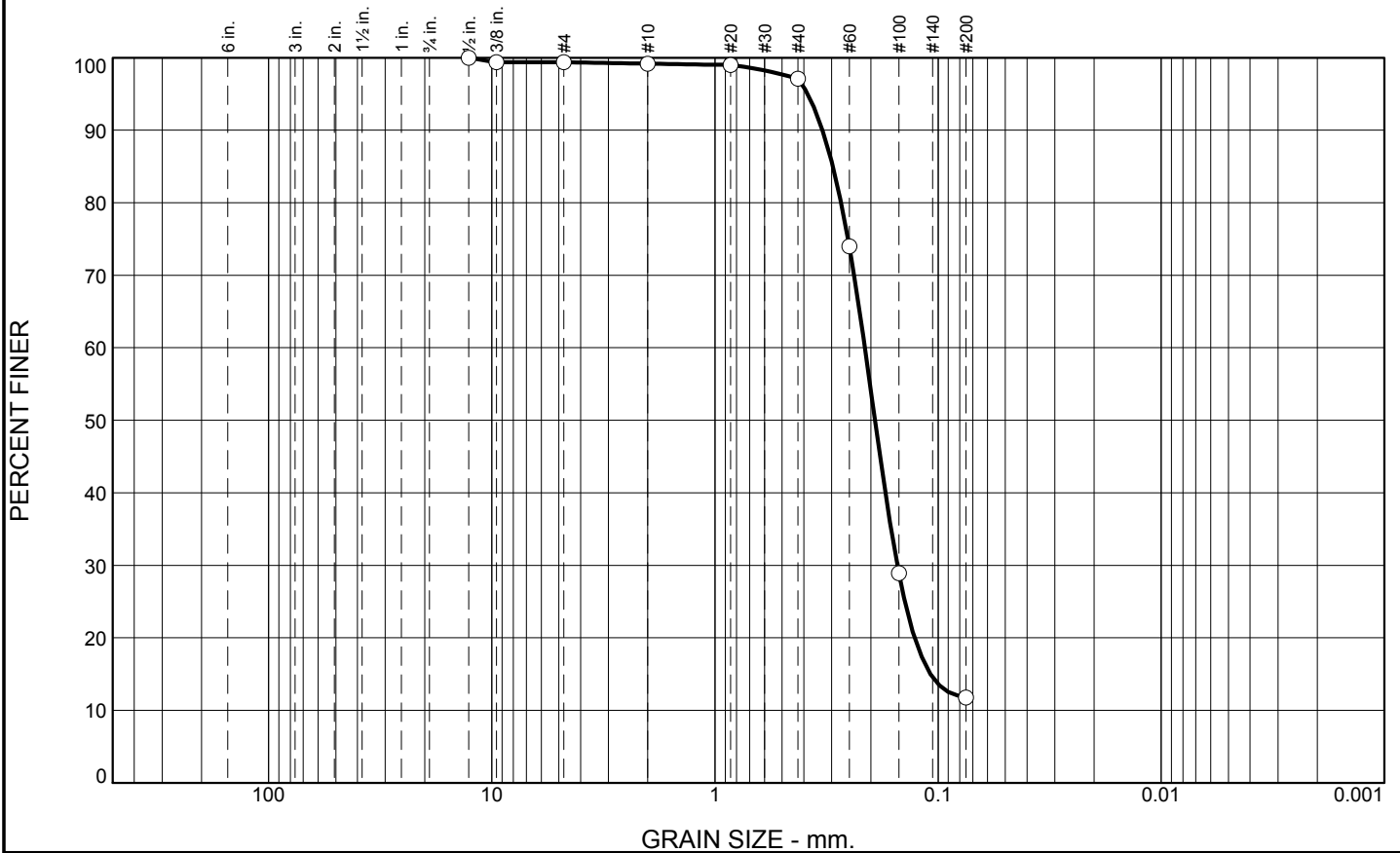
Checked By: R.Byrd

Boring Designation BI-CI-08-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-08-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-20-10 COMPLETED 05-20-10
8. TOTAL DEPTH OF BORING 12.5 Ft.		16. ELEVATION TOP OF BORING -9.9 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.9	0.0				
-11.9	2.0		SAND, silty, mostly fine-grained sand-sized quartz, trace shell fragments, trace clay, dark gray and greenish gray (SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.1918 mm % Fines: 11.8
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, some silt, trace shell fragments, gray and brown (SP)	B	Classification: SP-SM Color: 2.5Y 5/1-gray D50: 0.1845 mm % Fines: 6.9
				C	Classification: SP Color: 2.5Y 6/1-gray D50: 0.1879 mm % Fines: 3
				D	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1881 mm % Fines: 3.9
-22.4	12.5		At El. -21.9 Ft., trace of wood fragments, gray to lt. gray		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.2	2.1	85.3	11.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.4		
#4	99.4		
#10	99.2		
#20	99.0		
#40	97.1		
#60	74.0		
#100	28.9		
#200	11.8		

Material Description

SAND, (SP-SM), fine grained, with clay nodules and trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3296 D₈₅= 0.2961 D₆₀= 0.2130
D₅₀= 0.1918 D₃₀= 0.1523 D₁₅= 0.1082
D₁₀= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-8-10A
Sample Number: TE Lab ID: 4488.89

Depth: 0.0 - 2.0 (ft.)

Date: 5/27/10

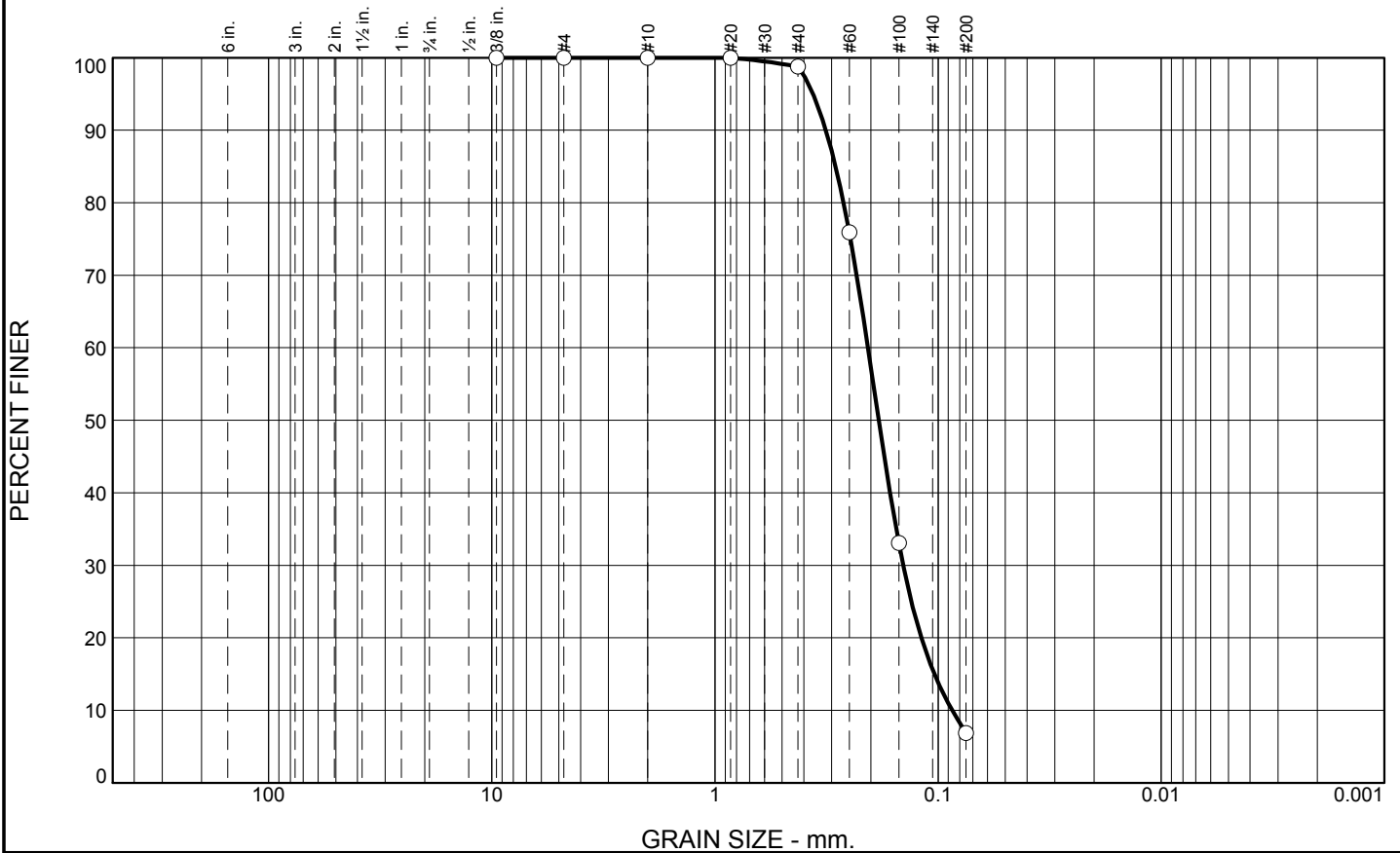
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	91.9	6.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.8		
#60	75.9		
#100	33.1		
#200	6.9		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3182 D₈₅= 0.2879 D₆₀= 0.2063
D₅₀= 0.1845 D₃₀= 0.1434 D₁₅= 0.1039
D₁₀= 0.0865 C_u= 2.39 C_c= 1.15

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-8-10B
Sample Number: TE Lab ID: 4488.90

Depth: 2.0 - 4.0 (ft.)

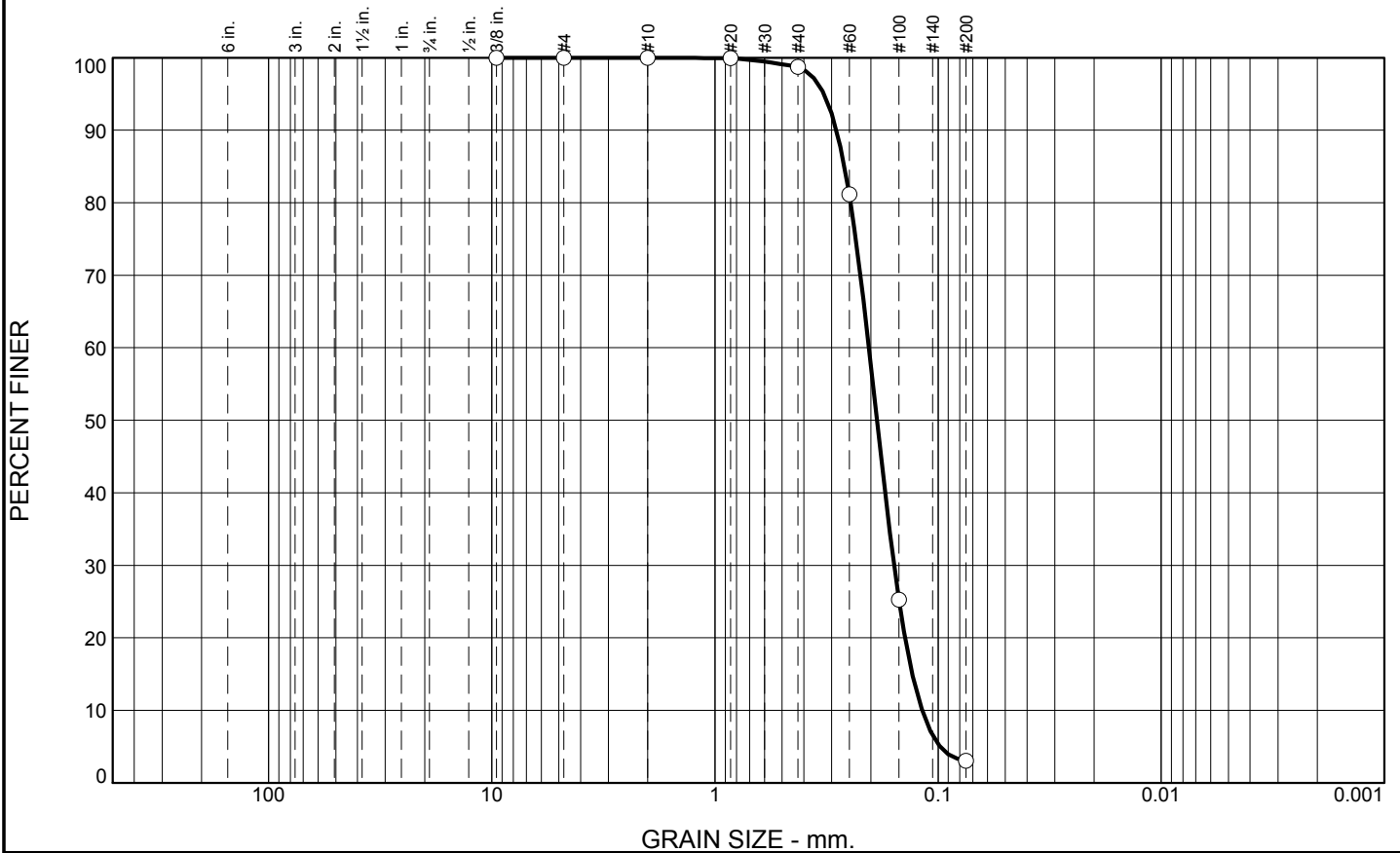
Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	95.7	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.7		
#60	81.2		
#100	25.3		
#200	3.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2854 D₈₅= 0.2628 D₆₀= 0.2042
D₅₀= 0.1879 D₃₀= 0.1576 D₁₅= 0.1305
D₁₀= 0.1179 C_u= 1.73 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-8-10C
Sample Number: TE Lab ID: 4488.91

Depth: 4.0 - 8.0 (ft.)

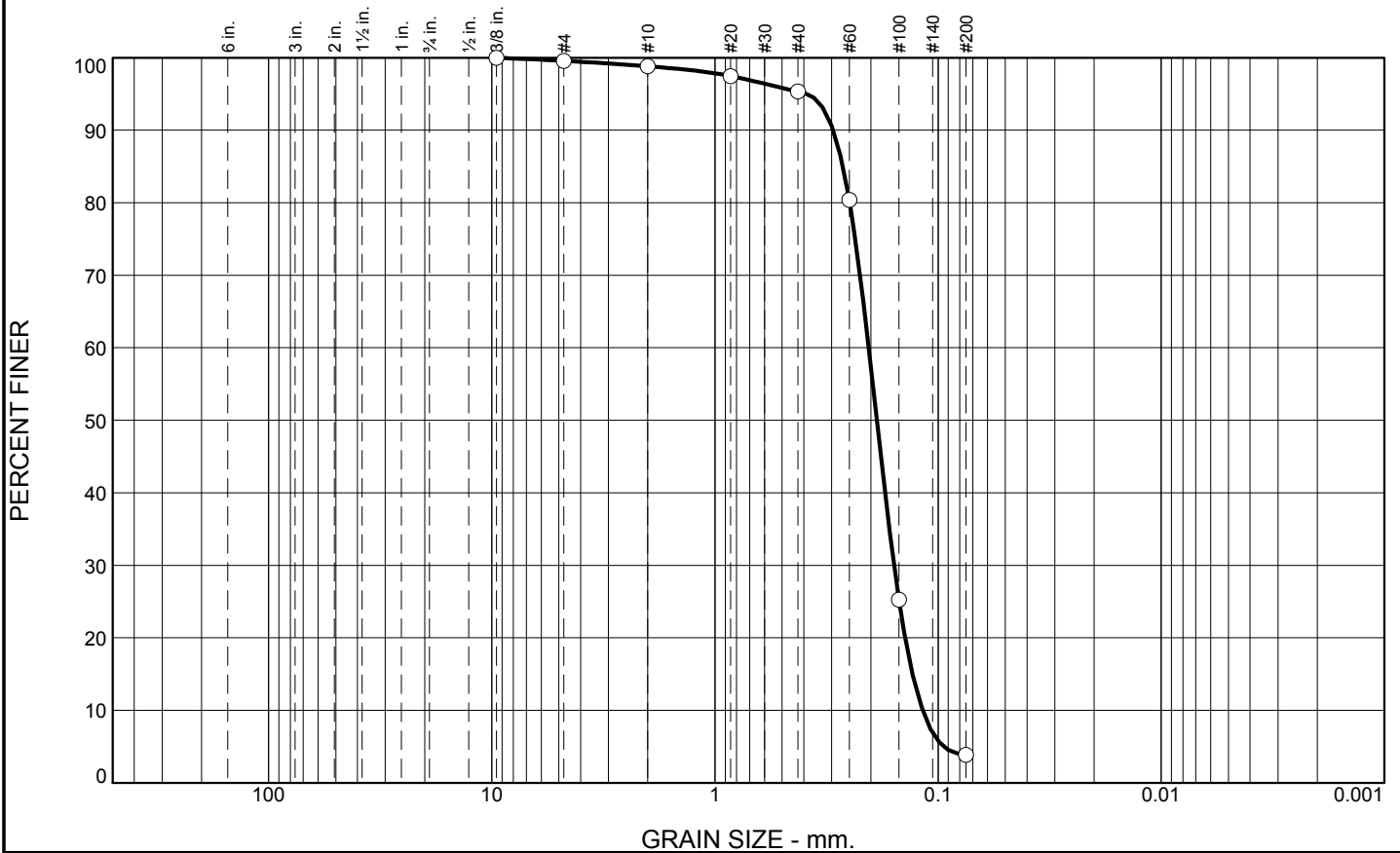
Date: 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.8	3.5	91.4	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	98.8		
#20	97.5		
#40	95.3		
#60	80.4		
#100	25.3		
#200	3.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2952 D₈₅= 0.2670 D₆₀= 0.2047
D₅₀= 0.1881 D₃₀= 0.1576 D₁₅= 0.1303
D₁₀= 0.1172 C_u= 1.75 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-8-10D
Sample Number: TE Lab ID: 4488.92

Depth: 8.0 - 12.5 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

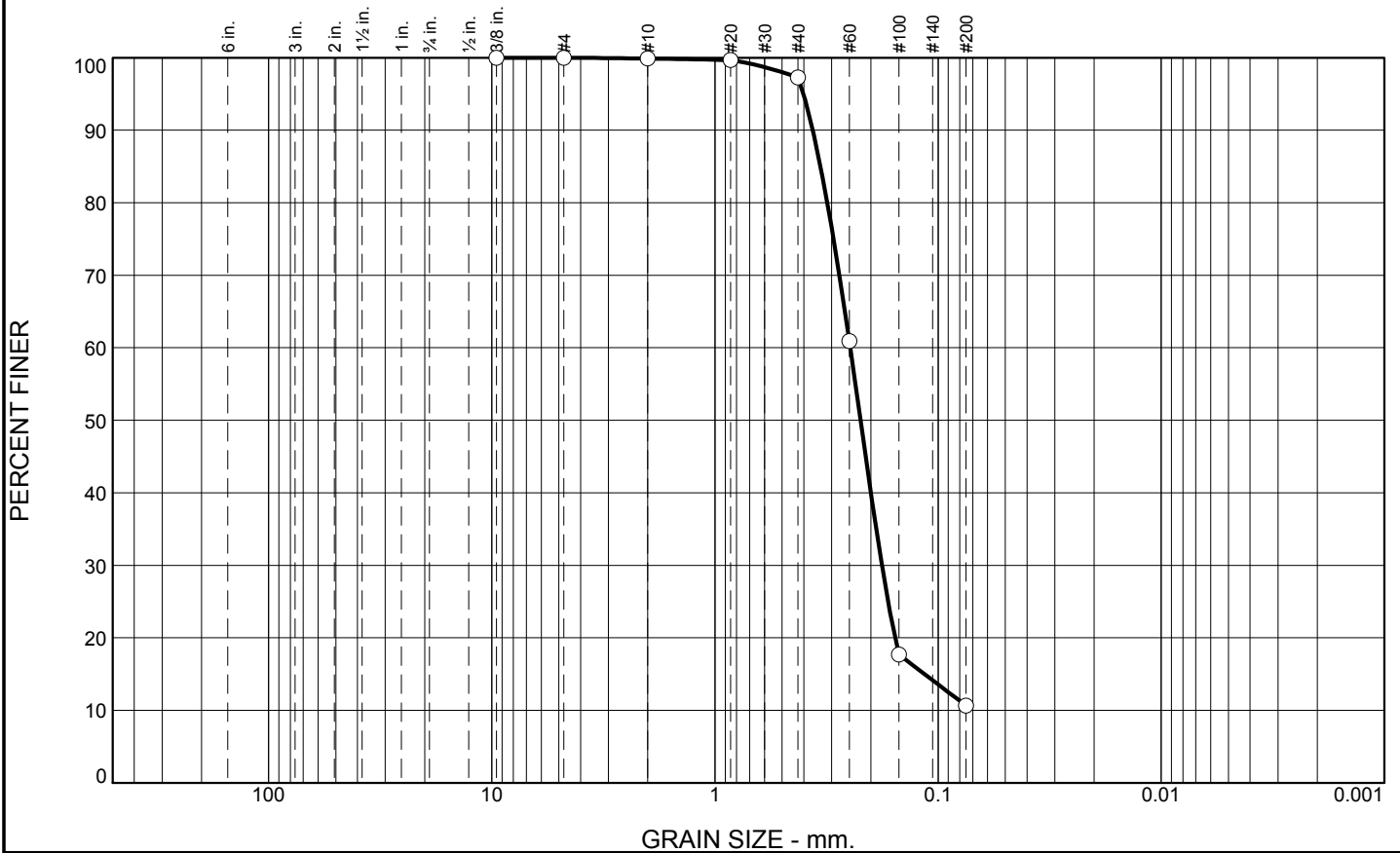
Checked By: R.Byrd

Boring Designation BI-CI-09-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-09-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 05-20-10 COMPLETED 05-20-10		
8. TOTAL DEPTH OF BORING 10.9 Ft.		16. ELEVATION TOP OF BORING -9.5 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.5	0.0				
-11.5	2.0	|↑↑↑↑|	SAND, silty, mostly fine-grained sand-sized quartz, trace shell fragments, dark gray and greenish gray (SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2226 mm % Fines: 10.7
		|●●●●|	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, gray and greenish gray (SP)	B	Classification: SP-SM Color: 2.5Y 6/2-light brownish gray D50: 0.2105 mm % Fines: 6
		|●●●●|	At El. -15.5 Ft., mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray and gray	C	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1704 mm % Fines: 4.2
-20.4	10.9		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.6	86.6	10.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	97.3		
#60	60.9		
#100	17.7		
#200	10.7		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3644 D₈₅= 0.3365 D₆₀= 0.2475
D₅₀= 0.2226 D₃₀= 0.1786 D₁₅= 0.1150
D₁₀= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-9-10A
Sample Number: TE Lab ID: 4488.83

Depth: 0.0 - 2.0 (ft.)

Date: 5/27/10

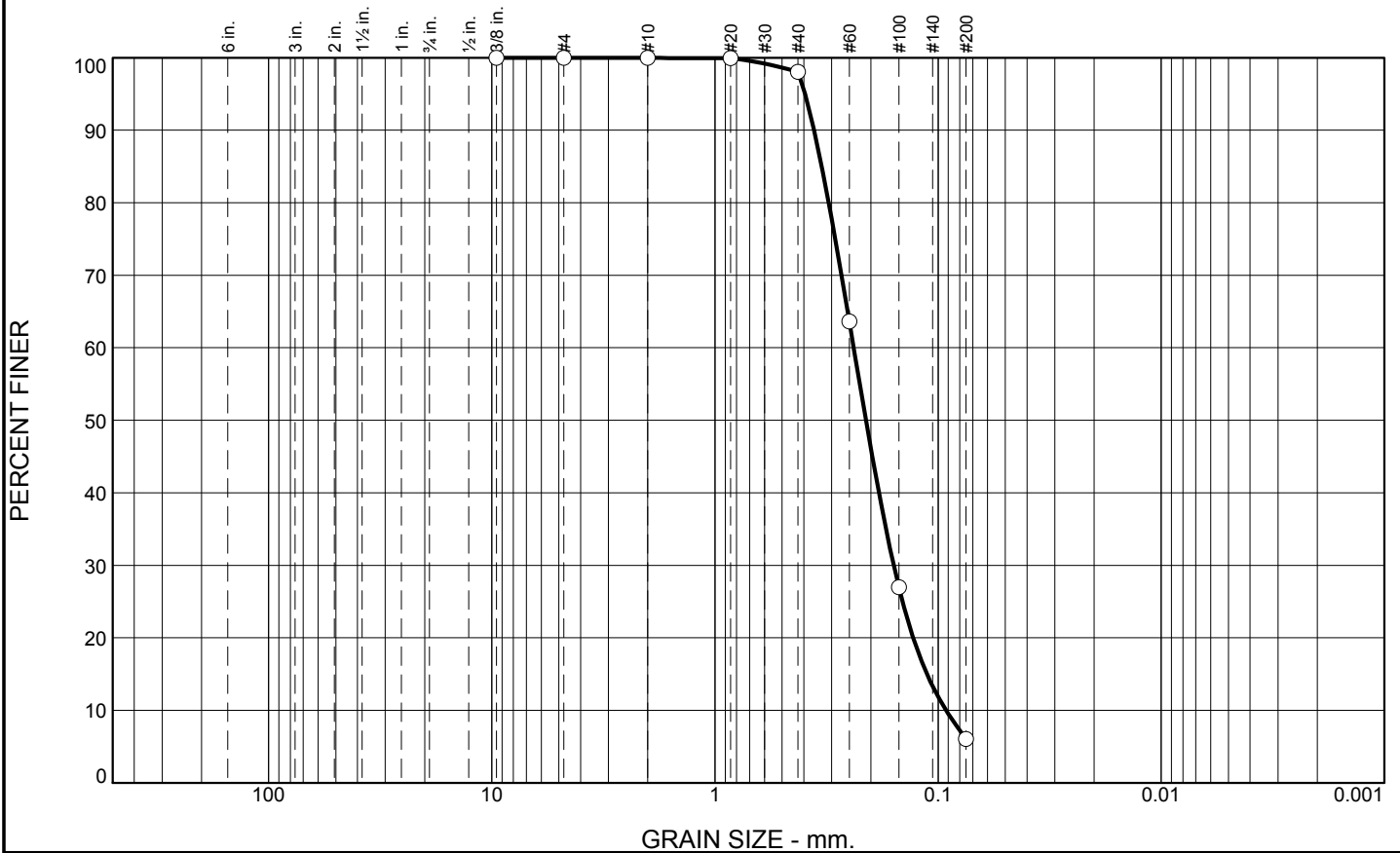
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.0	92.0	6.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.0		
#60	63.6		
#100	27.0		
#200	6.0		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3596 D₈₅= 0.3321 D₆₀= 0.2389
D₅₀= 0.2105 D₃₀= 0.1582 D₁₅= 0.1122
D₁₀= 0.0922 C_u= 2.59 C_c= 1.14

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-9-10B
Sample Number: TE Lab ID: 4488.84

Depth: 2.0 - 6.0 (ft.)

Date: 5/27/10

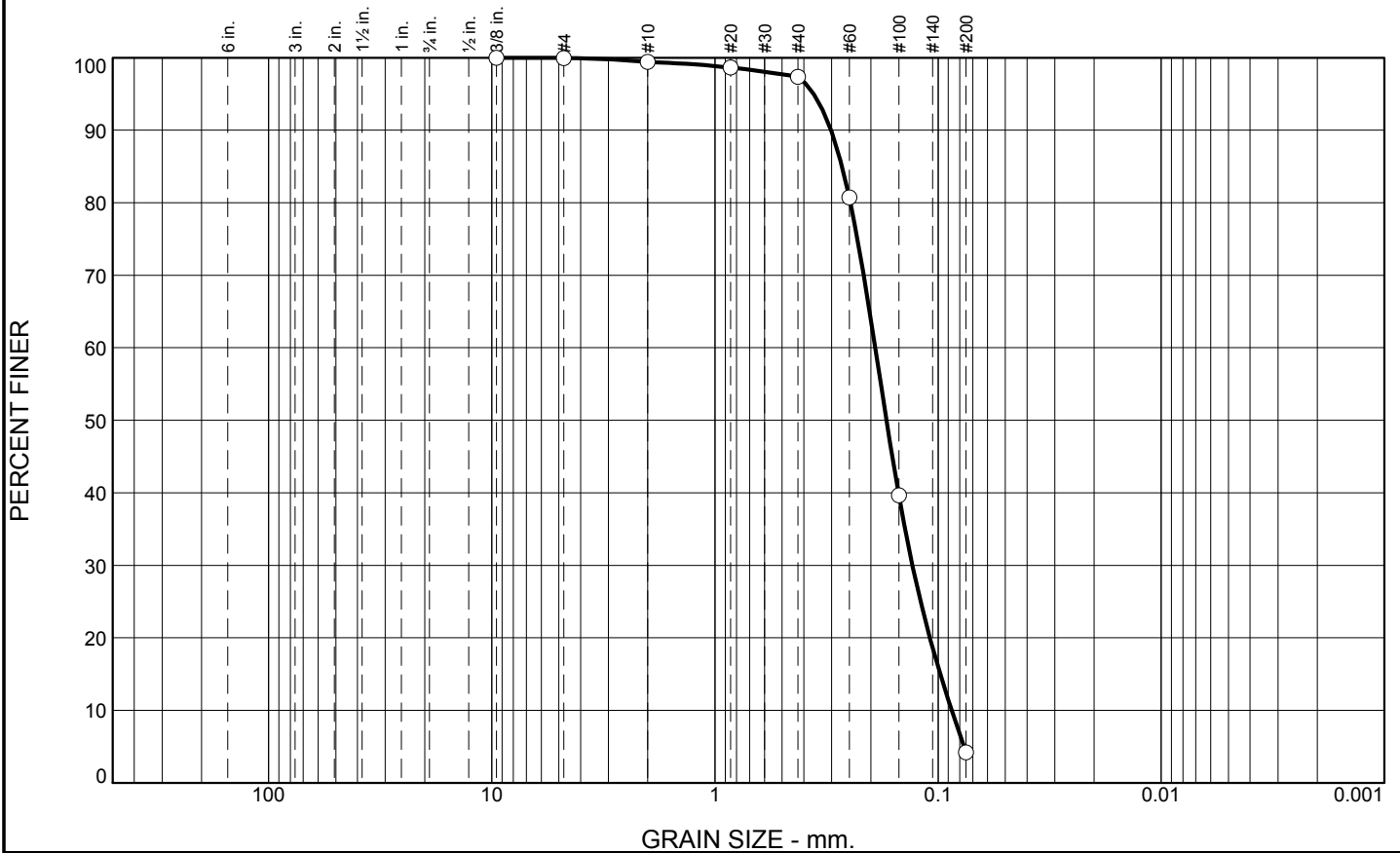
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	2.0	93.2	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.4		
#20	98.6		
#40	97.4		
#60	80.7		
#100	39.6		
#200	4.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3017 D₈₅= 0.2694 D₆₀= 0.1914
D₅₀= 0.1704 D₃₀= 0.1304 D₁₅= 0.0978
D₁₀= 0.0869 C_u= 2.20 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-9-10C
Sample Number: TE Lab ID: 4488.85

Depth: 6.0 - 10.9 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

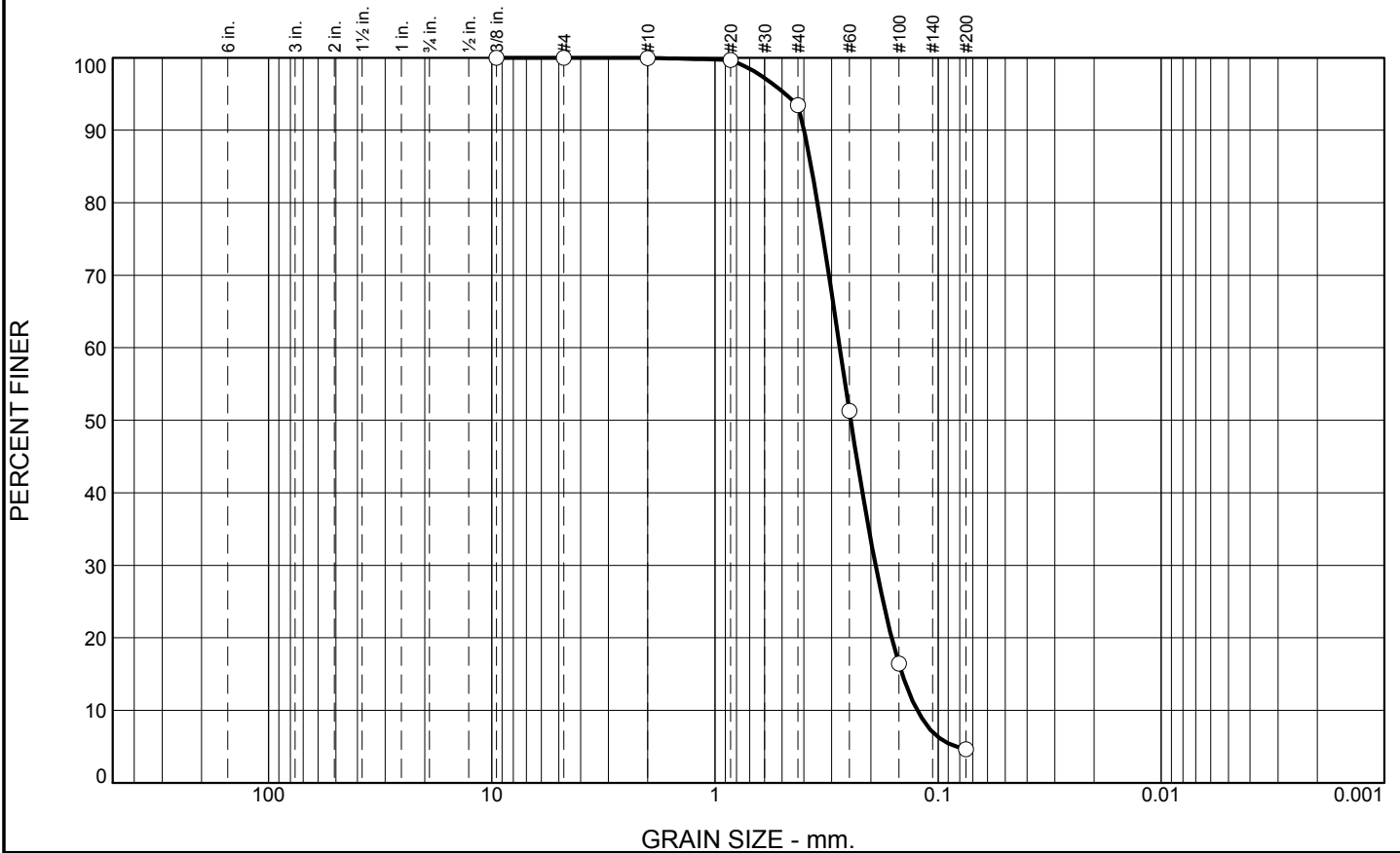
Checked By: R.Byrd

Boring Designation BI-CI-10-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-10-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.1 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 11.9 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.1	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2463 mm % Fines: 4.6
				B	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2187 mm % Fines: 3.3
-19.4	10.3				
-21.0	11.9		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	6.6	88.8	4.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	93.4		
#60	51.3		
#100	16.4		
#200	4.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3996 D₈₅= 0.3708 D₆₀= 0.2757
D₅₀= 0.2463 D₃₀= 0.1906 D₁₅= 0.1450
D₁₀= 0.1241 C_u= 2.22 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-10-10A
Sample Number: TE Lab ID: 4488.54

Depth: 0.0 - 5.0 (ft.)

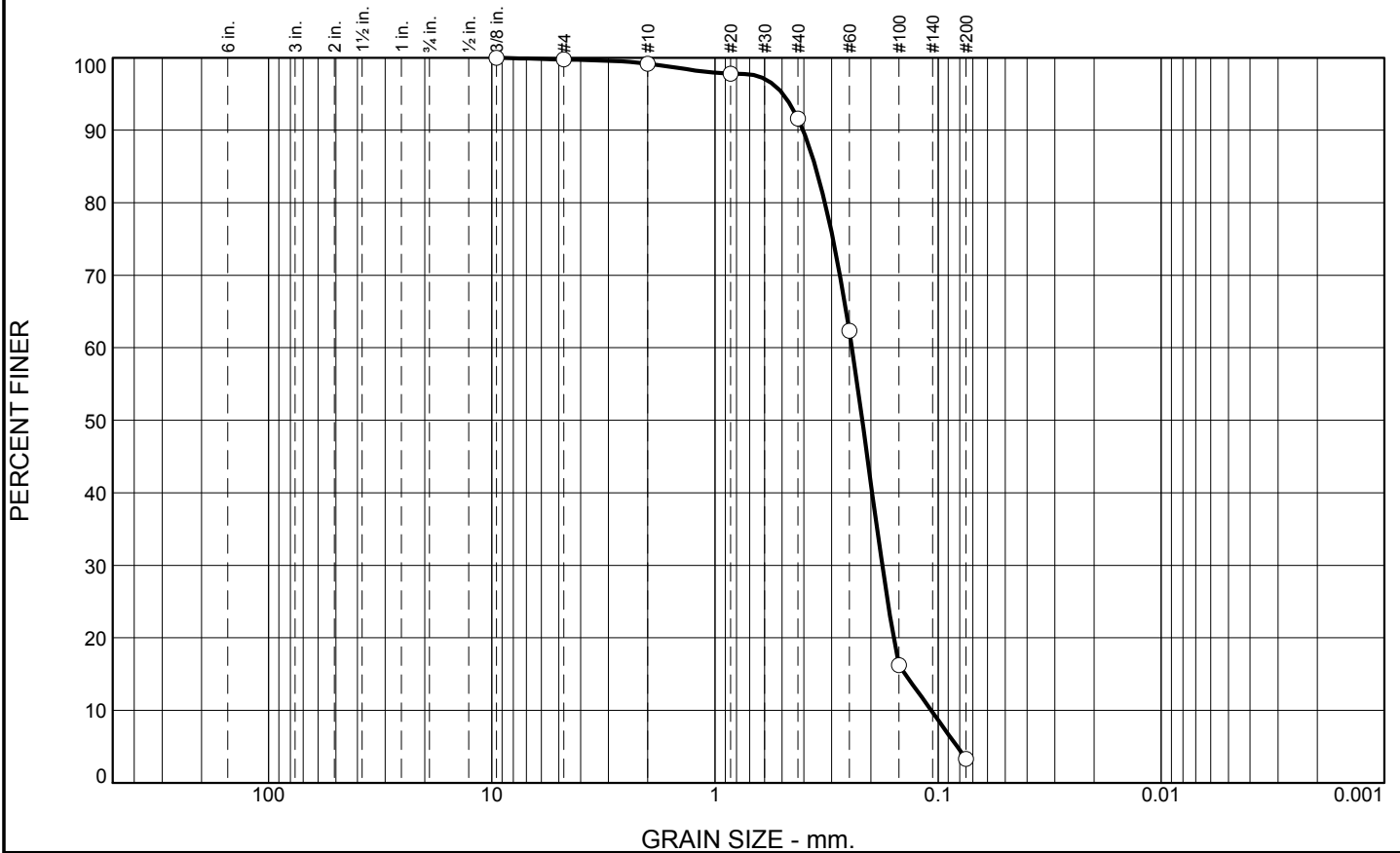
Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.6	7.6	88.3	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.2		
#20	97.8		
#40	91.6		
#60	62.3		
#100	16.2		
#200	3.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4034 D₈₅= 0.3549 D₆₀= 0.2434
D₅₀= 0.2187 D₃₀= 0.1779 D₁₅= 0.1404
D₁₀= 0.1074 C_u= 2.27 C_c= 1.21

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = Ch10D965

* (no specification provided)

Location: USACE Sample # BI-CI-10-10B **Depth:** 5.0 - 11.9 (ft.) **Date:** 5/27/10
Sample Number: TE Lab ID: 4488.55

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

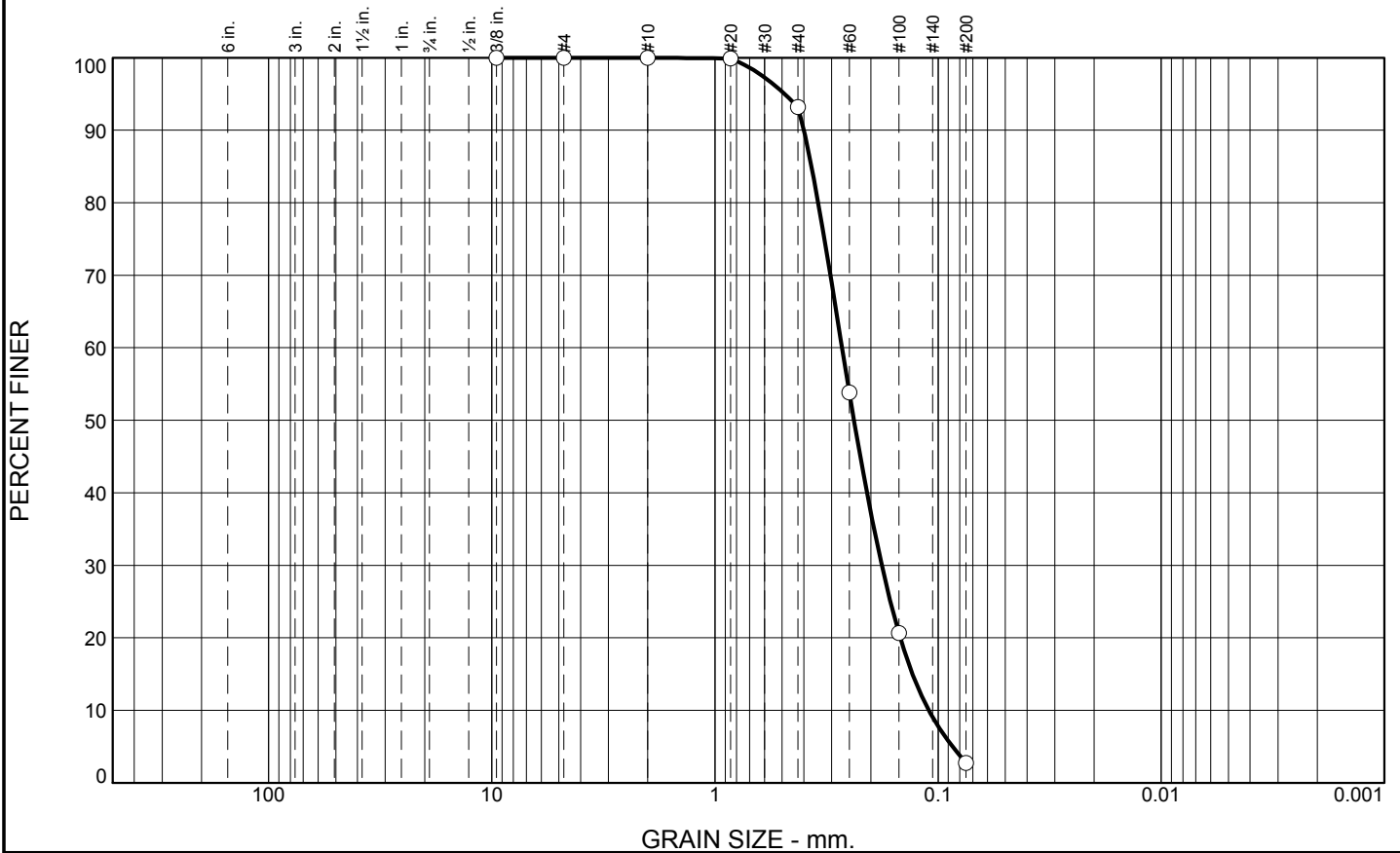
Tested By: L.Stokes **Checked By:** R.Byrd

Boring Designation BI-CI-11-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-11-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -10.0 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 14.4 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.0	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. brown (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2382 mm % Fines: 2.8
		•••••		B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2124 mm % Fines: 2.6
-19.1	9.1		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	C	Classification: SP-SM Color: 2.5Y 6.5/1-gray D50: 0.1394 mm % Fines: 8.6
-24.4	14.4				
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	6.8	90.4	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	93.2		
#60	53.8		
#100	20.7		
#200	2.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3999 D₈₅= 0.3694 D₆₀= 0.2694
D₅₀= 0.2382 D₃₀= 0.1788 D₁₅= 0.1303
D₁₀= 0.1101 C_u= 2.45 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-11-10A
Sample Number: TE Lab ID: 4488.59

Depth: 0.0 - 5.0 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

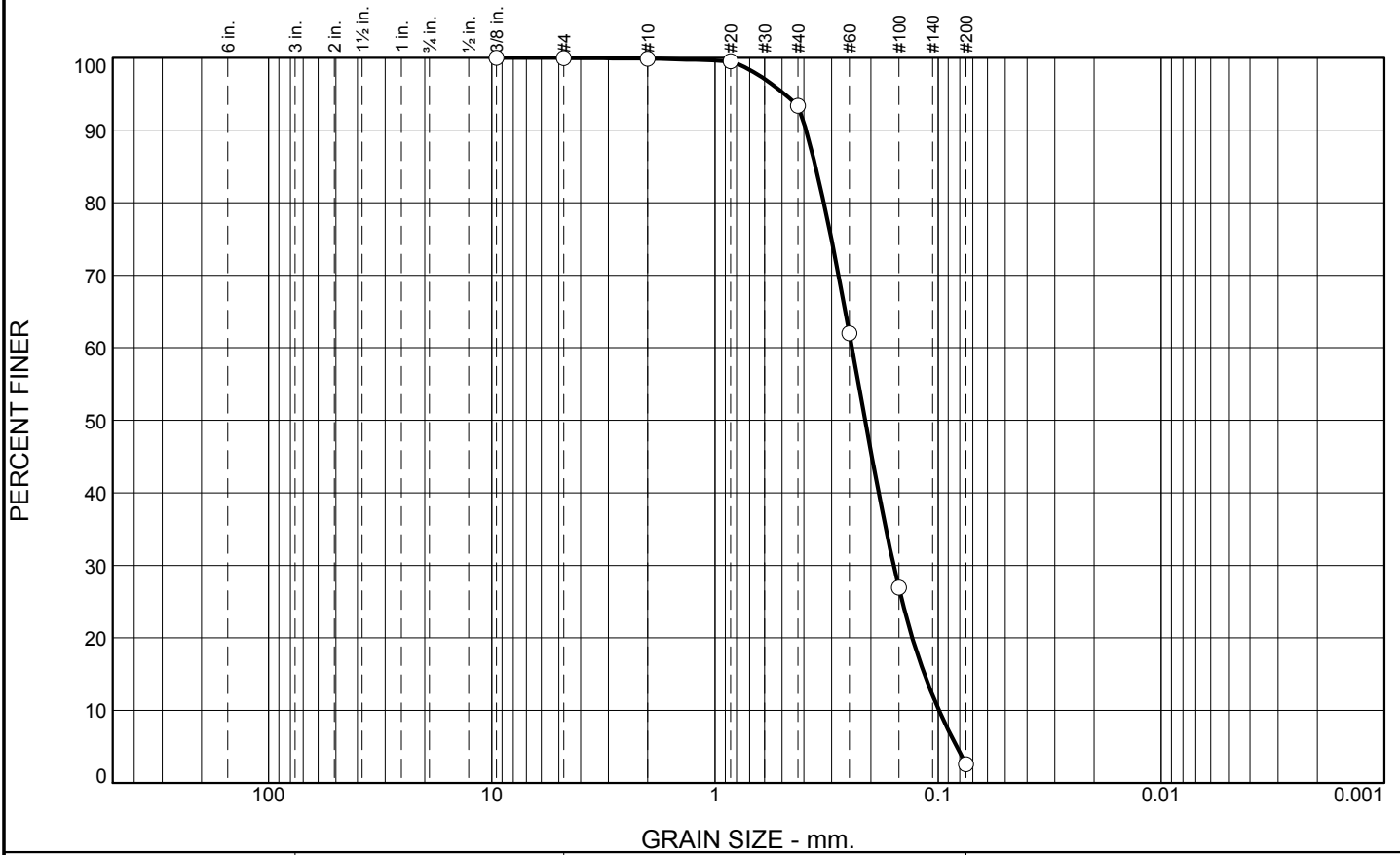
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	6.6	90.7	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.5		
#40	93.3		
#60	62.0		
#100	26.9		
#200	2.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3914 D₈₅= 0.3543 D₆₀= 0.2432
D₅₀= 0.2124 D₃₀= 0.1582 D₁₅= 0.1152
D₁₀= 0.0991 C_u= 2.46 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-11-10B
Sample Number: TE Lab ID: 4488.60

Depth: 5.0 - 10.0 (ft.)

Date: 5/27/10

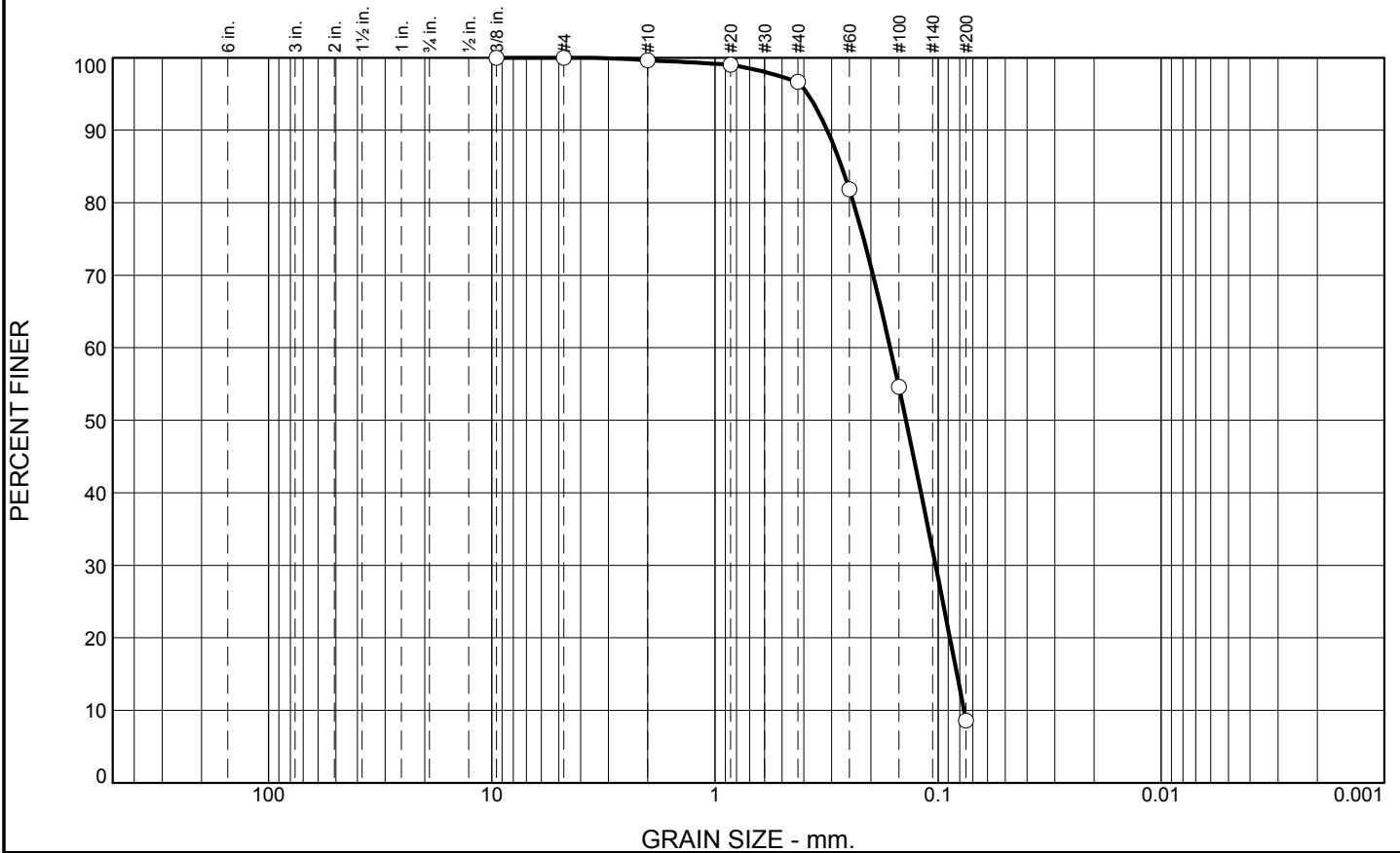
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	2.9	88.1	8.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.6		
#20	99.0		
#40	96.7		
#60	81.8		
#100	54.6		
#200	8.6		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3137 D₈₅= 0.2706 D₆₀= 0.1640
D₅₀= 0.1394 D₃₀= 0.1026 D₁₅= 0.0823
D₁₀= 0.0766 C_u= 2.14 C_c= 0.84

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-11-10C
Sample Number: TE Lab ID: 4488.61

Depth: 10.0 - 14.4 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

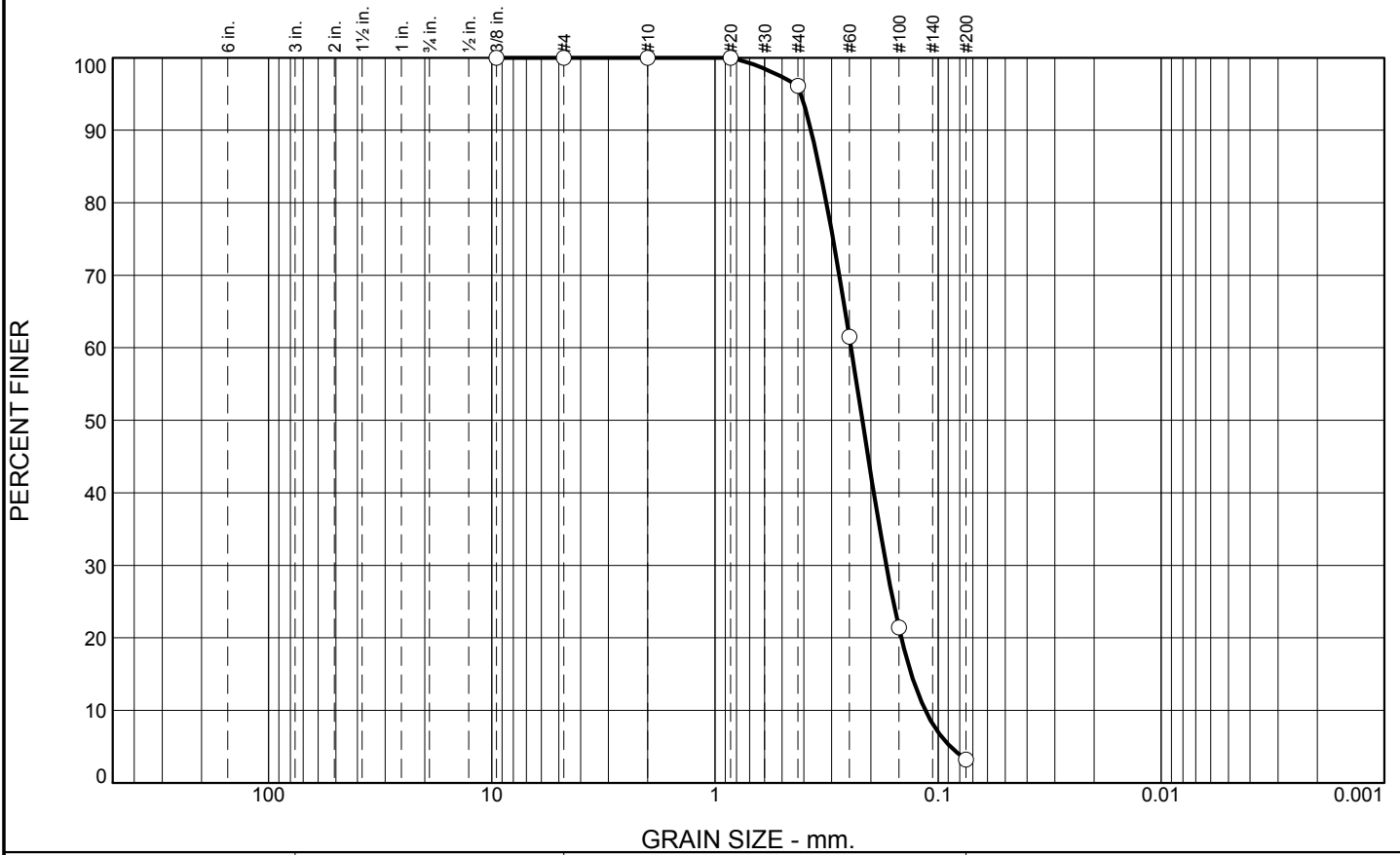
Checked By: R.Byrd

Boring Designation BI-CI-12-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-12-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.2 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 10.8 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.2	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. brown (SP)	A	Classification: SP Color: 2.5Y 6.5/1-gray D50: 0.2185 mm % Fines: 3.2
-15.3	6.1		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	B	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.1633 mm % Fines: 5.7
-19.0	9.8				
-20.0	10.8		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, trace shell fragments, gray (SP)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.9	92.9	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	96.1		
#60	61.5		
#100	21.4		
#200	3.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3715 D₈₅= 0.3412 D₆₀= 0.2455
D₅₀= 0.2185 D₃₀= 0.1708 D₁₅= 0.1318
D₁₀= 0.1141 C_u= 2.15 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-12-10A
Sample Number: TE Lab ID: 4488.64

Depth: 0.0 - 5.0 (ft.)

Date: 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
----------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

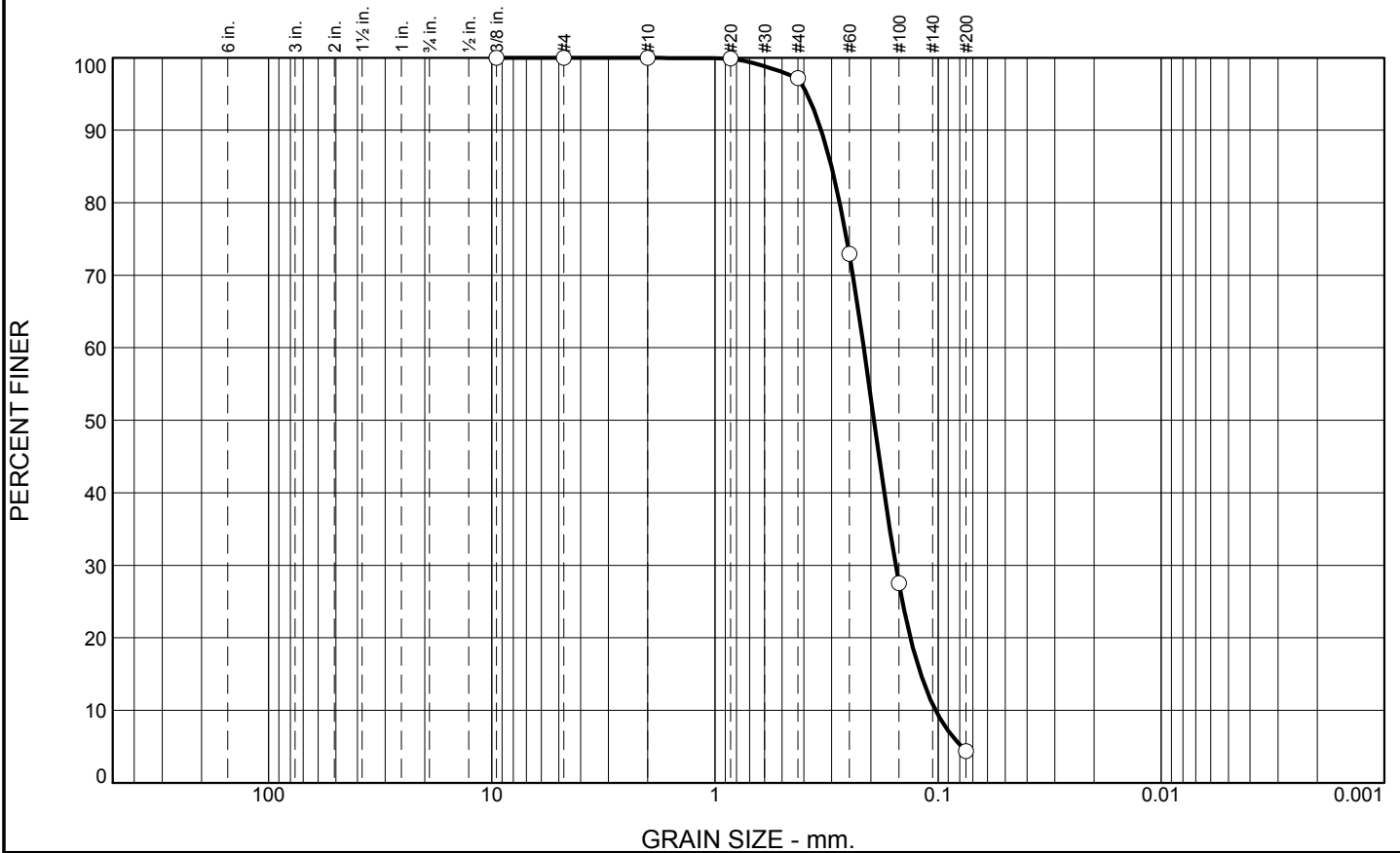
Checked By: R.Byrd

Boring Designation BI-CI-13-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-13-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 05-19-10 COMPLETED 05-19-10		
8. TOTAL DEPTH OF BORING 13.5 Ft.		16. ELEVATION TOP OF BORING -9.1 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.1	0.0				
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. brown (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1939 mm % Fines: 4.4
				B	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1663 mm % Fines: 3.2
-19.6	10.5			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	C	Classification: SP-SM Color: 5Y 6/2-light olive gray D50: 0.1442 mm % Fines: 6.5
-21.9	12.8				
-22.6	13.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, trace shell fragments, gray (SP)		
NOTES:					
1. Soils are field visually classified in accordance with the Unified Soils Classification System.					
2. NS = Sample not submitted for laboratory analysis from this interval.					
3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.8	92.8	4.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	97.2		
#60	73.0		
#100	27.5		
#200	4.4		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3341 D₈₅= 0.3006 D₆₀= 0.2154
D₅₀= 0.1939 D₃₀= 0.1550 D₁₅= 0.1197
D₁₀= 0.1027 C_u= 2.10 C_c= 1.09

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-13-10A
Sample Number: TE Lab ID: 4488.69

Depth: 0.0 - 4.5 (ft.)

Date: 5/27/10

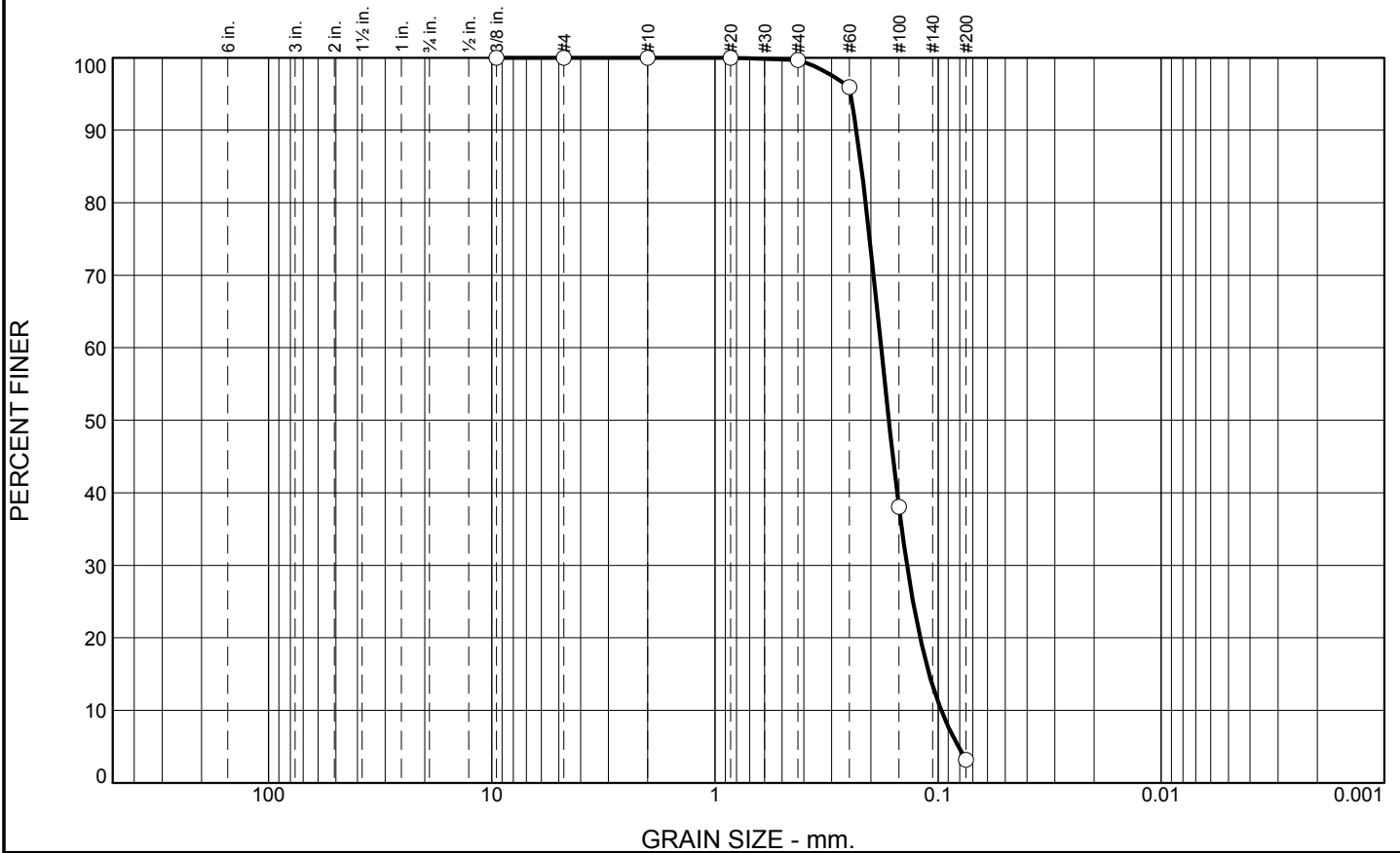
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	96.5	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.7		
#60	95.9		
#100	38.1		
#200	3.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2324 D₈₅= 0.2211 D₆₀= 0.1800
D₅₀= 0.1663 D₃₀= 0.1379 D₁₅= 0.1097
D₁₀= 0.0969 C_u= 1.86 C_c= 1.09

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-13-10B **Depth:** 4.5 - 9.0 (ft.) **Date:** 5/27/10
Sample Number: TE Lab ID: 4488.70

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

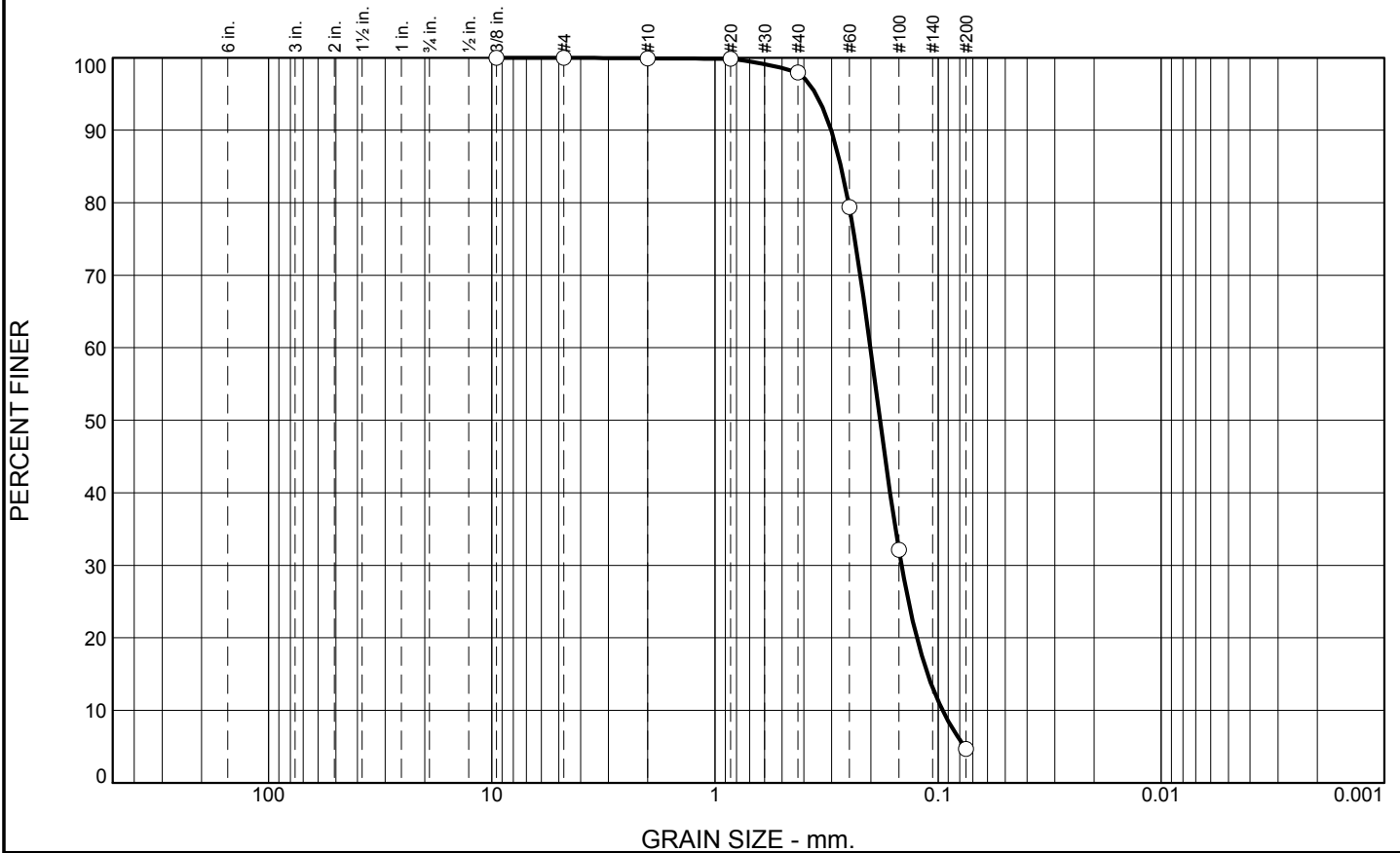
Tested By: L.Stokes **Checked By:** R.Byrd

Boring Designation BI-CI-14-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-14-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.1 Ft.		STARTED 05-19-10
8. TOTAL DEPTH OF BORING 11.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-19-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.1	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. brown (SP)	A	Classification: SP Color: 2.5Y 6.5/1.5-light gray D50: 0.1821 mm % Fines: 4.7
-17.1	8.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray (SP)	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1832 mm % Fines: 4.7
-20.1	11.0				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.9	93.3	4.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.9		
#40	98.0		
#60	79.4		
#100	32.1		
#200	4.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3014 D₈₅= 0.2723 D₆₀= 0.2012
D₅₀= 0.1821 D₃₀= 0.1459 D₁₅= 0.1114
D₁₀= 0.0956 C_u= 2.11 C_c= 1.11

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

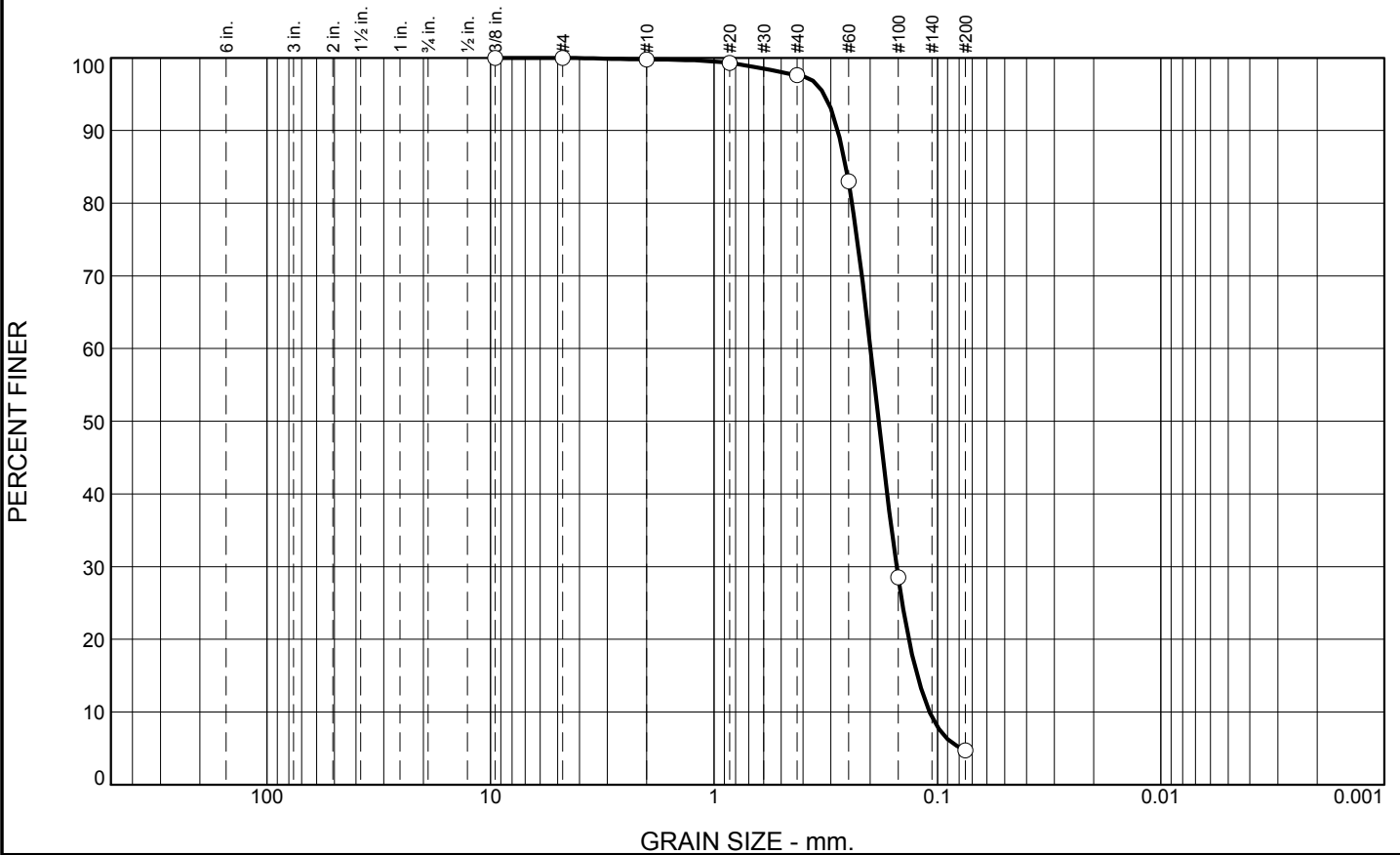
* (no specification provided)

Location: USACE Sample # BI-CI-14-10A **Sample Number:** TE Lab ID: 4488.72 **Depth:** 0.0 - 5.5 (ft.) **Date:** 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	2.2	92.9	4.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.3		
#40	97.6		
#60	83.0		
#100	28.5		
#200	4.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2791 D₈₅= 0.2568 D₆₀= 0.1995
D₅₀= 0.1832 D₃₀= 0.1524 D₁₅= 0.1231
D₁₀= 0.1084 C_u= 1.84 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-14-10B **Depth:** 5.5 - 11.0 (ft.) **Date:** 5/27/10
Sample Number: TE Lab ID: 4488.73

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
Figure	

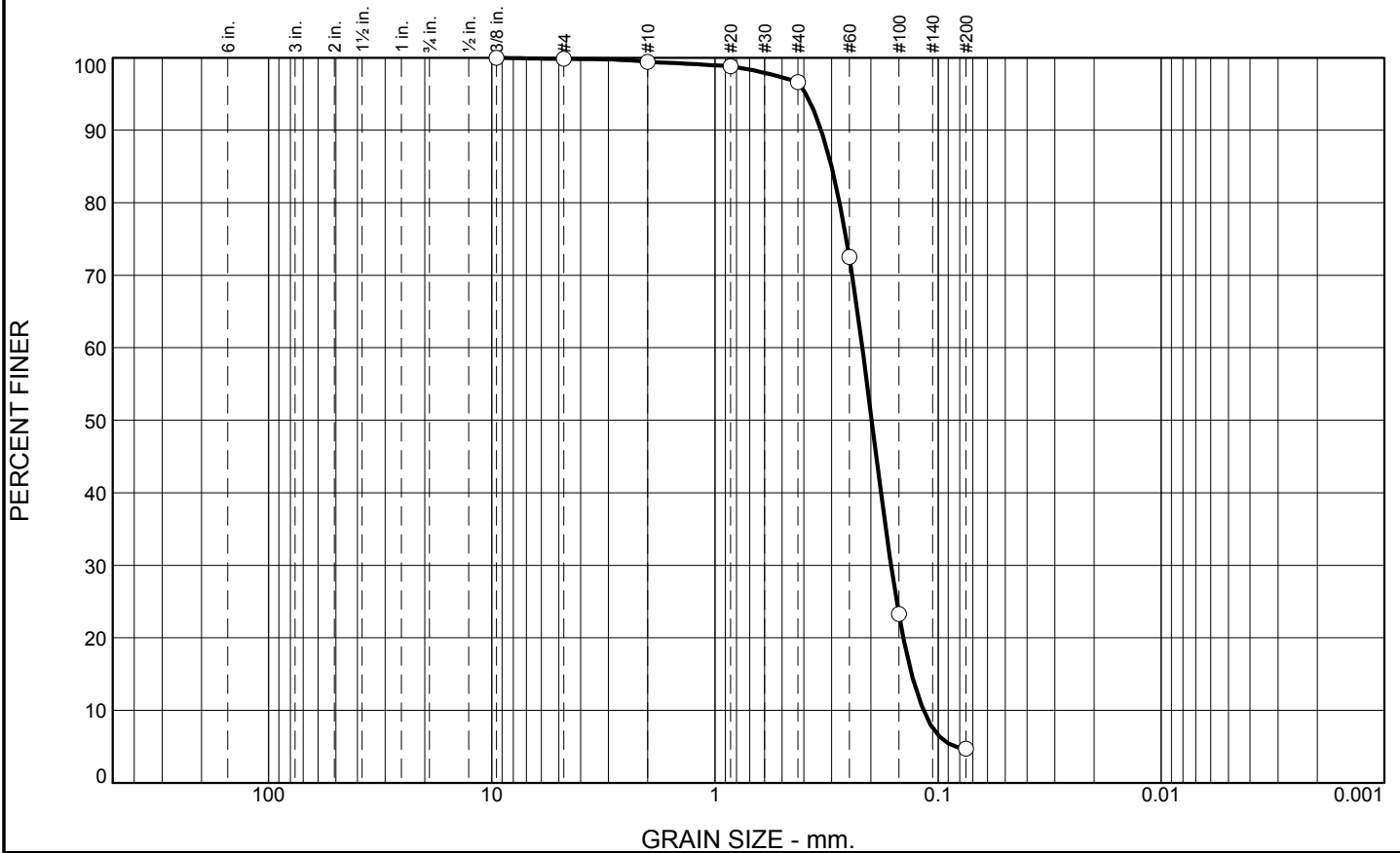
Tested By: L.Stokes **Checked By:** R.Byrd

Boring Designation BI-CI-15-10

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS								
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A									
2. BORING DESIGNATION BI-CI-15-10		10. COORDINATE SYSTEM/DATUM <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px dashed black;"> LOCATION COORDINATES E = 911,406 N = 266,526 </td> <td style="width: 50%;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px dashed black;">HORIZONTAL</td> <td>VERTICAL</td> </tr> <tr> <td style="border-right: 1px dashed black;">State Plane, MSE (U.S. Ft.)</td> <td>NAD83</td> </tr> <tr> <td style="border-right: 1px dashed black;"></td> <td>NAVD88</td> </tr> </table> </td> </tr> </table>		LOCATION COORDINATES E = 911,406 N = 266,526	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px dashed black;">HORIZONTAL</td> <td>VERTICAL</td> </tr> <tr> <td style="border-right: 1px dashed black;">State Plane, MSE (U.S. Ft.)</td> <td>NAD83</td> </tr> <tr> <td style="border-right: 1px dashed black;"></td> <td>NAVD88</td> </tr> </table>	HORIZONTAL	VERTICAL	State Plane, MSE (U.S. Ft.)	NAD83		NAVD88
LOCATION COORDINATES E = 911,406 N = 266,526	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px dashed black;">HORIZONTAL</td> <td>VERTICAL</td> </tr> <tr> <td style="border-right: 1px dashed black;">State Plane, MSE (U.S. Ft.)</td> <td>NAD83</td> </tr> <tr> <td style="border-right: 1px dashed black;"></td> <td>NAVD88</td> </tr> </table>	HORIZONTAL	VERTICAL	State Plane, MSE (U.S. Ft.)	NAD83		NAVD88				
HORIZONTAL	VERTICAL										
State Plane, MSE (U.S. Ft.)	NAD83										
	NAVD88										
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Vibracore</td> <td style="width: 30%;"><input type="checkbox"/> AUTO HAMMER</td> </tr> <tr> <td></td> <td><input type="checkbox"/> MANUAL HAMMER</td> </tr> </table>		Vibracore	<input type="checkbox"/> AUTO HAMMER		<input type="checkbox"/> MANUAL HAMMER				
Vibracore	<input type="checkbox"/> AUTO HAMMER										
	<input type="checkbox"/> MANUAL HAMMER										
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; border-right: 1px dashed black;">DISTURBED</td> <td>UNDISTURBED (UD)</td> </tr> <tr> <td style="border-right: 1px dashed black;">2</td> <td>0</td> </tr> </table>		DISTURBED	UNDISTURBED (UD)	2	0				
DISTURBED	UNDISTURBED (UD)										
2	0										
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES									
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.5 Ft.									
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px dashed black;">STARTED</td> <td>COMPLETED</td> </tr> <tr> <td style="border-right: 1px dashed black;">05-19-10</td> <td>05-19-10</td> </tr> </table>		STARTED	COMPLETED	05-19-10	05-19-10				
STARTED	COMPLETED										
05-19-10	05-19-10										
8. TOTAL DEPTH OF BORING 9.0 Ft.		16. ELEVATION TOP OF BORING -9.1 Ft.									
		17. TOTAL RECOVERY FOR BORING 100%									
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist									

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.1	0.0	|			
-12.1	3.0	|	SAND, silty, mostly fine-grained sand-sized quartz, trace organic matter, brown (SM)	A	Classification: SP Color: 2.5Y 4.5/2- D50: 0.1985 mm % Fines: 4.7
-18.1	9.0	|	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace organic matter, lt. brown (SP) At El. -16.1 Ft., mostly fine to medium-grained sand-sized quartz, trace clay, trace shell fragments, lt. gray	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1599 mm % Fines: 4.8
NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	2.8	91.9	4.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.4		
#20	98.8		
#40	96.6		
#60	72.5		
#100	23.3		
#200	4.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3342 D₈₅= 0.3002 D₆₀= 0.2186
D₅₀= 0.1985 D₃₀= 0.1626 D₁₅= 0.1315
D₁₀= 0.1163 C_u= 1.88 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-15-10A
Sample Number: TE Lab ID: 4488.78

Depth: 0.0 - 5.0 (ft.)

Date: 5/27/10

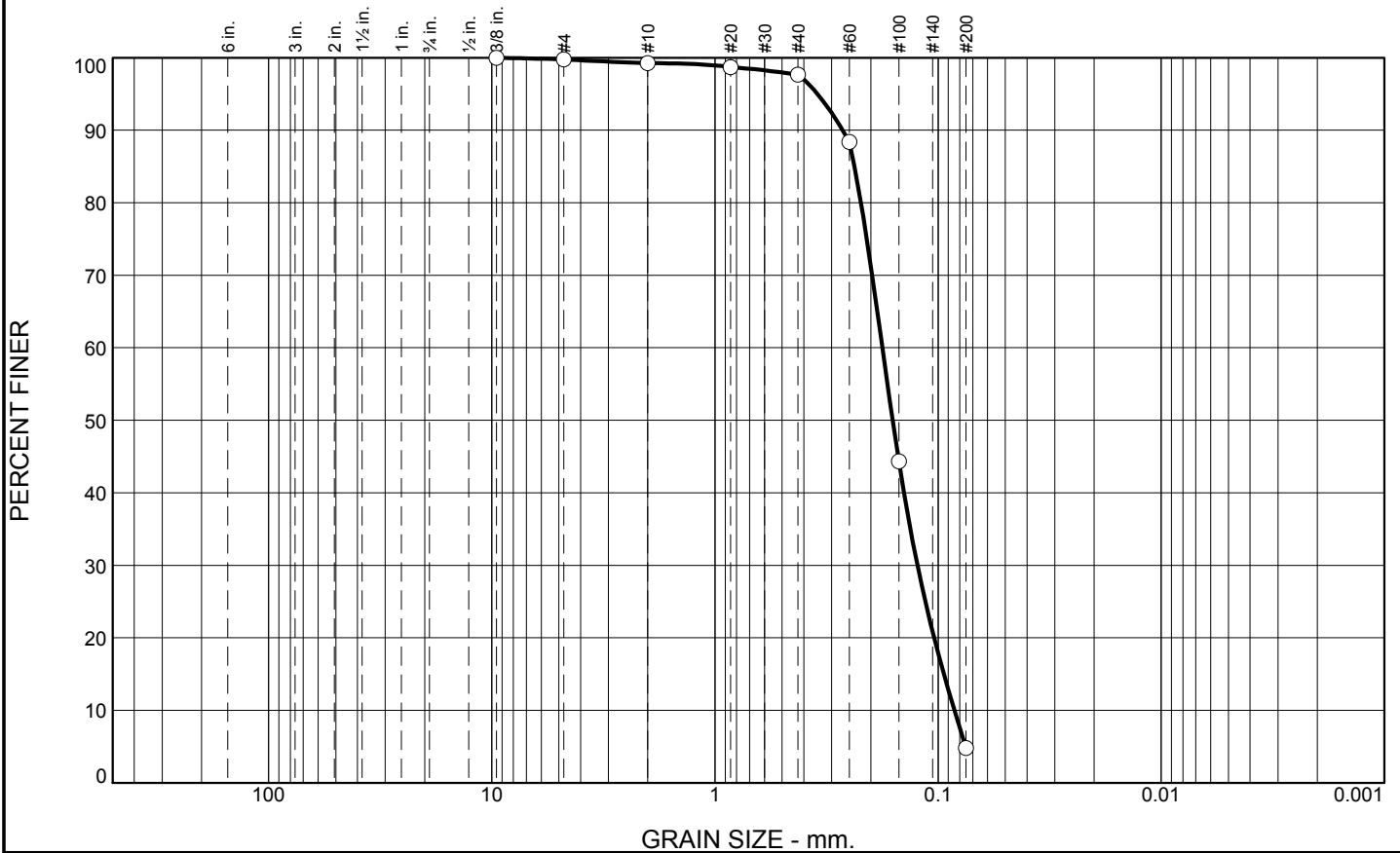
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.4	1.6	92.9	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.3		
#20	98.7		
#40	97.7		
#60	88.4		
#100	44.3		
#200	4.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2678 D₈₅= 0.2370 D₆₀= 0.1778
D₅₀= 0.1599 D₃₀= 0.1238 D₁₅= 0.0943
D₁₀= 0.0845 C_u= 2.10 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-15-10B
Sample Number: TE Lab ID: 4488.79

Depth: 5.0 - 9.0 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

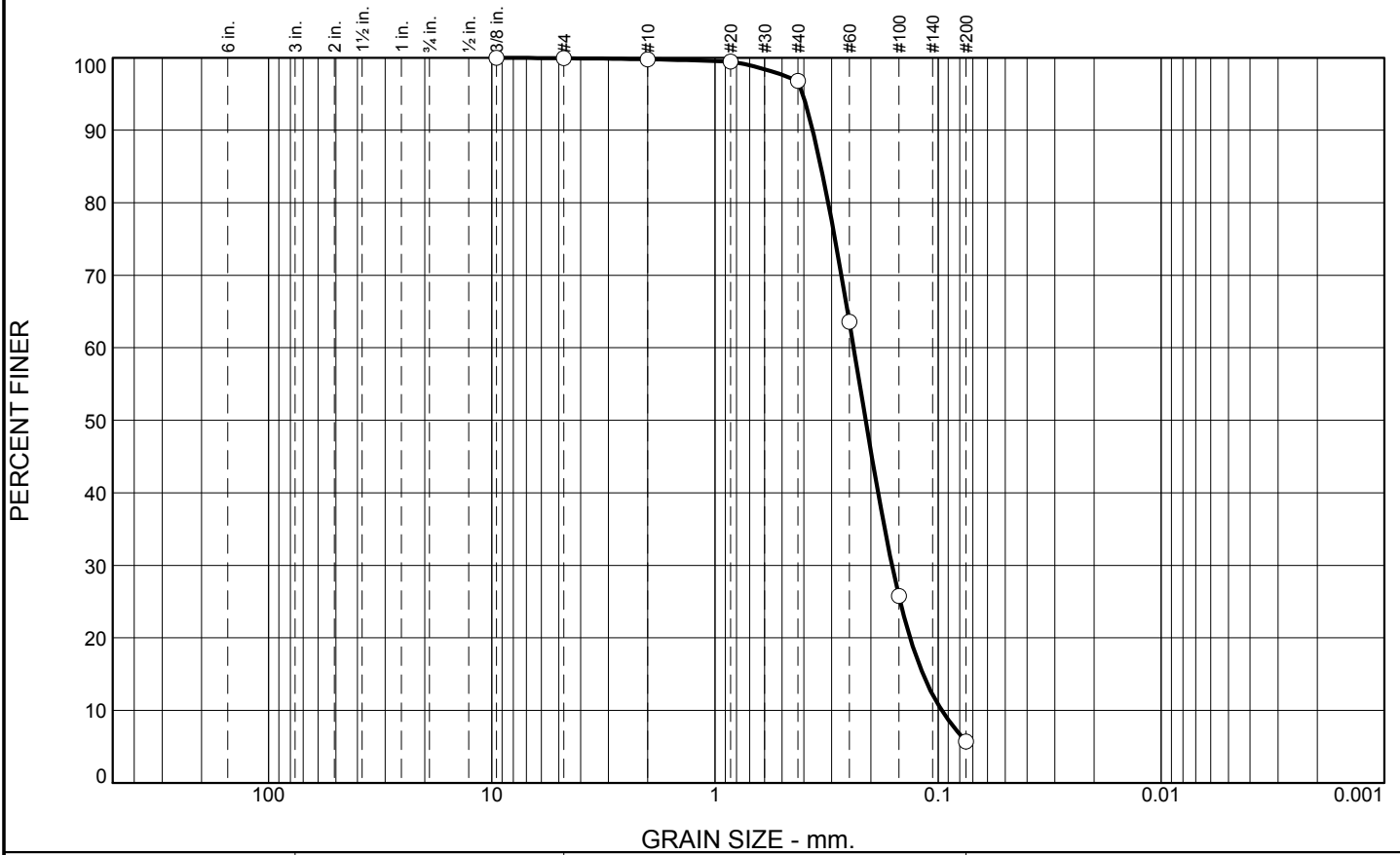
Checked By: R.Byrd

Boring Designation BI-CI-16-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-16-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-20-10
8. TOTAL DEPTH OF BORING 13.1 Ft.		16. ELEVATION TOP OF BORING -9.8 Ft.		COMPLETED 05-20-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.8	0.0				
		•••••	SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, trace shell, trace of clay lenses, dark gray and gray (SP-SM)	A	Classification: SP-SM Color: 2.5Y 5/3-light olive brown D50: 0.2112 mm % Fines: 5.7
-12.8	3.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, gray and tan (SP)	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2192 mm % Fines: 2.1
		•••••	At El. -16.8 Ft., mostly fine-grained sand-sized quartz, little shell fragments, gray to lt. gray	C	Classification: SP Color: 2.5Y 6/1-gray D50: 0.199 mm % Fines: 3.6
-22.9	13.1	•••••		NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	3.0	91.1	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.8		
#20	99.5		
#40	96.8		
#60	63.6		
#100	25.8		
#200	5.7		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3650 D₈₅= 0.3352 D₆₀= 0.2391
D₅₀= 0.2112 D₃₀= 0.1609 D₁₅= 0.1169
D₁₀= 0.0963 C_u= 2.48 C_c= 1.12

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-16-10A
Sample Number: TE Lab ID: 4488.99

Depth: 0.0 - 3.0 (ft.)

