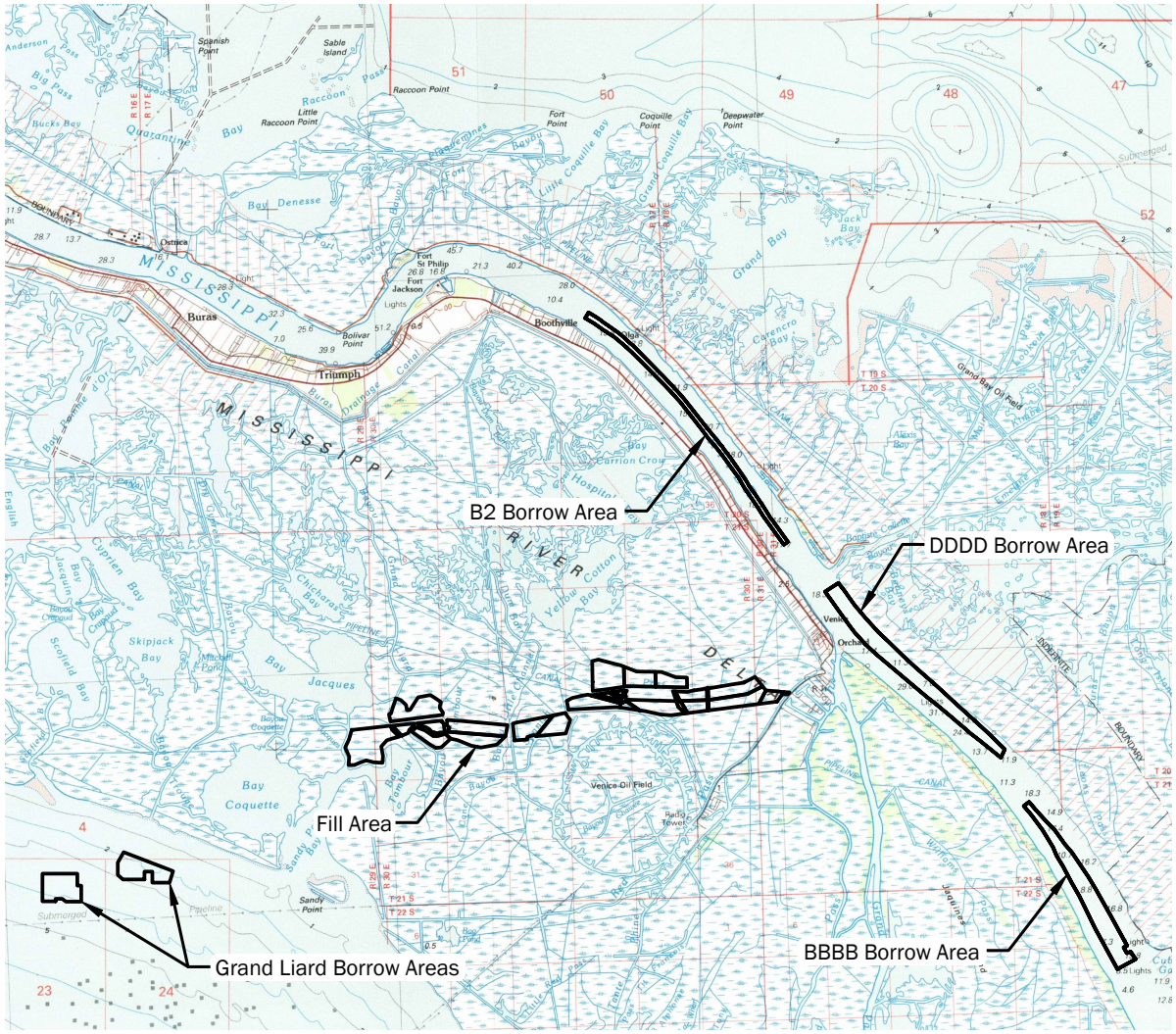
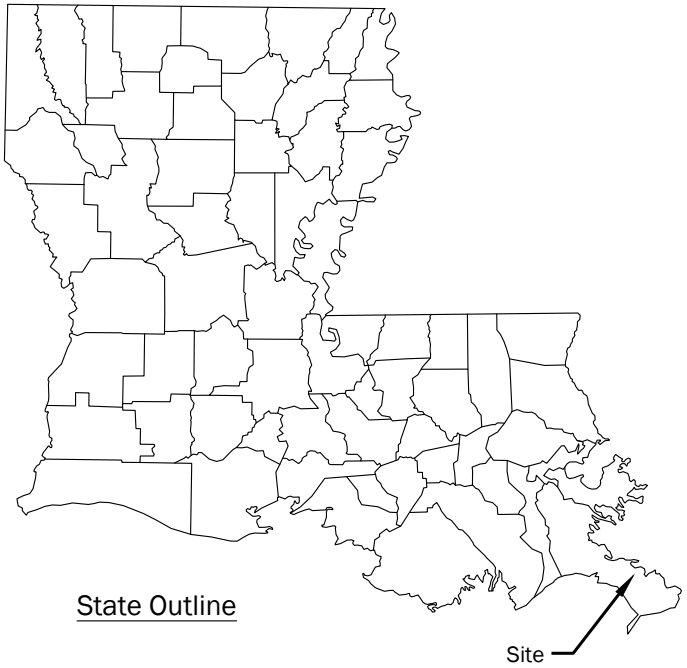
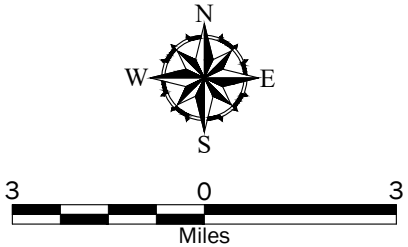
P:\18\18274005\CAD\00\Geotech - Data Report\1827400500_F01_Vicinity Map.dwg TAB:Vicinity Map Date Exported: 02/15/19 - 16:05 by kcook







Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
1. Topographic map was taken from USGS, Quad: Mississippi River Delta, Dated: 1983
2. Fill Area Layout was provided by Baird, Dated 9/11/18

Projection: LA State Plane, South Zone, NAD83, US Foot

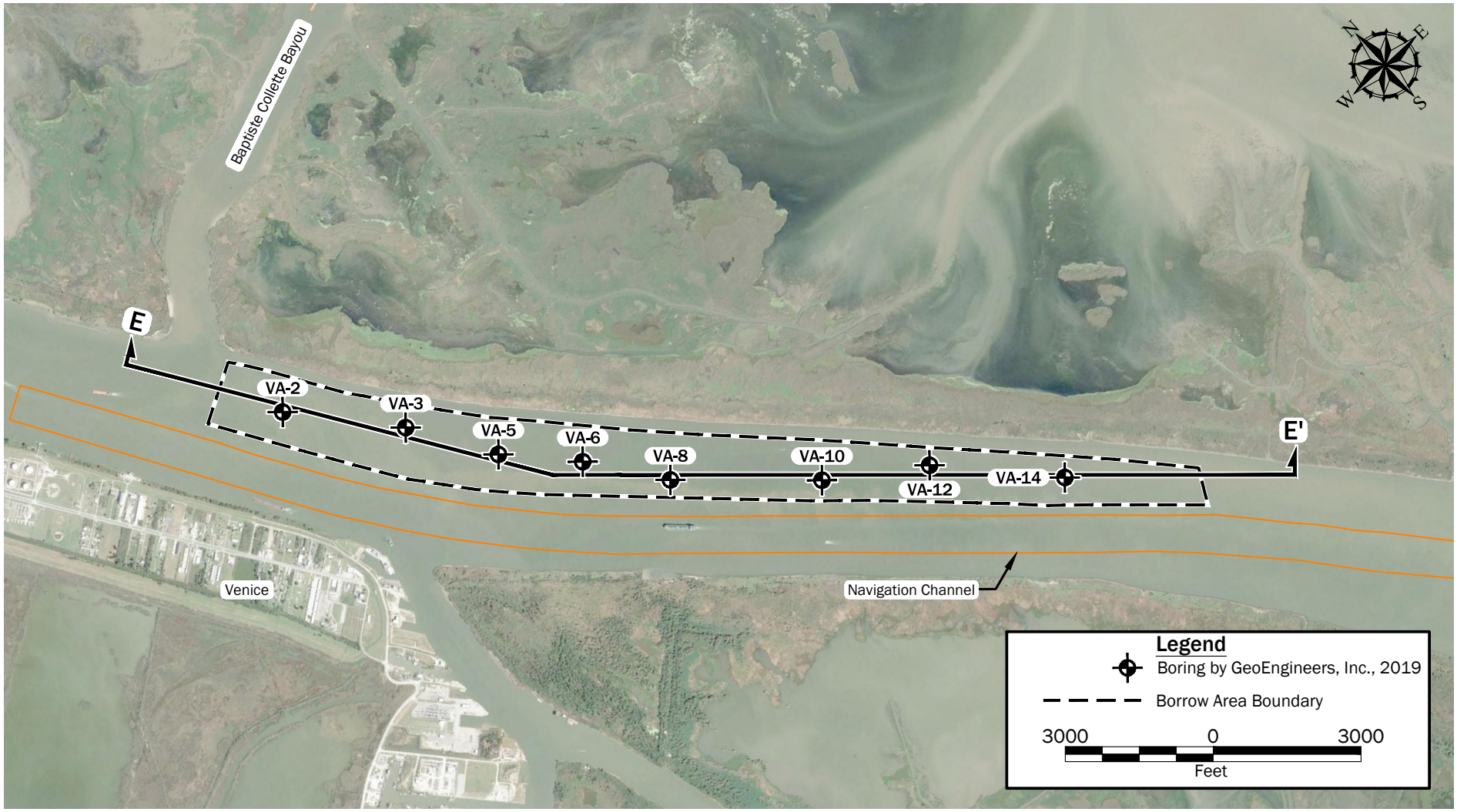
Vicinity Map

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 1

P:\18\18274005\CAD\00\Geotech - Borrow Area\1827400500_F03_Site Plan Borrow Area.dwg TAB:F3a-Site Plan Date Exported: 10/17/19 - 15:51 by kcook



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Aerial was taken from Google Earth Pro., Dated 12/30/2016
Layout was provided by Baird, Dated 9/11/2018