Date: 5/27/10

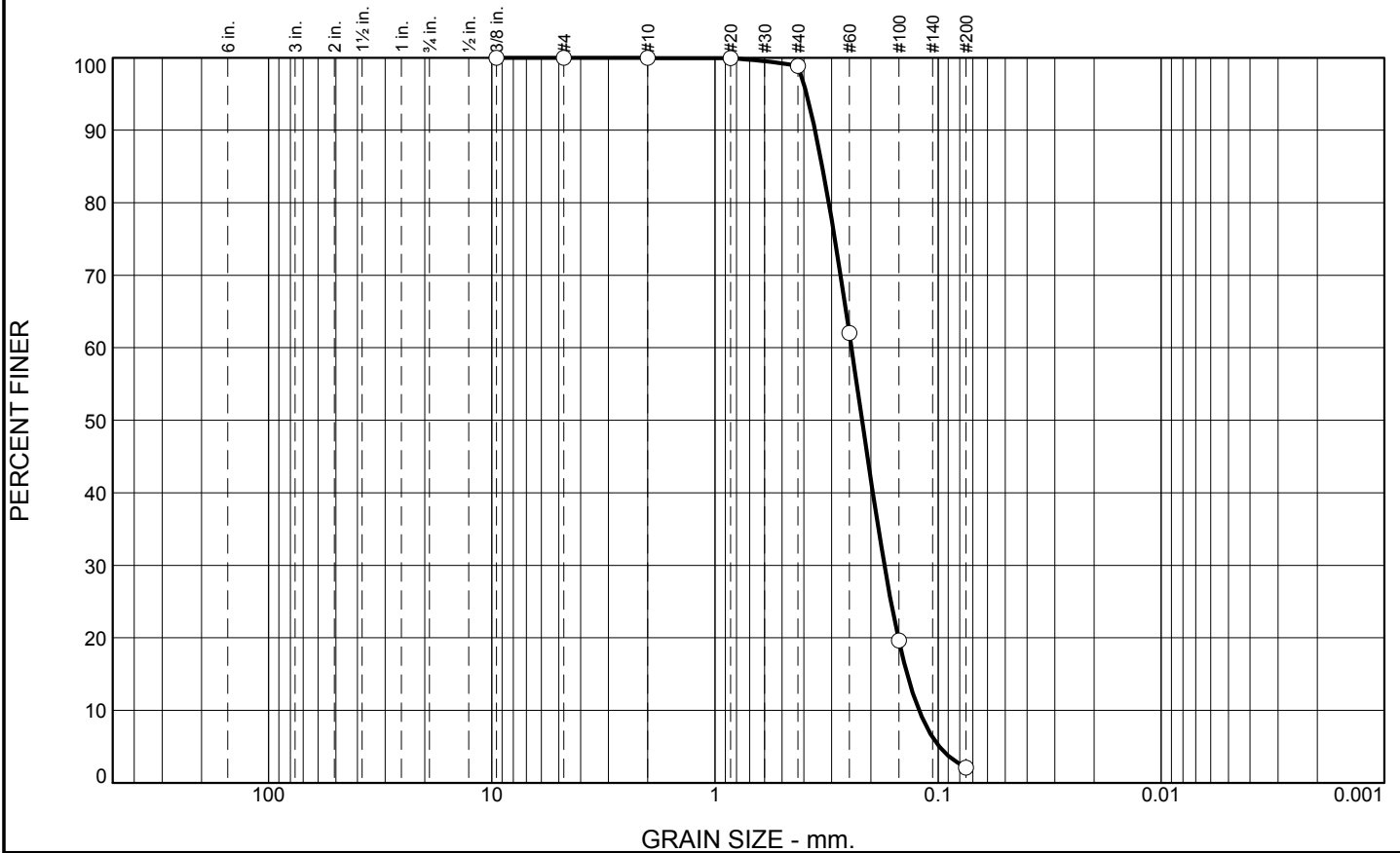
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.1	96.8	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.9		
#60	62.0		
#100	19.6		
#200	2.1		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3560 D₈₅= 0.3304 D₆₀= 0.2444
D₅₀= 0.2192 D₃₀= 0.1740 D₁₅= 0.1377
D₁₀= 0.1217 C_u= 2.01 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-16-10B
Sample Number: TE Lab ID: 4488.100

Depth: 3.0 - 7.0 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

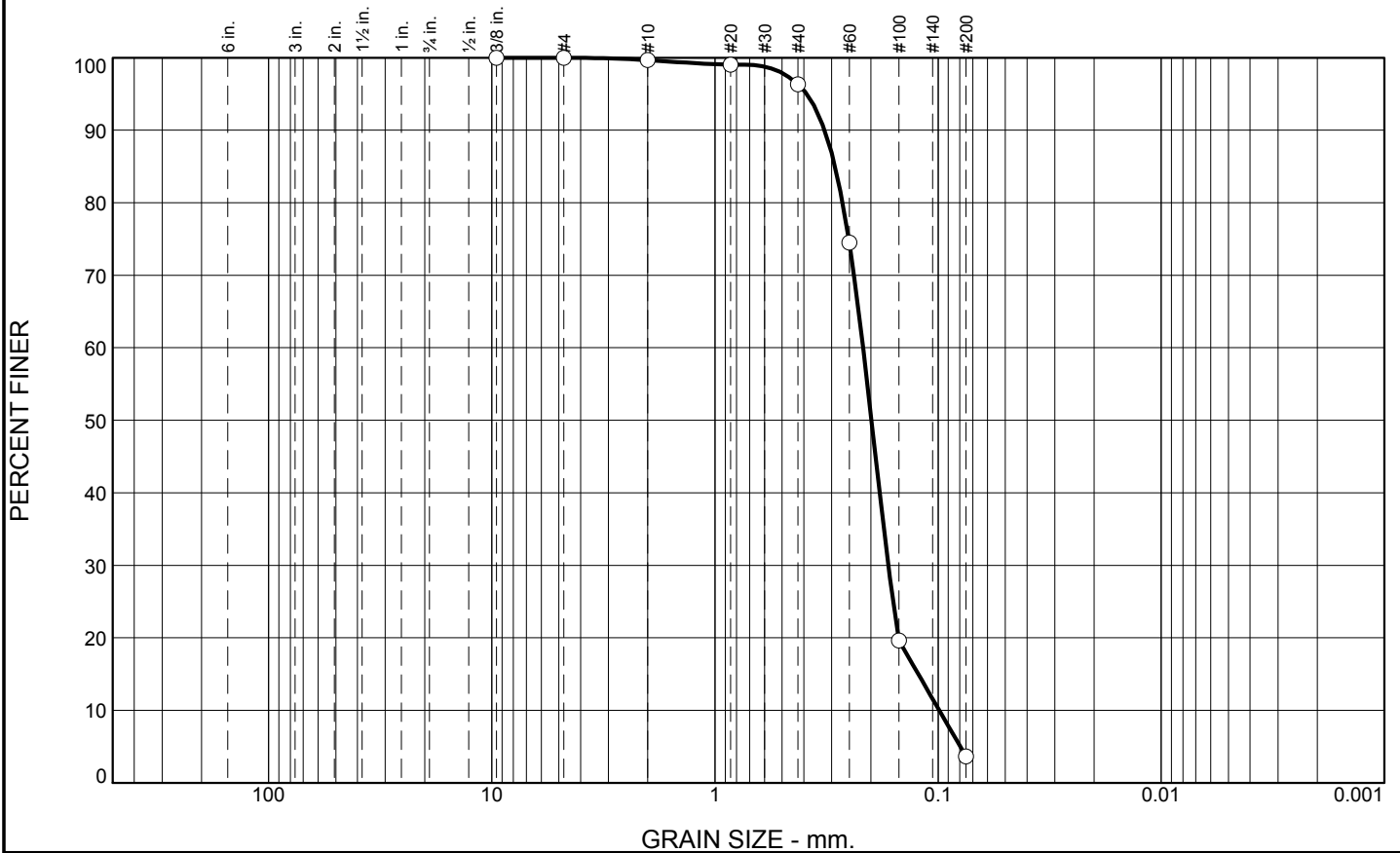
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	3.4	92.7	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.1		
#40	96.3		
#60	74.5		
#100	19.6		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3223 D₈₅= 0.2896 D₆₀= 0.2169
D₅₀= 0.1990 D₃₀= 0.1671 D₁₅= 0.1227
D₁₀= 0.0988 C_u= 2.19 C_c= 1.30

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-16-10C
Sample Number: TE Lab ID: 4488.101

Depth: 7.0 - 12.0 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

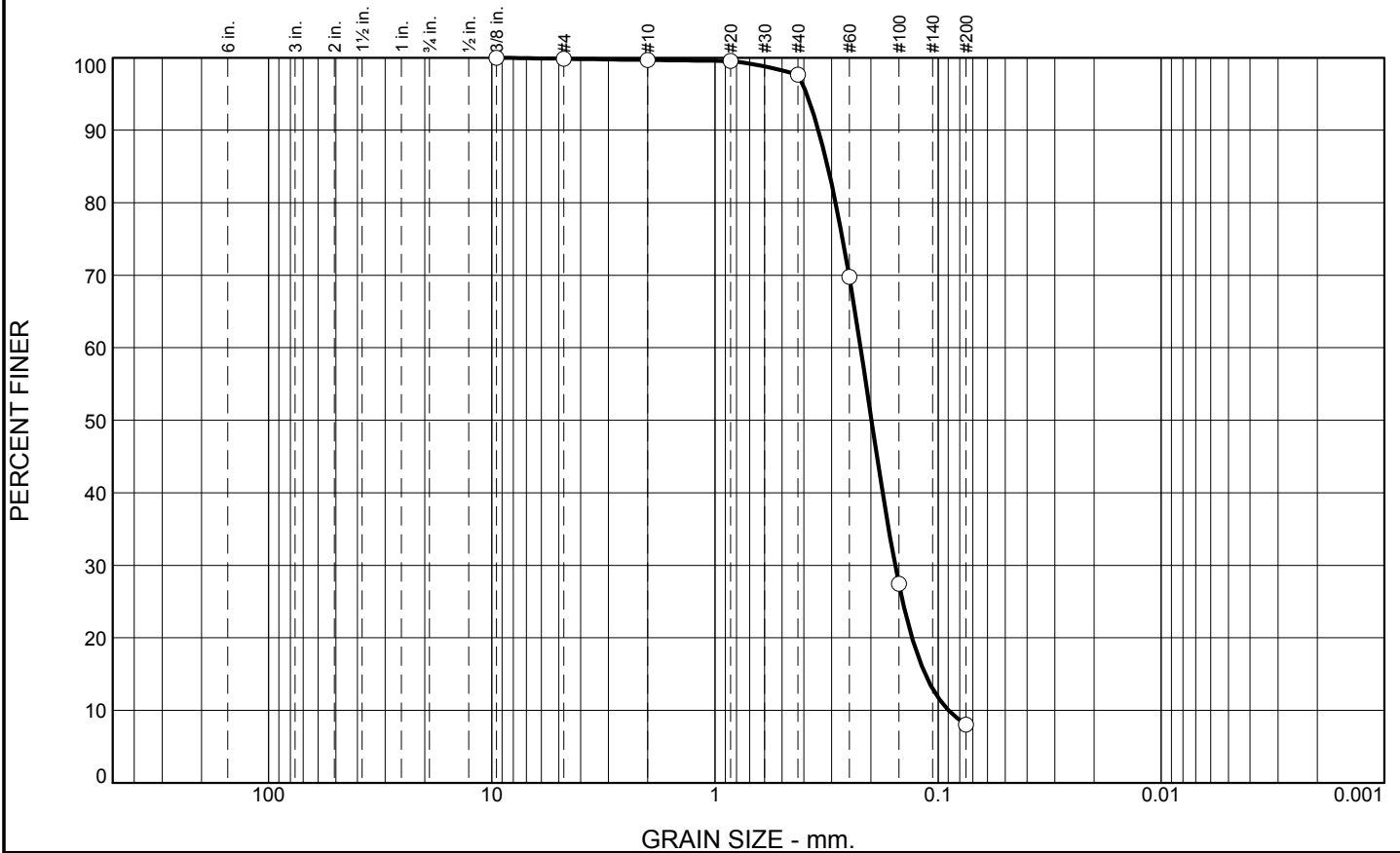
Checked By: R.Byrd

Boring Designation BI-CI-17-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-17-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-20-10
8. TOTAL DEPTH OF BORING 11.1 Ft.		16. ELEVATION TOP OF BORING -9.9 Ft.		COMPLETED 05-20-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.9	0.0				
-12.9	3.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, little silt, trace shell frags, greenish gray (SP)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.1989 mm % Fines: 8
-17.9	8.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, greenish gray and tan (SP)	B	Classification: SP Color: 10YR 6.5/2- D50: 0.197 mm % Fines: 2.7
-21.0	11.1		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, tan and gray (SP)	C	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1753 mm % Fines: 3.5
			At El. -20.6 Ft., trace of organics (wood)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	2.0	89.7	8.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	99.6		
#40	97.7		
#60	69.8		
#100	27.4		
#200	8.0		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3438 D₈₅= 0.3124 D₆₀= 0.2226
D₅₀= 0.1989 D₃₀= 0.1558 D₁₅= 0.1143
D₁₀= 0.0897 C_u= 2.48 C_c= 1.22

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-17-10A
Sample Number: TE Lab ID: 4488.93

Depth: 0.0 - 3.0 (ft.)

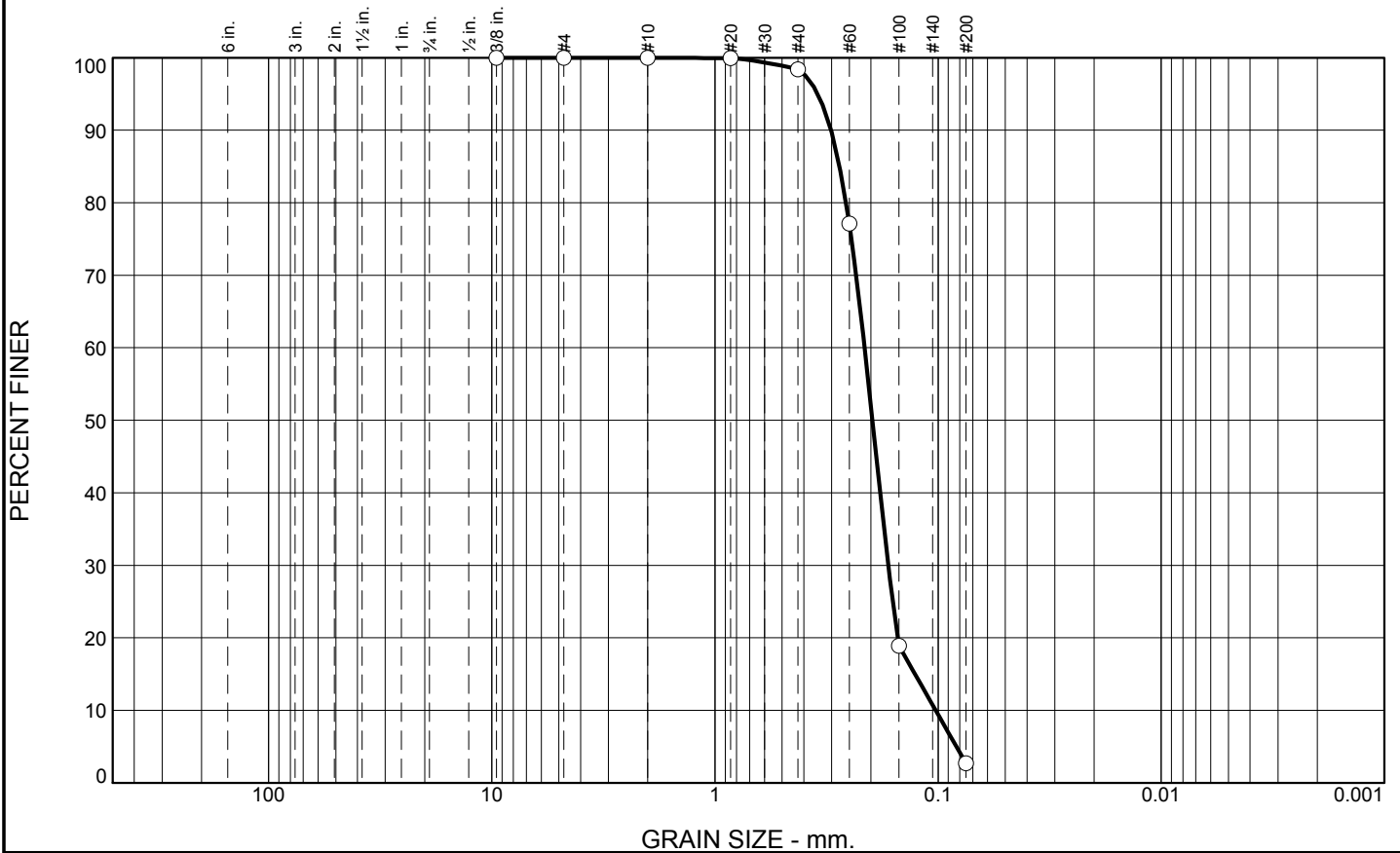
Date: 5/27/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	95.7	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.4		
#60	77.1		
#100	18.9		
#200	2.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3018 D₈₅= 0.2764 D₆₀= 0.2136
D₅₀= 0.1970 D₃₀= 0.1672 D₁₅= 0.1269
D₁₀= 0.1025 C_u= 2.08 C_c= 1.28

Classification

USCS= SP AASHTO=

Remarks

CADD-CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-17-10B
Sample Number: TE Lab ID: 4488.94

Depth: 3.0 -8.0 (ft.)

Date: 5/27/10

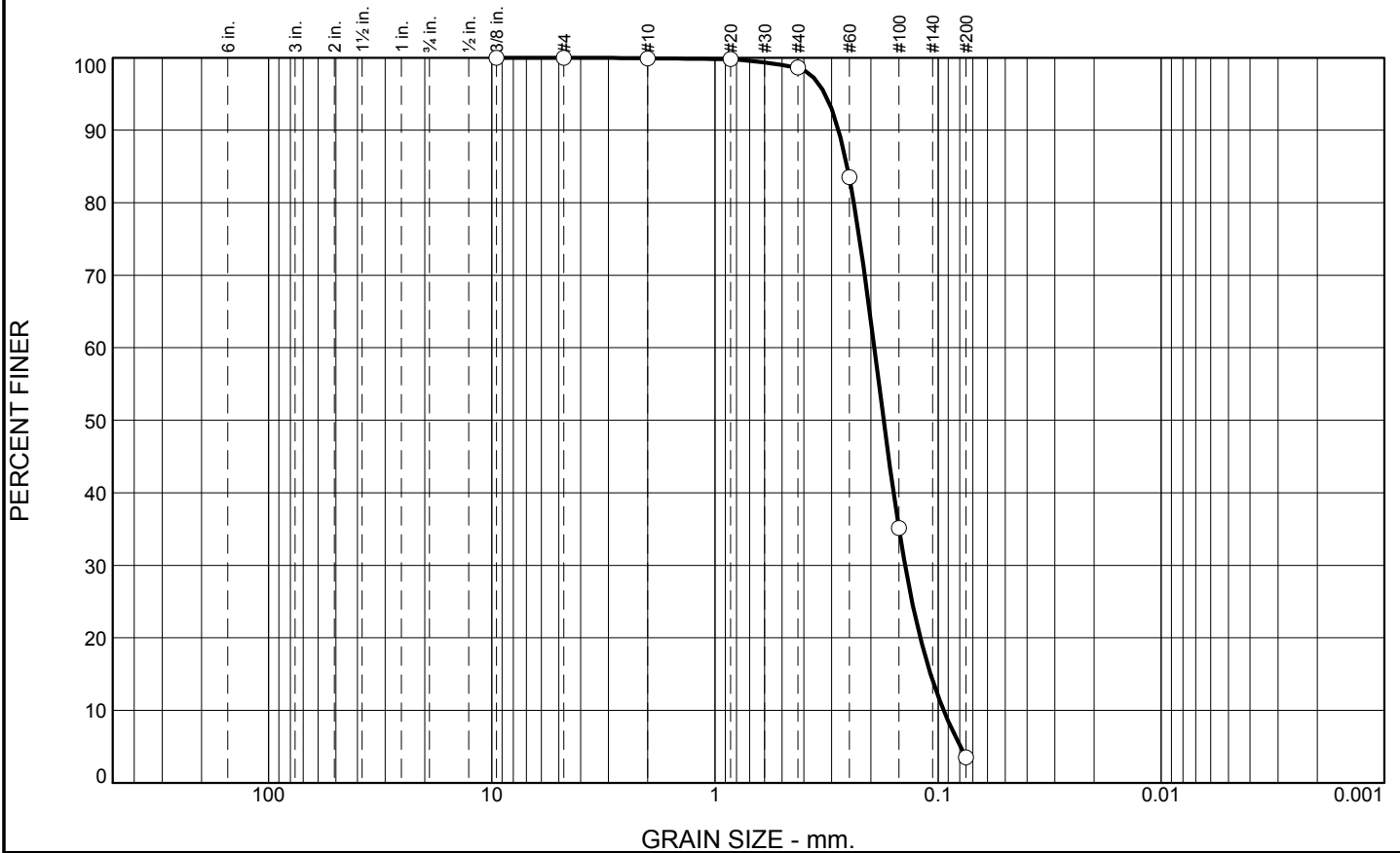
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.3	95.1	3.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	98.6		
#60	83.5		
#100	35.1		
#200	3.5		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2793 D₈₅= 0.2555 D₆₀= 0.1932
D₅₀= 0.1753 D₃₀= 0.1407 D₁₅= 0.1081
D₁₀= 0.0945 C_u= 2.04 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-17-10C
Sample Number: TE Lab ID: 4488.95

Depth: 8.0 - 11.1 (ft.)

Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

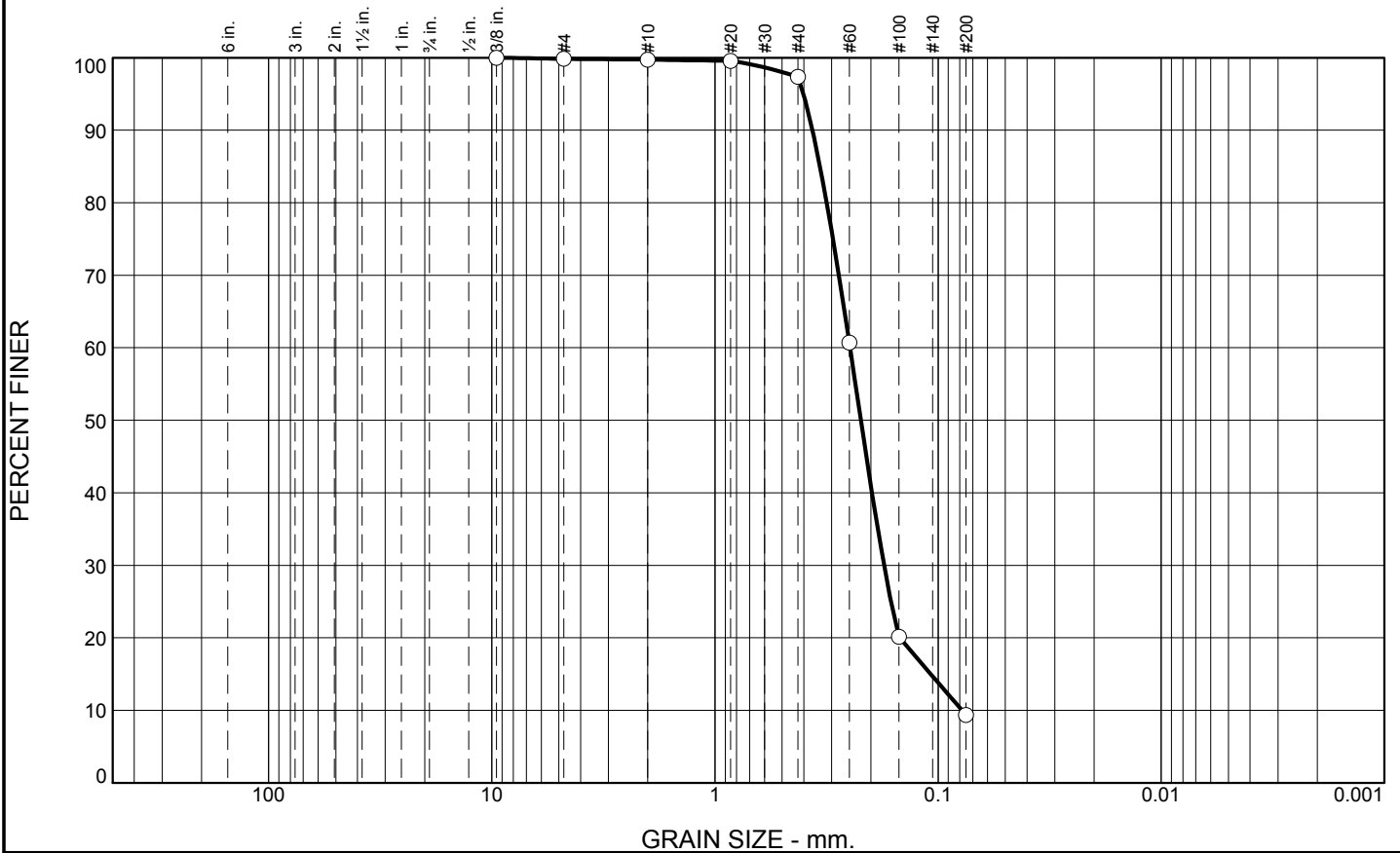
Checked By: R.Byrd

Boring Designation BI-CI-18-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-18-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore
3. DRILLING AGENCY Corps of Engineers - CESAM		12. TOTAL SAMPLES 3		13. TOTAL NUMBER CORE BOXES 0
4. NAME OF DRILLER Construction Solutions International, Inc.			14. WATER DEPTH 10.5 Ft.	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		6. THICKNESS OF OVERBURDEN N/A	15. DATE BORING STARTED: 05-20-10 COMPLETED: 05-20-10	
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%
8. TOTAL DEPTH OF BORING 10.6 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.5	0.0				
		↑↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, trace shell fragments, dark gray and greenish gray (SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2218 mm % Fines: 9.4
-12.5	3.0	●●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, gray (SP)	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2017 mm % Fines: 3.2
		●●●●●	At El. -17.5 Ft., mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, lenses of organic stained fines, gray and brown	C	Classification: SP Color: 2.5Y 7/1.5- D50: 0.1698 mm % Fines: 3.7
-20.1	10.6		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.1	2.4	87.9	9.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.7		
#20	99.6		
#40	97.3		
#60	60.7		
#100	20.1		
#200	9.4		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3657 D₈₅= 0.3382 D₆₀= 0.2481
D₅₀= 0.2218 D₃₀= 0.1747 D₁₅= 0.1079
D₁₀= 0.0782 C_u= 3.17 C_c= 1.57

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-18-10A
Sample Number: TE Lab ID: 4488.86

Depth: 0.0 - 3.0 (ft.)

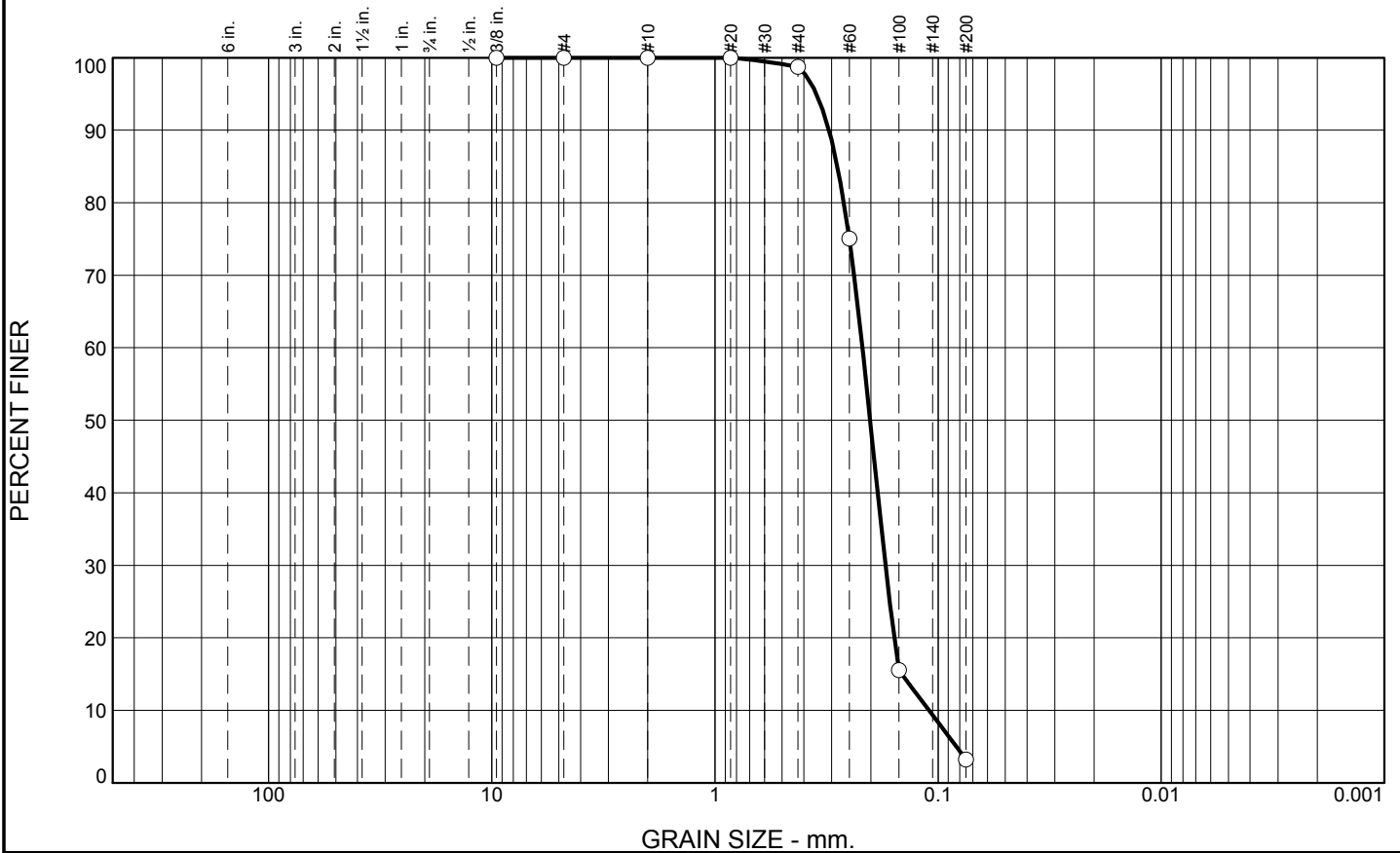
Date: 5/27/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	95.5	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.7		
#60	75.1		
#100	15.5		
#200	3.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3081 D₈₅= 0.2825 D₆₀= 0.2183
D₅₀= 0.2017 D₃₀= 0.1721 D₁₅= 0.1455
D₁₀= 0.1098 C_u= 1.99 C_c= 1.24

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-18-10B
Sample Number: TE Lab ID: 4488.87

Depth: 3.0 - 8.0 (ft.)

Date: 5/27/10

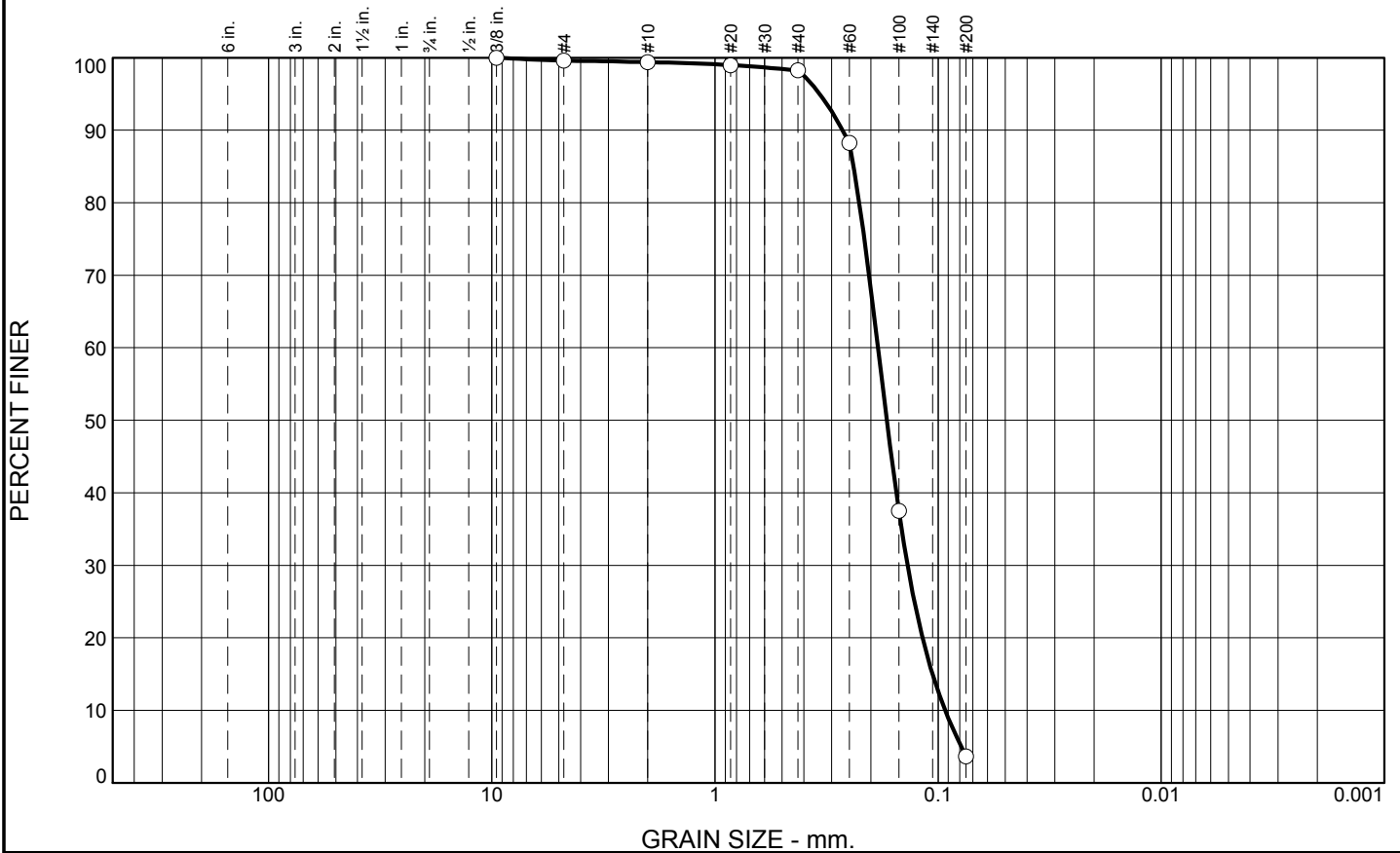
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.2	1.1	94.6	3.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	99.4		
#20	99.0		
#40	98.3		
#60	88.2		
#100	37.5		
#200	3.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2679 D₈₅= 0.2392 D₆₀= 0.1860
D₅₀= 0.1698 D₃₀= 0.1371 D₁₅= 0.1060
D₁₀= 0.0930 C_u= 2.00 C_c= 1.09

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-18-10C
Sample Number: TE Lab ID: 4488.88

Depth: 8.0 - 10.6 (ft.)

Date: 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

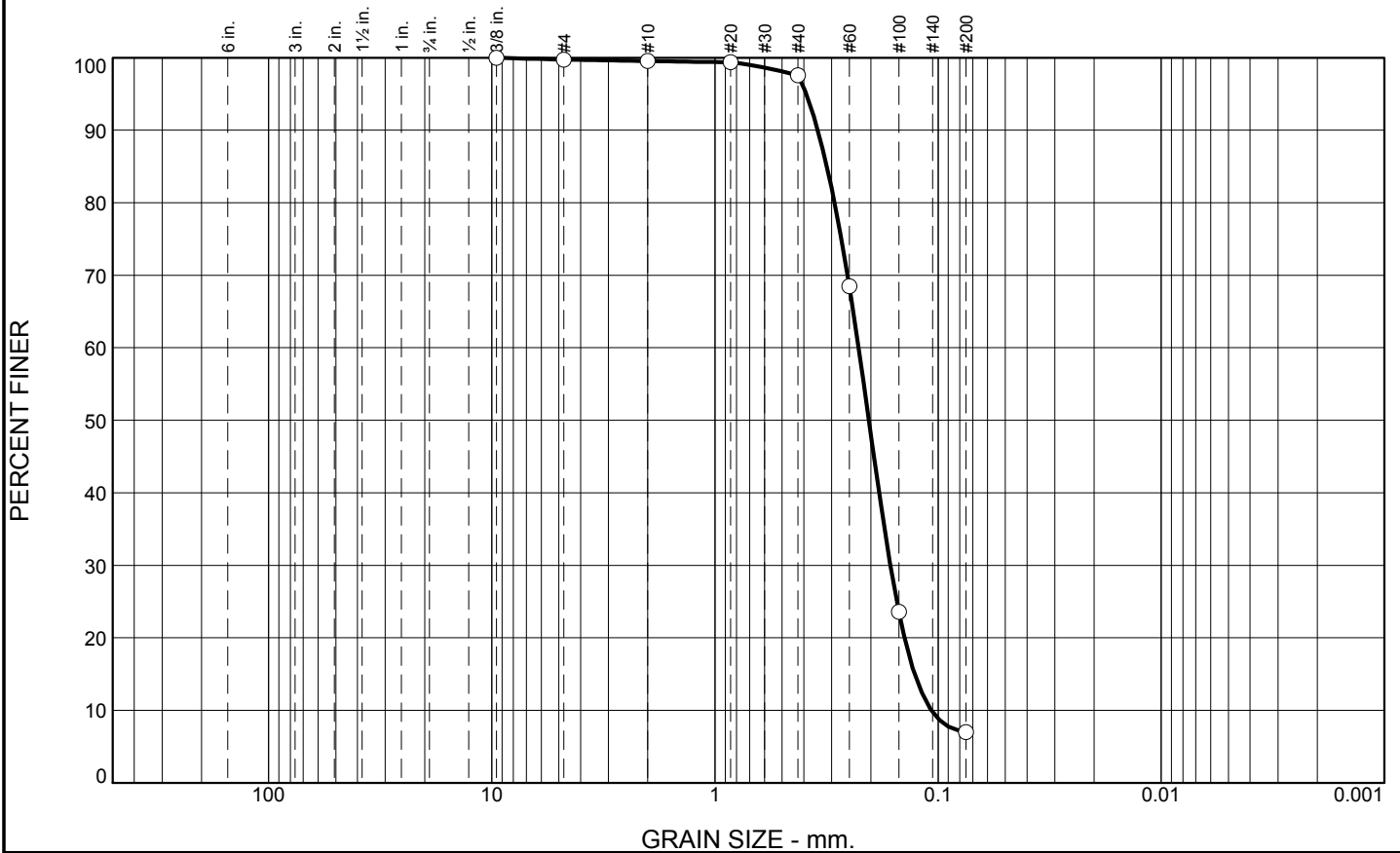
Checked By: R.Byrd

Boring Designation BI-CI-19-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-19-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-20-10
8. TOTAL DEPTH OF BORING 11.5 Ft.		16. ELEVATION TOP OF BORING -9.0 Ft.		COMPLETED 05-20-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.0	0.0				
-11.0	2.0		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, trace shell fragments, trace organic matter, dark gray to greenish gray (SP-SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2044 mm % Fines: 7
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, greenish gray (SP)	B	Classification: SP-SM Color: 2.5Y 6/2-light brownish gray D50: 0.2103 mm % Fines: 5.8
			At El. -15.0 Ft., mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, lt. greenish gray	C	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1799 mm % Fines: 3.3
-20.0	11.0				
-20.5	11.5		SAND, clayey, gray (SC)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.2	1.9	90.6	7.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.5		
#20	99.4		
#40	97.6		
#60	68.5		
#100	23.6		
#200	7.0		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3460 D₈₅= 0.3150 D₆₀= 0.2272
D₅₀= 0.2044 D₃₀= 0.1637 D₁₅= 0.1274
D₁₀= 0.1073 C_u= 2.12 C_c= 1.10

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-19-10A
Sample Number: TE Lab ID: 4488.80

Depth: 0.0 - 2.0 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

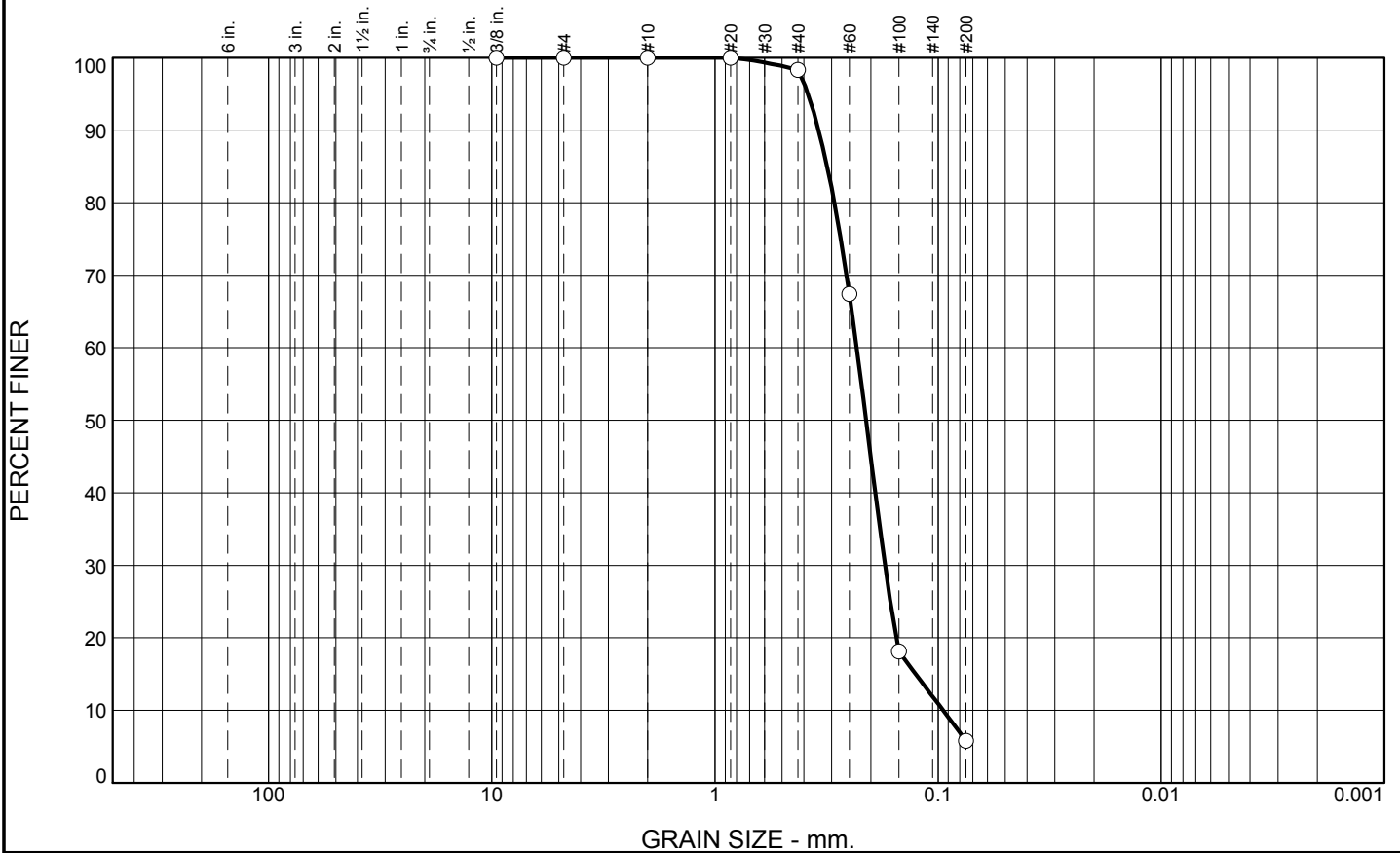
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.7	92.5	5.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.3		
#60	67.4		
#100	18.1		
#200	5.8		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3428 D₈₅= 0.3139 D₆₀= 0.2316
D₅₀= 0.2103 D₃₀= 0.1730 D₁₅= 0.1259
D₁₀= 0.0950 C_u= 2.44 C_c= 1.36

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

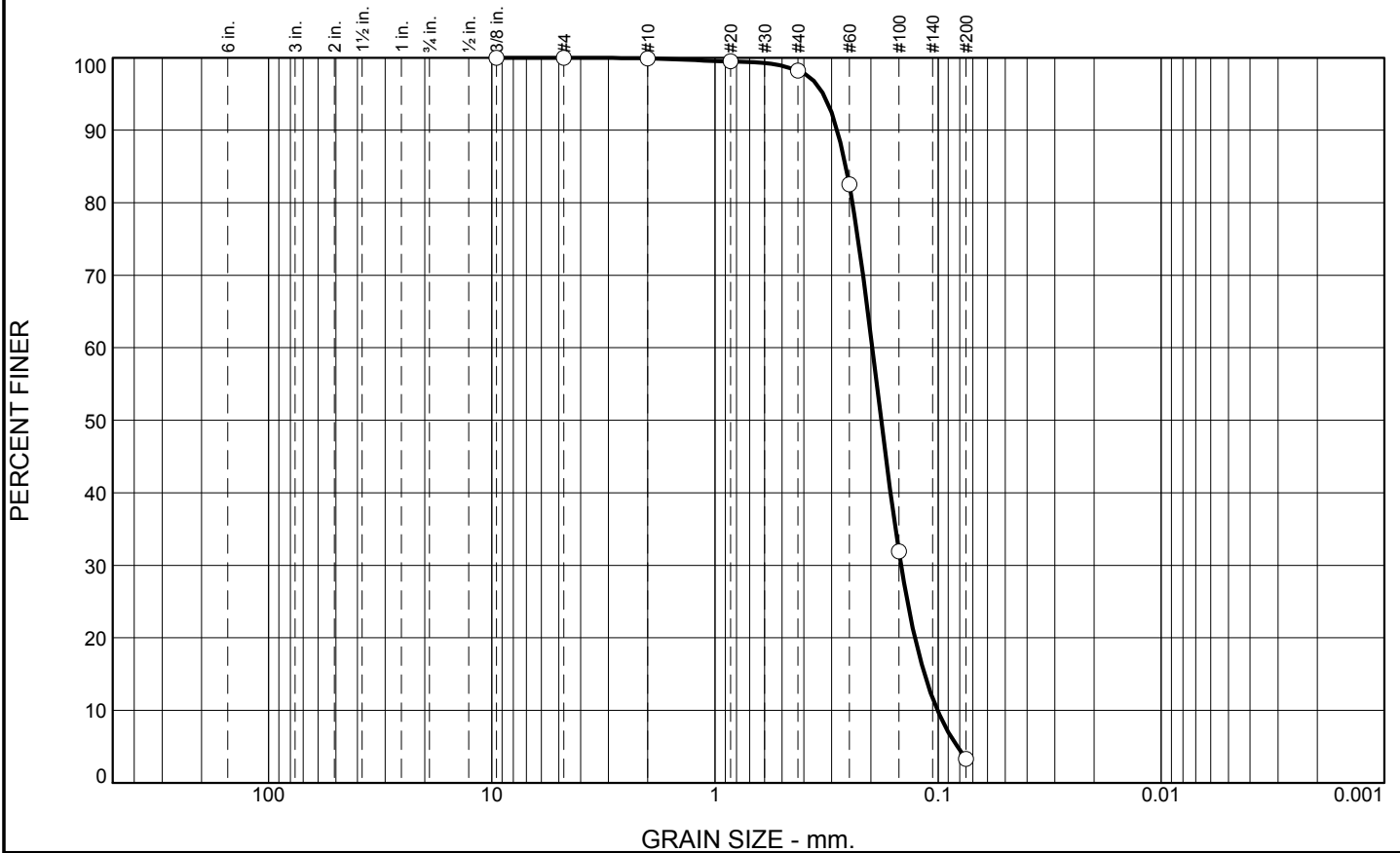
* (no specification provided)

Location: USACE Sample # BI-CI-19-10B **Depth:** 2.0 - 6.0 (ft.) **Date:** 5/27/10
Sample Number: TE Lab ID: 4488.81

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.7	94.9	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.5		
#40	98.2		
#60	82.5		
#100	31.9		
#200	3.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2831 D₈₅= 0.2590 D₆₀= 0.1972
D₅₀= 0.1799 D₃₀= 0.1466 D₁₅= 0.1151
D₁₀= 0.1007 C_u= 1.96 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-19-10C
Sample Number: TE Lab ID: 4488.82

Depth: 6.0 - 11.0 (ft.)

Date: 5/27/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: L.Stokes

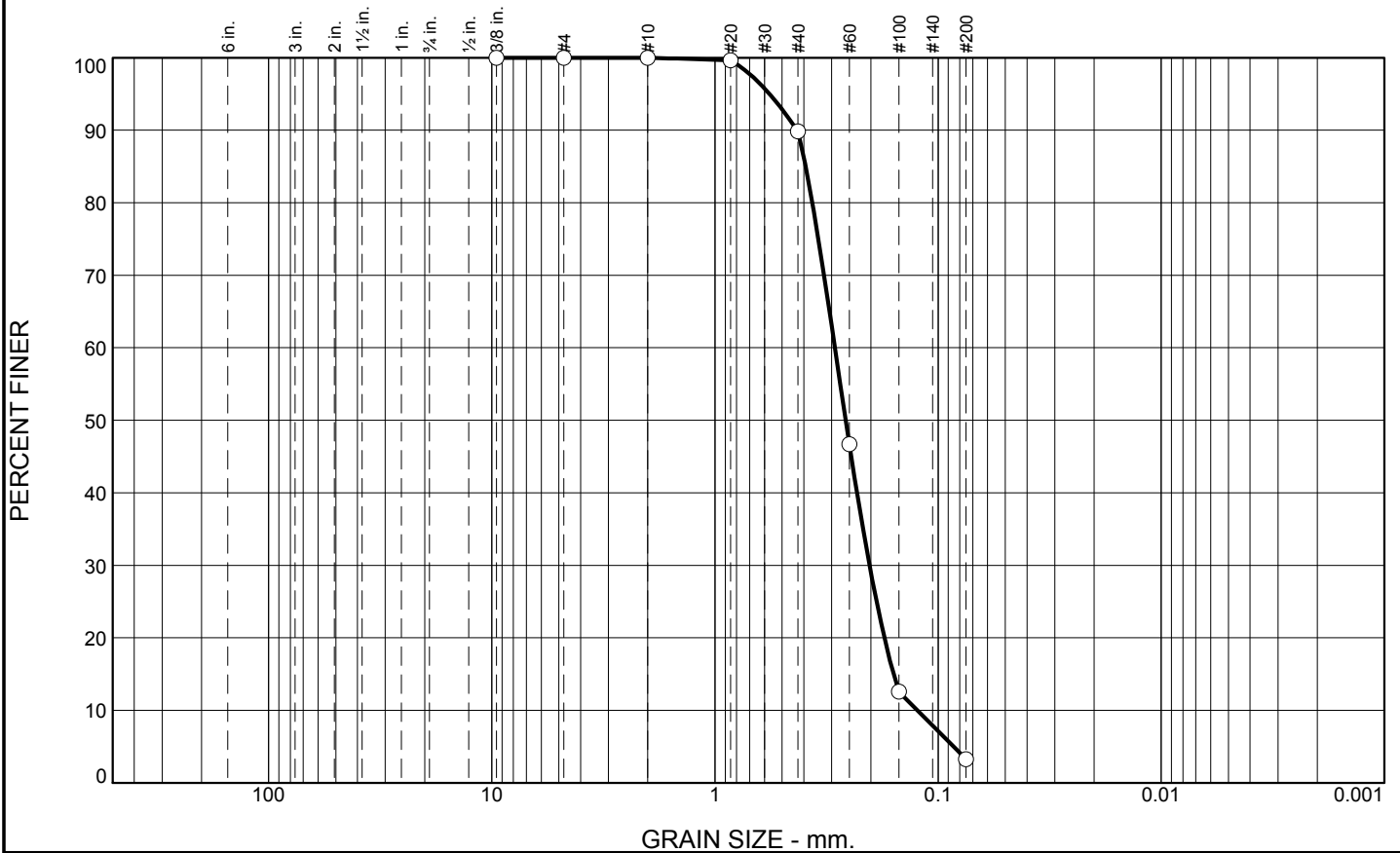
Checked By: R.Byrd

Boring Designation BI-CI-20-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-20-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -10.1 Ft.		STARTED 05-21-10
8. TOTAL DEPTH OF BORING 13.4 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-21-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.1	0.0				
-13.1	3.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, greenish gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2595 mm % Fines: 3.3
-18.1	8.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, gray and tan (SP)	B	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2053 mm % Fines: 2
-23.1	13.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace clay, trace shell fragments, greenish gray to gray (SP)	C	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.164 mm % Fines: 6.2
-23.5	13.4	|||||	SAND, silty, greenish gray (SM)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	10.2	86.5	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.6		
#40	89.8		
#60	46.7		
#100	12.6		
#200	3.3		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4286 D₈₅= 0.3927 D₆₀= 0.2899
D₅₀= 0.2595 D₃₀= 0.2029 D₁₅= 0.1584
D₁₀= 0.1238 C_u= 2.34 C_c= 1.15

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-20-10A
Sample Number: TE Lab ID: 4489.11

Depth: 0.0 - 3.0 (ft.)

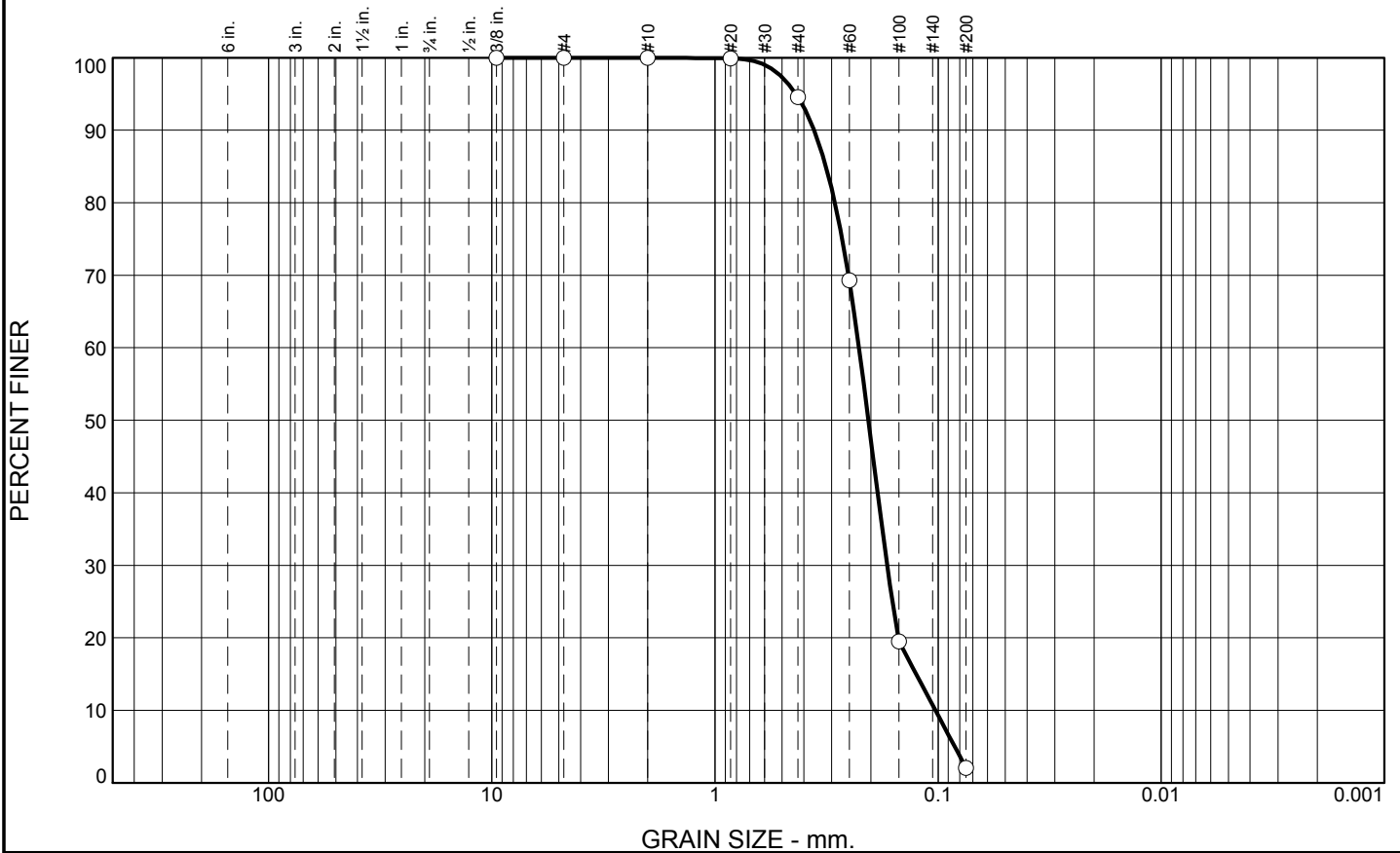
Date: 5/30/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	5.4	92.6	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	94.6		
#60	69.3		
#100	19.5		
#200	2.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3594 D₈₅= 0.3180 D₆₀= 0.2262
D₅₀= 0.2053 D₃₀= 0.1692 D₁₅= 0.1254
D₁₀= 0.1028 C_u= 2.20 C_c= 1.23

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

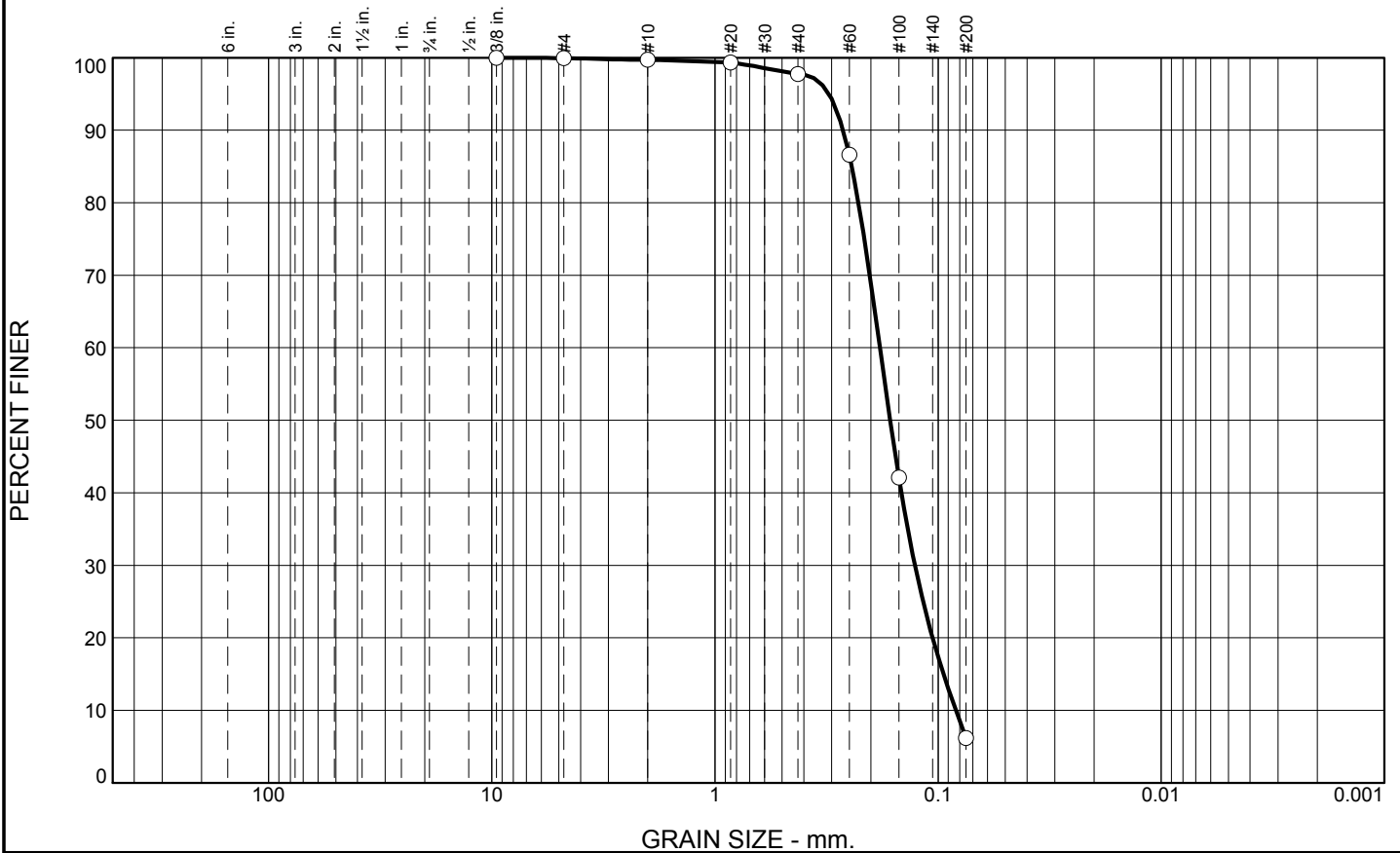
* (no specification provided)

Location: USACE Sample # BI-CI-20-10B **Depth:** 3.0 - 8.0 (ft.) **Date:** 5/30/10
Sample Number: TE Lab ID: 4489.12

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	1.9	91.6	6.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	99.3		
#40	97.8		
#60	86.6		
#100	42.1		
#200	6.2		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2664 D₈₅= 0.2438 D₆₀= 0.1823
D₅₀= 0.1640 D₃₀= 0.1270 D₁₅= 0.0946
D₁₀= 0.0833 C_u= 2.19 C_c= 1.06

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-20-10C
Sample Number: TE Lab ID: 4489.13

Depth: 8.0 - 13.0 (ft.)

Date: 5/30/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: G.Fancher

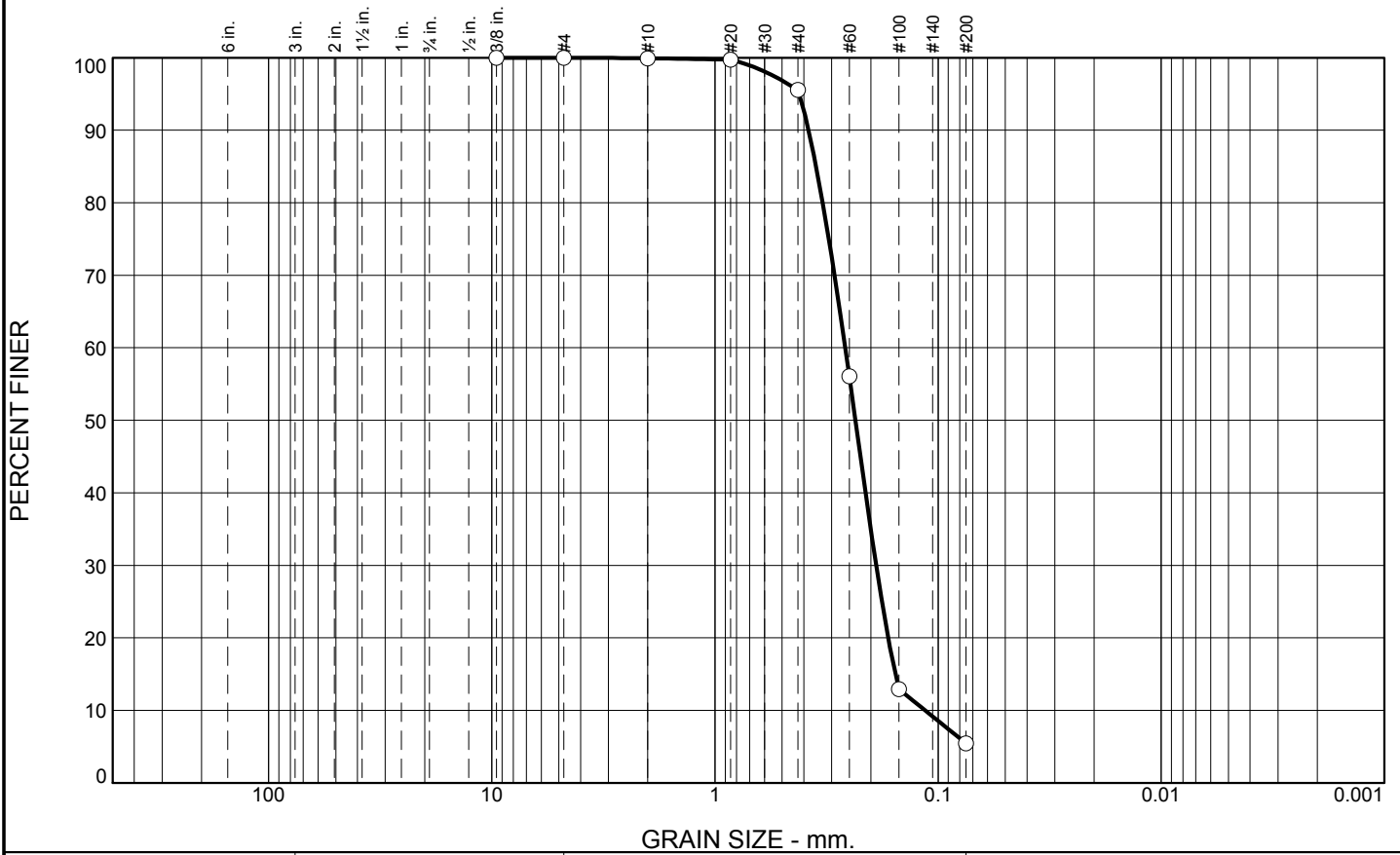
Checked By: R.Byrd

Boring Designation BI-CI-21-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-21-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -10.1 Ft.		STARTED 05-21-10
8. TOTAL DEPTH OF BORING 10.4 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-21-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.1	0.0				
-12.1	2.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace of clay lenses, greenish gray (SP)	A	Classification: SP-SM Color: - D50: 0.2347 mm % Fines: 5.5
-13.1	3.0	//	CLAY, lean, trace fine-grained sand-sized quartz, gray and brown (CL)	NS	
-19.1	9.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, greenish gray (SP) At El. -15.1 Ft., mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, gray	B C	Classification: SP Color: - D50: 0.213 mm % Fines: 2.7 Classification: SP Color: - D50: 0.1826 mm % Fines: 2.4
-20.5	10.4	||||	SAND, silty, mostly fine-grained sand-sized quartz, trace clay, dark gray (SM)	NS	
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	4.4	90.0	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	95.5		
#60	56.1		
#100	12.9		
#200	5.5		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3808 D₈₅= 0.3521 D₆₀= 0.2607
D₅₀= 0.2347 D₃₀= 0.1895 D₁₅= 0.1555
D₁₀= 0.1144 C_u= 2.28 C_c= 1.20

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-21-10A
Sample Number: TE Lab ID: 4489.08

Depth: 0.0 - 2.0 (ft.)

Date: 5/28/10

Thompson Engineering

Mobile, Alabama

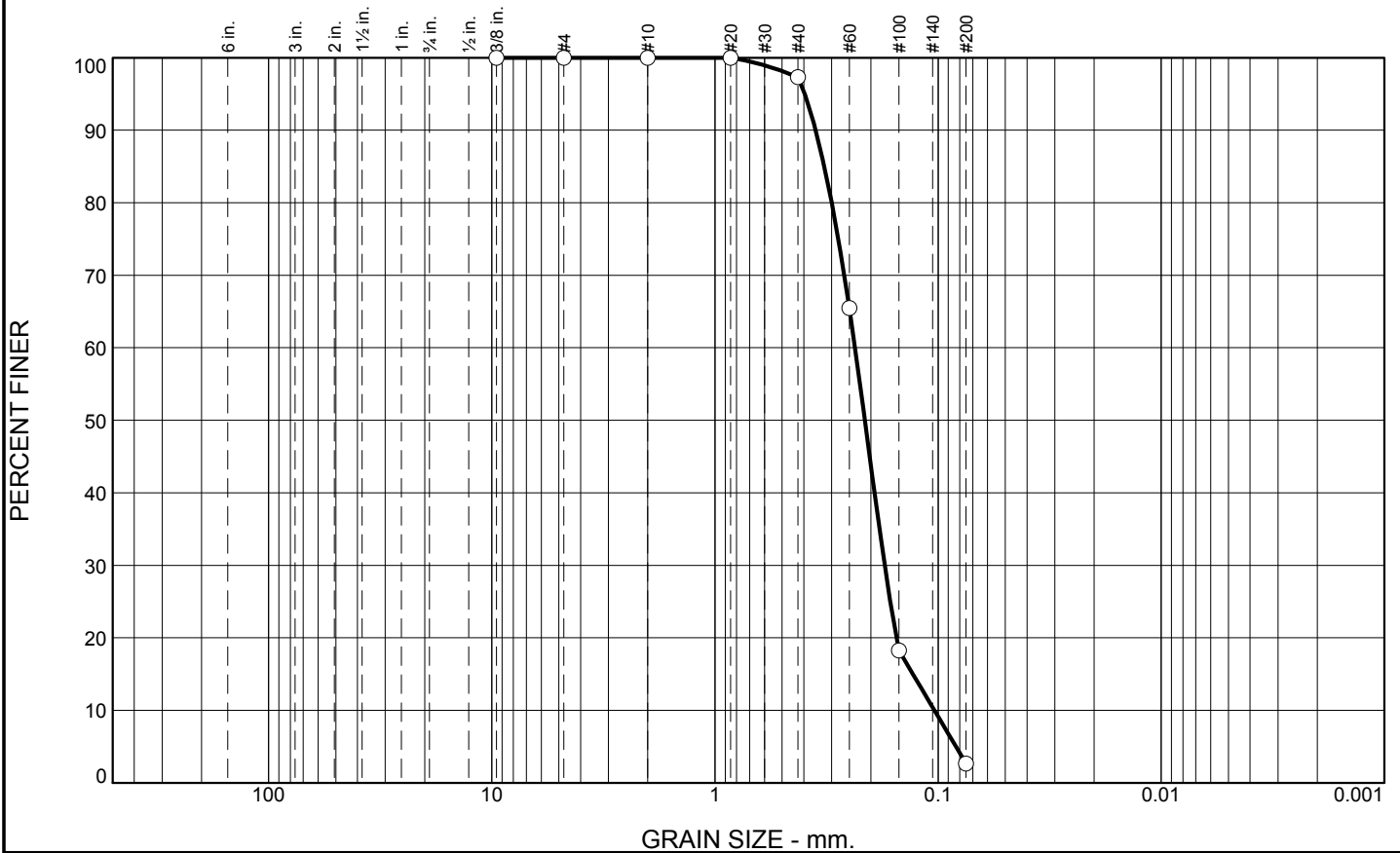
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009

Figure

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.7	94.6	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	97.3		
#60	65.5		
#100	18.3		
#200	2.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3538 D₈₅= 0.3235 D₆₀= 0.2357
D₅₀= 0.2130 D₃₀= 0.1735 D₁₅= 0.1297
D₁₀= 0.1039 C_u= 2.27 C_c= 1.23

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

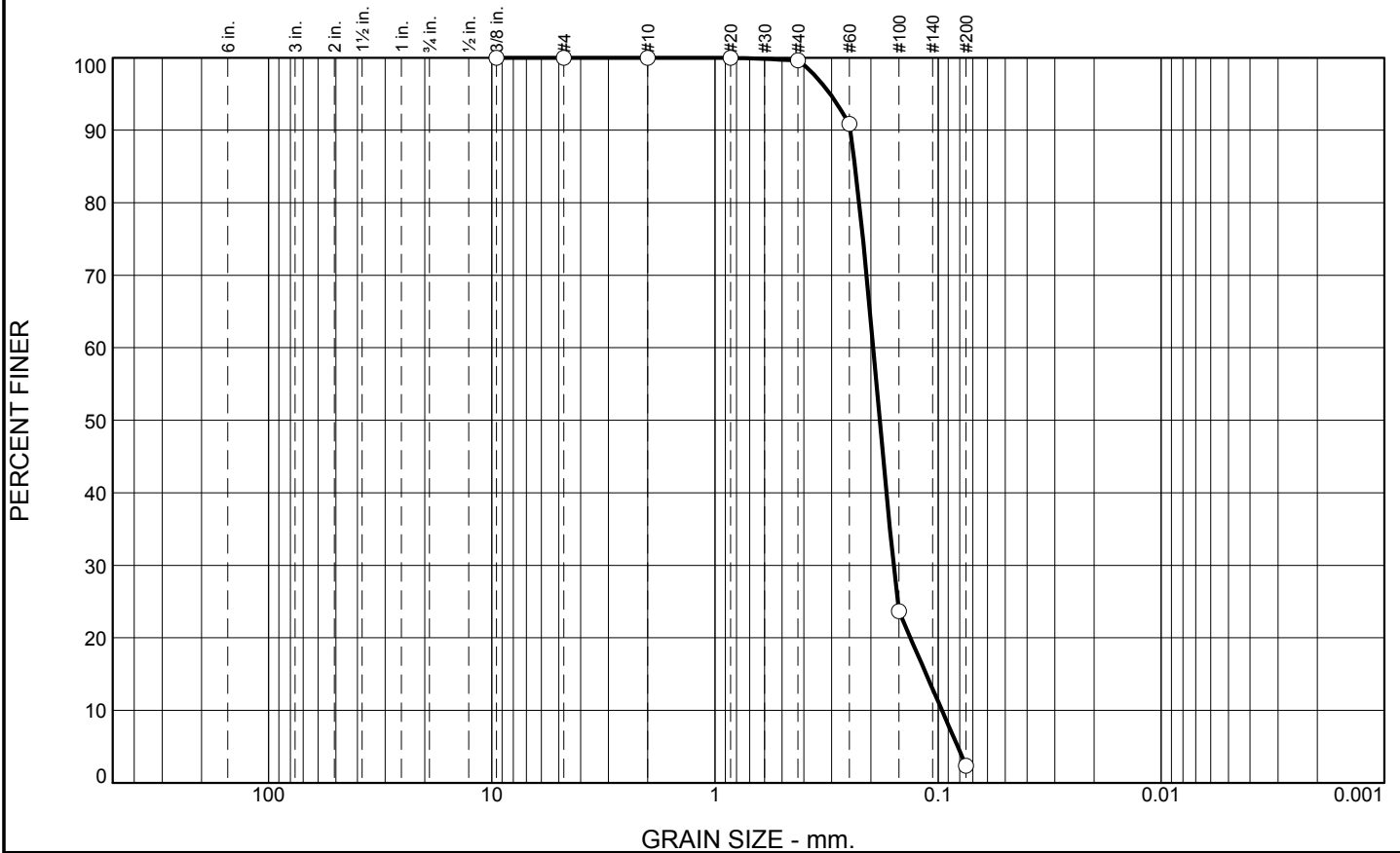
* (no specification provided)

Location: USACE Sample # BI-CI-21-10B **Sample Number:** TE Lab ID: 4489.09 **Depth:** 3.0 - 5.0 (ft.) **Date:** 5/28/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	97.2	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.6		
#60	90.9		
#100	23.7		
#200	2.4		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2476 D₈₅= 0.2356 D₆₀= 0.1954
D₅₀= 0.1826 D₃₀= 0.1582 D₁₅= 0.1132
D₁₀= 0.0962 C_u= 2.03 C_c= 1.33

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-21-10C **Depth:** 5.0 - 9.0 (ft.) **Date:** 5/30/10
Sample Number: TE Lab ID: 4489.10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

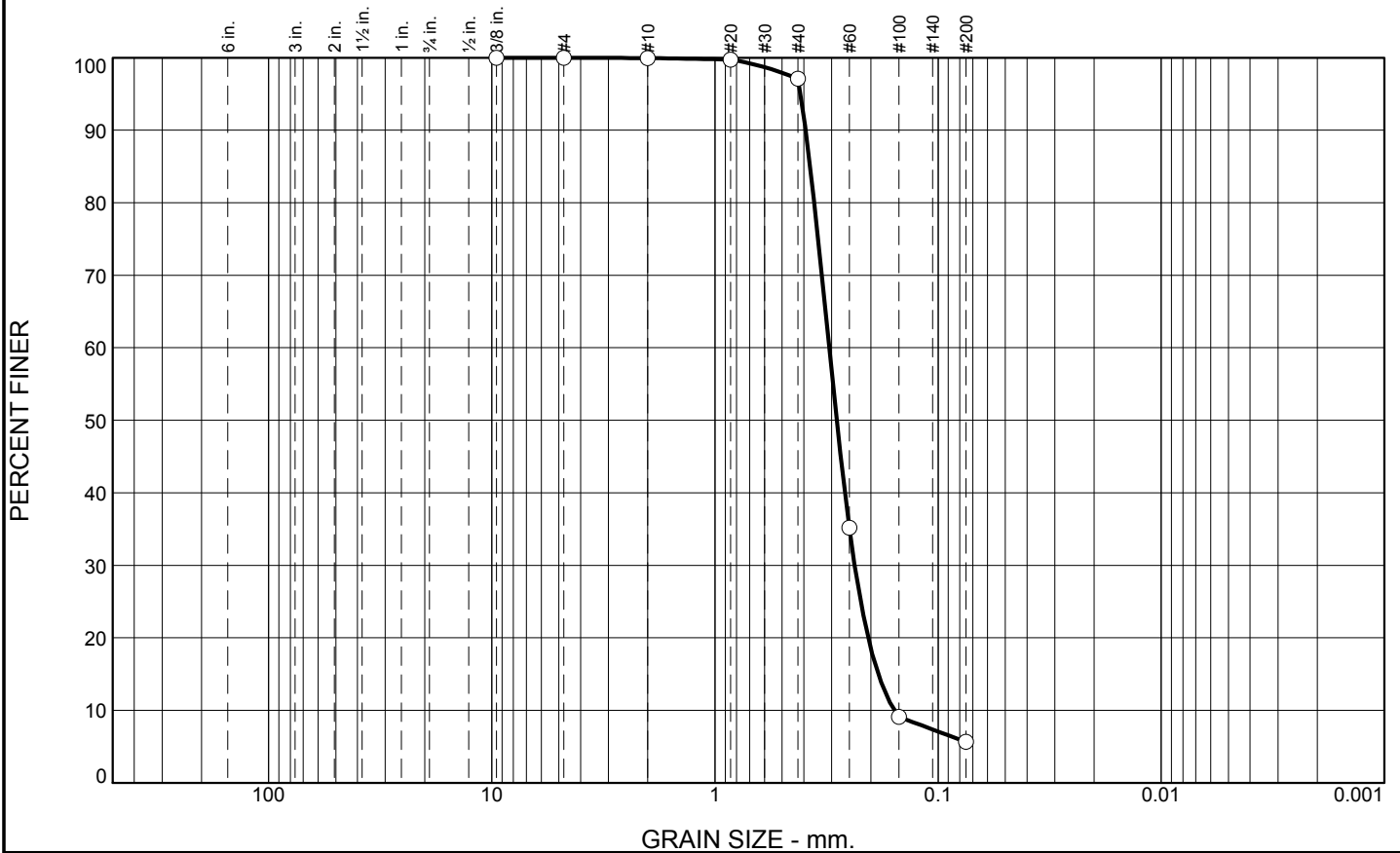
Tested By: G.Fancher **Checked By:** R.Byrd

Boring Designation BI-CI-22-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-22-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.0 Ft.		STARTED 05-21-10
8. TOTAL DEPTH OF BORING 11.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-21-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.0	0.0				
		↑↑↑↑↑	SAND, silty, mostly Geotechnical Engineer fine-grained sand-sized 0 quartz NS = Sample not submitted for laboratory analysis from this interval, trace shell fragments, trace organic matter, dark gray to gray (SM)	A	Classification: SP-SM Color: 2.5Y 6/2-light brownish gray D50: 0.2843 mm % Fines: 5.7
-13.0	4.0	●●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, trace organic matter, dark gray and brownish tan (SP)	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1783 mm % Fines: 2.7
		●●●●●	At El. -15.0 Ft., mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, gray and lt. gray	C	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2164 mm % Fines: 5.5
-20.0	11.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.8	91.4	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	97.1		
#60	35.2		
#100	9.1		
#200	5.7		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3927 D₈₅= 0.3748 D₆₀= 0.3072
D₅₀= 0.2843 D₃₀= 0.2366 D₁₅= 0.1856
D₁₀= 0.1570 C_u= 1.96 C_c= 1.16

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-22-10A
Sample Number: TE Lab ID: 4489.05

Depth: 0.0 - 4.0 (ft.)

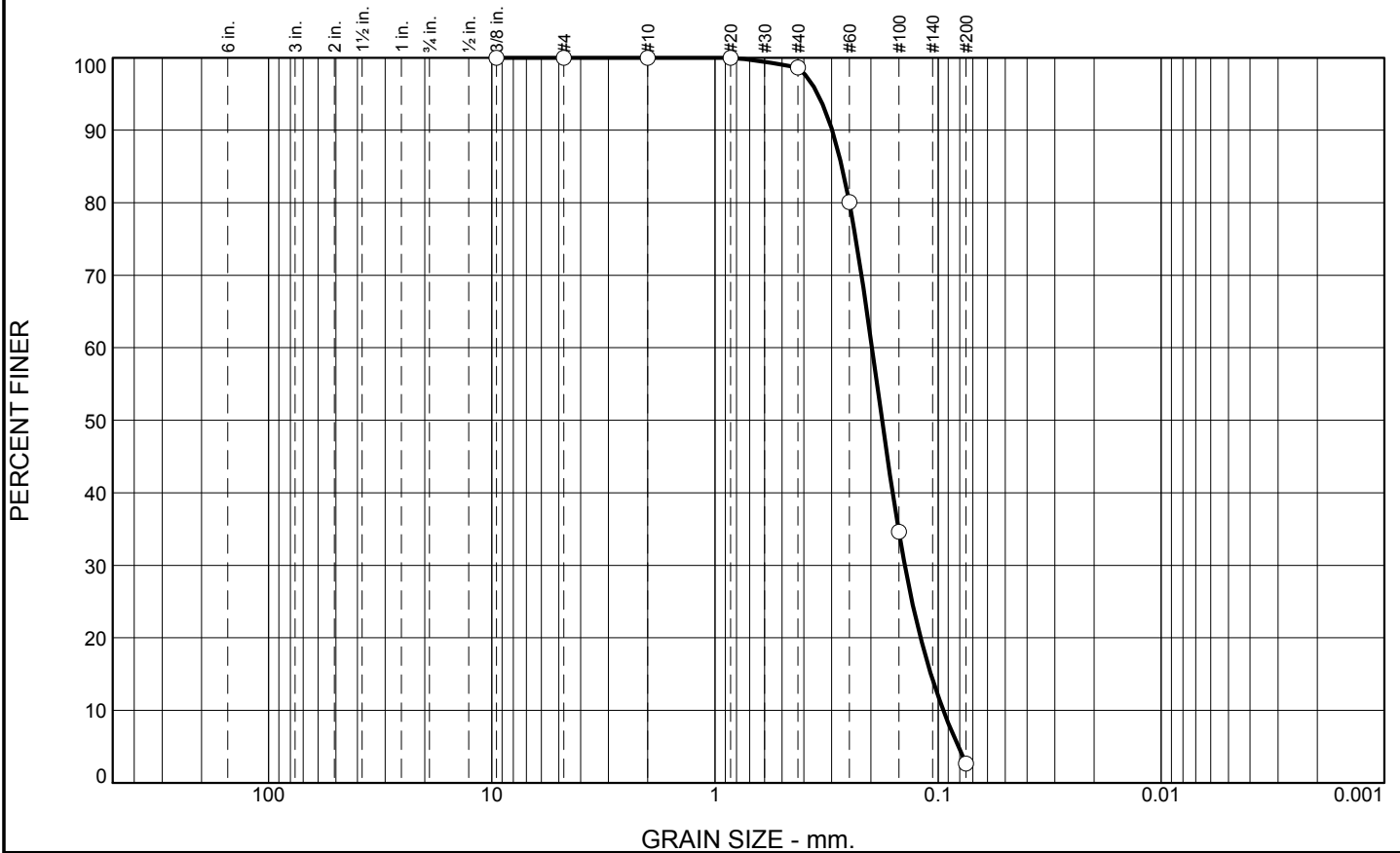
Date: 5/28/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
Figure	

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.4	95.9	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.6		
#60	80.1		
#100	34.6		
#200	2.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2984 D₈₅= 0.2700 D₆₀= 0.1979
D₅₀= 0.1783 D₃₀= 0.1410 D₁₅= 0.1078
D₁₀= 0.0948 C_u= 2.09 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-22-10B
Sample Number: TE Lab ID: 4489.06

Depth: 4.0 - 6.0 (ft.)

Date: 5/28/10

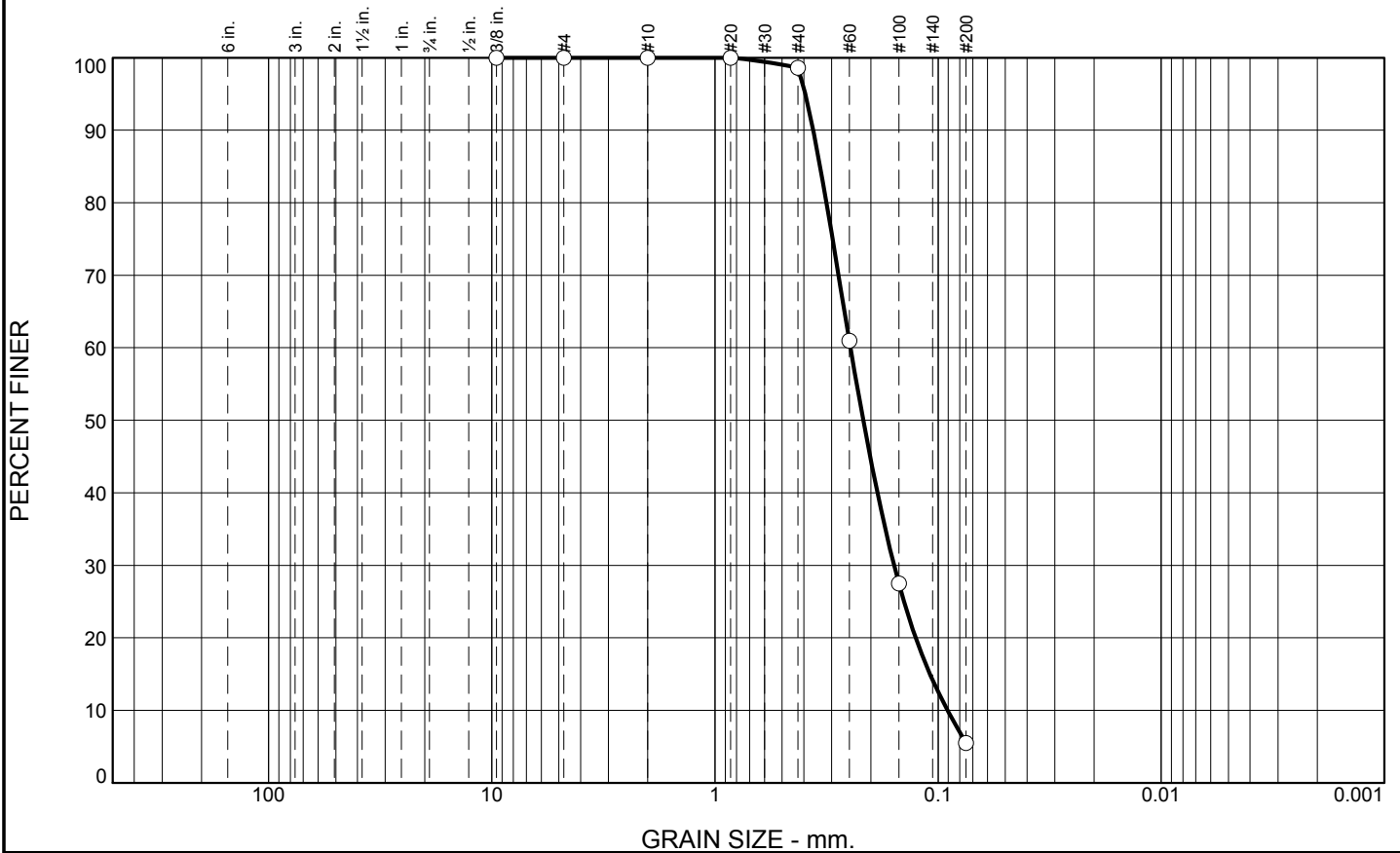
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.4	93.1	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.6		
#60	61.0		
#100	27.5		
#200	5.5		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3628 D₈₅= 0.3377 D₆₀= 0.2469
D₅₀= 0.2164 D₃₀= 0.1576 D₁₅= 0.1088
D₁₀= 0.0907 C_u= 2.72 C_c= 1.11

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-22-10C
Sample Number: TE Lab ID: 4489.07

Depth: 6.0 - 11.0 (ft.)

Date: 5/28/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

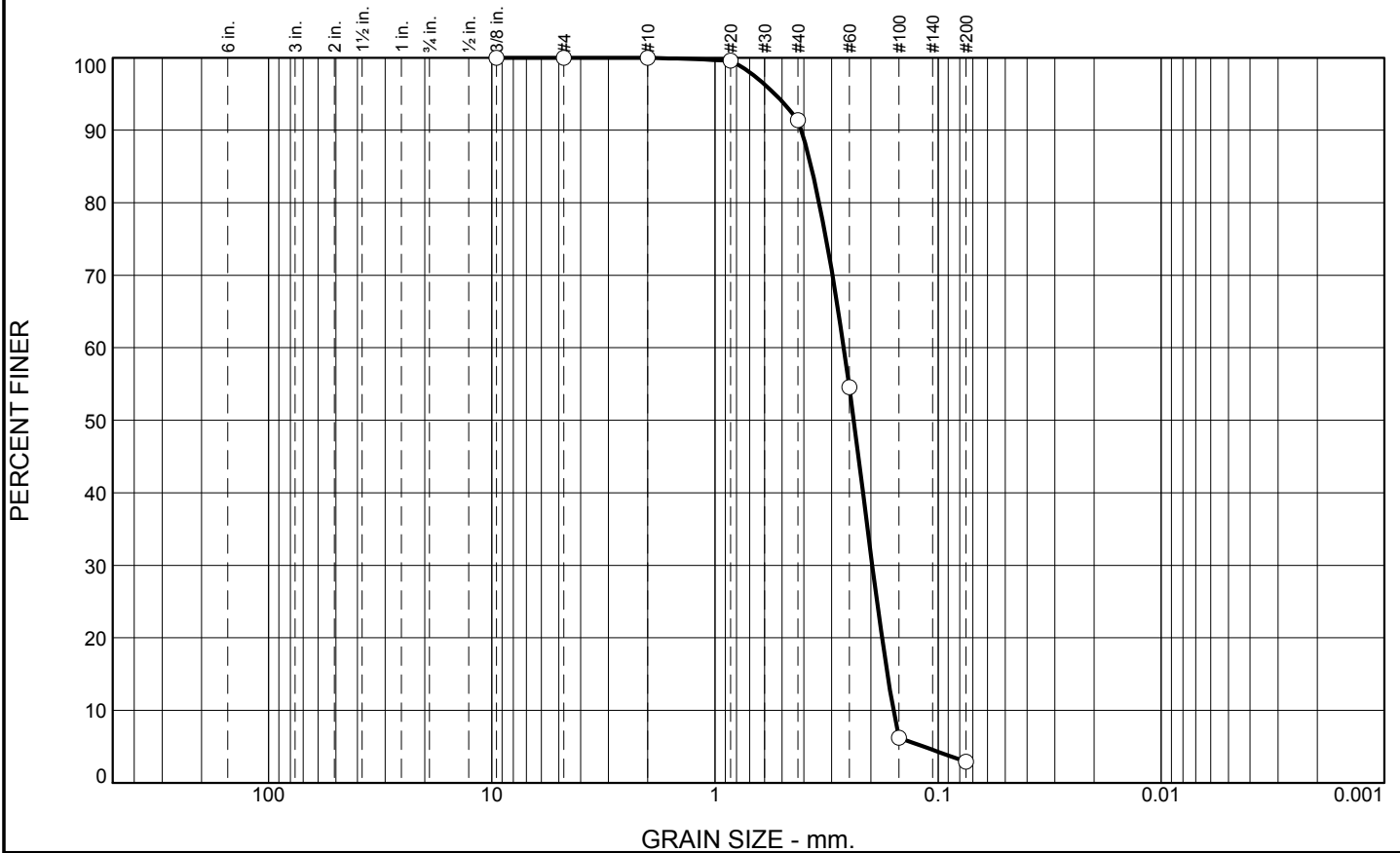
Checked By: R.Byrd

Boring Designation BI-CI-23-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-23-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -10.4 Ft.		STARTED 08-21-10
8. TOTAL DEPTH OF BORING 11.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 08-21-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.4	0.0				
				A	Classification: SP Color: 5Y 6/2-light olive gray D50: 0.2389 mm % Fines: 2.9
				B	Classification: SP Color: 2.5Y 6/1-gray D50: 0.2681 mm % Fines: 1.8
				C	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.2531 mm % Fines: 5.2
-21.9	11.5		<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	8.6	88.5	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.6		
#40	91.4		
#60	54.6		
#100	6.2		
#200	2.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4107 D₈₅= 0.3710 D₆₀= 0.2647
D₅₀= 0.2389 D₃₀= 0.1974 D₁₅= 0.1688
D₁₀= 0.1586 C_u= 1.67 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-23-10A
Sample Number: TE Lab ID: 4660.07

Depth: 0.0 - 4.0 (ft.)

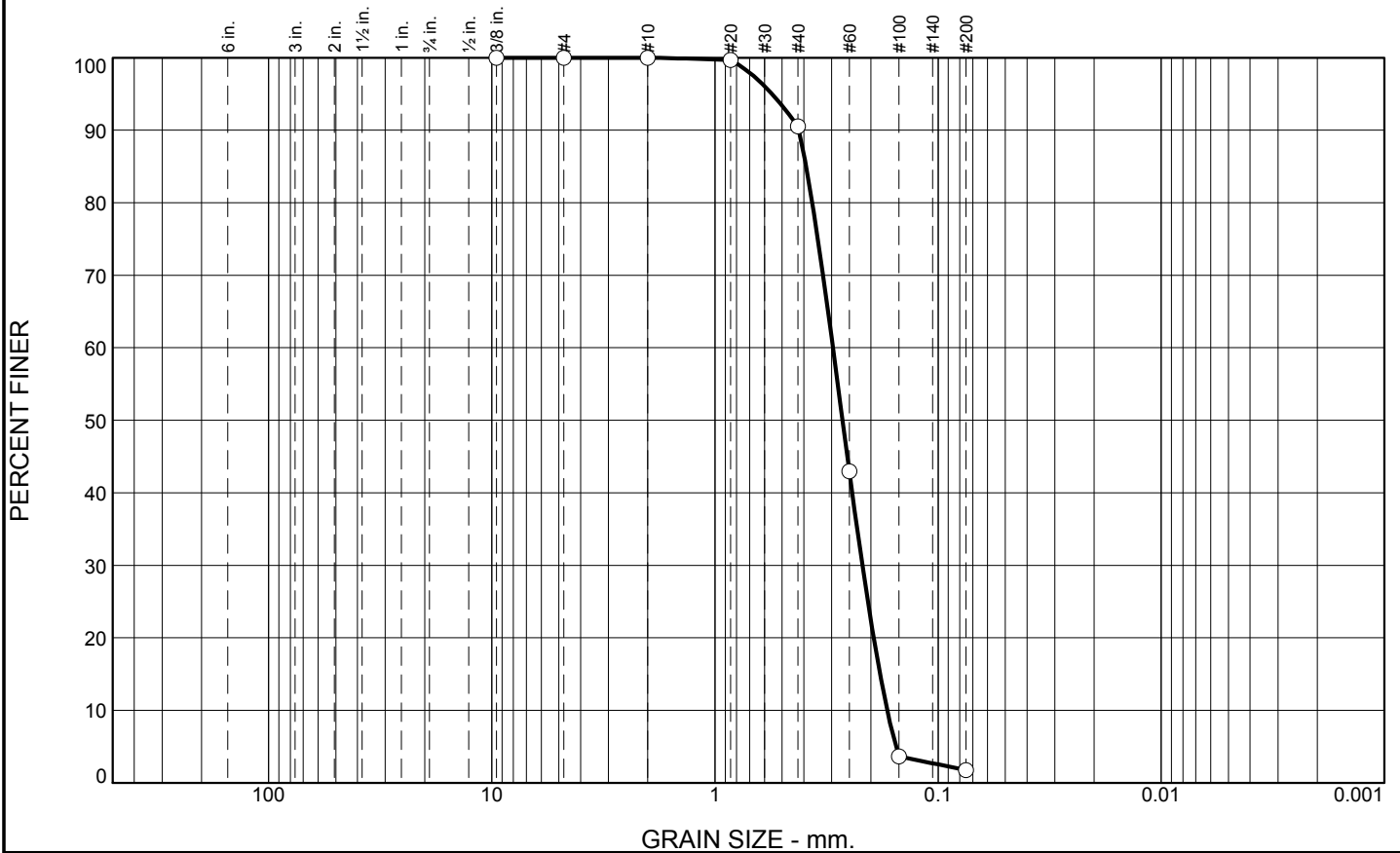
Date: 9/1/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	9.5	88.7	1.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	90.5		
#60	43.0		
#100	3.6		
#200	1.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4212 D₈₅= 0.3907 D₆₀= 0.2958
D₅₀= 0.2681 D₃₀= 0.2184 D₁₅= 0.1821
D₁₀= 0.1691 C_u= 1.75 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-23-10B
Sample Number: TE Lab ID: 4660.08

Depth: 4.0 - 8.0 (ft.)