Projection: LA State Plane, South Zone, NAD83, US Foot

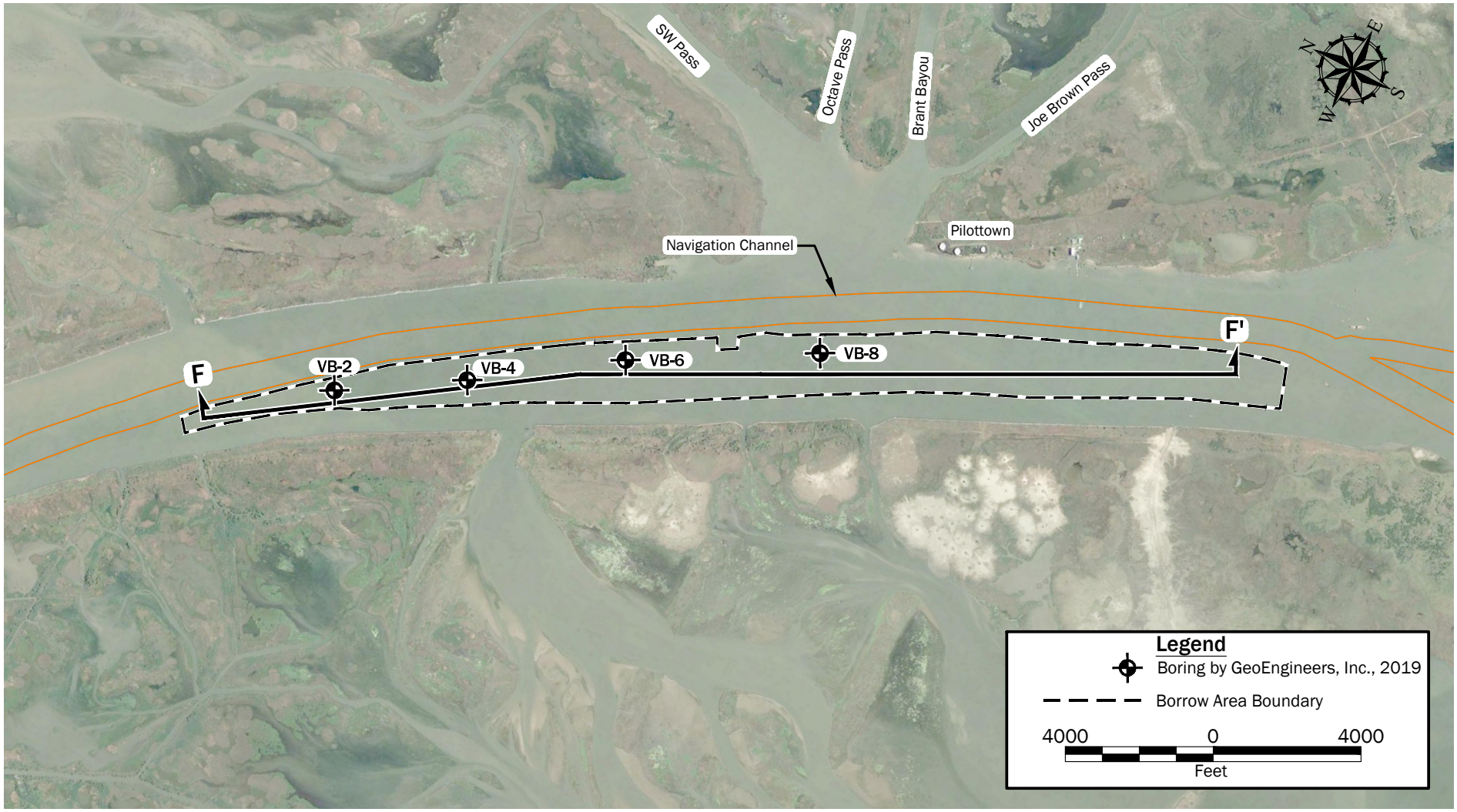
Mississippi River Borrow Area Site Plan - DDDD

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 3a

P:\18\18274005\CAD\00\Geotech - Borrow Area\1827400500_F04_Site Plan Borrow Area.dwg TAB:F02 - BLP Date Exported: 10/17/19 - 15:51 by kcook



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Aerial was taken from Google Earth Pro., Dated 12/30/2016
Layout was provided by Baird, Dated 9/11/2018

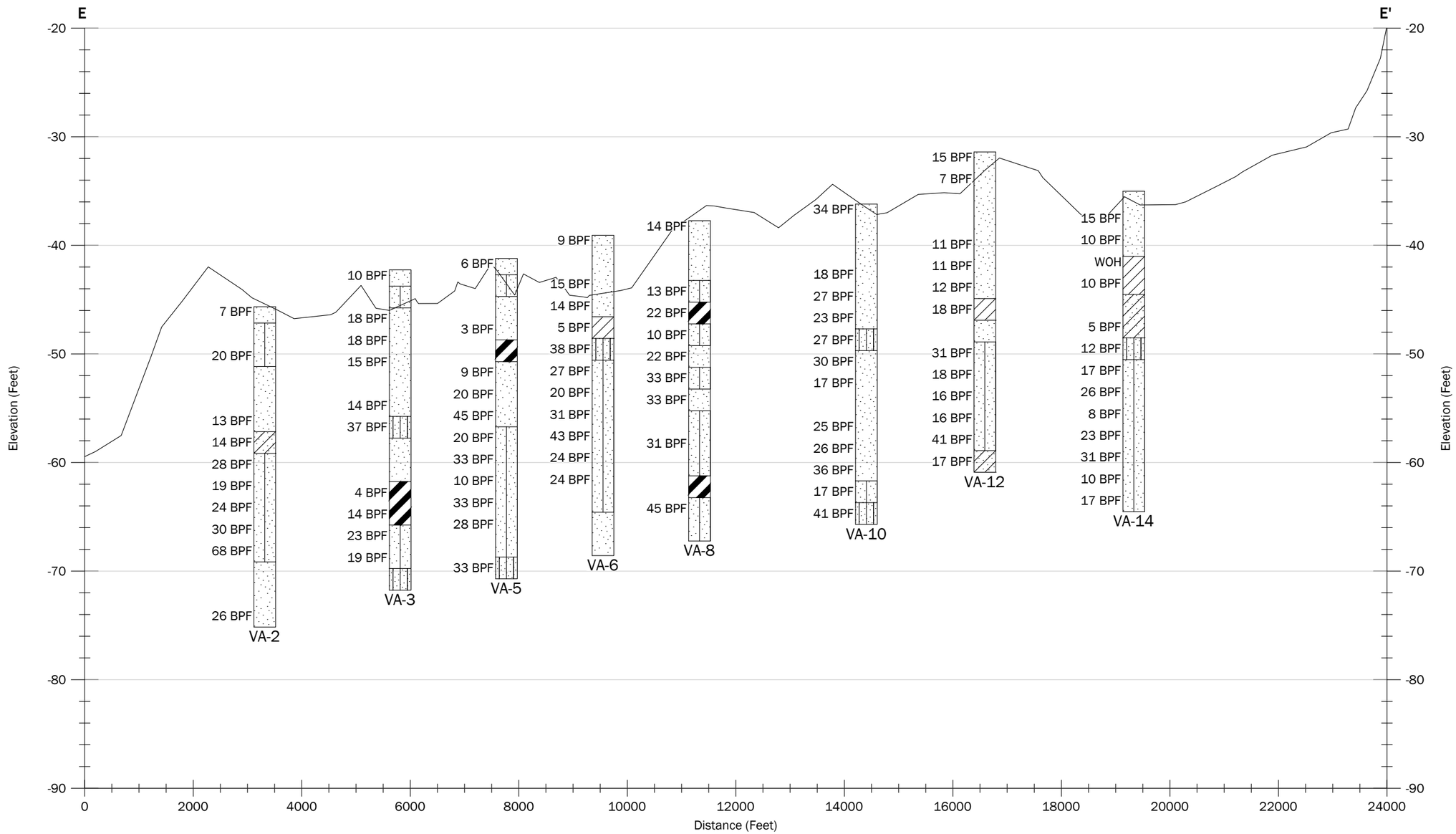
Projection: LA State Plane, South Zone, NAD83, US Foot

Mississippi River Borrow Area Site Plan - BBBB

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 3b



Soil Classification

- CL
- SP-SM
- CH
- PT
- OH
- WOOD
- SC-SM
- SC & SP-SC
- SP
- SM
- ML

Boring Legend

SPT (N) | Shear Strength (KSF)

BPF = Blows Per Foot
WOH = Weight of Hammer
P = Push

2000 0 2000
Horizontal Scale in Feet

10 0 10
Vertical Scale in Feet
Vertical Exaggeration: 200X

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Ground surface was taken from USACE, Dated 2014.