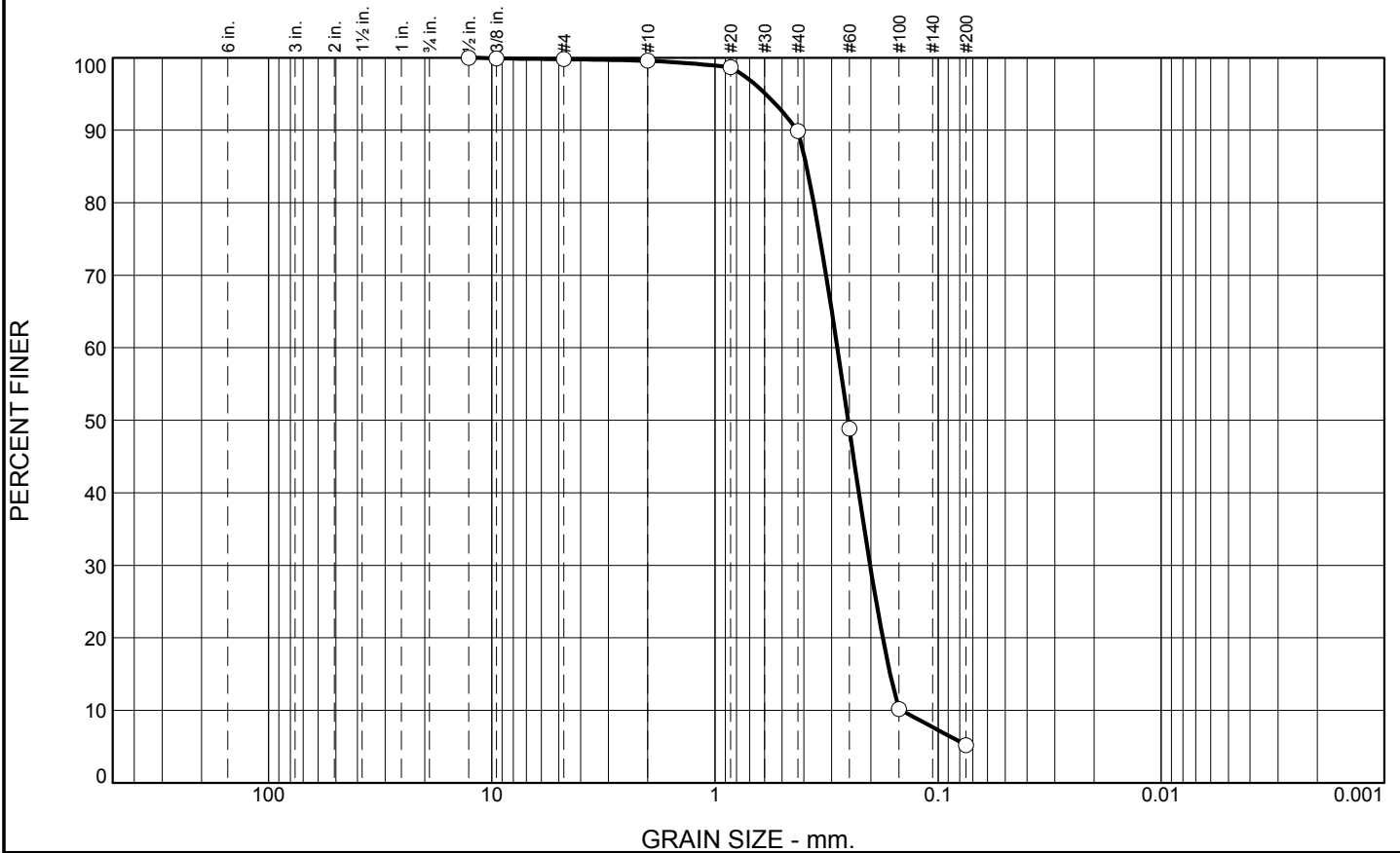
Date: 9/1/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.2	9.7	84.7	5.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.9		
#4	99.8		
#10	99.6		
#20	98.7		
#40	89.9		
#60	48.9		
#100	10.2		
#200	5.2		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4276 D₈₅= 0.3892 D₆₀= 0.2828
D₅₀= 0.2531 D₃₀= 0.2018 D₁₅= 0.1641
D₁₀= 0.1461 C_u= 1.94 C_c= 0.99

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-23-10C **Depth:** 8.0 - 11.5 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.09

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

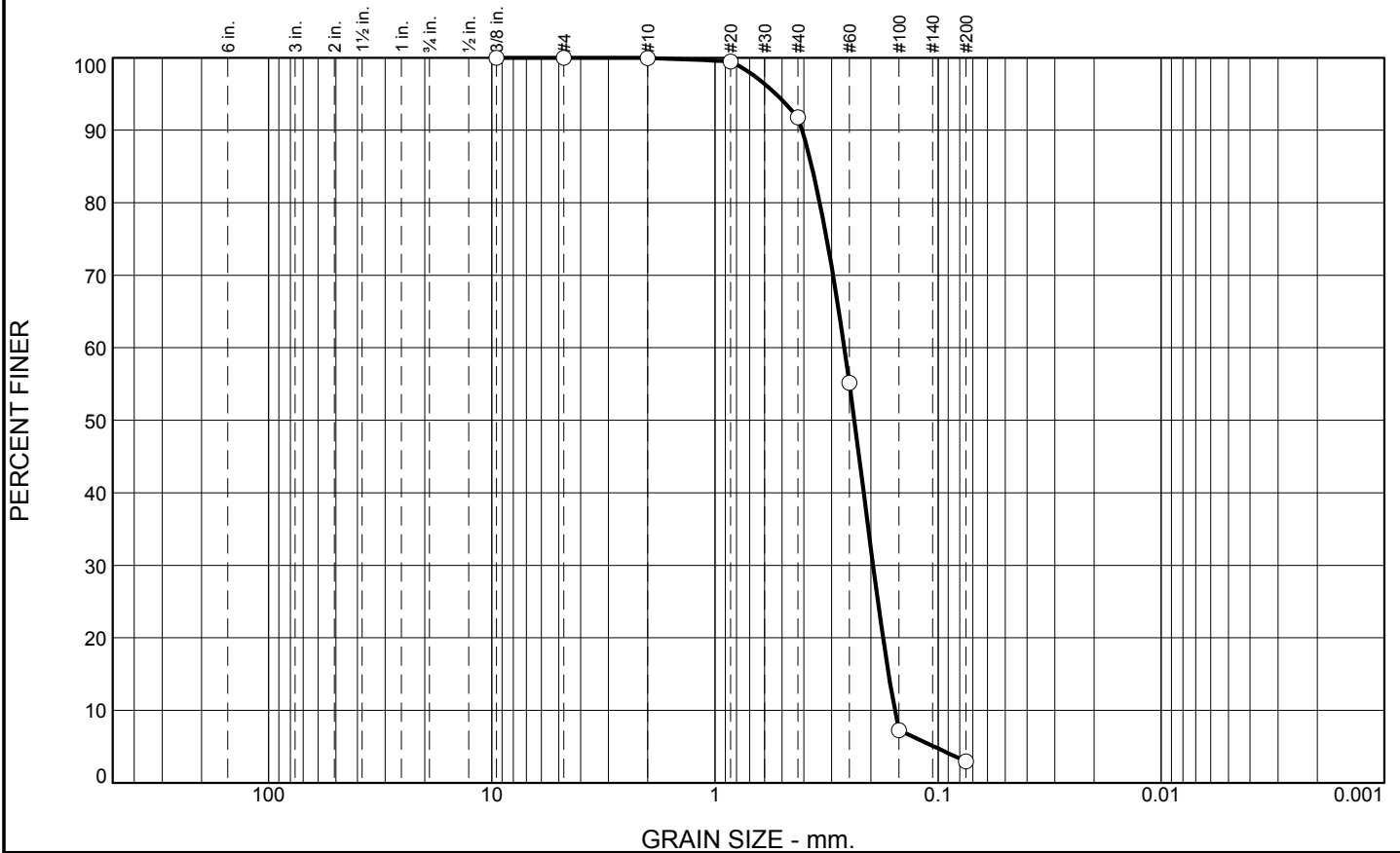
Tested By: G.Fancher **Checked By:** R.Byrd

Boring Designation BI-CI-24-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District		SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-24-10		LOCATION COORDINATES E = 908,974 N = 260,326		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.			12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A			14. WATER DEPTH 11.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING STARTED 08-21-10 COMPLETED 08-21-10		
8. TOTAL DEPTH OF BORING 13.0 Ft.			16. ELEVATION TOP OF BORING -10.5 Ft.		
			17. TOTAL RECOVERY FOR BORING 100%		
			18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.5	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace of sea grass from 0-2 ft., lt. gray and gray (SP)	A	Classification: SP Color: 5Y 6/2-light olive gray D50: 0.2373 mm % Fines: 2.9
		•••••		B	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2849 mm % Fines: 1.8
		•••••		C	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1913 mm % Fines: 9.3
-22.5	12.0				
-23.5	13.0	|||||	SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace shell fragments, dark gray (SM)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	8.2	88.9	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.5		
#40	91.8		
#60	55.2		
#100	7.3		
#200	2.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4072 D₈₅= 0.3682 D₆₀= 0.2630
D₅₀= 0.2373 D₃₀= 0.1957 D₁₅= 0.1668
D₁₀= 0.1563 C_u= 1.68 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-24-10A
Sample Number: TE Lab ID: 4660.10

Depth: 0.0 - 4.0 (ft.)

Date: 9/1/10

Thompson Engineering

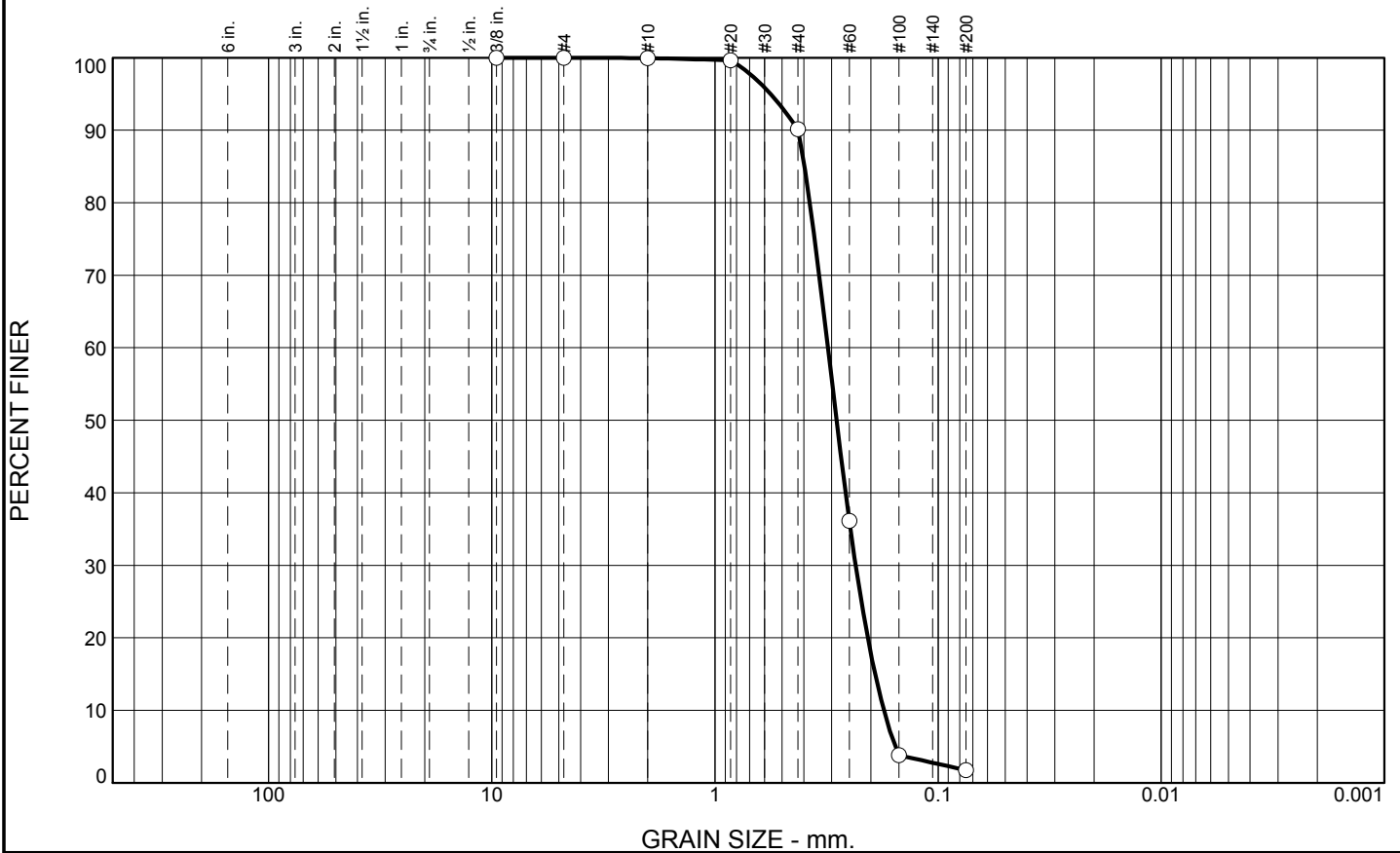
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	9.7	88.4	1.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.6		
#40	90.2		
#60	36.1		
#100	3.8		
#200	1.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4241 D₈₅= 0.3976 D₆₀= 0.3114
D₅₀= 0.2849 D₃₀= 0.2341 D₁₅= 0.1917
D₁₀= 0.1751 C_u= 1.78 C_c= 1.01

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-24-10B
Sample Number: TE Lab ID: 4660.11

Depth: 4.0 - 8.0 (ft.)

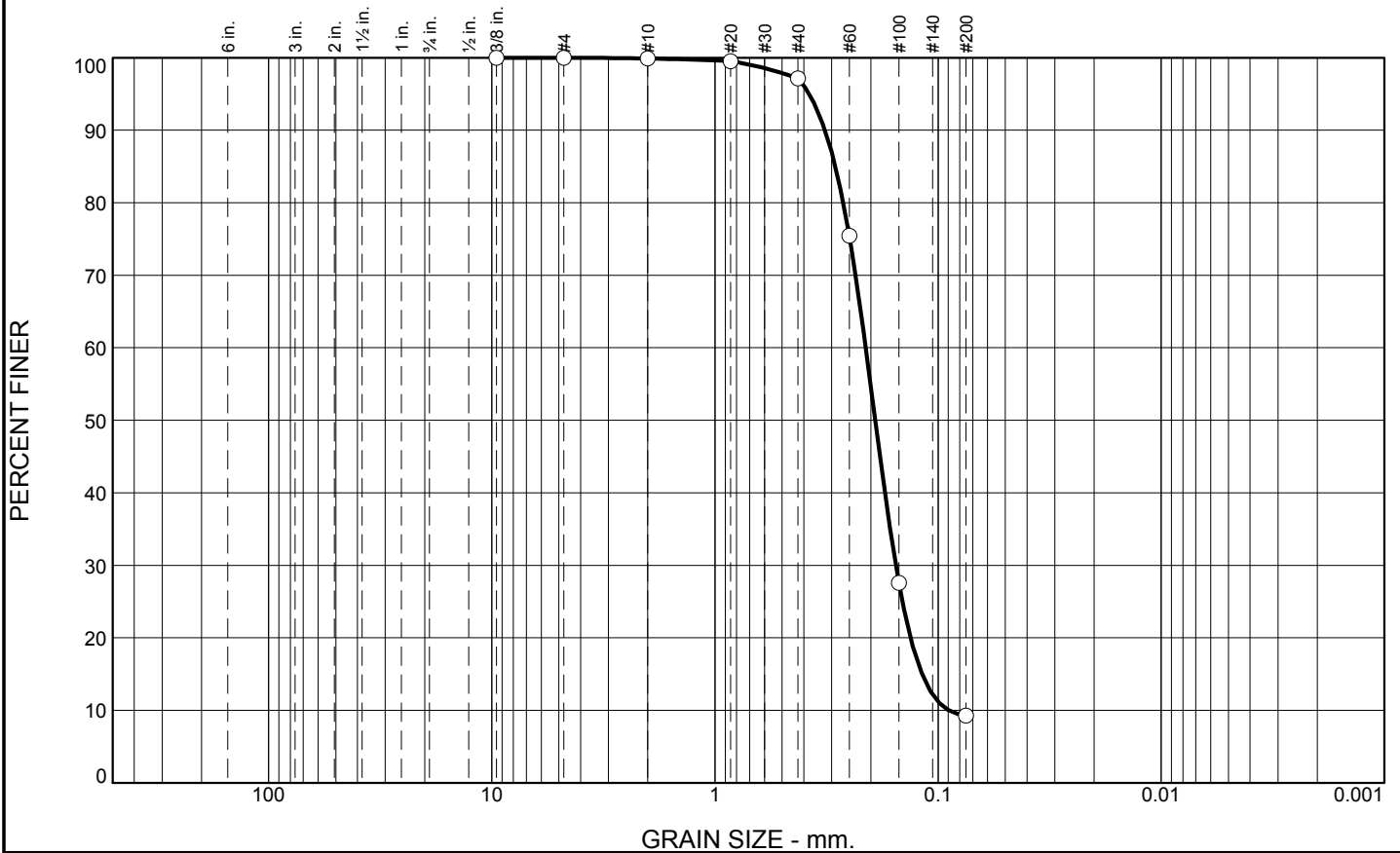
Date: 9/01/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.8	87.8	9.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.5		
#40	97.1		
#60	75.5		
#100	27.6		
#200	9.3		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3212 D₈₅= 0.2886 D₆₀= 0.2111
D₅₀= 0.1913 D₃₀= 0.1548 D₁₅= 0.1180
D₁₀= 0.0897 C_u= 2.35 C_c= 1.26

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-24-10C
Sample Number: TE Lab ID: 4660.12

Depth: 8.0 - 11.8 (ft.)

Date: 9/1/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

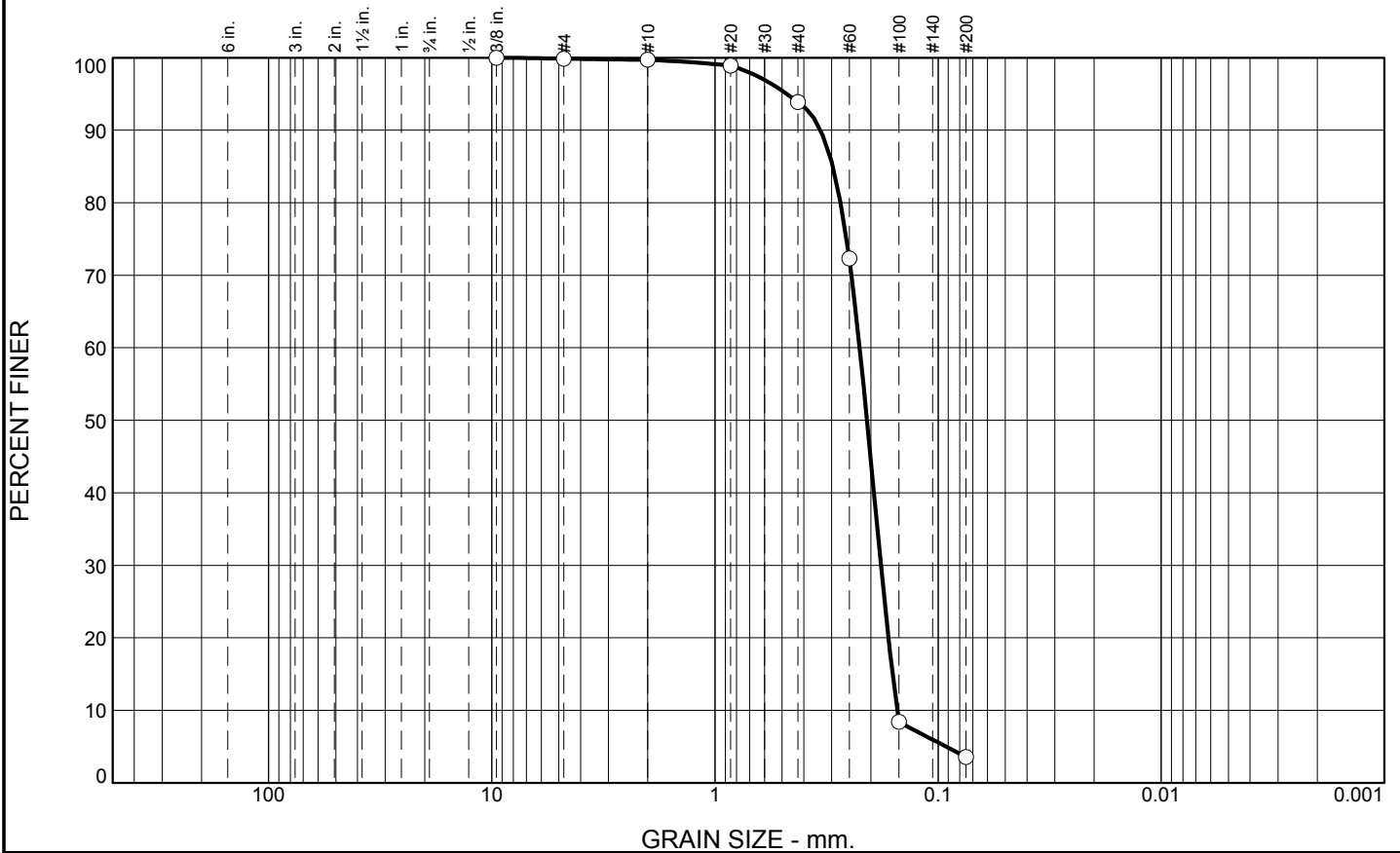
Checked By: R.Byrd

Boring Designation BI-CI-25-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-25-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 08-21-10
8. TOTAL DEPTH OF BORING 13.0 Ft.		16. ELEVATION TOP OF BORING -12.2 Ft.		COMPLETED 08-21-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.2	0.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, little shell fragments (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2084 mm % Fines: 3.6
				B	Classification: SP Color: 5Y 6/2-light olive gray D50: 0.2002 mm % Fines: 2.9
				C	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.1789 mm % Fines: 4.9
-24.6	12.4		SAND, clayey, mostly fine-grained sand-sized quartz, some clay, trace shell fragments, dark gray (SC)	NS	
-25.2	13.0				
			NOTES:		
			1. Soils are field visually classified in accordance with the Unified Soils Classification System.		
			2. NS = Sample not submitted for laboratory analysis from this interval.		
			3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	5.8	90.3	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	98.9		
#40	93.9		
#60	72.3		
#100	8.4		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3362 D₈₅= 0.2964 D₆₀= 0.2246
D₅₀= 0.2084 D₃₀= 0.1804 D₁₅= 0.1600
D₁₀= 0.1526 C_u= 1.47 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

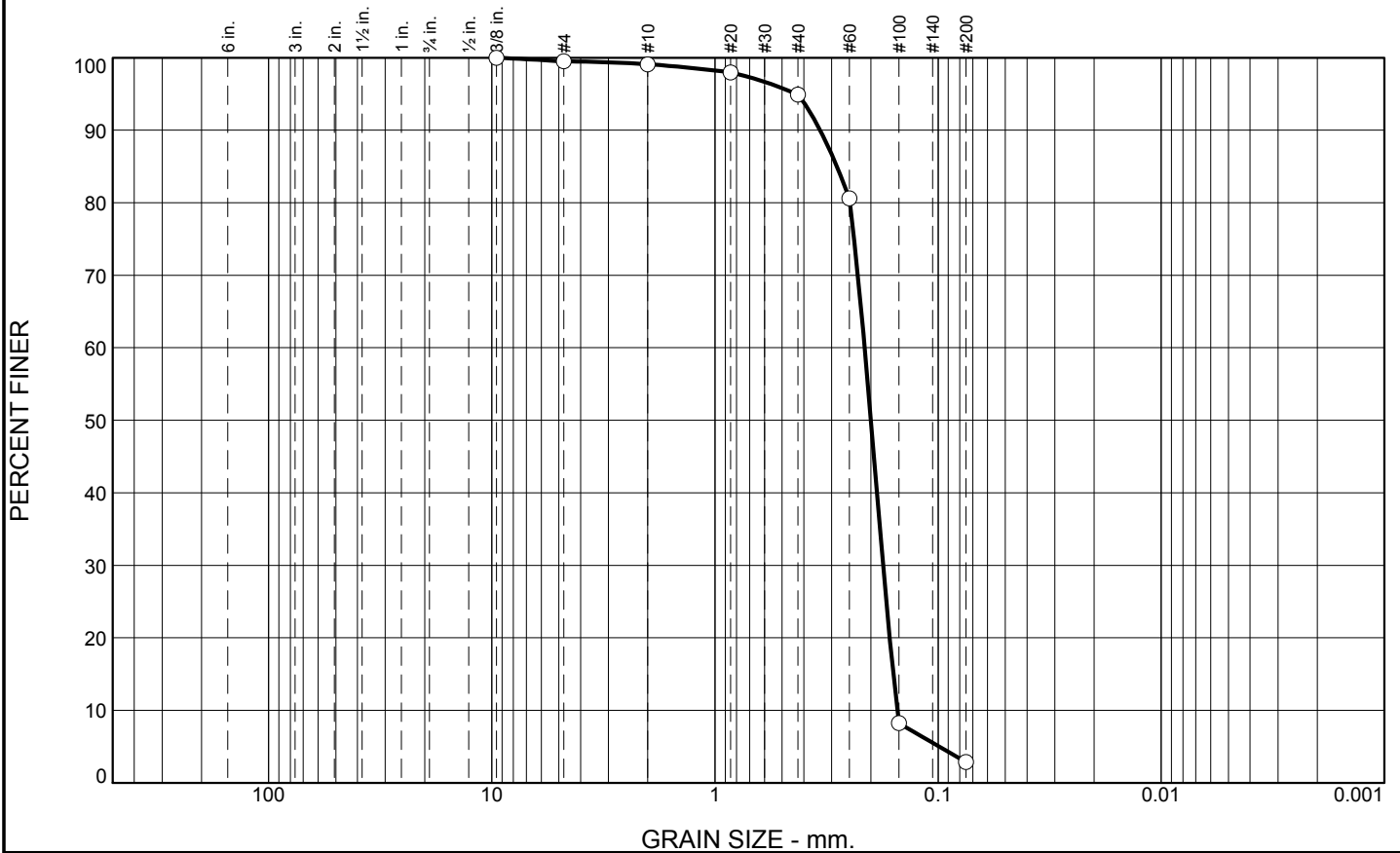
* (no specification provided)

Location: USACE Sample # BI-CI-25-10A **Depth:** 0.0 - 4.0 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.04

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.4	4.2	92.0	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.5		
#10	99.1		
#20	98.0		
#40	94.9		
#60	80.6		
#100	8.2		
#200	2.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3379 D₈₅= 0.2841 D₆₀= 0.2134
D₅₀= 0.2002 D₃₀= 0.1765 D₁₅= 0.1588
D₁₀= 0.1524 C_u= 1.40 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

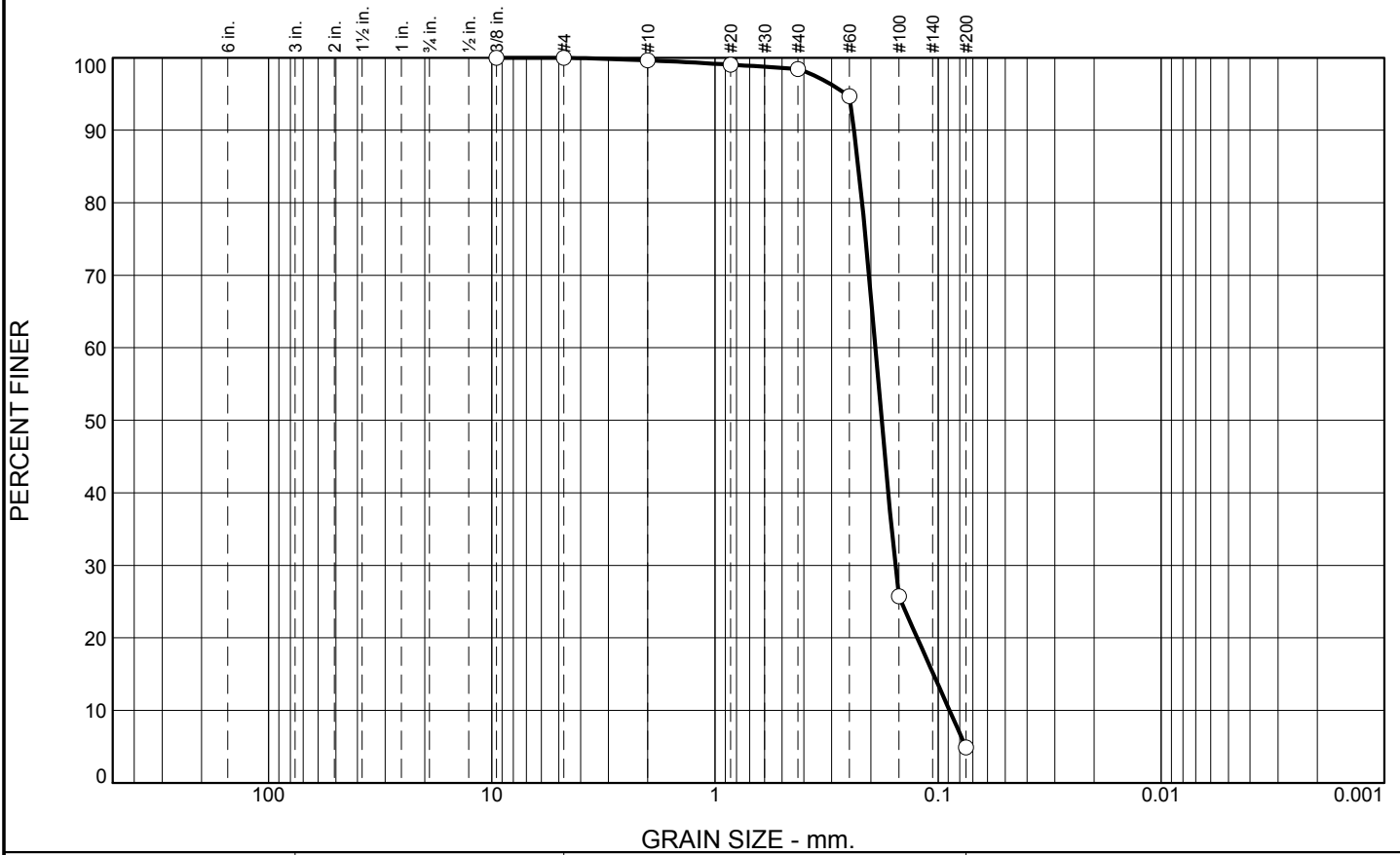
* (no specification provided)

Location: USACE Sample # BI-CI-25-10B **Depth:** 4.0 - 8.0 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.05

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
----------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	1.2	93.5	4.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.6		
#20	99.0		
#40	98.4		
#60	94.7		
#100	25.7		
#200	4.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2380 D₈₅= 0.2278 D₆₀= 0.1910
D₅₀= 0.1789 D₃₀= 0.1554 D₁₅= 0.1050
D₁₀= 0.0889 C_u= 2.15 C_c= 1.42

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-25-10C
Sample Number: TE Lab ID: 4660.06

Depth: 8.0 - 12.4 (ft.)

Date: 9/1/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

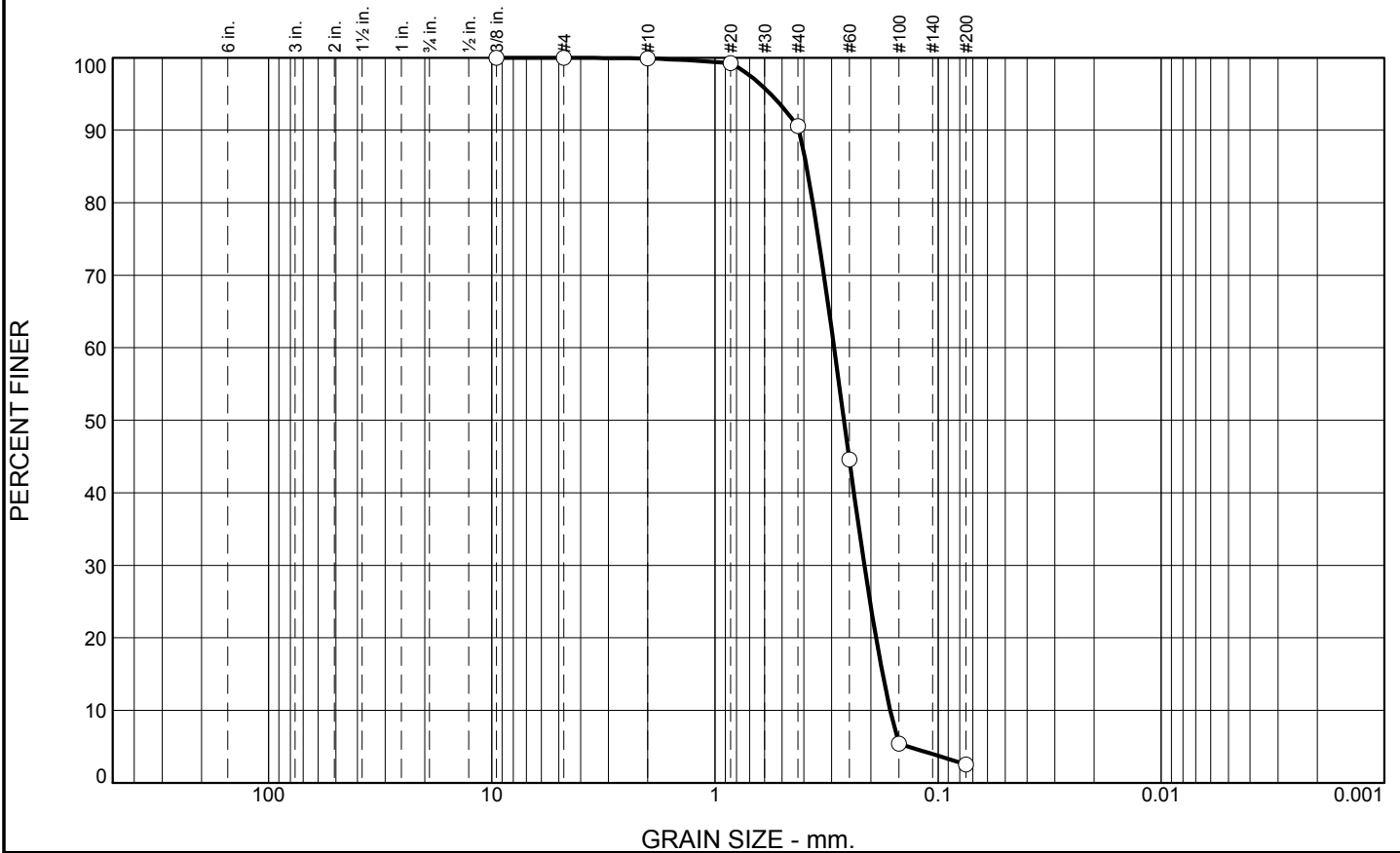
Checked By: R.Byrd

Boring Designation BI-CI-26-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-26-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 08-21-10
8. TOTAL DEPTH OF BORING 11.8 Ft.		16. ELEVATION TOP OF BORING -11.6 Ft.		COMPLETED 08-21-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.6	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace silt, w/ traces of dark gray lenses of silt, lt. gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2642 mm % Fines: 2.5
		•••••		B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2753 mm % Fines: 2.6
		•••••		C	Classification: SP Color: 2.5Y 6/1-gray D50: 0.275 mm % Fines: 3.2
-23.4	11.8		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	9.3	88.1	2.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.3		
#40	90.6		
#60	44.6		
#100	5.4		
#200	2.5		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4207 D₈₅= 0.3892 D₆₀= 0.2923
D₅₀= 0.2642 D₃₀= 0.2140 D₁₅= 0.1773
D₁₀= 0.1640 C_u= 1.78 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-26-10A
Sample Number: TE Lab ID: 4660.13

Depth: 0.0 - 4.0 (ft.)

Date: 9/1/10

Thompson Engineering

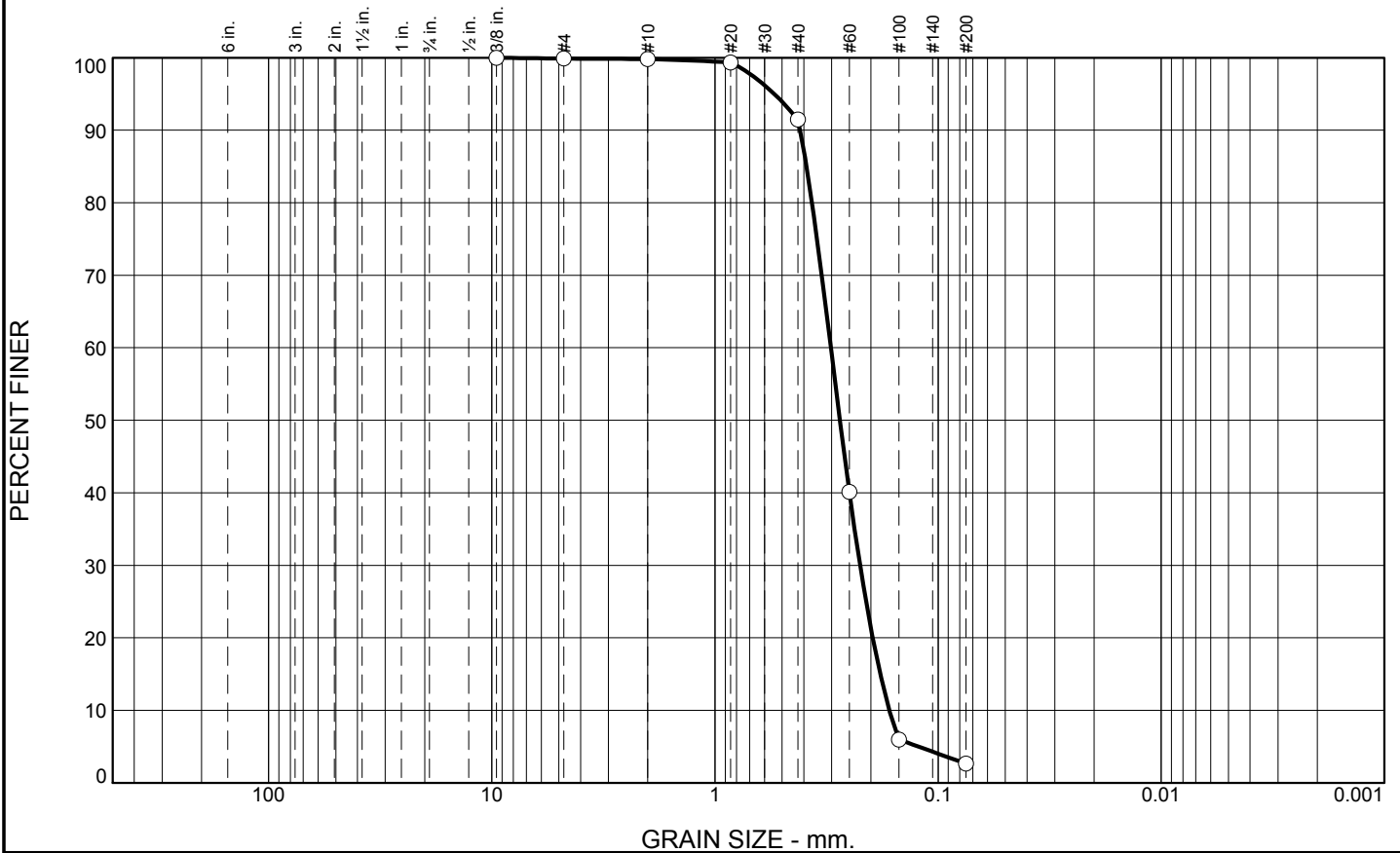
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	8.3	88.9	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.8		
#20	99.3		
#40	91.5		
#60	40.1		
#100	6.0		
#200	2.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4156 D₈₅= 0.3891 D₆₀= 0.3022
D₅₀= 0.2753 D₃₀= 0.2237 D₁₅= 0.1817
D₁₀= 0.1654 C_u= 1.83 C_c= 1.00

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

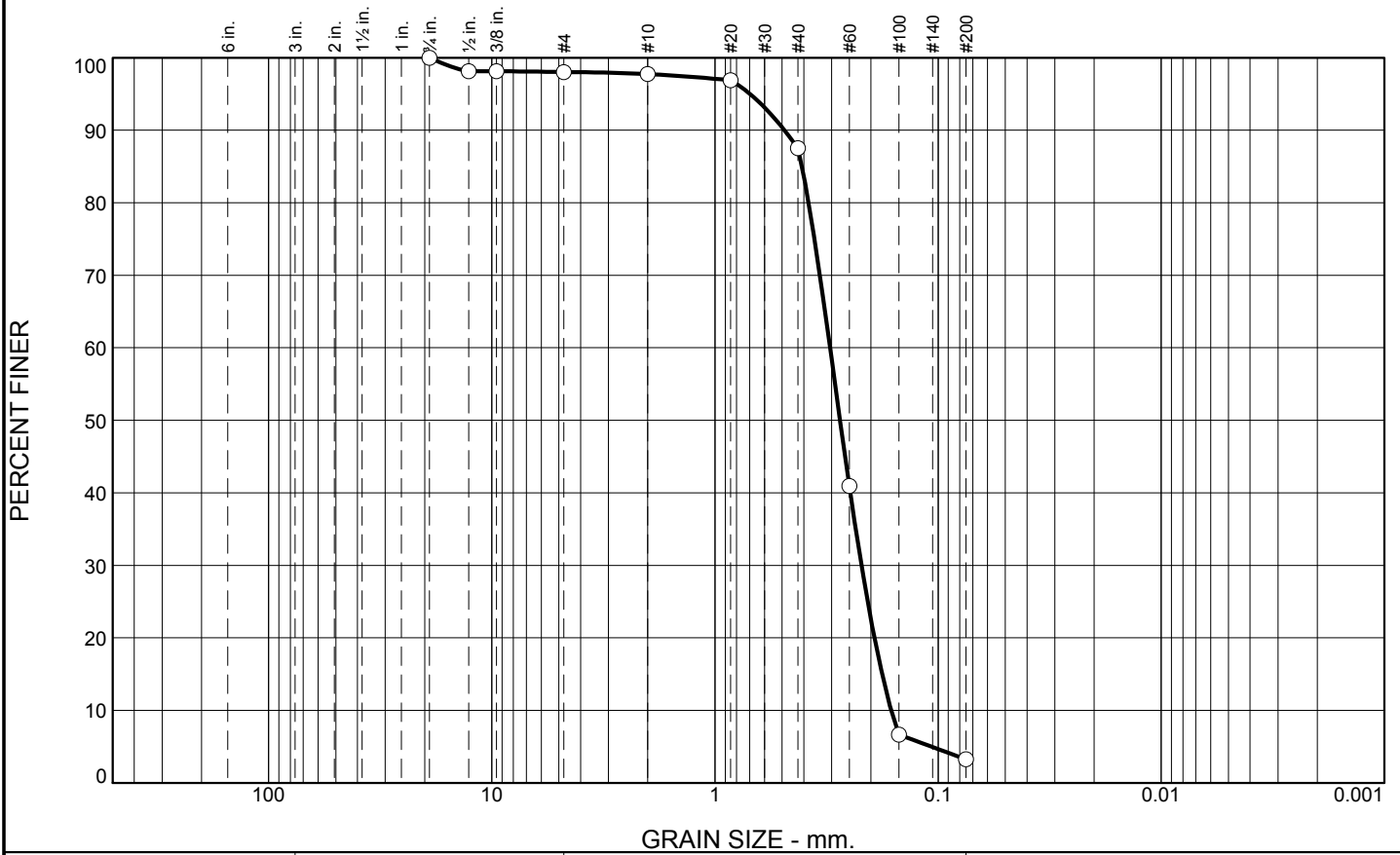
* (no specification provided)

Location: USACE Sample # BI-CI-26-10B **Depth:** 4.0 - 8.0 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.14

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	0.3	10.2	84.3	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.750	100.0		
.500	98.1		
.375	98.1		
#4	98.0		
#10	97.7		
#20	96.9		
#40	87.5		
#60	40.9		
#100	6.7		
#200	3.2		

Material Description

SAND, (SP), medium to fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4879 D₈₅= 0.4082 D₆₀= 0.3047
D₅₀= 0.2750 D₃₀= 0.2204 D₁₅= 0.1783
D₁₀= 0.1623 C_u= 1.88 C_c= 0.98

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-26-10C
Sample Number: TE Lab ID: 4660.15

Depth: 8.0 - 11.8 (ft.)

Date: 9/1/10

<p style="font-size: 1.2em; margin: 0;">Thompson Engineering</p> <p style="font-size: 1.2em; margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

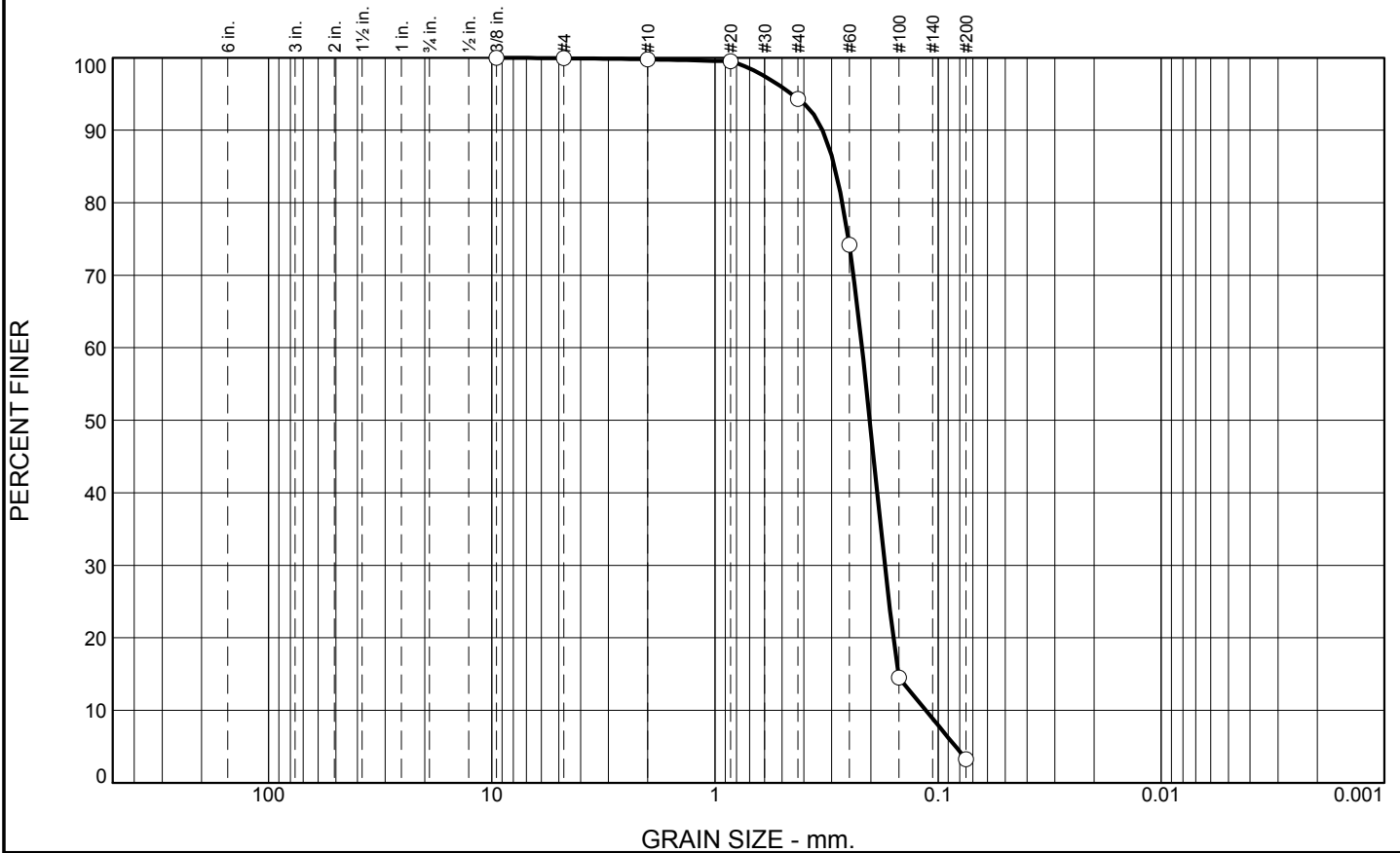
Checked By: R.Byrd

Boring Designation BI-CI-27-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-27-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 08-22-10 COMPLETED 08-22-10
8. TOTAL DEPTH OF BORING 8.3 Ft.		16. ELEVATION TOP OF BORING -11.3 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.3	0.0				
		[Dotted Pattern]	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, trace of silt 5 - 6 ft. (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2025 mm % Fines: 3.3
				B	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.1844 mm % Fines: 6.2
-19.6	8.3				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	5.5	91.0	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.8		
#20	99.5		
#40	94.3		
#60	74.2		
#100	14.5		
#200	3.3		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3293 D₈₅= 0.2910 D₆₀= 0.2193
D₅₀= 0.2025 D₃₀= 0.1732 D₁₅= 0.1508
D₁₀= 0.1135 C_u= 1.93 C_c= 1.21

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-27-10A
Sample Number: TE Lab ID: 4660.24

Depth: 0.0 - 4.0 (ft.)

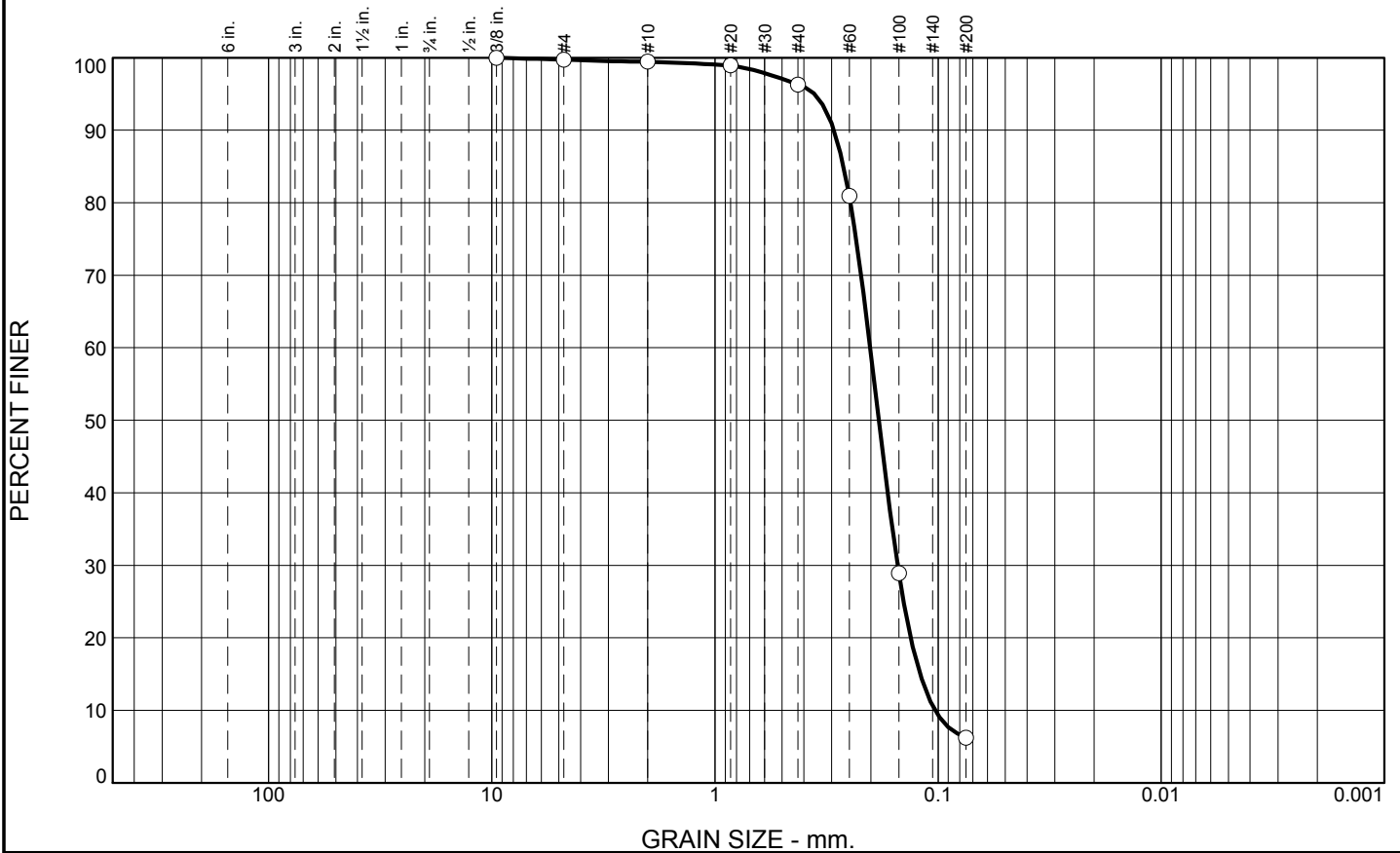
Date: 9/1/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.</p>
------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.3	3.1	90.1	6.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.4		
#20	99.0		
#40	96.3		
#60	80.9		
#100	28.9		
#200	6.2		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2929 D₈₅= 0.2652 D₆₀= 0.2016
D₅₀= 0.1844 D₃₀= 0.1519 D₁₅= 0.1203
D₁₀= 0.1032 C_u= 1.95 C_c= 1.11

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-27-10B
Sample Number: TE Lab ID: 4660.25

Depth: 4.0 - 8.3 (ft.)

Date: 9/1/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

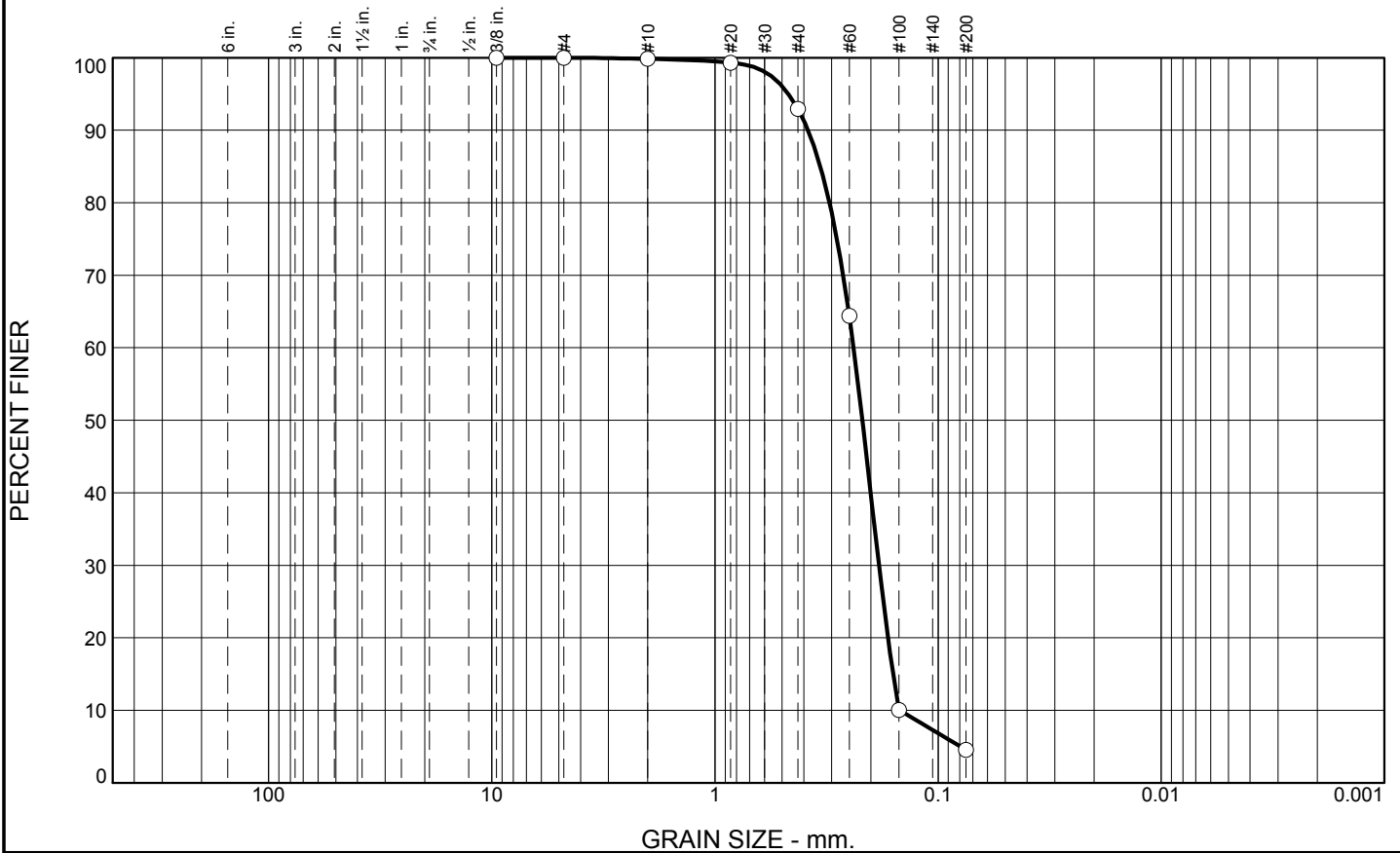
Checked By: R.Byrd

Boring Designation BI-CI-28-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-28-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 08-22-10		
8. TOTAL DEPTH OF BORING 8.3 Ft.		16. ELEVATION TOP OF BORING -10.6 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.6	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, trace of sea grass, dark gray (SP)	A	Classification: SP Color: 5Y 5/1-gray D50: 0.2185 mm % Fines: 4.6
-14.6	4.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	B	Classification: SP-SM Color: 2.5Y 6/1-gray D50: 0.185 mm % Fines: 5.5
-18.9	8.3		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	6.9	88.3	4.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.3		
#40	92.9		
#60	64.4		
#100	10.1		
#200	4.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3830 D₈₅= 0.3369 D₆₀= 0.2393
D₅₀= 0.2185 D₃₀= 0.1840 D₁₅= 0.1592
D₁₀= 0.1488 C_u= 1.61 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-28-10A
Sample Number: TE Lab ID: 4660.20

Depth: 0.0 - 4.0 (ft.)

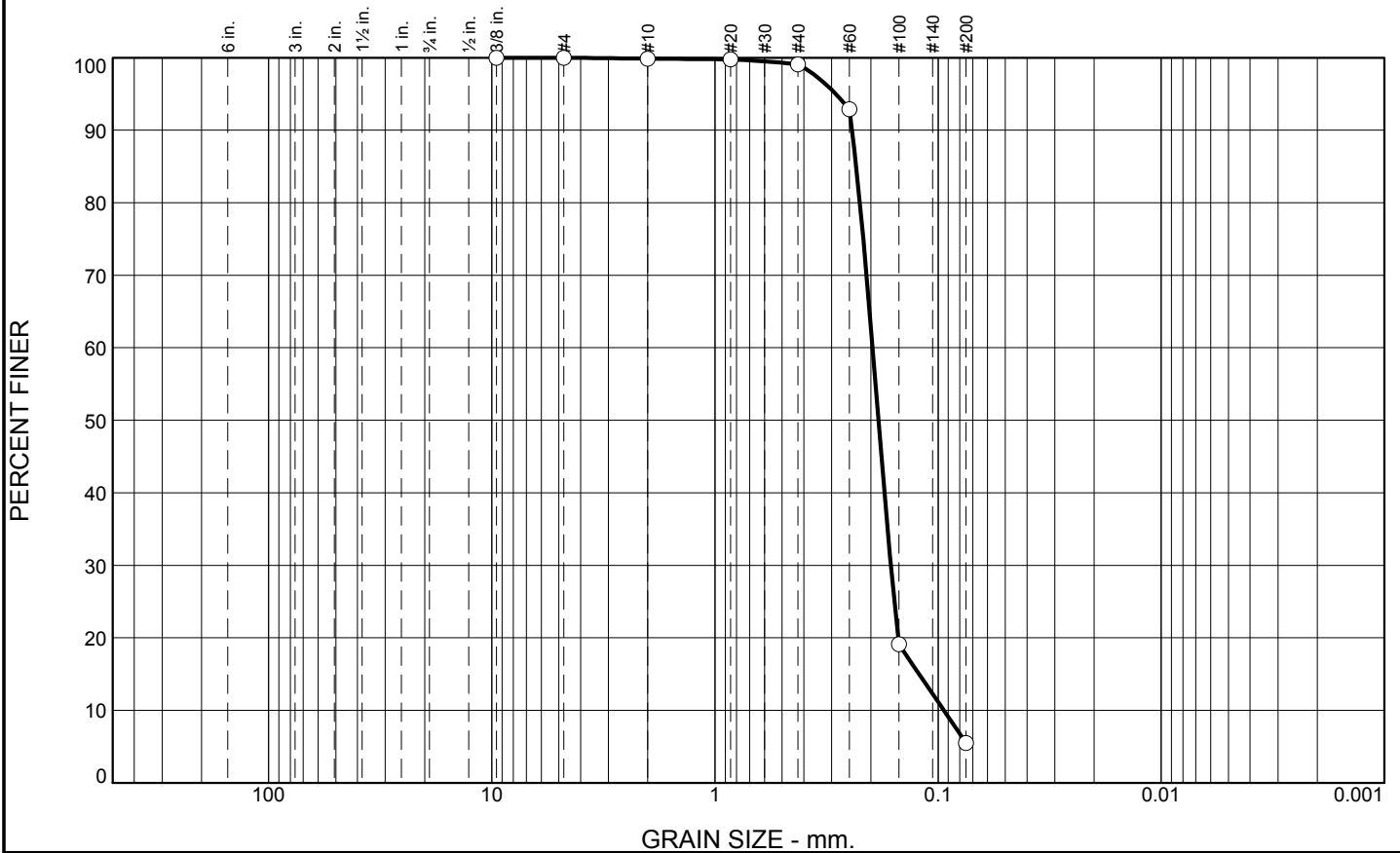
Date: 9/1/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.8	93.6	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.1		
#60	92.9		
#100	19.1		
#200	5.5		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2429 D₈₅= 0.2327 D₆₀= 0.1967
D₅₀= 0.1850 D₃₀= 0.1629 D₁₅= 0.1216
D₁₀= 0.0943 C_u= 2.08 C_c= 1.43

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-28-10B
Sample Number: TE Lab ID: 4660.21

Depth: 4.0 - 8.3 (ft.)

Date: 9/1/10

Thompson Engineering

Mobile, Alabama


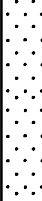
Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

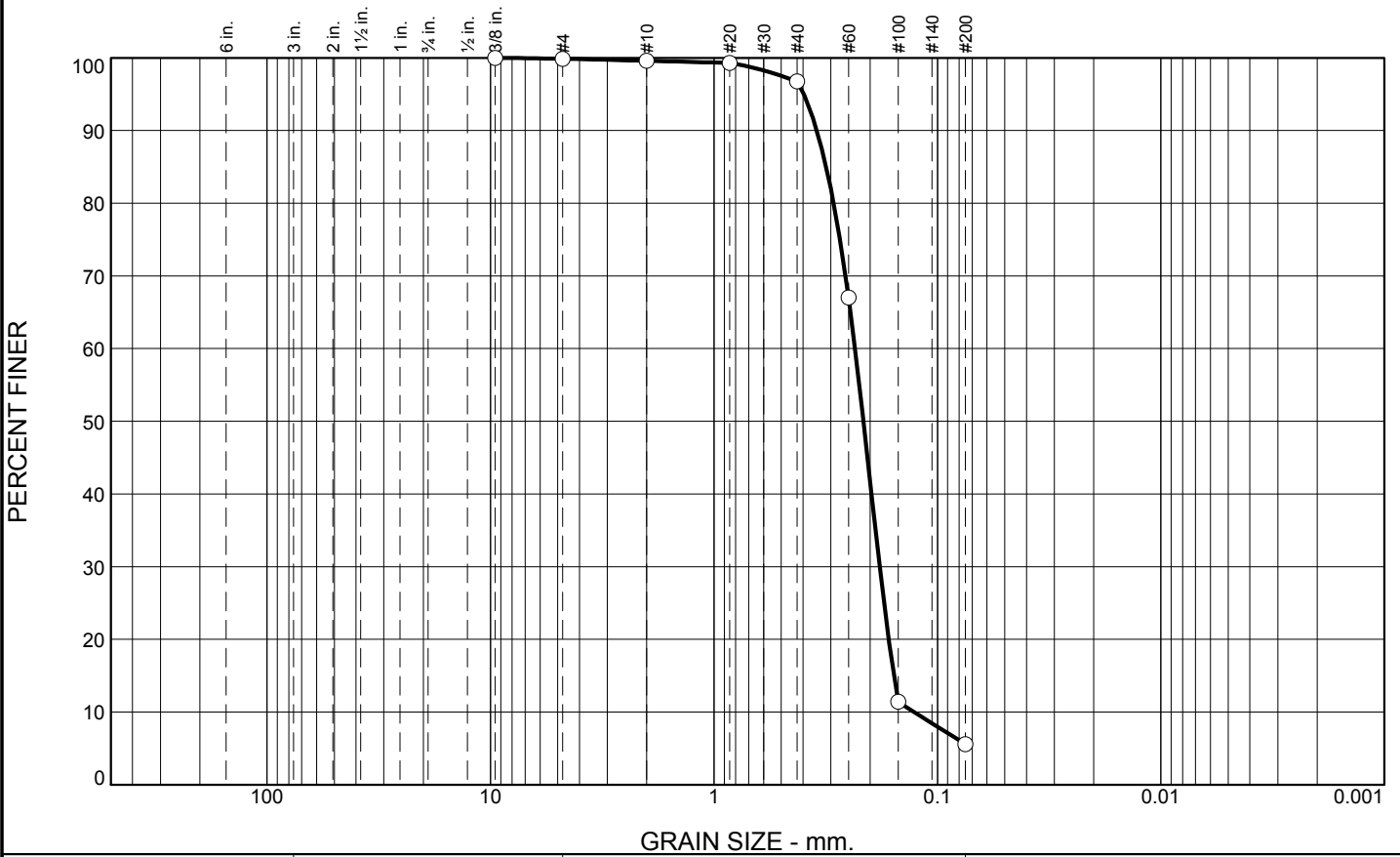
Checked By: R.Byrd

Boring Designation BI-CI-29-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-29-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 08-22-10
8. TOTAL DEPTH OF BORING 6.7 Ft.		16. ELEVATION TOP OF BORING -12.1 Ft.		COMPLETED 08-22-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.1	0.0				
-14.1	2.0		SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace shell fragments, dark gray and gray (SM)	A	Classification: SP-SM Color: 5Y 5/2-olive gray D50: 0.2145 mm % Fines: 5.6
-18.8	6.7		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt (SP)	B	Classification: SP Color: 5Y 5/2-olive gray D50: 0.191 mm % Fines: 4.2
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	2.8	91.2	5.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.6		
#20	99.3		
#40	96.8		
#60	67.0		
#100	11.4		
#200	5.6		

Material Description
SAND, (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3465 D₈₅= 0.3146 D₆₀= 0.2339
 D₅₀= 0.2145 D₃₀= 0.1813 D₁₅= 0.1567
 D₁₀= 0.1270 C_u= 1.84 C_c= 1.11

Classification
 USCS= SP-SM AASHTO=

Remarks
 CADD CODE = CH10D965

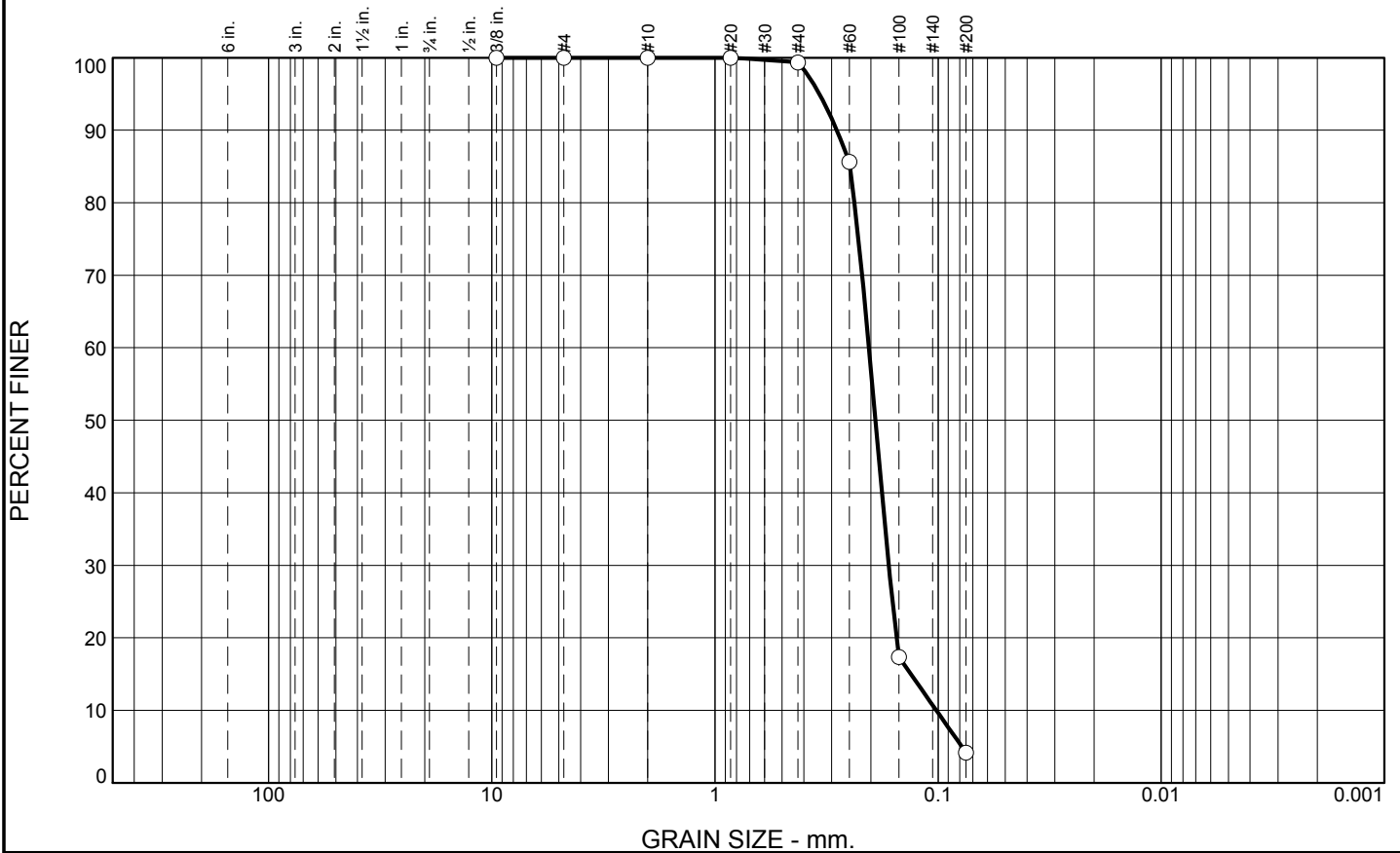
* (no specification provided)

Location: USACE Sample # BI-CI-29-10A **Depth:** 0.0 - 2.0 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.22

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.:</p>
------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	95.1	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.3		
#60	85.6		
#100	17.4		
#200	4.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2842 D₈₅= 0.2484 D₆₀= 0.2042
D₅₀= 0.1910 D₃₀= 0.1664 D₁₅= 0.1325
D₁₀= 0.1019 C_u= 2.00 C_c= 1.33

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-29-10B
Sample Number: TE Lab ID: 4660.23

Depth: 2.0 - 6.7 (ft.)

Date: 9/1/10




<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

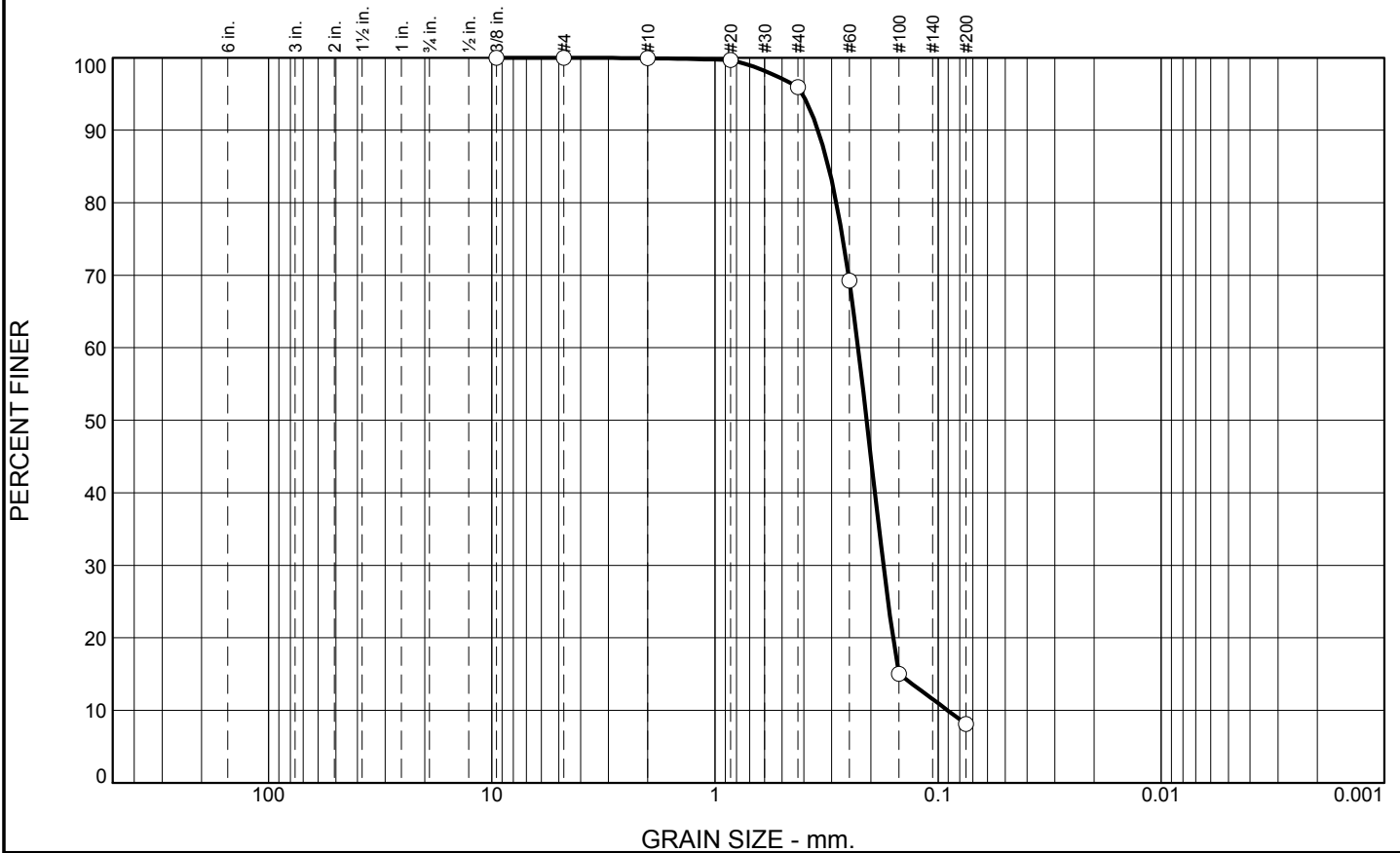
Checked By: R.Byrd

Boring Designation BI-CI-30-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-30-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 08-22-10
8. TOTAL DEPTH OF BORING 7.9 Ft.		16. ELEVATION TOP OF BORING -12.5 Ft.		COMPLETED 08-22-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.5	0.0				
-14.5	2.0		SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace shell fragments, dark gray and gray (SM)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.2091 mm % Fines: 8.1
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt (SP)	B	Classification: SP Color: 5Y 5/1-gray D50: 0.1971 mm % Fines: 3.8
-20.4	7.9			C	Classification: SP Color: 2.5Y 6/1-gray D50: 0.1858 mm % Fines: 3.6
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	4.0	87.8	8.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	95.9		
#60	69.3		
#100	15.0		
#200	8.1		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3453 D₈₅= 0.3101 D₆₀= 0.2283
D₅₀= 0.2091 D₃₀= 0.1758 D₁₅= 0.1496
D₁₀= 0.0907 C_u= 2.52 C_c= 1.49

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-30-10A
Sample Number: TE Lab ID: 4660.26

Depth: 0.0 - 2.0 (ft.)

Date: 9/1/10

Thompson Engineering

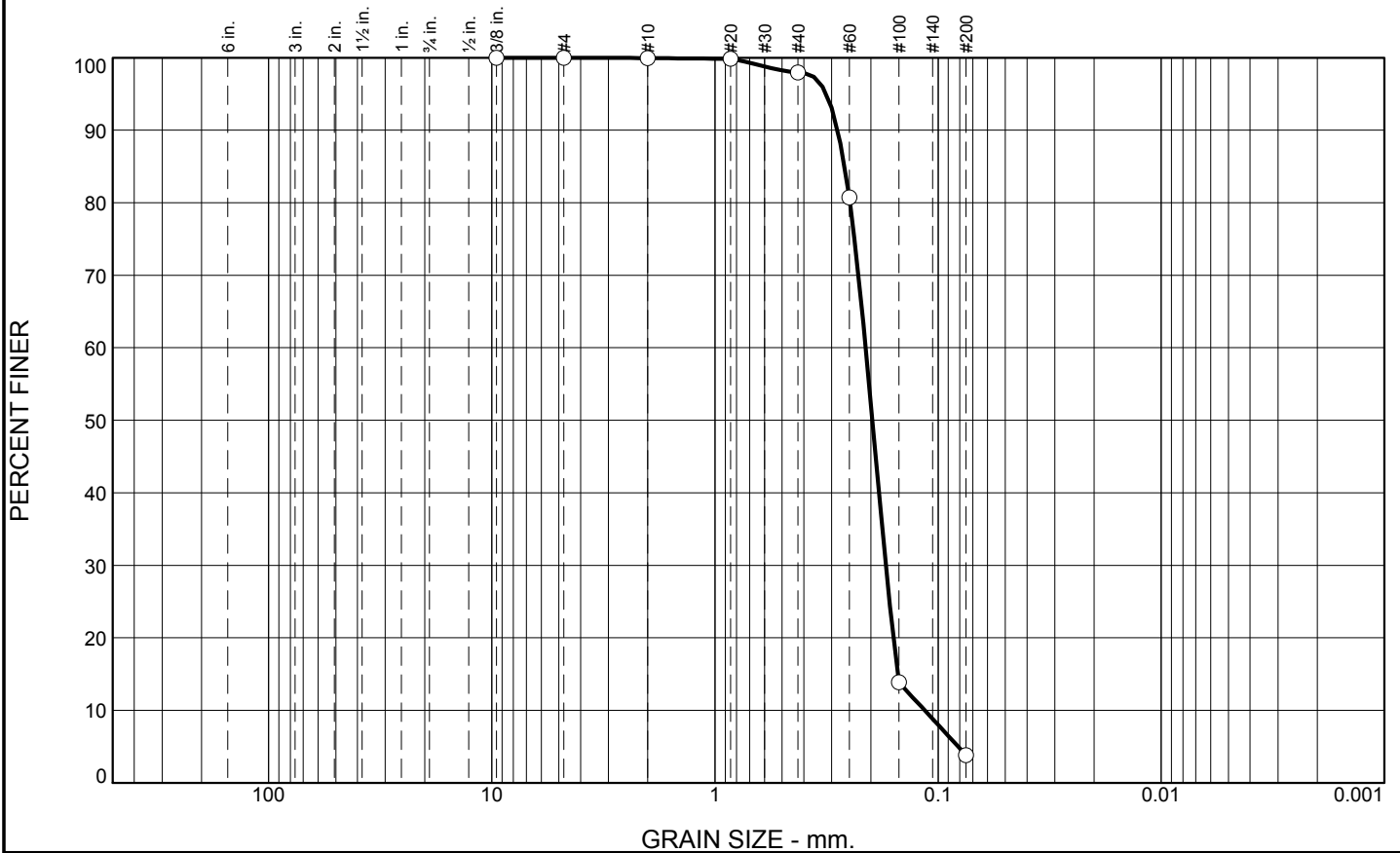
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.9	94.2	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	98.0		
#60	80.7		
#100	13.9		
#200	3.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2819 D₈₅= 0.2623 D₆₀= 0.2112
D₅₀= 0.1971 D₃₀= 0.1715 D₁₅= 0.1517
D₁₀= 0.1149 C_u= 1.84 C_c= 1.21

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-30-10B
Sample Number: TE Lab ID: 4660.27

Depth: 2.0 - 5.0 (ft.)

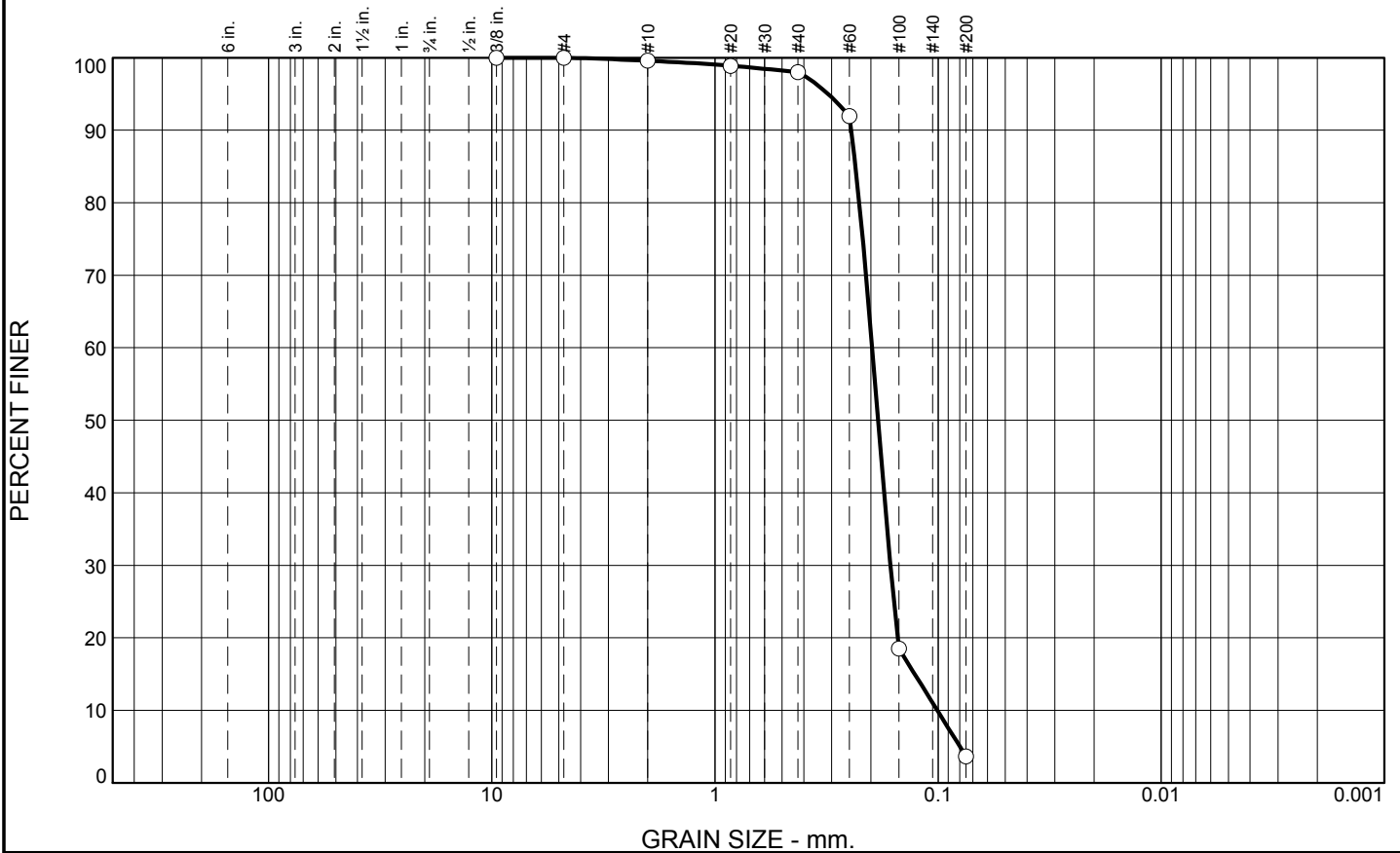
Date: 9/1/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	1.6	94.4	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.6		
#20	98.9		
#40	98.0		
#60	91.9		
#100	18.5		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2451 D₈₅= 0.2344 D₆₀= 0.1975
D₅₀= 0.1858 D₃₀= 0.1636 D₁₅= 0.1273
D₁₀= 0.1009 C_u= 1.96 C_c= 1.34

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-30-10C
Sample Number: TE Lab ID: 4660.28

Depth: 5.0 - 7.9 (ft.)

Date: 9/1/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

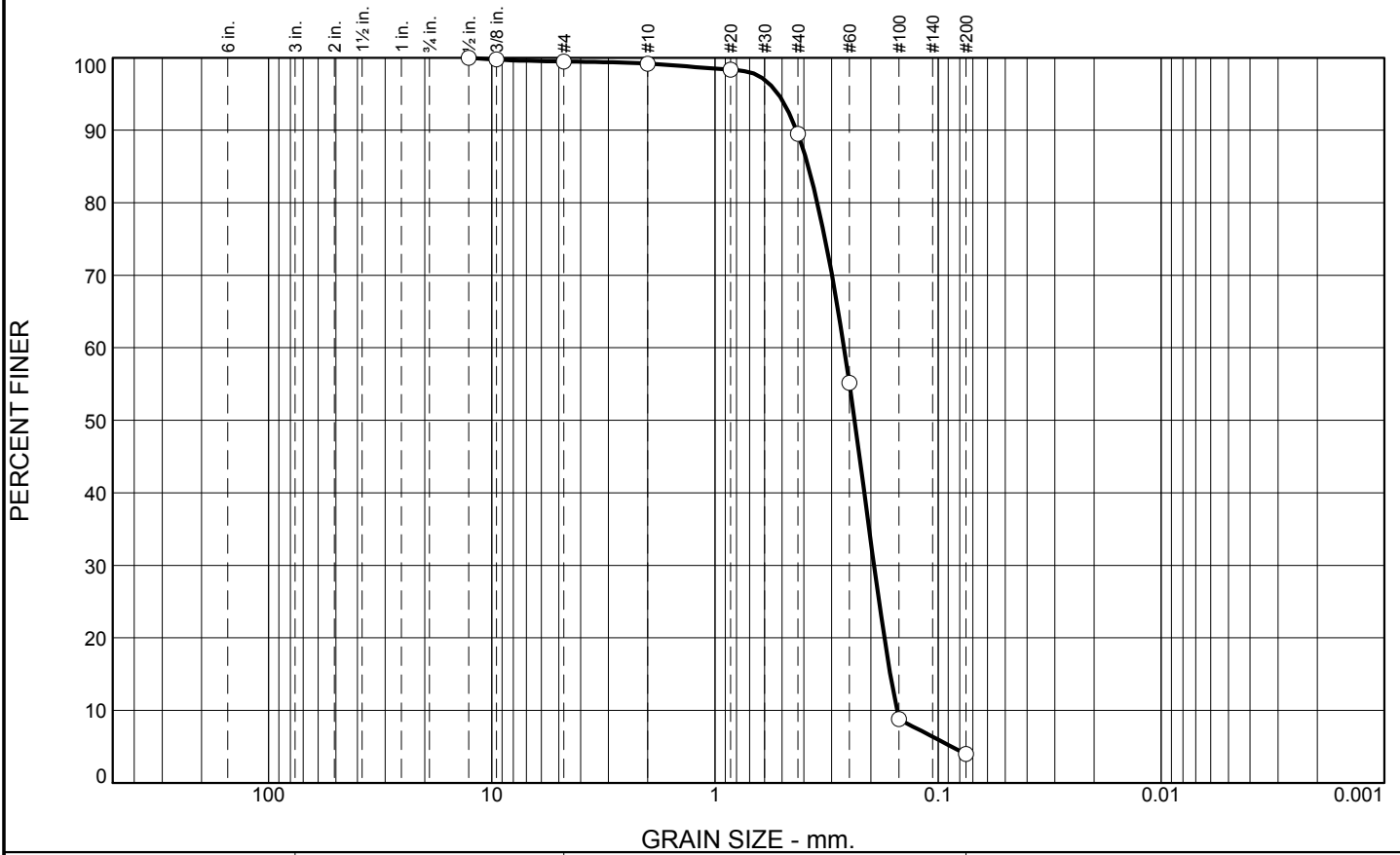
Checked By: R.Byrd

Boring Designation BI-CI-31-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-31-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13.3 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -12.6 Ft.		STARTED 08-22-10
8. TOTAL DEPTH OF BORING 7.3 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 08-22-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.6	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace wood debris, trace shell fragments, w/ silty sand lenses, lt. gray and gray (SP)	A	Classification: SP Color: 5Y 6/1-gray D50: 0.2368 mm % Fines: 4
		•••••		B	Classification: SP Color: 2.5Y 6/1-gray D50: 0.2315 mm % Fines: 3.9
-19.9	7.3				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.3	9.7	85.5	4.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.7		
#4	99.5		
#10	99.2		
#20	98.3		
#40	89.5		
#60	55.2		
#100	8.8		
#200	4.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4311 D₈₅= 0.3823 D₆₀= 0.2638
D₅₀= 0.2368 D₃₀= 0.1938 D₁₅= 0.1640
D₁₀= 0.1529 C_u= 1.72 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-31-10A
Sample Number: TE Lab ID: 4660.29

Depth: 0.0 - 4.0 (ft.)

Date: 9/1/10

Thompson Engineering

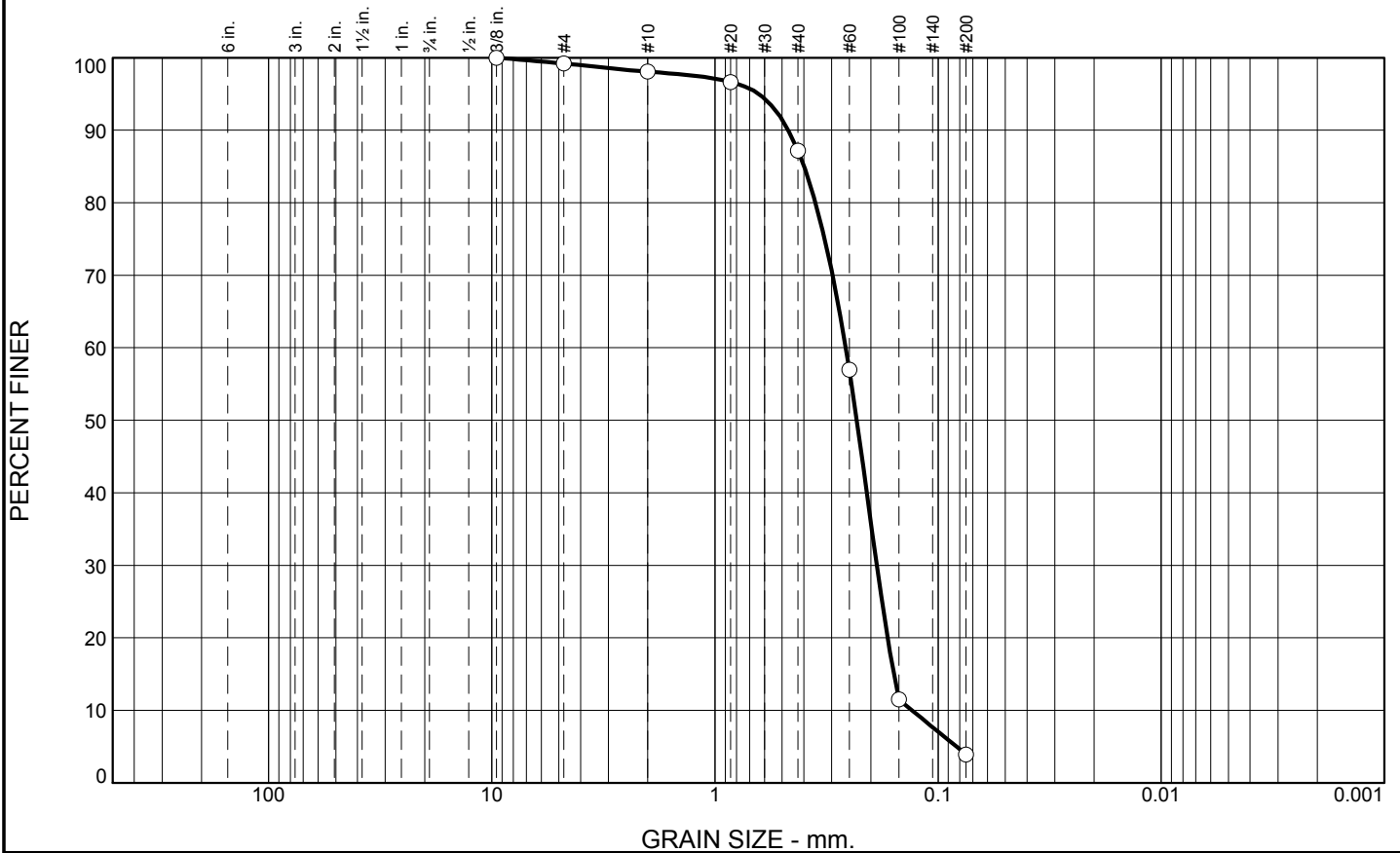
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.8	1.1	10.9	83.3	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.2		
#10	98.1		
#20	96.6		
#40	87.2		
#60	57.0		
#100	11.5		
#200	3.9		

Material Description

SAND, (SP), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4691 D₈₅= 0.3990 D₆₀= 0.2592
D₅₀= 0.2315 D₃₀= 0.1883 D₁₅= 0.1580
D₁₀= 0.1309 C_u= 1.98 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-31-10B
Sample Number: TE Lab ID: 4660.30

Depth: 4.0 - 7.3 (ft.)