Projection: NAD83 Texas State Planes, Central Zone, US Foot

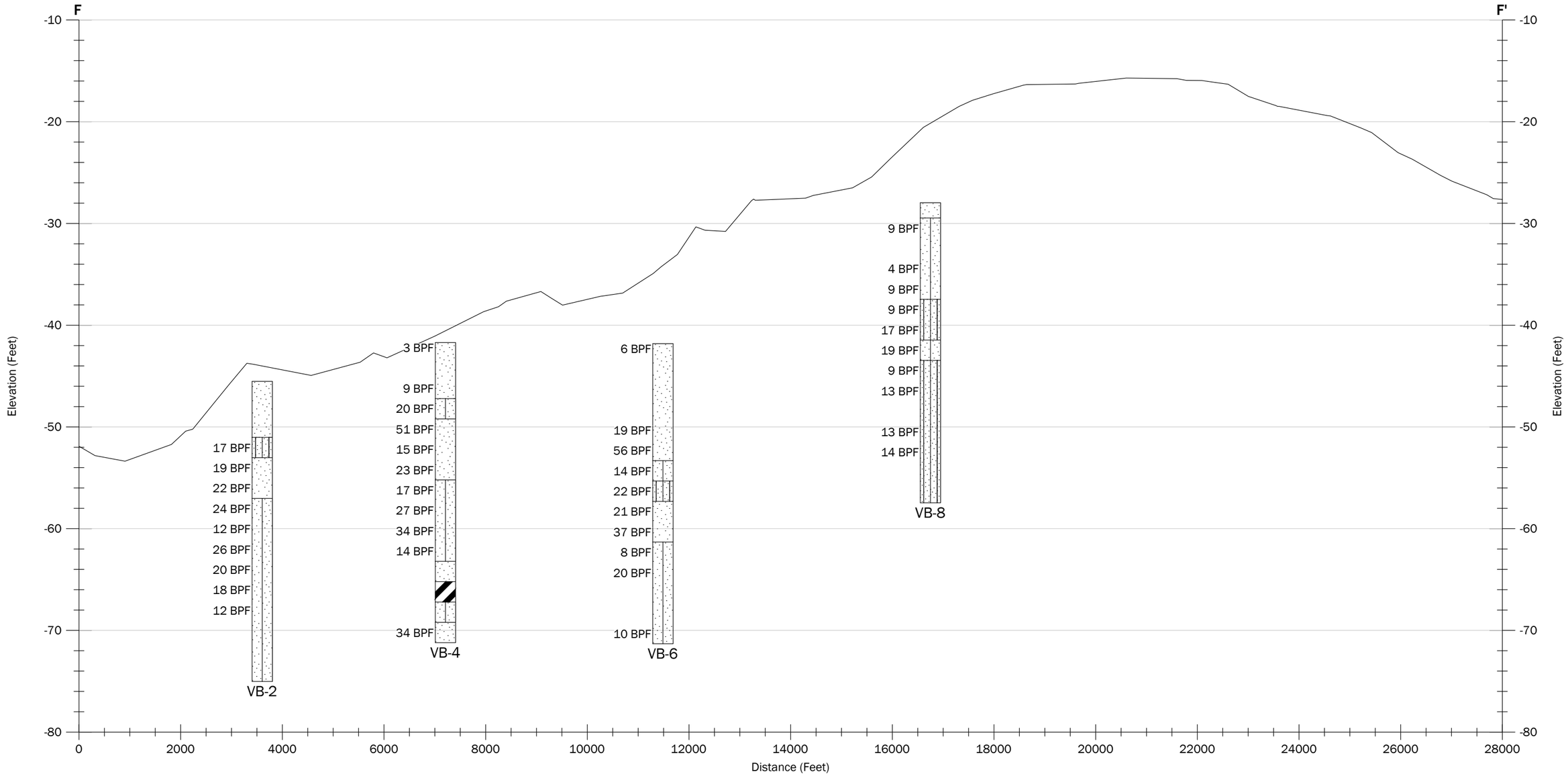
Subsurface Profile E-E'

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 8

P:\18\18274005\CAD\00\Geotech - Borrow Area\1827400500_F03_Site Plan Borrow Area.dwg TAB:F08 - SS EE Date Exported: 10/17/19 - 15:59 by kcook



Soil Classification

- CL
- SP-SM
- CH
- PT
- OH
- WOOD
- SC-SM
- SC & SP-SC
- SP
- SM
- ML

Boring Legend

SPT (N) | Shear Strength (KSF)

BPF = Blows Per Foot
WOH = Weight of Hammer
P = Push

2000 0 2000
Horizontal Scale in Feet

10 0 10
Vertical Scale in Feet
Vertical Exaggeration: 200X

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Ground surface was taken from USACE, Dated 2014.

Projection: NAD83 Texas State Planes, Central Zone, US Foot

Subsurface Profile F-F'

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 9

P:\18\18274005\CAD\00\Geotech - Borrow Area\1827400500_F04_Site Plan Borrow Area.dwg TAB:F08 - SS BB Date Exported: 10/17/19 - 16:00 by kcook

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

Sampler Symbol Descriptions

- 2.4-inch I.D. split barrel
- Standard Penetration Test (SPT)
- Shelby tube
- Piston
- Direct-Push
- Bulk or grab
- Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

- Measured groundwater level in exploration, well, or piezometer
- Water level observed at time of exploration

Graphic Log Contact

- Distinct contact between soil strata
- Approximate contact between soil strata

Material Description Contact

- Contact between geologic units
- Contact between soil of the same geologic unit

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point lead test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GEOENGINEERS

Figure F-1

Drilled	Start 9/14/2019	End 9/14/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-46 / NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge		
Latitude / Longitude	29.282378 / -89.350239				System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	51.0		

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.5 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	4	7		1			SP	Brownish gray sand (loose)	26							5	
		X	4			2			SP-SM	Brownish gray sand with silt	24							6	
-50		X	16	20		3				Brown sand with silt (firm)									
	5	X	14			4			SP	Grayish brown sand	28							2	
-55		X	18			5				Grayish brown sand	23							2	
	10	X	9	13		6				Brownish gray sand (firm)	27							3	
		X	10	14		7			SC	Gray and dark gray clayey sand (firm)	50							36	
-60		X	9	28		8			SP-SM	Gray sand with silt (firm)									
	15	X	14	19		9				Gray sand with silt (firm)	25							6	
-65		X	4	24		10				Gray sand with silt (firm)									
	20	X	8	30		11				Brownish gray sand with silt (dense)	27							6	
		X	12	68		12				Gray sand with silt (very dense)									
-70		X	14			13			SP	Light brown sand	22							2	
	25	X	13			14				Gray sand									
-75		X	10	26		15				Light gray and tan sand (firm)	23							2	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Log of Boring VA-2

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-2
Sheet 1 of 1

Drilled	Start 9/11/2019	End 9/11/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-45 NAVD88		Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge				
Latitude / Longitude	29.278999 -89.347564		System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	50.0				

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.9 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	4	10		1			SP	Brown sand (firm)	22							2	
		X	15			2			SP-SM	Brown sand with silt and trace gravel	23							10	
-50	5	X	18	18		3			SP	Brown sand with clay pockets (firm)									
		X	7	18		4				Brown sand (firm)	22							3	
		X	10	15		5				Brown sand with clay pockets (firm)									
-55	10	X	4			6				Brown sand	25							5	
		X	14	14		7				Brown sand (firm)	24							3	
-60	15	X	18	37		8			SM	Gray silty sand (dense)	29							13	
		X	18			9			SP	Gray sand with clay pockets									
		X	18			10				Brown sand	23							3	
-65	20	X	4	4		11			CH	Gray clay	70								
		X	8	14		12				Gray clay	77								
-70	25	X	7	23		13			SP-SM	Gray sand with silt (firm)	22							9	
		X	9	19		14				Gray sand with silt and 2-inch clay layer at bottom (firm)									
		X	18			15			SM	Gray silty sand with clay	31							21	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VA-3

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-3
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_LAB_MUDLINE

Drilled	Start 9/11/2019	End 9/11/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-42 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge
Latitude / Longitude	29.272725 -89.34163				System Datum	Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)	45.0

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.9 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	☒	16	6		1			SP	Brown sand (loose)	26							2	
-45		☒	12			2			SP-SM	Brown sand with silt									
	5	☒	18			3			SP	Brown sand	24							3	
		☒	6	3		4				Brown sand (very loose)									
-50		☒	18			5			CH	Gray clay	66								
	10	☒	8	9		6			SP	Brown and gray sand (loose)	24							4	
-55		☒	12	20		7				Brown sand (firm)	24							2	
	15	☒	8	45		8				Gray sand (dense)									
		☒	9	20		9			SP-SM	Gray sand with silt (firm)	25							9	
-60		☒	5	33		10				Gray sand with silt (dense)									
	20	☒	10	10		11				Gray sand with silt (firm)	22							7	
-65		☒	4	33		12				Dark gray sand with silt (dense)									
	25	☒	8	28		13				Gray sand with silt (firm)	27							7	
		☒	5			14				Dark gray sand with silt									
-70		☒	18	33		15			SM	Gray silty sand (dense)	20							17	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VA-5

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-4
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 9/14/2019	End 9/14/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-41 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge		
Latitude / Longitude	29.270483 -89.338589				System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	43.0		

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.5 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	12	9		1			SP	Grayish brown sand (loose)	26							1	
		X	18			2				Brown sand									
-45	5	X	13	15		3				Brownish gray sand (firm)	27							3	
		X	8	14		4				Brown sand with clay traces and organic matter (firm)									
-50		X	16	5		5			CL	Gray clay with silt and trace sand	62							97	
	10	X	18	38		6			SM	Gray silty sand with trace clay (dense)	23							12	
		X	9	27		7			SP-SM	Gray and brown sand with silt and trace clay (firm)									
-55	15	X	18	20		8				Gray sand with silt and trace clay (firm)	28							10	
		X	8	31		9				Gray sand with silt and clay layers (dense)									
-60		X	15	43		10				Gray sand with silt and trace clay (dense)	25							10	
	20	X	6	24		11				Gray sand with silt (firm)									
		X	7	24		12				Dark gray sand with silt (firm)	28							8	
-65	25	X	18			13				Gray sand with silt									
		X	18			14			SP	Gray sand	23							3	
-70		X	18			15				Gray sand	24							4	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VA-6

GeoEngineers

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-5
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_LAB_MUDLINE

Drilled	Start 9/10/2019	End 9/10/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-37 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge
Latitude / Longitude	29.265728 -89.33404				System Datum	Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)	47.0

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.7 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	☒	18	14		1			SP	Brown sand with trace gravel (firm)	24							2	
40		☒	6			2				Brown sand									
	5	☒	7			3				Brown sand with trace organic matter	26							4	
		☒	6	13		4			SP-SM	Gray sand with silt (firm)	26							8	
45		☒	18	22		5			CH	Gray clay with silt lenses and trace sand	40								
	10	☒	7	10		6			SP-SM	Gray sand with silt and clay pockets (firm)									
50		☒	8	22		7			SP	Gray sand (dense)	21							5	
	15	☒	12	33		8			SP-SM	Brown sand with silt (dense)	21							6	
		☒	4	33		9			SP	Brown sand (dense)	24							5	
55		☒	6			10			SP-SM	Gray sand with silt									
	20	☒	4	31		11				Brown sand with silt (dense)	26							8	
60		☒	15			12				Gray sand with silt									
	25	☒	12			13			CH	Gray clay with trace silt and sand	67								
		☒	15	45		14			SP-SM	Gray sand with silt and clay pockets (dense)									
65		☒	18			15				Brown sand with silt	17							7	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VA-8

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-6
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_LAB_MUDLINE

Drilled Start 9/10/2019 End 9/10/2019	Total Depth (ft) 29.5	Logged By JTH Checked By ARS	Driller GeoEngineers, Inc.	Drilling Method Mud Rotary 0' - 29.5'
Surface Elevation (ft) Vertical Datum -36 NAVD88	Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Truck-Mounted Drill Rig and Spud Barge		
Latitude 29.26033 Longitude -89.326591	System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 40.0		