Date: 9/1/10

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

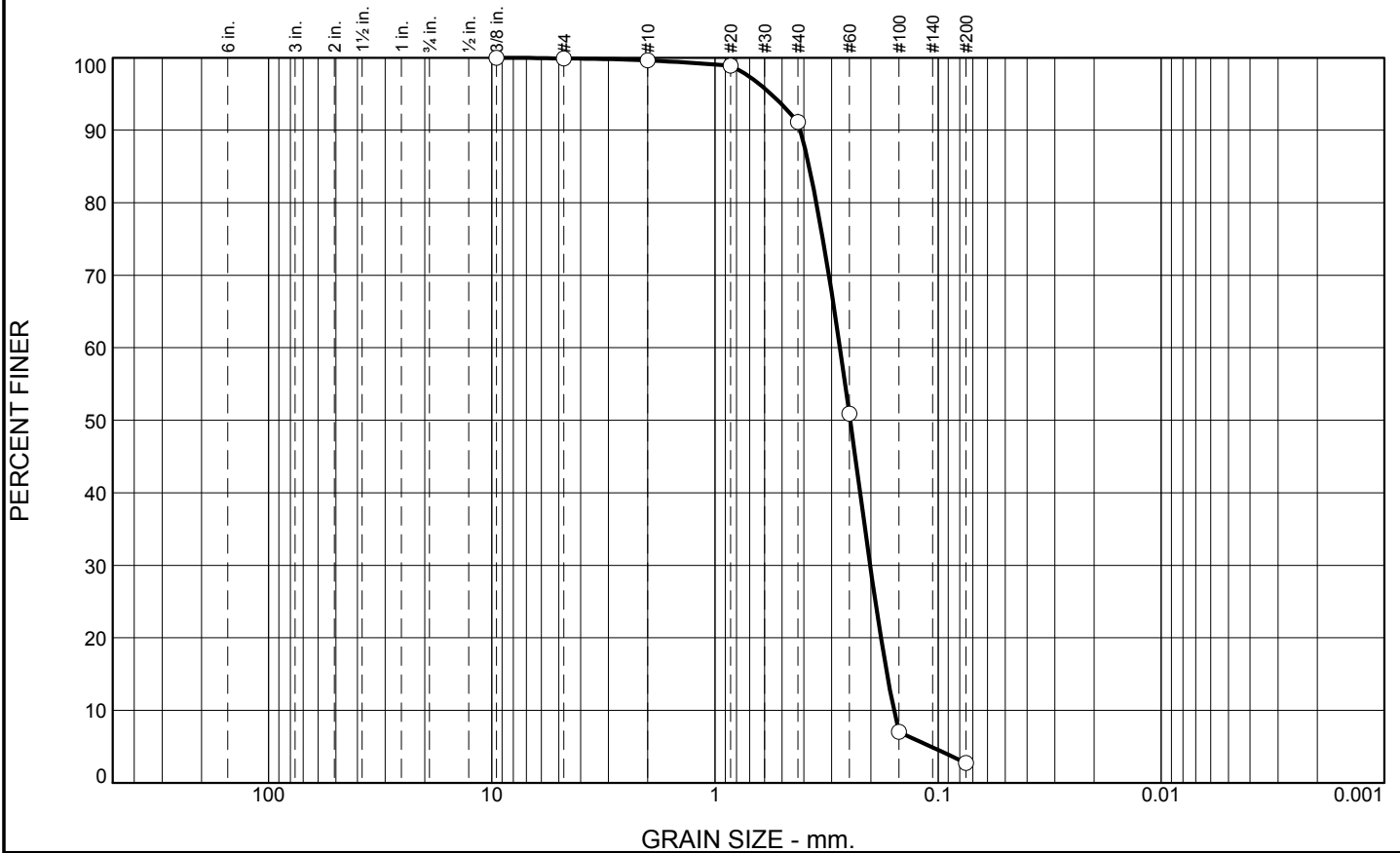
Checked By: R.Byrd

Boring Designation BI-CI-32-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-32-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 4
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 08-21-10
8. TOTAL DEPTH OF BORING 12.2 Ft.		16. ELEVATION TOP OF BORING -13.1 Ft.		COMPLETED 08-21-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.1	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray and gray (SP)	A	Classification: SP Color: 5Y 6/2-light olive gray D50: 0.2477 mm % Fines: 2.8
		•••••		B	Classification: SP Color: 5Y 7/1-light gray D50: 0.2094 mm % Fines: 4
		•••••	At El. -21.4 Ft., little silt	C	Classification: SP-SM Color: 5Y 6/2-light olive gray D50: 0.169 mm % Fines: 5.5
-22.6	9.5	•••••			
		•••••	SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	D	Classification: SP-SM Color: 2.5Y 6/2-light brownish gray D50: 0.1695 mm % Fines: 6.6
-25.3	12.2	•••••			
		•••••	NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	8.5	88.3	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.6		
#20	98.9		
#40	91.1		
#60	50.9		
#100	7.0		
#200	2.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4149 D₈₅= 0.3789 D₆₀= 0.2753
D₅₀= 0.2477 D₃₀= 0.2016 D₁₅= 0.1694
D₁₀= 0.1577 C_u= 1.75 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

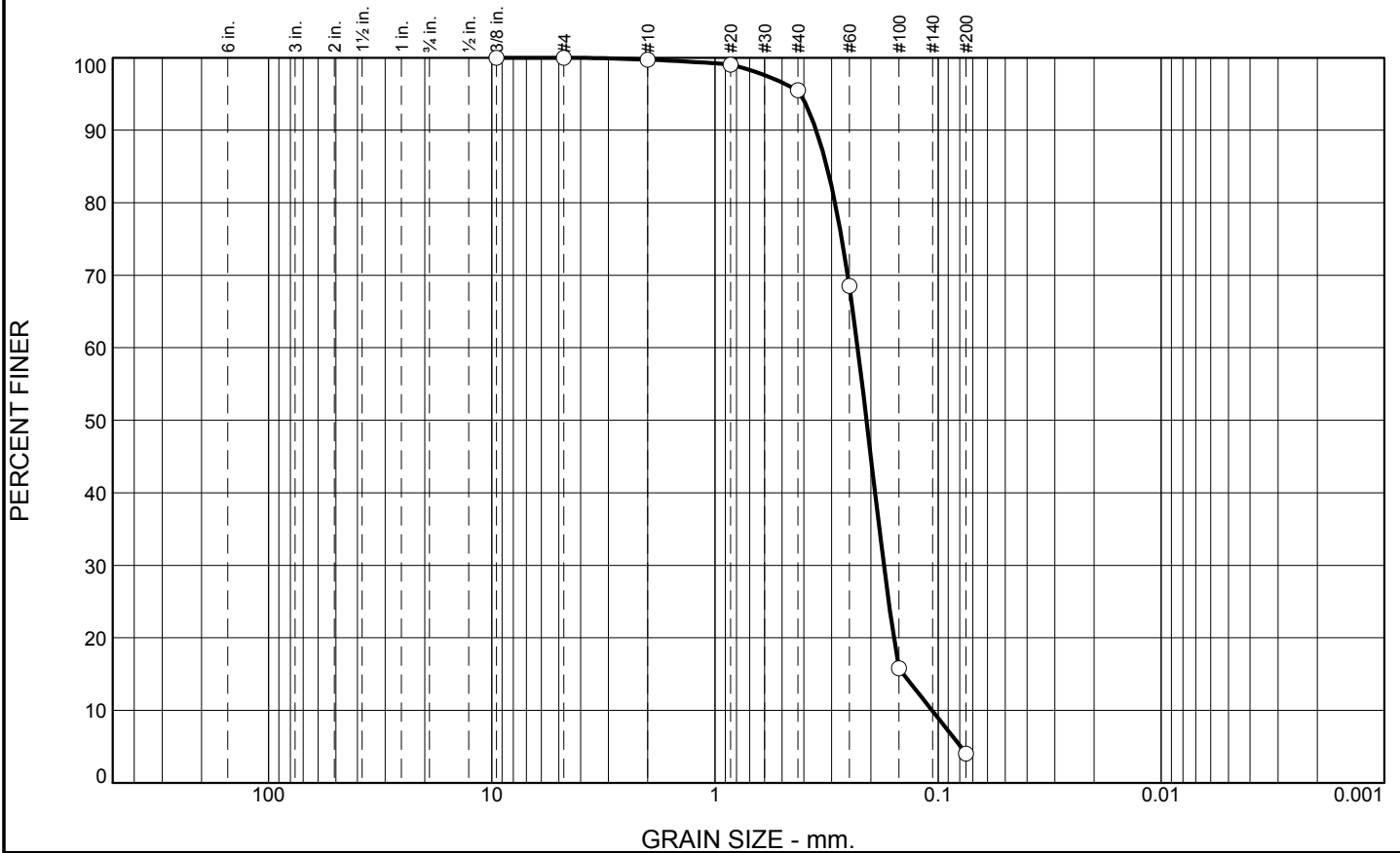
* (no specification provided)

Location: USACE Sample # BI-CI-32-10A **Depth:** 0.0 - 5.0 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.16

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	4.2	91.5	4.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.1		
#40	95.5		
#60	68.5		
#100	15.8		
#200	4.0		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3516 D₈₅= 0.3150 D₆₀= 0.2294
D₅₀= 0.2094 D₃₀= 0.1749 D₁₅= 0.1432
D₁₀= 0.1066 C_u= 2.15 C_c= 1.25

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-32-10B
Sample Number: TE Lab ID: 4660.17

Depth: 5.0 - 8.3 (ft.)

Date: 9/1/10

Thompson Engineering

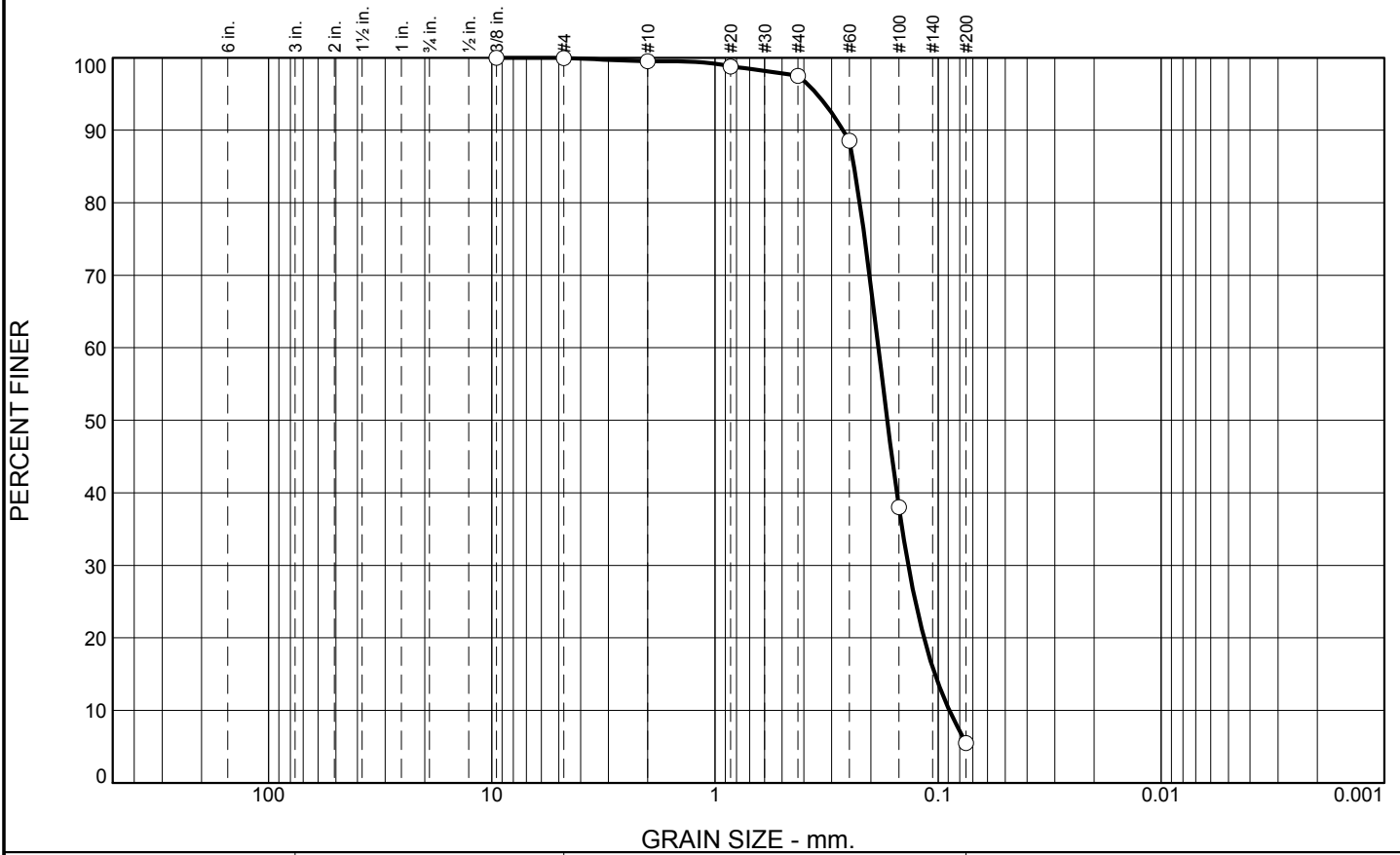
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No.: 10-2123-0009 **Report No.**

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	2.0	92.0	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.5		
#20	98.8		
#40	97.5		
#60	88.6		
#100	38.0		
#200	5.5		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2665 D₈₅= 0.2380 D₆₀= 0.1852
D₅₀= 0.1690 D₃₀= 0.1360 D₁₅= 0.1034
D₁₀= 0.0890 C_u= 2.08 C_c= 1.12

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-32-10C
Sample Number: TE Lab ID: 4660.18

Depth: 8.3 - 9.5 (ft.)

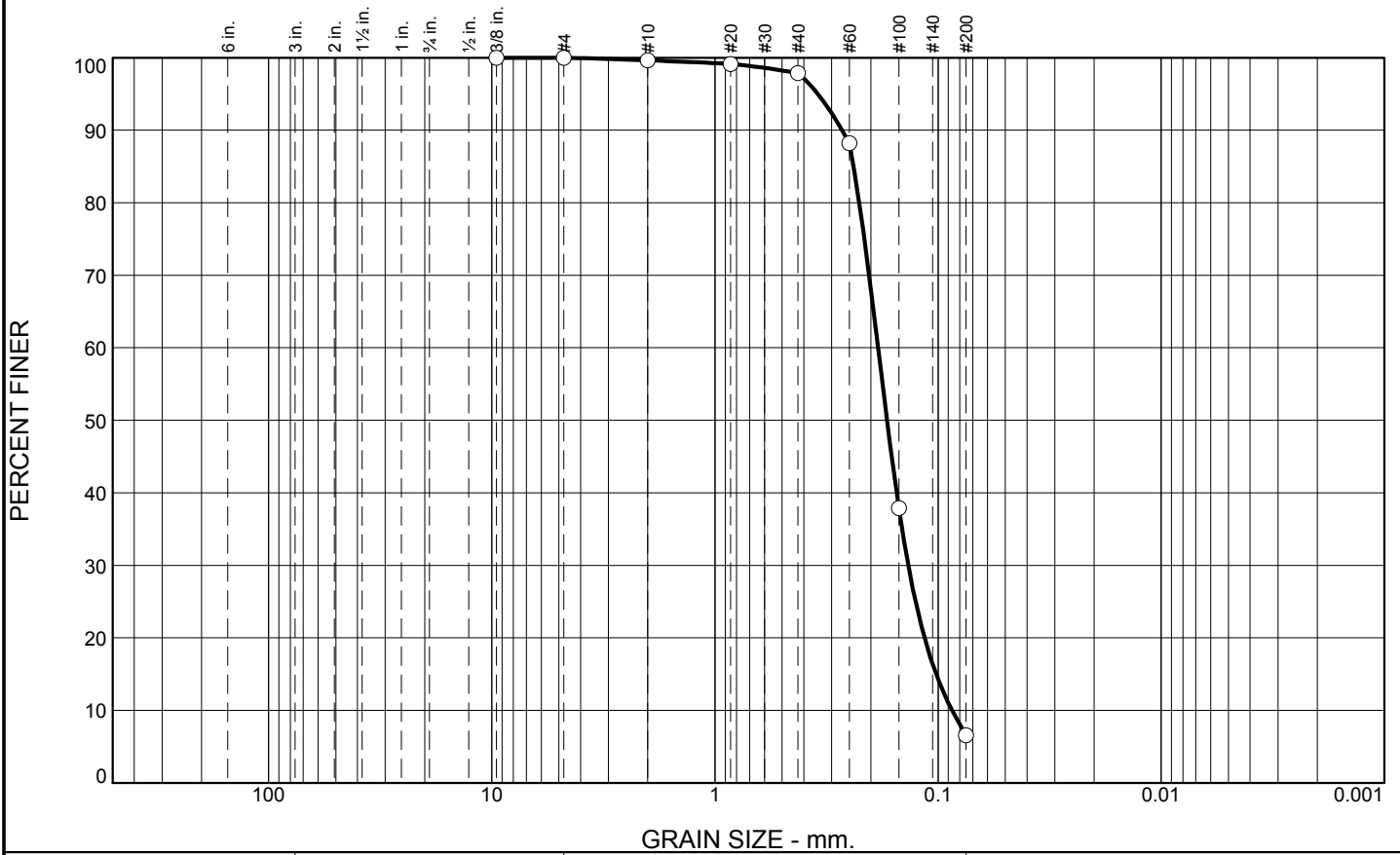
Date: 9/1/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	1.7	91.3	6.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.6		
#20	99.1		
#40	97.9		
#60	88.2		
#100	37.9		
#200	6.6		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2693 D₈₅= 0.2392 D₆₀= 0.1858
D₅₀= 0.1695 D₃₀= 0.1361 D₁₅= 0.1022
D₁₀= 0.0866 C_u= 2.15 C_c= 1.15

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-32-10D
Sample Number: TE Lab ID: 4660.19

Depth: 9.5 - 12.2 (ft.)

Date: 9/1/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Report No.</p>
------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

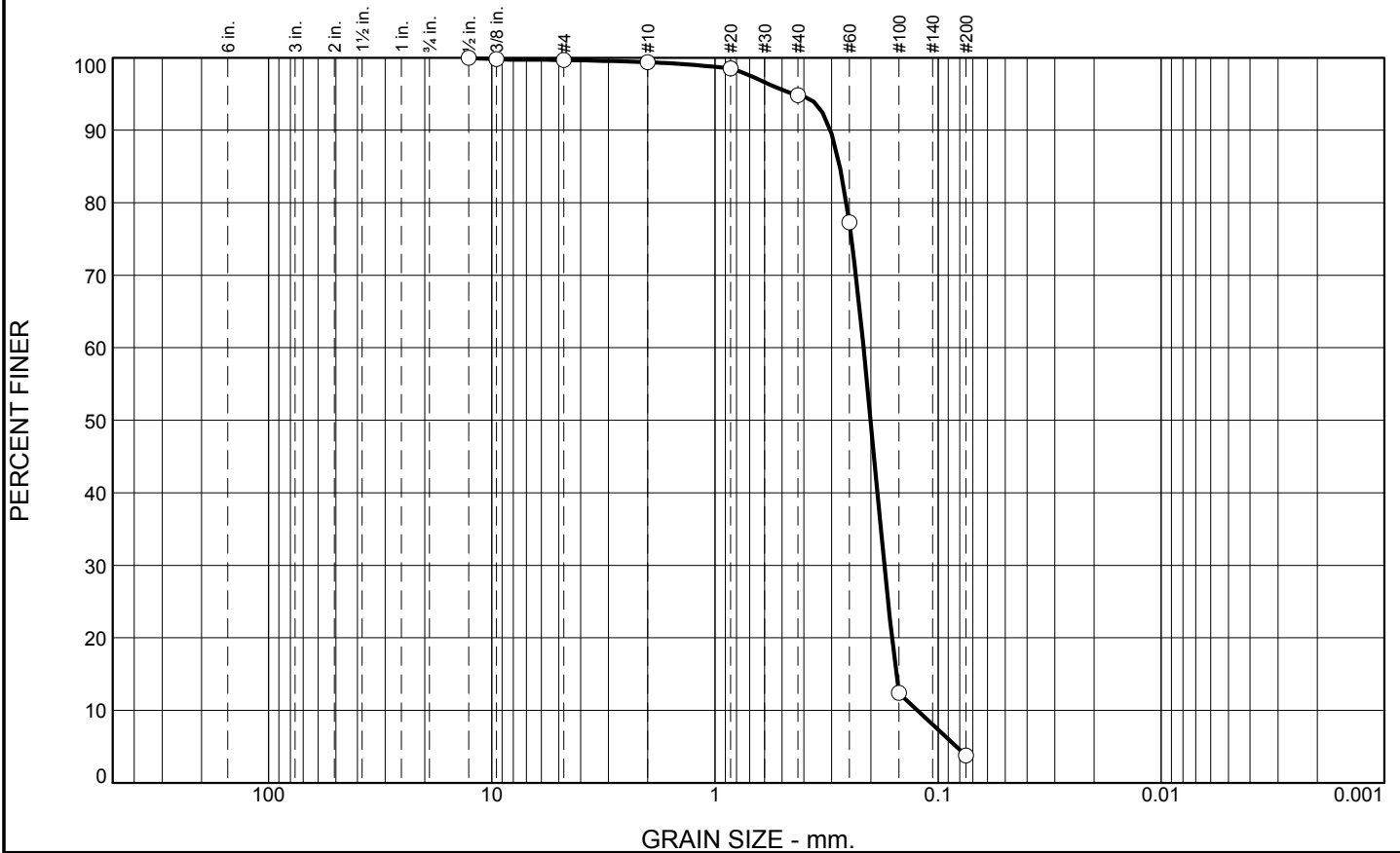
Checked By: R.Byrd

Boring Designation BI-CI-33-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-33-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -13.6 Ft.		STARTED 08-21-10
8. TOTAL DEPTH OF BORING 11.9 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 08-21-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.6	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 2.5Y 6/1-gray D50: 0.2008 mm % Fines: 3.8
		•••••		B	Classification: SP Color: 2.5Y 6/1-gray D50: 0.1903 mm % Fines: 3.6
-22.4	8.8	•••••		C	Classification: SP Color: 2.5Y 6/1-gray D50: 0.181 mm % Fines: 4.6
		//	CLAY, fat, some fine-grained sand-sized quartz, trace shell fragments, greenish gray - green (CH)	NS	
-25.5	11.9	//			
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.3	4.6	91.0	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.8		
#4	99.7		
#10	99.4		
#20	98.5		
#40	94.8		
#60	77.3		
#100	12.4		
#200	3.8		

Material Description
SAND, (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3039 D₈₅= 0.2755 D₆₀= 0.2158
 D₅₀= 0.2008 D₃₀= 0.1741 D₁₅= 0.1539
 D₁₀= 0.1238 C_u= 1.74 C_c= 1.13

Classification
 USCS= SP AASHTO=

Remarks
 CADD CODE = CH10D965

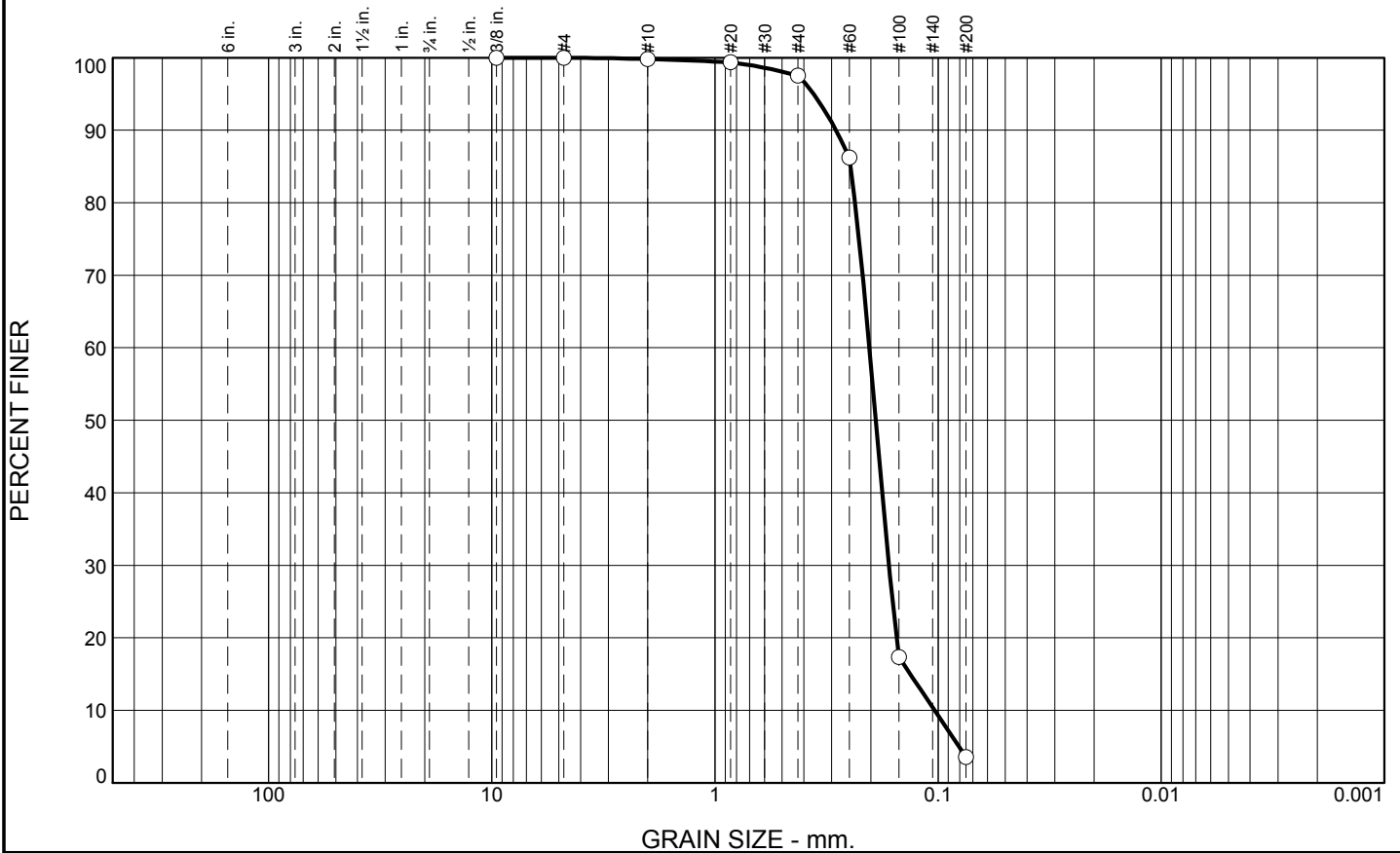
* (no specification provided)

Location: USACE Sample # BI-CI-33-10A **Depth:** 0.0 - 4.0 (ft.) **Date:** 9/1/10
Sample Number: TE Lab ID: 4660.01

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No.: 10-2123-0009 Report No.
-----------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	2.3	93.9	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.4		
#40	97.5		
#60	86.2		
#100	17.3		
#200	3.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2869 D₈₅= 0.2468 D₆₀= 0.2033
D₅₀= 0.1903 D₃₀= 0.1661 D₁₅= 0.1333
D₁₀= 0.1037 C_u= 1.96 C_c= 1.31

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-33-10B
Sample Number: TE Lab ID: 4660.02

Depth: 4.0 - 8.0 (ft.)

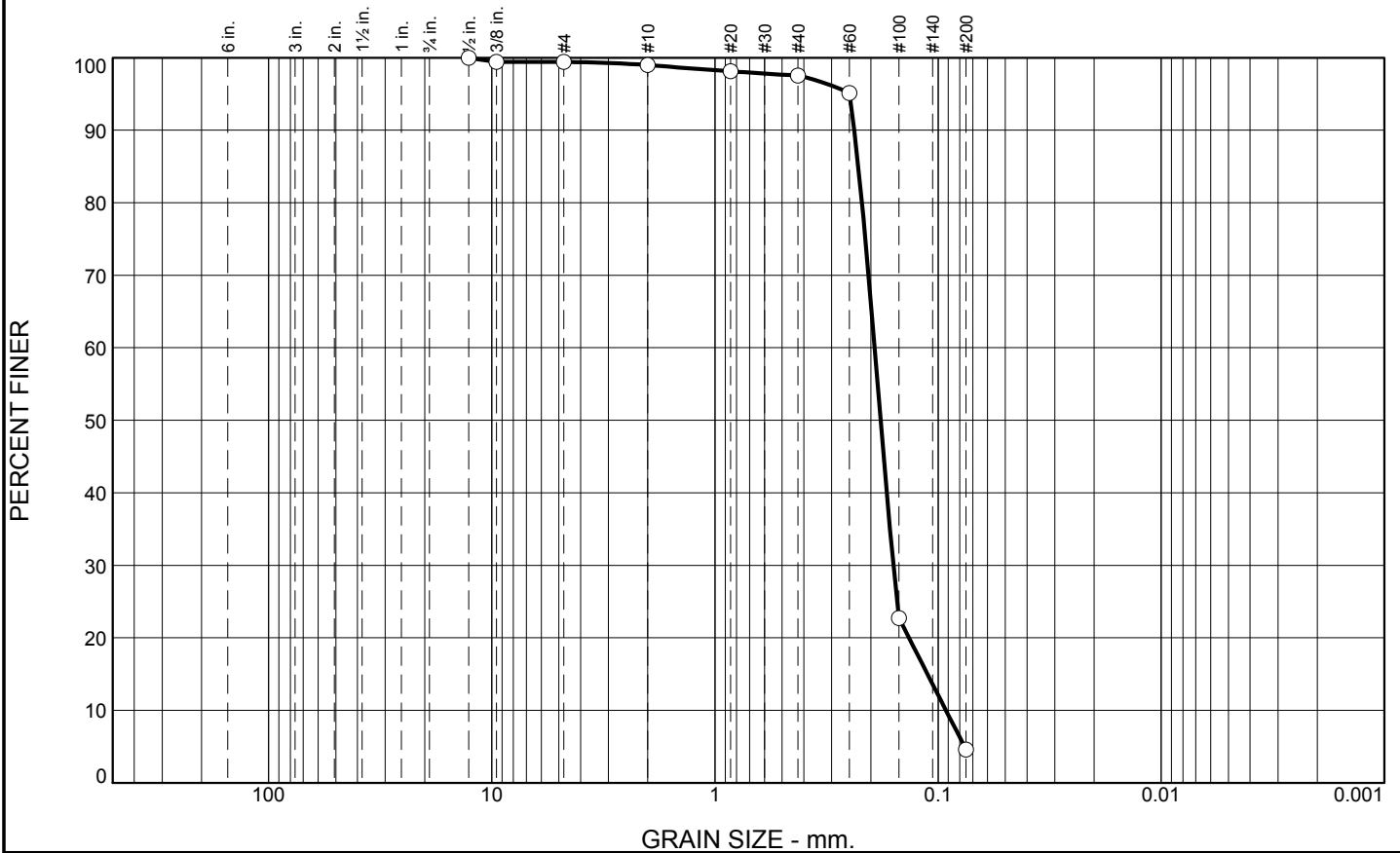
Date: 9/1/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.4	1.5	92.9	4.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.4		
#4	99.4		
#10	99.0		
#20	98.1		
#40	97.5		
#60	95.1		
#100	22.7		
#200	4.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2374 D₈₅= 0.2277 D₆₀= 0.1925
D₅₀= 0.1810 D₃₀= 0.1587 D₁₅= 0.1116
D₁₀= 0.0922 C_u= 2.09 C_c= 1.42

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-CI-33-10C
Sample Number: TE Lab ID: 4660.03

Depth: 8.0 - 8.8 (ft.)

Date: 9/1/10

<p style="font-size: 1.2em; font-weight: bold; margin: 0;">Thompson Engineering</p> <p style="font-size: 1.2em; font-weight: bold; margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Report No.</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: G.Fancher

Checked By: R.Byrd

Boring Designation BI-CI-34-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-34-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 17.8 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -16.4 Ft.		STARTED 06-27-11
8. TOTAL DEPTH OF BORING 15.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-27-11
18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-16.4	0.0				
		▨	CLAY, lean, trace shell fragments, dark gray (CL)		
-19.1	2.7				
		•••	SAND, poorly-graded, some clay, gray (SP)		
-22.3	5.9				
		▨	CLAY, lean, trace sand, gray (CL)	NS	
		▨	At El. -25.6 Ft., trace shell fragments, gray		
-31.4	15.0				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Boring Designation BI-CI-35-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-35-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 17.2 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-27-11
8. TOTAL DEPTH OF BORING 15.0 Ft.		16. ELEVATION TOP OF BORING -16.3 Ft.		COMPLETED 06-27-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-16.3	0.0				
		•••••	SAND, poorly-graded, mostly medium-grained sand-sized quartz, trace shell fragments, gray (SP)	A	Classification: SP Color: 5Y 6/1-gray D50: 0.1936 mm % Fines: 3.8
-21.1	4.8	•••••	SAND, poorly-graded, mostly medium-grained sand-sized quartz, trace organic matter, gray (SP)	B	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.1943 mm % Fines: 2.8
-24.8	8.5	•••••			
		↑↑↑↑↑	SAND, silty, trace fine-grained shell fragments, trace shell fragments, dark gray (SM)		
-27.6	11.3	↑↑↑↑↑			
		▨▨▨▨▨	CLAY, lean, trace shell fragments, dark gray (CL)	NS	
-31.3	15.0	▨▨▨▨▨			
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation determined from USACE hydrographic survey completed 2010.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.0	5.1	90.1	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.0		
#20	97.0		
#40	93.9		
#60	80.2		
#100	18.6		
#200	3.8		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	LL=	
	Coefficients	
D ₉₀ = 0.3501	D ₈₅ = 0.2897	D ₆₀ = 0.2087
D ₅₀ = 0.1936	D ₃₀ = 0.1663	D ₁₅ = 0.1269
D ₁₀ = 0.1003	C _u = 2.08	C _c = 1.32
Classification		
USCS= SP	AASHTO=	
Remarks		

* (no specification provided)

Location: USACE Sample # BI-CI-35A-11
Sample Number: TE Lab ID: 5054.81

Depth: 0.0 - 4.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	2.6	93.9	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.3		
#20	98.6		
#40	96.7		
#60	83.7		
#100	14.1		
#200	2.8		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.3077	D ₈₅ = 0.2600	D ₆₀ = 0.2075
D ₅₀ = 0.1943	D ₃₀ = 0.1701	D ₁₅ = 0.1513
D ₁₀ = 0.1167	C _u = 1.78	C _c = 1.19

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-35B-11
Sample Number: TE Lab ID: 5054.82

Depth: 4.0 - 8.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

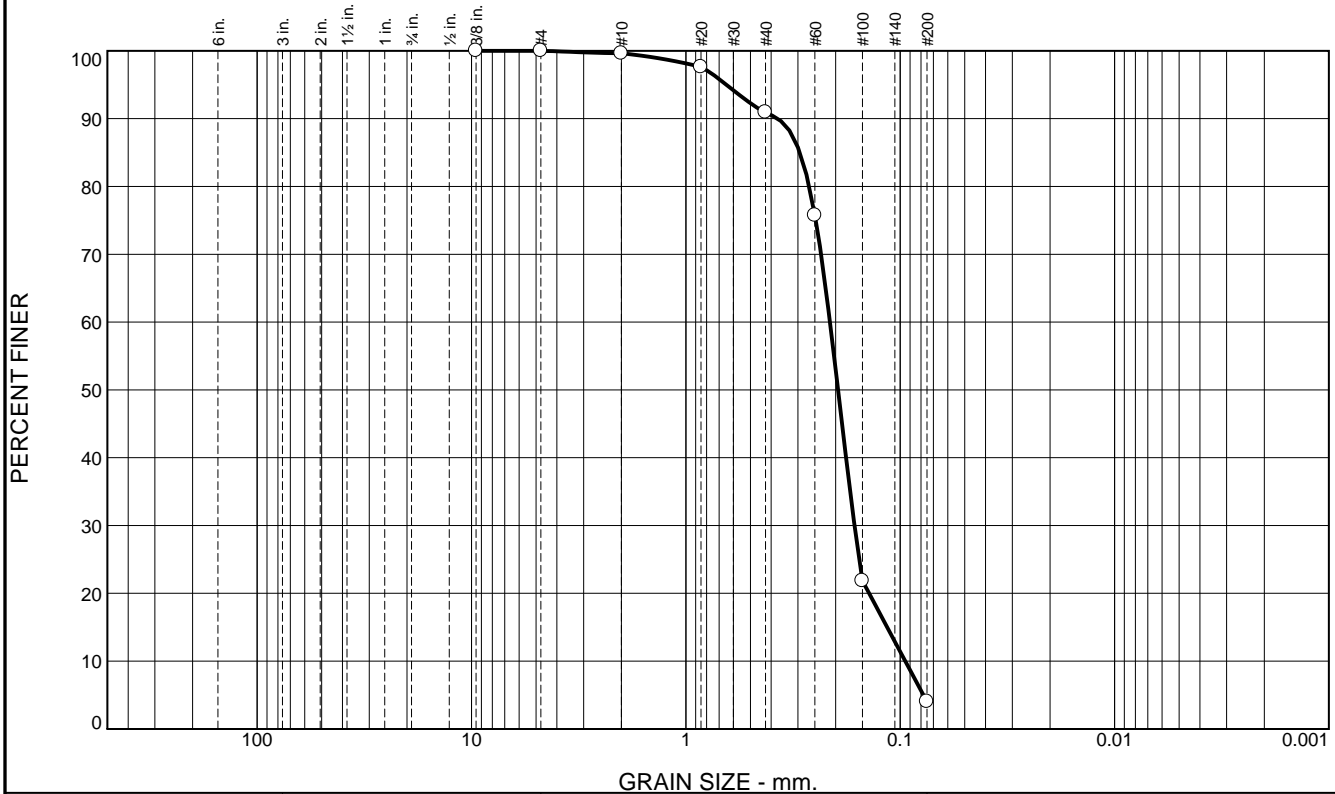
Figure

Boring Designation BI-CI-36-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-36-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-24-11
8. TOTAL DEPTH OF BORING 13.8 Ft.		16. ELEVATION TOP OF BORING -15.7 Ft.		COMPLETED 06-24-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-15.7	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 5Y 5/2-olive gray D50: 0.1949 mm % Fines: 4
		•••••		B	Classification: SP Color: 5Y 5/2-olive gray D50: 0.1764 mm % Fines: 3.4
		•••••		C	Classification: SP-SM Color: 5Y 5/2-olive gray D50: 0.1619 mm % Fines: 8.2
-28.0	12.3				
-29.5	13.8	|||||	SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace clay, dark gray (SM)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation determined from USACE hydrographic survey completed 2010.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	8.7	86.9	4.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.6		
#20	97.6		
#40	90.9		
#60	75.7		
#100	21.8		
#200	4.0		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.3730	D ₈₅ = 0.2940	D ₆₀ = 0.2126
D ₅₀ = 0.1949	D ₃₀ = 0.1634	D ₁₅ = 0.1150
D ₁₀ = 0.0947	C _u = 2.24	C _c = 1.33

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-36A-11
Sample Number: TE Lab ID: 5054.56

Depth: 0.0 - 5.0 (ft)

Date: 7/18/11

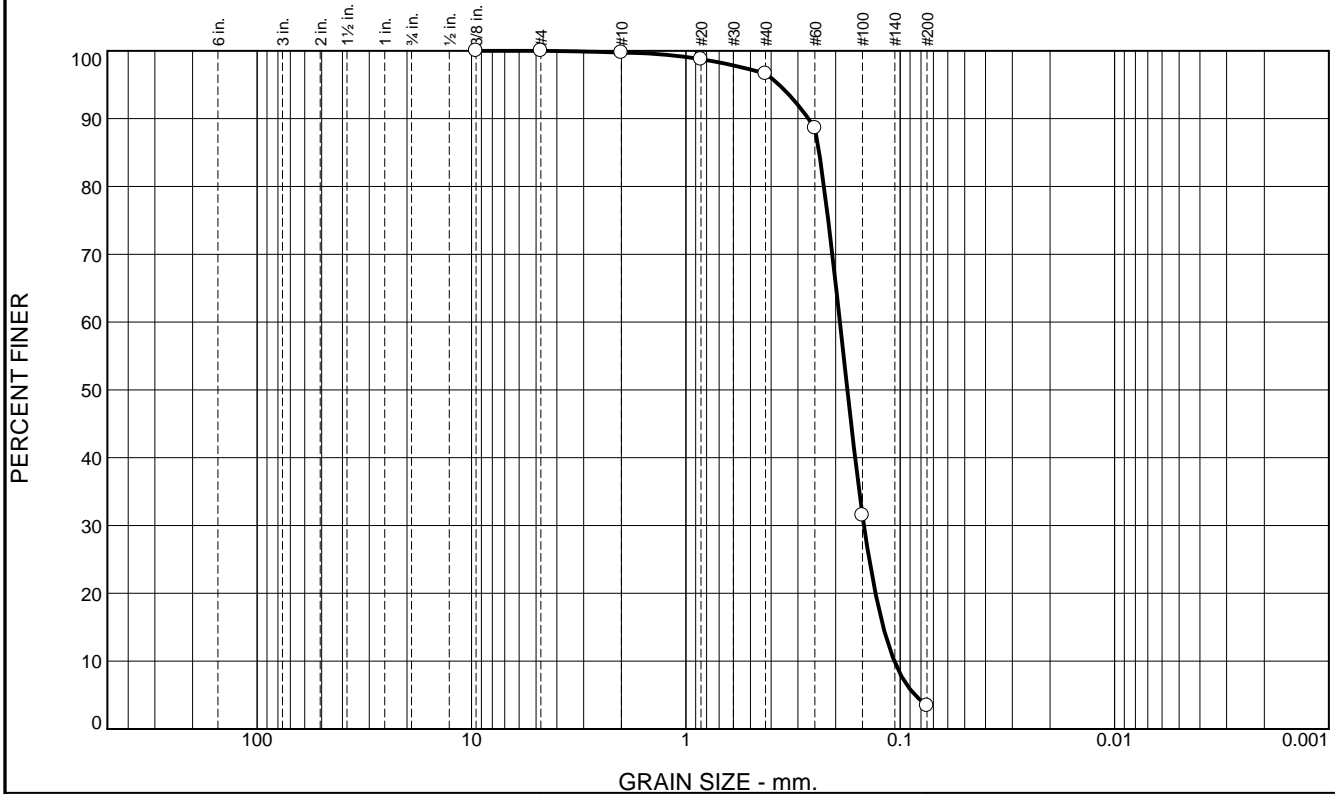
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	3.1	93.2	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	98.8		
#40	96.6		
#60	88.6		
#100	31.5		
#200	3.4		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2683 D₈₅= 0.2390 D₆₀= 0.1910
D₅₀= 0.1764 D₃₀= 0.1477 D₁₅= 0.1199
D₁₀= 0.1065 C_u= 1.79 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-36B-11
Sample Number: TE Lab ID: 5054.57

Depth: 5.0 - 10.0 (ft)

Date: 7/18/11

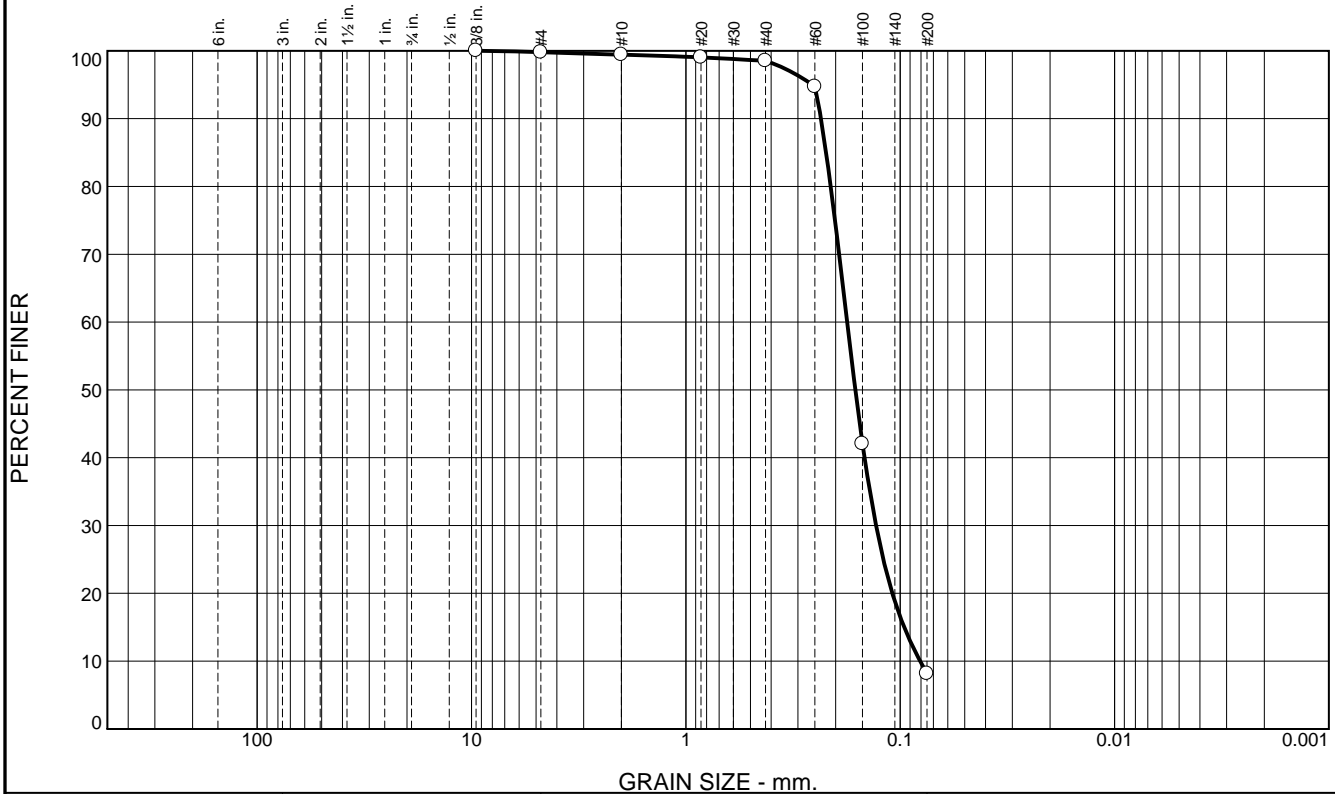
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	0.9	90.3	8.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.4		
#20	99.0		
#40	98.5		
#60	94.7		
#100	42.1		
#200	8.2		

Material Description

Slightly silty SAND (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2343 D₈₅= 0.2215 D₆₀= 0.1768
D₅₀= 0.1619 D₃₀= 0.1297 D₁₅= 0.0958
D₁₀= 0.0807 C_u= 2.19 C_c= 1.18

Classification

USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-36C-11
Sample Number: TE Lab ID: 5054.58

Depth: 10.0 - 12.3 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

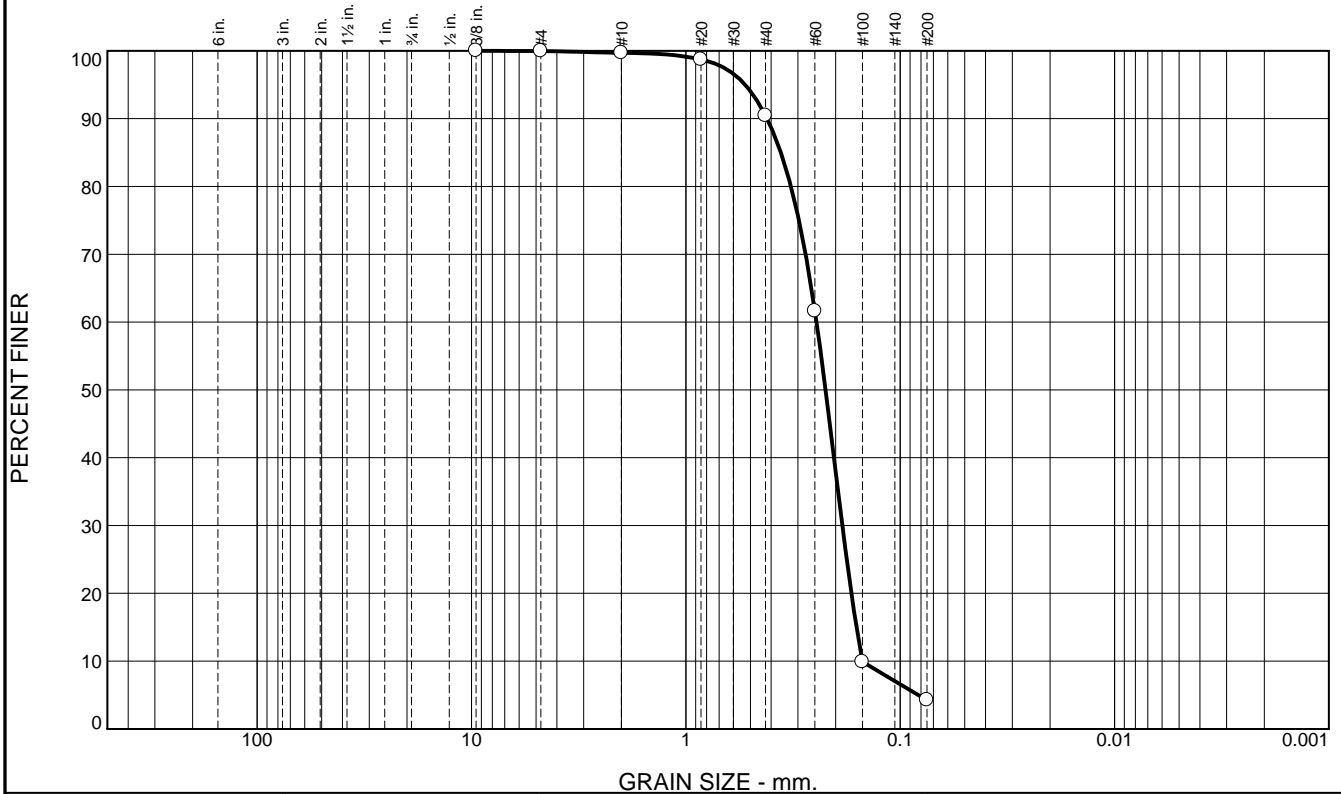
Figure

Boring Designation BI-CI-37-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-37-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-24-11
8. TOTAL DEPTH OF BORING 11.3 Ft.		16. ELEVATION TOP OF BORING -15.0 Ft.		COMPLETED 06-24-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-15.0	0.0				
-16.6	1.6	| | | | |	SAND, silty, mostly fine-grained sand-sized quartz, little silt, trace shell fragments, gray (SM)		
		. . . . .	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP Color: 5Y 4/2-olive gray D50: 0.2229 mm % Fines: 4.2
		. . . . .	At El. -23.5 Ft., thin layer of clay	B	Classification: SP Color: 5Y 5/2-olive gray D50: 0.2549 mm % Fines: 3.4
-26.3	11.3			NS	
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation determined from USACE hydrographic survey completed 2010.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	9.3	86.2	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	98.7		
#40	90.4		
#60	61.6		
#100	9.9		
#200	4.2		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4182 D₈₅= 0.3606 D₆₀= 0.2457
D₅₀= 0.2229 D₃₀= 0.1861 D₁₅= 0.1600
D₁₀= 0.1502 C_u= 1.64 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-37A-11
Sample Number: TE Lab ID: 5054.59

Depth: 0.0 - 5.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.7	1.3	12.5	80.1	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.1		
#4	97.3		
#10	96.0		
#20	93.7		
#40	83.5		
#60	48.4		
#100	8.3		
#200	3.4		

Material Description
SAND (SP), medium to fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.5298 D₈₅= 0.4423 D₆₀= 0.2884
 D₅₀= 0.2549 D₃₀= 0.2028 D₁₅= 0.1677
 D₁₀= 0.1549 C_u= 1.86 C_c= 0.92

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-37B-11
Sample Number: TE Lab ID: 5054.60

Depth: 5.0 - 10.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-38-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-38-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -14.7 Ft.		STARTED 06-24-11
8. TOTAL DEPTH OF BORING 13.1 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-24-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.7	0.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2072 mm % Fines: 4.4
-19.5	4.8	/ / / / /	CLAY, lean, dark gray (CL)	NS	
-20.3	5.6	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	B	Classification: SP Color: 5Y 4/1-dark gray D50: 0.1886 mm % Fines: 3.6
-25.2	10.5	/ / / / /	SAND, clayey, mostly fine-grained sand-sized quartz, some clay, dark gray (SC)	NS	
-27.8	13.1	/ / / / /			
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation determined from USACE hydrographic survey completed 2010.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.2	8.6	86.5	4.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.7		
#4	99.7		
#10	99.5		
#20	98.4		
#40	90.9		
#60	69.9		
#100	14.7		
#200	4.4		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.4000 D₈₅= 0.3237 D₆₀= 0.2262
D₅₀= 0.2072 D₃₀= 0.1750 D₁₅= 0.1506
D₁₀= 0.1095 C_u= 2.06 C_c= 1.24

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-38A-11
Sample Number: TE Lab ID: 5054.61

Depth: 0.0 - 4.8 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.7	95.6	3.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.2		
#60	90.1		
#100	16.4		
#200	3.6		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2497 D₈₅= 0.2384 D₆₀= 0.2005
 D₅₀= 0.1886 D₃₀= 0.1662 D₁₅= 0.1393
 D₁₀= 0.1061 C_u= 1.89 C_c= 1.30

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-38B-11
Sample Number: TE Lab ID: 5054.62

Depth: 5.6 - 10.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

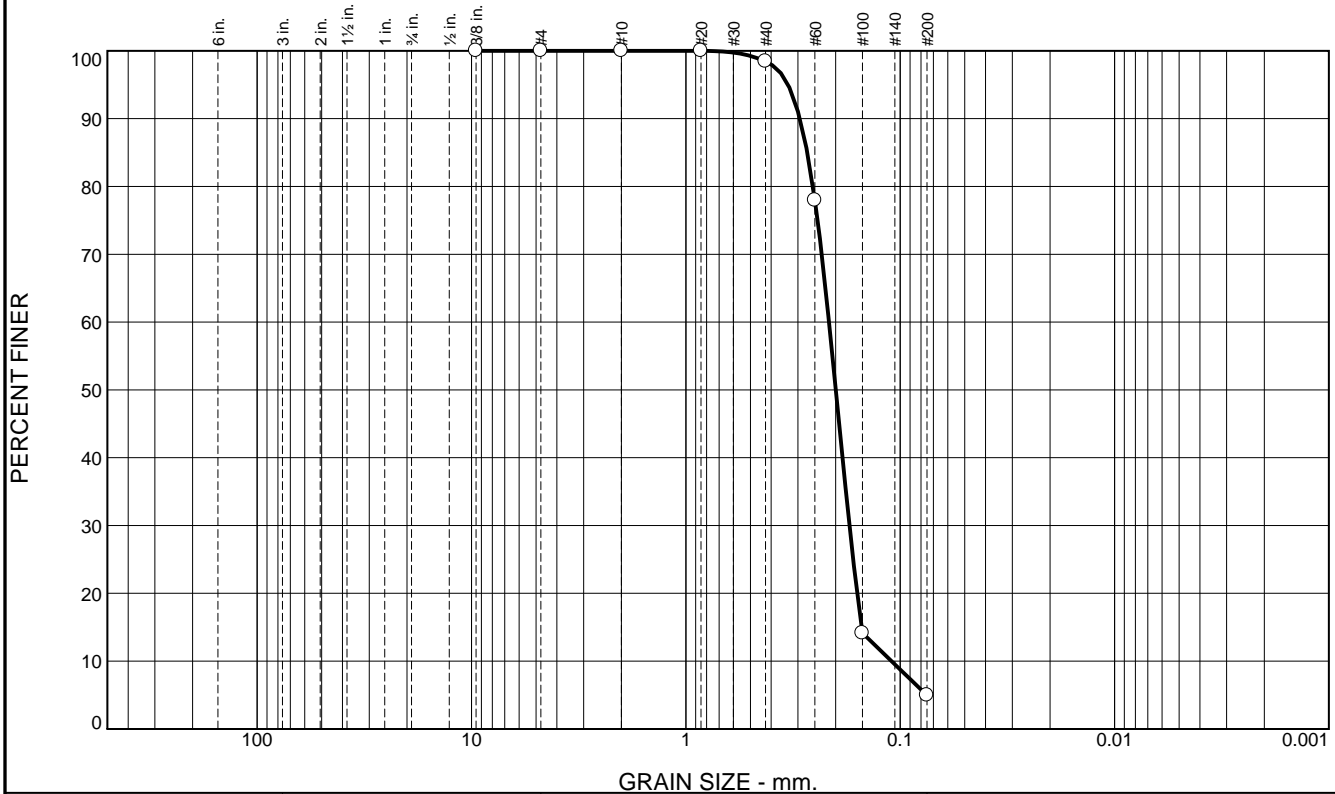
Figure

Boring Designation BI-CI-39-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-39-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15.2 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -14.7 Ft.		STARTED 06-25-11
8. TOTAL DEPTH OF BORING 12.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-25-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.7	0.0				
-15.7	1.0	|||||	SAND, silty, mostly fine-grained sand-sized quartz, little silt, dark gray (SM)	NS	
		●●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	A	Classification: SP-SM Color: 5Y 4/2-olive gray D50: 0.1997 mm % Fines: 5
		●●●●●	At El. -22.5 Ft., mostly fine-grained sand-sized quartz, some shell fragments, lt. gray	B	Classification: SP Color: 5Y 3/2-dark olive gray D50: 0.1802 mm % Fines: 4.3
-25.2	10.5				
-27.2	12.5	//////	SAND, clayey, mostly fine-grained sand-sized quartz, some clay, dark gray (SC)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation determined from USACE hydrographic survey completed 2010.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	93.4	5.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.4		
#60	78.0		
#100	14.1		
#200	5.0		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2940 D₈₅= 0.2714 D₆₀= 0.2148
 D₅₀= 0.1997 D₃₀= 0.1725 D₁₅= 0.1514
 D₁₀= 0.1098 C_u= 1.96 C_c= 1.26

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-39A-11
Sample Number: TE Lab ID: 5054.72

Depth: 1.0 - 6.0 (ft)

Date: 7/18/11

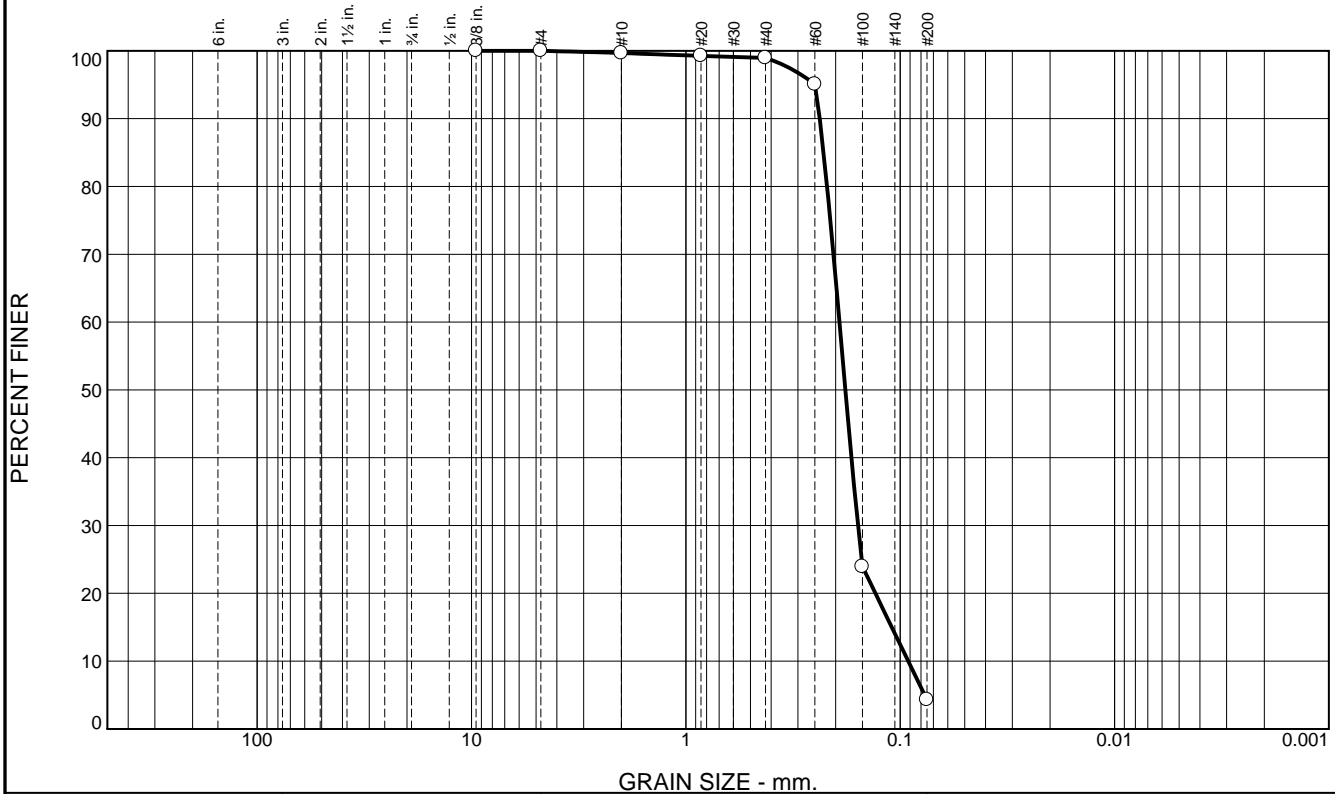
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	0.7	94.7	4.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.3		
#40	99.0		
#60	95.1		
#100	23.9		
#200	4.3		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2375 D₈₅= 0.2277 D₆₀= 0.1919
D₅₀= 0.1802 D₃₀= 0.1574 D₁₅= 0.1094
D₁₀= 0.0917 C_u= 2.09 C_c= 1.41

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-39B-11
Sample Number: TE Lab ID: 5054.73

Depth: 6.0 - 10.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

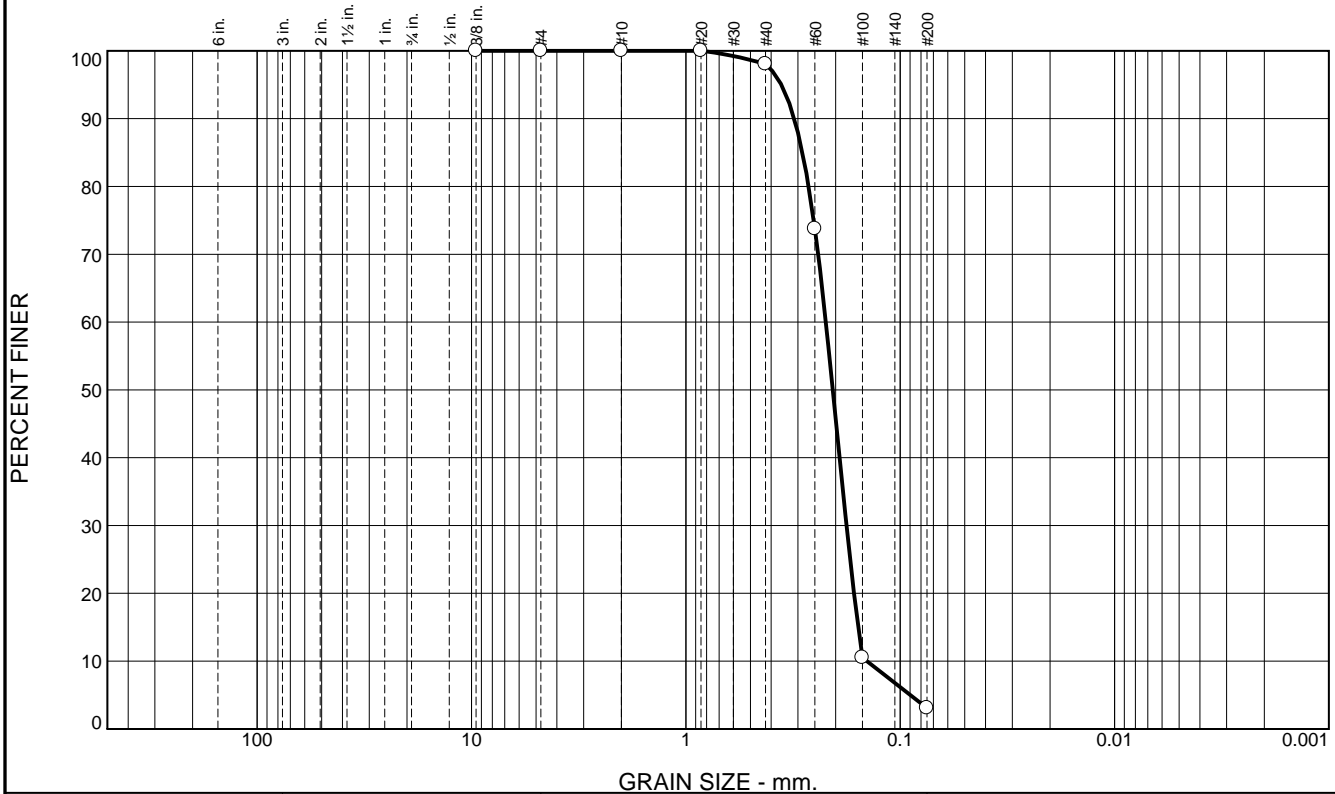
Figure

Boring Designation BI-CI-40-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-40-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -14.4 Ft.		STARTED 06-25-11
8. TOTAL DEPTH OF BORING 14.6 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-25-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.4	0.0				
-16.1	1.7	↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, little silt, gray and brown (SM)	NS	
		●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	A	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2062 mm % Fines: 3.1
-23.6	9.2	↑↑↑↑			
-25.3	10.9	↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, some silt, little clay, gray (SM)	NS	
-26.5	12.1	▨▨▨▨	SAND, clayey, mostly fine-grained sand-sized quartz, some clay, dark gray (SC)		
-29.0	14.6	↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation determined from USACE hydrographic survey completed 2010.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.0	94.9	3.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.0		
#60	73.7		
#100	10.5		
#200	3.1		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3123 D₈₅= 0.2860 D₆₀= 0.2223
 D₅₀= 0.2062 D₃₀= 0.1780 D₁₅= 0.1570
 D₁₀= 0.1431 C_u= 1.55 C_c= 1.00

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-40A-11
Sample Number: TE Lab ID: 5054.74

Depth: 2.0 - 7.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-41-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-41-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15.2 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -14.5 Ft.		STARTED 06-25-11
8. TOTAL DEPTH OF BORING 10.9 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-25-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.5	0.0				
-16.6	2.1		SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace clay, gray (SM)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.1975 mm % Fines: 8.9
-18.8	4.3		SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)	B	Classification: SP Color: 2.5Y 4/2-dark grayish brown D50: 0.2158 mm % Fines: 3.9
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray (SP)	C	Classification: SP Color: 2.5Y 4/3-olive brown D50: 0.2118 mm % Fines: 3.1
-25.4	10.9				NS
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation determined from USACE hydrographic survey completed 2010.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.9	89.2	8.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.7		
#40	98.1		
#60	79.7		
#100	15.2		
#200	8.9		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2868 D₈₅= 0.2658 D₆₀= 0.2122
 D₅₀= 0.1975 D₃₀= 0.1708 D₁₅= 0.1463
 D₁₀= 0.0844 C_u= 2.51 C_c= 1.63

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-41A-11
Sample Number: TE Lab ID: 5054.75

Depth: 0.0 - 2.1 (ft)

Date: 7/18/11

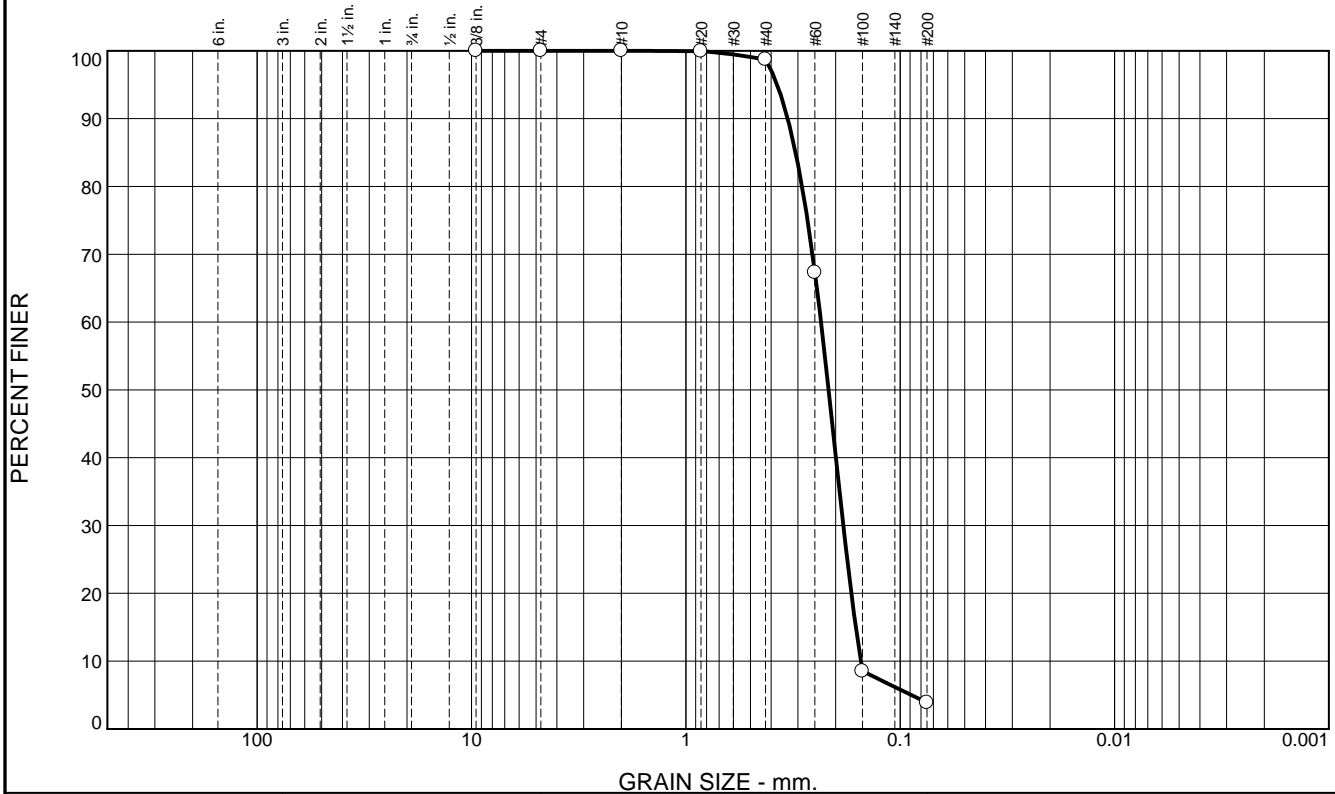
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	94.8	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.7		
#60	67.3		
#100	8.5		
#200	3.9		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	LL=	

	Coefficients	
D ₉₀ = 0.3349	D ₈₅ = 0.3078	D ₆₀ = 0.2342
D ₅₀ = 0.2158	D ₃₀ = 0.1842	D ₁₅ = 0.1612
D ₁₀ = 0.1527	C _u = 1.53	C _c = 0.95

USCS= SP	Classification
	AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-41B-11
Sample Number: TE Lab ID: 5054.76

Depth: 2.1 - 4.3 (ft)

Date: 7/18/11

Thompson Engineering

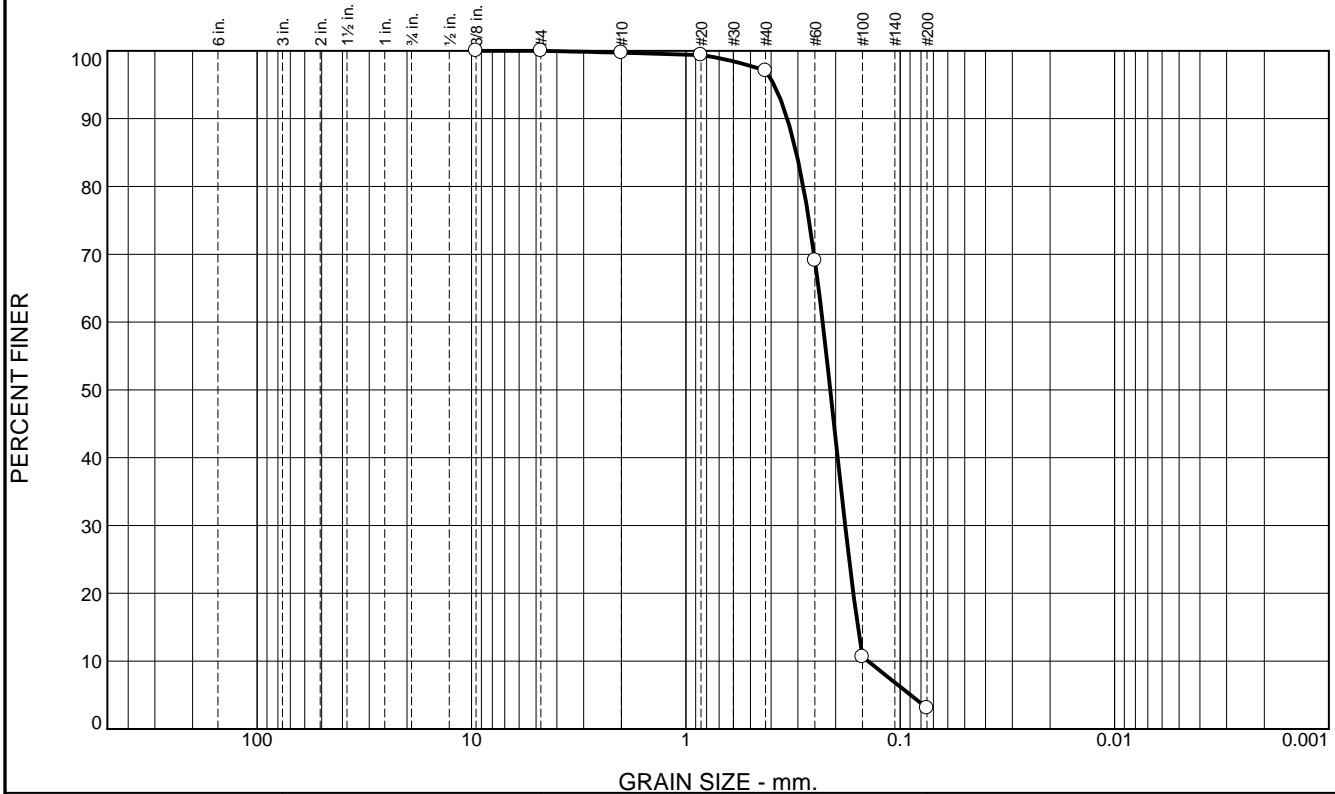
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	2.6	94.0	3.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.4		
#40	97.1		
#60	69.1		
#100	10.6		
#200	3.1		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.3366	D ₈₅ = 0.3056	D ₆₀ = 0.2300
D ₅₀ = 0.2118	D ₃₀ = 0.1806	D ₁₅ = 0.1575
D ₁₀ = 0.1414	C _u = 1.63	C _c = 1.00

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-41C-11
Sample Number: TE Lab ID: 5054.77

Depth: 4.3 - 9.3 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

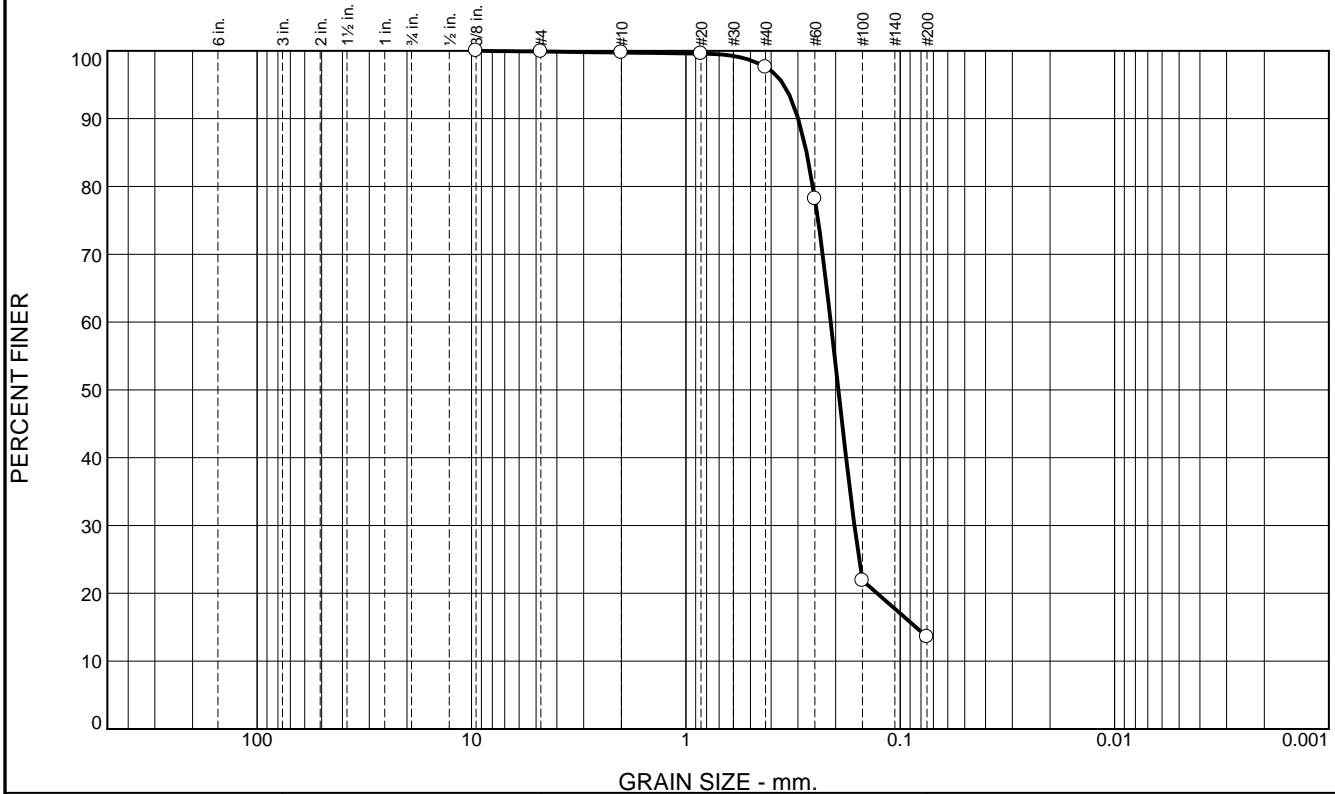
Figure

Boring Designation BI-CI-42-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-42-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-24-11
8. TOTAL DEPTH OF BORING 15.1 Ft.		16. ELEVATION TOP OF BORING -13.2 Ft.		COMPLETED 06-24-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.2	0.0				
-15.4	2.2		SAND, silty, mostly fine-grained sand-sized quartz, some silt, little clay, gray (SM)	A	Classification: SM Color: 2.5Y 4/2-dark grayish brown D50: 0.1942 mm % Fines: 13.6
-16.5	3.3		SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)	B	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.1952 mm % Fines: 10.6
-20.9	7.7		SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP) At El. -18.4 Ft., mostly fine-grained sand-sized quartz, lt. gray	C	Classification: SP Color: 5Y 4/2-olive gray D50: 0.172 mm % Fines: 4.8
-22.2	9.0		CLAY, lean, dark gray (CL)		
-25.2	12.0		SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace clay, gray (SM)	NS	
-28.3	15.1		SAND, poorly-graded, mostly medium-grained sand-sized quartz, little shell fragments, lt. gray (SP) At El. -26.7 Ft., mostly fine-grained sand-sized quartz, lt. gray		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	2.1	84.0	13.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	99.6		
#40	97.6		
#60	78.2		
#100	21.9		
#200	13.6		

Material Description

Silty SAND (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2994 D₈₅= 0.2734 D₆₀= 0.2108
D₅₀= 0.1942 D₃₀= 0.1635 D₁₅= 0.0843
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-42A-11
Sample Number: TE Lab ID: 5054.63

Depth: 0.0 - 2.2 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	87.8	10.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.4		
#60	78.7		
#100	19.9		
#200	10.6		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2941 D₈₅= 0.2705 D₆₀= 0.2112
 D₅₀= 0.1952 D₃₀= 0.1659 D₁₅= 0.1039
 D₁₀= C_u= C_c=

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-42B-11
Sample Number: TE Lab ID: 5054.64

Depth: 2.2 - 3.3 (ft)

Date: 7/18/11

Thompson Engineering

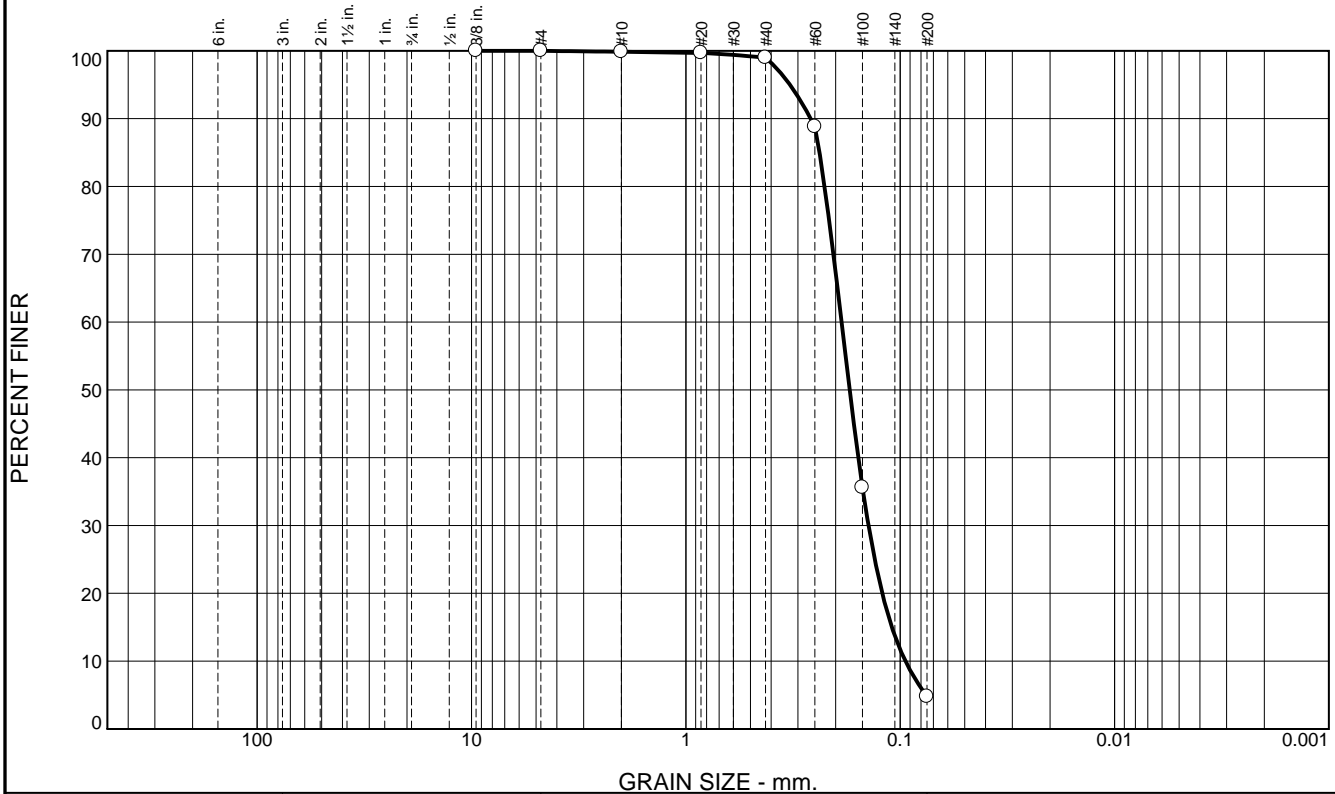
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.9	94.2	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	99.0		
#60	88.8		
#100	35.6		
#200	4.8		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2616 D₈₅= 0.2381 D₆₀= 0.1876
D₅₀= 0.1720 D₃₀= 0.1407 D₁₅= 0.1094
D₁₀= 0.0946 C_u= 1.98 C_c= 1.12

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-42C-11
Sample Number: TE Lab ID: 5054.65

Depth: 3.3 - 7.7 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers

Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

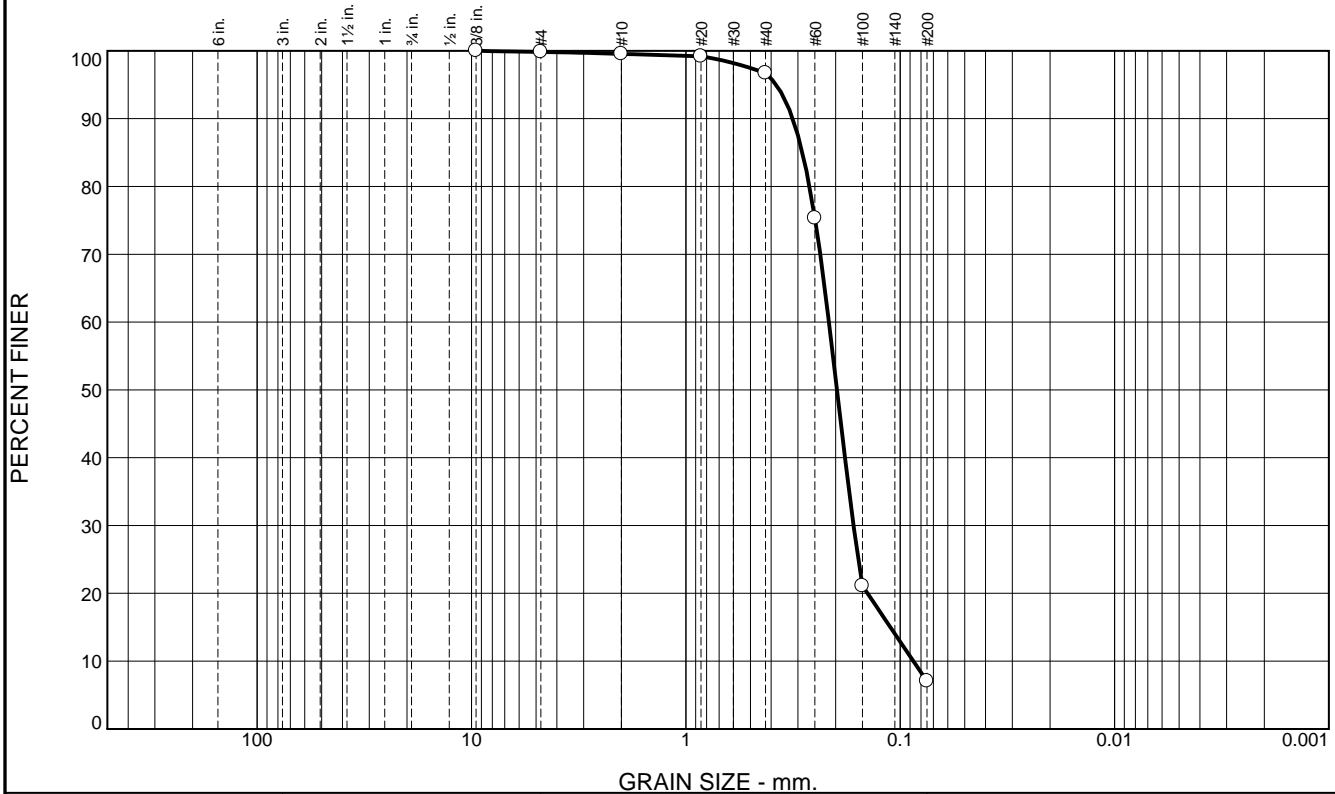
Figure

Boring Designation BI-CI-43-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-43-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 06-24-11 COMPLETED 06-24-11		
8. TOTAL DEPTH OF BORING 17.2 Ft.		16. ELEVATION TOP OF BORING -13.0 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.0	0.0				
		|↑↑↑↑↑|	SAND, silty, mostly fine-grained sand-sized quartz, some silt, dark gray (SM)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.1972 mm % Fines: 7
		|●●●●●|	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	B	Classification: SP Color: 5Y 5/1-gray D50: 0.2126 mm % Fines: 2.2
		|●●●●●|		C	Classification: SP Color: 5Y 5/1-gray D50: 0.19 mm % Fines: 3.3
		|▨▨▨▨|	CLAY, lean, dark gray (CL)		
		|▨▨▨▨|	SAND, clayey, mostly fine-grained sand-sized quartz, some clay, dark gray (SC)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.3	2.8	89.7	7.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.5		
#20	99.2		
#40	96.7		
#60	75.3		
#100	21.1		
#200	7.0		

Material Description

Slightly silty SAND (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3174 D₈₅= 0.2861 D₆₀= 0.2150
D₅₀= 0.1972 D₃₀= 0.1651 D₁₅= 0.1111
D₁₀= 0.0868 C_u= 2.48 C_c= 1.46

Classification

USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-43A-11
Sample Number: TE Lab ID: 5054.66

Depth: 0.0 - 4.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

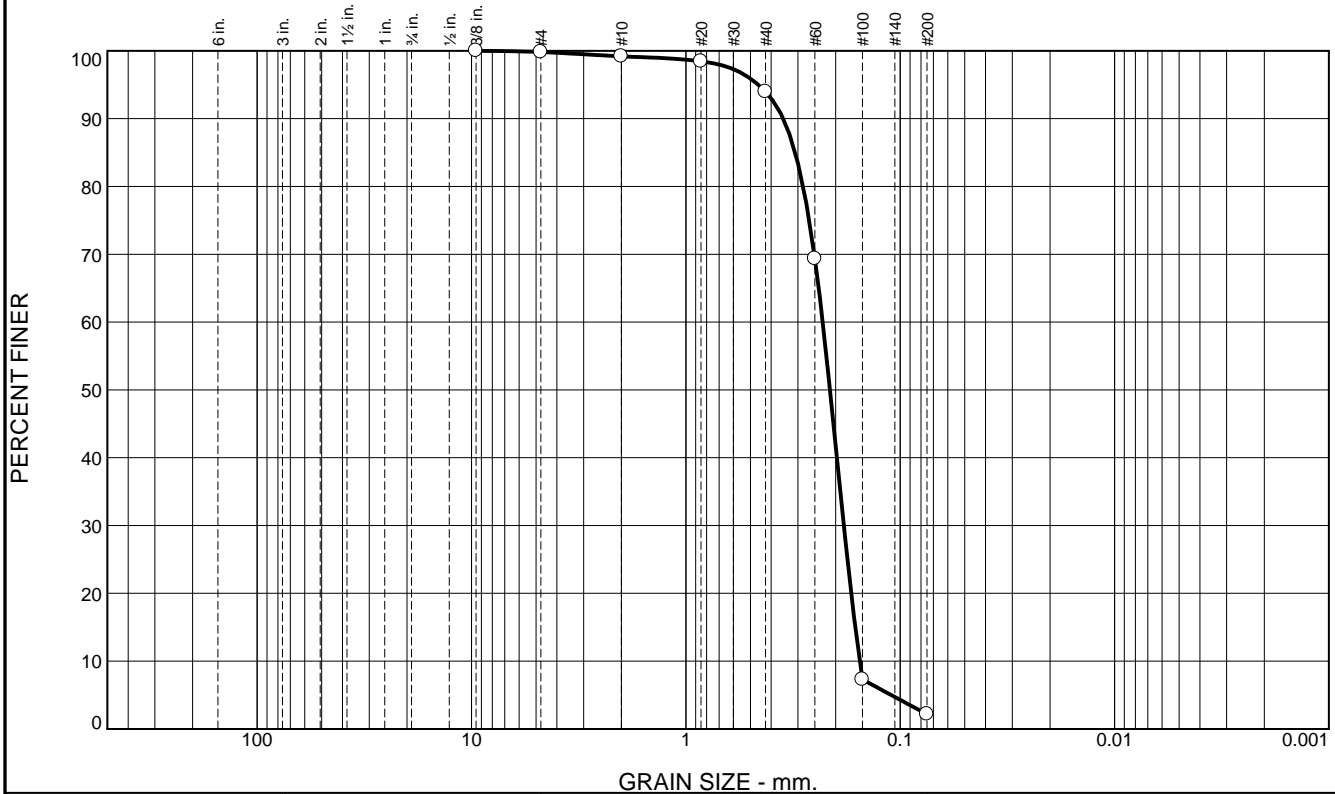
Client: US Army Corps of Engineers

Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.6	5.3	91.7	2.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.2		
#20	98.4		
#40	93.9		
#60	69.3		
#100	7.3		
#200	2.2		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3513 D₈₅= 0.3092 D₆₀= 0.2300
D₅₀= 0.2126 D₃₀= 0.1832 D₁₅= 0.1621
D₁₀= 0.1545 C_u= 1.49 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-43B-11
Sample Number: TE Lab ID: 5054.67

Depth: 4.5 - 9.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.5	96.1	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.4		
#60	89.3		
#100	15.0		
#200	3.3		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2567 D₈₅= 0.2403 D₆₀= 0.2019
D₅₀= 0.1900 D₃₀= 0.1677 D₁₅= 0.1501
D₁₀= 0.1117 C_u= 1.81 C_c= 1.25

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-43C-11
Sample Number: TE Lab ID: 5054.68

Depth: 9.5 - 13.9 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-44-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-44-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.			12. TOTAL SAMPLES	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL		13. TOTAL NUMBER CORE BOXES
6. THICKNESS OF OVERBURDEN N/A		BEARING		14. WATER DEPTH 13.5 Ft.
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-24-11 COMPLETED 06-24-11
8. TOTAL DEPTH OF BORING 12.0 Ft.		16. ELEVATION TOP OF BORING -13.2 Ft.		17. TOTAL RECOVERY FOR BORING 100%
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

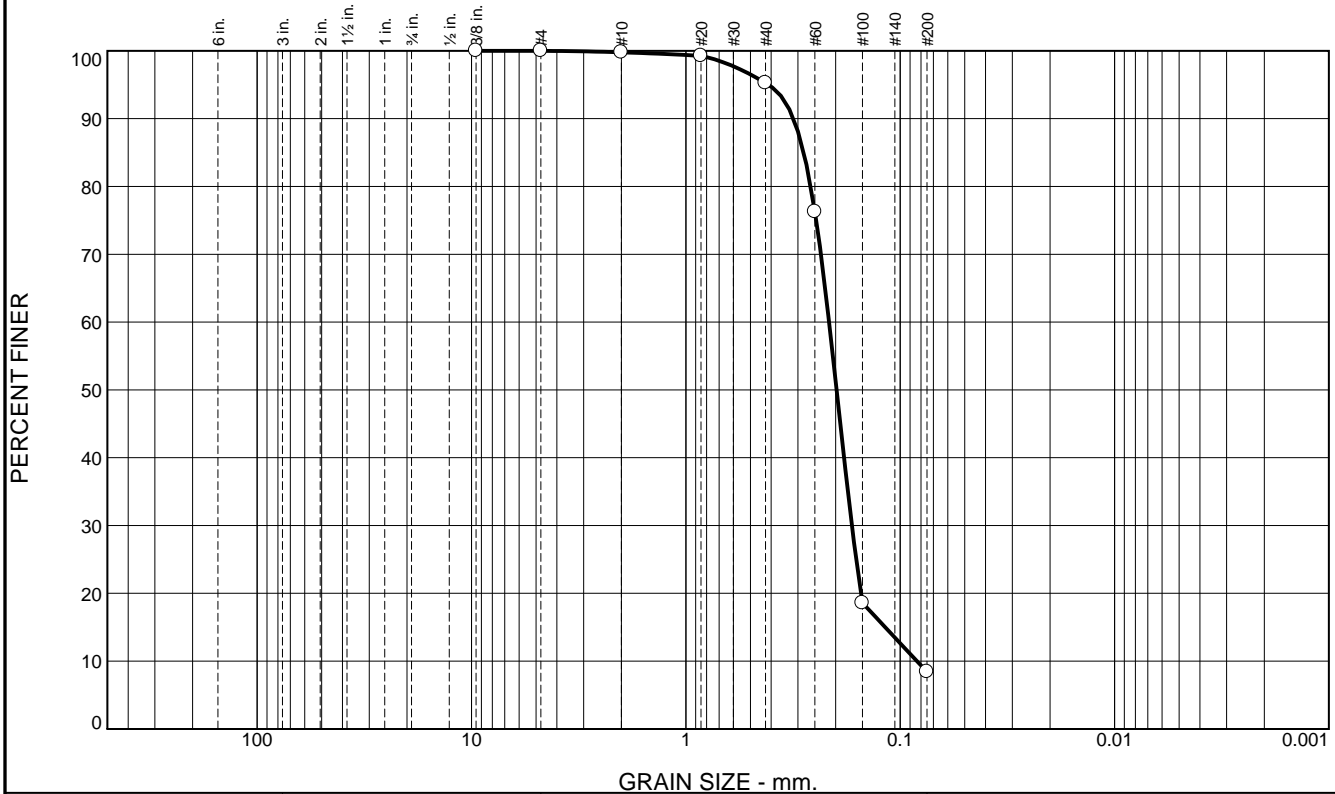
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.2	0.0				
-14.2	1.0		SAND, clayey, mostly fine-grained sand-sized quartz, some clay, dark gray (SC)	NS	0
			CLAY, lean, dark gray (CL)		
-16.3	3.1				
-18.2	5.0		SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)		
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)		
-22.5	9.3				
-23.7	10.5		CLAY, lean, dark gray (CL)		
-24.7	11.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, gray (SP)		
-25.2	12.0		SAND, clayey, mostly fine-grained sand-sized quartz, gray (SC)		
<p>NOTES:</p> <ol style="list-style-type: none"> 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor. 					

Boring Designation BI-CI-45-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-45-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13.6 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-24-11
8. TOTAL DEPTH OF BORING 12.4 Ft.		16. ELEVATION TOP OF BORING -13.5 Ft.		COMPLETED 06-24-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.5	0.0				
-15.5	2.0	|||||	SAND, silty, mostly fine-grained sand-sized quartz, trace clay, gray (SM)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.198 mm % Fines: 8.4
		.....	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, lt. gray (SP)	B	Classification: SP Color: 5Y 5/1-gray D50: 0.1915 mm % Fines: 4.1
		.....		C	Classification: SP-SM Color: 5Y 5/1-gray D50: 0.1771 mm % Fines: 6.4
-25.9	12.4				
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	4.5	86.9	8.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.3		
#40	95.3		
#60	76.3		
#100	18.6		
#200	8.4		

Material Description

Slightly silty SAND (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3150 D₈₅= 0.2821 D₆₀= 0.2146
D₅₀= 0.1980 D₃₀= 0.1680 D₁₅= 0.1175
D₁₀= 0.0835 C_u= 2.57 C_c= 1.57

Classification

USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-45A-11
Sample Number: TE Lab ID: 5054.69

Depth: 0.0 - 2.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.7	94.0	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.6		
#40	98.1		
#60	83.7		
#100	18.4		
#200	4.1		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3009 D₈₅= 0.2592 D₆₀= 0.2055
D₅₀= 0.1915 D₃₀= 0.1657 D₁₅= 0.1270
D₁₀= 0.0998 C_u= 2.06 C_c= 1.34

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-45B-11
Sample Number: TE Lab ID: 5054.70

Depth: 2.0 - 7.0 (ft)

Date: 7/18/11

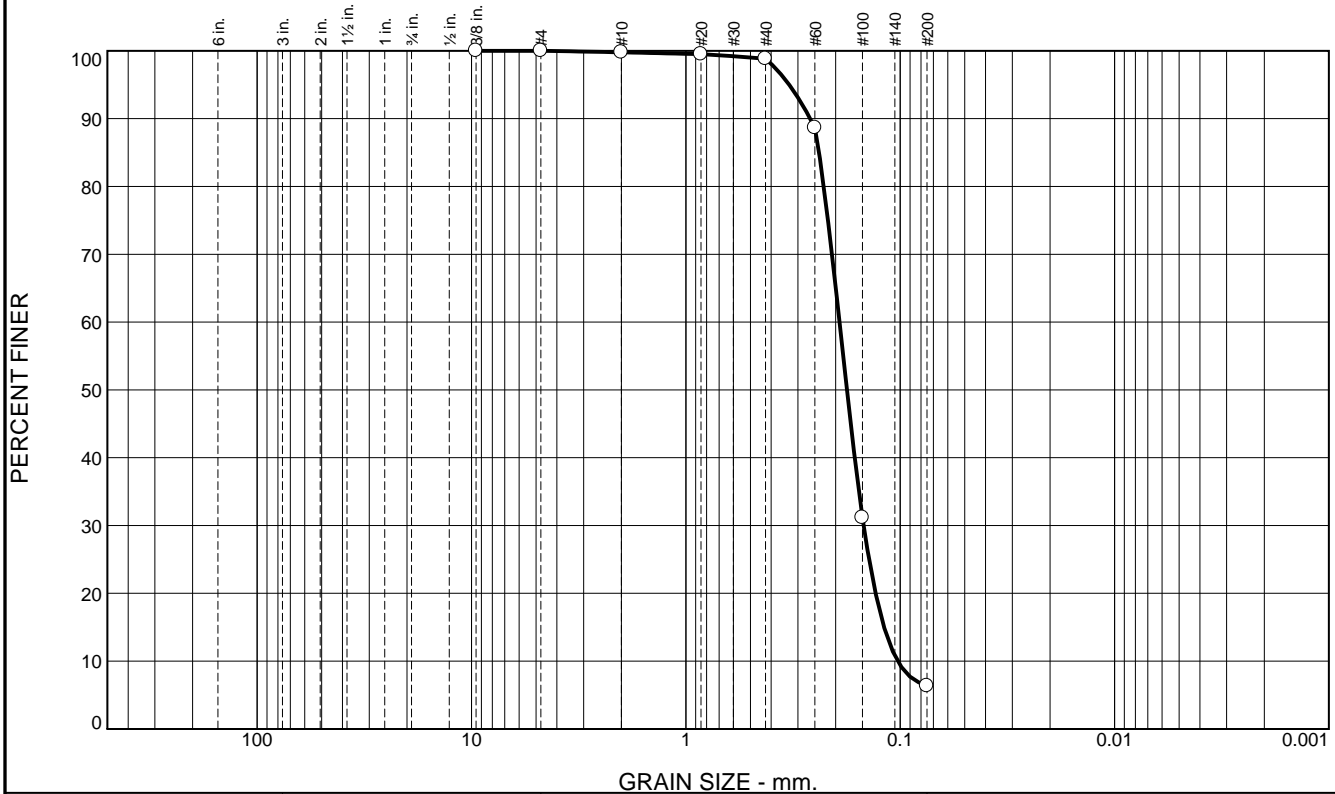
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.0	92.4	6.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.5		
#40	98.8		
#60	88.7		
#100	31.2		
#200	6.4		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2631 D₈₅= 0.2393 D₆₀= 0.1918
 D₅₀= 0.1771 D₃₀= 0.1482 D₁₅= 0.1189
 D₁₀= 0.1027 C_u= 1.87 C_c= 1.11

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-45C-11
Sample Number: TE Lab ID: 5054.71

Depth: 7.0 - 12.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-46-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-46-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-23-11
8. TOTAL DEPTH OF BORING 18.0 Ft.		16. ELEVATION TOP OF BORING -12.3 Ft.		COMPLETED 06-23-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.3	0.0	|	SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.1986 mm % Fines: 6.9
-16.3	4.0	|	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	B	Classification: SP Color: 5Y 4/1-dark gray D50: 0.2257 mm % Fines: 2.1
		|	At El. -20.0 Ft., mostly medium-grained sand-sized quartz, trace shell fragments, lt. gray	C	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2114 mm % Fines: 2
-25.7	13.4	|	CLAY, lean, trace shell fragments, trace fine-grained sand, dark gray (CL)	NS	
-30.3	18.0	|	NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.1	2.4	90.2	6.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	99.5		
#20	99.3		
#40	97.1		
#60	77.2		
#100	16.6		
#200	6.9		

Material Description

Slightly silty SAND (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3019 D₈₅= 0.2758 D₆₀= 0.2145
D₅₀= 0.1986 D₃₀= 0.1700 D₁₅= 0.1334
D₁₀= 0.0933 C_u= 2.30 C_c= 1.44

Classification

USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-46A-11
Sample Number: TE Lab ID: 5054.38

Depth: 0.0 - 4.0 (ft)

Date: 7/18/11

Thompson Engineering

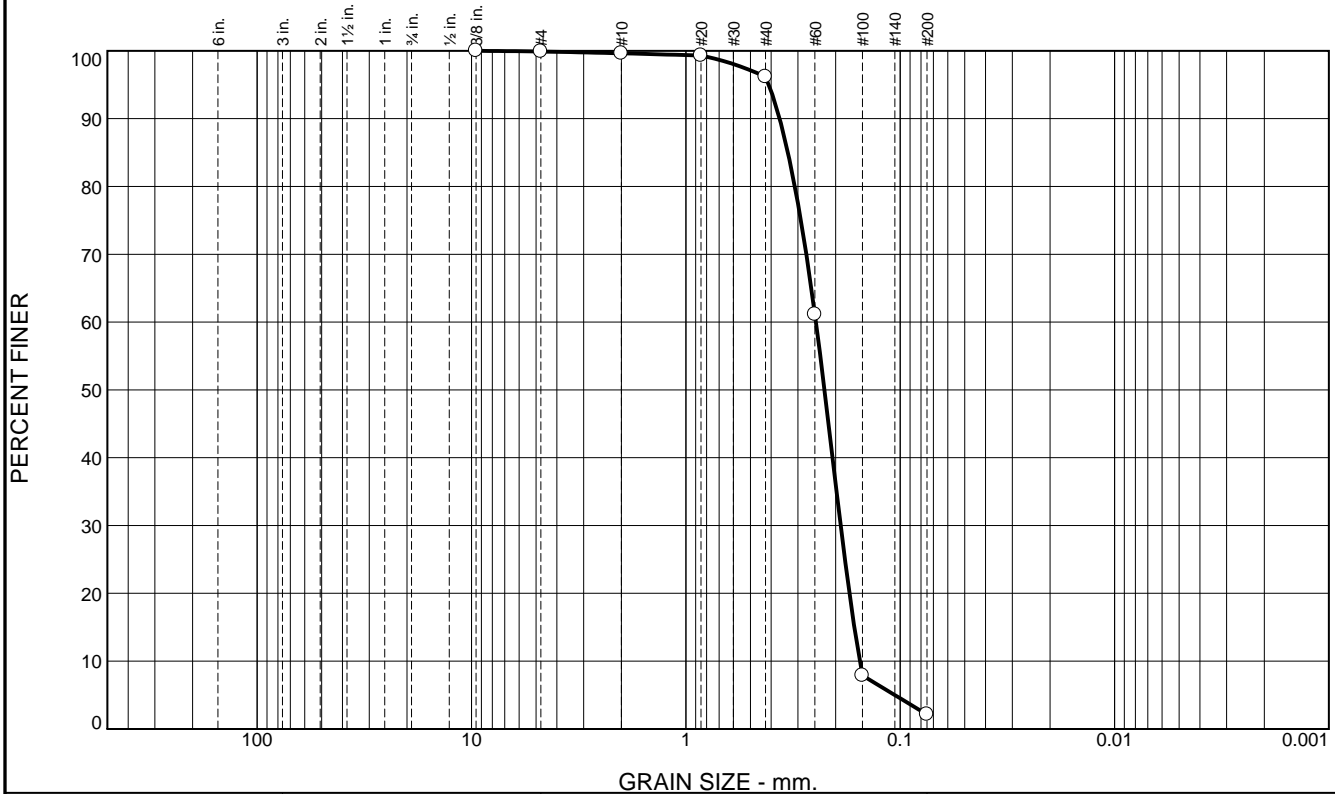
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	3.4	94.1	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.6		
#20	99.3		
#40	96.2		
#60	61.1		
#100	7.9		
#200	2.1		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3653 D₈₅= 0.3343 D₆₀= 0.2473

D₅₀= 0.2257 D₃₀= 0.1895 D₁₅= 0.1637

D₁₀= 0.1543 C_u= 1.60 C_c= 0.94

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-46B-11
Sample Number: TE Lab ID: 5054.39

Depth: 4.0 - 9.0 (ft)

Date: 7/18/11

Thompson Engineering

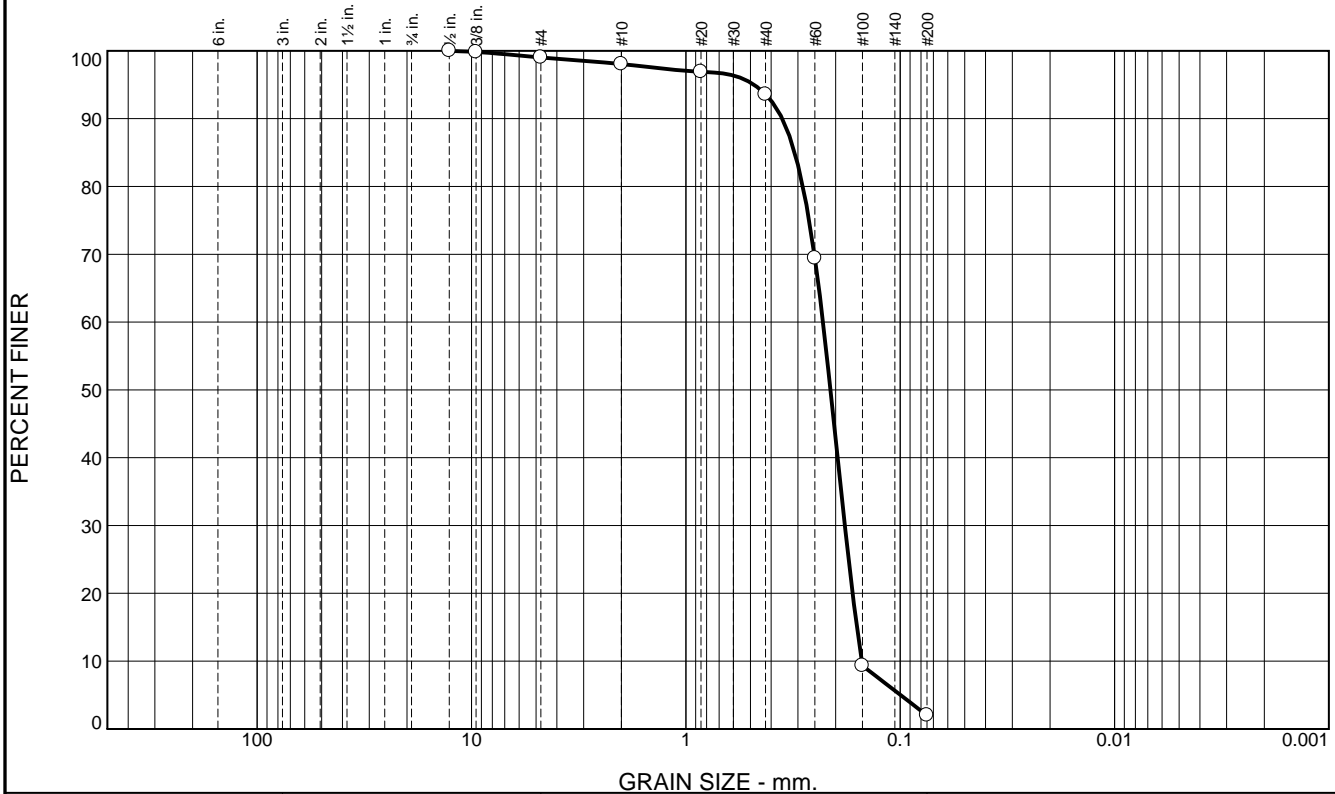
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	1.0	4.4	91.6	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.8		
#4	99.0		
#10	98.0		
#20	96.9		
#40	93.6		
#60	69.4		
#100	9.3		
#200	2.0		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3550 D₈₅= 0.3109 D₆₀= 0.2293
D₅₀= 0.2114 D₃₀= 0.1812 D₁₅= 0.1593
D₁₀= 0.1512 C_u= 1.52 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-46C-11
Sample Number: TE Lab ID: 5054.40

Depth: 9.0 - 13.4 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-47-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-47-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 915,792 N = 266,445	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -11.9 Ft.		STARTED 06-23-11
8. TOTAL DEPTH OF BORING 14.8 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-23-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.9	0.0				
		↑↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, some clay, trace shell fragments, dark gray (SM)	NS	0
-15.4	3.5	●●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)		5
-19.6	7.7	▨▨▨▨▨	CLAY, lean, dark gray (CL)		10
-21.7	9.8	●●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)		15
-22.1	10.2	▨▨▨▨▨	CLAY, lean, dark gray (CL)		20
-25.5	13.6	●●●●●	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace shell fragments, gray (SP)		25
-26.7	14.8	▨▨▨▨▨	CLAY, lean, dark gray (CL)		30
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Boring Designation BI-CI-48-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-48-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -11.8 Ft.		STARTED 06-23-11
8. TOTAL DEPTH OF BORING 17.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-23-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS	
-11.8	0.0					
-12.1	0.3	[Diagonal Hatching]	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	NS	0	
			SAND, clayey, mostly fine-grained sand-sized quartz, some clay, gray (SC)			
-16.3	4.5	[Diagonal Hatching]	CLAY, lean, dark gray (CL)			5
-17.8	6.0					
		[Vertical Lines]	SAND, silty, mostly fine-grained sand-sized quartz, some silt, dark gray (SM)			10
-21.8	10.0	[Dotted]	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, lt. gray (SP)	15		
			At El. -24.8 Ft., mostly fine to medium-grained sand-sized quartz, trace shell fragments, lt. gray			
-28.8	17.0			20		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>						

Boring Designation BI-CI-49-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-49-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 9.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-23-11
8. TOTAL DEPTH OF BORING 9.3 Ft.		16. ELEVATION TOP OF BORING -8.2 Ft.		COMPLETED 06-23-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.2	0.0				
-9.2	1.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.2361 mm % Fines: 8.5
-12.6	4.4	| | | | |	SAND, silty, mostly fine-grained sand-sized quartz, little silt, gray (SM)		
-17.5	9.3	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	B	Classification: SP Color: 5Y 4/2-olive gray D50: 0.1799 mm % Fines: 4.4
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	15.0	75.6	8.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.1		
#20	97.0		
#40	84.1		
#60	54.7		
#100	14.2		
#200	8.5		

Material Description
Slightly silty SAND (SP-SM), medium to fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.5202 D₈₅= 0.4367 D₆₀= 0.2684
 D₅₀= 0.2361 D₃₀= 0.1873 D₁₅= 0.1523
 D₁₀= 0.0902 C_u= 2.97 C_c= 1.45

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-49A-11
Sample Number: TE Lab ID: 5054.41

Depth: 0.0 - 4.4 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	94.9	4.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.3		
#60	88.3		
#100	28.5		
#200	4.4		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2652 D₈₅= 0.2406 D₆₀= 0.1942
 D₅₀= 0.1799 D₃₀= 0.1523 D₁₅= 0.1259
 D₁₀= 0.1130 C_u= 1.72 C_c= 1.06

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-49B-11
Sample Number: TE Lab ID: 5054.42

Depth: 4.4 - 9.3 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-50-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-50-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-24-11
8. TOTAL DEPTH OF BORING 13.9 Ft.		16. ELEVATION TOP OF BORING -13.2 Ft.		COMPLETED 06-24-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.2	0.0				
-15.2	2.0		SAND, silty, mostly fine-grained sand-sized quartz, some silt, little clay, dark gray (SM)	A	Classification: SP-SM Color: 5Y 3/2-dark olive gray D50: 0.2023 mm % Fines: 10.4
				NS	
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, gray (SP)	B	Classification: SP-SM Color: 2.5Y 3/3-dark olive brown D50: 0.1975 mm % Fines: 7.8
			At El. -17.2 Ft., mostly fine-grained sand-sized quartz, lt. gray	NS	
				C	Classification: SP Color: 2.5Y 4/2-dark grayish brown D50: 0.195 mm % Fines: 3.5
-23.2	10.0		SAND, silty, mostly fine-grained sand-sized quartz, little silt, gray (SM)	NS	
-26.6	13.4		At El. -26.2 Ft., mostly fine-grained sand-sized quartz, some silt, gray		
-27.1	13.9		CLAY, lean, trace clay, dark gray (CL)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.2	3.2	85.9	10.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.5		
#20	99.2		
#40	96.3		
#60	73.4		
#100	17.5		
#200	10.4		

Material Description

Slightly silty SAND (SP-SM), fine grained

PL=	Atterberg Limits	PI=
	LL=	

D ₉₀ = 0.3253	Coefficients	D ₆₀ = 0.2200
D ₅₀ = 0.2023	D ₈₅ = 0.2927	D ₁₅ = 0.1178
D ₁₀ =	D ₃₀ = 0.1708	C _c =
	C _u =	

USCS= SP-SM	Classification	AASHTO=
-------------	-----------------------	---------

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-50A-11
Sample Number: TE Lab ID: 5054.53

Depth: 0.0 - 1.5 (ft)

Date: 7/18/11

Thompson Engineering

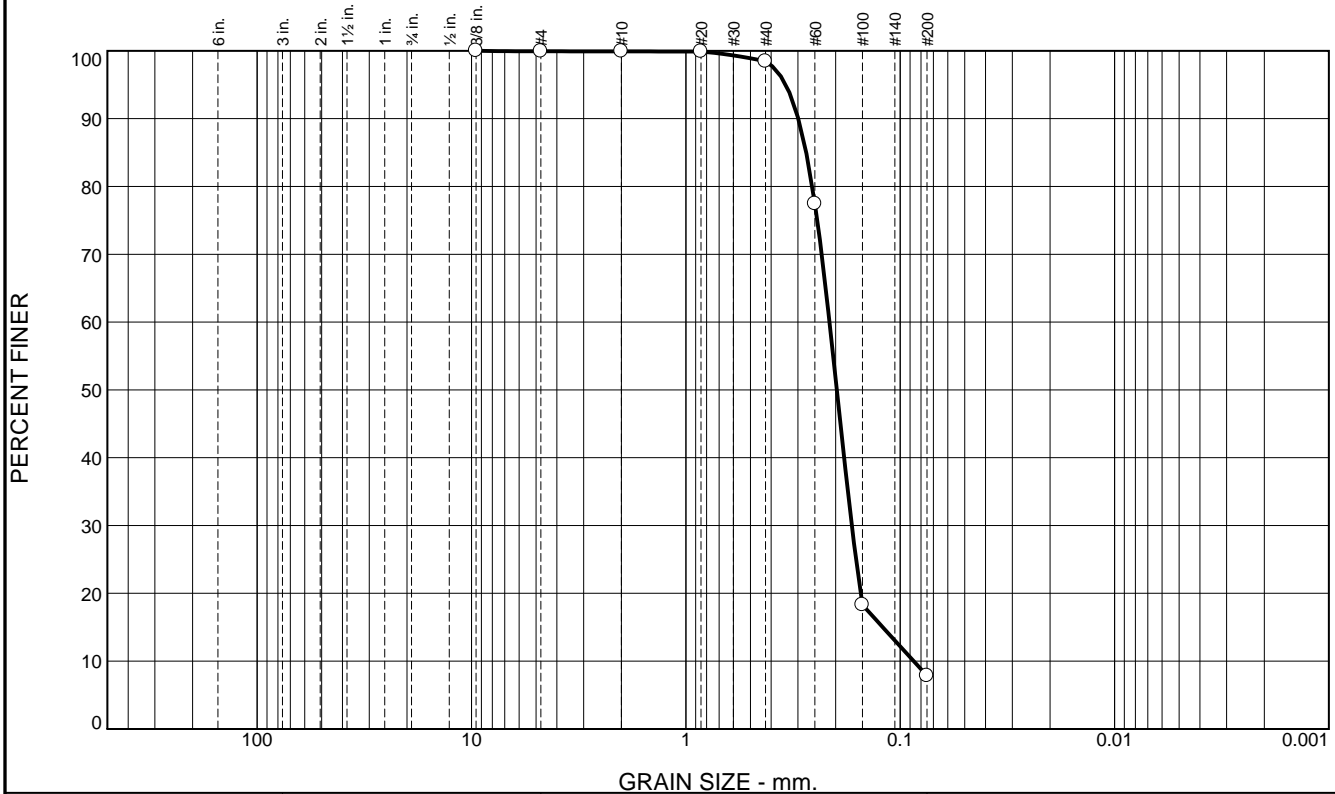
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.0	1.4	90.7	7.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.9		
#20	99.9		
#40	98.5		
#60	77.4		
#100	18.3		
#200	7.8		

Material Description

Slightly silty SAND (SP-SM), fine grained

PL=	Atterberg Limits	PI=
	LL=	

	Coefficients	
D ₉₀ = 0.2991	D ₈₅ = 0.2746	D ₆₀ = 0.2137
D ₅₀ = 0.1975	D ₃₀ = 0.1682	D ₁₅ = 0.1206
D ₁₀ = 0.0865	C _u = 2.47	C _c = 1.53

USCS= SP-SM	Classification
	AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-50B-11
Sample Number: TE Lab ID: 5054.54

Depth: 2.0 - 4.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.8	94.6	3.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	98.1		
#60	79.9		
#100	17.9		
#200	3.5		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2879 D₈₅= 0.2659 D₆₀= 0.2102
D₅₀= 0.1950 D₃₀= 0.1674 D₁₅= 0.1304
D₁₀= 0.1026 C_u= 2.05 C_c= 1.30

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-50C-11
Sample Number: TE Lab ID: 5054.55

Depth: 5.0 - 10.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

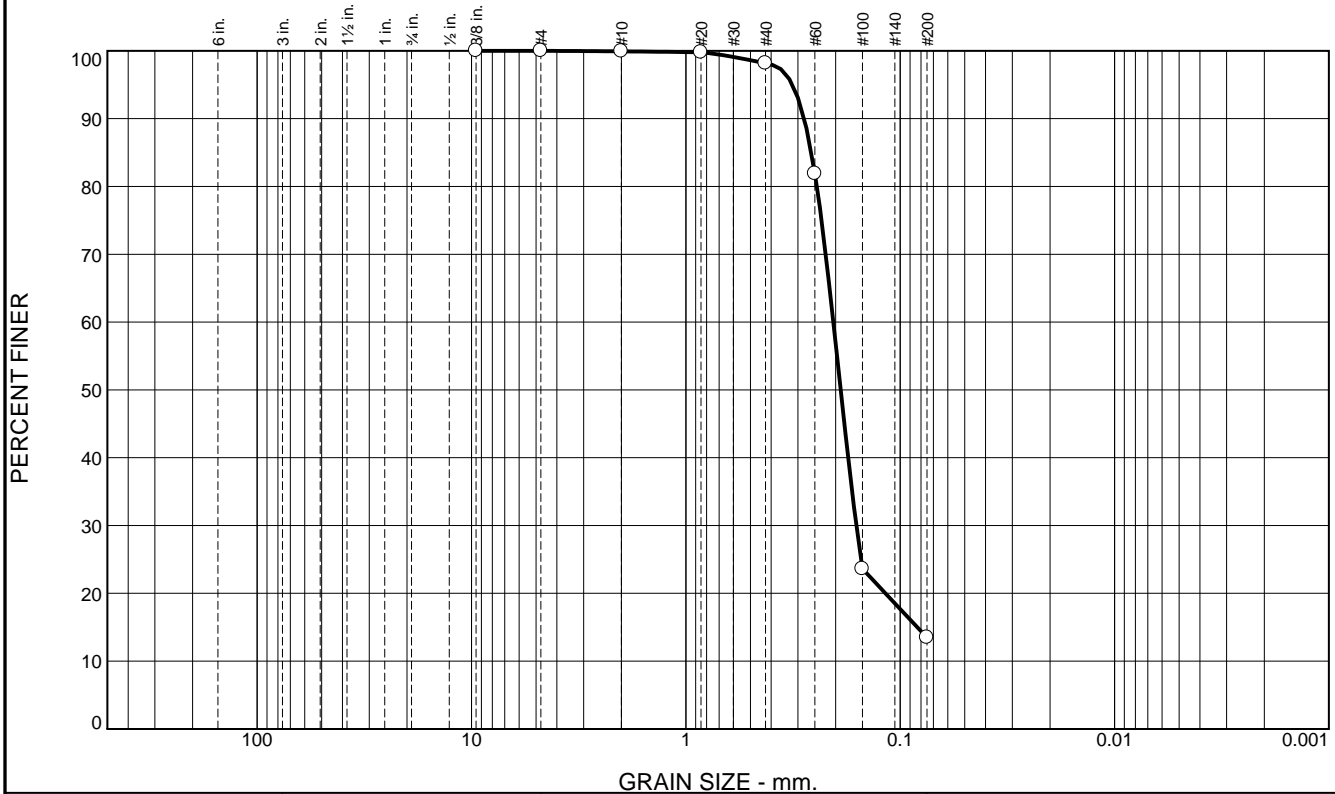
Figure

Boring Designation BI-CI-51-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-51-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-25-11 COMPLETED 06-25-11
8. TOTAL DEPTH OF BORING 14.6 Ft.		16. ELEVATION TOP OF BORING -14.4 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.4	0.0				
-16.1	1.7		SAND, silty, mostly fine-grained sand-sized quartz, trace clay, gray (SM)	A	Classification: SM Color: 5Y 3/2-dark olive gray D50: 0.1895 mm % Fines: 13.5
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, gray (SP)	B	Classification: SP Color: 5Y 4/2-olive gray D50: 0.1854 mm % Fines: 4.2
				C	Classification: SP-SM Color: 2.5Y 6/2-light brownish gray D50: 0.1752 mm % Fines: 7
-27.0	12.6				
-29.0	14.6		SAND, silty, mostly fine-grained sand-sized quartz, some silt, little clay, gray (SM)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation determined from USACE hydrographic survey completed 2010.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.7	84.7	13.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	98.2		
#60	81.9		
#100	23.6		
#200	13.5		

Material Description
Silty SAND (SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2808 D₈₅= 0.2598 D₆₀= 0.2050
 D₅₀= 0.1895 D₃₀= 0.1602 D₁₅= 0.0832
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-51A-11
Sample Number: TE Lab ID: 5054.78

Depth: 0.0 - 1.7 (ft)

Date: 7/18/11

Thompson Engineering

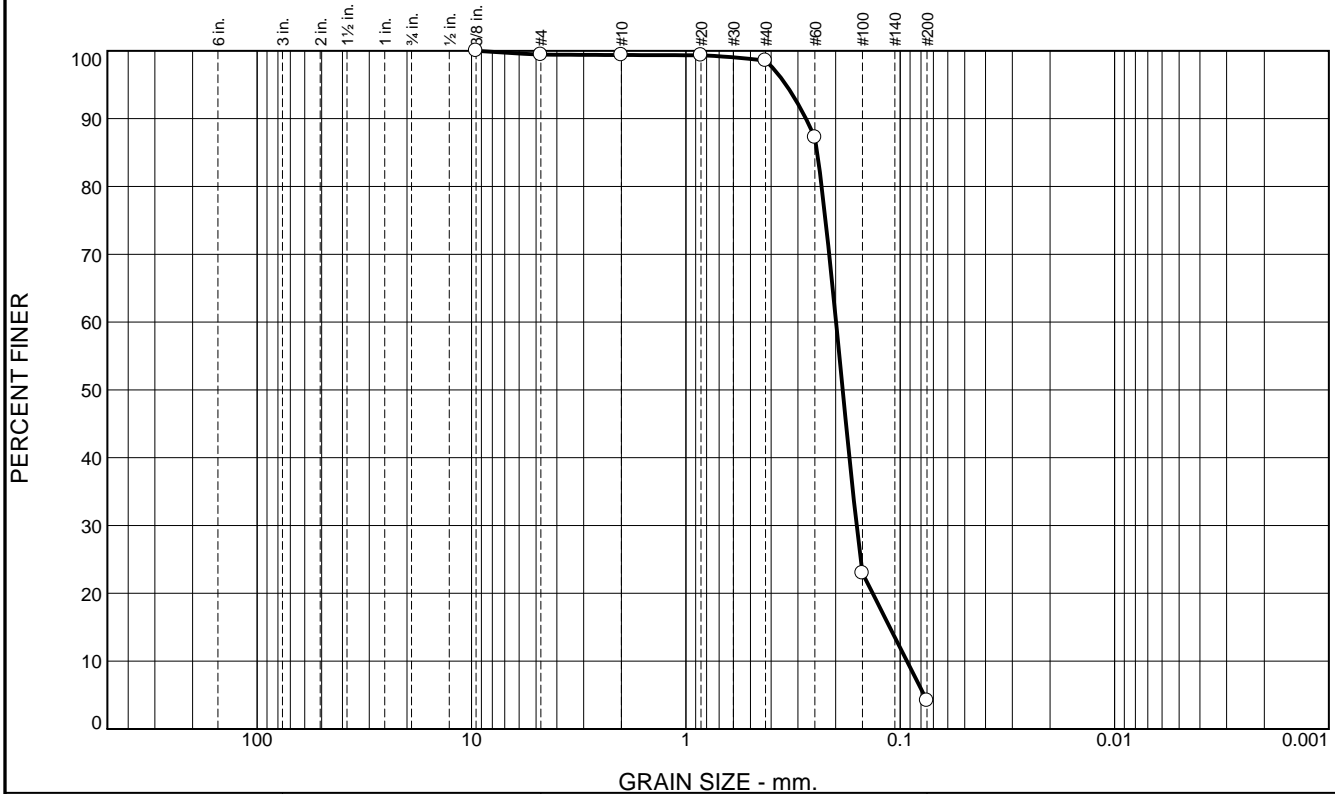
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.0	0.8	94.4	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.4		
#10	99.4		
#20	99.3		
#40	98.6		
#60	87.2		
#100	23.0		
#200	4.2		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2754 D₈₅= 0.2440 D₆₀= 0.1991
 D₅₀= 0.1854 D₃₀= 0.1597 D₁₅= 0.1118
 D₁₀= 0.0930 C_u= 2.14 C_c= 1.38

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-51B-11
Sample Number: TE Lab ID: 5054.79

Depth: 1.7 - 6.7 (ft)

Date: 7/18/11

Thompson Engineering

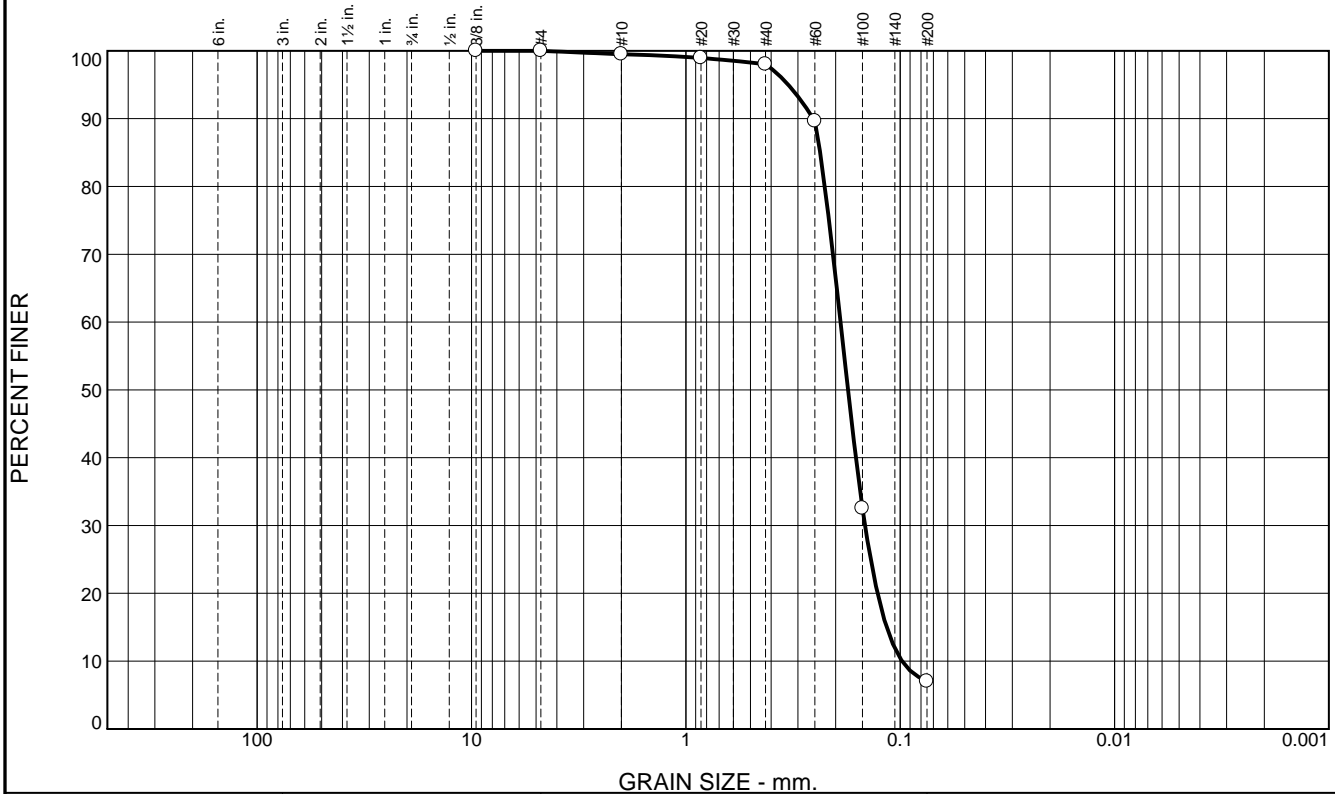
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	1.5	91.0	7.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.5		
#20	98.9		
#40	98.0		
#60	89.6		
#100	32.5		
#200	7.0		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2543 D₈₅= 0.2365 D₆₀= 0.1897
 D₅₀= 0.1752 D₃₀= 0.1460 D₁₅= 0.1157
 D₁₀= 0.0980 C_u= 1.94 C_c= 1.15

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-51C-11
Sample Number: TE Lab ID: 5054.80

Depth: 6.7 - 11.7 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-52-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-52-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		VERTICAL NAVD88
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		DISTURBED 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 18 Ft.		UNDISTURBED (UD)
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-27-11
8. TOTAL DEPTH OF BORING 17.4 Ft.		16. ELEVATION TOP OF BORING -16.6 Ft.		COMPLETED 06-27-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-16.6	0.0		CLAY, lean, little fine-grained sand, dark gray (CL)		
-22.0	5.4		SAND, silty, some fine-grained sand, dark gray (SM)		
-23.5	6.9		CLAY, lean, little fine-grained sand, dark gray (CL)	NS	
-31.8	15.2		SAND, silty, some sand, trace shell fragments, dark gray (SM)		
-34.0	17.4				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Boring Designation BI-CI-53-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-53-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 910,206 N = 255,912	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 19.8 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -17.8 Ft.		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 13.3 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-28-11
18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-17.8	0.0		CLAY, fat, discontinue sand, dark gray (CH)	NS	
-29.4	11.6				
-31.1	13.3		CLAY, lean, trace sand, dark gray (CL)		
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>		

Boring Designation BI-CI-59-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-59-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore
3. DRILLING AGENCY Corps of Engineers - CESAM		12. TOTAL SAMPLES		13. TOTAL NUMBER CORE BOXES
4. NAME OF DRILLER Construction Solutions International, Inc		14. WATER DEPTH 15.5 Ft.		15. DATE BORING
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		16. ELEVATION TOP OF BORING -13.5 Ft.	17. TOTAL RECOVERY FOR BORING 100%	18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist
6. THICKNESS OF OVERBURDEN N/A		19. LOCATION COORDINATES E = 908,061 N = 255,801		
7. DEPTH DRILLED INTO ROCK N/A		20. CONTRACTOR FILE NO.		
8. TOTAL DEPTH OF BORING 12.0 Ft.		21. DISTURBED 0		
22. BEARING		23. UNDISTURBED (UD) 0		

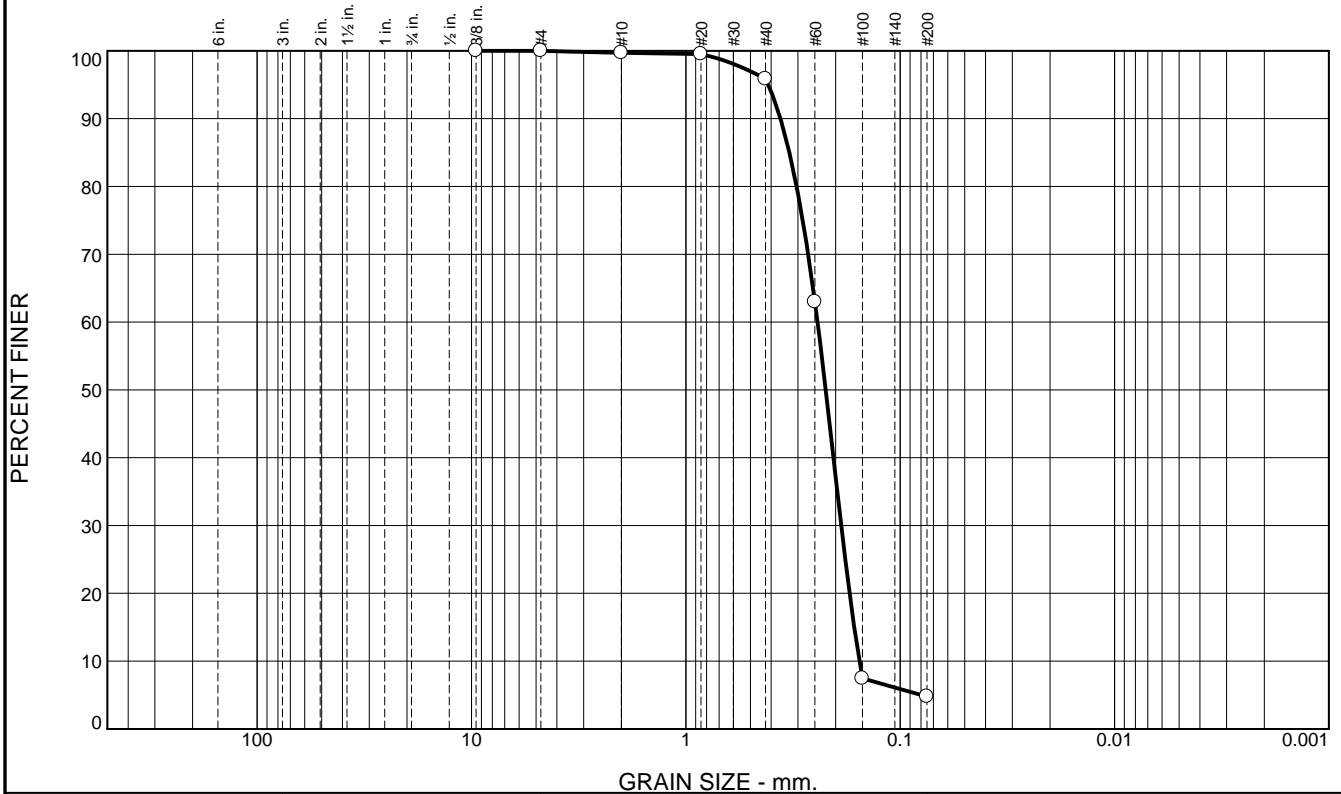
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.5	0.0				
-14.9	1.4	▨	CLAY, lean, some fine-grained sand, dark gray (CL)		
		▨	CLAY, fat, dark gray (CH)	NS	
			At El. -20.6 Ft., trace shell fragments, dark gray		
-25.5	12.0				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-CI-60-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-60-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 15.9 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 12.9 Ft.		16. ELEVATION TOP OF BORING -13.9 Ft.		COMPLETED 06-28-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.9	0.0				
		•••••	SAND, poorly-graded with silt, some sand, trace shell fragments, gray (SP-SM)	A	Classification: SP Color: 2.5Y 4/2-dark grayish brown D50: 0.2226 mm % Fines: 4.8
-17.4	3.5	•••••	SAND, silty, some fine-grained silt, gray (SM)	B	Classification: SP-SM Color: 2.5Y 7/2-light gray D50: 0.2043 mm % Fines: 5.4
		•••••		NS	
-26.8	12.9	•••••			
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	3.8	91.1	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.5		
#40	95.9		
#60	63.0		
#100	7.4		
#200	4.8		

Material Description

SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3620 D₈₅= 0.3291 D₆₀= 0.2431
 D₅₀= 0.2226 D₃₀= 0.1883 D₁₅= 0.1639
 D₁₀= 0.1550 C_u= 1.57 C_c= 0.94

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-60A-11 **Depth:** 0.0 - 3.5 (ft) **Date:** 7/15/11
Sample Number: TE Lab ID: 5054.92

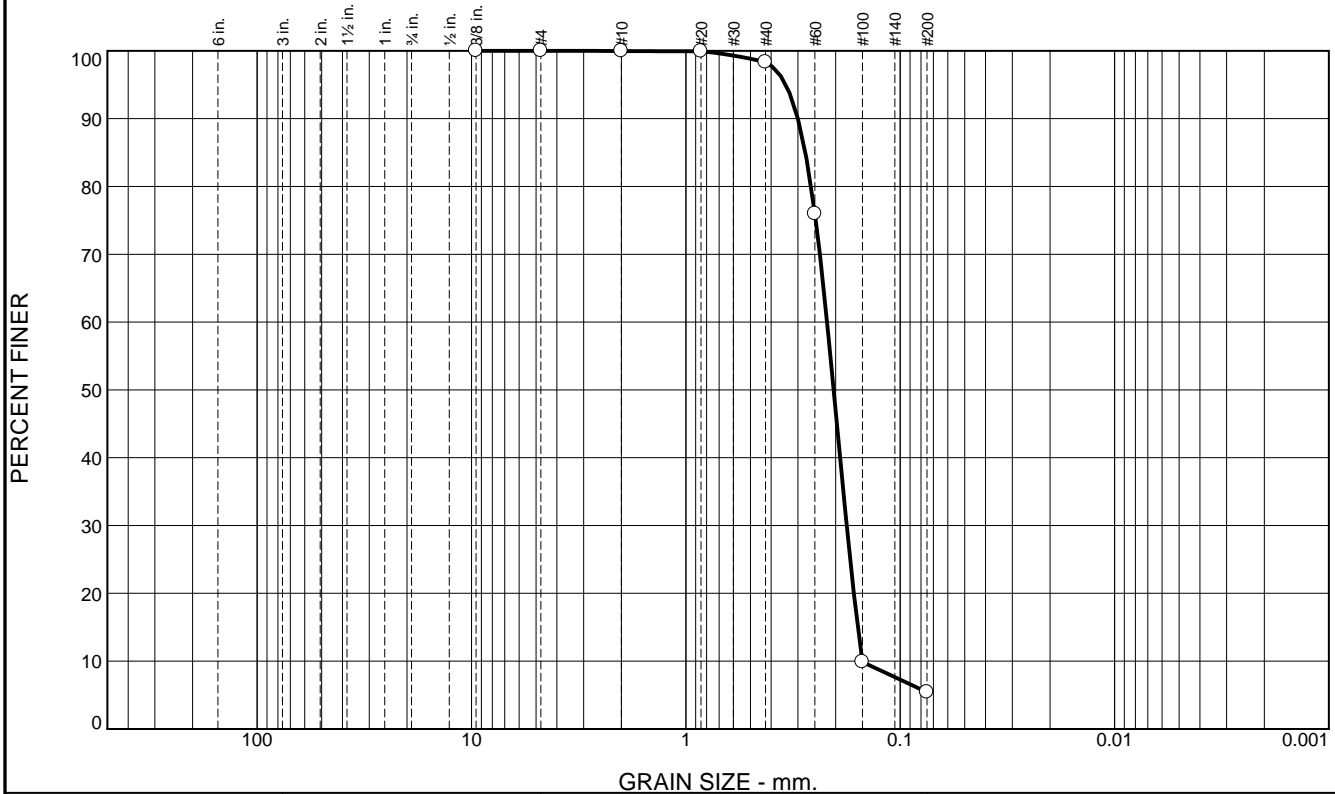
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.7	92.9	5.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.3		
#60	76.0		
#100	9.9		
#200	5.4		

Material Description

Slightly silty SAND (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3004 D₈₅= 0.2771 D₆₀= 0.2194
D₅₀= 0.2043 D₃₀= 0.1776 D₁₅= 0.1577
D₁₀= 0.1502 C_u= 1.46 C_c= 0.96

Classification

USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-66B-11
Sample Number: TE Lab ID: 5054.93

Should be BI-CI-60B-11

Depth: 3.5 - 7.6 (ft)

Date: 7/18/11

Thompson Engineering

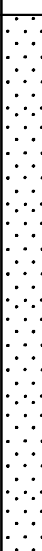
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

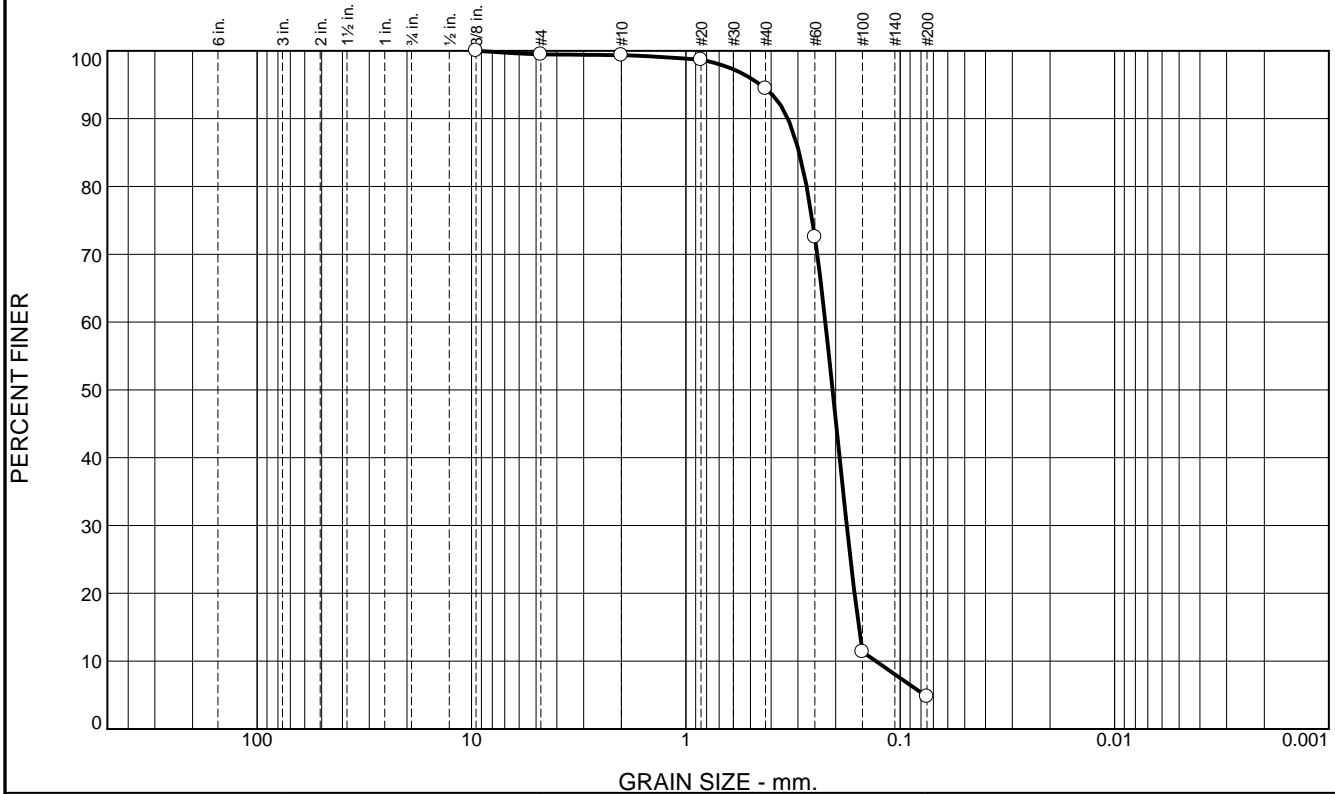
Figure

Boring Designation BI-CI-61-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-61-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14.6 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -13.4 Ft.		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 12.4 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-28-11
18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-13.4	0.0				
			SAND, poorly-graded, trace shell fragments, gray (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2066 mm % Fines: 4.8
			At El. -17.4 Ft., trace shell fragments, gray	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1925 mm % Fines: 3.3
				NS	
-25.8	12.4				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.1	5.0	89.6	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.5		
#10	99.4		
#20	98.7		
#40	94.4		
#60	72.5		
#100	11.4		
#200	4.8		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3345 D₈₅= 0.2963 D₆₀= 0.2234

D₅₀= 0.2066 D₃₀= 0.1775 D₁₅= 0.1559

D₁₀= 0.1299 C_u= 1.72 C_c= 1.09

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-61A-11
Sample Number: TE Lab ID: 5054.85

Depth: 0.0 - 4.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.1	2.6	93.5	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.5		
#10	99.4		
#20	98.9		
#40	96.8		
#60	84.9		
#100	15.4		
#200	3.3		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2996 D₈₅= 0.2505 D₆₀= 0.2055
D₅₀= 0.1925 D₃₀= 0.1684 D₁₅= 0.1465
D₁₀= 0.1100 C_u= 1.87 C_c= 1.26

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-61B-11
Sample Number: TE Lab ID: 5054.86

Depth: 4.0 - 7.1 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

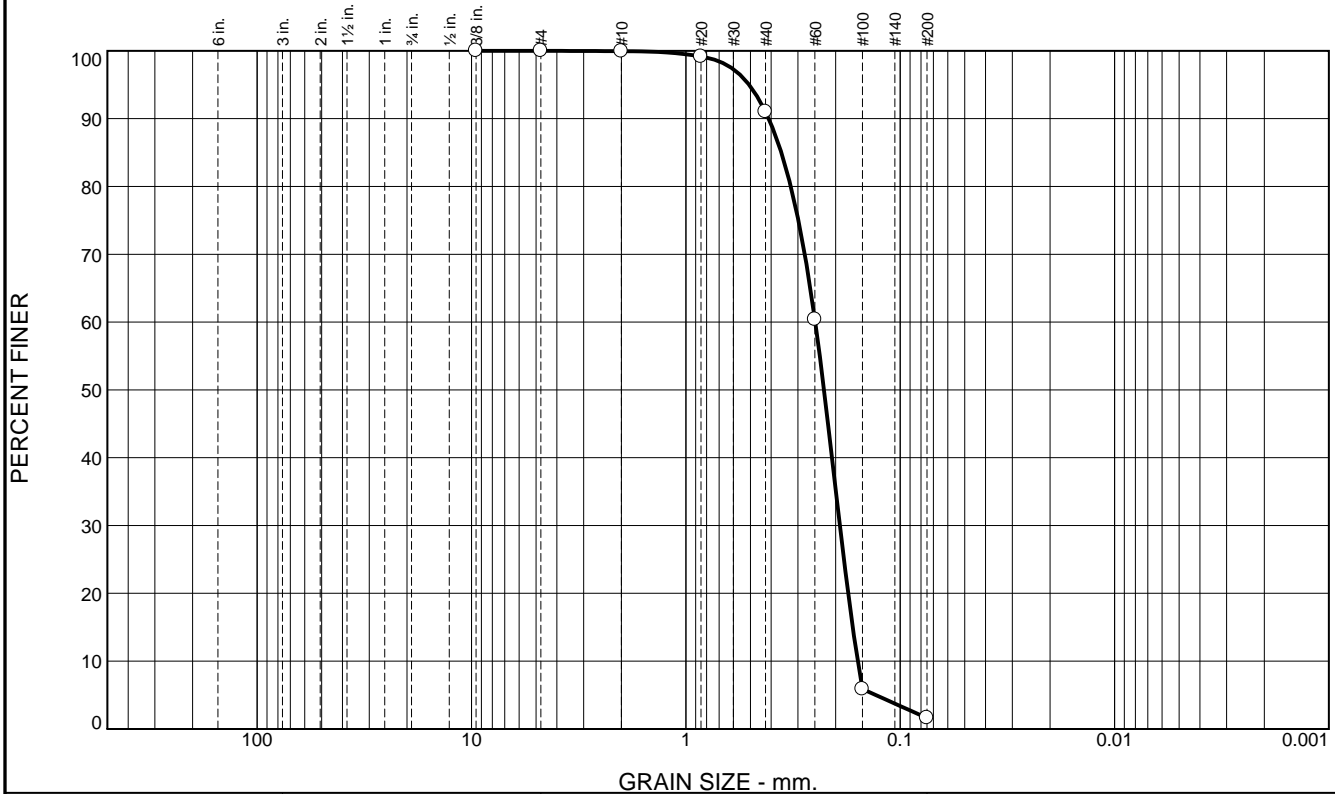
Figure

Boring Designation BI-CI-62-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-62-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.9 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 06-28-11		
8. TOTAL DEPTH OF BORING 10.3 Ft.		16. ELEVATION TOP OF BORING -10.8 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.8	0.0				
		•••••	SAND, poorly-graded, trace shell fragments, gray (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.2268 mm % Fines: 1.6
		•••••	At El. -15.8 Ft., trace shell fragments, gray	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1865 mm % Fines: 4.1
-21.1	10.3				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	8.9	89.4	1.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.2		
#40	91.0		
#60	60.4		
#100	5.9		
#200	1.6		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.4108	D ₈₅ = 0.3586	D ₆₀ = 0.2491
D ₅₀ = 0.2268	D ₃₀ = 0.1911	D ₁₅ = 0.1666
D ₁₀ = 0.1579	C _u = 1.58	C _c = 0.93

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-62A-11
Sample Number: TE Lab ID: 5054.87

Depth: 0.0 - 5.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	2.1	93.6	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.1		
#40	97.7		
#60	87.1		
#100	21.6		
#200	4.1		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.2796	D ₈₅ = 0.2444	D ₆₀ = 0.1999
D ₅₀ = 0.1865	D ₃₀ = 0.1613	D ₁₅ = 0.1154
D ₁₀ = 0.0947	C _u = 2.11	C _c = 1.37

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-62B-11
Sample Number: TE Lab ID: 5054.88

Depth: 5.0 - 10.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

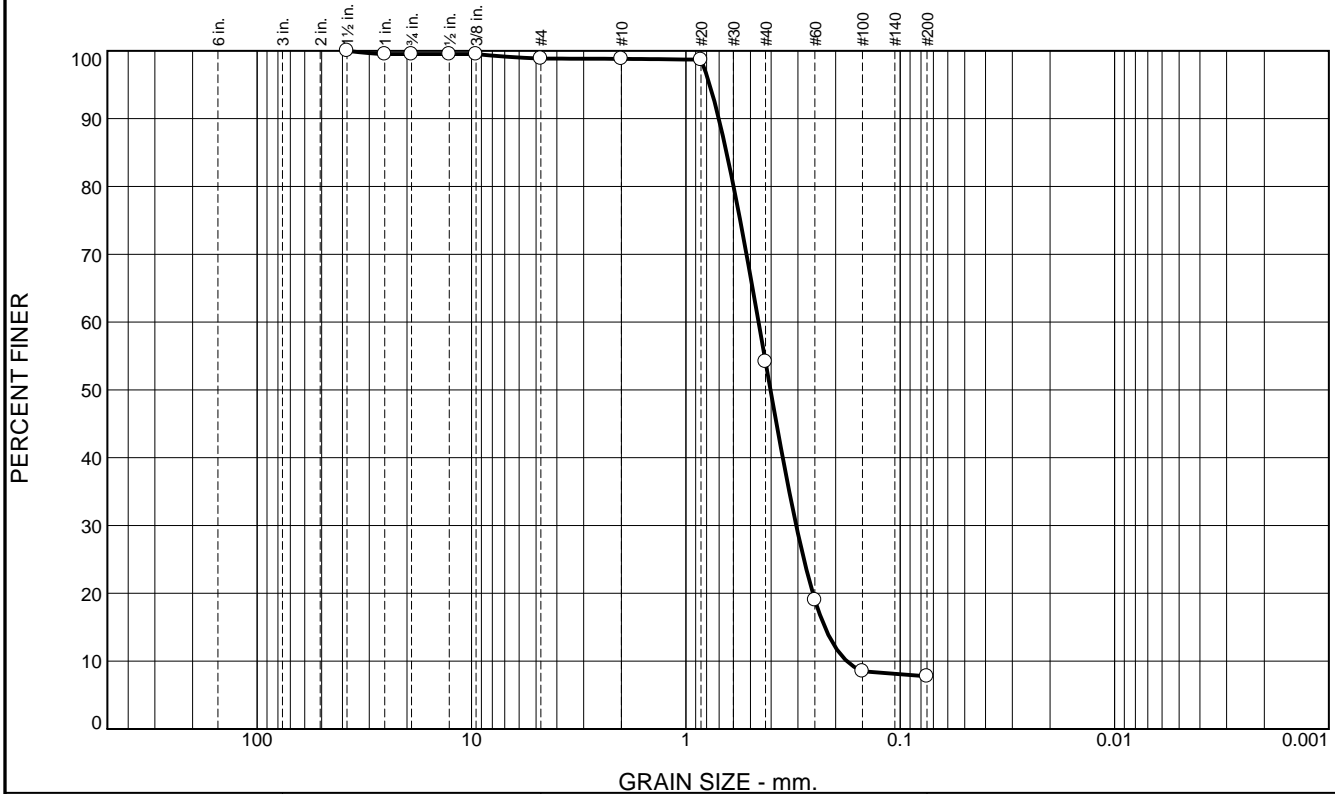
Figure

Boring Designation BI-CI-63-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-63-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore
3. DRILLING AGENCY Corps of Engineers - CESAM		12. TOTAL SAMPLES 3		13. TOTAL NUMBER CORE BOXES 0
4. NAME OF DRILLER Construction Solutions International, Inc			14. WATER DEPTH 11.8 Ft.	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		6. THICKNESS OF OVERBURDEN N/A	15. DATE BORING STARTED: 06-28-11 COMPLETED: 06-28-11	
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -11.4 Ft.		17. TOTAL RECOVERY FOR BORING 100%
8. TOTAL DEPTH OF BORING 12.3 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.4	0.0	•••••	SAND, poorly-graded, trace shell fragments, gray (SP)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.403 mm % Fines: 7.8
		•••••	At El. -15.4 Ft., trace shell fragments, lt. gray	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.203 mm % Fines: 2.8
		•••••		C	Classification: SP-SM Color: 2.5Y 5.5/2-brownish gray D50: 0.1592 mm % Fines: 8.2
		•••••		NS	
-23.7	12.3		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.5	0.6	0.1	44.7	46.3	7.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.5		
.75	99.5		
.5	99.5		
.375	99.5		
#4	98.9		
#10	98.7		
#20	98.7		
#40	54.1		
#60	19.0		
#100	8.5		
#200	7.8		

Material Description
Slightly silty SAND (SP-SM), medium to fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.7020 D₈₅= 0.6456 D₆₀= 0.4579
 D₅₀= 0.4030 D₃₀= 0.3058 D₁₅= 0.2247
 D₁₀= 0.1774 C_u= 2.58 C_c= 1.15

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-63A-11
Sample Number: TE Lab ID: 5054.89

Depth: 0.0 - 4.0 (ft)

Date: 7/18/11

Thompson Engineering

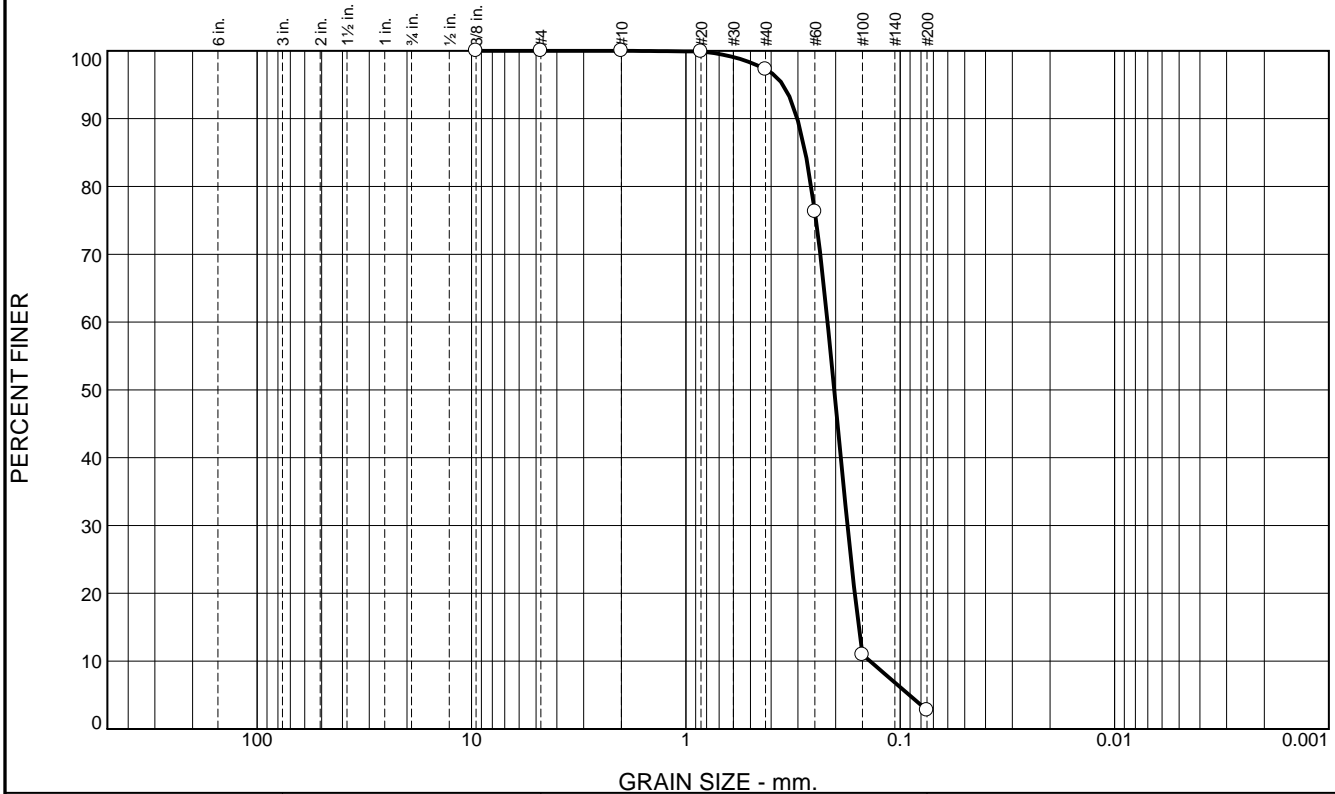
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.7	94.5	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	97.3		
#60	76.3		
#100	11.0		
#200	2.8		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3023 D₈₅= 0.2772 D₆₀= 0.2182
 D₅₀= 0.2030 D₃₀= 0.1762 D₁₅= 0.1561
 D₁₀= 0.1383 C_u= 1.58 C_c= 1.03

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-63B-11
Sample Number: TE Lab ID: 5054.90

Depth: 4.0 - 8.2 (ft)

Date: 7/18/11

Thompson Engineering

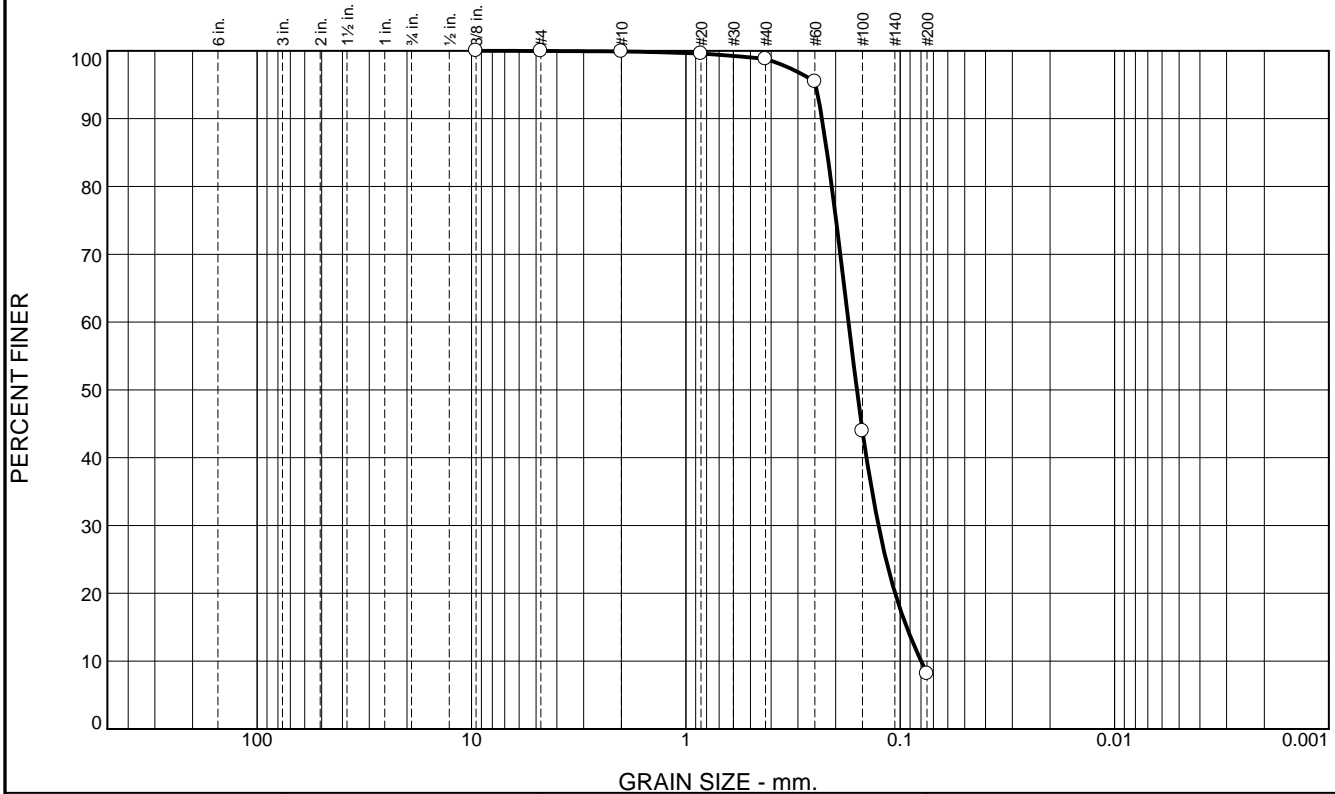
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.1	90.6	8.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.6		
#40	98.8		
#60	95.5		
#100	43.9		
#200	8.2		

Material Description

Slightly silty SAND (SP-SM), medium to fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2317 D₈₅= 0.2191 D₆₀= 0.1743
D₅₀= 0.1592 D₃₀= 0.1264 D₁₅= 0.0933
D₁₀= 0.0798 C_u= 2.18 C_c= 1.15

Classification

USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-63C-11
Sample Number: TE Lab ID: 5054.91

Depth: 8.2 - 9.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers

Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-64-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-64-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		VERTICAL NAVD88
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 907,005 N = 256,817	13. TOTAL NUMBER CORE BOXES	DISTURBED 0
6. THICKNESS OF OVERBURDEN N/A		CONTRACTOR FILE NO.	14. WATER DEPTH 12.6 Ft.	UNDISTURBED (UD)
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING	STARTED 06-28-11	COMPLETED 06-28-11
8. TOTAL DEPTH OF BORING 10.9 Ft.		16. ELEVATION TOP OF BORING -11.9 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.9	0.0		CLAY, lean, dark gray (CL)		
				NS	
-20.2	8.3		SAND, poorly-graded, mostly medium-grained sand-sized quartz, gray (SP)		
-20.7	8.8				
-22.8	10.9		CLAY, fat, dark gray (CH)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Boring Designation BI-CI-65-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-65-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc		12. TOTAL SAMPLES 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.6 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING STARTED 06-28-11 COMPLETED 06-28-11		
8. TOTAL DEPTH OF BORING 11.7 Ft.		16. ELEVATION TOP OF BORING -11.0 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

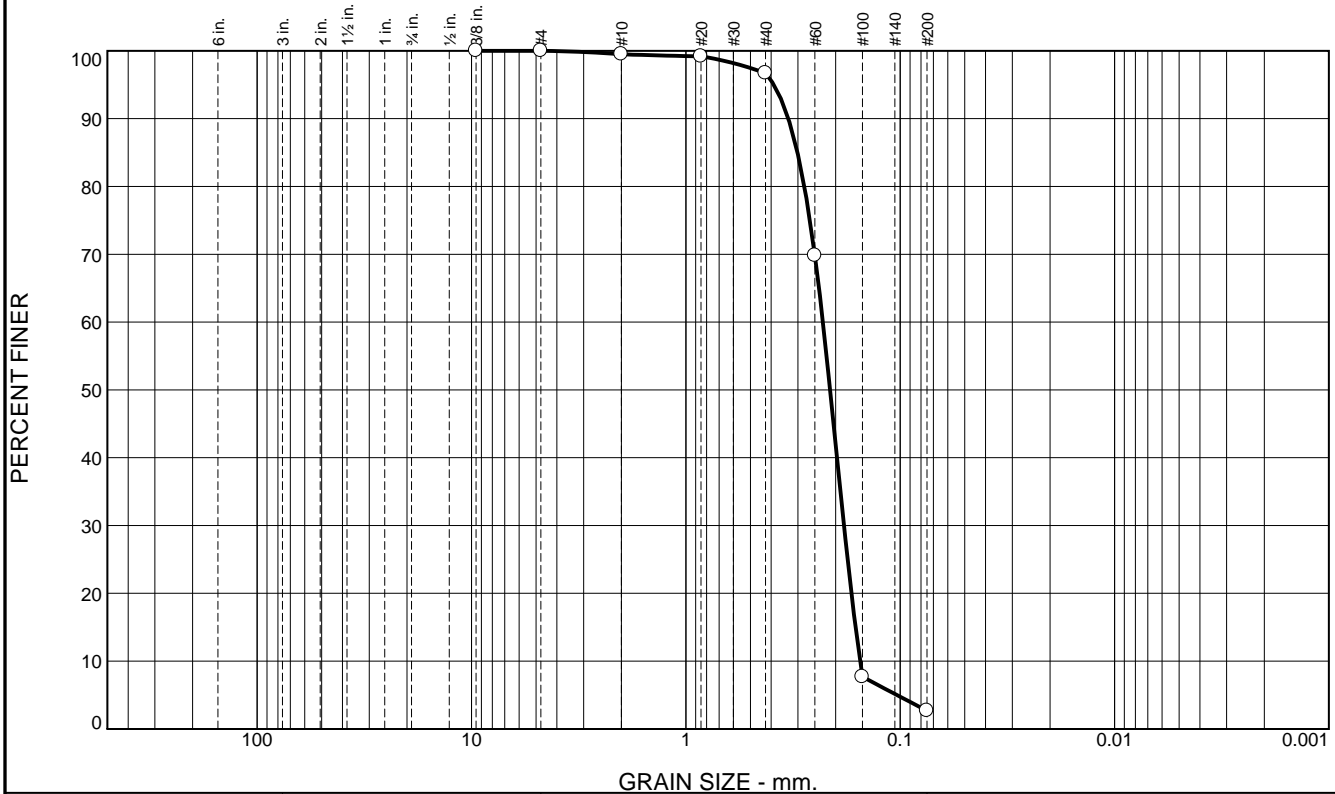
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.0	0.0				
-13.0	2.0		CLAY, lean, dark gray (CL)		
			CLAY, fat, dark gray (CH)	NS	
-22.7	11.7				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-CI-67-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-67-11		LOCATION COORDINATES E = 917,834 N = 270,914		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		HORIZONTAL NAD83
4. NAME OF DRILLER Construction Solutions International, Inc.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	12. TOTAL SAMPLES 4
6. THICKNESS OF OVERBURDEN N/A		13. TOTAL NUMBER CORE BOXES		DISTURBED 0
7. DEPTH DRILLED INTO ROCK N/A		14. WATER DEPTH 10 Ft.		UNDISTURBED (UD) 0
8. TOTAL DEPTH OF BORING 14.5 Ft.		15. DATE BORING 06-23-11		STARTED 06-23-11
		16. ELEVATION TOP OF BORING -9.6 Ft.		COMPLETED 06-23-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.6	0.0				
-11.6	2.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, gray and black (SP)	A	Classification: SP Color: 5Y 6/2-light olive gray D50: 0.2123 mm % Fines: 2.7
-16.1	6.5		SAND, silty, mostly fine-grained sand-sized quartz, trace silt, gray (SM)	B	Classification: SP-SM Color: 5Y 4/2-olive gray D50: 0.1999 mm % Fines: 9.4
-24.1	14.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, some shell fragments, gray (SP) At El. -18.6 Ft., mostly fine-grained sand-sized quartz, lt. gray	C	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.204 mm % Fines: 3
				D	Classification: SP Color: 2.5Y 6/1-gray D50: 0.193 mm % Fines: 2.3
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	2.8	94.0	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.5		
#20	99.2		
#40	96.7		
#60	69.8		
#100	7.7		
#200	2.7		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3327 D₈₅= 0.3016 D₆₀= 0.2295
D₅₀= 0.2123 D₃₀= 0.1829 D₁₅= 0.1616
D₁₀= 0.1539 C_u= 1.49 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-67A-11
Sample Number: TE Lab ID: 5054.43

Depth: 0.0 - 2.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	89.0	9.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.4		
#60	76.6		
#100	16.2		
#200	9.4		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3017 D₈₅= 0.2770 D₆₀= 0.2160
 D₅₀= 0.1999 D₃₀= 0.1711 D₁₅= 0.1329
 D₁₀= 0.0800 C_u= 2.70 C_c= 1.69

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-67B-11
Sample Number: TE Lab ID: 5054.44

Depth: 2.0 - 6.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.5	0.9	2.9	90.7	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	97.5		
#10	96.6		
#20	95.5		
#40	93.7		
#60	72.8		
#100	14.8		
#200	3.0		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3399 D₈₅= 0.2980 D₆₀= 0.2214
D₅₀= 0.2040 D₃₀= 0.1735 D₁₅= 0.1503
D₁₀= 0.1131 C_u= 1.96 C_c= 1.20

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-67C-11
Sample Number: TE Lab ID: 5054.45

Depth: 6.5 - 11.5 (ft)

Date: 7/18/11

Thompson Engineering

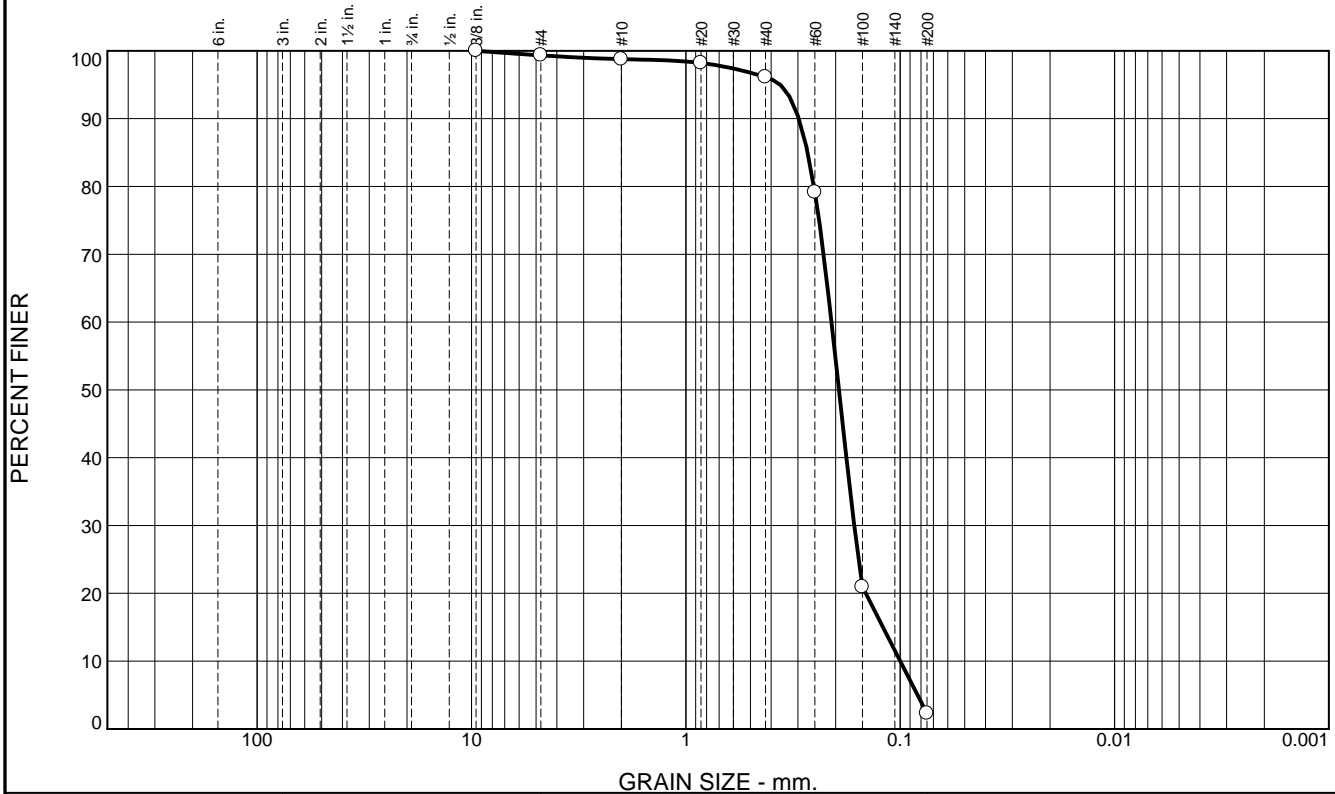
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	0.5	2.7	93.8	2.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.3		
#10	98.8		
#20	98.2		
#40	96.1		
#60	79.1		
#100	20.9		
#200	2.3		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2974 D₈₅= 0.2704 D₆₀= 0.2091
 D₅₀= 0.1930 D₃₀= 0.1638 D₁₅= 0.1203
 D₁₀= 0.0999 C_u= 2.09 C_c= 1.28

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-67D-11
Sample Number: TE Lab ID: 5054.46

Depth: 11.5 - 14.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

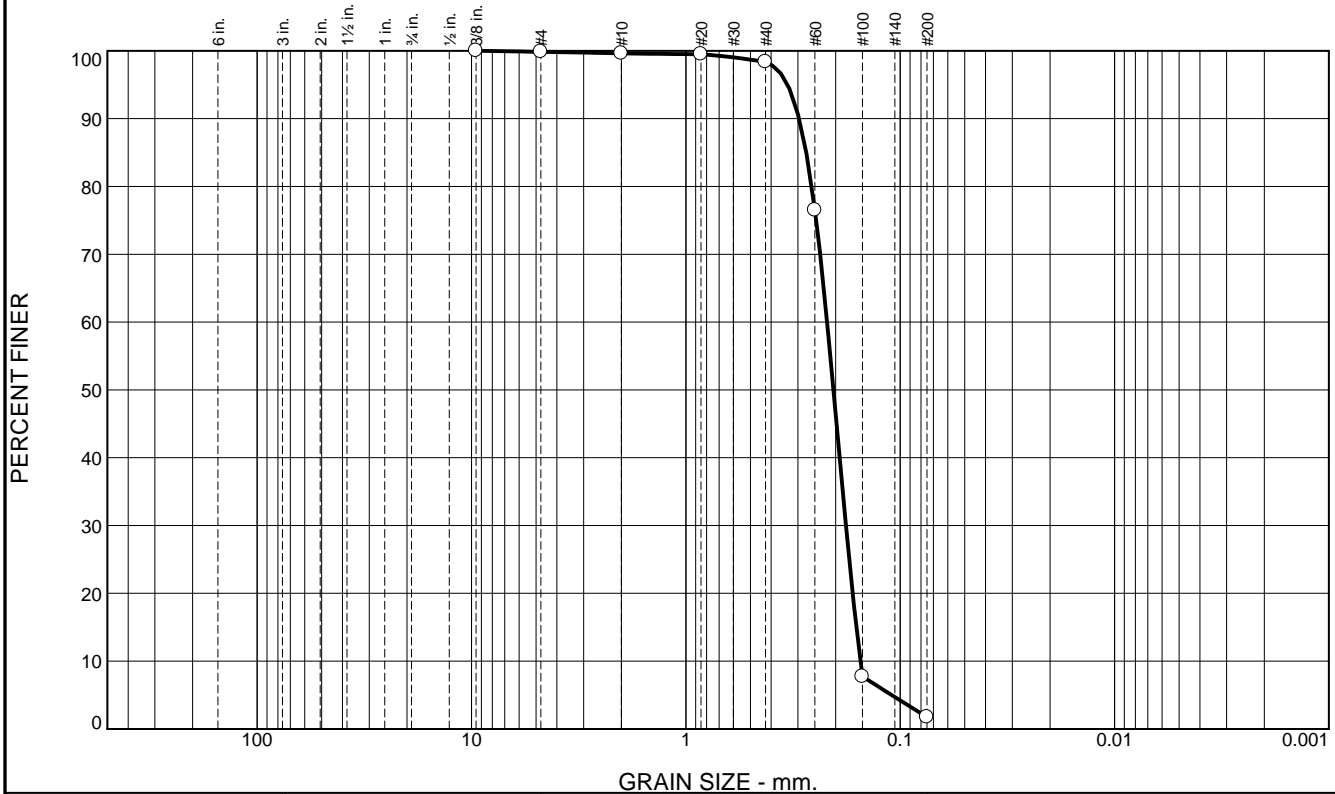
Figure

Boring Designation BI-CI-70-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-70-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 9 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 06-23-11		
8. TOTAL DEPTH OF BORING 11.4 Ft.		16. ELEVATION TOP OF BORING -8.1 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.1	0.0				
-11.0	2.9		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2047 mm % Fines: 1.7
-14.1	6.0		SAND, silty, mostly fine-grained sand-sized quartz, little silt, gray (SM)	B	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.1829 mm % Fines: 7.3
-16.1	8.0		CLAY, lean, gray (CL)	NS	
-19.5	11.4		SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.2	1.2	96.7	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.6		
#20	99.5		
#40	98.4		
#60	76.5		
#100	7.7		
#200	1.7		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2966 D₈₅= 0.2745 D₆₀= 0.2193
D₅₀= 0.2047 D₃₀= 0.1791 D₁₅= 0.1602
D₁₀= 0.1534 C_u= 1.43 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-70A-11
Sample Number: TE Lab ID: 5054.47

Depth: 0.0 - 2.9 (ft)

Date: 7/18/11

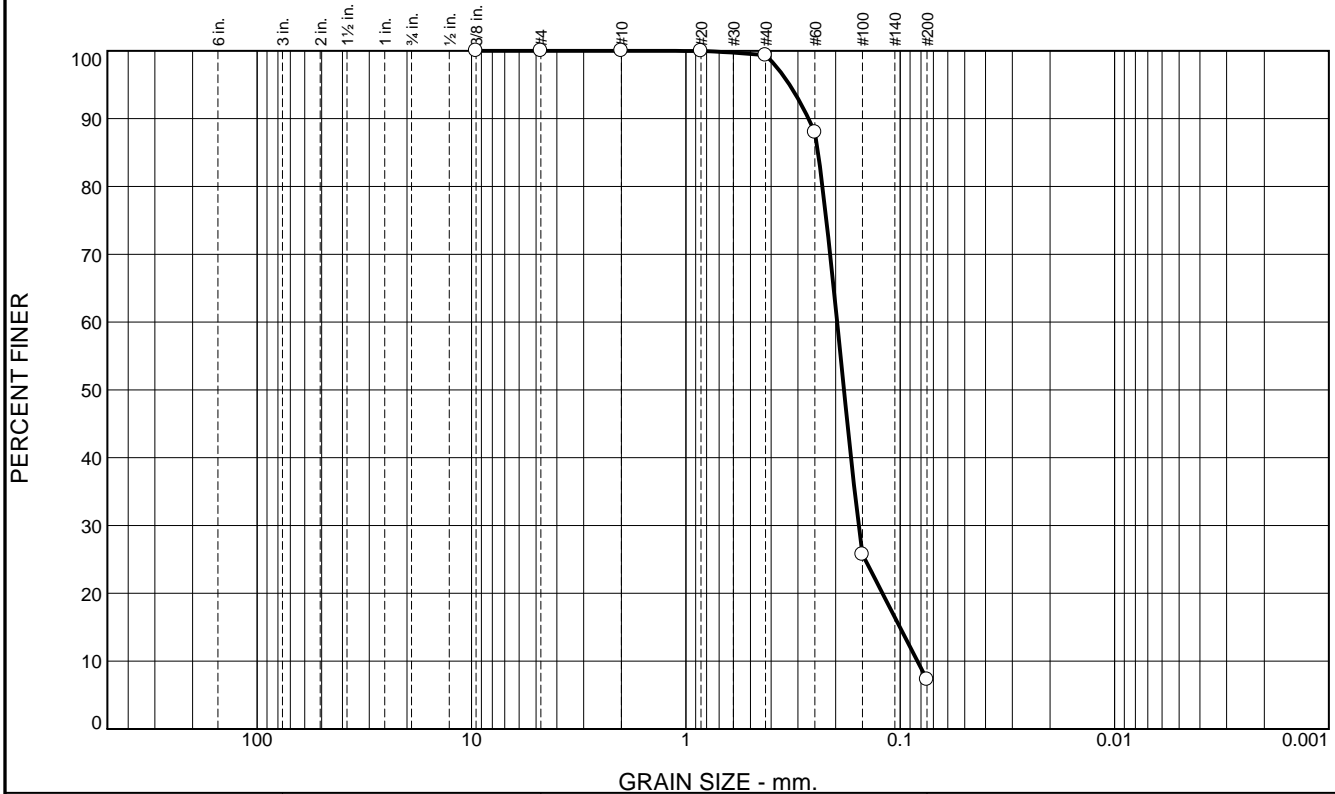
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	92.0	7.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.3		
#60	88.0		
#100	25.7		
#200	7.3		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2678 D₈₅= 0.2419 D₆₀= 0.1968
 D₅₀= 0.1829 D₃₀= 0.1562 D₁₅= 0.1003
 D₁₀= 0.0831 C_u= 2.37 C_c= 1.49

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-70B-11
Sample Number: TE Lab ID: 5054.48

Depth: 2.9 - 6.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-72-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-72-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibrocure		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-23-11
8. TOTAL DEPTH OF BORING 13.0 Ft.		16. ELEVATION TOP OF BORING -11.5 Ft.		COMPLETED 06-23-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-11.5	0.0				
		•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell fragments, gray (SP)	A	Classification: SP-SM Color: 5Y 5/2-olive gray D50: 0.1866 mm % Fines: 5.5
-14.4	2.9	//	CLAY, lean, dark gray (CL)	NS	
-24.5	13.0				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	0.2	0.5	92.4	5.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.1		
#4	98.6		
#10	98.4		
#20	98.1		
#40	97.9		
#60	91.6		
#100	17.8		
#200	5.5		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2460 D₈₅= 0.2352 D₆₀= 0.1983
 D₅₀= 0.1866 D₃₀= 0.1645 D₁₅= 0.1281
 D₁₀= 0.0966 C_u= 2.05 C_c= 1.41

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-72A-11
Sample Number: TE Lab ID: 5054.49

Depth: 0.0 - 2.9 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

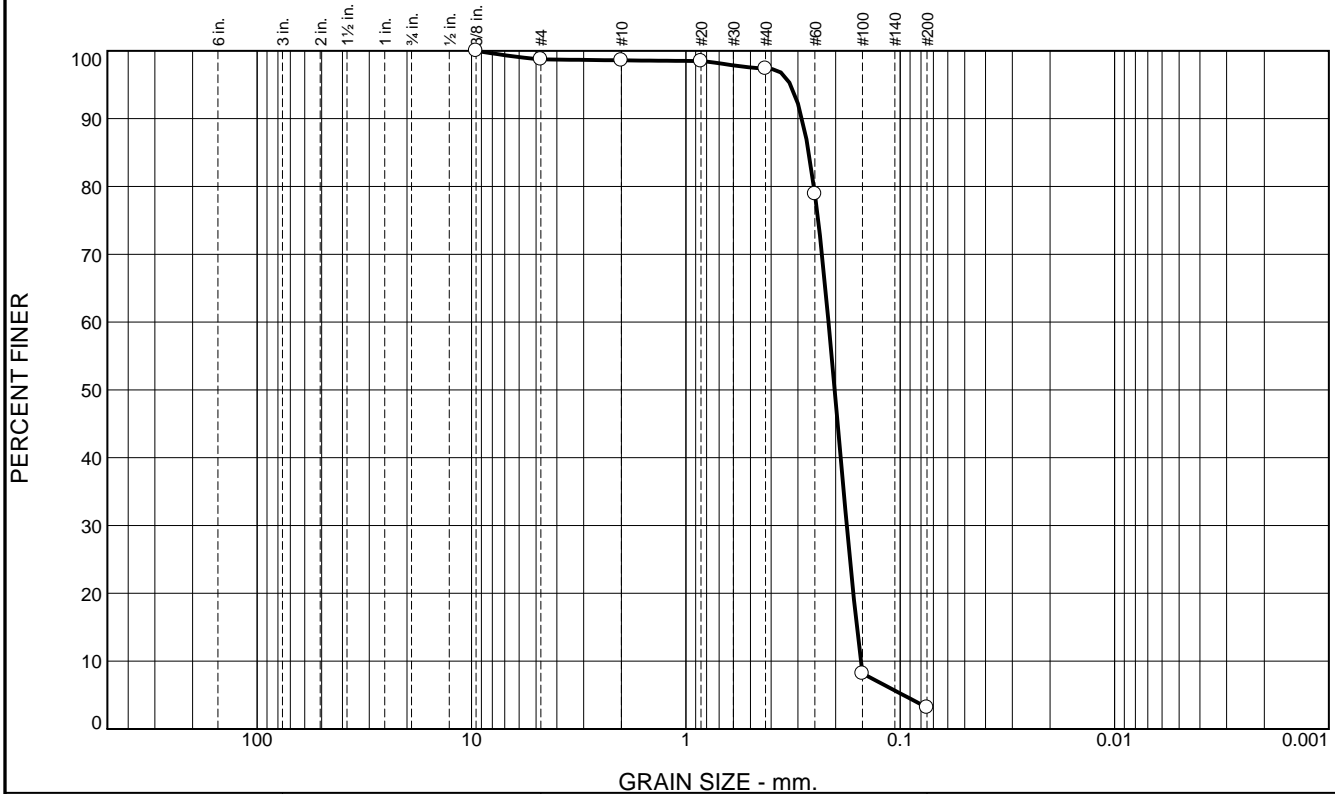
Figure

Boring Designation BI-CI-73-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District		SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-73-11		LOCATION COORDINATES E = 918,798 N = 269,909		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83 VERTICAL NAVD88
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	
4. NAME OF DRILLER Construction Solutions International, Inc.			12. TOTAL SAMPLES		DISTURBED 3 UNDISTURBED (UD) 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A			14. WATER DEPTH 10 Ft.		
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 06-22-11 COMPLETED 06-22-11
8. TOTAL DEPTH OF BORING 15.0 Ft.			16. ELEVATION TOP OF BORING -8.8 Ft.		
			17. TOTAL RECOVERY FOR BORING 100%		
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist					