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.7 feet

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	6	34		1			SP	Brown sand (dense)	24							2	
		X	8			2				Brown sand									
40	5	X	7			3				Light brown sand	25							3	
		X	18	18		4				Grayish brown sand (firm)	26							2	
45		X	16	27		5				Brown sand (firm)	25							2	
	10	X	7	23		6				Gray sand (firm)									
		X	5	27		7			SM	Gray silty sand with clay (firm)	31							26	
50		X	4	30		8			SP	Gray sand with trace silt and trace clay (dense)	29							5	
	15	X	18	17		9				Gray sand with trace silt (firm)									
55		X	18			10				Brownish gray sand	22							3	
	20	X	10	25		11				Gray sand (firm)									
		X	5	26		12				Brownish gray sand (firm)	26							5	
60	25	X	6	36		13				Gray sand (dense)									
		X	18	17		14			SP-SM	Brownish gray sand with silt (firm)	28							5	
65		X	18	41		15			SM	Brown and dark gray silty sand with clay (dense)	24							19	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VA-10

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-7
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_LAB_MUDLINE

Drilled	Start 9/9/2019	End 9/9/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-33 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge		
Latitude / Longitude	29.256644 -89.320942				System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	35.0		

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.4 feet

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	4	15		1			SP	Brown sand (firm)	26							3	
35		X	18	7		2				Brown sand (loose)									
	5	X	18			3				Brown sand	25							3	
40		X	12			4				Brown sand	25							2	
		X	15	11		5				Brown sand (firm)	23							2	
	10	X	4	11		6				Brownish gray sand (firm)	30							4	
45		X	18	12		7				Brown sand (firm)	24							2	
									CL	Gray clay with silt and sand									
	15	X	6	18		8													
50		X	11			9			SP	Brown sand	26							2	
		X	18	31		10			SP-SM	Gray sand with silt and clay pockets (dense)									
	20	X	10	18		11				Brownish gray sand with silt (firm)	26							7	
55		X	4	16		12				Gray sand with silt (firm)									
	25	X	5	16		13				Gray sand with silt (firm)	25							8	
60		X	12	41		14				Brownish gray sand with silt (dense)	24							8	
		X	12	17		15			SC	Brown and gray clayey sand (firm)	29							47	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VA-12

GeoEngineers

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-8
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 9/9/2019	End 9/9/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-35 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge		
Latitude / Longitude	29.251801 -89.314786				System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	38.0		

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.4 feet

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	6			1			SP	Brown sand	23							2	
		X	6	15		2				Brown sand (firm)									
-40	5	X	8	10		3				Brown sand	23							2	
		X	12	WOH		4			CL	Gray silty clay									
		X	12	10		5				Gray clay with sand	60								
-45	10	X	18			6			SC	Gray clayey sand with clay layers									
		X	18	5		7				Gray clayey sand with silty clay layers (loose)									
-50	15	X	3	12		8			SM	Gray silty sand with trace gravel (firm)	24							12	
		X	8	17		9			SP-SM	Brown sand with silt (firm)	25							6	
		X	6	26		10				Gray sand with silt (firm)	23							12	
-55	20	X	6	8		11				Gray sand with silt (loose)	25							8	
		X	2	23		12				Gray sand with silt (firm)	23							8	
-60	25	X	7	31		13				Gray sand with silt (dense)	27							12	
		X	5	10		14				Gray sand with silt (firm)									
		X	5	17		15				Brown sand with silt (firm)	25							5	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIS_GEOTECH_LAB_MUDLINE

Log of Boring VA-14

GeoEngineers

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-9
Sheet 1 of 1

Drilled	Start 9/14/2019	End 9/14/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-46 NAVD88		Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge				
Latitude / Longitude	29.2255 -89.294333		System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	43.0				

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.5 feet

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	17			1			SP	Brown sand	26							2	
		X	18			2				Brown sand	28							2	
50	5	X	18			3				Brown sand									
		X	5	17		4			SM	Tan silty sand with trace gravel and wood fragments (firm)	51							32	
55		X	16	19		5			SP	Brown sand with trace silt and organic layers (firm)									
	10	X	7	22		6				Brown sand and trace organic matter (firm)	28							3	
		X	15	24		7			SP-SM	Brown sand with silt (firm)									
60	15	X	10	12		8				Brown sand with silt and trace organic matter (firm)	31							7	
		X	12	26		9				Gray silty sand with silt (firm)									
65		X	6	20		10				Gray sand with silt (firm)	26							7	
	20	X	14	18		11				Gray sand with silt (firm)									
		X	7	12		12				Gray sand with silt (firm)	24							6	
70	25	X	12			13				Gray sand with silt	29							7	
		X	14			14				Gray sand with silt	27							8	
75		X	18			15				Brown and gray sand with silt	25							6	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VB-2

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-10
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 9/13/2019	End 9/13/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-42 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge		
Latitude / Longitude	29.216937 -89.288689				System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	43.0		

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.5 feet

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0	X	14	3		1			SP	Brown sand with organic matter (loose)	34							3	
-45		X	18			2				Brown sand with trace gravel and organic matter	40							1	
	5	X	18	9		3				Brown sand with silt traces (loose)									
		X	12	20		4			SP-SM	Brown sand with silt, trace gravel, and organic matter (firm)	29							9	
-50		X	12	51		5			SP	Brown sand with clay traces (very dense)									
	10	X	8	15		6				Brown sand (firm)	25							5	
-55		X	16	23		7				Gray sand with clay layers and organic matter (firm)									
	15	X	10	17		8			SP-SM	Brown sand with silt and clay pockets (firm)	27							12	
		X	18	27		9				Gray sand with silt and 5-inch clay layer and trace organic matter (firm)									
-60		X	7	34		10				Gray sand with silt and trace clay (dense)	25							10	
	20	X	18	14		11				Gray sand with silt and 4-inch clay layer (firm)									
-65		X	7			12			SP	Gray sand with organic matter	26							3	
	25	X	12			13			CH	Gray clay with trace silt	75								
		X	18			14			SP-SM	Gray sand with silt	30							7	
-70		X	10	34		15			SP	Gray sand (dense)	31							5	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VB-4

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-11
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_LAB_MUDLINE

Drilled	Start 9/13/2019	End 9/13/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-42 NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge
Latitude / Longitude	29.206906 -89.281428				System Datum	Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)	39.0

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.5 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		8	6		1			SP	Brown sand (loose)	26							3	
-45			18			2				Brown sand	25							2	
	5		16			3				Brown sand	29							2	
			10			4				Brown sand with organic matter layers	28							4	
-50			17	19		5				Brown sand (firm)	28							5	
	10		7	56		6				Brown sand (very dense)									
-55			10	14		7			SP-SM	Dark gray sand with silt, clay pockets, and organic matter (firm)	30							11	
	15		16	22		8			SM	Brown silty sand with clay and organic matter (firm)	32								
			9	21		9			SP	Gray sand with clay pockets (firm)	25							5	
-60			15	37		10				Gray sand with clayey sand layers (dense)									
	20		7	8		11			SP-SM	Dark gray sand with silt (loose)	27							6	
-65			14	20		12				Gray sand with silt, clay layers and trace organic matter (firm)									
	25		9			13				Gray sand with silt and clay pockets	27							8	
			12			14				Gray sand with silt and clay pockets									
-70			18	10		15				Gray sand with silt, clay pockets, and 2-inch clay layer at bottom (firm)									

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VB-6

GeoEngineers

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-12
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 9/12/2019	End 9/12/2019	Total Depth (ft)	29.5	Logged By / Checked By	JTH / ARS	Driller	GeoEngineers, Inc.	Drilling Method	Mud Rotary 0' - 29.5'
Surface Elevation (ft) / Vertical Datum	-29 / NAVD88				Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	Truck-Mounted Drill Rig and Spud Barge
Latitude / Longitude	29.194037 / -89.273757				System Datum	Geographic NAD83 (feet)			Depth of water to mudline at time of exploration (ft)	32.0

Notes: Cement-Bentonite Grout Full Depth. River stage at 1.7 feet

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0					1			SP	Brown sand	25							2	
-30			6	9		2			SP-SM	Brown sand with silt (loose)	31							6	
			18			3				Brown sand with silt									
	5																		
-35			7	4		4				Brown sand with silt (loose)	30							5	
			12	9		5				Brown and gray sand with silt (loose)									
	10								SM										
-40			15	9		6				Brown silty sand (loose)	22							20	
			18	17		7				Brown silty sand (firm)	19							13	
			18	19		8			SP-SM	Brown sand with silt (firm)	25							5	
	15																		
-45			18	9		9			SM	Gray silty sand (loose)									
			18	13		10				Brown silty sand (firm)	24							15	
	20		18			11				Gray silty sand with clay layers, clay pockets and wood fragments									
-50			9	13		12				Gray silty sand with clay pockets (firm)	32							22	
			8	14		13				Dark gray silty sand (firm)	29								
	25																		
-55			18			14				Brown silty sand	26							25	
			18			15				Brown silty sand	24							15	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on DEM.
*Indicates a remold was used for strength testing.