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.8	0.0				
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP Color: 5Y 4/2-olive gray D50: 0.2021 mm % Fines: 3.2
-11.4	2.6		SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)	B	Classification: SM Color: 2.5Y 4/2-dark grayish brown D50: 0.2044 mm % Fines: 14.1
				C	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2022 mm % Fines: 8.3
				NS	
-23.8	15.0				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	0.1	1.2	94.2	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	98.7		
#10	98.6		
#20	98.5		
#40	97.4		
#60	78.9		
#100	8.2		
#200	3.2		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	LL=	
	Coefficients	
D ₉₀ = 0.2873	D ₈₅ = 0.2670	D ₆₀ = 0.2159
D ₅₀ = 0.2021	D ₃₀ = 0.1775	D ₁₅ = 0.1593
D ₁₀ = 0.1526	C _u = 1.41	C _c = 0.96
	Classification	
USCS= SP	AASHTO=	
	Remarks	

* (no specification provided)

Location: USACE Sample # BI-CI-73A-11
Sample Number: TE Lab ID: 5054.26

Depth: 0.0 -2.6 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	2.0	83.7	14.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.7		
#40	97.8		
#60	70.8		
#100	19.9		
#200	14.1		

Material Description

Silty SAND (SM), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.3327	D ₈₅ = 0.3024	D ₆₀ = 0.2241
D ₅₀ = 0.2044	D ₃₀ = 0.1691	D ₁₅ = 0.0838
D ₁₀ =	C _u =	C _c =

USCS= SM **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-73B-11
Sample Number: TE Lab ID: 5054.27

Depth: 2.6 - 7.6 (ft)

Date: 7/18/11

Thompson Engineering

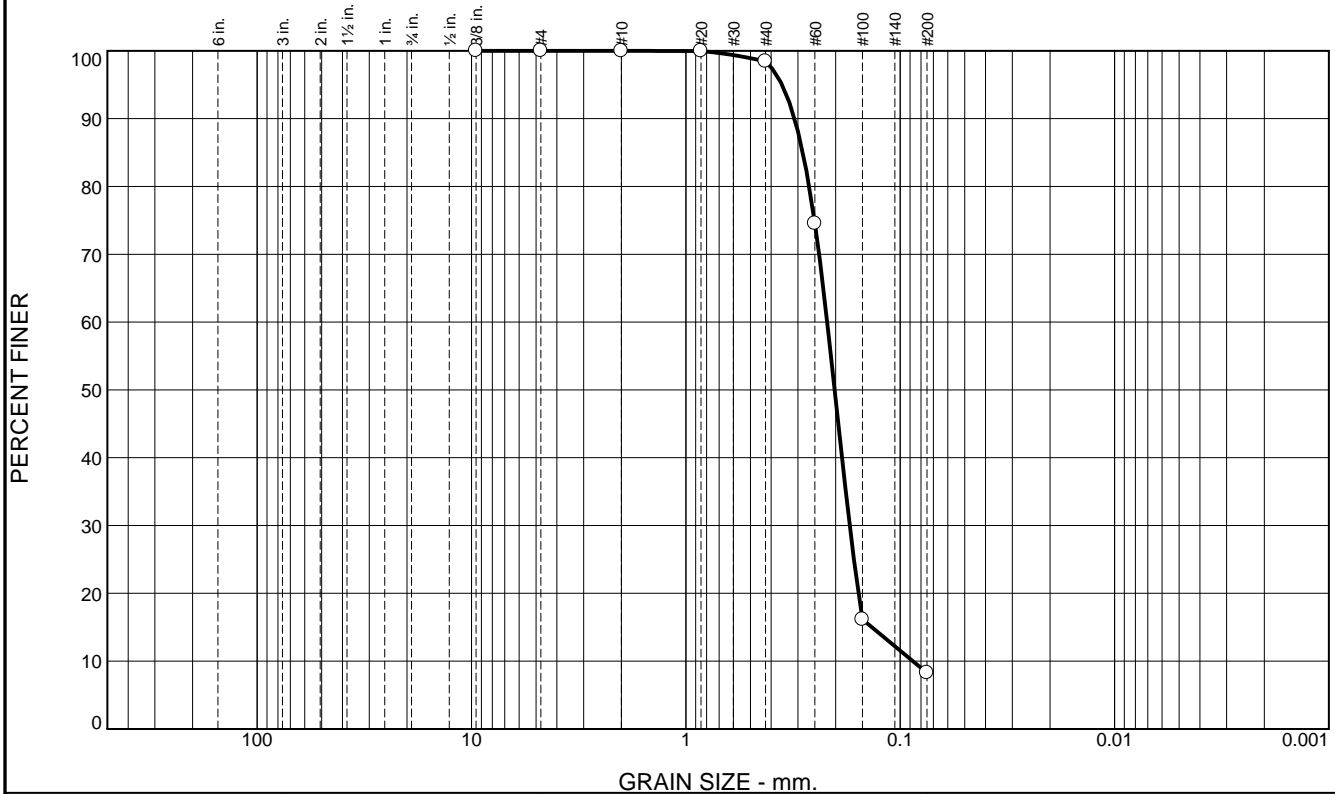
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	90.1	8.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.4		
#60	74.5		
#100	16.1		
#200	8.3		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3114 D₈₅= 0.2849 D₆₀= 0.2191
 D₅₀= 0.2022 D₃₀= 0.1720 D₁₅= 0.1356
 D₁₀= 0.0873 C_u= 2.51 C_c= 1.55

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-73C-11
Sample Number: TE Lab ID: 5054.28

Depth: 7.6 - 10.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

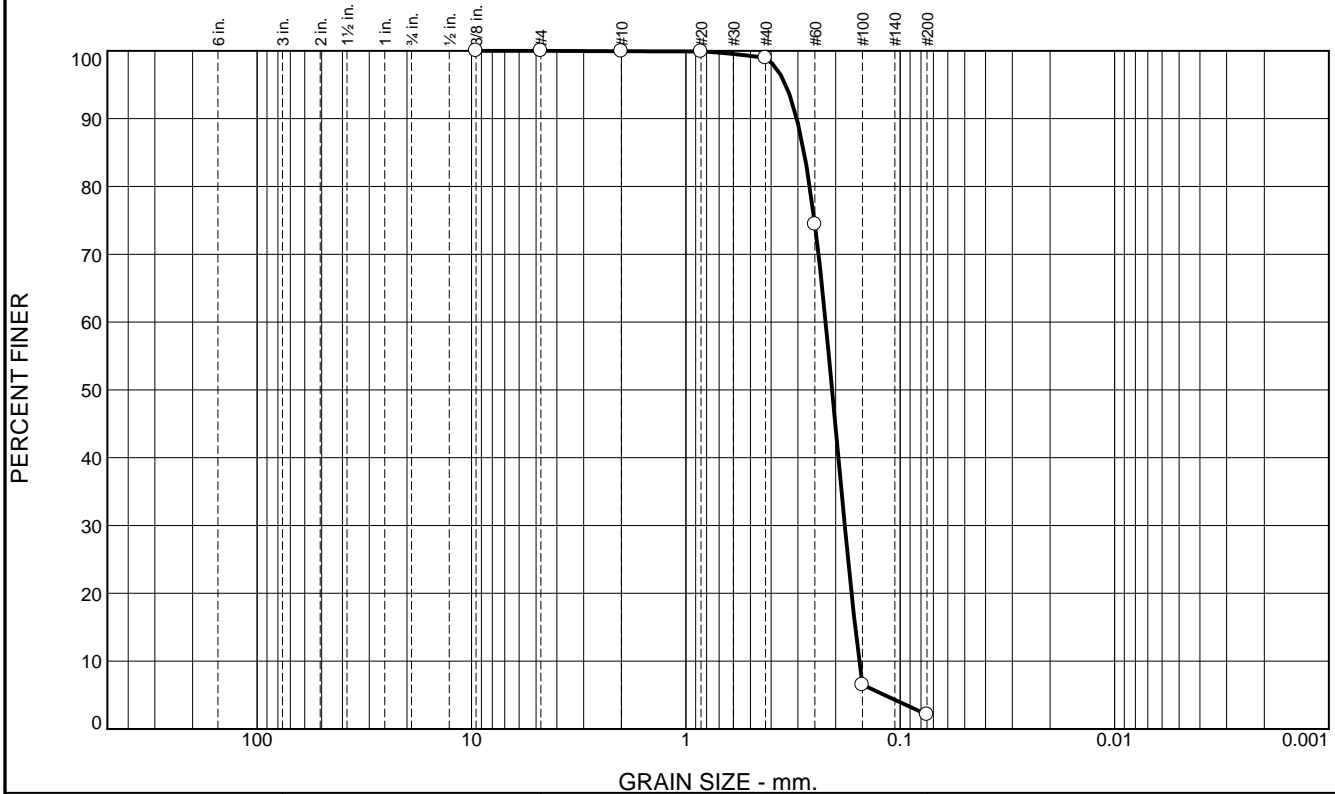
Figure

Boring Designation BI-CI-75-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-75-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 4		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 9.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 06-22-11		
8. TOTAL DEPTH OF BORING 15.9 Ft.		16. ELEVATION TOP OF BORING -8.8 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.8	0.0				
-11.8	3.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.2077 mm % Fines: 2.1
-16.8	8.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	B	Classification: SP-SM Color: 2.5Y 4/4-olive brown D50: 0.2007 mm % Fines: 10
-24.7	15.9	|||||	SAND, silty, mostly fine-grained sand-sized quartz, some silt, some clay, dark gray (SM)	C	Classification: SM Color: 2.5Y 4/2-dark grayish brown D50: 0.1729 mm % Fines: 13.2
				D	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.1821 mm % Fines: 7.7
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.9	96.9	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.9		
#40	99.0		
#60	74.4		
#100	6.5		
#200	2.1		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	Coefficients	
D ₉₀ = 0.3039	D ₈₅ = 0.2810	D ₆₀ = 0.2228
D ₅₀ = 0.2077	D ₃₀ = 0.1813	D ₁₅ = 0.1621
D ₁₀ = 0.1552	C _u = 1.44	C _c = 0.95

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-75A-11
Sample Number: TE Lab ID: 5054.29

Depth: 0.0 - 3.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.8	88.1	10.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	98.1		
#60	75.0		
#100	17.7		
#200	10.0		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3115 D₈₅= 0.2842 D₆₀= 0.2178
 D₅₀= 0.2007 D₃₀= 0.1700 D₁₅= 0.1180
 D₁₀= 0.0751 C_u= 2.90 C_c= 1.77

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-75B-11
Sample Number: TE Lab ID: 5054.30

Depth: 3.0 - 8.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.2	85.5	13.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	98.7		
#60	85.6		
#100	36.7		
#200	13.2		

Material Description
Silty SAND (SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2688 D₈₅= 0.2480 D₆₀= 0.1902
 D₅₀= 0.1729 D₃₀= 0.1369 D₁₅= 0.0881
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-75C-11
Sample Number: TE Lab ID: 5054.31

Depth: 8.0 - 13.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	1.8	89.8	7.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.3		
#20	98.9		
#40	97.5		
#60	82.8		
#100	30.0		
#200	7.7		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2812 D₈₅= 0.2579 D₆₀= 0.1988
 D₅₀= 0.1821 D₃₀= 0.1500 D₁₅= 0.1172
 D₁₀= 0.0971 C_u= 2.05 C_c= 1.16

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-75D-11
Sample Number: TE Lab ID: 5054.32

Depth: 13.0 - 15.9 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

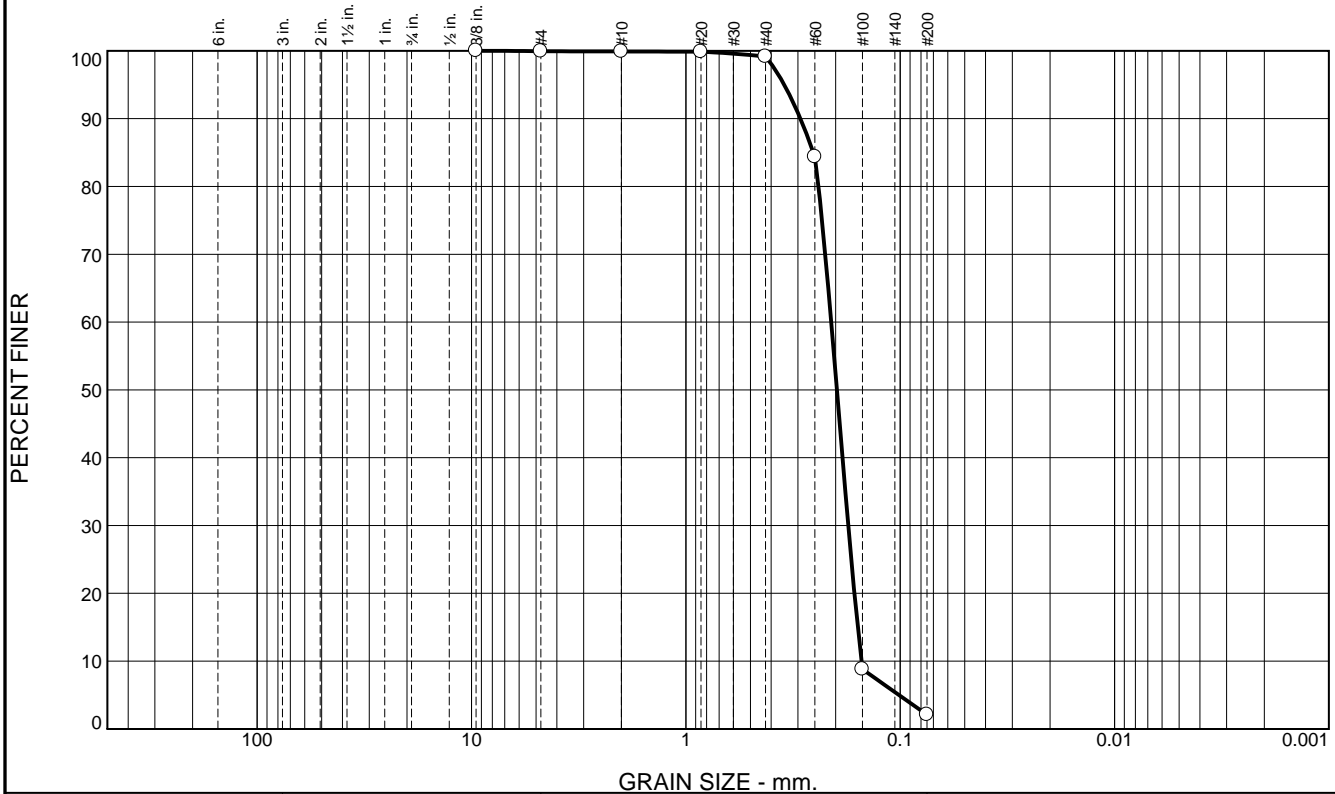
Figure

Boring Designation BI-CI-76-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-76-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 8.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 06-22-11		
8. TOTAL DEPTH OF BORING 11.6 Ft.		16. ELEVATION TOP OF BORING -7.8 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-7.8	0.0				
-10.0	2.2	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP Color: 2.5Y 7/2-light gray D50: 0.1973 mm % Fines: 2.1
		+ + + + +	SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)	B	Classification: SM Color: 2.5Y 5/2-grayish brown D50: 0.1764 mm % Fines: 12.1
		+ + + + +	At El. -15.2 Ft., mostly fine-grained sand-sized quartz, some silt, trace clay, gray	NS	
		+ + + + +	At El. -16.8 Ft., mostly fine-grained sand-sized quartz, some silt, gray	C	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.1837 mm % Fines: 5.8
-19.4	11.6				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.0	0.7	97.1	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.9		
#20	99.9		
#40	99.2		
#60	84.3		
#100	8.8		
#200	2.1		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2924 D₈₅= 0.2542 D₆₀= 0.2096

D₅₀= 0.1973 D₃₀= 0.1747 D₁₅= 0.1578

D₁₀= 0.1516 C_u= 1.38 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-76A-11
Sample Number: TE Lab ID: 5054.33

Depth: 0.0 - 2.2 (ft)

Date: 7/18/11

Thompson Engineering

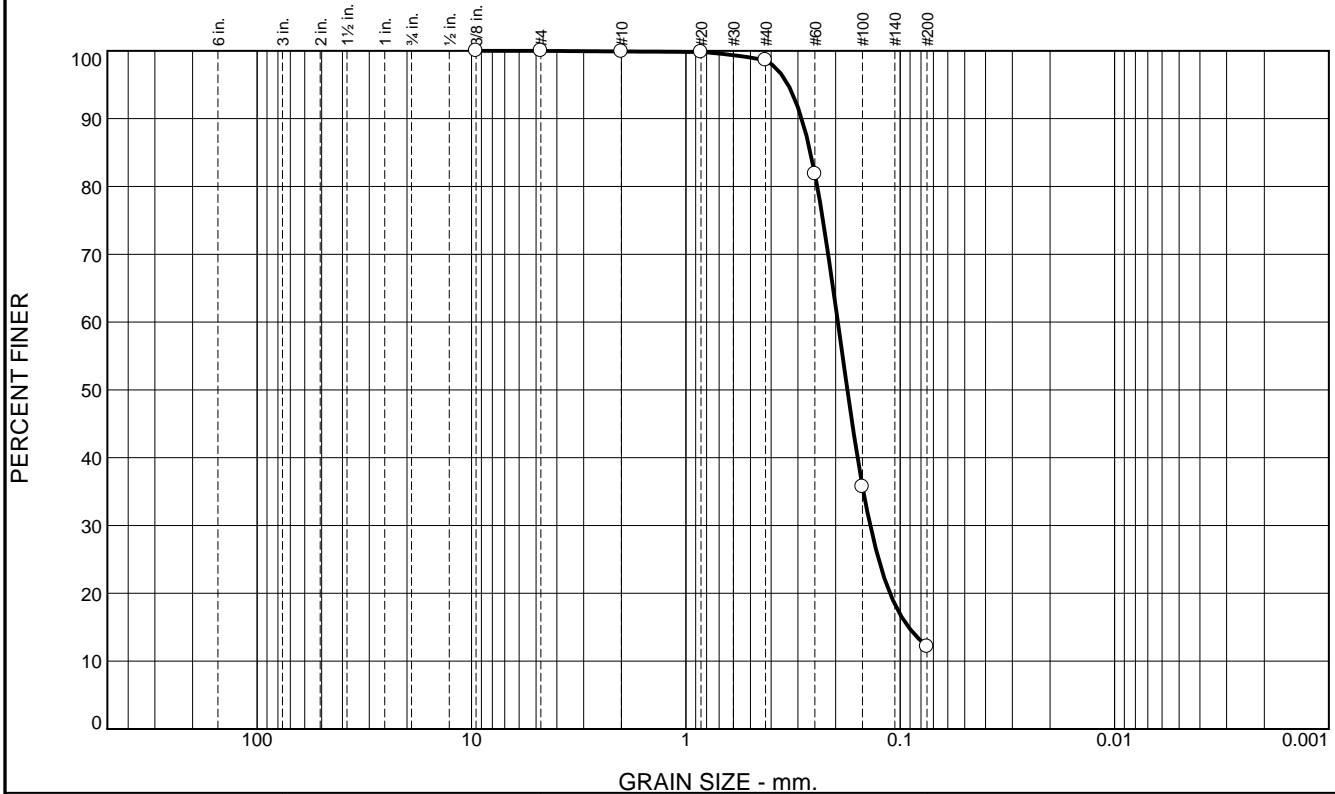
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.3	86.5	12.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	98.6		
#60	81.9		
#100	35.7		
#200	12.1		

Material Description
Silty SAND (SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2883 D₈₅= 0.2622 D₆₀= 0.1953
 D₅₀= 0.1764 D₃₀= 0.1381 D₁₅= 0.0913
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-76B-11
Sample Number: TE Lab ID: 5054.34

Depth: 2.2 - 7.2 (ft)

Date: 7/18/11

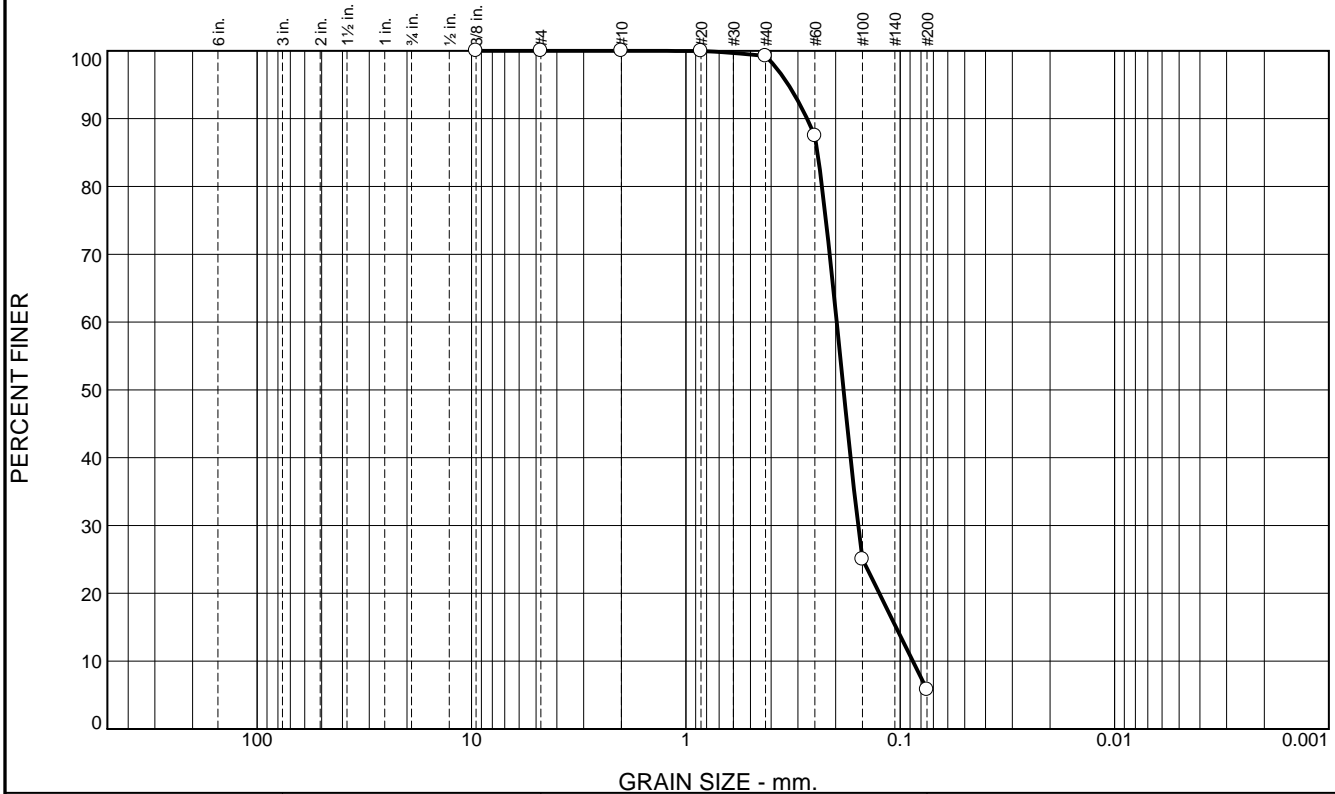
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	93.4	5.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.2		
#60	87.5		
#100	25.0		
#200	5.8		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2721 D₈₅= 0.2433 D₆₀= 0.1977
 D₅₀= 0.1837 D₃₀= 0.1571 D₁₅= 0.1045
 D₁₀= 0.0873 C_u= 2.26 C_c= 1.43

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-76C-11
Sample Number: TE Lab ID: 5054.35

Depth: 9.0 - 11.6 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

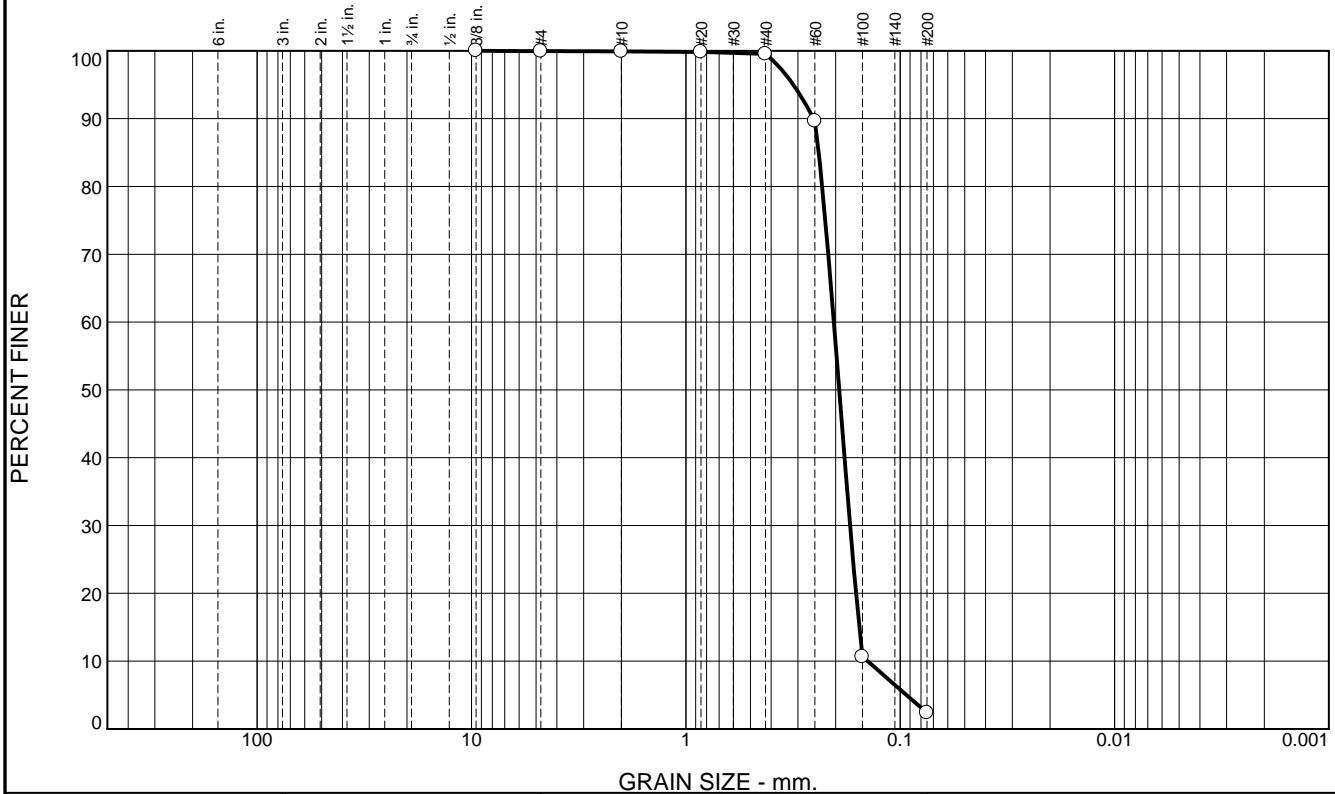
Figure

Boring Designation BI-CI-77-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-77-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 9.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-22-11
8. TOTAL DEPTH OF BORING 13.3 Ft.		16. ELEVATION TOP OF BORING -8.6 Ft.		COMPLETED 06-22-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.6	0.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP Color: 5Y 6/1-gray D50: 0.1924 mm % Fines: 2.4
-13.6	5.0	|||||	SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)		
-14.6	6.0	//	CLAY, lean, dark gray (CL)	NS	
-21.9	13.3		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.4	97.1	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.5		
#60	89.6		
#100	10.6		
#200	2.4		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2535 D₈₅= 0.2401 D₆₀= 0.2038
D₅₀= 0.1924 D₃₀= 0.1714 D₁₅= 0.1552
D₁₀= 0.1421 C_u= 1.43 C_c= 1.01

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-77A-11
Sample Number: TE Lab ID: 5054.36

Depth: 0.0 - 5.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

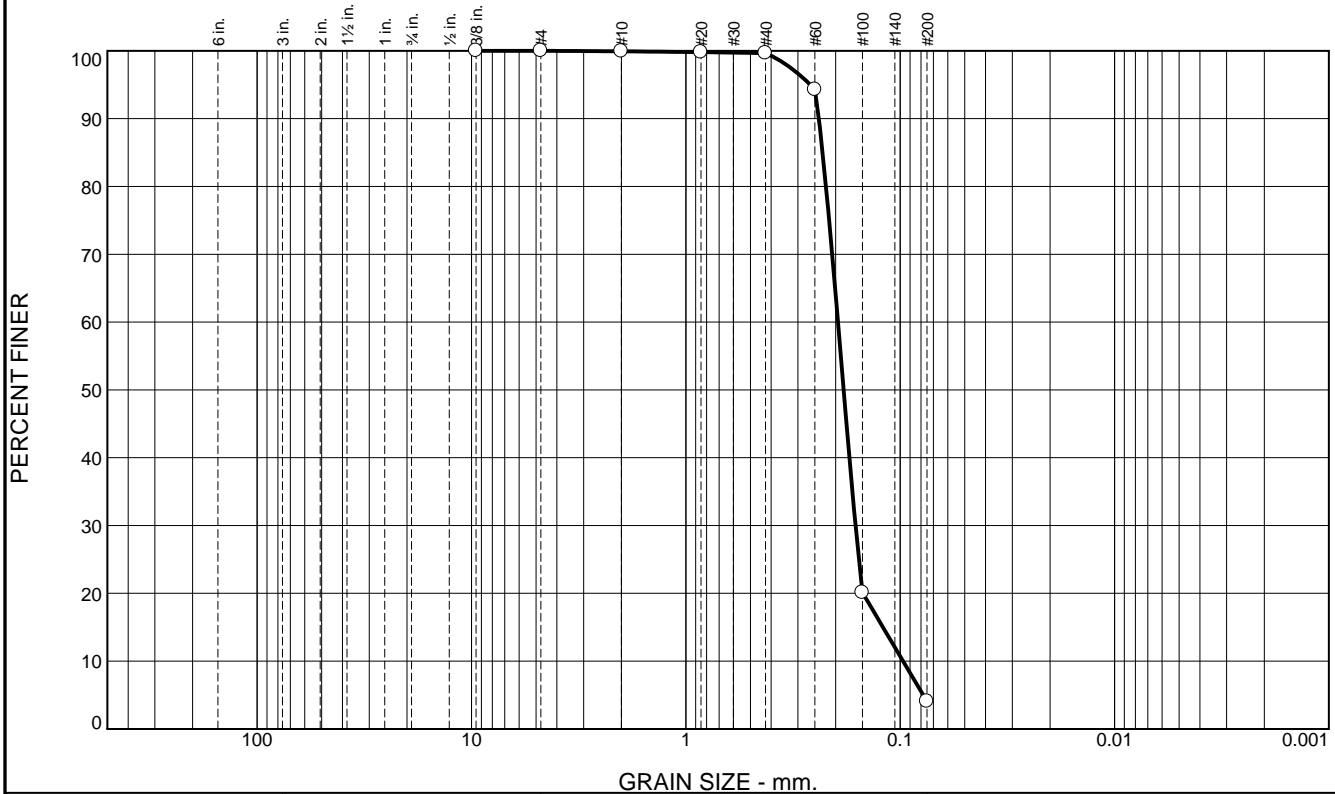
Figure

Boring Designation BI-CI-78-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-78-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-22-11
8. TOTAL DEPTH OF BORING 11.9 Ft.		16. ELEVATION TOP OF BORING -10.3 Ft.		COMPLETED 06-22-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.3	0.0				
-12.3	2.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, gray (SP)	A	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.1836 mm % Fines: 4.1
-13.8	3.5	| | | | |	SAND, silty, mostly fine-grained sand-sized quartz, some silt, lt. gray (SM)		
		/ / / / /	CLAY, lean, dark gray (CL)	NS	
-22.2	11.9				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.2	95.6	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.7		
#60	94.3		
#100	20.1		
#200	4.1		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2398 D₈₅= 0.2301 D₆₀= 0.1950
D₅₀= 0.1836 D₃₀= 0.1617 D₁₅= 0.1204
D₁₀= 0.0969 C_u= 2.01 C_c= 1.38

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-78A-11
Sample Number: TE Lab ID: 5054.37

Depth: 0.0 - 3.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

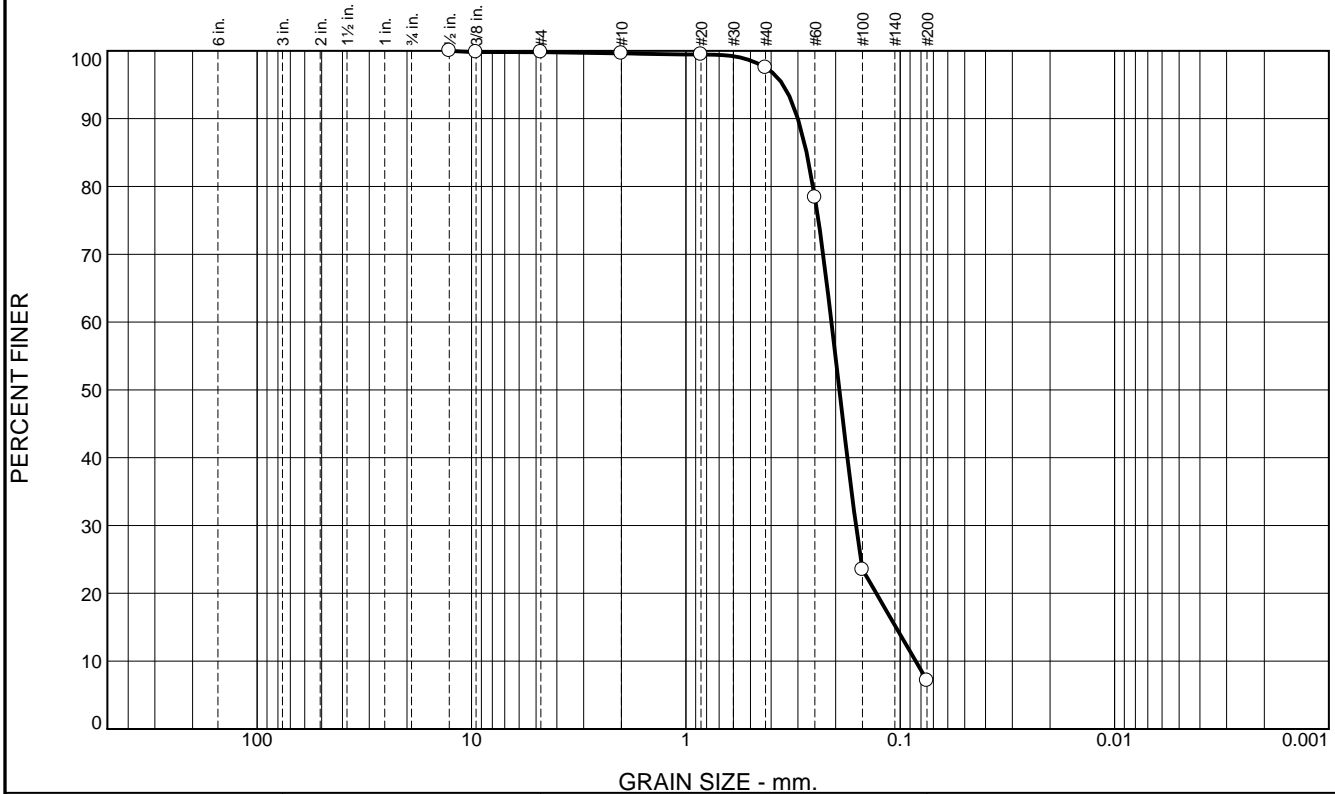
Figure

Boring Designation BI-CI-82-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-82-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -10.8 Ft.		STARTED 06-23-11
8. TOTAL DEPTH OF BORING 16.1 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-23-11
18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.8	0.0				
		↑↑↑↑↑	SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.1921 mm % Fines: 7.1
-13.8	3.0	|||||	CLAY, lean, dark gray (CL)	NS	
-17.2	6.4	●●●●●	SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP)	B	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1954 mm % Fines: 4.3
		●●●●●		C	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.1828 mm % Fines: 2.8
-26.9	16.1				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.2	2.1	90.4	7.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.8		
#4	99.8		
#10	99.6		
#20	99.5		
#40	97.5		
#60	78.4		
#100	23.5		
#200	7.1		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3005 D₈₅= 0.2735 D₆₀= 0.2092
 D₅₀= 0.1921 D₃₀= 0.1608 D₁₅= 0.1046
 D₁₀= 0.0846 C_u= 2.47 C_c= 1.46

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-82A-11
Sample Number: TE Lab ID: 5054.50

Depth: 0.0 - 3.0 (ft)

Date: 7/18/11

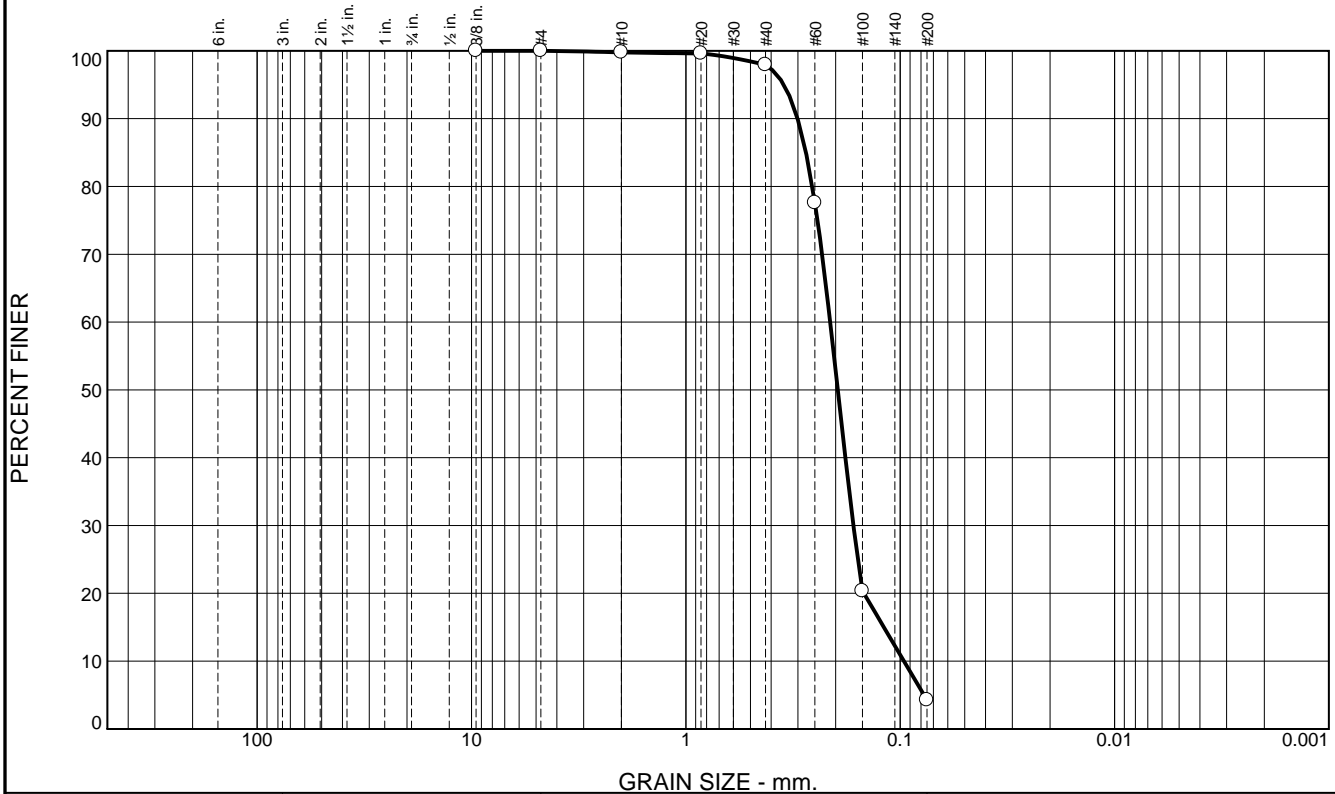
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.9	93.6	4.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.6		
#40	97.9		
#60	77.6		
#100	20.3		
#200	4.3		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3014 D₈₅= 0.2754 D₆₀= 0.2121
 D₅₀= 0.1954 D₃₀= 0.1653 D₁₅= 0.1192
 D₁₀= 0.0961 C_u= 2.21 C_c= 1.34

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-82B-11
Sample Number: TE Lab ID: 5054.51

Depth: 6.5 - 11.5 (ft)

Date: 7/18/11

Thompson Engineering

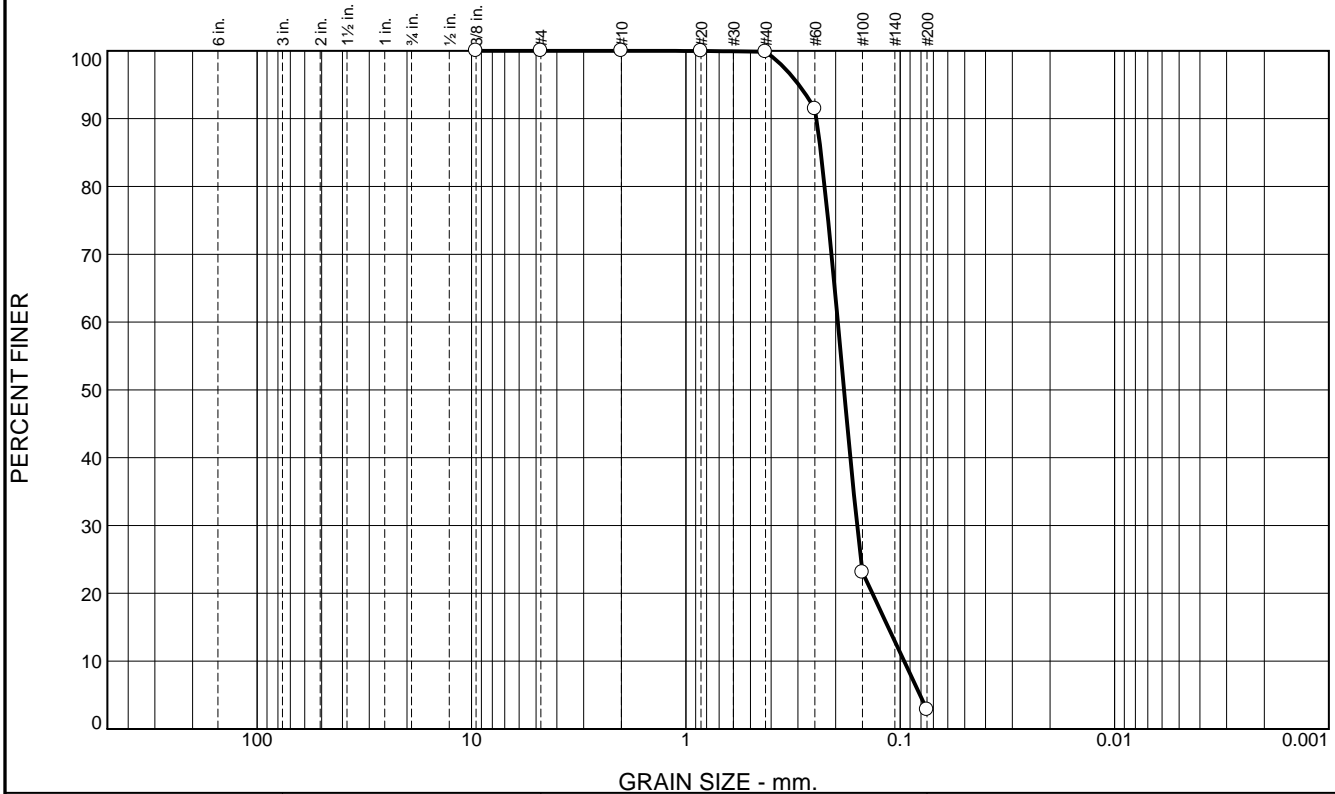
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	97.0	2.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	91.5		
#100	23.1		
#200	2.8		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	LL=	

D ₉₀ = 0.2461	Coefficients	D ₆₀ = 0.1953
D ₅₀ = 0.1828	D ₈₅ = 0.2346	D ₁₅ = 0.1137
D ₁₀ = 0.0958	D ₃₀ = 0.1588	C _c = 1.35
	C _u = 2.04	

USCS= SP **Classification** AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-82C-11
Sample Number: TE Lab ID: 5054.52

Depth: 11.5 - 16.1 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Boring Designation BI-CI-84-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-84-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibrocure		VERTICAL NAVD88
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 916,262 N = 266,080	CONTRACTOR FILE NO.	13. TOTAL NUMBER CORE BOXES
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12.3 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -12.0 Ft.		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 11.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-28-11
18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.0	0.0				
			SAND, silty, some sand, trace shell fragments, dark gray (SM)	NS	
-15.3	3.3		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, gray (SP)		
-20.3	8.3		CLAY, lean, dark gray (CL)		
-23.0	11.0				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Boring Designation BI-CI-85-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-85-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 915,574 N = 264,681	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A		CONTRACTOR FILE NO.	14. WATER DEPTH 13 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		DEG. FROM VERTICAL	15. DATE BORING STARTED 06-28-11 COMPLETED 06-28-11	
8. TOTAL DEPTH OF BORING 11.8 Ft.		BEARING	16. ELEVATION TOP OF BORING -12.5 Ft.	
			17. TOTAL RECOVERY FOR BORING 100%	
			18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.5	0.0				
-14.4	1.9		SAND, silty, some fine-grained sand-sized sand, dark gray (SM)	NS	0
-19.4	6.9		CLAY, lean, dark gray (CL)		
-21.4	8.9		CLAY, fat, dark gray (CH)		
-24.3	11.8		SAND, poorly-graded, mostly medium-grained sand-sized quartz, trace shell fragments, gray (SP)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		15 20 25

Boring Designation BI-CI-86-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-86-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14.6 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-28-11 COMPLETED 06-28-11
8. TOTAL DEPTH OF BORING 6.9 Ft.		16. ELEVATION TOP OF BORING -14.0 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.0	0.0				
-17.0	3.0		SAND, silty, trace shell fragments, dark gray (SM)	A	Classification: SP-SM Color: 5Y 6/1-gray D50: 0.182 mm % Fines: 10.7
-20.9	6.9		SAND, poorly-graded, trace shell fragments, gray (SP)	B	Classification: SP Color: 2.5Y 5/2-grayish brown D50: 0.196 mm % Fines: 3.3
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation determined from USACE hydrographic survey completed 2010.</p>		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.4	86.8	10.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	97.5		
#60	80.1		
#100	32.2		
#200	10.7		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2980 D₈₅= 0.2693 D₆₀= 0.2006
 D₅₀= 0.1820 D₃₀= 0.1458 D₁₅= 0.1048
 D₁₀= C_u= C_c=

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-86A-11
Sample Number: TE Lab ID: 5054.101

Depth: 0.0 - 3.0 (ft)

Date: 7/18/11

Thompson Engineering

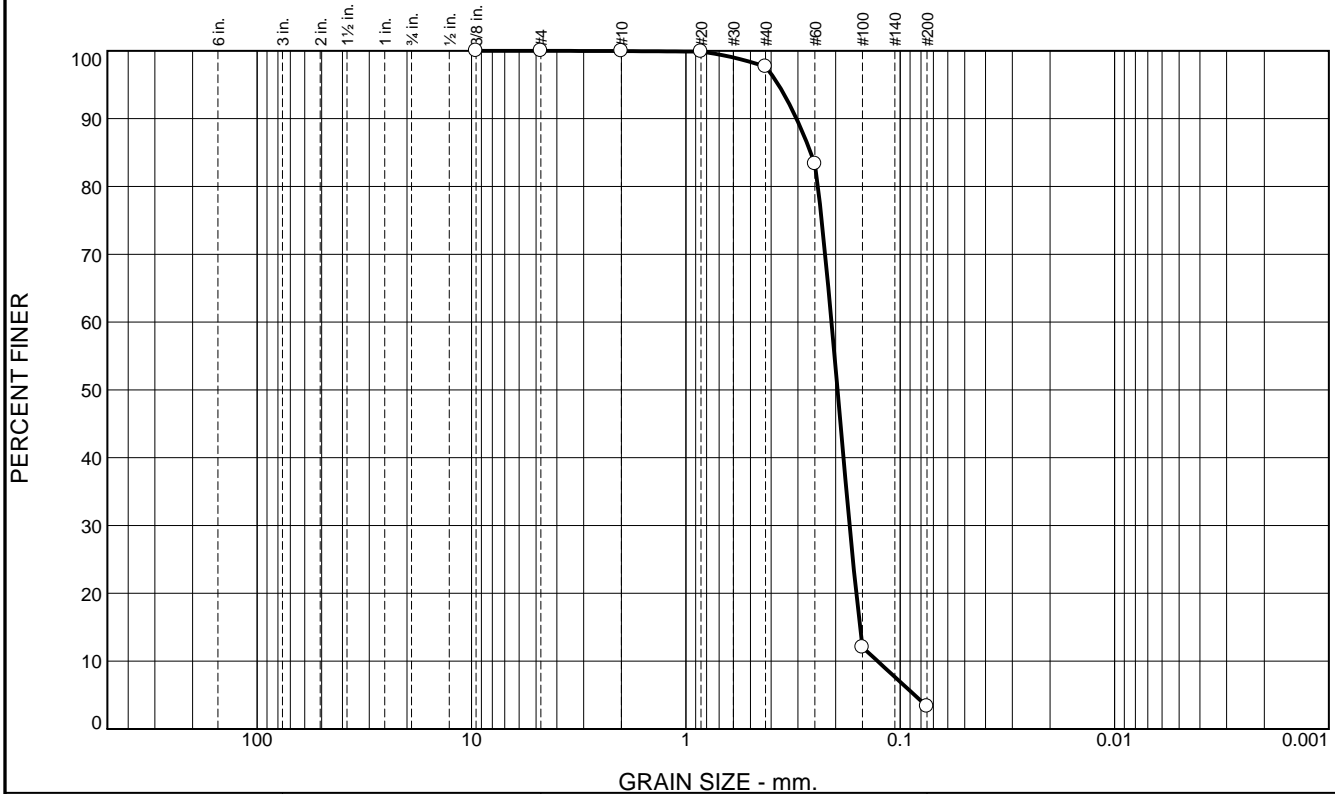
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.3	94.4	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	97.7		
#60	83.3		
#100	12.0		
#200	3.3		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3050 D₈₅= 0.2616 D₆₀= 0.2090
 D₅₀= 0.1960 D₃₀= 0.1722 D₁₅= 0.1540
 D₁₀= 0.1275 C_u= 1.64 C_c= 1.11

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-86B-11
Sample Number: TE Lab ID: 5054.102

Depth: 3.0 - 6.9 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

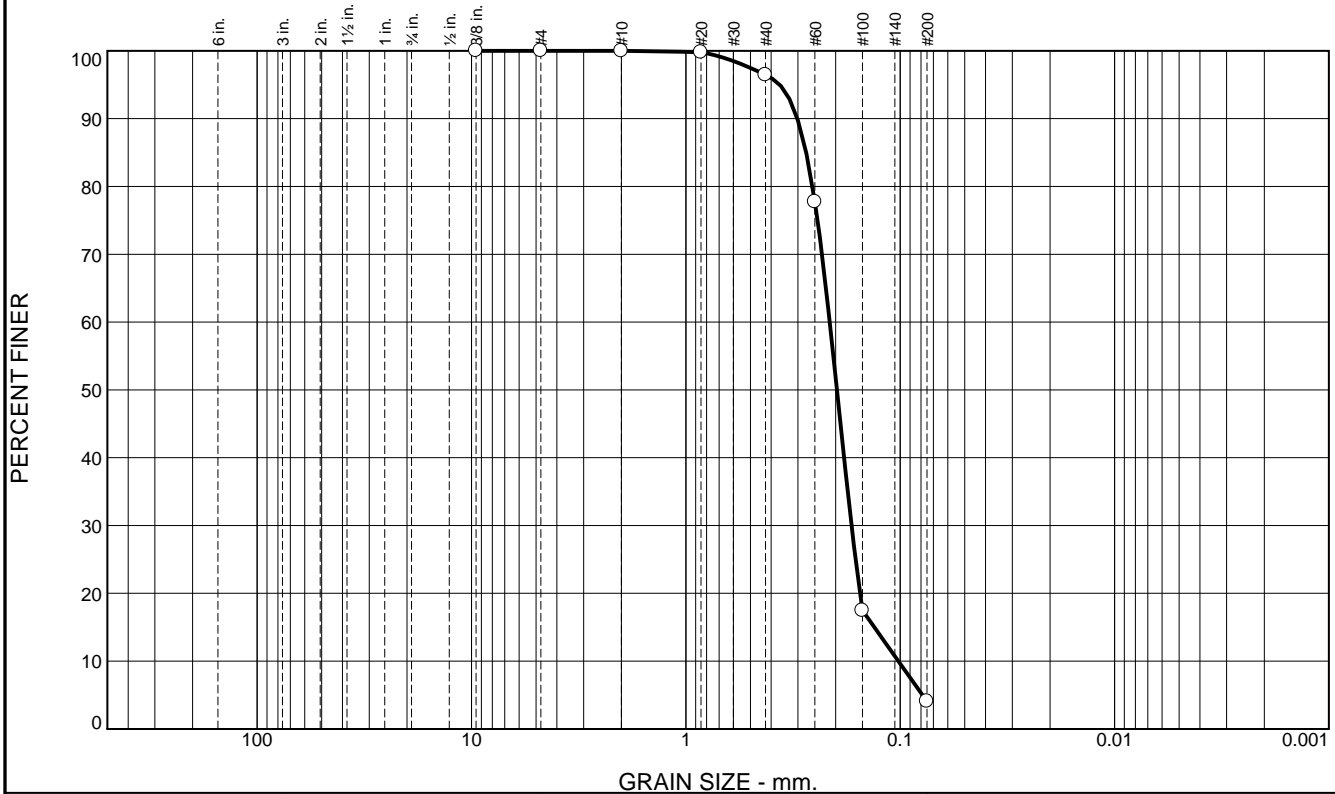
Figure

Boring Designation BI-CI-87-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-87-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 13.2 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -14.4 Ft.		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 7.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-28-11
18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.4	0.0				
		•••••	SAND, poorly-graded, mostly medium-grained sand-sized quartz, some shell fragments, dark gray (SP)	A	Classification: SP Color: 2.5Y 6/2-light brownish gray D50: 0.1972 mm % Fines: 4.1
		•••••	At El. -18.4 Ft., trace shell fragments, gray	B	Classification: SP Color: 2.5Y 6/1-gray D50: 0.1859 mm % Fines: 3.5
-21.9	7.5		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation determined from USACE hydrographic survey completed 2010.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.6	92.3	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	96.4		
#60	77.7		
#100	17.5		
#200	4.1		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3021 D₈₅= 0.2748 D₆₀= 0.2131
 D₅₀= 0.1972 D₃₀= 0.1687 D₁₅= 0.1321
 D₁₀= 0.1020 C_u= 2.09 C_c= 1.31

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-87A-11
Sample Number: TE Lab ID: 5054.99

Depth: 0.0 - 4.0 (ft)

Date: 7/18/11

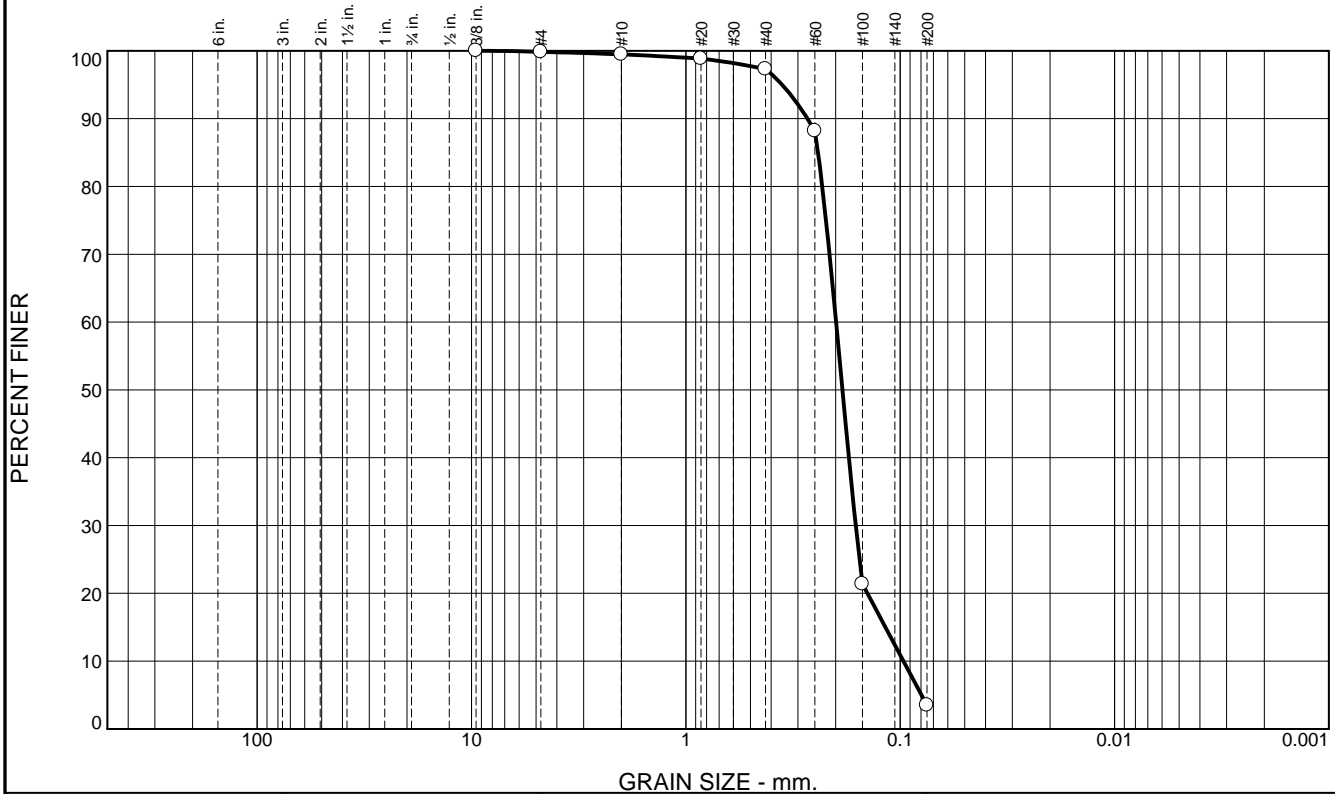
Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.3	2.2	93.8	3.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.5		
#20	98.9		
#40	97.3		
#60	88.2		
#100	21.4		
#200	3.5		

Material Description

SAND (SP), fine grained

PL=	Atterberg Limits	PI=
	LL=	

	Coefficients	
D ₉₀ = 0.2709	D ₈₅ = 0.2417	D ₆₀ = 0.1990
D ₅₀ = 0.1859	D ₃₀ = 0.1613	D ₁₅ = 0.1172
D ₁₀ = 0.0965	C _u = 2.06	C _c = 1.35

USCS= SP	Classification
	AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-87B-11
Sample Number: TE Lab ID: 5054.100

Depth: 4.0 - 7.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project
Project No: 11-2116-0057

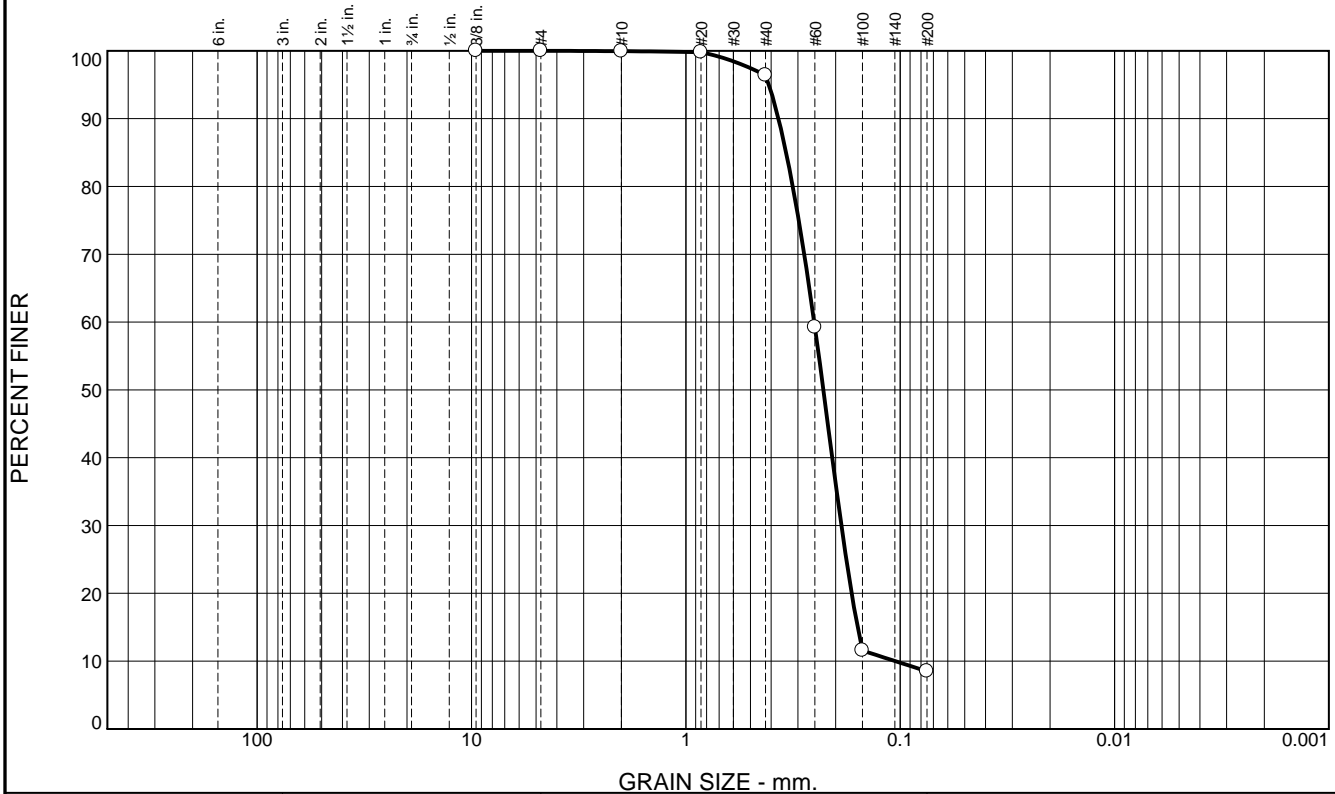
Figure

Boring Designation BI-CI-88-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District		SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-88-11		LOCATION COORDINATES E = 906,273 N = 257,485		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore	<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.			12. TOTAL SAMPLES 2		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A			14. WATER DEPTH 11.9 Ft.		
7. DEPTH DRILLED INTO ROCK N/A			15. DATE BORING		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 11.2 Ft.			16. ELEVATION TOP OF BORING -10.1 Ft.		
			17. TOTAL RECOVERY FOR BORING 100%		
			18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.1	0.0		SAND, poorly-graded with silt, trace organic matter, trace shell fragments, gray (SP-SM)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2283 mm % Fines: 8.5
			At El. -14.1 Ft., trace manufactured debris, gray	B	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2044 mm % Fines: 4.5
-21.3	11.2			NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.6	87.9	8.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	96.4		
#60	59.2		
#100	11.6		
#200	8.5		

Material Description
Slightly silty SAND (SP-SM), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3698 D₈₅= 0.3406 D₆₀= 0.2519
 D₅₀= 0.2283 D₃₀= 0.1880 D₁₅= 0.1580
 D₁₀= 0.1054 C_u= 2.39 C_c= 1.33

Classification
 USCS= SP-SM AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-88A-11
Sample Number: TE Lab ID: 5054.94

Depth: 0.0 - 4.0 (ft)

Date: 7/18/11

Thompson Engineering

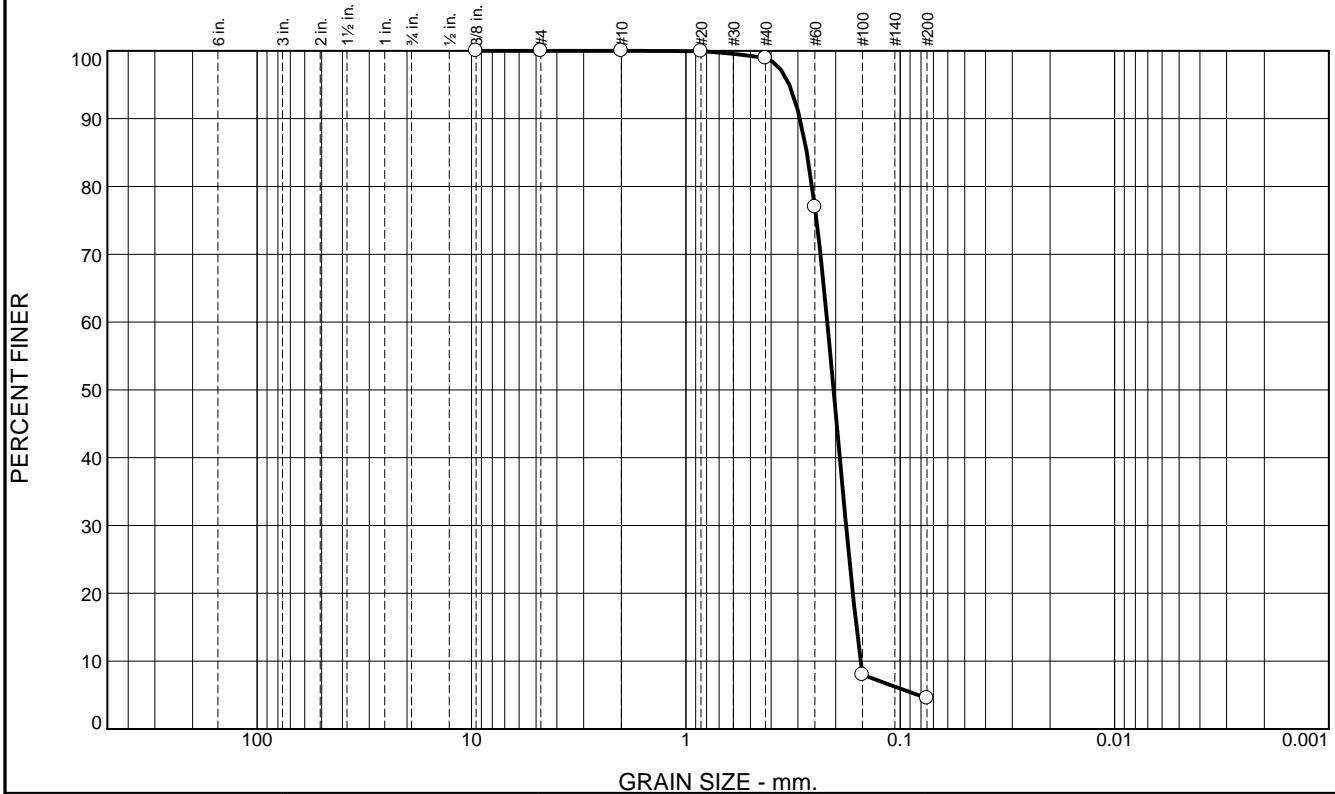
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.1	94.4	4.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.9		
#60	77.0		
#100	8.0		
#200	4.5		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2937 D₈₅= 0.2727 D₆₀= 0.2188
 D₅₀= 0.2044 D₃₀= 0.1788 D₁₅= 0.1599
 D₁₀= 0.1530 C_u= 1.43 C_c= 0.96

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-88B-11
Sample Number: TE Lab ID: 5054.95

Depth: 4.0 - 9.5 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure





Boring Designation BI-CI-89-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-89-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.6 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.9 Ft.		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 10.0 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-28-11
18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.9	0.0				
-11.5	1.6	↑↑↑↑	SAND, silty, trace shell fragments, gray (SM)	NS	0
-13.6	3.7	▨▨▨▨	SAND, clayey, some fine-grained silt, some clay, gray (SC)		
-19.9	10.0	▨▨▨▨▨▨▨▨▨▨	CLAY, lean, mostly clay, dark gray (CL)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Boring Designation BI-CI-90-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-90-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		VERTICAL NAVD88
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		DISTURBED 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.6 Ft.		UNDISTURBED (UD) 0
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 11.7 Ft.		16. ELEVATION TOP OF BORING -10.3 Ft.		COMPLETED 06-28-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

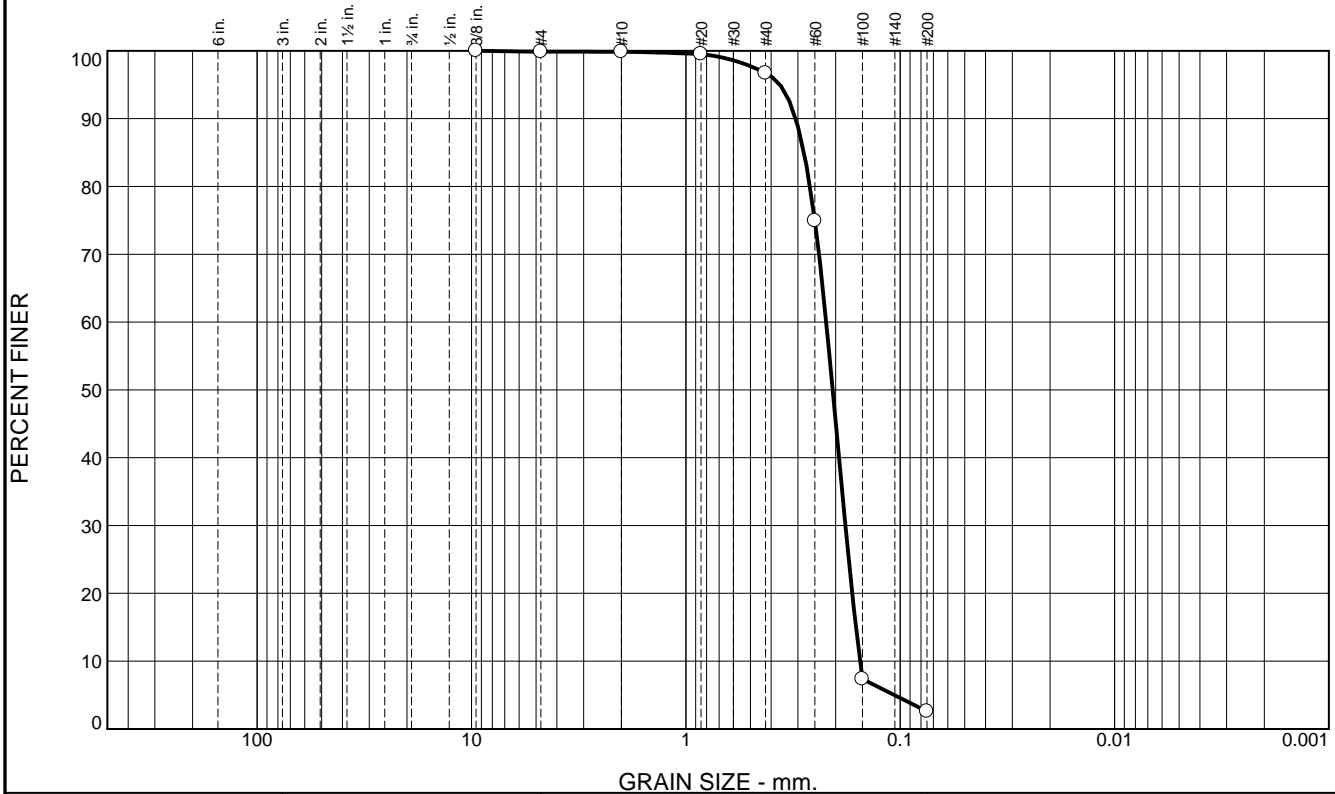
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.3	0.0				
-11.0	0.7		CLAY, lean, dark gray (CL)		
-12.5	2.2		CLAY, fat, dark gray (CH)		
-13.3	3.0		CLAY, lean, dark gray (CL)		
			CLAY, fat, dark gray (CH)	NS	
-22.0	11.7				
			NOTES:		
			1. Soils are field visually classified in accordance with the Unified Soils Classification System.		
			2. NS = Sample not submitted for laboratory analysis from this interval.		
			3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-CI-91-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-91-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 11.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 7.8 Ft.		16. ELEVATION TOP OF BORING -10.3 Ft.		COMPLETED 06-28-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-10.3	0.0				
			SAND, poorly-graded, mostly medium-grained sand-sized quartz, gray (SP)	A	Classification: SP-SM Color: 2.5Y 5/2-grayish brown D50: 0.2172 mm % Fines: 5.2
			At El. -13.3 Ft., trace shell fragments, gray	B	Classification: SP Color: 2.5Y 6/1-gray D50: 0.2064 mm % Fines: 2.6
-16.3	6.0				
			SAND, silty, trace shell fragments, dark gray (SM)	C	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2099 mm % Fines: 1.7
-18.1	7.8				
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.0	3.2	94.1	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.9		
#20	99.5		
#40	96.7		
#60	74.9		
#100	7.3		
#200	2.6		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3076 D₈₅= 0.2813 D₆₀= 0.2214
 D₅₀= 0.2064 D₃₀= 0.1801 D₁₅= 0.1609
 D₁₀= 0.1540 C_u= 1.44 C_c= 0.95

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-91B-11
Sample Number: TE Lab ID: 5054.97

Depth: 3.0 - 6.0 (ft)

Date: 7/18/11

Thompson Engineering

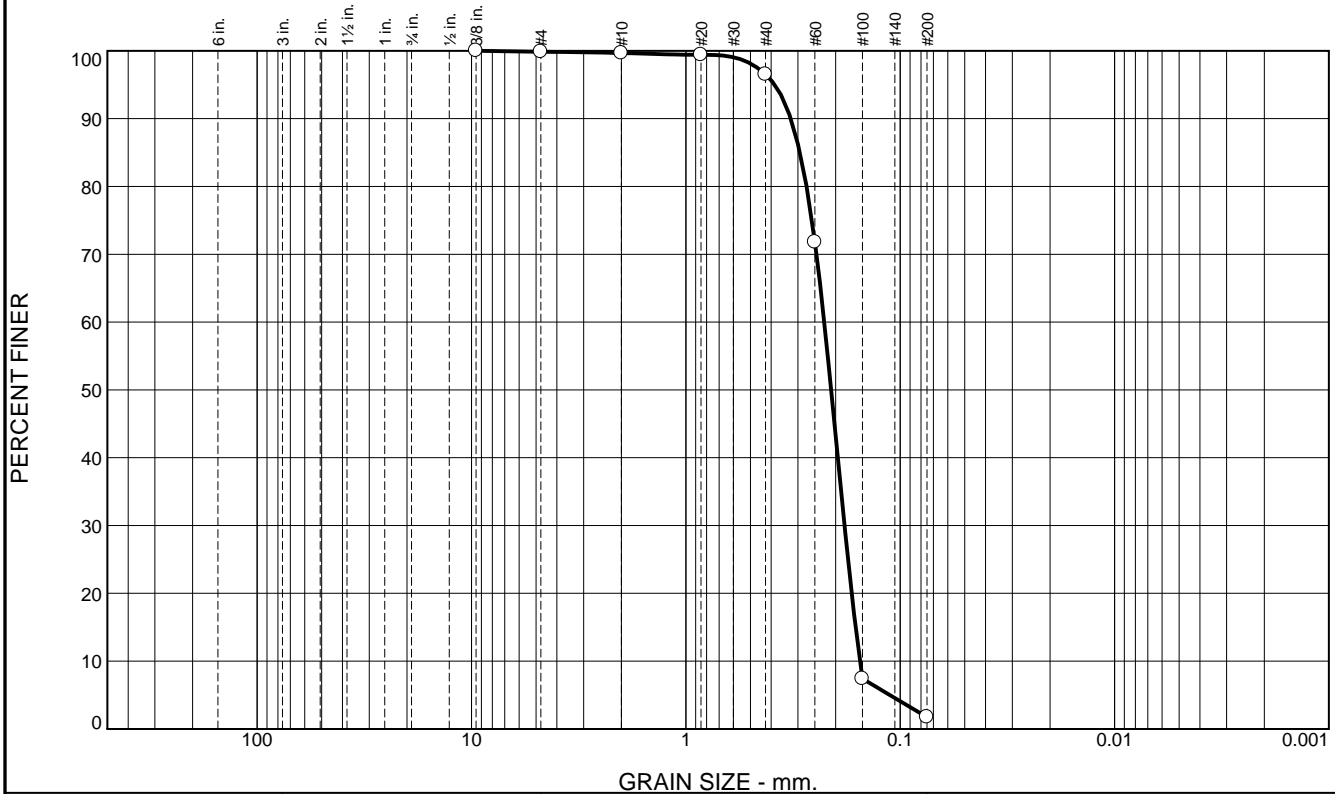
Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	3.2	94.8	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.7		
#20	99.4		
#40	96.5		
#60	71.8		
#100	7.4		
#200	1.7		

Material Description

SAND (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3241 D₈₅= 0.2939 D₆₀= 0.2261

D₅₀= 0.2099 D₃₀= 0.1818 D₁₅= 0.1615

D₁₀= 0.1541 C_u= 1.47 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-91C-11
Sample Number: TE Lab ID: 5054.98

Depth: 6.0 - 7.8 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers

Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure


Boring Designation BI-CI-92-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-CI-92-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibrocure		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		LOCATION COORDINATES E = 905,276 N = 256,545	13. TOTAL NUMBER CORE BOXES	
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 10.6 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -9.7 Ft.		STARTED 06-28-11
8. TOTAL DEPTH OF BORING 9.4 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 06-28-11
		18. SIGNATURE AND TITLE OF INSPECTOR Michele Johnson, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-9.7	0.0				
-10.1	0.4	|||||	SAND, silty, trace fine-grained sand-sized organic matter, trace organic matter, gray (SM)		
-13.2	3.5	|||||	CLAY, lean, some fine-grained sand, dark gray (CL)		
-19.1	9.4	|||||	CLAY, fat, dark gray (CH)	NS	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-CI-TEST-11

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Cat Island			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-CI-TEST-11		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 8.5 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 06-22-11
8. TOTAL DEPTH OF BORING 18.0 Ft.		16. ELEVATION TOP OF BORING -8.5 Ft.		COMPLETED 06-22-11
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Rhonda Capes, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.5	0.0				
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, lt. gray (SP) At El. -17.5 Ft., trace shell fragments	A	Classification: SP Color: - D50: 0.2025 mm % Fines: 4.4
				B	Classification: SP Color: - D50: 0.2035 mm % Fines: 3.2
				NS	
-26.5	18.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.1	93.4	4.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	97.8		
#60	75.2		
#100	13.9		
#200	4.4		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.3083 D₈₅= 0.2819 D₆₀= 0.2187
 D₅₀= 0.2025 D₃₀= 0.1738 D₁₅= 0.1518
 D₁₀= 0.1127 C_u= 1.94 C_c= 1.23

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-TESTA-11
Sample Number: TE Lab ID: 5054.24

Depth: 0.0 - 5.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.1	1.3	95.2	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.7		
#20	99.6		
#40	98.4		
#60	77.0		
#100	9.4		
#200	3.2		

Material Description
SAND (SP), fine grained

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.2955 D₈₅= 0.2735 D₆₀= 0.2181
 D₅₀= 0.2035 D₃₀= 0.1775 D₁₅= 0.1581
 D₁₀= 0.1510 C_u= 1.44 C_c= 0.96

Classification
 USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: USACE Sample # BI-CI-TESTB-11
Sample Number: TE Lab ID: 5054.25

Depth: 5.0 - 10.0 (ft)

Date: 7/18/11

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 009
 Mississippi Barrier Island Restoration Project

Project No: 11-2116-0057

Figure

Appendix D

Mississippi Sound Vibracores and Lab Results

This page was intentionally left blank for duplex printing.

This page was intentionally left blank for duplex printing.

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10 ² *D60)	
BI-MS-1-10	MISSISSIPPI SOUND	2010	5/6/2010	11:00 AM	30.24085	-88.99857	269457.68180	932072.78270	20-ft Vibracore	16.7	14.2		2.0	SP	SM														
BI-MS-1-10A	MISSISSIPPI SOUND	2010	5/6/2010	11:00 AM	30.24085	-88.99857	269457.68180	932072.78270	20-ft Vibracore	16.7	14.2	0.0 - 2.0	2.0	SP	SM		VERY DK GRAY	10YR 3/1	3	GRAYISH BROWN	10YR 5/2	5	NO	0.19	0.20	13.5	#VALUE!	#VALUE!	
BI-MS-1-10B	MISSISSIPPI SOUND	2010	5/6/2010	11:00 AM	30.24085	-88.99857	269457.68180	932072.78270	20-ft Vibracore	16.7	14.2	2.0 - 7.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	10YR 5/1	5	GRAY	2.5Y 6/1	6	YES	0.16	0.17	4.8	2.1	1.0	
BI-MS-1-10C	MISSISSIPPI SOUND	2010	5/6/2010	11:00 AM	30.24085	-88.99857	269457.68180	932072.78270	20-ft Vibracore	16.7	14.2	7.0 - 10.7	3.7	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	10YR 5/1	5	LT GRAY	2.5Y 7/1	7	YES	0.19	0.18	5.7	2.3	1.4	
BI-MS-2-10	MISSISSIPPI SOUND	2010	5/6/2010	12:15 PM	30.24549	-88.99913	271145.43480	931898.40930	20-ft Vibracore	18.0	16.1																		
BI-MS-2-10A	MISSISSIPPI SOUND	2010	5/6/2010	12:15 PM	30.24549	-88.99913	271145.43480	931898.40930	20-ft Vibracore	18.0	16.1	0.0 - 2.0	2.0	SM	SM		VERY DK GRAY	10YR 3/1	3	GRAYISH BROWN	10YR 5/2	5	NO	0.21	#VALUE!	15.1	#VALUE!	#VALUE!	
BI-MS-2-10B	MISSISSIPPI SOUND	2010	5/6/2010	12:15 PM	30.24549	-88.99913	271145.43480	931898.40930	20-ft Vibracore	18.0	16.1	2.0 - 7.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.18	0.19	3.7	1.8	1.0	
BI-MS-2-10C	MISSISSIPPI SOUND	2010	5/6/2010	12:15 PM	30.24549	-88.99913	271145.43480	931898.40930	20-ft Vibracore	18.0	16.1	7.0 - 12.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	10YR 5/1	5	GRAY	10YR 5/1	5	NO	0.17	0.17	5.8	2.1	1.1	
BI-MS-3-10	MISSISSIPPI SOUND	2010	5/6/2010	1:00 PM	30.24822	-88.99974	272138.57520	931707.24930	20-ft Vibracore	19.0	16.2																		
BI-MS-3-10A	MISSISSIPPI SOUND	2010	5/6/2010	1:00 PM	30.24822	-88.99974	272138.57520	931707.24930	20-ft Vibracore	19.0	16.2	0.0 - 5.5	5.5	SP	SP-SM		DK GRAY	10YR 4/1	4	GRAY	10YR 5/1	5	NO	0.18	0.17	6.6	2.3	1.4	
BI-MS-3-10B	MISSISSIPPI SOUND	2010	5/6/2010	1:00 PM	30.24822	-88.99974	272138.57520	931707.24930	20-ft Vibracore	19.0	16.2	5.58 - 12.0	6.0	SP	SP-SM		DK GRAY	10YR 4/1	4	GRAY	10YR 5/1	5	NO	0.19	0.18	7.9	2.4	1.6	
BI-MS-04-10	MISSISSIPPI SOUND	2010	5/21/2010	12:44 PM	30.25146	-88.99975	273316.91860	931705.81600	20-ft Vibracore	22.0	12.1																		
BI-MS-04-10A	MISSISSIPPI SOUND	2010	5/21/2010	12:44 PM	30.25146	-88.99975	273316.91860	931705.81600	20-ft Vibracore	22.0	12.1	10.5 - 12.1	1.6	SM	SM	SUBANGULAR TO ROUNDED	LT BROWNISH GRAY	2.5Y 6/2	6	LT GRAY	10YR 7/2	7	NO	0.11	#VALUE!	18.2	#VALUE!	#VALUE!	
BI-MS-5-10	MISSISSIPPI SOUND	2010	5/8/2010	2:09 PM	30.25402	-89.00066	274248.37370	931419.86320	20-ft Vibracore	21.0	10.8	NO SAMPLE TAKEN		CL	NO SAMPLE TESTED														
BI-MS-6-10	MISSISSIPPI SOUND	2010	5/10/2010	9:41 AM	30.24532	-89.03575	271102.32380	920335.22690	20-ft Vibracore	9.0	14.3																		
BI-MS-6-10A	MISSISSIPPI SOUND	2010	5/10/2010	9:41 AM	30.24532	-89.03575	271102.32380	920335.22690	20-ft Vibracore	9.0	14.3	0.0 - 3.0	3.0	SP	SP	ANGULAR TO SUBANGULAR	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.20	0.20	2.2	1.4	1.0	
BI-MS-6-10B	MISSISSIPPI SOUND	2010	5/10/2010	9:41 AM	30.24532	-89.03575	271102.32380	920335.22690	20-ft Vibracore	9.0	14.3	3.0 - 10.5	7.5	SM	SM		GRAY	10YR 5/1	5	GRAY	10YR 5/1	5	NO	0.19	#VALUE!	15.7	#VALUE!	#VALUE!	
BI-MS-6-10C	MISSISSIPPI SOUND	2010	5/10/2010	9:41 AM	30.24532	-89.03575	271102.32380	920335.22690	20-ft Vibracore	9.0	14.3	10.5 - 14.3	3.8	SP	SP-SM	ANGULAR TO SUBANGULAR	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	YES	0.19	0.20	5.3	1.9	1.1	
BI-MS-7-10	MISSISSIPPI SOUND	2010	5/8/2010	12:31 PM	30.23904	-89.03667	268818.90160	920040.64620	20-ft Vibracore	12.0	14.5																		
BI-MS-7-10A	MISSISSIPPI SOUND	2010	5/8/2010	12:31 PM	30.23904	-89.03667	268818.90160	920040.64620	20-ft Vibracore	12.0	14.5	0.0 - 5.0	5.0	SM	SM		DK GRAY	10YR 4/1	4	DK GRAY	10YR 4/1	4	NO	0.19	#VALUE!	20.0	#VALUE!	#VALUE!	
BI-MS-7-10B	MISSISSIPPI SOUND	2010	5/8/2010	12:31 PM	30.23904	-89.03667	268818.90160	920040.64620	20-ft Vibracore	12.0	14.5	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.20	0.20	3.9	2.0	1.3	
BI-MS-7-10C	MISSISSIPPI SOUND	2010	5/8/2010	12:31 PM	30.23904	-89.03667	268818.90160	920040.64620	20-ft Vibracore	12.0	14.5	10.0 - 14.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.12	0.18	8.1	1.9	0.8	
BI-MS-8-10	MISSISSIPPI SOUND	2010	5/8/2010	1:14 PM	30.23090	-89.03573	265857.98170	920332.21270	20-ft Vibracore	14.0	17.1																		
BI-MS-8-10A	MISSISSIPPI SOUND	2010	5/8/2010	1:14 PM	30.23090	-89.03573	265857.98170	920332.21270	20-ft Vibracore	14.0	17.1	1.5 - 6.5	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	10YR 5/1	5	GRAY	10YR 5/1	5	NO	0.21	0.22	4.6	2.1	1.3	
BI-MS-8-10B	MISSISSIPPI SOUND	2010	5/8/2010	1:14 PM	30.23090	-89.03573	265857.98170	920332.21270	20-ft Vibracore	14.0	17.1	6.5 - 11.5	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.20	0.21	3.5	1.7	1.1	
BI-MS-9-10	MISSISSIPPI SOUND	2010	5/6/2010	1:43 PM	30.25179	-89.02062	273447.18160	925116.53570	20-ft Vibracore	8.0	14.6																		
BI-MS-9-10A	MISSISSIPPI SOUND	2010	5/6/2010	1:43 PM	30.25179	-89.02062	273447.18160	925116.53570	20-ft Vibracore	8.0	14.6	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	10YR 5/1	5	GRAY	10YR 5/1	5	NO	0.18	0.18	3.9	2.1	1.4	
BI-MS-10-10	MISSISSIPPI SOUND	2010	5/8/2010	11:31 AM	30.24269	-89.01910	270136.86230	925591.05270	20-ft Vibracore	12.0	15.7																		
BI-MS-10-10A	MISSISSIPPI SOUND	2010	5/8/2010	11:31 AM	30.24269	-89.01910	270136.86230	925591.05270	20-ft Vibracore	12.0	15.7	0.0 - 3.0	3.0	SM	SM		DK GRAY	10YR 4/1	4	DK GRAY	10YR 4/1	4	NO	0.18	0.18	14.0	#VALUE!	#VALUE!	
BI-MS-10-10B	MISSISSIPPI SOUND	2010	5/8/2010	11:31 AM	30.24269	-89.01910	270136.86230	925591.05270	20-ft Vibracore	12.0	15.7	4.2 - 8.0	3.8	SM	SP-SM		DK GRAY	10YR 4/1	4	DK GRAY	10YR 4/1	4	NO	0.17	0.17	11.9	#VALUE!	#VALUE!	
BI-MS-10-10C	MISSISSIPPI SOUND	2010	5/8/2010	11:31 AM	30.24269	-89.01910	270136.86230	925591.05270	20-ft Vibracore	12.0	15.7	8.0 - 15.7	7.7	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.18	0.19	6.1	2.0	1.1	
BI-MS-11-10	MISSISSIPPI SOUND	2010	5/5/2010	3:06 PM	30.22879	-89.00516	265074.73510	929985.21470	20-ft Vibracore	17.0	11.6																		
BI-MS-11-10A	MISSISSIPPI SOUND	2010	5/5/2010	3:06 PM	30.22879	-89.00516	265074.73510	929985.21470	20-ft Vibracore	17.0	11.6	0.0 - 4.08	4.1	SP	SP-SM		DK GRAY	10YR 6/1	6	DK GRAYISH BROWN	10YR 4/2	4	NO	0.19	0.19	10.1	#VALUE!	#VALUE!	
BI-MS-12-10	MISSISSIPPI SOUND	2010	5/5/2010	3:55 PM	30.23237	-88.99186	266370.62630	934187.32290	20-ft Vibracore	19.0	13.9																		
BI-MS-12-10A	MISSISSIPPI SOUND	2010	5/5/2010	3:55 PM	30.23237	-88.99186	266370.62630	934187.32290	20-ft Vibracore	19.0	13.9	0.0 - 3.0	3.0	SM	SM		DK GRAY	10YR 4/1	4	DK GRAY	10YR 4/1	4	NO	0.12	#VALUE!	18.4	#VALUE!	#VALUE!	
BI-MS-12-10B	MISSISSIPPI SOUND	2010	5/5/2010	3:55 PM	30.23237	-88.99186	266370.62630	934187.32290	20-ft Vibracore	19.0	13.9	4.0 - 6.7	3.7	SM	SM		DK GRAY	10YR 4/1	4	DK GRAY	10YR 4/1	4	NO	0.15	#VALUE!	26.4	#VALUE!	#VALUE!	
BI-MS-12-10C	MISSISSIPPI SOUND	2010	5/5/2010	3:55 PM	30.23237	-88.99186	266370.62630	934187.32290	20-ft Vibracore	19.0	13.9	6.7 - 11.5	4.8	SP	SM		DK GRAY	10YR 4/1	4	DK GRAY	10YR 4/1	4	YES	0.15	0.16	14.3	#VALUE!	#VALUE!	
BI-MS-13-10	MISSISSIPPI SOUND	2010	5/6/2010	9:25 AM	30.23244	-88.98853	266394.63460	935238.97190	20-ft Vibracore	17.0	13.6																		
BI-MS-13-10A	MISSISSIPPI SOUND	2010	5/6/2010	9:25 AM	30.23244	-88.98853	266394.63460	935238.97190	20-ft Vibracore	17.0	13.6	0.0 - 4.5	4.5	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	10YR 6/1	6	GRAY	10YR 6/1	6	NO	0.19	0.19	7.4	2.0	1.1	
BI-MS-13-10B	MISSISSIPPI SOUND	2010	5/6/2010	9:25 AM	30.23244	-88.98853	266394.63460	935238.97190	20-ft Vibracore	17.0	13.6	4.5 - 9.5	5.0	SP	SM		DK GRAY	10YR 4/1	4	GRAY	10YR 5/1	5	YES	0.14	#VALUE!	23.0	#VALUE!	#VALUE	

MsCIP Barrier Island Restoration Project 2010-2013 Geotechnical Investigation Sampling Results