Log of Boring VB-8

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Restoration
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure F-13
Sheet 1 of 1

Date:10/16/19 Path:P:\18\18274005\GINT\18274005 00 NEW.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEIB_GEOTECH_LAB_MUDLINE

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
VA-2 Composite	0.0 - 29.5	Tan sand with trace silt and clay (SP-SM)	HYD SG SV MC	24.7			NP	NP	NP	6.0							SG=2.700
VA-3 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	HYD SG SV MC	27.3			NP	NP	NP	15.1							SG=2.695
VA-5 Composite	0.0 - 29.5	Tan silty sand with trace clay (SM)	HYD SG SV MC	25.3			NP	NP	NP	13.5							SG=2.668
VA-6 Composite	0.0 - 29.5	Tan sand with silt and clay (SP-SM)	HYD SG SV MC	26.2			NP	NP	NP	11.4							SG=2.660
VA-8 Composite	0.0 - 29.5	Gray silty sand with clay (SM)	HYD SG SV MC	26.2			NP	NP	NP	17.1							SG=2.685
VA-10 Composite	0.0 - 29.5	Tan sand with silt and clay (SP-SM)	HYD SG MC	25.6			NP	NP	NP	11.4							SG=2.677
VA-12 Composite	0.0 - 29.5	Tan sand with silt, clay, and organic matter (SP-SM)	HYD SG SV MC	27.6			NP	NP	NP	11.4							SG=2.665
VA-14 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	HYD SG SV MC	28.0			NP	NP	NP	16.6							SG=2.711
VB-2 Composite	0.0 - 29.5	Tan sand with trace silt, clay, and organic matter (SP-SM)	HYD SG SV MC	26.9			NP	NP	NP	8.5							SG=2.702
VB-4 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	HYD SG SV MC	32.7			NP	NP	NP	17.3							SG=2.664
VB-6 Composite	0.0 - 29.5	Tan sand with trace silt, clay, and organic matter (SP-SM)	HYD SG SV MC	27.0			NP	NP	NP	7.6							SG=2.682
VB-8 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	HYD SG SV MC	28.2			NP	NP	NP	18.4							SG=2.731

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 10.18.19

Summary of Lab Results
Project No.: 18274-005-00

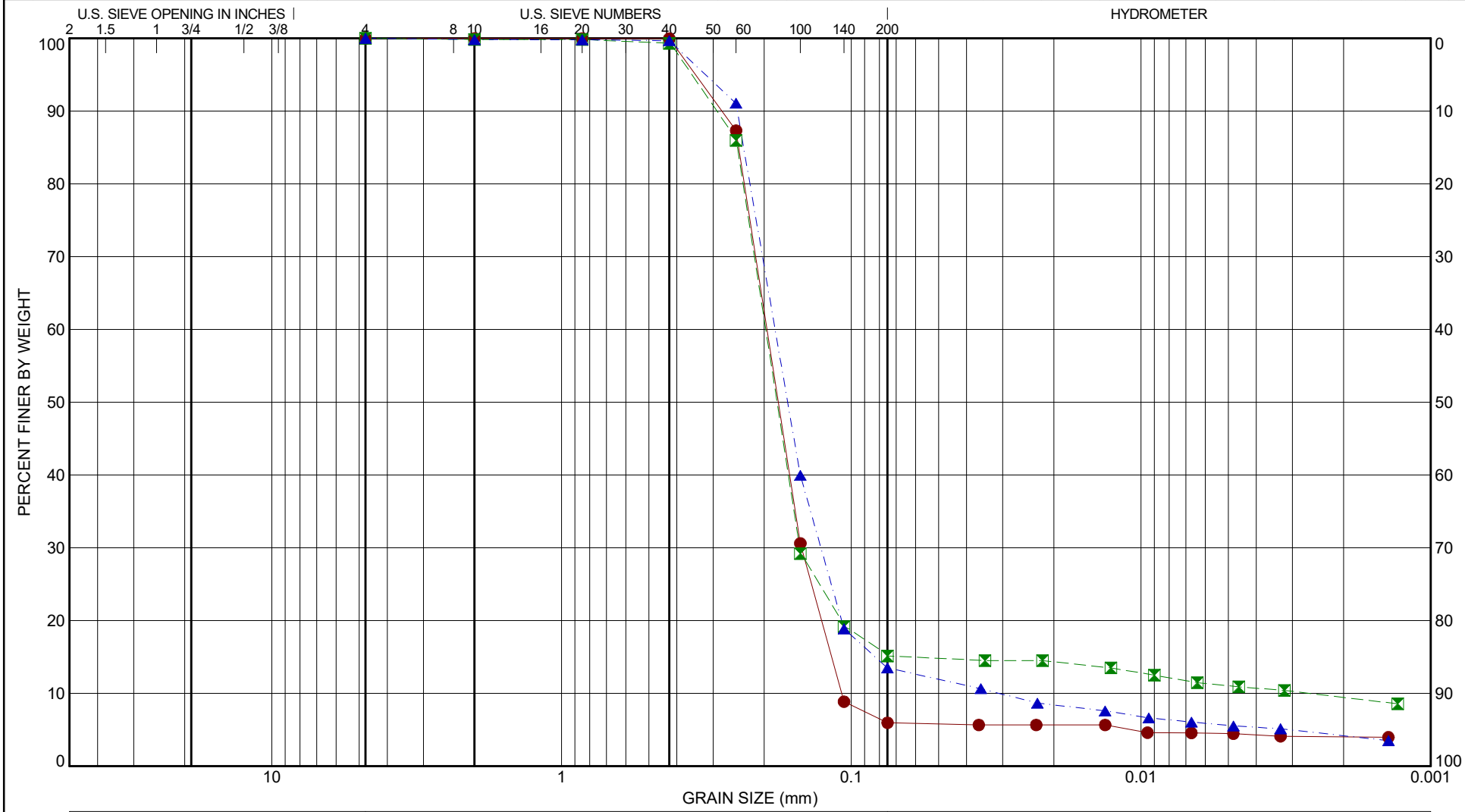
Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure G-51

Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
VA-2 Composite	0.0 - 29.5	Tan sand with trace silt and clay (SP-SM)	0.0	94.0	1.5	4.5	0.28	0.195	0.179	0.149	0.108	1.05	1.81	NP	NP	NP
VA-3 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	0.0	84.9	4.1	11.0	0.294	0.198	0.181	0.151	0.003	43.76	75.10	NP	NP	NP
VA-5 Composite	0.0 - 29.5	Tan silty sand with trace clay (SM)	0.0	86.5	7.9	5.6	0.247	0.183	0.166	0.127	0.031	2.87	5.94	NP	NP	NP



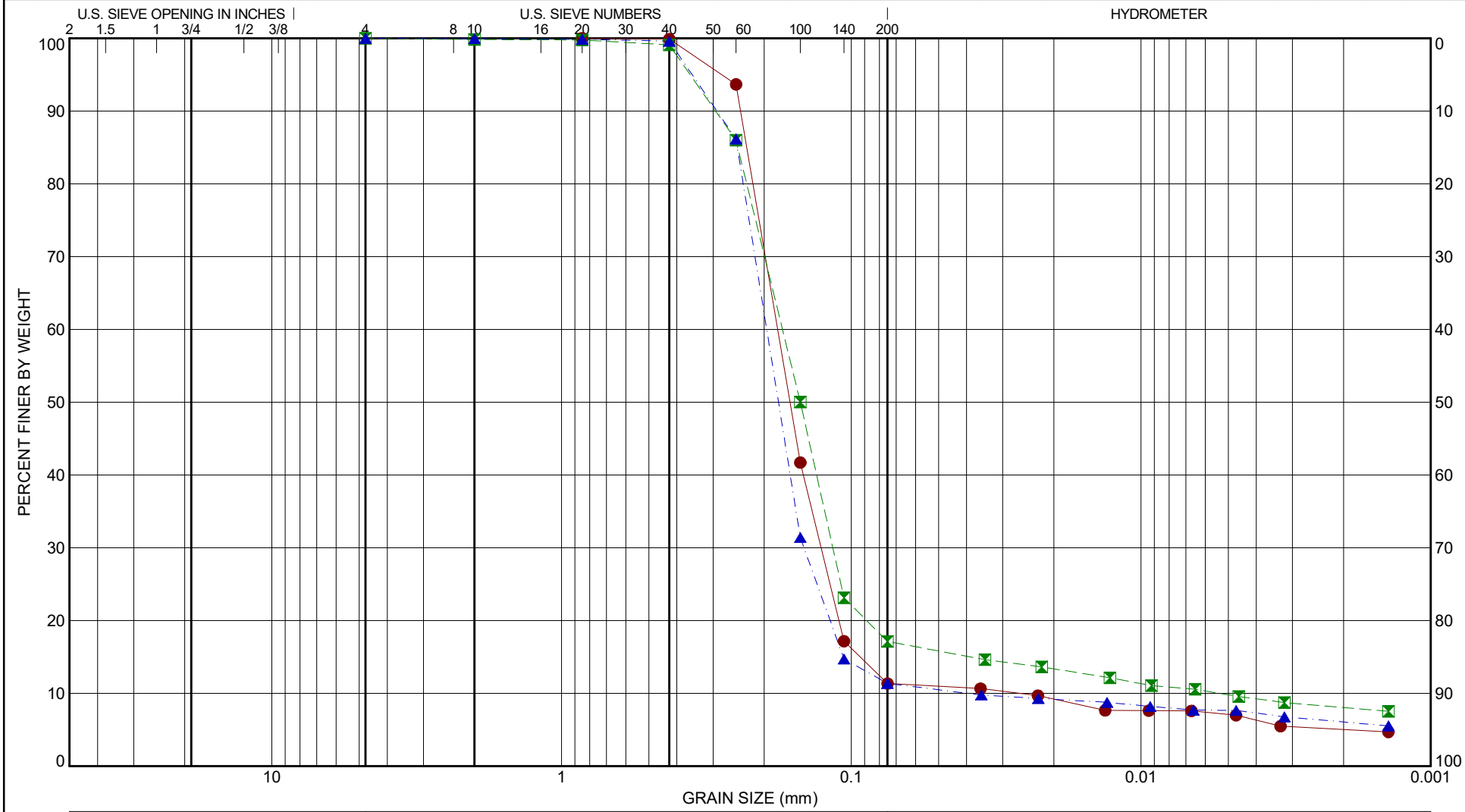
GRAVEL		SAND			SILT OR CLAY
coarse	fine	coarse	medium	fine	

Tested By:	Date Tested:	GRAIN SIZE DISTRIBUTION	Spanish Pass Ridge and Marsh Restoration
JJC/WMA/SLC	10/3/2019	ASTM D422/D1140/D6913/T88	Plaquemines Parish, Louisiana
Reviewed By:	Date Reviewed:	Project No.: 18274-005-00	GEOENGINEERS
Karen Allen	10/15/2019		Figure G-52

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

GEI - GRAIN SIZE - EXPLORATION ID - GEO TEMPLATE WITH LAB.GDT - 10/18/19 13:42 - P:\18\18274005\00\LAB\GINT LAB\18274-005-00 BR LAB.GPJ

Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
VA-6 Composite	0.0 - 29.5	Tan sand with silt and clay (SP-SM)	0.0	88.6	4.3	7.1	0.241	0.18	0.163	0.127	0.026	3.43	6.84	NP	NP	NP
VA-8 Composite	0.0 - 29.5	Gray silty sand with clay (SM)	0.0	82.9	7.3	9.8	0.294	0.173	0.15	0.116	0.005	14.60	32.49	NP	NP	NP
VA-10 Composite	0.0 - 29.5	Tan sand with silt and clay (SP-SM)	0.0	88.6	3.7	7.7	0.291	0.196	0.178	0.146	0.039	2.75	4.96	NP	NP	NP



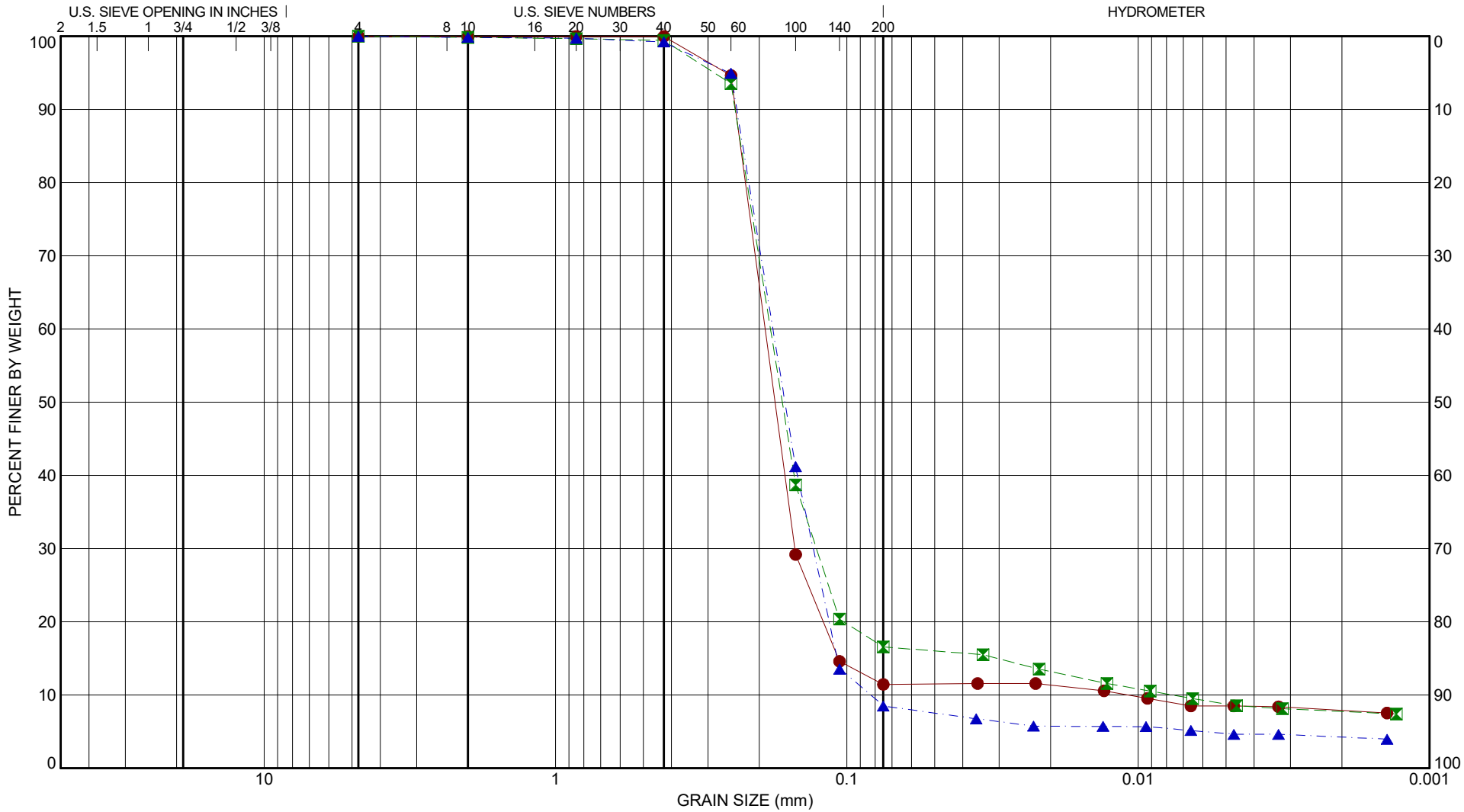
GRAVEL		SAND			SILT OR CLAY
coarse	fine	coarse	medium	fine	

Tested By:	Date Tested:	GRAIN SIZE DISTRIBUTION	Spanish Pass Ridge and Marsh Restoration
JHB/WMA/DPD	10/10/2019	ASTM D422/D1140/D6913/T88	Plaquemines Parish, Louisiana
Reviewed By:	Date Reviewed:	Project No.: 18274-005-00	GEOENGINEERS
Karen Allen	10/15/2019		Figure G-53

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

GEI - GRAIN SIZE - EXPLORATION ID - GEO TEMPLATE WITH LAB.GDT - 10/18/19 13:42 - P:\18\18274005\00\LAB\GINT LAB\18274-005-00 BR LAB.GPJ

	Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
●	VA-12 Composite	0.0 - 29.5	Tan sand with silt, clay, and organic matter (SP-SM)	0.0	88.6	2.9	8.5	0.241	0.191	0.176	0.151	0.011	11.00	17.57	NP	NP	NP
⊠	VA-14 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	0.0	83.4	7.8	8.8	0.242	0.183	0.167	0.127	0.008	11.59	23.96	NP	NP	NP
▲	VB-2 Composite	0.0 - 29.5	Tan sand with trace silt, clay, and organic matter (SP-SM)	0.0	91.5	3.8	4.7	0.239	0.179	0.163	0.13	0.083	1.14	2.15	NP	NP	NP



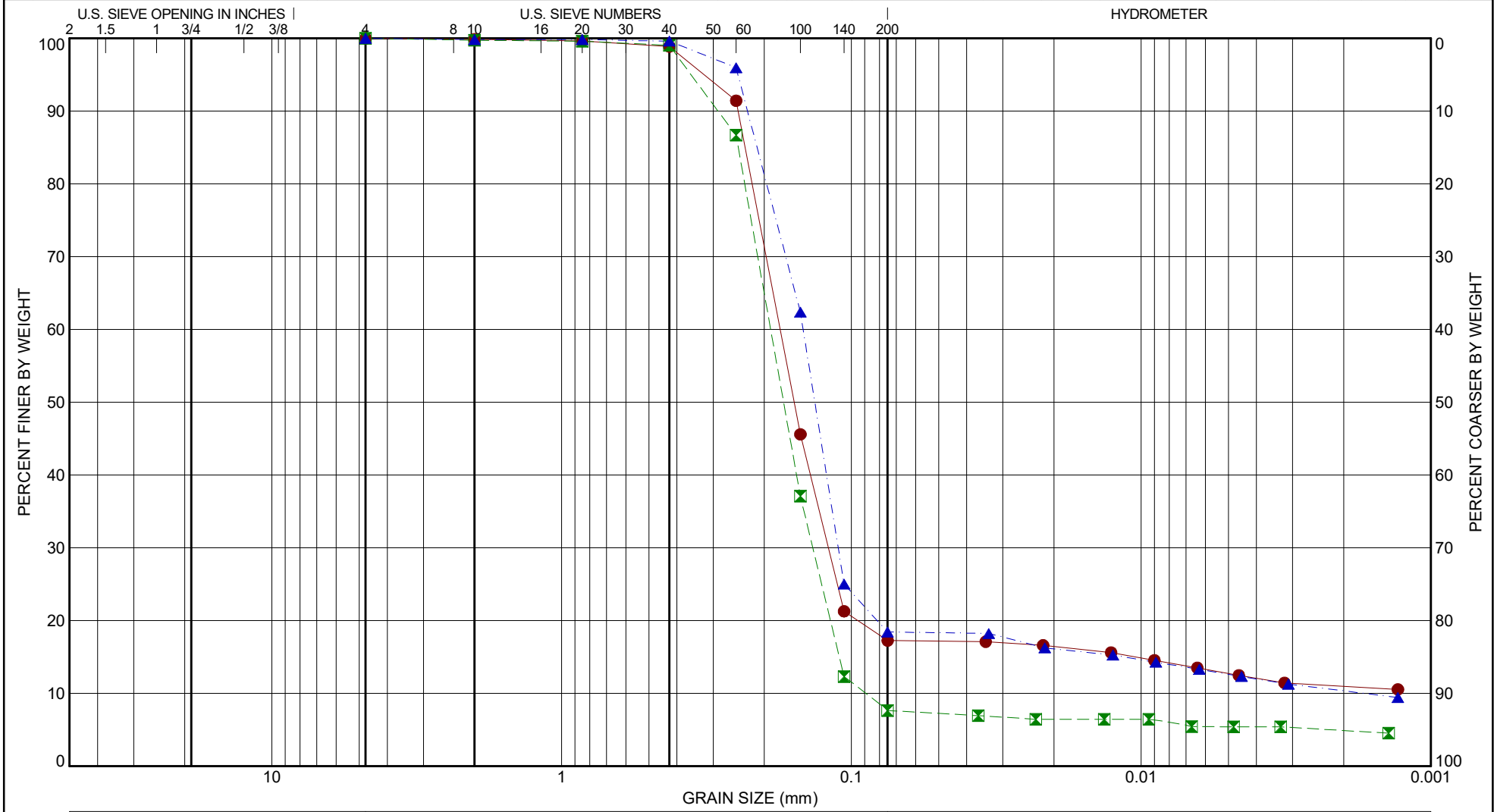
GRAVEL		SAND			SILT OR CLAY
coarse	fine	coarse	medium	fine	

Tested By:	Date Tested:	GRAIN SIZE DISTRIBUTION	Spanish Pass Ridge and Marsh Restoration
JHB/WMA/DPD	10/10/2019	ASTM D422/D1140/D6913/T88	Plaquemines Parish, Louisiana
Reviewed By:	Date Reviewed:	Project No.: 18274-005-00	GEOENGINEERS
Karen Allen	10/15/2019		Figure G-54

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

GEI - GRAIN SIZE - EXPLORATION ID - GEO TEMPLATE WITH LAB.GDT - 10/18/19 13:42 - P:\18\18274005\00\LAB\GINT LAB\18274-005-00 BR LAB.GPJ