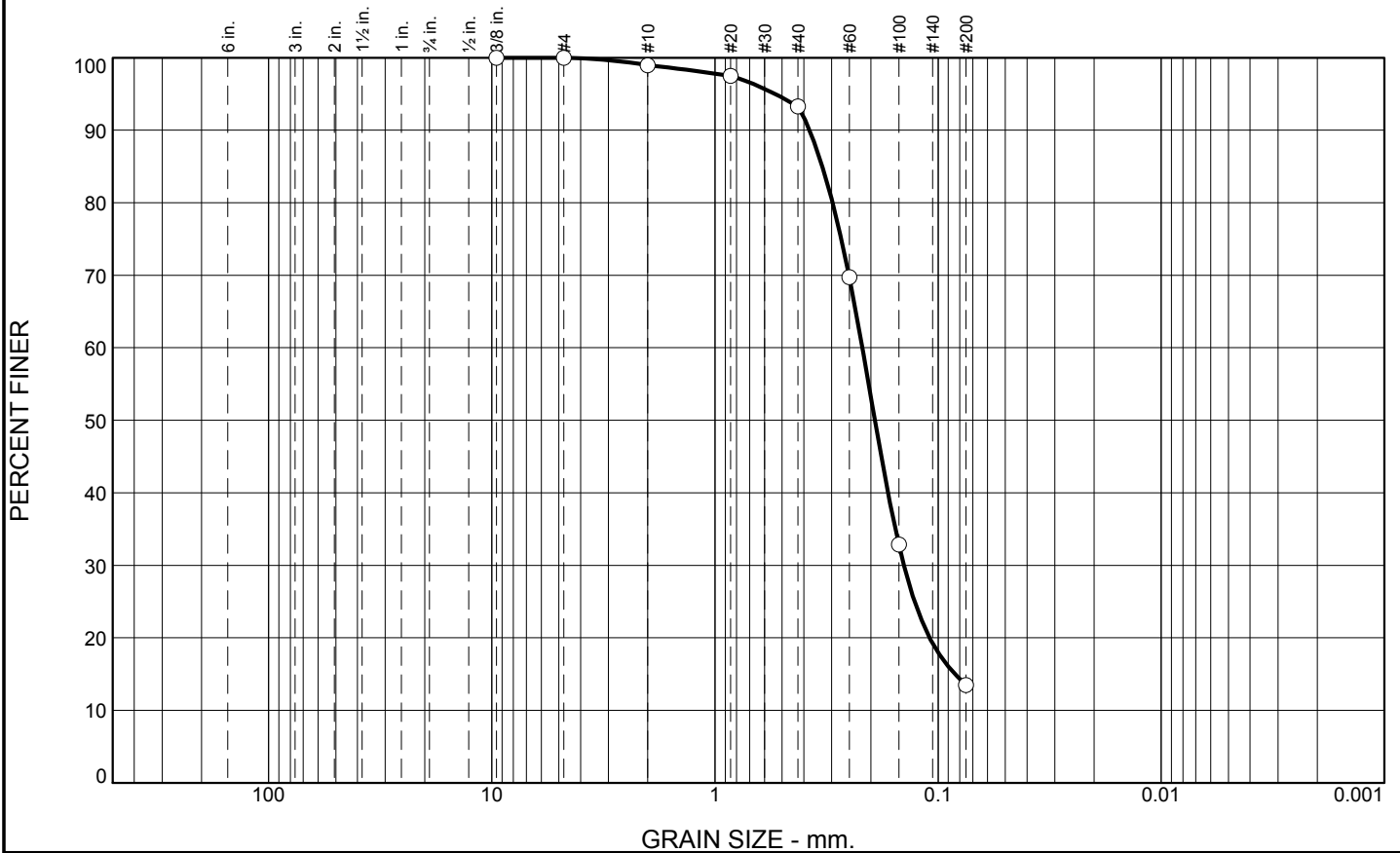
Vibracore / Sample ID	Investigation Area	Sample Event	Date of Sample	Time_CST	Latitude	Longitude	Northing_Y	Easting_X	Sample Method	Water Depth (feet)	Boring Depth (feet below seafloor surface)	Sample Depth (Feet below seafloor surface)	Sample Thickness (feet)	Field USCS	Lab USCS	Angularity	Wet Munsell Color	Wet Munsell Color Code	Wet Munsell Value	Dry Munsell Color	Dry Munsell Color Code	Dry Munsell Value	CaCO3	D50 (mm)	Graphic Mean (mm)	% Fines	Cu (D60/D10)	Cc (D30) ² / (D10*P60)	
BI-MS-21-10A	MISSISSIPPI SOUND	2010	5/14/2010	9:40 AM	30.23678	-88.99010	267973.70230	934745.34070	20-ft Vibracore	21.0	12.8	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	2.5Y 6/1	6	NO	0.17	0.17	3.6	2.0	1.1	
BI-MS-21-10B	MISSISSIPPI SOUND	2010	5/14/2010	9:40 AM	30.23678	-88.99010	267973.70230	934745.34070	20-ft Vibracore	21.0	12.8	5.0 - 9.5	4.5	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	5Y 5/1	5	GRAY	2.5Y 6/1	6	NO	0.15	0.15	5.6	2.0	1.0	
BI-MS-22-10	MISSISSIPPI SOUND	2010	5/13/2010	1:28 PM	30.23381	-88.99444	266895.47540	933373.30000	20-ft Vibracore	19.0	11.4																		
BI-MS-22-10A	MISSISSIPPI SOUND	2010	5/13/2010	1:28 PM	30.23381	-88.99444	266895.47540	933373.30000	20-ft Vibracore	19.0	11.4	0.0 - 5.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DK GRAY	2.5Y 4/1	4	OLIVE GRAY	5Y 5/2	5	NO	0.17	0.18	6.1	2.3	1.1	
BI-MS-22-10B	MISSISSIPPI SOUND	2010	5/13/2010	1:28 PM	30.23381	-88.99444	266895.47540	933373.30000	20-ft Vibracore	19.0	11.4	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	5Y 7/1	7	NO	0.20	0.21	3.2	2.2	1.3	
BI-MS-23-10	MISSISSIPPI SOUND	2010	5/14/2010	10:16 AM	30.23419	-88.98959	267031.53930	934905.09800	20-ft Vibracore	22.0	16.6																		
BI-MS-23-10A	MISSISSIPPI SOUND	2010	5/14/2010	10:16 AM	30.23419	-88.98959	267031.53930	934905.09800	20-ft Vibracore	22.0	16.6	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DK GRAY	2.5Y 4/1	4	GRAY	5Y 6/1	6	NO	0.19	0.20	3.8	1.9	1.1	
BI-MS-23-10B	MISSISSIPPI SOUND	2010	5/14/2010	10:16 AM	30.23419	-88.98959	267031.53930	934905.09800	20-ft Vibracore	22.0	16.6	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DK GRAY	2.5Y 4/1	4	GRAY	5Y 6/1	6	NO	0.18	0.19	3.7	1.9	1.1	
BI-MS-23-10C	MISSISSIPPI SOUND	2010	5/14/2010	10:16 AM	30.23419	-88.98959	267031.53930	934905.09800	20-ft Vibracore	22.0	16.6	10.0 - 16.3	6.3	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	GRAY	5Y 6/1	6	NO	0.18	0.18	6.8	1.9	1.1	
BI-MS-24-10	MISSISSIPPI SOUND	2010	5/15/2010	10:06 AM	30.24077	-88.99658	269427.67980	932701.12940	20-ft Vibracore	19.0	15.5																		
BI-MS-24-10A	MISSISSIPPI SOUND	2010	5/15/2010	10:06 AM	30.24077	-88.99658	269427.67980	932701.12940	20-ft Vibracore	19.0	15.5	0.0 - 5.0	5.0	SM	SP-SM		DK GRAY	2.5Y 4/1	4	GRAY	5Y 6/1	6	NO	0.16	0.16	10.7	#VALUE!	#VALUE!	
BI-MS-24-10B	MISSISSIPPI SOUND	2010	5/15/2010	10:06 AM	30.24077	-88.99658	269427.67980	932701.12940	20-ft Vibracore	19.0	15.5	5.0 - 10.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	DK GRAY	2.5Y 4/1	4	GRAY	5Y 6/1	6	YES	0.14	0.15	6.0	2.0	0.9	
BI-MS-24-10C	MISSISSIPPI SOUND	2010	5/15/2010	10:06 AM	30.24077	-88.99658	269427.67980	932701.12940	20-ft Vibracore	19.0	15.5	10.0 - 13.7	3.7	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	GRAY	2.5Y 6/1	6	NO	0.16	0.16	5.6	2.0	1.1	
BI-MS-25-10	MISSISSIPPI SOUND	2010	5/18/2010	9:36 AM	30.22699	-88.99223	264414.17140	934067.74490	20-ft Vibracore	23.0	18.9																		
BI-MS-25-10A	MISSISSIPPI SOUND	2010	5/18/2010	9:36 AM	30.22699	-88.99223	264414.17140	934067.74490	20-ft Vibracore	23.0	18.9	0.0 - 5.0	5.0	SP	SP	ANGULAR TO SUBANGULAR	GRAY	2.5Y 5/1	5	GRAY	5Y 6/1	6	NO	0.25	0.30	3.7	2.6	1.1	
BI-MS-25-10B	MISSISSIPPI SOUND	2010	5/18/2010	9:36 AM	30.22699	-88.99223	264414.17140	934067.74490	20-ft Vibracore	23.0	18.9	5.0 - 10.4	5.4	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	2.5Y 7/1	7	NO	0.21	0.24	3.8	1.9	1.0	
BI-MS-25-10C	MISSISSIPPI SOUND	2010	5/18/2010	9:36 AM	30.22699	-88.99223	264414.17140	934067.74490	20-ft Vibracore	23.0	18.9	10.4 - 13.5	3.1	SM	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	2.5Y 7/1	7	NO	0.20	0.20	6.2	2.5	1.4	
BI-MS-25-10D	MISSISSIPPI SOUND	2010	5/18/2010	9:36 AM	30.22699	-88.99223	264414.17140	934067.74490	20-ft Vibracore	23.0	18.9	13.5 - 18.9	5.4	ML	SM		VERY DK GRAY	2.5Y 3/1	3	GRAY	5Y 5/1	5	NO	0.09	#VALUE!	38.0	#VALUE!	#VALUE!	
BI-MS-26-10	MISSISSIPPI SOUND	2010	5/14/2010	11:02 AM	30.22774	-88.98778	264684.99930	935473.50200	20-ft Vibracore	21.0	19.3																		
BI-MS-26-10A	MISSISSIPPI SOUND	2010	5/14/2010	11:02 AM	30.22774	-88.98778	264684.99930	935473.50200	20-ft Vibracore	21.0	19.3	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	DK GRAYISH BROWN	2.5Y 4/2	4	LT BROWNISH GRAY	2.5Y 6/2	6	NO	0.24	0.26	3.2	2.4	1.0	
BI-MS-26-10B	MISSISSIPPI SOUND	2010	5/14/2010	11:02 AM	30.22774	-88.98778	264684.99930	935473.50200	20-ft Vibracore	21.0	19.3	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	GRAY	5Y 6/1	6	NO	0.20	0.22	2.6	2.1	1.0	
BI-MS-26-10C	MISSISSIPPI SOUND	2010	5/14/2010	11:02 AM	30.22774	-88.98778	264684.99930	935473.50200	20-ft Vibracore	21.0	19.3	15.0 - 19.3	4.3	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	2.5Y 7/1	7	NO	0.19	0.20	2.7	1.7	1.0	
BI-MS-26-10D	MISSISSIPPI SOUND	2010	5/14/2010	11:02 AM	30.22774	-88.98778	264684.99930	935473.50200	20-ft Vibracore	21.0	19.3	10.0 - 15.0	5.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	2.5Y 7/1	7	NO	0.19	0.21	5.9	2.0	1.1	
BI-MS-27-10	MISSISSIPPI SOUND	2010	5/18/2010	10:00 AM	30.22235	-88.99146	262726.34200	934308.57980	20-ft Vibracore	22.5	14.7																		
BI-MS-27-10A	MISSISSIPPI SOUND	2010	5/18/2010	10:00 AM	30.22235	-88.99146	262726.34200	934308.57980	20-ft Vibracore	22.5	14.7	0.0 - 5.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	2.5Y 7/1	7	NO	0.23	0.24	2.3	2.2	1.0	
BI-MS-27-10B	MISSISSIPPI SOUND	2010	5/18/2010	10:00 AM	30.22235	-88.99146	262726.34200	934308.57980	20-ft Vibracore	22.5	14.7	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	2.5Y 7/1	7	NO	0.26	0.26	1.7	2.3	1.2	
BI-MS-27-10C	MISSISSIPPI SOUND	2010	5/18/2010	10:00 AM	30.22235	-88.99146	262726.34200	934308.57980	20-ft Vibracore	22.5	14.7	10.0 - 13.1	3.1	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	5Y 7/1	7	NO	0.20	0.21	4.0	2.0	1.1	
BI-MS-27-10D	MISSISSIPPI SOUND	2010	5/18/2010	10:00 AM	30.22235	-88.99146	262726.34200	934308.57980	20-ft Vibracore	22.5	14.7	13.1 - 14.7	1.6	SM	SM		VERY DK GRAY	2.5Y 3/1	3	GRAYISH BROWN	2.5Y 5/2	5	NO	0.10	#VALUE!	27.5	#VALUE!	#VALUE!	
BI-MS-28-10	MISSISSIPPI SOUND	2010	5/14/2010	12:54 PM	30.22283	-88.98662	262898.81890	935837.44240	20-ft Vibracore	25.0	19.0																		
BI-MS-28-10A	MISSISSIPPI SOUND	2010	5/14/2010	12:54 PM	30.22283	-88.98662	262898.81890	935837.44240	20-ft Vibracore	25.0	19.0	0.0 - 5.0	5.0	SP	SP	ANGULAR TO SUBANGULAR	GRAYISH BROWN	2.5Y 5/2	5	GRAY	5Y 6/1	6	NO	0.24	0.25	4.1	2.2	1.0	
BI-MS-28-10B	MISSISSIPPI SOUND	2010	5/14/2010	12:54 PM	30.22283	-88.98662	262898.81890	935837.44240	20-ft Vibracore	25.0	19.0	5.0 - 10.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	5Y 7/1	7	NO	0.24	0.25	2.5	2.2	1.0	
BI-MS-28-10C	MISSISSIPPI SOUND	2010	5/14/2010	12:54 PM	30.22283	-88.98662	262898.81890	935837.44240	20-ft Vibracore	25.0	19.0	10.0 - 15.0	5.0	SP	SP	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	5Y 7/1	7	NO	0.26	0.28	3.0	2.3	1.0	
BI-MS-28-10D	MISSISSIPPI SOUND	2010	5/14/2010	12:54 PM	30.22283	-88.98662	262898.81890	935837.44240	20-ft Vibracore	25.0	19.0	15.0 - 19.0	4.0	SP	SP-SM	SUBANGULAR TO ROUNDED	GRAY	2.5Y 5/1	5	LT GRAY	5Y 7/1	7	NO	0.20	0.21	5.7	2.3	1.1	
BI-MS-29-10	MISSISSIPPI SOUND	2010	5/18/2010	10:30 AM	30.21802	-88.99009	261150.99580	934739.10130	20-ft Vibracore	24.0	15.2																		
BI-MS-29-10A	MISSISSIPPI SOUND	2010	5/18/2010	10:30 AM	30.21802	-88.99009	261150.99580	934739.10130	20-ft Vibracore	24.0	15.2	0.0 - 4.0	4.0	SP	SP	ANGULAR TO SUBANGULAR	GRAY	2.5Y 6/1	6	LT GRAY	5Y 7/1	7	NO	0.25	0.28	3.3	2.3	1.0	
BI-MS-29-10B	MISSISSIPPI SOUND	2010	5/18/2010	10:30 AM	30.21802	-88.99009	261150.99580	934739.10130	20-ft Vibracore	24.0	15.2	4.0 - 6.0	2.0	SM	SM		VERY DK GRAY	2.5Y 3/1	3	GRAY	5Y 5/1	5	YES	0.10	#VALUE!	33.3	#VALUE!	#VALUE!	
BI-MS-29-10C	MISSISSIPPI SOUND	2010	5/18/2010	10:30 AM	30.21802	-88.99009	261150.99580	934739.10130	20-ft Vibracore	24.0	15.2	6.0 - 10.6	4.6	SP	SP	SUBANGULAR TO ROUNDED	GRAY	5Y 6/1	6	LT GRAY	2.5Y 7/1	7	NO	0.18	0.18	3.8	1.9	1.1	
BI-MS-29-10D	MISSISSIPPI SOUND	2010	5/18/2010	10:30 AM	30.21802	-88.99009	261150.99580	934739.10130	20-ft Vibracore	24.0	15.2	10.6 - 15.2	4.6	SM	SP-SM	ANGULAR TO SUBANGULAR	DK GRAY	5Y 4/1	4	GRAY	5Y 6/1	6	YES	0.21	0.25	8.1	2.9	1.2	
BI-MS-30-10	MISSISSIPPI SOUND	2010	5/18/2010	11:41 AM	30.21823	-88.98669	261225.90																						

Boring Designation BI-MS-01-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-01-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 16.7 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-06-10 COMPLETED 05-06-10
8. TOTAL DEPTH OF BORING 14.2 Ft.		16. ELEVATION TOP OF BORING -16.1 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-16.1	0.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, trace shell fragments, gray (SP) At El. -18.1 Ft., discontinue silt	A	Classification: SM Color: 10YR 5/2-grayish brown D50: 0.192 mm % Fines: 13.5
				B	Classification: SP Color: 2.5Y 6.5/1-gray D50: 0.163 mm % Fines: 4.8
				C	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1876 mm % Fines: 5.7
-26.9	10.8		SAND, silty, mostly fine-grained sand-sized quartz (SM)	NS	
-30.3	14.2				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.0	5.7	79.8	13.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.0		
#20	97.5		
#40	93.3		
#60	69.7		
#100	32.8		
#200	13.5		

Material Description

SILTY SAND, (SM), fine grained, with trace shell and clay pockets

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3770 D₈₅= 0.3300 D₆₀= 0.2186
D₅₀= 0.1920 D₃₀= 0.1424 D₁₅= 0.0840
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-1-10A
Sample Number: TE Lab ID: 4461.15

Depth: 0.0 - 2.0 (ft)

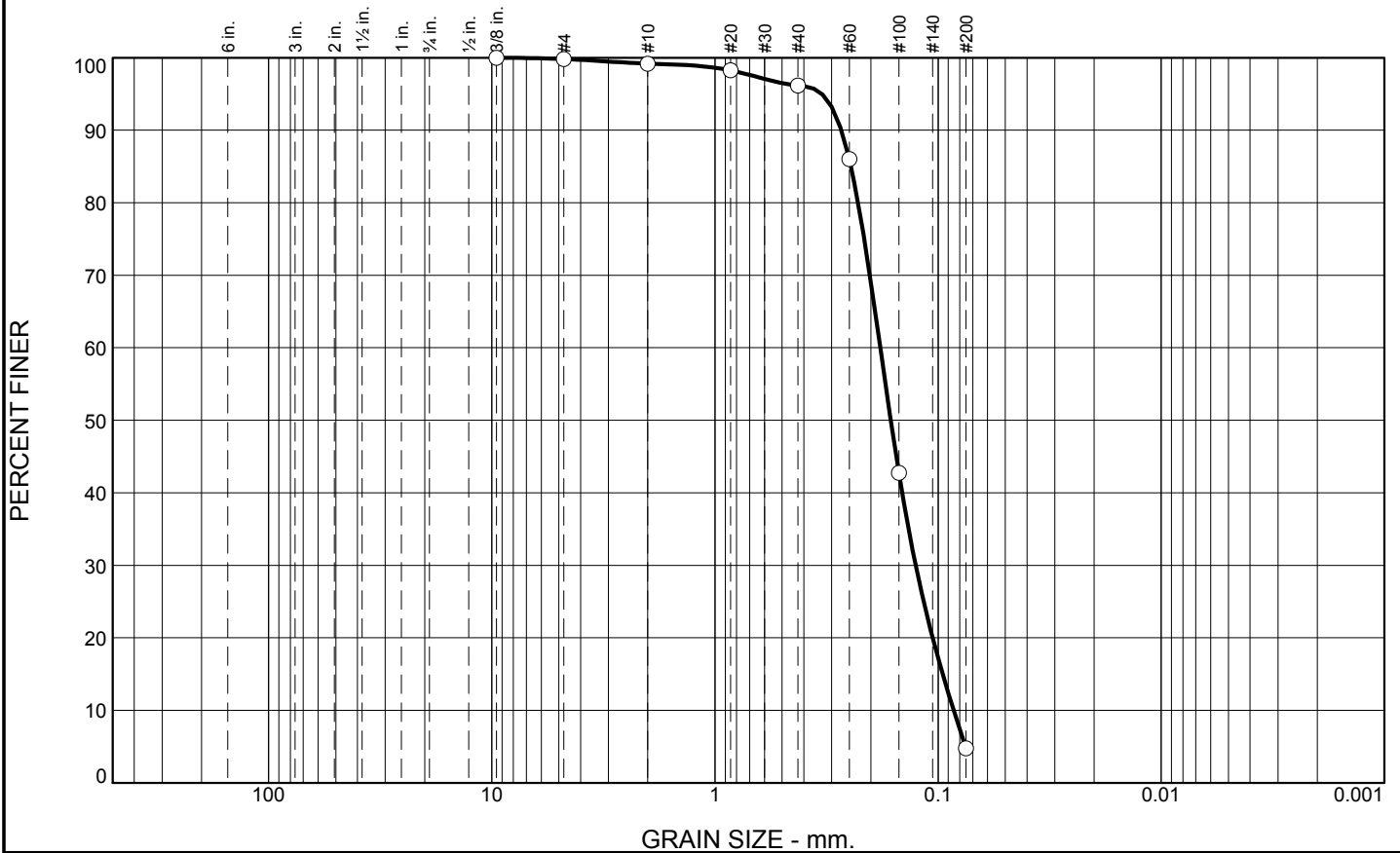
Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009 Figure
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.6	3.1	91.3	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.2		
#20	98.3		
#40	96.1		
#60	86.0		
#100	42.7		
#200	4.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2713 D₈₅= 0.2458 D₆₀= 0.1816
D₅₀= 0.1630 D₃₀= 0.1260 D₁₅= 0.0955
D₁₀= 0.0852 C_u= 2.13 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-1-10B
Sample Number: TE Lab ID: 4461.16

Depth: 2.0 -7.0 (ft)

Date: 5/13/10

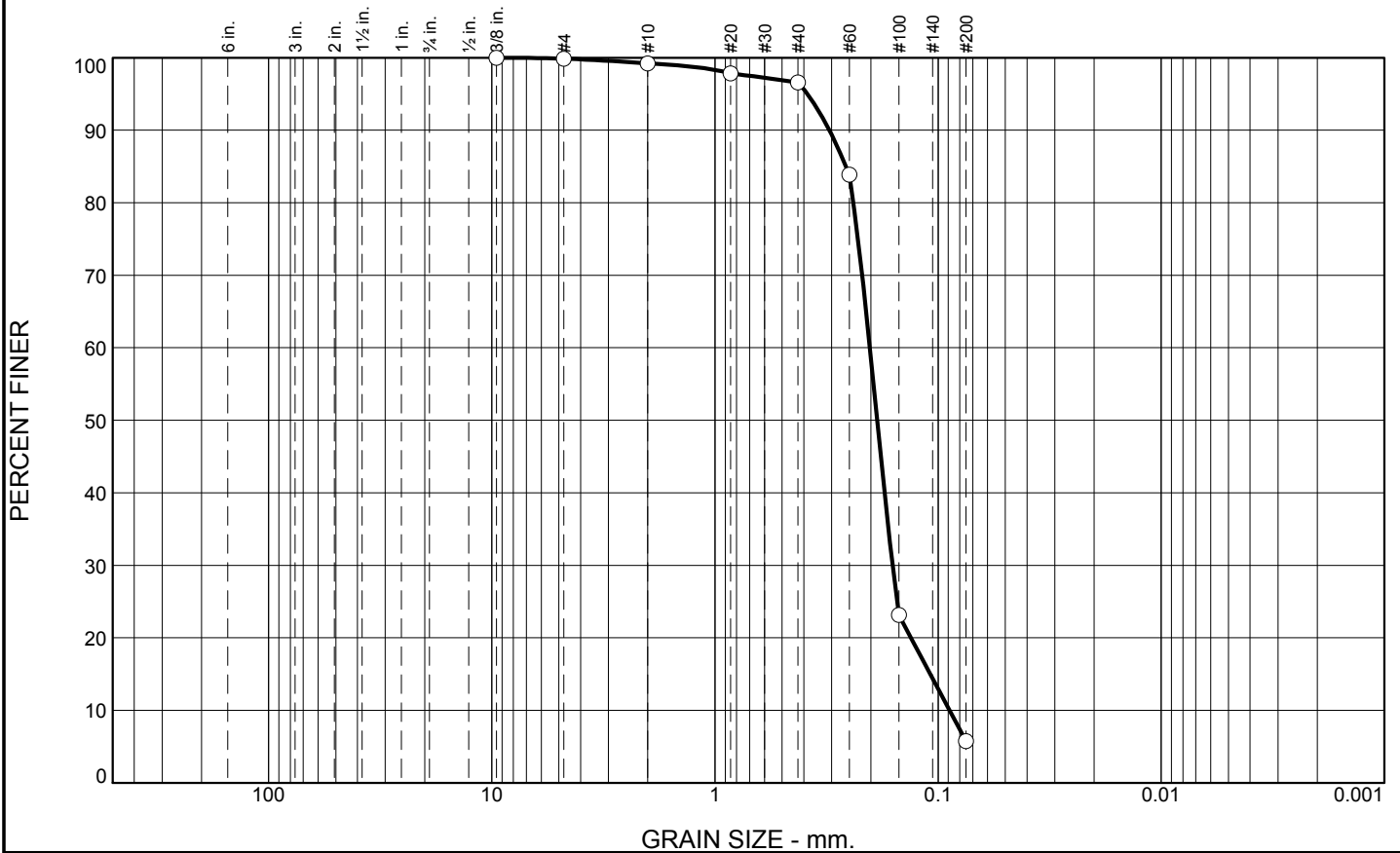
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
-----------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.7	2.6	90.9	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.2		
#20	97.8		
#40	96.6		
#60	83.9		
#100	23.1		
#200	5.7		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3071 D₈₅= 0.2588 D₆₀= 0.2022
D₅₀= 0.1876 D₃₀= 0.1601 D₁₅= 0.1085
D₁₀= 0.0889 C_u= 2.28 C_c= 1.43

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-1-10C
Sample Number: TE Lab ID: 4461.17

Depth: 7.0 - 10.67 (ft)

Date: 5/13/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes

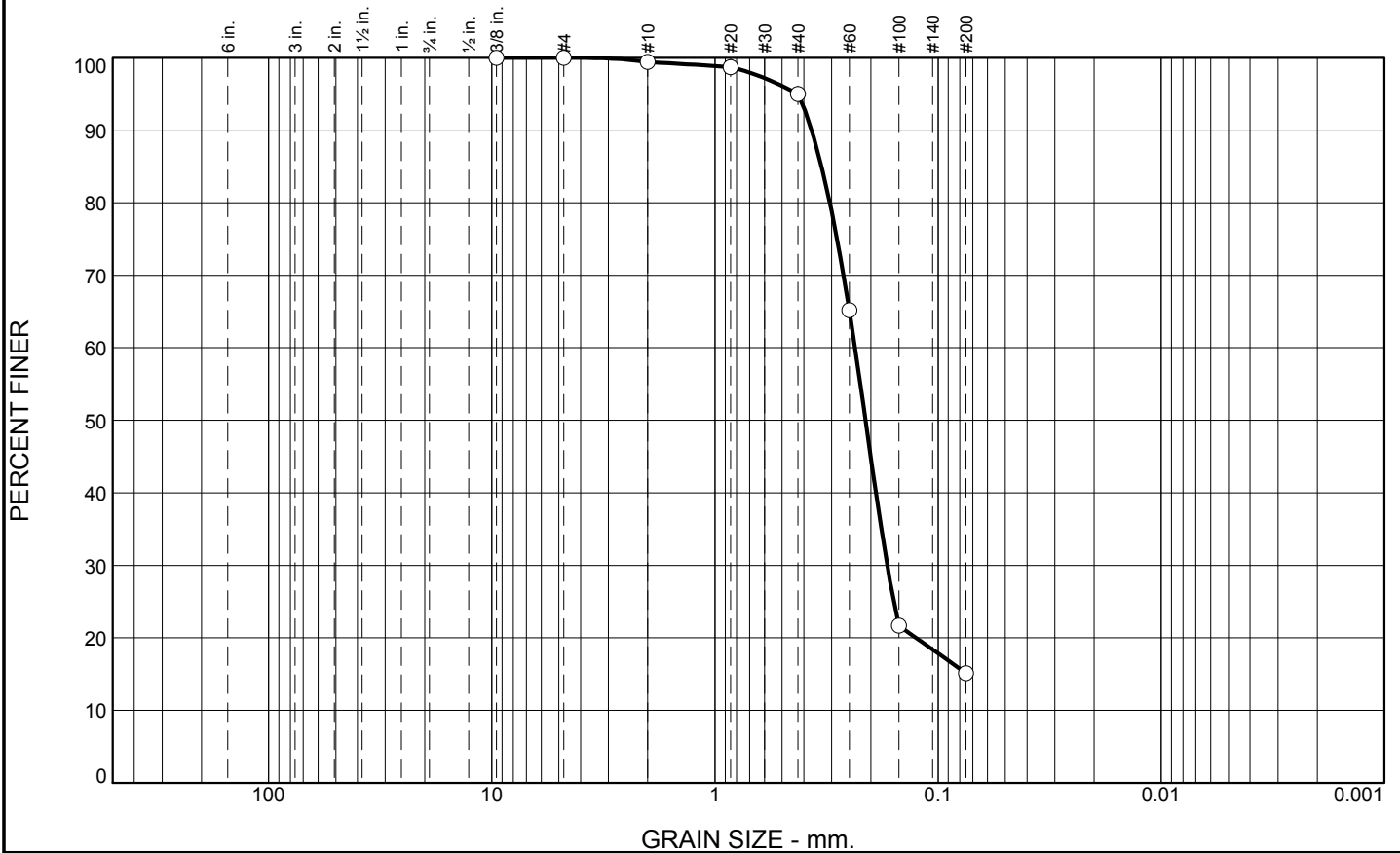
Checked By: R.Byrd

Boring Designation BI-MS-02-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-02-10		LOCATION COORDINATES E = 931,898 N = 271,145		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		HORIZONTAL NAD83
4. NAME OF DRILLER Construction Solutions International, Inc.		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		VERTICAL NAVD88
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
6. THICKNESS OF OVERBURDEN N/A		12. TOTAL SAMPLES		DISTURBED 3
7. DEPTH DRILLED INTO ROCK N/A		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
8. TOTAL DEPTH OF BORING 16.1 Ft.		14. WATER DEPTH 18 Ft.		15. DATE BORING
		16. ELEVATION TOP OF BORING -17.4 Ft.		STARTED 05-06-10
		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-06-10
		18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-17.4	0.0				
-19.4	2.0		SAND, silty, mostly fine-grained sand-sized quartz, trace shell fragments, gray (SM)	A	Classification: SM Color: 10YR 5/2-grayish brown D50: 0.2115 mm % Fines: 15.1
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, gray (SP)	B	Classification: SP Color: 10YR 6/1-gray D50: 0.1841 mm % Fines: 3.7
				C	Classification: SP-SM Color: 10YR 5/1-gray D50: 0.1717 mm % Fines: 5.8
-29.4	12.0				
			SAND, silty, mostly fine-grained sand-sized quartz (SM)	NS	
-33.5	16.1				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	4.4	79.9	15.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.4		
#20	98.7		
#40	95.0		
#60	65.2		
#100	21.7		
#200	15.1		

Material Description

SILTY SAND, (SM), fine grained, with clay pockets

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3691 D₈₅= 0.3329 D₆₀= 0.2356
D₅₀= 0.2115 D₃₀= 0.1691 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

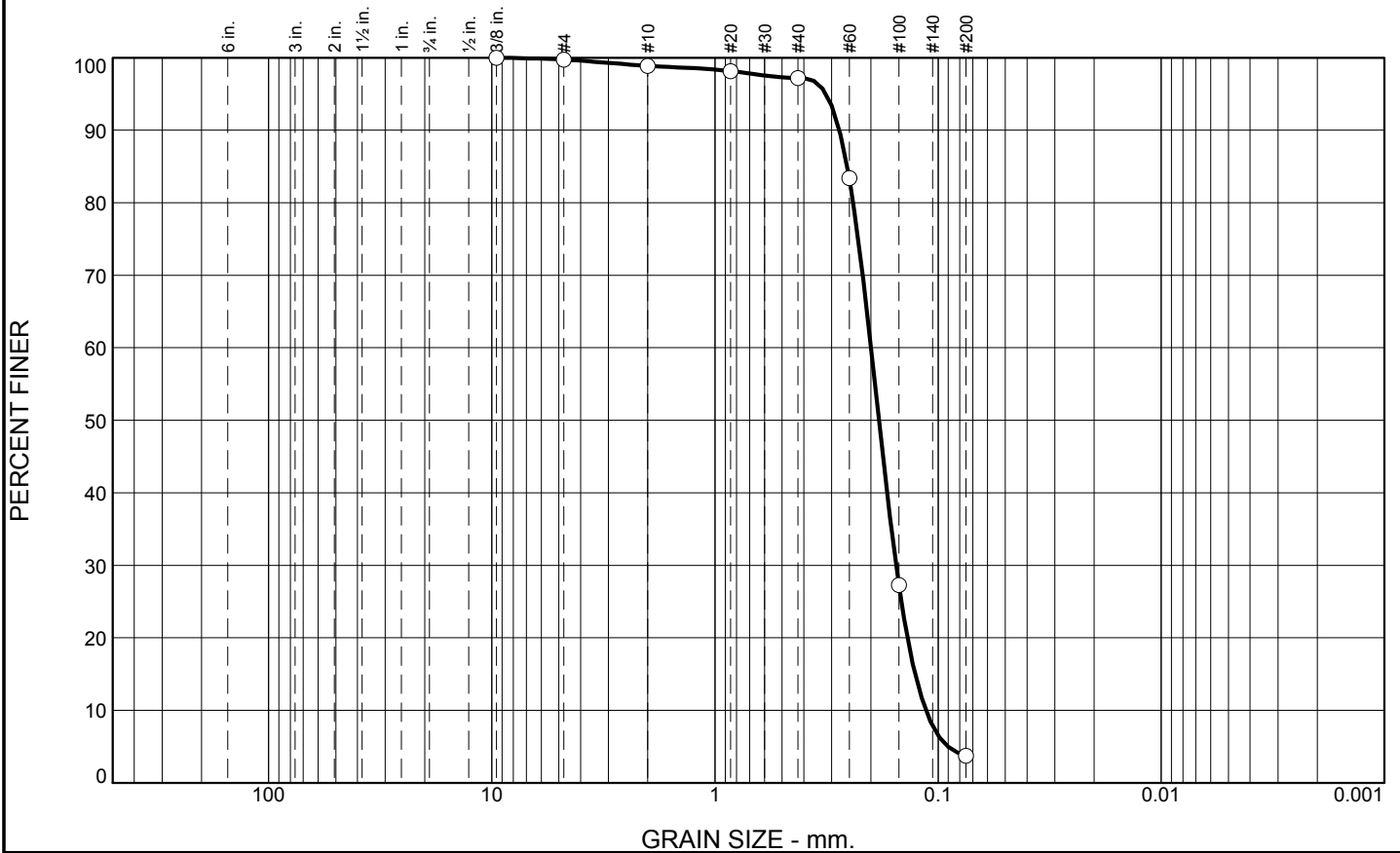
* (no specification provided)

Location: USACE Sample # BI-MS-2-10A **Depth:** 0.0 - 2.0 (ft) **Date:** 5/13/10
Sample Number: TE Lab ID: 4461.18

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009 Figure</p>
--------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.8	1.7	93.5	3.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	98.9		
#20	98.2		
#40	97.2		
#60	83.4		
#100	27.3		
#200	3.7		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2768 D₈₅= 0.2553 D₆₀= 0.1998
D₅₀= 0.1841 D₃₀= 0.1543 D₁₅= 0.1267
D₁₀= 0.1135 C_u= 1.76 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-2-10B
Sample Number: TE Lab ID: 4461.19

Depth: 2.0 - 7.0 (ft)

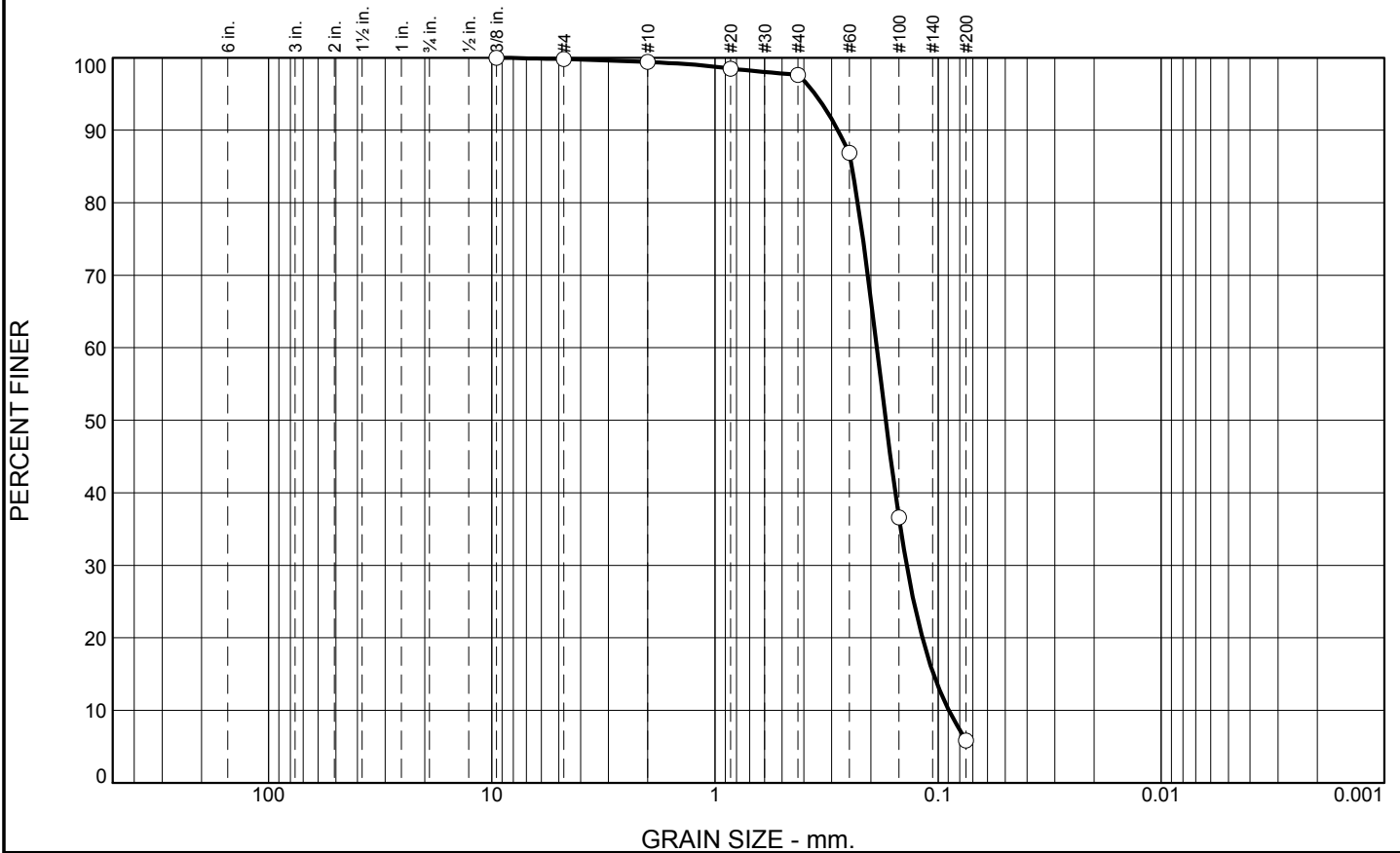
Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009 Figure
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	1.8	91.8	5.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.4		
#20	98.5		
#40	97.6		
#60	86.9		
#100	36.6		
#200	5.8		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2812 D₈₅= 0.2436 D₆₀= 0.1882
D₅₀= 0.1717 D₃₀= 0.1383 D₁₅= 0.1049
D₁₀= 0.0895 C_u= 2.10 C_c= 1.14

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-2-10C
Sample Number: TE Lab ID: 4461.20

Depth: 7.0 - 12.0 (ft)

Date: 5/13/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009</p>
<p>Figure</p>	

Tested By: J.Maddox/L.Stokes

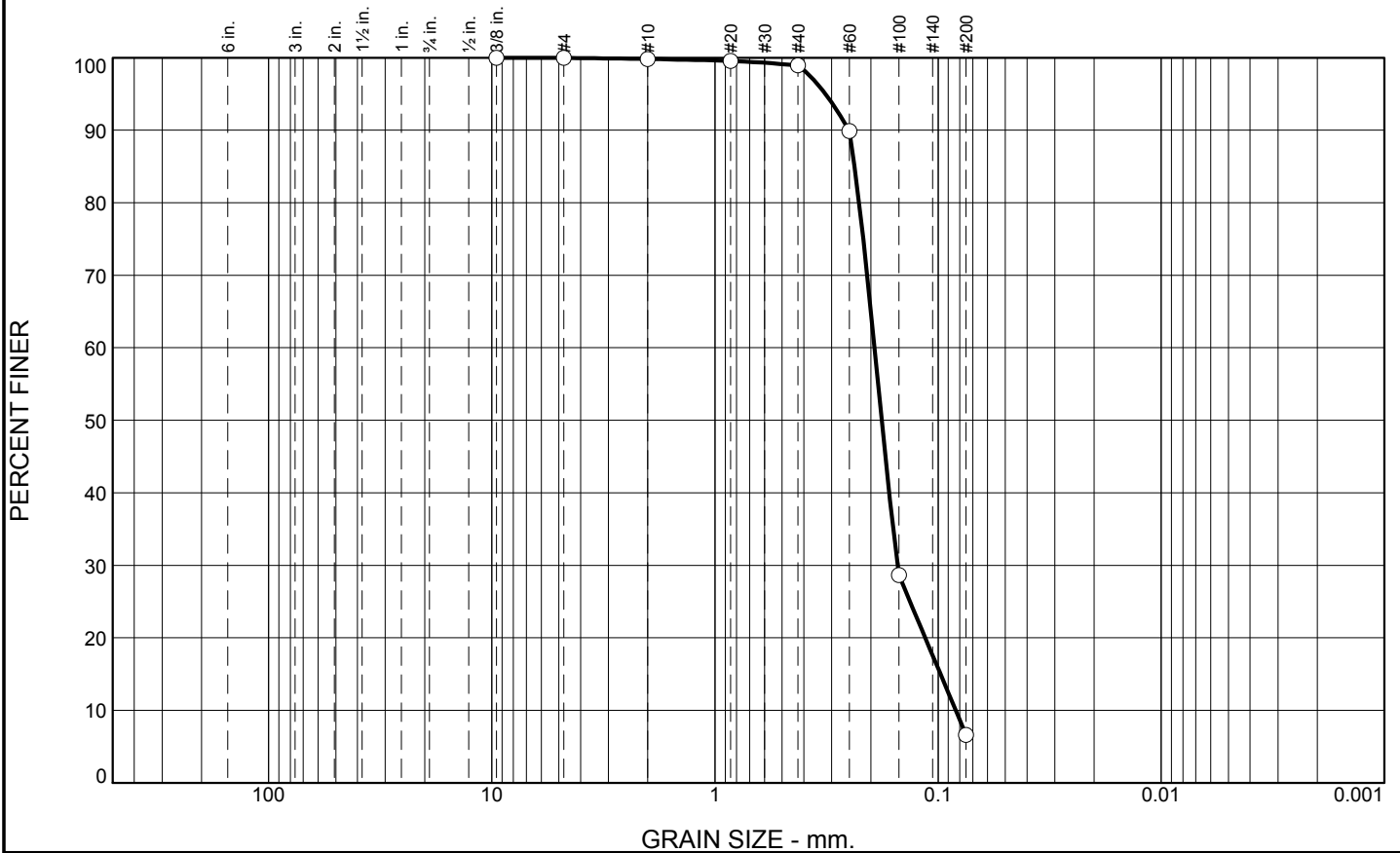
Checked By: R.Byrd

Boring Designation BI-MS-03-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-03-10		LOCATION COORDINATES E = 931,707 N = 272,139		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)
3. DRILLING AGENCY Corps of Engineers - CESAM		CONTRACTOR FILE NO.		HORIZONTAL NAD83
4. NAME OF DRILLER Construction Solutions International, Inc.			11. MANUFACTURER'S DESIGNATION OF DRILL <input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER Vibracore	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	12. TOTAL SAMPLES DISTURBED 2 UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		13. TOTAL NUMBER CORE BOXES		
7. DEPTH DRILLED INTO ROCK N/A		14. WATER DEPTH 19 Ft.		
8. TOTAL DEPTH OF BORING 16.2 Ft.		15. DATE BORING STARTED 05-06-10 COMPLETED 05-06-10		16. ELEVATION TOP OF BORING -18.3 Ft.
			17. TOTAL RECOVERY FOR BORING 100%	
			18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.3	0.0	•••••	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, trace shell fragments, gray (SP)	A	Classification: SP-SM Color: 10YR 5/1-gray D50: 0.179 mm % Fines: 6.6
-23.9	5.6	•••••	SAND, silty, mostly fine-grained sand-sized quartz, gray (SM)	NS	
-25.0	6.7	•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, trace shell fragments, gray (SP)	B	Classification: SP-SM Color: 10YR 5/1-gray D50: 0.1856 mm % Fines: 7.9
-30.3	12.0	•••••	SAND, silty, mostly fine-grained sand-sized quartz, dark gray (SM)	NS	
-32.5	14.2	•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, gray and tan (SP)		
-34.5	16.2	•••••	NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	0.9	92.3	6.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.6		
#40	98.9		
#60	89.9		
#100	28.7		
#200	6.6		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2512 D₈₅= 0.2368 D₆₀= 0.1928
D₅₀= 0.1790 D₃₀= 0.1520 D₁₅= 0.0976
D₁₀= 0.0834 C_u= 2.31 C_c= 1.44

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

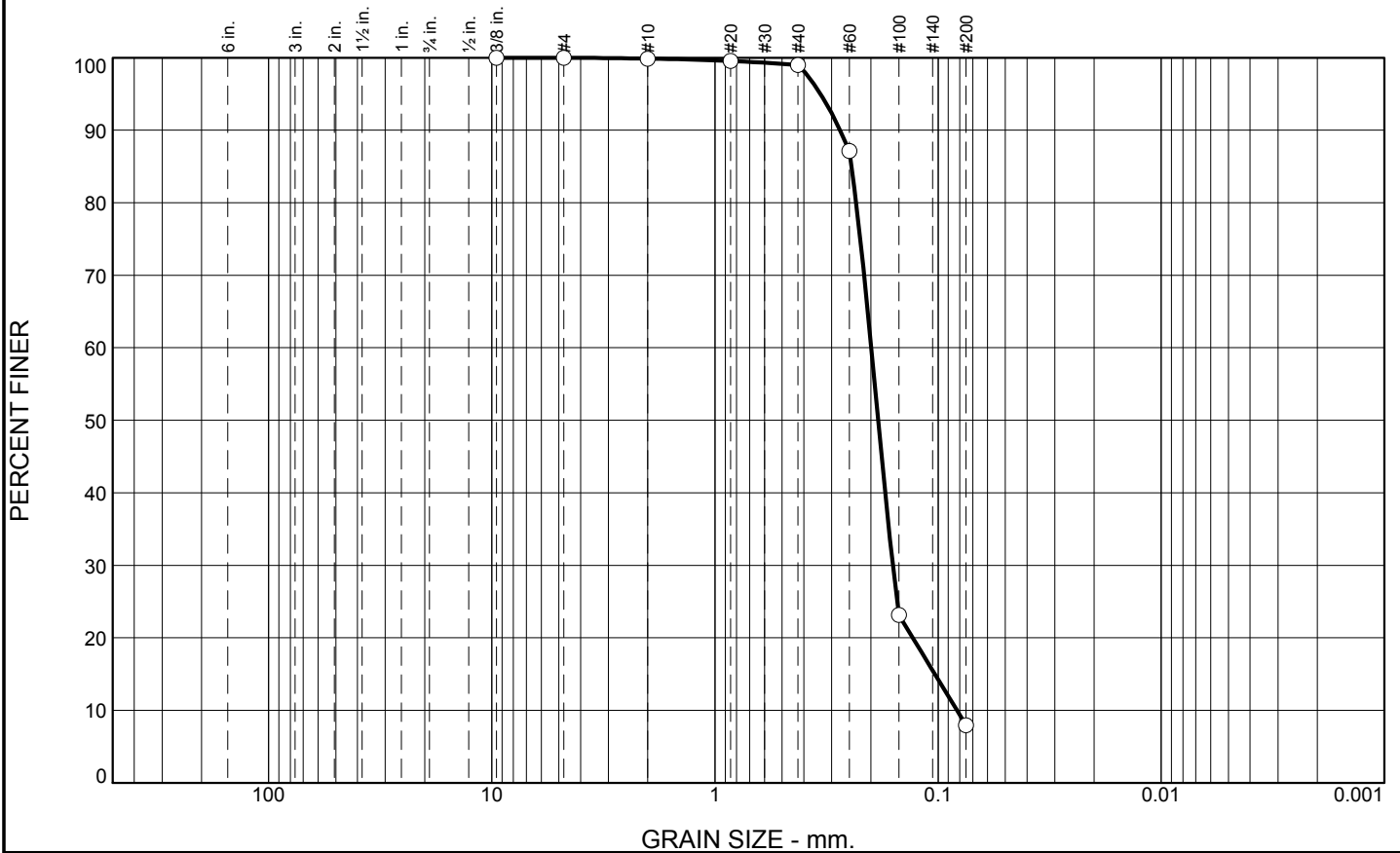
* (no specification provided)

Location: USACE Sample # BI-MS-3-10A **Depth:** 0.0 - 5.5 (ft) **Date:** 5/13/10
Sample Number: TE Lab ID: 4461.21

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009 Figure</p>
--------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.9	91.1	7.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.6		
#40	99.0		
#60	87.1		
#100	23.2		
#200	7.9		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2749 D₈₅= 0.2443 D₆₀= 0.1993
D₅₀= 0.1856 D₃₀= 0.1596 D₁₅= 0.1034
D₁₀= 0.0823 C_u= 2.42 C_c= 1.55

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-3-10B
Sample Number: TE Lab ID: 4461.22

Depth: 6.58 - 12.0 (ft)

Date: 5/13/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Mississippi Barrier Island Restoration Project
Contract No. W91278-10-D-0026 - Task 03
Project No: 1021230009

Figure

Tested By: J.Maddox/L.Stokes

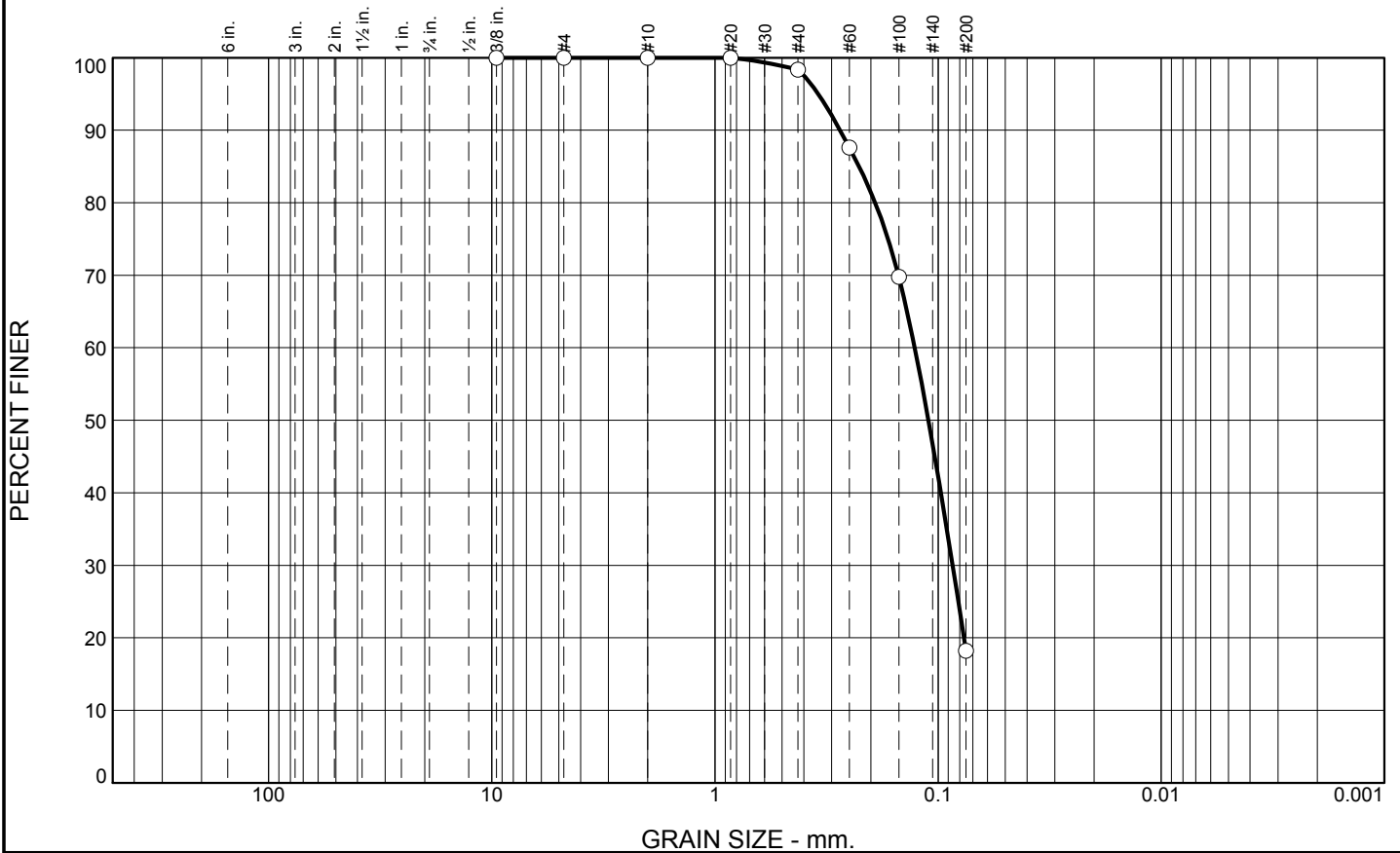
Checked By: R.Byrd

Boring Designation BI-MS-04-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-04-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 22 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -21.2 Ft.		STARTED 05-21-10
8. TOTAL DEPTH OF BORING 12.1 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-21-10
18. SIGNATURE AND TITLE OF INSPECTOR Mark Green, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-21.2	0.0	▨	CLAY, lean, very soft, trace fine-grained sand-sized quartz (CL)	NS	
-31.7	10.5	▧	SAND, silty, mostly fine-grained sand-sized quartz, trace clay, trace organic matter, Lt. gray, tan, and orange, mottled (SM)	A	Classification: SM Color: - D50: 0.1105 mm % Fines: 18.2
-33.3	12.1	▧	NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	80.2	18.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	98.4		
#60	87.6		
#100	69.8		
#200	18.2		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2751 D₈₅= 0.2262 D₆₀= 0.1273
D₅₀= 0.1105 D₃₀= 0.0861 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-04-10A
Sample Number: TE Lab ID: 4489.14

Depth: 10.5 - 12.1 (ft.)

Date: 5/30/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



Figure

Tested By: G.Fancher

Checked By: R.Byrd




Boring Designation BI-MS-05-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-05-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-08-10
8. TOTAL DEPTH OF BORING 10.8 Ft.		16. ELEVATION TOP OF BORING -21.4 Ft.		COMPLETED 05-08-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

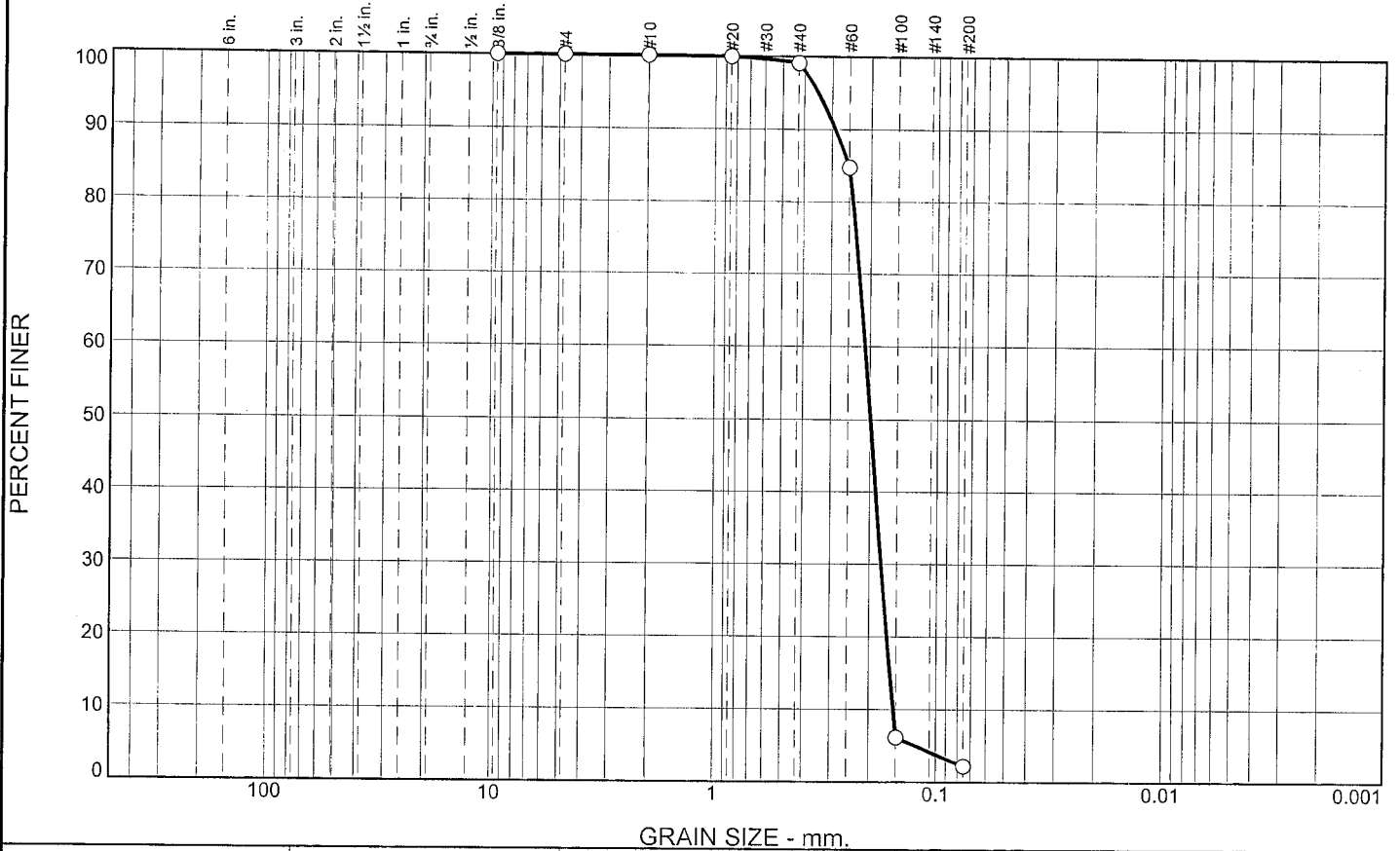
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-21.4	0.0		CLAY, lean (CL)	NS	
-31.3	9.9				
-32.2	10.8		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt (SM)		
NOTES:			<p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>		

Boring Designation BI-MS-06-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-06-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 9 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -8.1 Ft.		STARTED 05-10-10
8. TOTAL DEPTH OF BORING 14.3 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-10-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-8.1	0.0				
-11.1	3.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, little shell fragments, lt. gray (SP)	A	Classification: SP Color: 10YR 6/1-gray D50: 0.1984 mm % Fines: 2.2
-18.6	10.5		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, little shell fragments, gray (SM)	B	Classification: SM Color: 10YR 5/1-gray D50: 0.1871 mm % Fines: 15.7
-22.4	14.3		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little shell fragments, trace silt, lt. gray (SP)	C	Classification: SP-SM Color: 10YR 6/1-gray D50: 0.1872 mm % Fines: 5.3
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.	NS	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.9	96.9	2.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.1		
#60	84.8		
#100	6.2		
#200	2.2		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2903 D₈₅= 0.2516 D₆₀= 0.2103
D₅₀= 0.1984 D₃₀= 0.1767 D₁₅= 0.1605
D₁₀= 0.1547 C_u= 1.36 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-6-10A
Sample Number: TE Lab ID: 4473.01

Depth: 0.0 - 3.0 (ft)

Date: 5/17/10

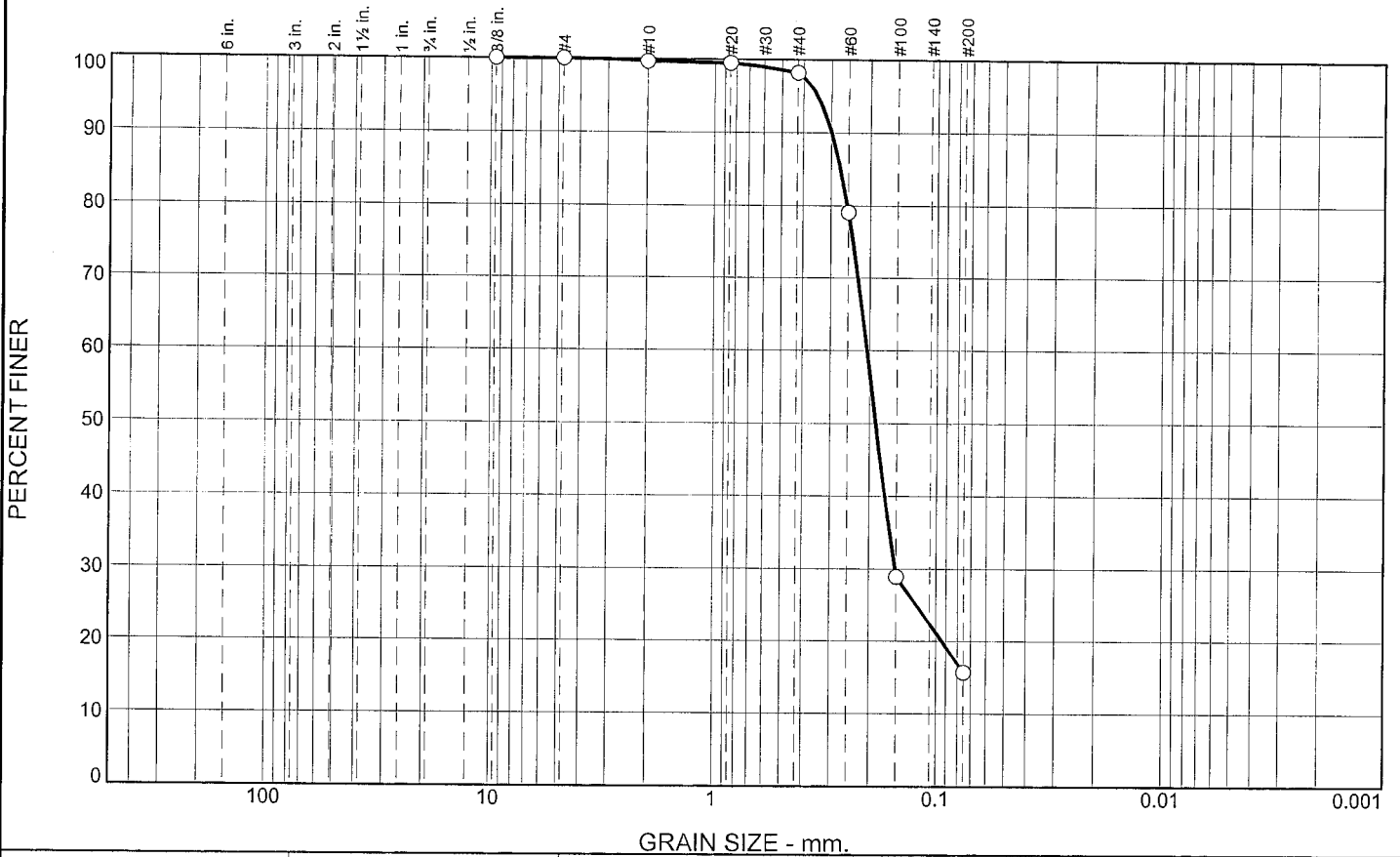
<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.5	82.5	15.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	98.2		
#40	79.1		
#60	28.9		
#100	15.7		
#200	15.7		

Material Description

SILTY SAND, (SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2987 D₈₅= 0.2718 D₆₀= 0.2052
D₅₀= 0.1871 D₃₀= 0.1521 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

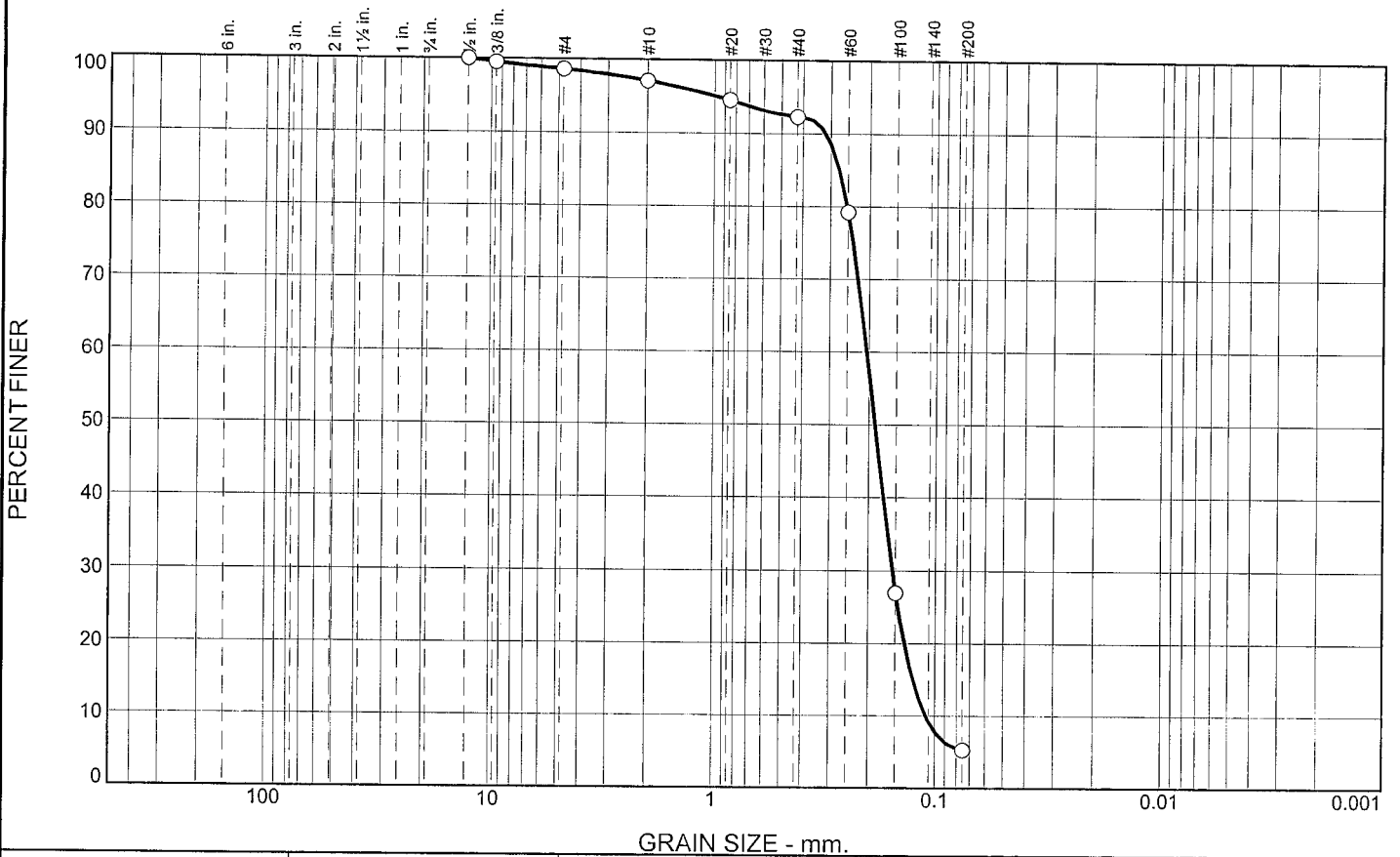
* (no specification provided)

Location: USACE Sample # BI-MS-6-10B Depth: 3.0 - 10.5 (ft) Date: 5/17/10
Sample Number: TE Lab ID: 4473.02

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	1.5	4.8	87.0	5.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.500	100.0		
.375	99.5		
#4	98.6		
#10	97.1		
#20	94.5		
#40	92.3		
#60	79.2		
#100	27.0		
#200	5.3		

Material Description

SAND, (SP-SM), fine grained, with shell

Atterberg Limits

PL= LL= PI=

Coefficients

D ₉₀ = 0.3167	D ₈₅ = 0.2746	D ₆₀ = 0.2045
D ₅₀ = 0.1872	D ₃₀ = 0.1551	D ₁₅ = 0.1253
D ₁₀ = 0.1101	C _u = 1.86	C _c = 1.07

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-6-10C
Sample Number: TE Lab ID: 4473.03

Depth: 10.5 - 14.3 (ft)

Date: 5/17/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p>
------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

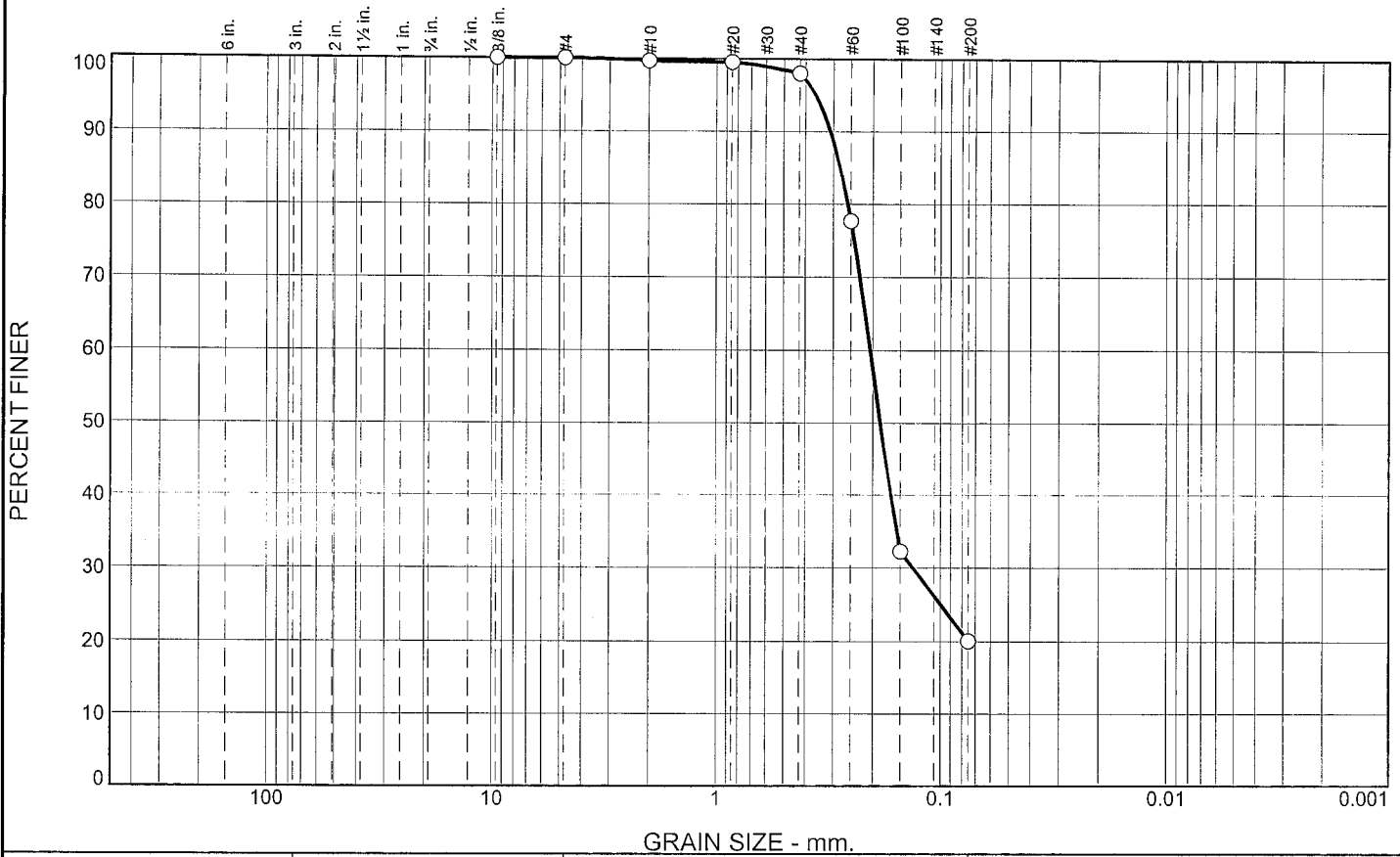
Tested By: L.Stokes Checked By: R.Byrd

Boring Designation BI-MS-07-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-07-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		VERTICAL NAVD88
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		DISTURBED 3
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 05-08-10		UNDISTURBED (UD) 0
8. TOTAL DEPTH OF BORING 14.5 Ft.		16. ELEVATION TOP OF BORING -12.3 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.3	0.0				
		↑↑↑↑↑	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, brown (SM)	A	Classification: SM Color: 10YR 4/1-dark gray D50: 0.185 mm % Fines: 20
-17.3	5.0	●●●●●	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace shell fragments, tan and lt. gray (SP)	B	Classification: SP Color: 10YR 6/1-gray D50: 0.1976 mm % Fines: 3.9
		●●●●●		C	Classification: SP-SM Color: 10YR 6/1-gray D50: 0.1216 mm % Fines: 8.1
-26.8	14.5				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.7	78.0	20.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.5		
#40	98.0		
#60	77.6		
#100	32.2		
#200	20.0		

Material Description

SILTY SAND, (SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3094 D₈₅= 0.2795 D₆₀= 0.2050
D₅₀= 0.1850 D₃₀= 0.1322 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-7-10A
Sample Number: TE Lab ID: 4473.04

Depth: 0.0 - 5.0 (ft)

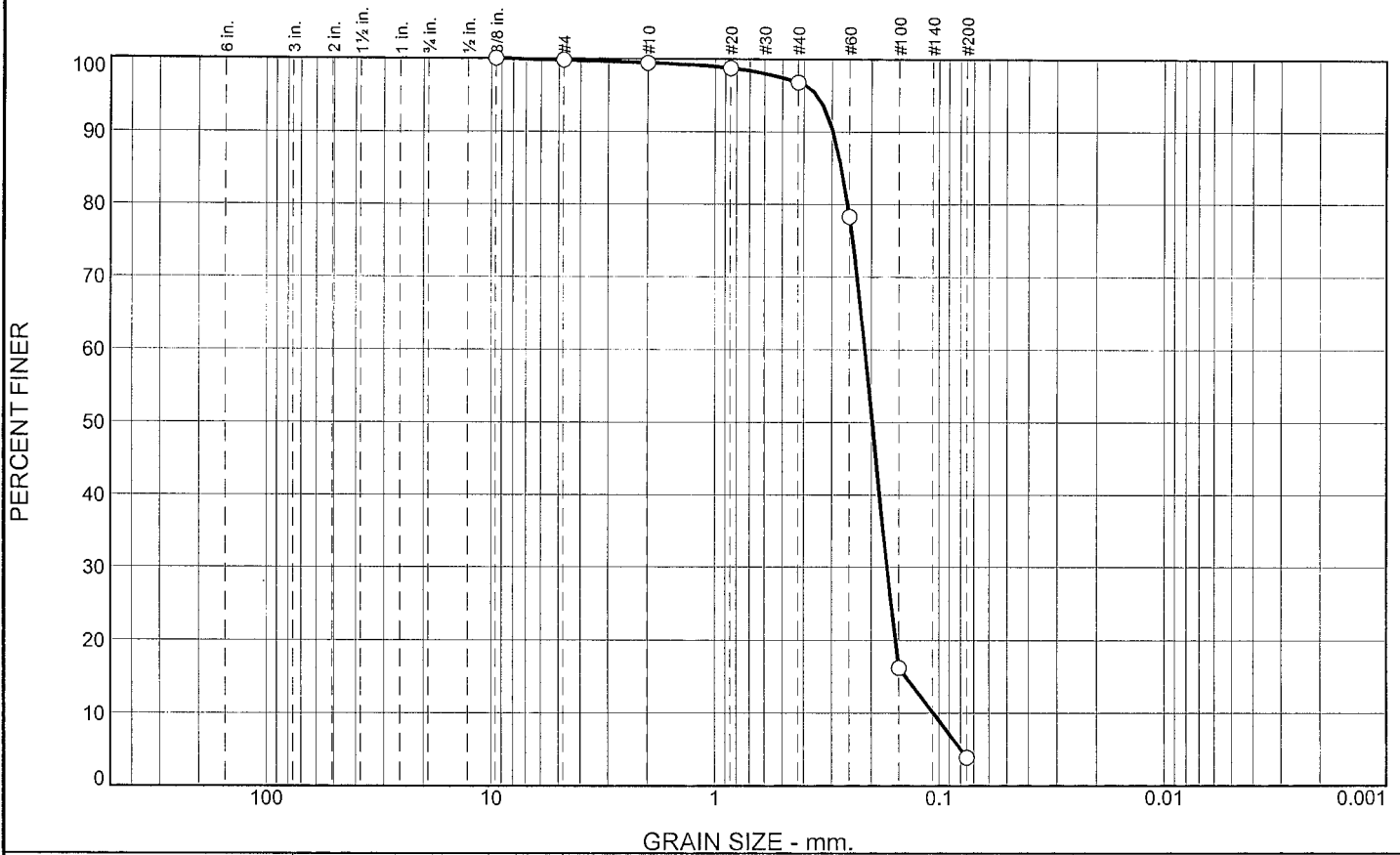
Date: 5/17/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
Figure	

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	2.6	92.9	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.4		
#20	98.7		
#40	96.8		
#60	78.3		
#100	16.2		
#200	3.9		

Material Description

SAND, (SP), fine grained, with shell

Atterberg Limits

PL= LL= PI=

Coefficients

D ₉₀ = 0.2969	D ₈₅ = 0.2719	D ₆₀ = 0.2131
D ₅₀ = 0.1976	D ₃₀ = 0.1699	D ₁₅ = 0.1401
D ₁₀ = 0.1056	C _u = 2.02	C _c = 1.28

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-7-10B
Sample Number: TE Lab ID: 4473.05

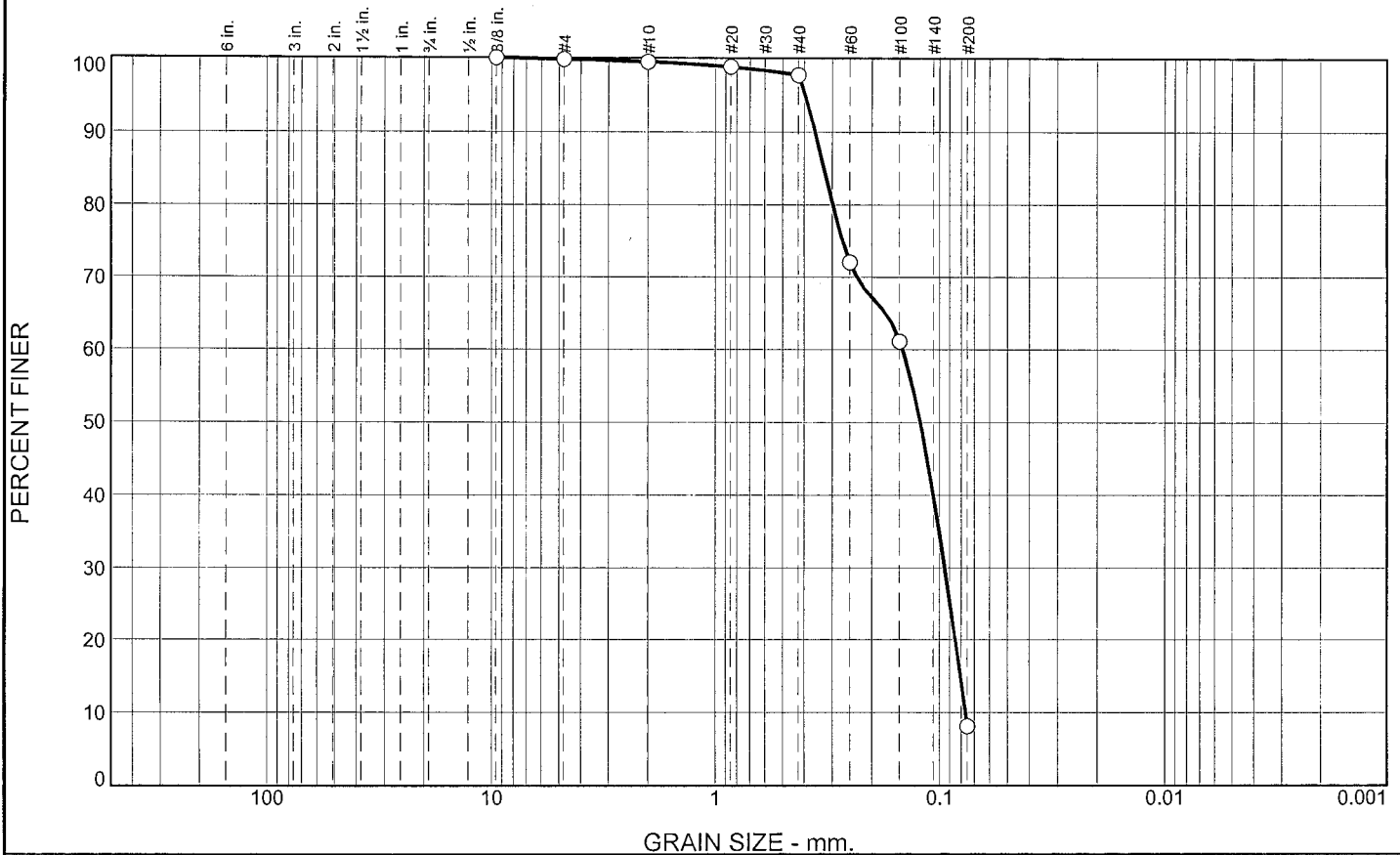
Depth: 5.0 - 10.0 (ft)

Date: 5/17/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Figure</p>
------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.4	1.7	89.6	8.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.4		
#20	98.8		
#40	97.7		
#60	72.0		
#100	61.1		
#200	8.1		

Material Description

SAND, (SP-SM), fine grained, with shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3581 D₈₅= 0.3268 D₆₀= 0.1458
D₅₀= 0.1216 D₃₀= 0.0946 D₁₅= 0.0806
D₁₀= 0.0765 C_u= 1.91 C_c= 0.80

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-7-10C
Sample Number: TE Lab ID: 4473.06

Depth: 10.0 - 14.0 (ft)

Date: 5/17/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

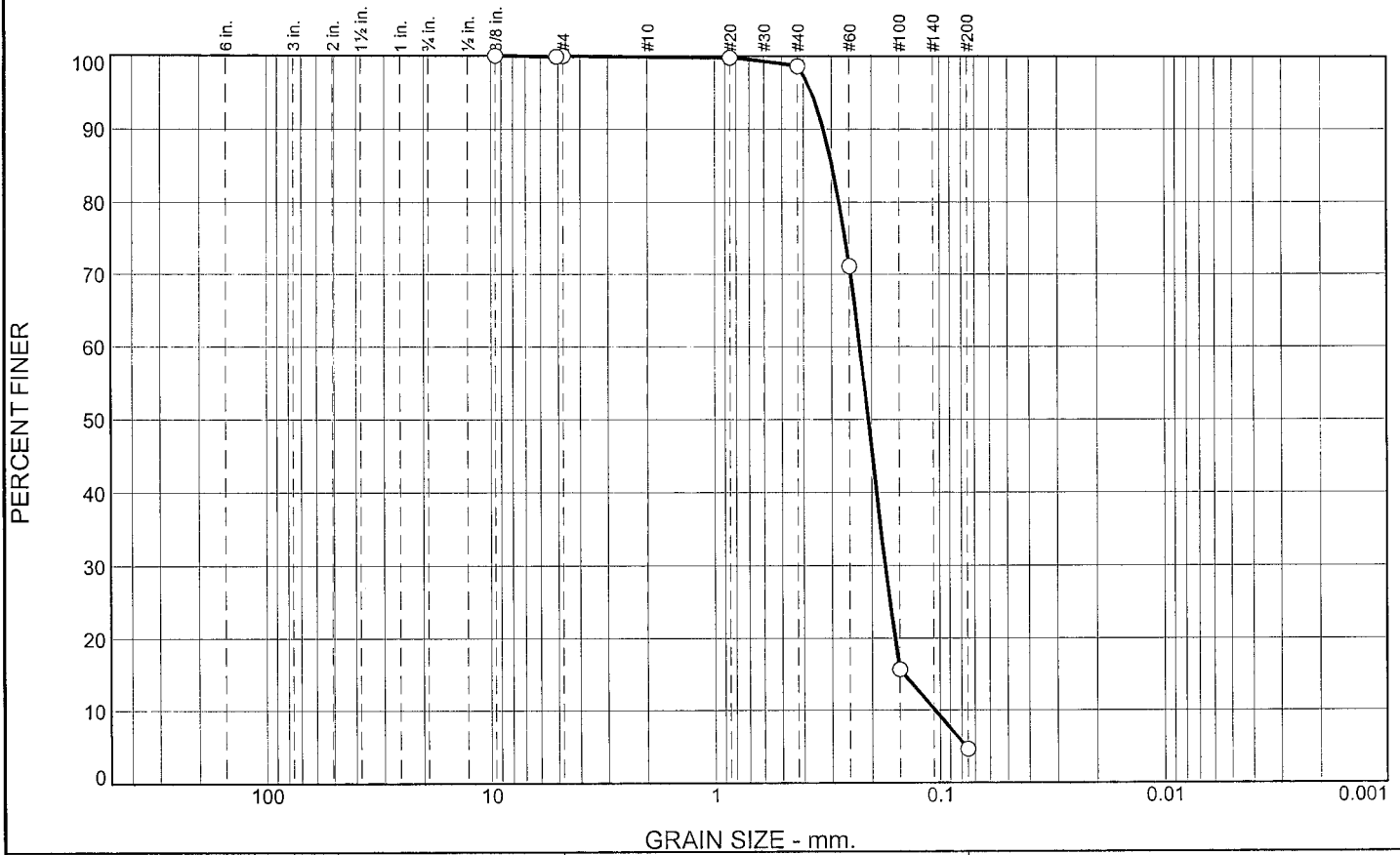
Checked By: R.Byrd

Boring Designation BI-MS-08-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-08-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 14 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-08-10
8. TOTAL DEPTH OF BORING 17.1 Ft.		16. ELEVATION TOP OF BORING -14.3 Ft.		COMPLETED 05-08-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-14.3	0.0				
-15.8	1.5		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, some shell fragments, gray (SM)	NS	
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, little shell fragments, lt. gray and tan (SP)	A	Classification: SP Color: 10YR 5/1-gray D50: 0.2066 mm % Fines: 4.6
			CLAY, lean, trace fine to medium-grained sand-sized quartz, dark gray (CL)	NS	
-25.8	11.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, little shell fragments, gray (SP)	B	Classification: SP Color: 10YR 6/1-gray D50: 0.2027 mm % Fines: 3.5
-29.3	15.0				
-31.4	17.1				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.3	94.0	4.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
0.20	99.9		
#4	100.0		
#20	99.7		
#40	98.6		
#60	71.1		
#100	15.6		
#200	4.6		

Material Description

SAND, (SP), fine grained, trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3262 D₈₅= 0.2982 D₆₀= 0.2251
D₅₀= 0.2066 D₃₀= 0.1741 D₁₅= 0.1441
D₁₀= 0.1052 C_u= 2.14 C_c= 1.28

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-8-10A
Sample Number: TE Lab ID: 4473.07

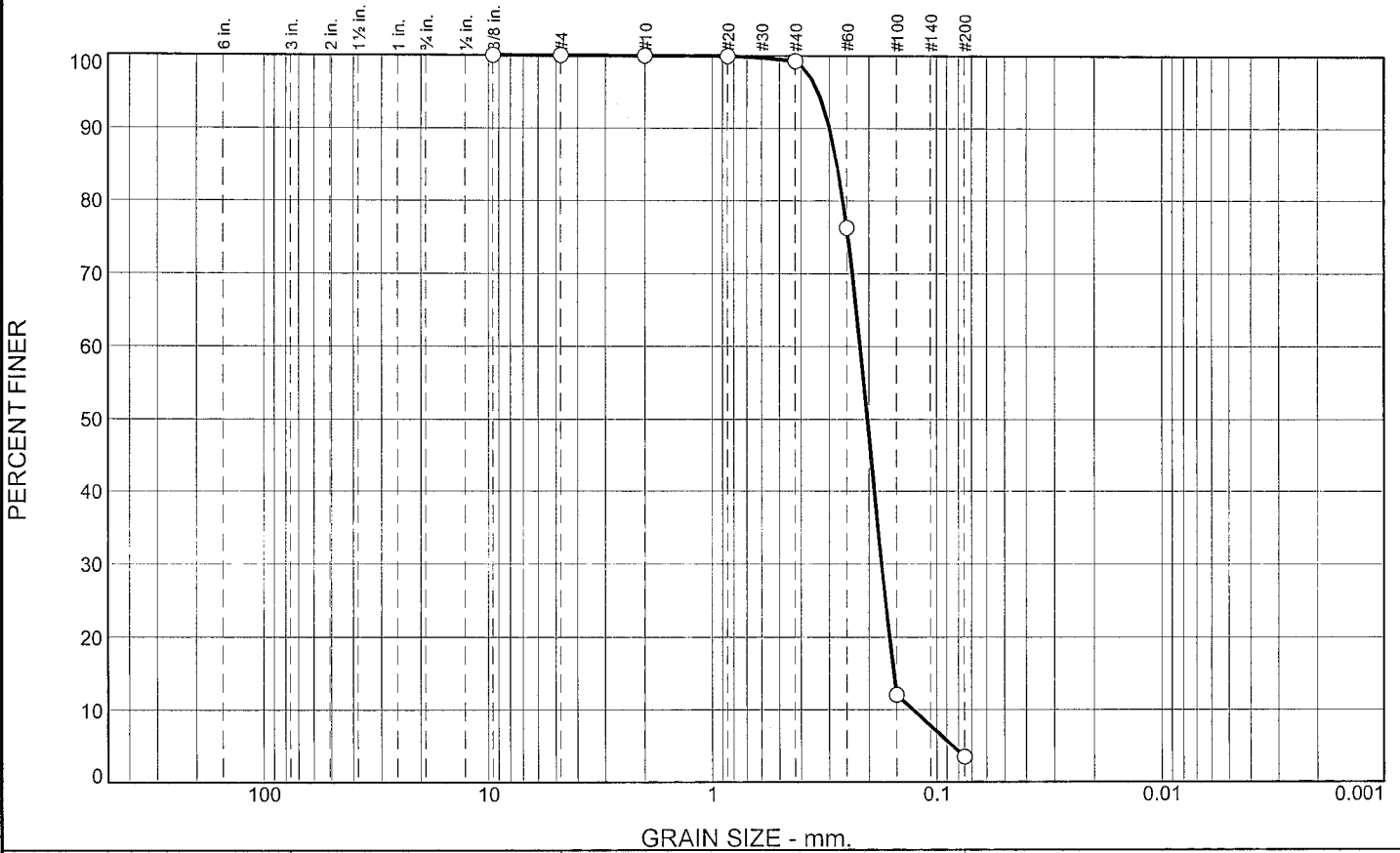
Depth: 1.5 - 6.5 (ft)

Date: 5/17/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	95.8	3.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.3		
#60	76.3		
#100	12.1		
#200	3.5		

Material Description

SAND, (SP), fine grained, trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2988 D₈₅= 0.2763 D₆₀= 0.2181
D₅₀= 0.2027 D₃₀= 0.1753 D₁₅= 0.1546
D₁₀= 0.1271 C_u= 1.72 C_c= 1.11

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-8-10B
Sample Number: TE Lab ID: 4473.08

Depth: 6.5 - 11.5 (ft)

Date: 5/17/10

<p style="font-size: 1.2em; font-weight: bold; margin: 0;">Thompson Engineering</p> <p style="font-size: 1.2em; font-weight: bold; margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009 Figure</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L. Stokes

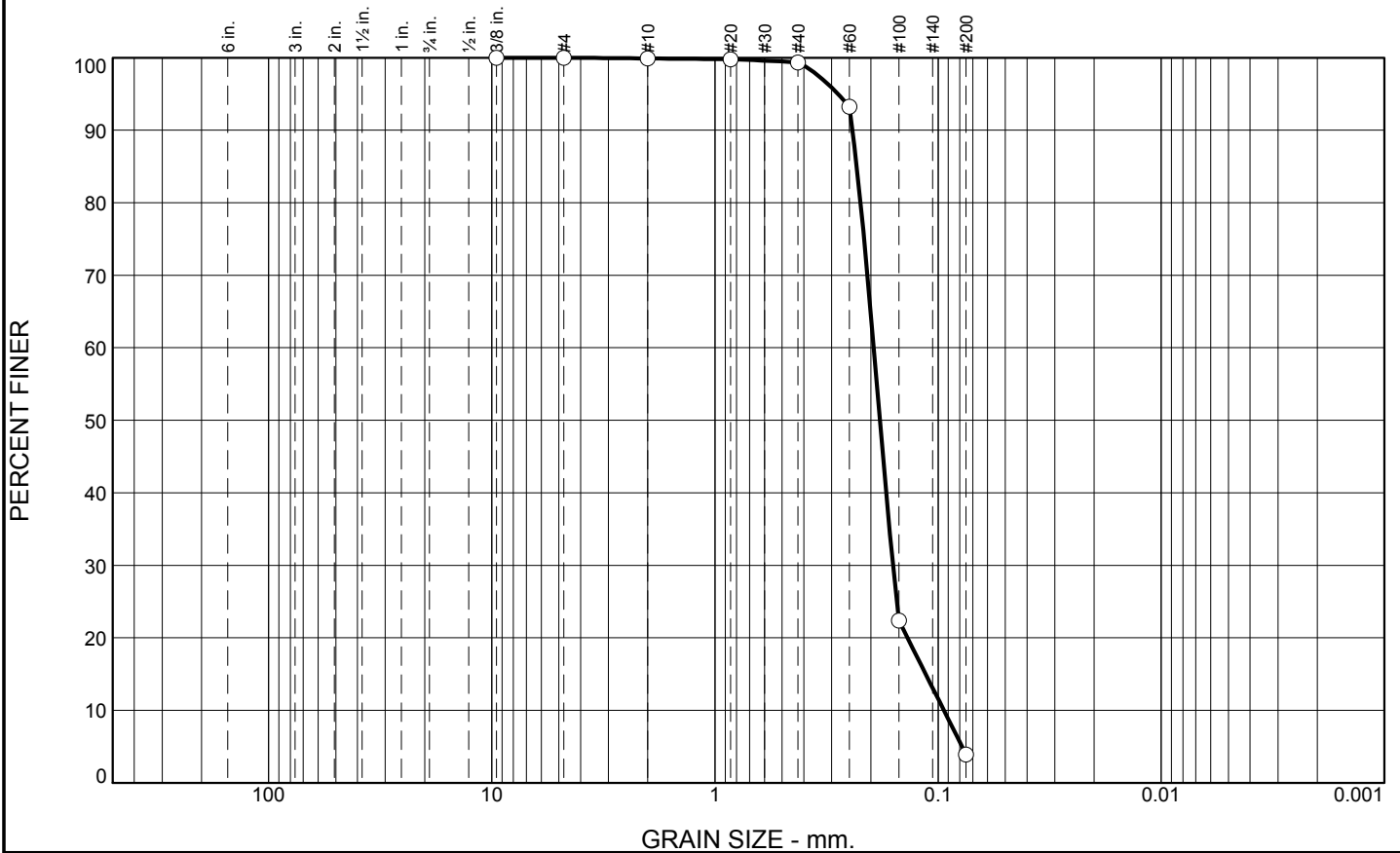
Checked By: R. Byrd

Boring Designation BI-MS-09-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-09-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 8 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -7.3 Ft.		STARTED 05-06-10
8. TOTAL DEPTH OF BORING 14.6 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-06-10
18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-7.3	0.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, gray (SP)	A	Classification: SP Color: 10YR 5/1-gray D50: 0.1824 mm % Fines: 3.9
-12.3	5.0		SAND, silty, mostly fine-grained sand-sized quartz, gray (SM)		
-16.3	9.0		CLAY, lean, dark gray (CL)	NS	
-20.8	13.5		SAND, silty, mostly fine-grained sand-sized quartz, trace shell fragments, gray (SM)		
-21.9	14.6		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.5	95.5	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.4		
#60	93.2		
#100	22.4		
#200	3.9		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2418 D₈₅= 0.2314 D₆₀= 0.1944
D₅₀= 0.1824 D₃₀= 0.1594 D₁₅= 0.1137
D₁₀= 0.0942 C_u= 2.06 C_c= 1.39