Soil Boring ID	Depth (ft)	Classification	%Gravel	%Sand	%Silt	%Clay	D90	D60	D50	D30	D10	Cc	Cu	LL	PL	PI
VB-4 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	0.0	82.7	4.5	12.7	0.246	0.176	0.158	0.12				NP	NP	NP
VB-6 Composite	0.0 - 29.5	Tan sand with trace silt, clay, and organic matter (SP-SM)	0.0	92.4	2.2	5.4	0.288	0.19	0.171	0.136	0.089	1.09	2.12	NP	NP	NP
VB-8 Composite	0.0 - 29.5	Tan silty sand with clay (SM)	0.0	81.6	5.8	12.6	0.228	0.147	0.134	0.111	0.002	49.20	85.92	NP	NP	NP

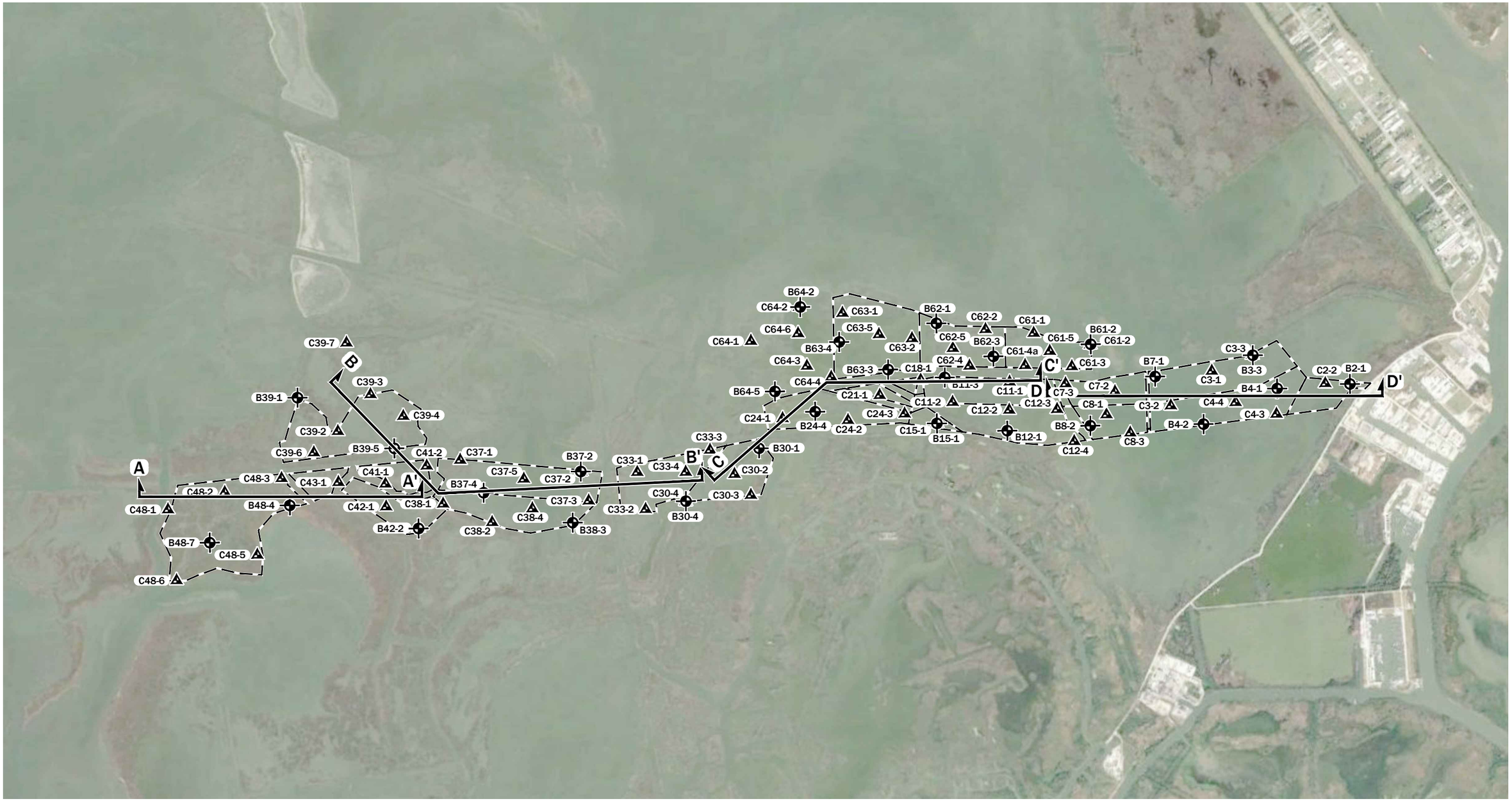


GRAVEL		SAND			SILT OR CLAY
coarse	fine	coarse	medium	fine	

Tested By:	Date Tested:	GRAIN SIZE DISTRIBUTION	Spanish Pass Ridge and Marsh Restoration
JHB/WMA/DPD	10/10/2019	ASTM D422/D1140/D6913/T88	Plaquemines Parish, Louisiana
Reviewed By:	Date Reviewed:	Project No.: 18274-005-00	GEOENGINEERS
Karen Allen	10/15/2019		Figure G-55

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

GEI - GRAIN SIZE - EXPLORATION ID - GEO TEMPLATE WITH LAB.GDT - 10/18/19 13:42 - P:\18\18274005\00\LAB\GINT LAB\18274-005-00 BR LAB.GPJ



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
1. Aerial was taken from Google Earth Pro., Dated 12/30/2016
2. Fill Area Layout was provided by Baird, Dated 9/11/18

Projection: LA State Plane, South Zone, NAD83, US Foot

Legend

C48-1 — CPT by GeoEngineers, 2018

B48-7 — Boring by GeoEngineers, 2018

Fill Area Boundary

A — A' Cross Section Location

N W E S

3000 0 3000
Feet

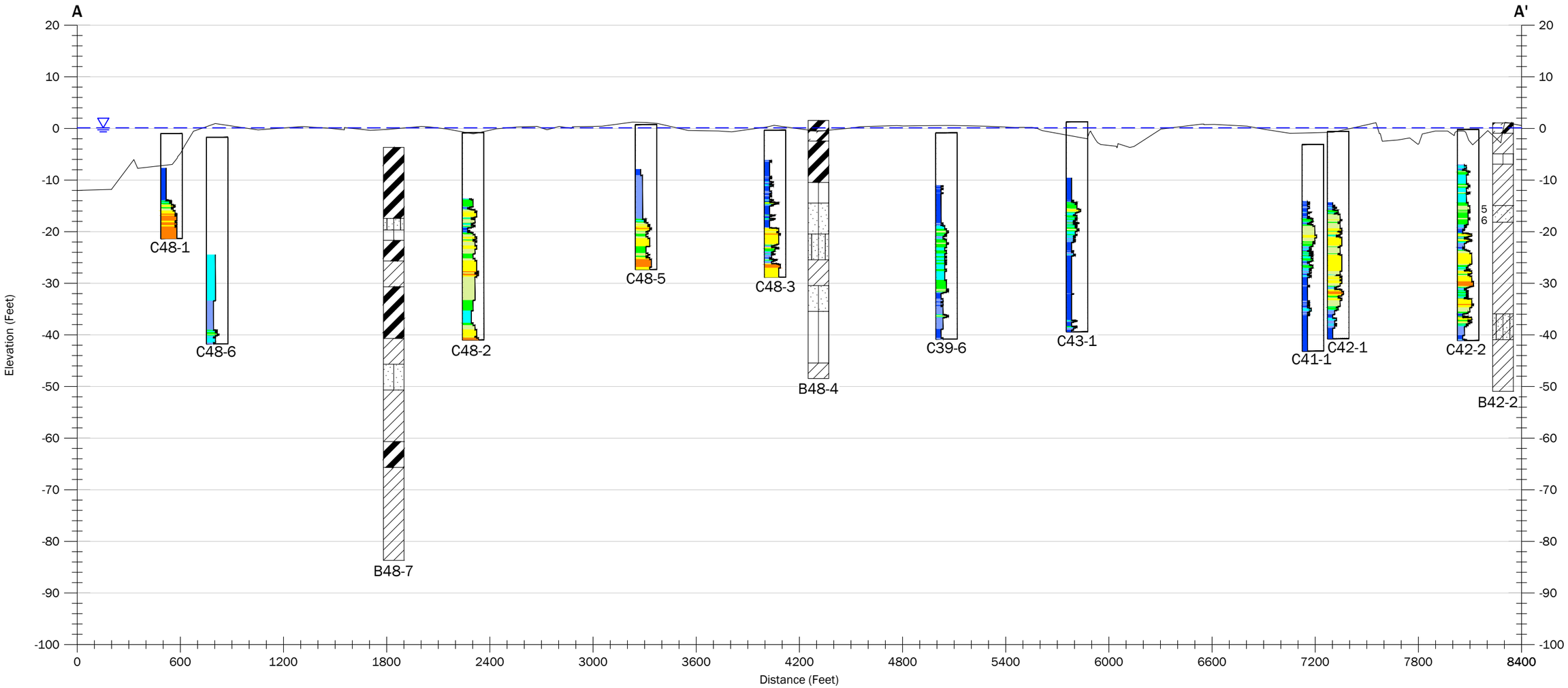
Fill Area Site Plan

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 2

P:\18\18274005\CAD\00\Geotech - Data Report\1827400500_F02a-2b_Site Plan and BLPs with pipeline.dwg TAB:F02 - Site Plan 11X17 Date Exported: 02/15/19 17:47 by kcook



CPT Legend

- 1 - Sensitive, Fine Grained Soils
- 2 - Organic Soils, Peats
- 3 - Clay
- 4 - Clays & Silty Clays
- 5 - Silty Clays & Clayey Silts
- 6 - Clayey Silts & Sandy Silts
- 7 - Sandy Silts & Silty Sands
- 8 - Silty Sands & Sands
- 9 - Sands
- 10 - Sands & Gravelly Sands
- 11 - Very Stiff Fine Grained Soils*
- 12 - Sands & Clayey Sands*

*Overconsolidated or Cemented

Boring Legend

- CL - Silty Clay
- CH - Clay
- SM - Silty Sand
- ML - Silt
- SP-SM - Sand with Silt
- OH - Organic Clay
- SC-SM - Silty Clayey Sand
- SC - Clayey Sand
- CL-ML - Clayey Silt
- PT - Peat