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-9-10A
Sample Number: TE Lab ID: 4461.23

Depth: 0.0 - 5.0 (ft)

Date: 5/13/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009</p> <p style="text-align: right;">Figure</p>
------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes

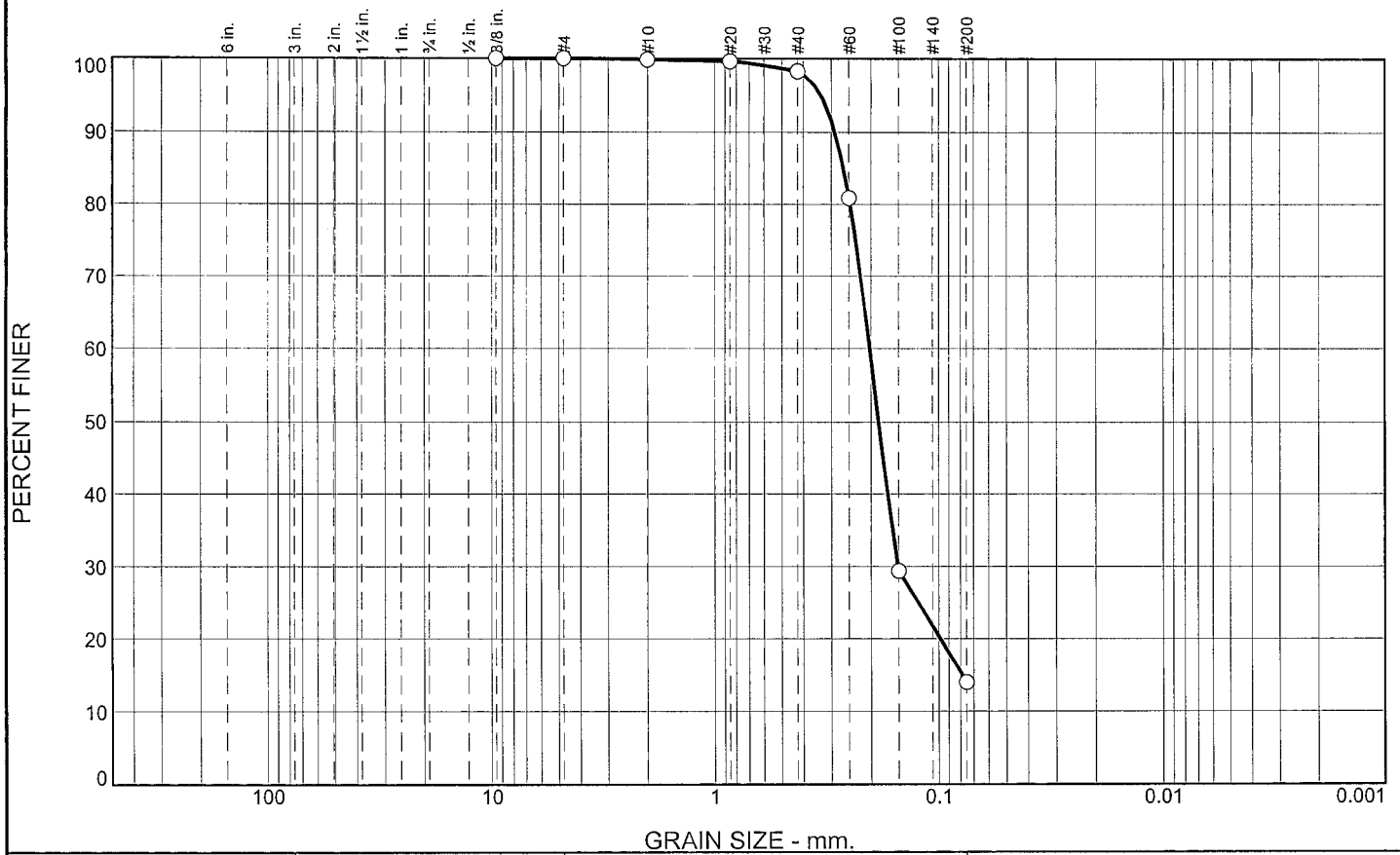
Checked By: R.Byrd

Boring Designation BI-MS-10-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-10-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 12 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -12.1 Ft.		STARTED 05-08-10
8. TOTAL DEPTH OF BORING 15.7 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-08-10
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-12.1	0.0				
-15.1	3.0	|↑↑↑↑↑|	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	A	Classification: SM Color: 10YR 4/1-dark gray D50: 0.1849 mm % Fines: 14
-16.3	4.2	|↑↑↑↑↑|	SILT, inorganic-L, trace fine to medium-grained sand-sized quartz, gray (ML)	NS	
-20.1	8.0	|↑↑↑↑↑|	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, gray (SM)	B	Classification: SP-SM Color: 10YR 4/1-dark gray D50: 0.1711 mm % Fines: 11.9
-27.8	15.7	|●●●●●|	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, lt. gray (SP)	C	Classification: SP-SM Color: 10YR 6/1-gray D50: 0.184 mm % Fines: 6.1
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.5	84.3	14.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.6		
#40	98.3		
#60	80.8		
#100	29.3		
#200	14.0		

Material Description

SILTY SAND, (SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2896 D₈₅= 0.2649 D₆₀= 0.2023
D₅₀= 0.1849 D₃₀= 0.1512 D₁₅= 0.0786
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

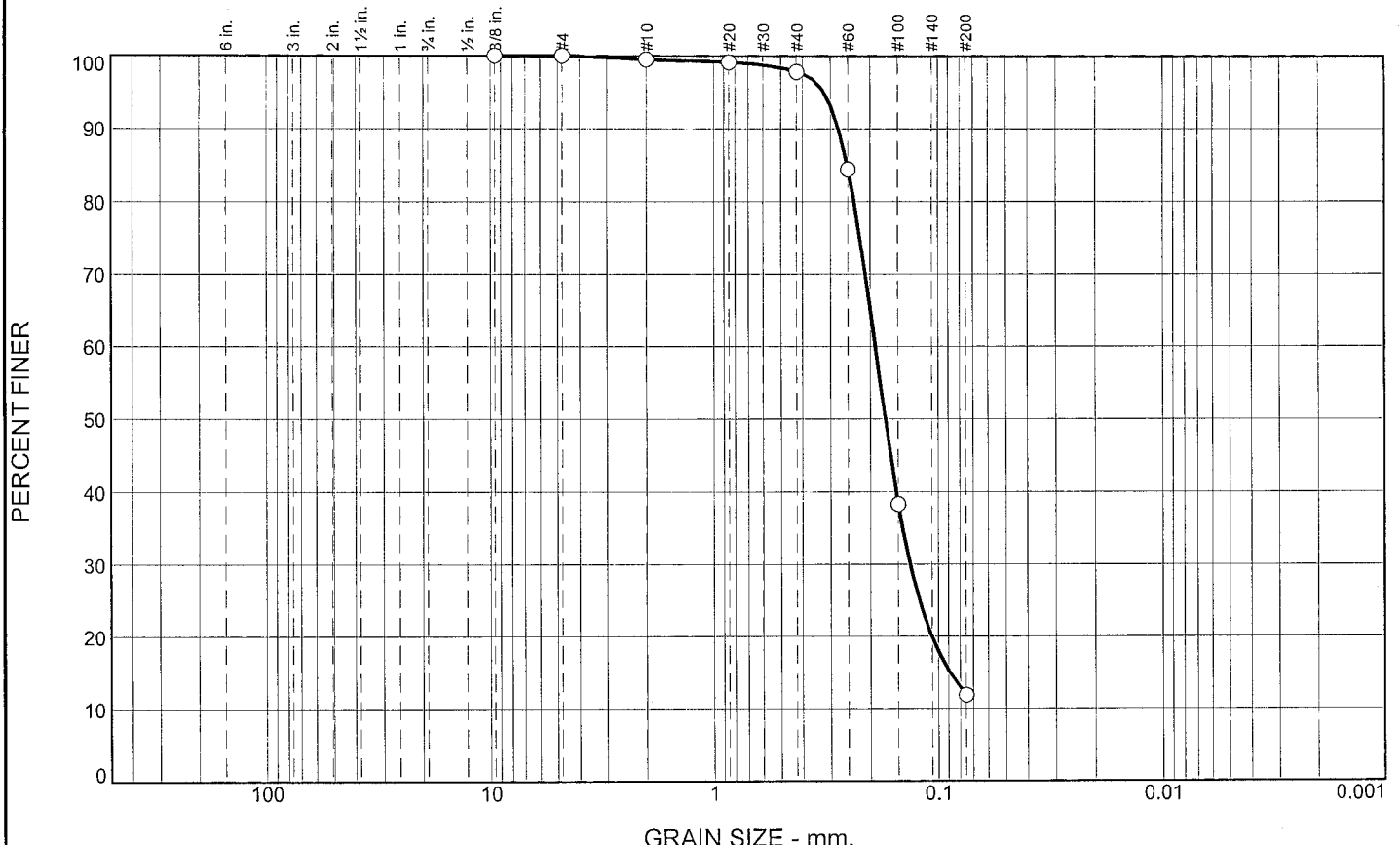
* (no specification provided)

Location: USACE Sample # BI-MS-10-10A Depth: 0.0 - 3.0 (ft) Date: 5/17/10
Sample Number: TE Lab ID: 4473.09

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	1.7	85.9	11.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.5		
#20	99.1		
#40	97.8		
#60	84.4		
#100	38.3		
#200	11.9		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2764 D₈₅= 0.2522 D₆₀= 0.1895
D₅₀= 0.1711 D₃₀= 0.1331 D₁₅= 0.0887
D₁₀= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

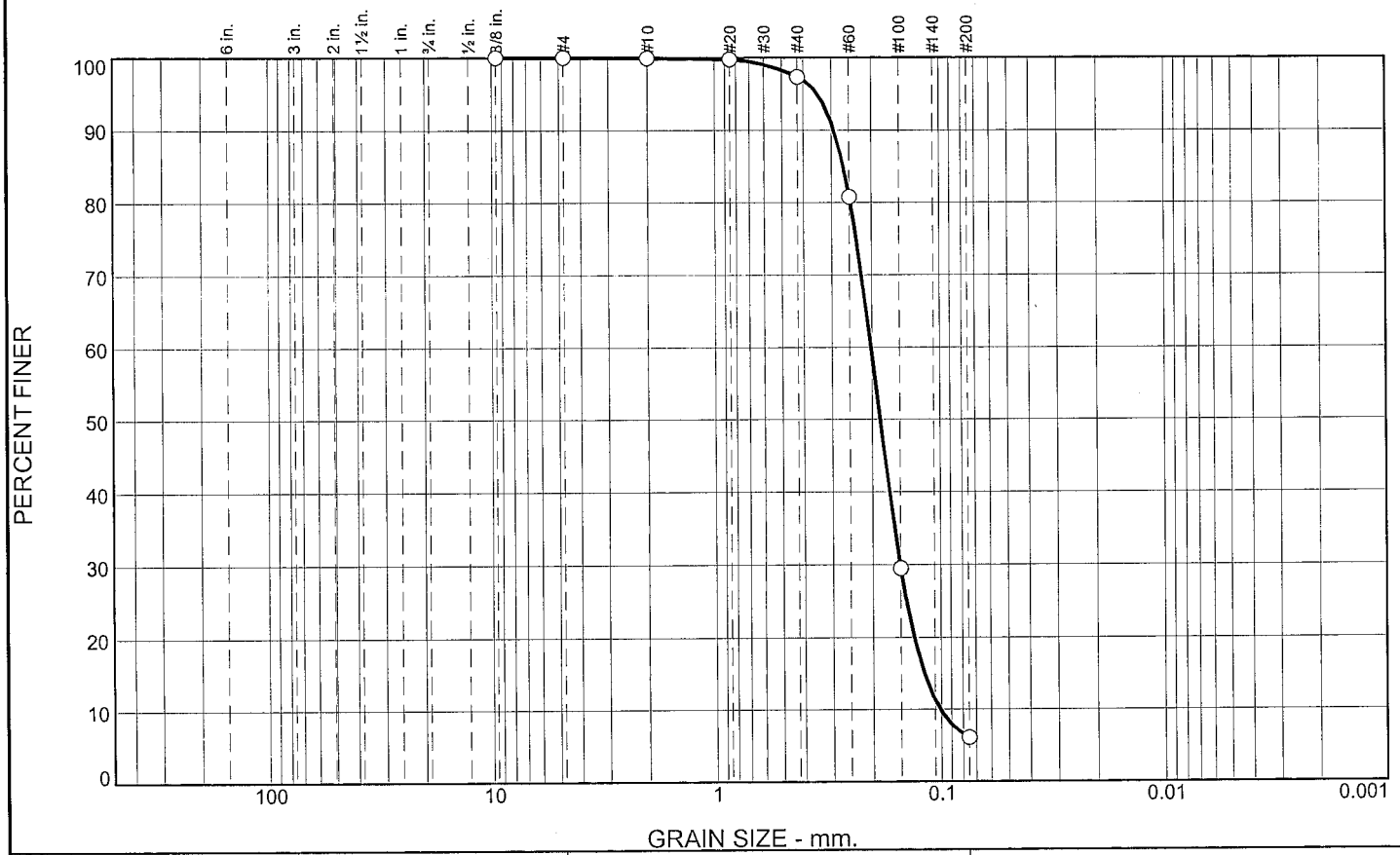
* (no specification provided)

Location: USACE Sample # BI-MS-10-10B Depth: 4.2 - 8.0 (ft) Date: 5/17/10
Sample Number: TE Lab ID: 4473.10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.6	91.2	6.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.9		
#20	99.7		
#40	97.3		
#60	80.7		
#100	29.5		
#200	6.1		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2928 D₈₅= 0.2659 D₆₀= 0.2015
D₅₀= 0.1840 D₃₀= 0.1509 D₁₅= 0.1185
D₁₀= 0.1010 C_u= 2.00 C_c= 1.12

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-10-10C Depth: 8.0 - 15.7 (ft) Date: 5/17/10
Sample Number: TE Lab ID: 4473.11

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009 Figure
-----------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

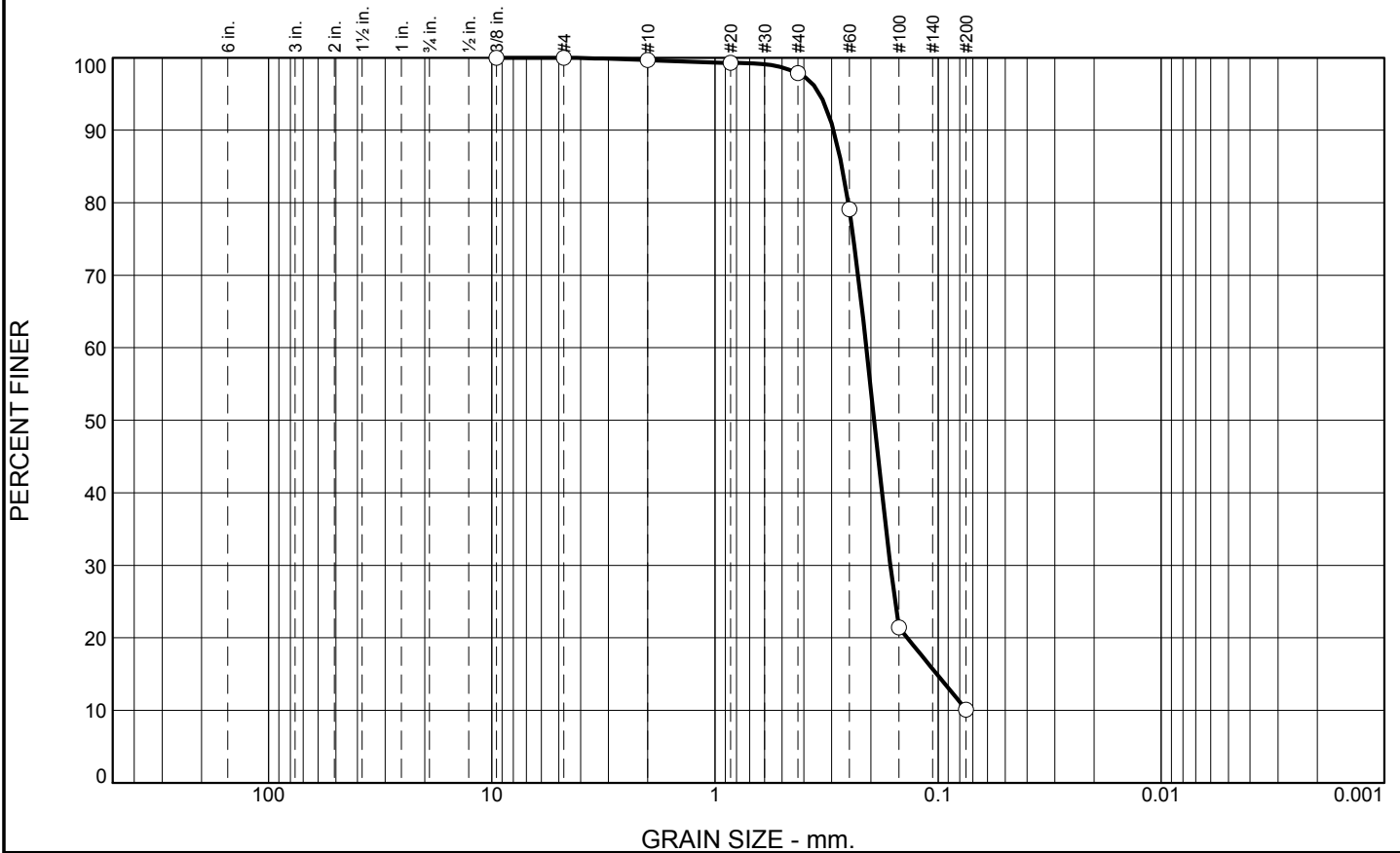
Tested By: L.Stokes Checked By: R.Byrd

Boring Designation BI-MS-11-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-11-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 17 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-05-10
8. TOTAL DEPTH OF BORING 11.6 Ft.		16. ELEVATION TOP OF BORING -15.9 Ft.		COMPLETED 05-05-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-15.9	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SP)	A	Classification: SP-SM Color: 10YR 4/2-dark grayish brown D50: 0.1935 mm % Fines: 10.1
-20.2	4.3				
		|||||	SAND, silty, mostly fine-grained sand-sized quartz, some silt, gray (SM)		
		|||||	SAND, clayey, mostly fine-grained sand-sized quartz, gray (SC)	NS	
-27.5	11.6				
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	1.8	87.8	10.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.3		
#40	97.9		
#60	79.1		
#100	21.4		
#200	10.1		

Material Description

SAND, (SP-SM), fine grained, with trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2940 D₈₅= 0.2696 D₆₀= 0.2097
D₅₀= 0.1935 D₃₀= 0.1637 D₁₅= 0.1013
D₁₀= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-11-10A
Sample Number: TE Lab ID: 4461.24

Depth: 0.0 - 4.08 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

Tested By: J.Maddox/L.Stokes

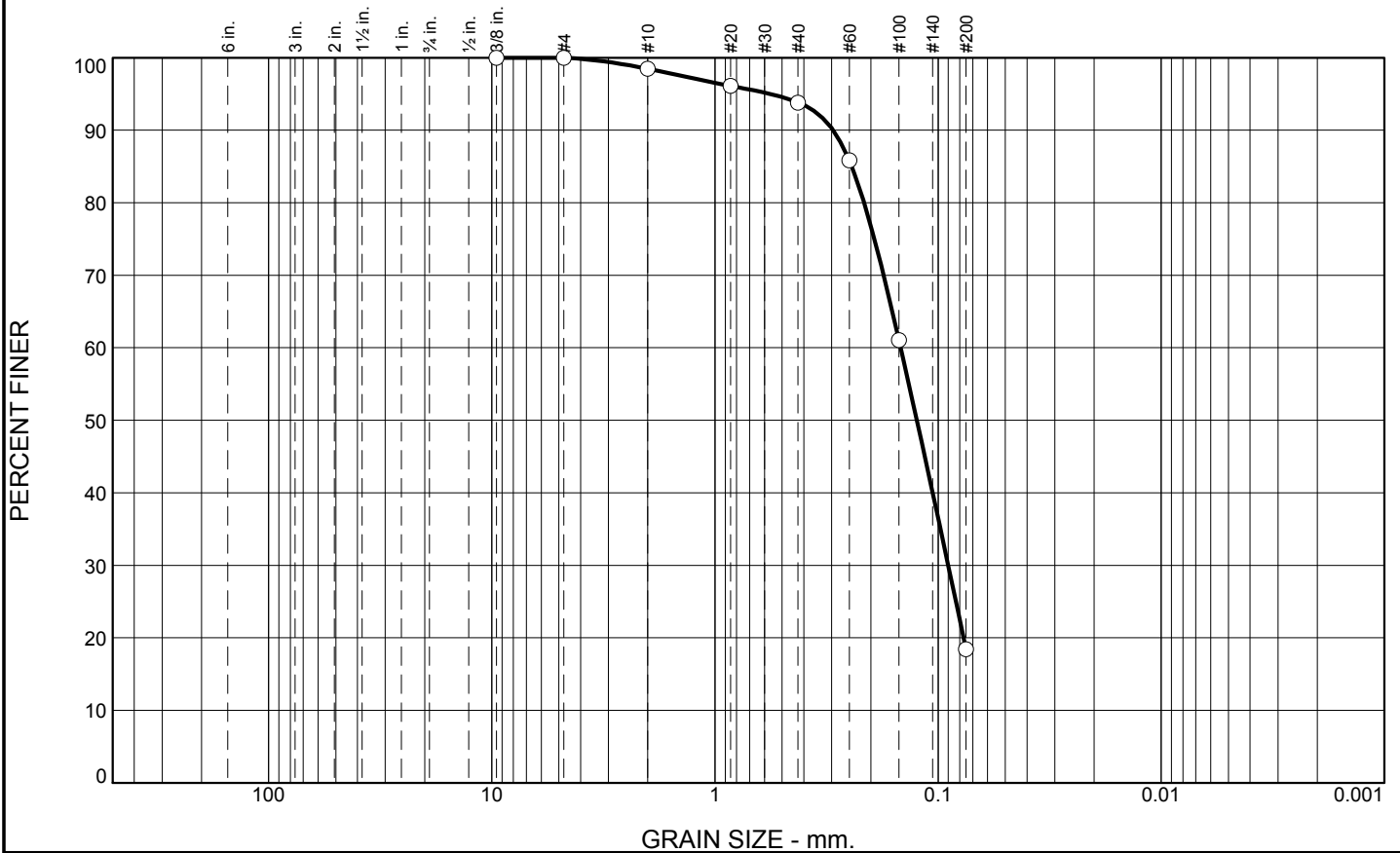
Checked By: R.Byrd

Boring Designation BI-MS-12-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-12-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 19 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -17.9 Ft.		STARTED 05-05-10
8. TOTAL DEPTH OF BORING 13.9 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-05-10
18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-17.9	0.0		SAND, silty, mostly fine-grained sand-sized quartz, with lenses of fat clay, gray (SM)	A	Classification: SM Color: 10YR 4/1-dark gray D50: 0.1246 mm % Fines: 18.4
-24.7	6.8			B	Classification: SM Color: 10YR 4/1-dark gray D50: 0.1525 mm % Fines: 26.4
-30.6	12.7		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, gray (SP)	C	Classification: SM Color: 10YR 4/1-dark gray D50: 0.1492 mm % Fines: 14.3
-30.8	12.9			NS	
-31.8	13.9		SAND, clayey, mostly fine-grained sand-sized quartz, gray (SC)		
			SAND, silty, mostly fine-grained sand-sized quartz, gray (SM)		
<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.</p>					

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.5	4.7	75.4	18.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	98.5		
#20	96.1		
#40	93.8		
#60	85.8		
#100	61.1		
#200	18.4		

Material Description

SILTY SAND, (SM), fine grained, with clay pockets

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2952 D₈₅= 0.2438 D₆₀= 0.1473
D₅₀= 0.1246 D₃₀= 0.0901 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

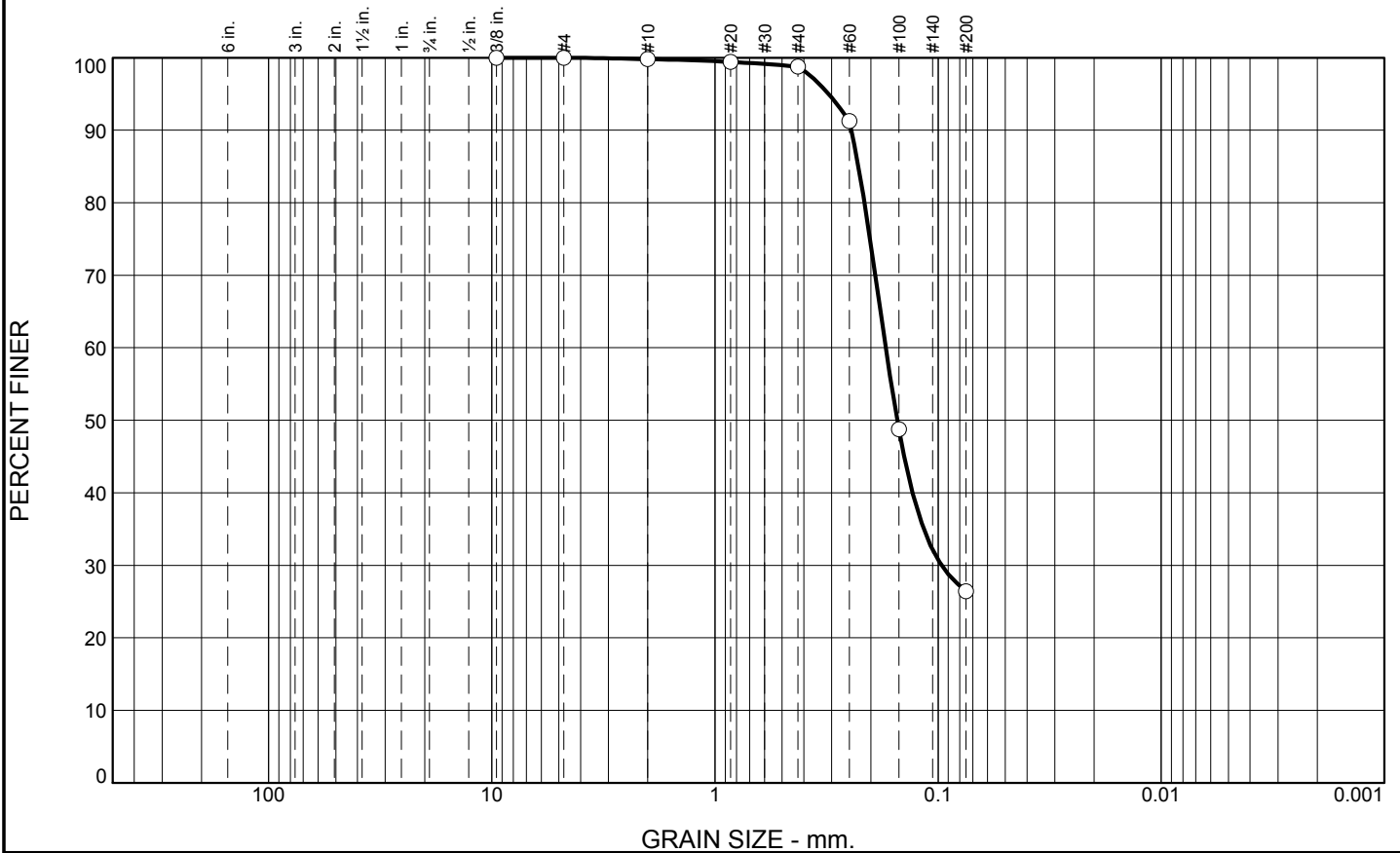
* (no specification provided)

Location: USACE Sample # BI-MS-12-10A **Depth:** 0.0 - 3.0 (ft) **Date:** 5/13/10
Sample Number: TE Lab ID: 4461.25

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009 Figure
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.0	72.4	26.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.4		
#40	98.8		
#60	91.3		
#100	48.8		
#200	26.4		

Material Description

SILTY SAND, (SM), fine grained, with clay pockets

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2447 D₈₅= 0.2276 D₆₀= 0.1716
D₅₀= 0.1525 D₃₀= 0.0964 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

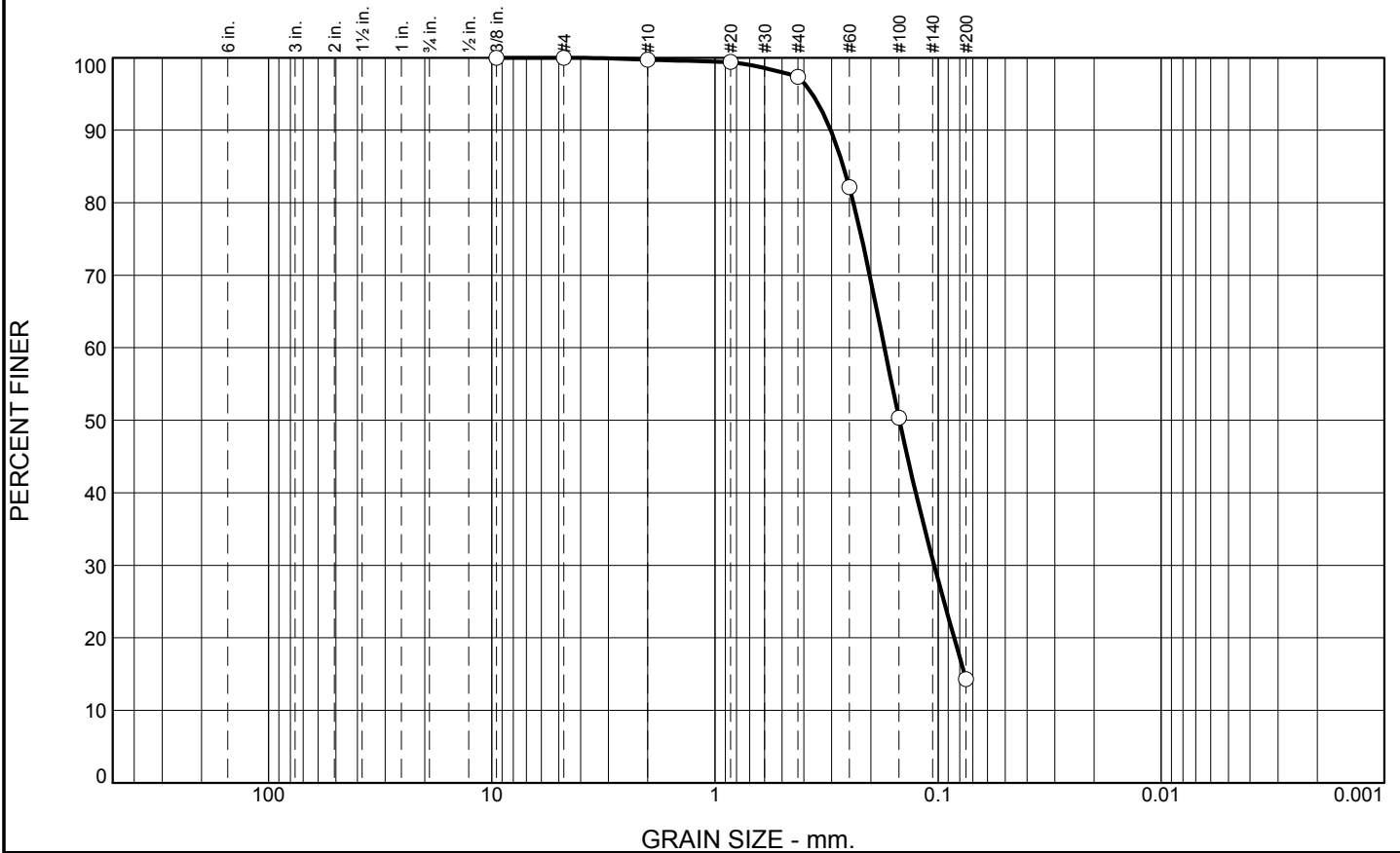
* (no specification provided)

Location: USACE Sample # BI-MS-12-10B **Depth:** 4.0 - 6.67 (ft) **Date:** 5/13/10
Sample Number: TE Lab ID: 4461.26

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009 Figure
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	2.3	83.1	14.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.4		
#40	97.4		
#60	82.2		
#100	50.3		
#200	14.3		

Material Description

SILTY SAND, (SM), fine grained, with clay nodules

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3027 D₈₅= 0.2657 D₆₀= 0.1740
D₅₀= 0.1492 D₃₀= 0.1041 D₁₅= 0.0762
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-12-10C
Sample Number: TE Lab ID: 4461.27

Depth: 6.67- 11.47 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

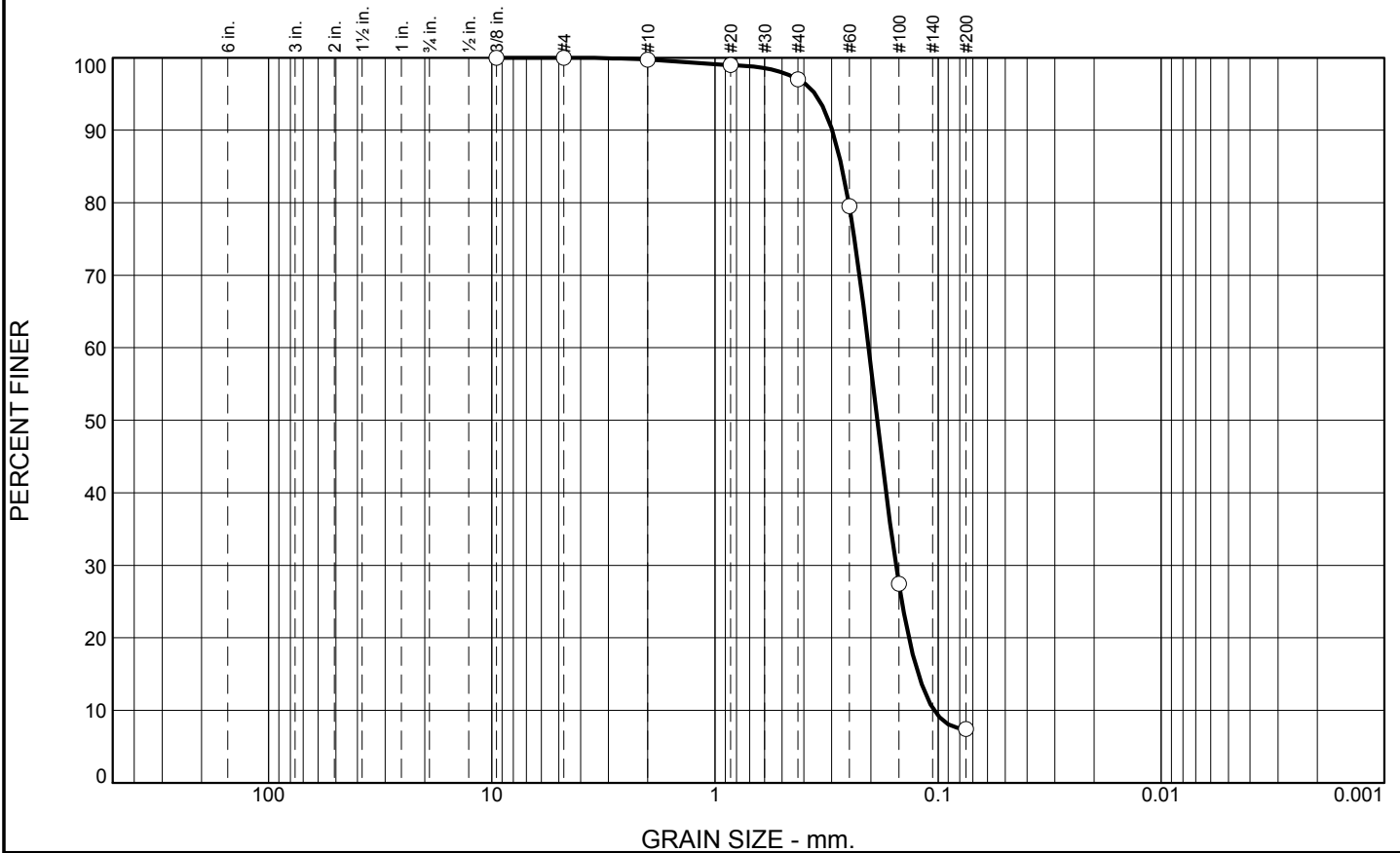
Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Boring Designation BI-MS-13-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-13-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES 3		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 17 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING 05-06-10		
8. TOTAL DEPTH OF BORING 13.6 Ft.		16. ELEVATION TOP OF BORING -16.6 Ft.		
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-16.6	0.0				
		•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace shell fragments, gray (SP)	A	Classification: SP-SM Color: 10YR 6/1-gray D50: 0.1873 mm % Fines: 7.4
-20.2	3.6				
-21.2	4.6	•••••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace shell fragments, trace silt, gray (SP) SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, gray (SP)	B	Classification: SM Color: 10YR 5/1-gray D50: 0.1408 mm % Fines: 23
		•••••		C	Classification: SP-SM Color: 10YR 5/2-grayish brown D50: 0.1248 mm % Fines: 13.3
-30.2	13.6				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	2.7	89.6	7.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.7		
#20	99.0		
#40	97.0		
#60	79.5		
#100	27.4		
#200	7.4		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2983 D₈₅= 0.2704 D₆₀= 0.2048
D₅₀= 0.1873 D₃₀= 0.1545 D₁₅= 0.1227
D₁₀= 0.1043 C_u= 1.96 C_c= 1.12

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-13-10A
Sample Number: TE Lab ID: 4461.28

Depth: 0.0 - 4.5 (ft)

Date: 5/13/10

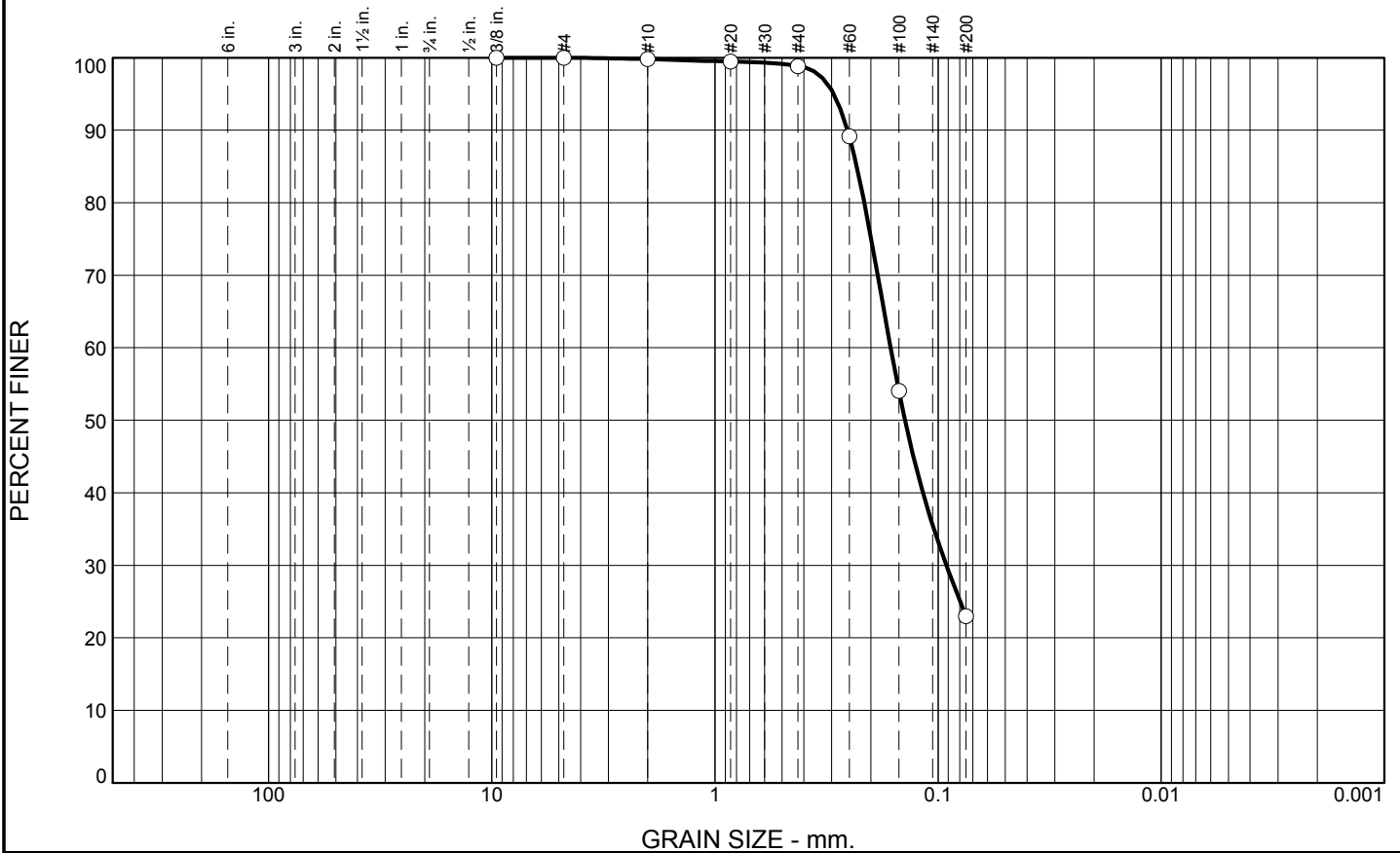
<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03</p> <p>Project No: 1021230009</p>
--------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.0	75.8	23.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.8		
#20	99.5		
#40	98.8		
#60	89.2		
#100	54.0		
#200	23.0		

Material Description

SILTY SAND, (SM), fine grained, with clay nodules

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2544 D₈₅= 0.2315 D₆₀= 0.1633
D₅₀= 0.1408 D₃₀= 0.0918 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-13-10B
Sample Number: TE Lab ID: 4461.29

Depth: 4.5 - 9.5 (ft)

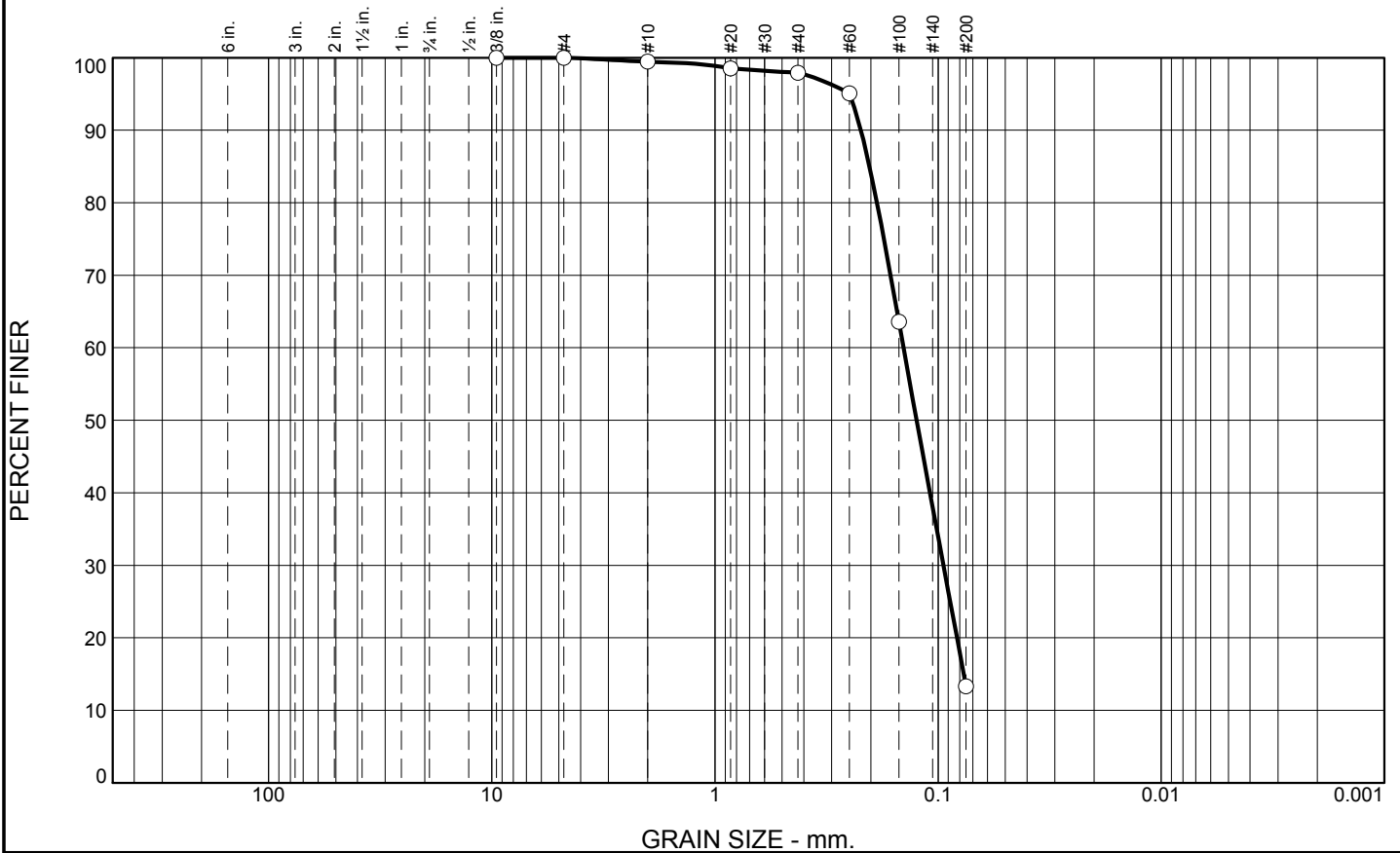
Date: 5/13/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009</p>
<p>Figure</p>	

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	1.5	84.6	13.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.4		
#20	98.5		
#40	97.9		
#60	95.1		
#100	63.6		
#200	13.3		

Material Description

SILTY SAND, (SM), fine grained, with clay nodules and trace shell

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2219 D₈₅= 0.2031 D₆₀= 0.1429
D₅₀= 0.1248 D₃₀= 0.0947 D₁₅= 0.0768
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-13-10C
Sample Number: TE Lab ID: 4461.30

Depth: 9.5 - 13.5 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009 Figure
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: J.Maddox/L.Stokes **Checked By:** R.Byrd

Boring Designation BI-MS-14-10

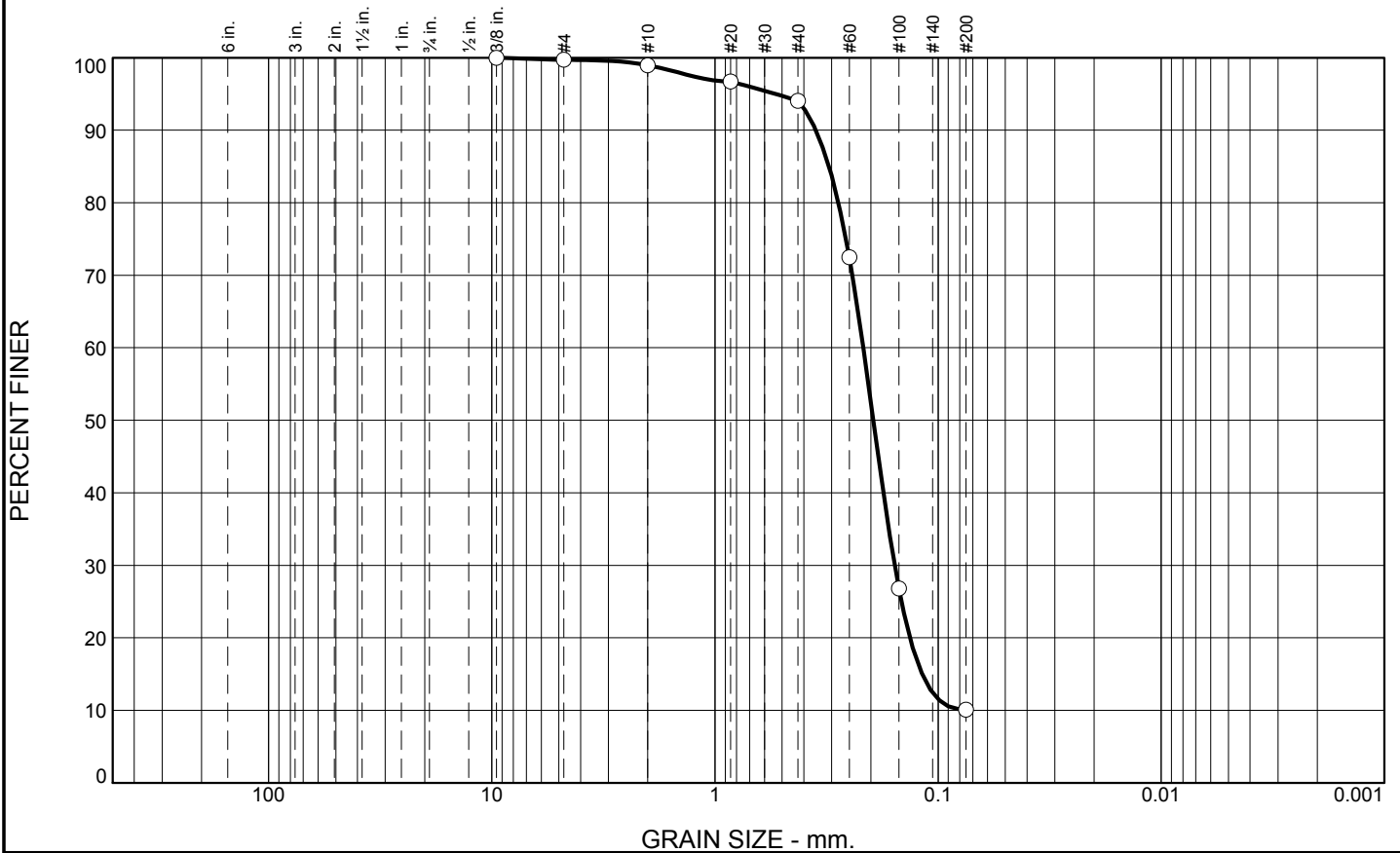
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-14-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 24.5 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -24.0 Ft.		STARTED 05-06-10
8. TOTAL DEPTH OF BORING 19.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-06-10
18. SIGNATURE AND TITLE OF INSPECTOR J. Krick, Geotechnical Engineer				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-24.0	0.0		CLAY, lean, dark gray (CL)		
		▨		NS	
-37.0	13.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, gray (SP)	A	Classification: SP-SM Color: 10YR 5/1-gray D50: 0.1951 mm % Fines: 10.1
-42.0	18.0	•••		NS	
-43.5	19.5	▨	SAND, silty, mostly fine-grained sand-sized quartz, little clay (SM)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2
						OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88	
LOCATION COORDINATES X = 936,733 Y = 266,407			ELEVATION TOP OF BORING -24.0 Ft.			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS	
			applying NOAA tidal gauge data conversion factor.			



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.7	5.0	83.9	10.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.0		
#20	96.7		
#40	94.0		
#60	72.5		
#100	26.8		
#200	10.1		

Material Description

SAND, (SP-SM), fine grained, with clay nodules

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3531 D₈₅= 0.3082 D₆₀= 0.2165
D₅₀= 0.1951 D₃₀= 0.1566 D₁₅= 0.1178
D₁₀= C_u= C_c=

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-14-10A
Sample Number: TE Lab ID: 4461.31

Depth: 13.0 - 17.67 (ft)

Date: 5/13/10

Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Mississippi Barrier Island Restoration Project Contract No. W91278-10-D-0026 - Task 03 Project No: 1021230009
Figure	

Tested By: J.Maddox/L.Stokes

Checked By: R.Byrd

Boring Designation BI-MS-15-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-15-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 0
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-11-10
8. TOTAL DEPTH OF BORING 20.0 Ft.		16. ELEVATION TOP OF BORING -20.0 Ft.		COMPLETED 05-11-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-20.0	0.0				
		[Diagonal Hatching]	CLAY, lean, dark gray (CL)		
-25.0	5.0				
		[Vertical Lines]	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, little clay, trace organic matter, gray (SM)		
-27.5	7.5				
		[Diagonal Hatching]	CLAY, lean, dark gray (CL)		
-31.0	11.0			NS	
		[Dotted]	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, lt. gray (SP)		
-32.0	12.0				
		[Diagonal Hatching]	CLAY, lean, dark gray (CL)		
-37.5	17.5				
		[Vertical Lines]	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, little clay, lt. gray (SM)		
-40.0	20.0				
			<p>NOTES:</p> <p>1. Soils are field visually classified in accordance with the Unified Soils Classification System.</p> <p>2. NS = Sample not submitted for laboratory analysis from this interval.</p> <p>3. Seafloor elevation calculated using sampling</p>		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2 OF 2 SHEETS
			PROJECT MsCIP Barrier Island Restoration		COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 938,097 Y = 266,405			ELEVATION TOP OF BORING -20.0 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		



Boring Designation BI-MS-16-10

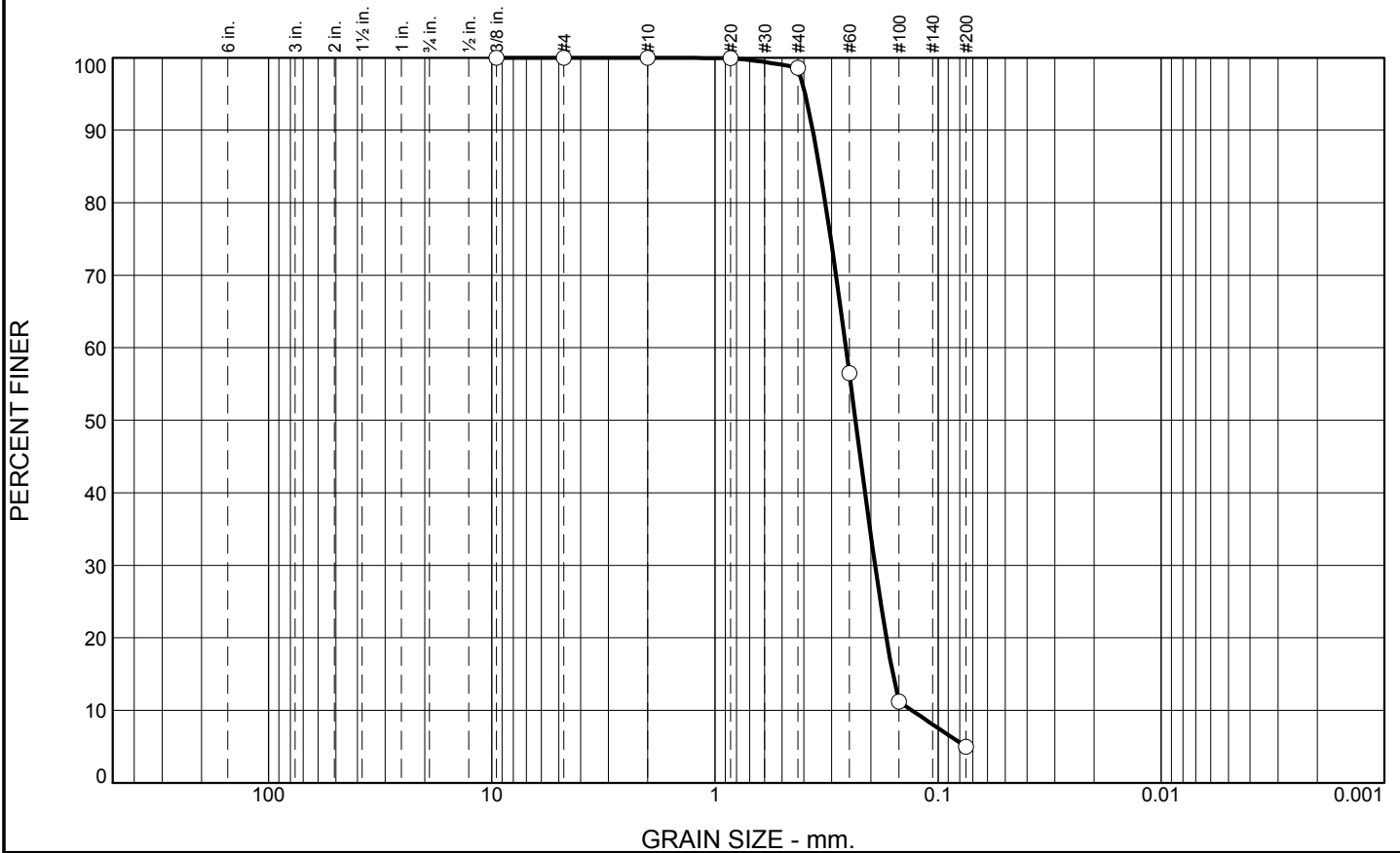
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-16-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 1
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 20 Ft.		
7. DEPTH DRILLED INTO ROCK N/A		15. DATE BORING		STARTED 05-11-10
8. TOTAL DEPTH OF BORING 20.0 Ft.		16. ELEVATION TOP OF BORING -19.0 Ft.		COMPLETED 05-11-10
		17. TOTAL RECOVERY FOR BORING 100%		
		18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-19.0	0.0				
		▨	CLAY, lean, dark gray (CL)	NS	
-23.3	4.3				
		•••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little silt, trace shell fragments, lt. gray (SP)	A	Classification: SP-SM Color: 2.5Y 6/2-light brownish gray D50: 0.2346 mm % Fines: 5
-27.2	8.2				
-28.5	9.5	▨	CLAY, lean, dark gray (CL)		
		•••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little clay, trace silt, lt. gray (SP)		
-31.0	12.0				
		▨	CLAY, lean, dark gray (CL)	NS	
-35.6	16.6				
		•••	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt (SP)		
-39.0	20.0				
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District		SHEET 2
					OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88
LOCATION COORDINATES X = 940,118 Y = 266,636			ELEVATION TOP OF BORING -19.0 Ft.		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
			vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.4	93.6	5.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.6		
#60	56.5		
#100	11.2		
#200	5.0		

Material Description

Sand, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3644 D₈₅= 0.3404 D₆₀= 0.2588
D₅₀= 0.2346 D₃₀= 0.1917 D₁₅= 0.1595
D₁₀= 0.1313 C_u= 1.97 C_c= 1.08

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-16-10A
Sample Number: TE Lab ID: 4488.01

Depth: 4.3 - 8.2 (ft.)

Date: 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Boring Designation BI-MS-17-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-17-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES DISTURBED: 0 UNDISTURBED (UD): 0		
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		14. WATER DEPTH 21 Ft.
6. THICKNESS OF OVERBURDEN N/A		15. DATE BORING STARTED: 05-13-10 COMPLETED: 05-13-10		
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -19.2 Ft.		
8. TOTAL DEPTH OF BORING 15.2 Ft.		17. TOTAL RECOVERY FOR BORING 100%		
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

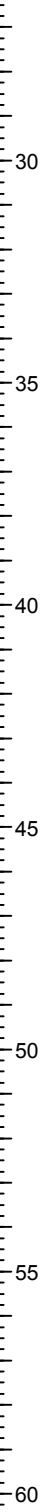
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-19.2	0.0		CLAY, lean, dark gray (CL)	NS	
-31.2	12.0		SAND, clayey, mostly fine to medium-grained sand-sized quartz, gray (SC)		
-32.8	13.6		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, lt. gray (SP)		
-34.4	15.2		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Boring Designation BI-MS-18-10

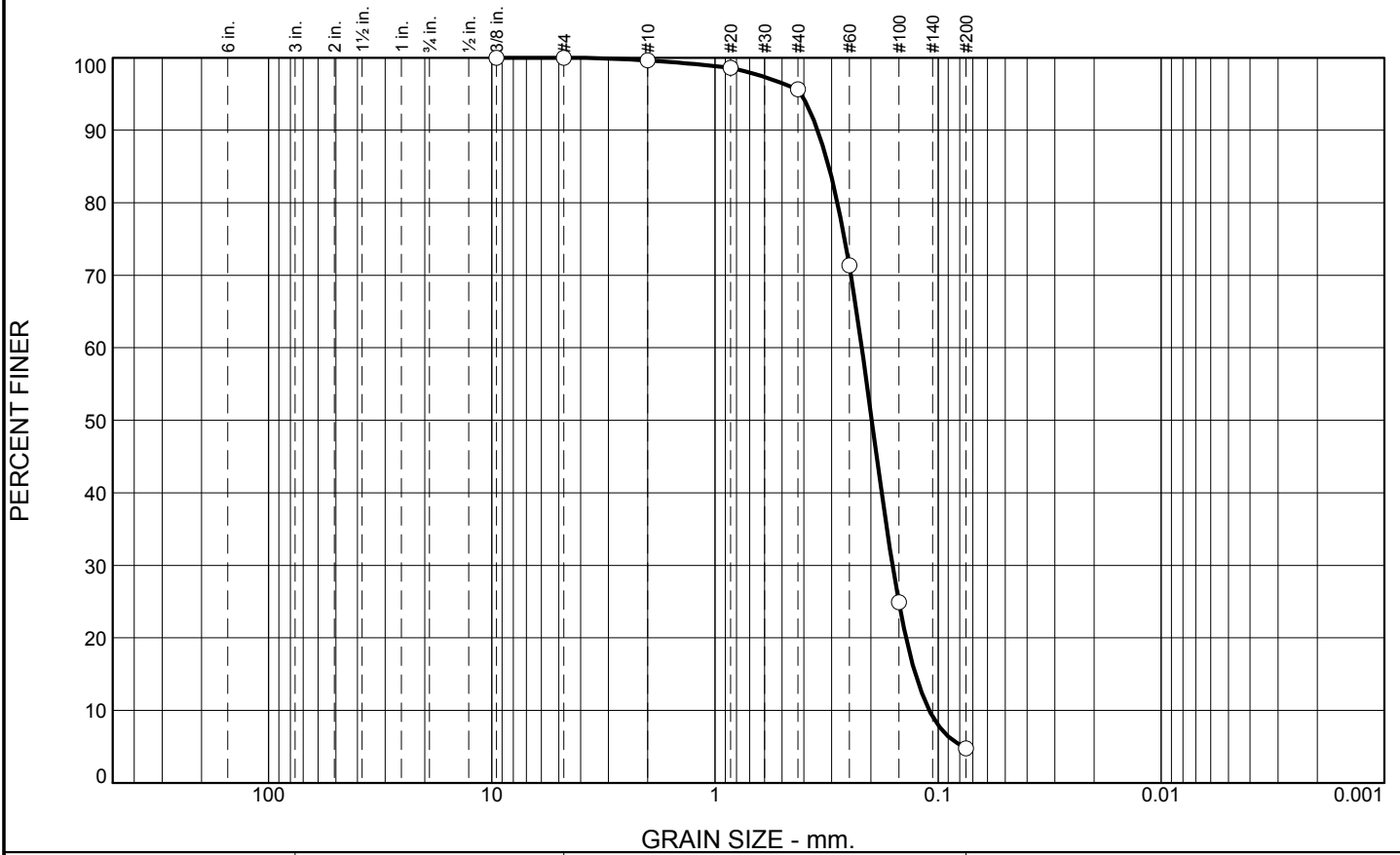
DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 2 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-18-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 20 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -18.3 Ft.		STARTED 05-13-10
8. TOTAL DEPTH OF BORING 17.5 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-13-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-18.3	0.0				
-19.8	1.5	||||	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	NS	
		●●●●	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 5Y 7/1-light gray D50: 0.1983 mm % Fines: 4.8
		●●●●		B	Classification: SP Color: 5Y 7/1-light gray D50: 0.1864 mm % Fines: 2.4
		●●●●		C	Classification: SP Color: 5Y 6/1-gray D50: 0.1694 mm % Fines: 4
-32.8	14.5	●●●●			
		||||	CLAY, lean, dark gray (CL)	NS	
-35.3	17.0	||||			
-35.8	17.5	||||	SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, lt. gray (SM)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion		

DRILLING LOG (Cont. Sheet)			INSTALLATION Mobile District			SHEET 2
						OF 2 SHEETS
PROJECT MsCIP Barrier Island Restoration			COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL NAVD88	
LOCATION COORDINATES X = 932,674 Y = 270,457			ELEVATION TOP OF BORING -18.3 Ft.			
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS	
			factor.			



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	4.0	90.8	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.6		
#20	98.6		
#40	95.6		
#60	71.4		
#100	24.9		
#200	4.8		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3466 D₈₅= 0.3090 D₆₀= 0.2198
 D₅₀= 0.1983 D₃₀= 0.1601 D₁₅= 0.1263
 D₁₀= 0.1095 C_u= 2.01 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

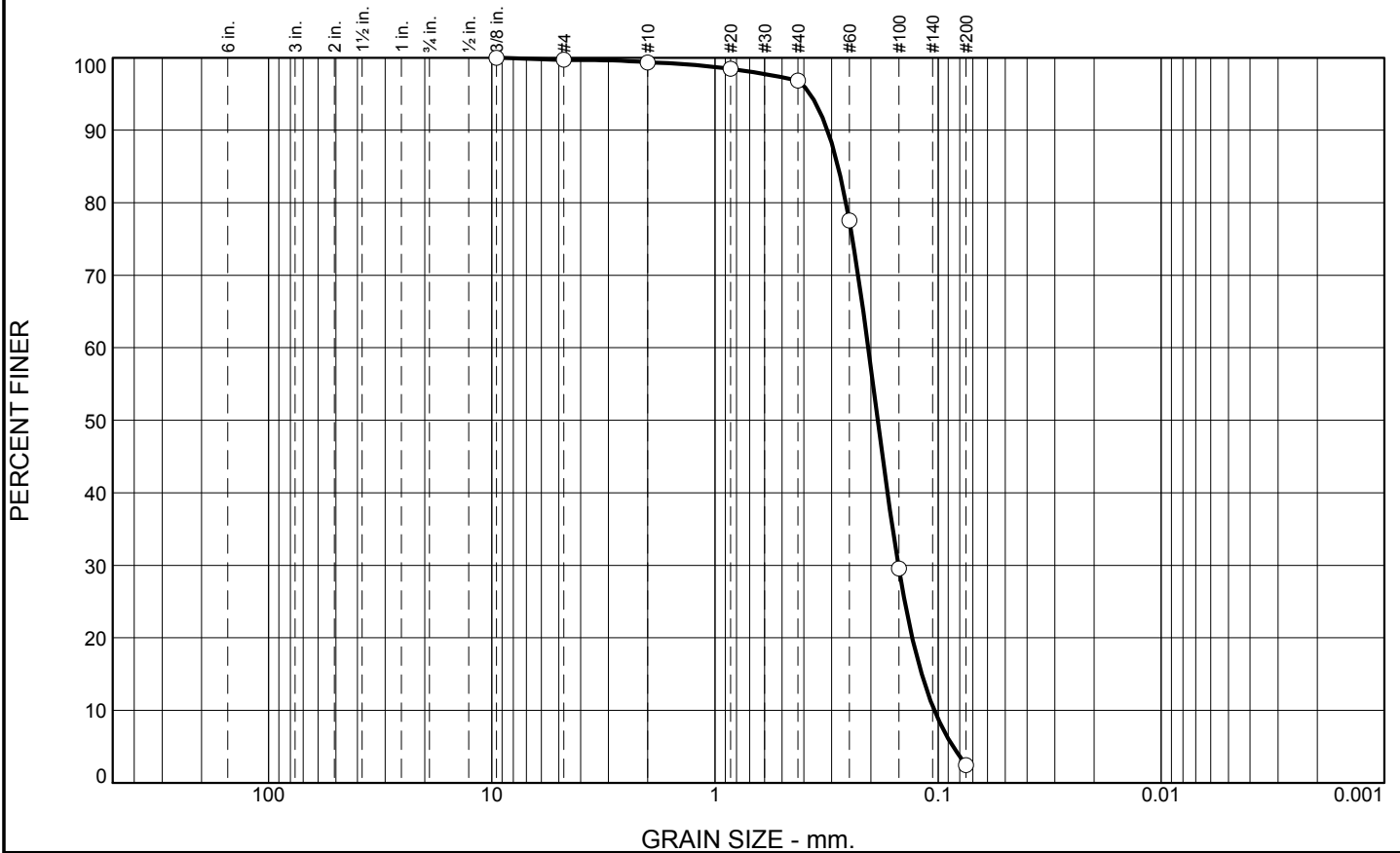
* (no specification provided)

Location: USACE Sample # BI-MS-18-10A **Depth:** 1.5 - 6.5 (ft.) **Date:** 5/27/10
Sample Number: TE Lab ID: 4488.02

<h2 style="margin: 0;">Thompson Engineering</h2> <h3 style="margin: 0;">Mobile, Alabama</h3>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes **Checked By:** R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.4	2.5	94.4	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.3		
#20	98.5		
#40	96.8		
#60	77.5		
#100	29.6		
#200	2.4		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3131 D₈₅= 0.2807 D₆₀= 0.2057
D₅₀= 0.1864 D₃₀= 0.1508 D₁₅= 0.1185
D₁₀= 0.1041 C_u= 1.98 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-18-10B
Sample Number: TE Lab ID: 4488.03

Depth: 6.5 - 11.5 (ft.)

Date: 5/27/10

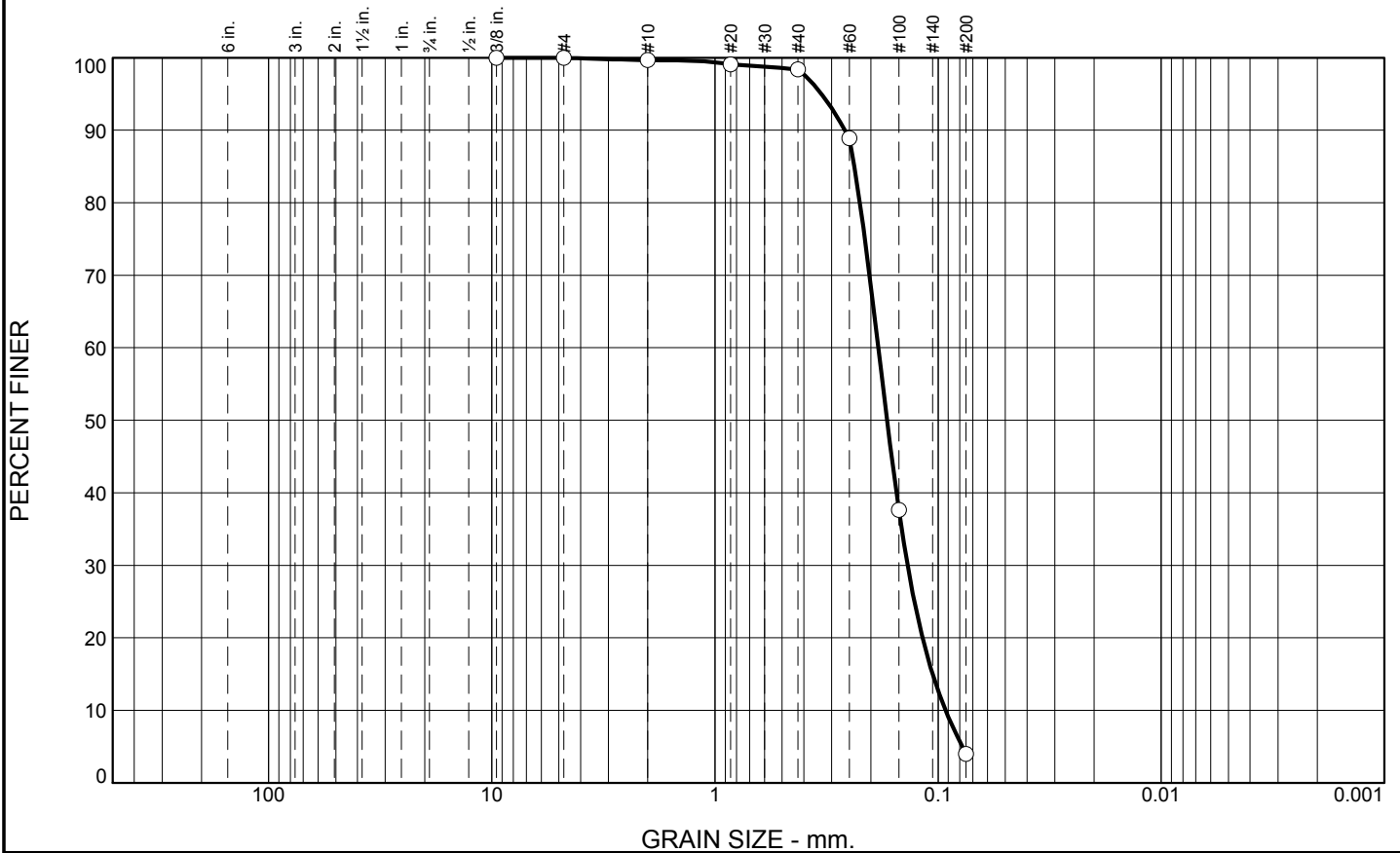
Thompson Engineering Mobile, Alabama	Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009
-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Figure

Tested By: L.Stokes





Checked By: R.Byrd

Particle Size Distribution Report

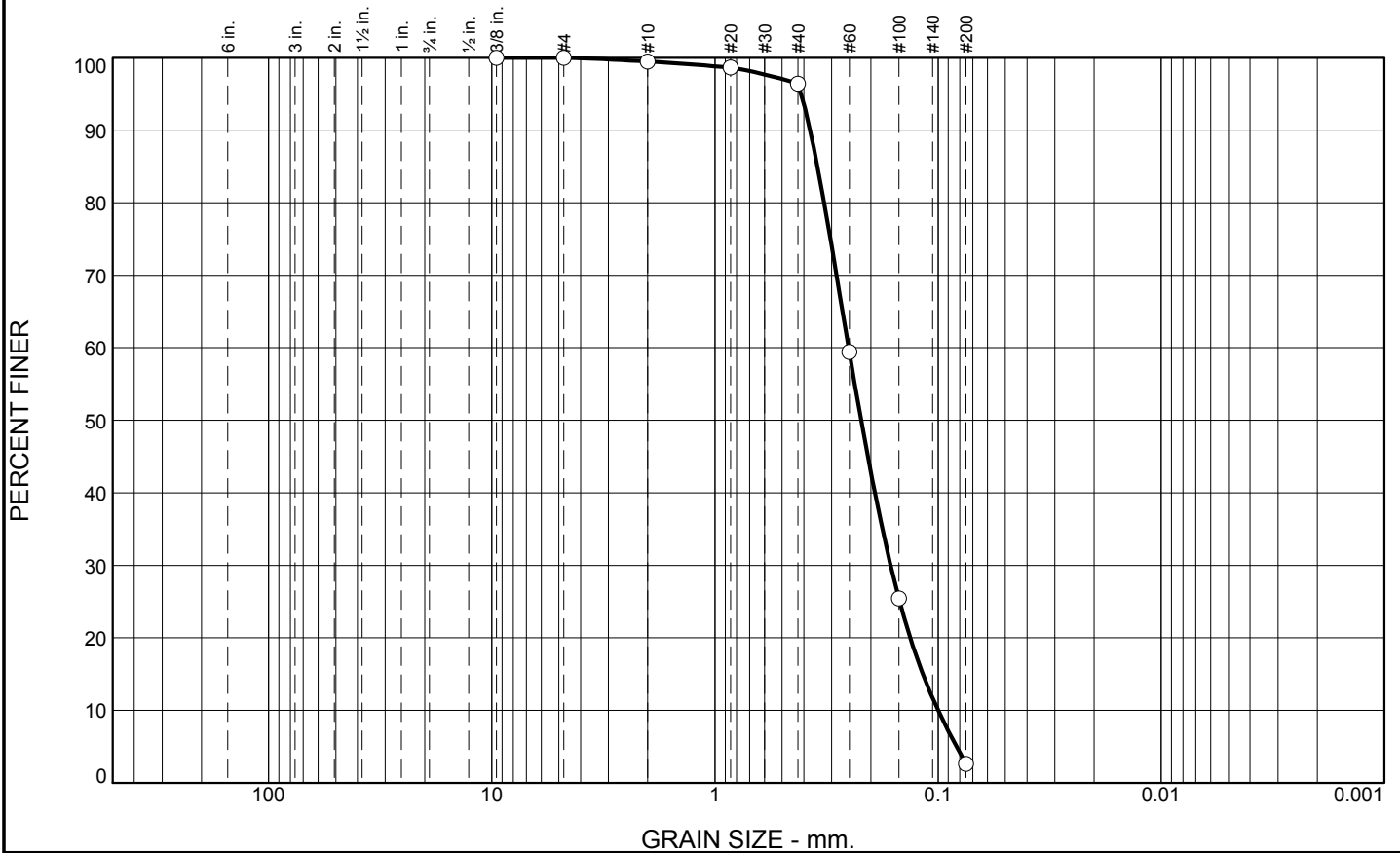


Boring Designation BI-MS-19-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound			9. SIZE AND TYPE OF BIT N/A	
2. BORING DESIGNATION BI-MS-19-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 2
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 23 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -21.9 Ft.		STARTED 05-14-10
8. TOTAL DEPTH OF BORING 17.6 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-14-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-21.9	0.0				
-24.9	3.0		SAND, silty, mostly Geologist fine to medium-grained sand-sized 0 quartz NS = Sample not submitted for laboratory analysis from this interval, some silt, trace shell fragments, gray (SM)	NS	
-35.4	13.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)	A	Classification: SP Color: 2.5Y 7/1-light gray D50: 0.2212 mm % Fines: 2.6
-38.2	16.3		CLAY, lean, dark gray (CL)	NS	
-39.5	17.6		SILT, inorganic-L, brown (ML)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	3.1	93.8	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.5		
#20	98.6		
#40	96.4		
#60	59.4		
#100	25.4		
#200	2.6		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3749 D₈₅= 0.3471 D₆₀= 0.2519
D₅₀= 0.2212 D₃₀= 0.1633 D₁₅= 0.1171
D₁₀= 0.0999 C_u= 2.52 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-19-10A
Sample Number: TE Lab ID: 4488.19

Depth: 3.0 - 8.0 (ft.)

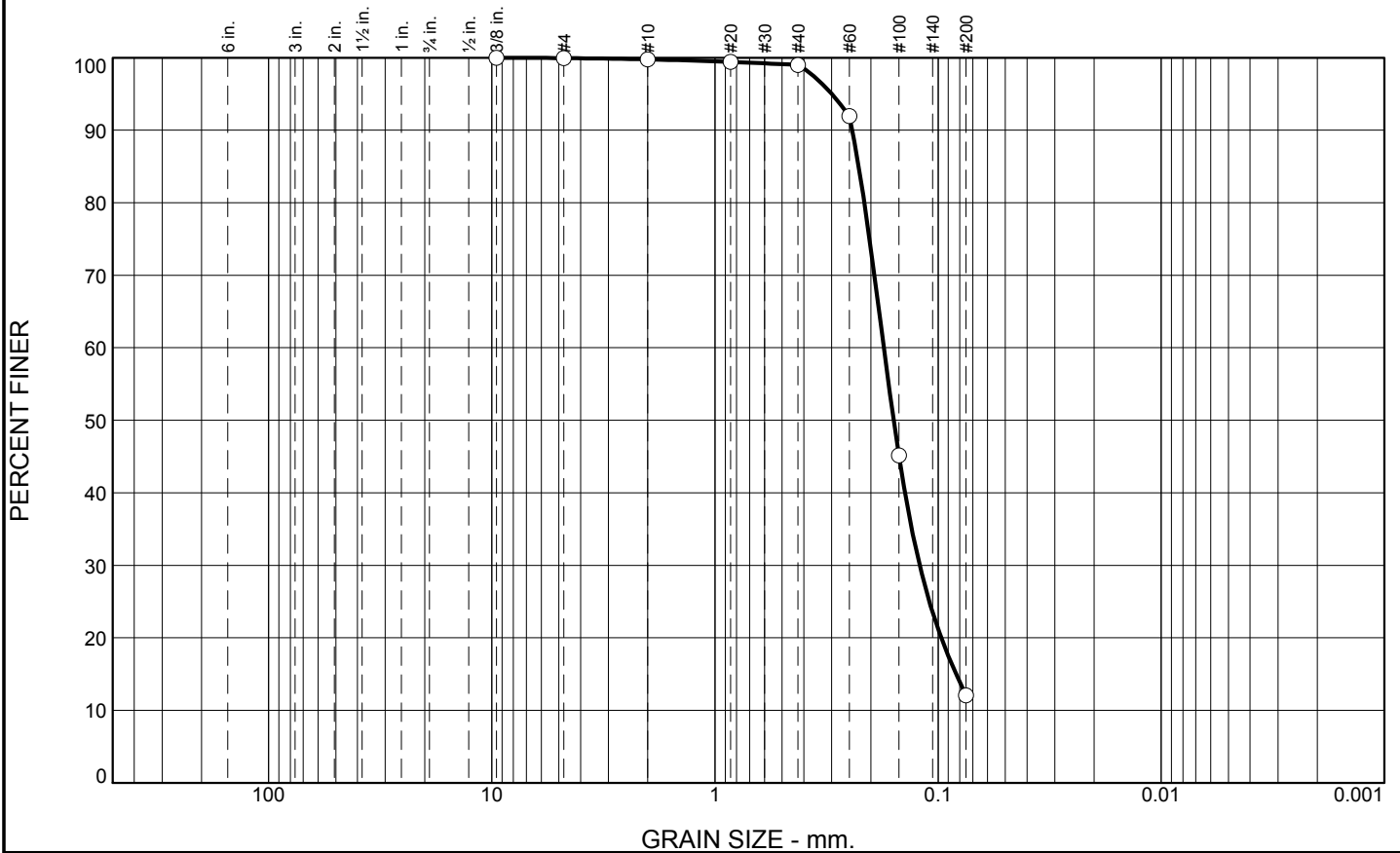
Date: 5/27/10

<p>Thompson Engineering</p> <p>Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project Project No: 10-2123-0009</p>
<p>Figure</p>	

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	0.8	86.9	12.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.8		
#20	99.4		
#40	99.0		
#60	91.9		
#100	45.2		
#200	12.1		

Material Description

SILTY SAND, (SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2424 D₈₅= 0.2267 D₆₀= 0.1751
D₅₀= 0.1582 D₃₀= 0.1209 D₁₅= 0.0830
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-19-10B
Sample Number: TE Lab ID: 4488.20

Depth: 8.0 - 13.5 (ft.)

Date: 5/27/10

Thompson Engineering

Mobile, Alabama

Client: US Army Corps of Engineers
Project: Contract No. W91278-10-D-0026 - Task 03
Mississippi Barrier Island Restoration Project
Project No: 10-2123-0009


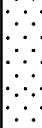




Figure

Tested By: L.Stokes

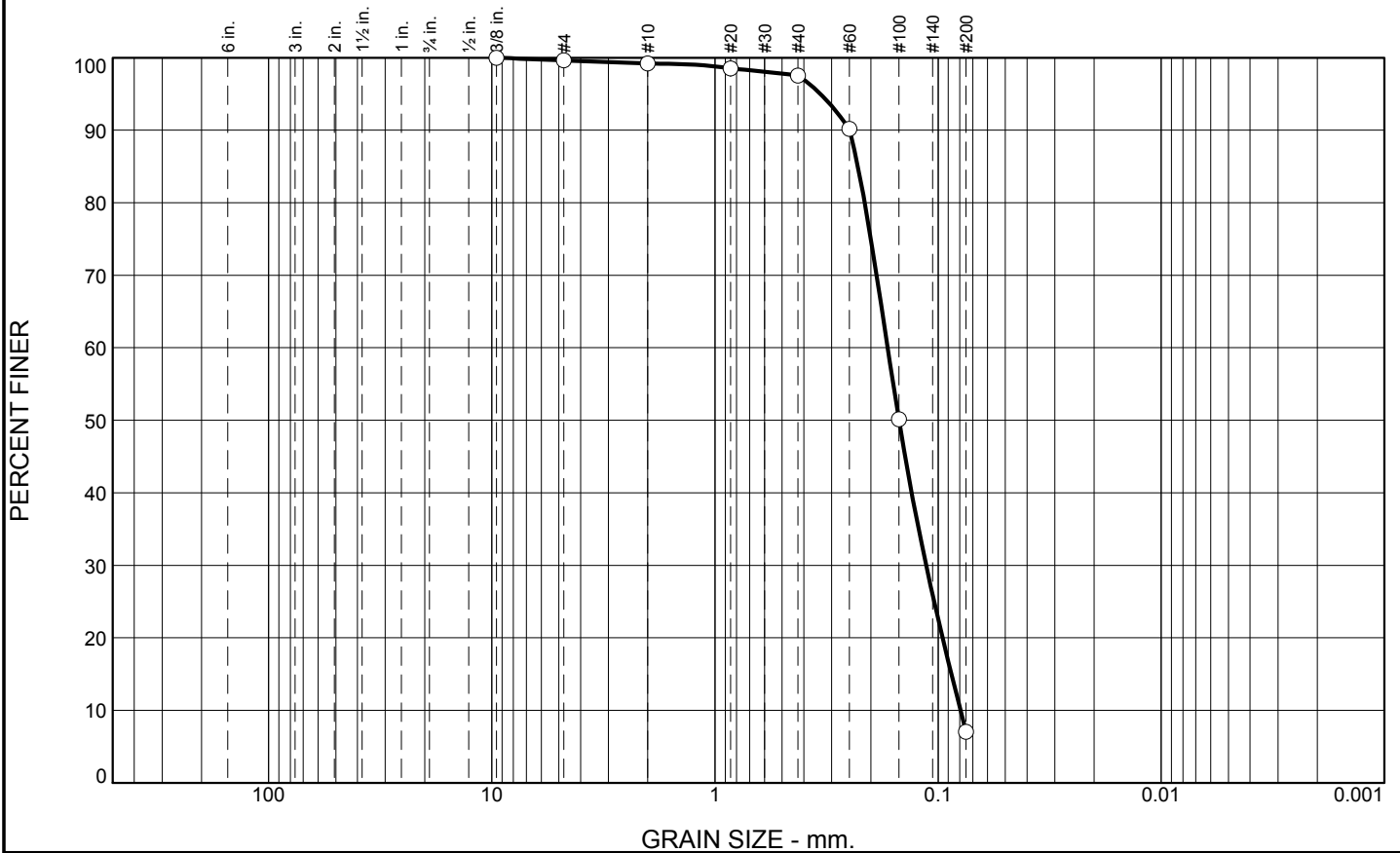
Checked By: R.Byrd

Boring Designation BI-MS-20-10

DRILLING LOG		DIVISION South Atlantic	INSTALLATION Mobile District	SHEET 1 OF 1 SHEETS
1. PROJECT MsCIP Barrier Island Restoration Mississippi Sound		9. SIZE AND TYPE OF BIT N/A		
2. BORING DESIGNATION BI-MS-20-10		10. COORDINATE SYSTEM/DATUM State Plane, MSE (U.S. Ft.)		HORIZONTAL NAD83
3. DRILLING AGENCY Corps of Engineers - CESAM		11. MANUFACTURER'S DESIGNATION OF DRILL Vibracore		<input type="checkbox"/> AUTO HAMMER <input type="checkbox"/> MANUAL HAMMER
4. NAME OF DRILLER Construction Solutions International, Inc.		12. TOTAL SAMPLES		DISTURBED 3
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0
6. THICKNESS OF OVERBURDEN N/A		14. WATER DEPTH 21 Ft.		15. DATE BORING
7. DEPTH DRILLED INTO ROCK N/A		16. ELEVATION TOP OF BORING -19.6 Ft.		STARTED 05-13-10
8. TOTAL DEPTH OF BORING 16.6 Ft.		17. TOTAL RECOVERY FOR BORING 100%		COMPLETED 05-13-10
18. SIGNATURE AND TITLE OF INSPECTOR Marty Gates, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	SAMPLE	LABORATORY RESULTS
-19.6	0.0				
-20.6	1.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments, gray (SM)	A	Classification: SP-SM Color: 2.5Y 7/1-light gray D50: 0.1497 mm % Fines: 7
-24.6	5.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)		
-26.0	6.4		CLAY, lean, dark gray (CL)	NS	
-33.8	14.2		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace silt, trace shell fragments, lt. gray (SP)	B	Classification: SP Color: 2.5Y 6.5/1-gray D50: 0.1636 mm % Fines: 4.1
-35.4	15.8		CLAY, lean, dark gray (CL)	NS	
-36.2	16.6		SAND, silty, mostly fine to medium-grained sand-sized quartz, some silt, trace shell fragments (SM)		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. NS = Sample not submitted for laboratory analysis from this interval. 3. Seafloor elevation calculated using sampling vessel's fathometer water depth reading and applying NOAA tidal gauge data conversion factor.		

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.4	1.7	90.5	7.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	99.2		
#20	98.5		
#40	97.5		
#60	90.2		
#100	50.2		
#200	7.0		

Material Description

SAND, (SP-SM), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2492 D₈₅= 0.2288 D₆₀= 0.1683
D₅₀= 0.1497 D₃₀= 0.1131 D₁₅= 0.0872
D₁₀= 0.0794 C_u= 2.12 C_c= 0.96

Classification

USCS= SP-SM AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-20-10A
Sample Number: TE Lab ID: 4488.05

Depth: 0.0 - 5.0 (ft.)

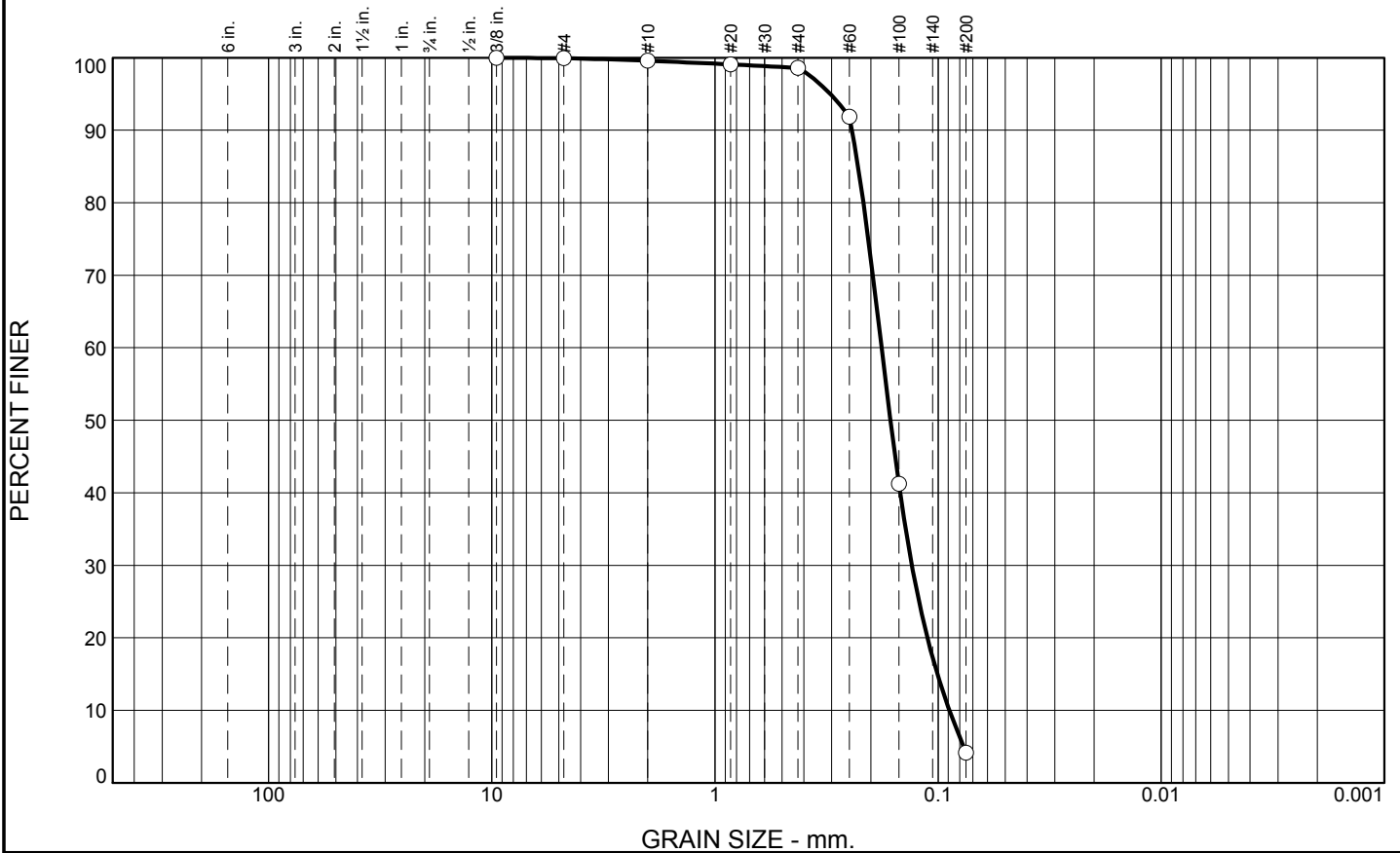
Date: 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	1.0	94.5	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.6		
#20	99.1		
#40	98.6		
#60	91.9		
#100	41.2		
#200	4.1		

Material Description

SAND, (SP), fine grained

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.2431 D₈₅= 0.2282 D₆₀= 0.1792
D₅₀= 0.1636 D₃₀= 0.1311 D₁₅= 0.1008
D₁₀= 0.0890 C_u= 2.01 C_c= 1.08

Classification

USCS= SP AASHTO=

Remarks

CADD CODE = CH10D965

* (no specification provided)

Location: USACE Sample # BI-MS-20-10B
Sample Number: TE Lab ID: 4488.06

Depth: 6.4 - 11.4 (ft.)

Date: 5/27/10

<h2 style="margin: 0;">Thompson Engineering</h2> <p style="margin: 0;">Mobile, Alabama</p>	<p>Client: US Army Corps of Engineers</p> <p>Project: Contract No. W91278-10-D-0026 - Task 03 Mississippi Barrier Island Restoration Project</p> <p>Project No: 10-2123-0009</p> <p style="text-align: right;">Figure</p>
--------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Tested By: L.Stokes

Checked By: R.Byrd