600 0 600
Horizontal Scale in Feet

20 0 20
Vertical Scale in Feet
Vertical Exaggeration: 30X

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Ground Surface was Provided by Morris P Hebert, Dated: 10/26/2018

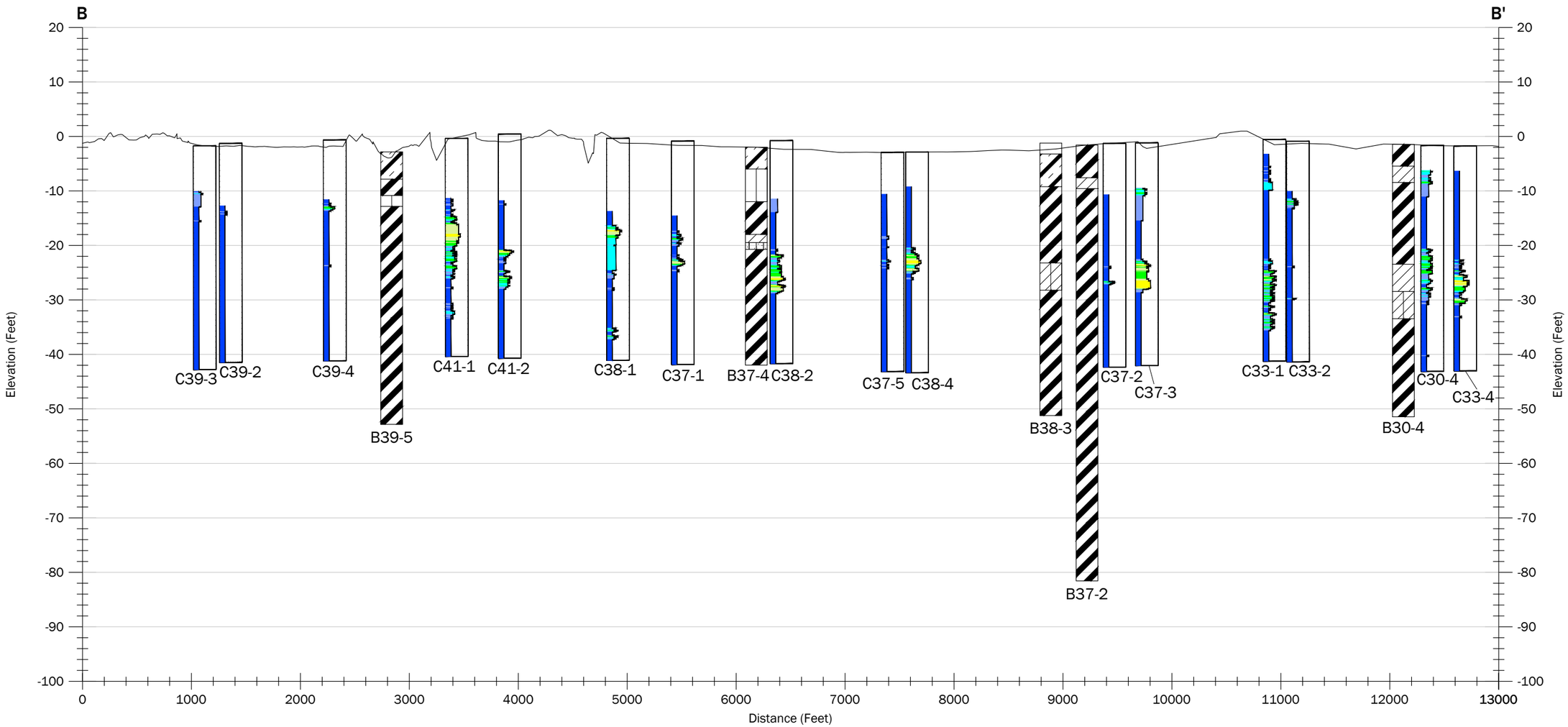
Subsurface Profile A-A'

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 4

P:\18\18274005\CAD\00\Geotech - Data Report\18274005 00_F04a-4d_Cross Section.dwg TAB:Cross Section AA Date Exported: 02/28/19 - 16:06 by kcook



CPT Legend

- 1 - Sensitive, Fine Grained Soils
- 2 - Organic Soils, Peats
- 3 - Clay
- 4 - Clays & Silty Clays
- 5 - Silty Clays & Clayey Silts
- 6 - Clayey Silts & Sandy Silts
- 7 - Sandy Silts & Silty Sands
- 8 - Silty Sands & Sands
- 9 - Sands
- 10 - Sands & Gravelly Sands
- 11 - Very Stiff Fine Grained Soils*
- 12 - Sands & Clayey Sands*

*Overconsolidated or Cemented

Boring Legend

- CL - Silty Clay
- CH - Clay
- SM - Silty Sand
- ML - Silt
- SP-SM - Sand with Silt
- OH - Organic Clay
- SC-SM - Silty Clayey Sand
- SC - Clayey Sand
- CL-ML - Clayey Silt
- PT - Peat

1000 0 1000
Horizontal Scale in Feet

20 0 20
Vertical Scale in Feet
Vertical Exaggeration: 50X

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Ground Surface was Provided by Morris P Hebert, Dated: 10/26/2018

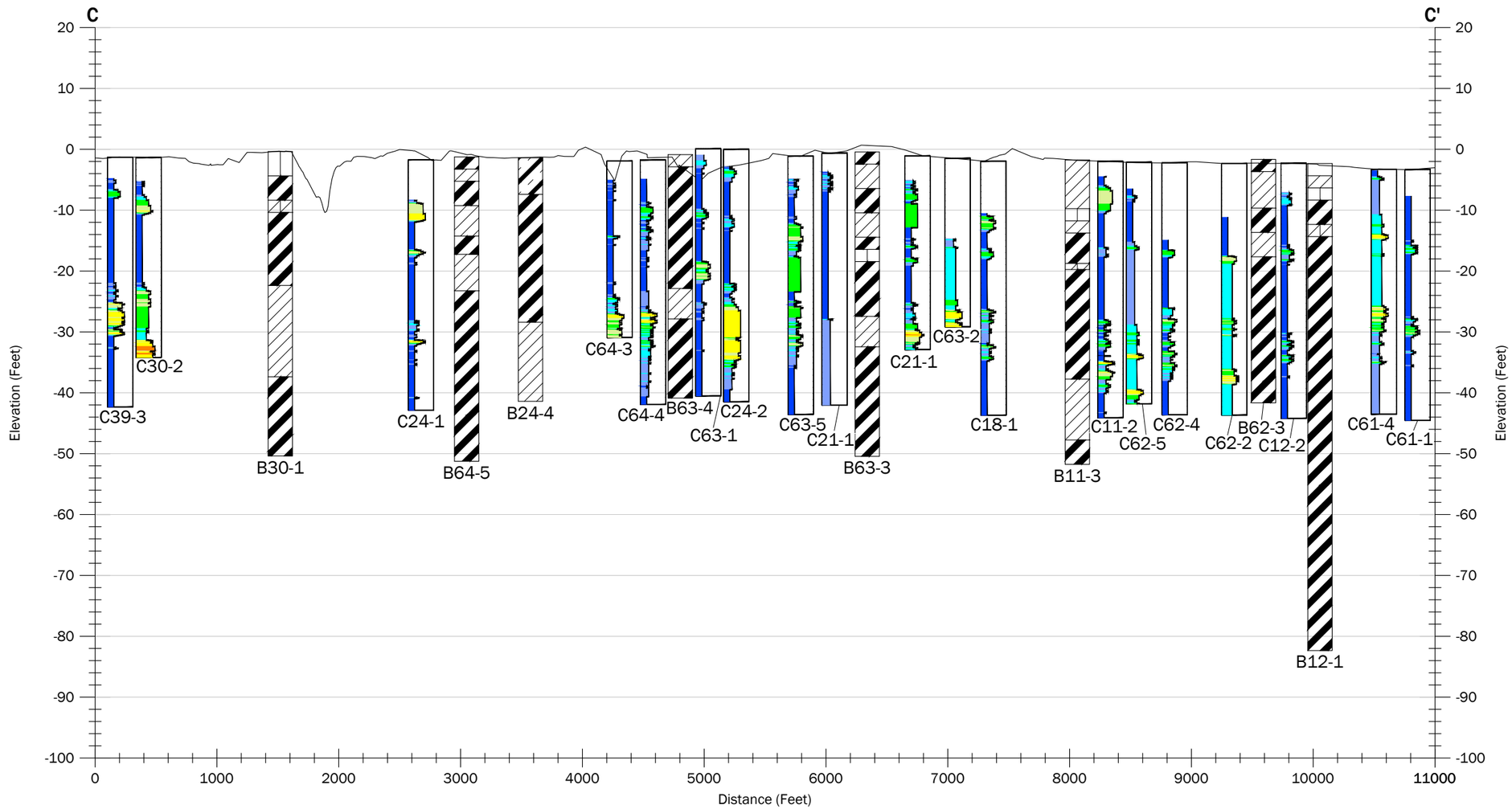
Subsurface Profile B-B'

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GeoEngineers

Figure 5

P:\18\18274005\CAD\00\Geotech - Data Report\18274005 00 F04a-4d_Cross Section.dwg TAB:Cross Section BB Date Exported: 02/28/19 - 16:11 by kcook



CPT Legend

- 1 - Sensitive, Fine Grained Soils
- 2 - Organic Soils, Peats
- 3 - Clay
- 4 - Clays & Silty Clays
- 5 - Silty Clays & Clayey Silts
- 6 - Clayey Silts & Sandy Silts
- 7 - Sandy Silts & Silty Sands
- 8 - Silty Sands & Sands
- 9 - Sands
- 10 - Sands & Gravelly Sands
- 11 - Very Stiff Fine Grained Soils*
- 12 - Sands & Clayey Sands*

*Overconsolidated or Cemented

Boring Legend

- CL - Silty Clay
- CH - Clay
- SM - Silty Sand
- ML - Silt
- SP-SM - Sand with Silt
- OH - Organic Clay
- SC-SM - Silty Clayey Sand
- SC - Clayey Sand
- CL-ML - Clayey Silt
- PT - Peat

1000 0 1000
Horizontal Scale in Feet

20 0 20
Vertical Scale in Feet
Vertical Exaggeration: 50X

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Ground Surface was Provided by Morris P Hebert, Dated: 10/26/2018

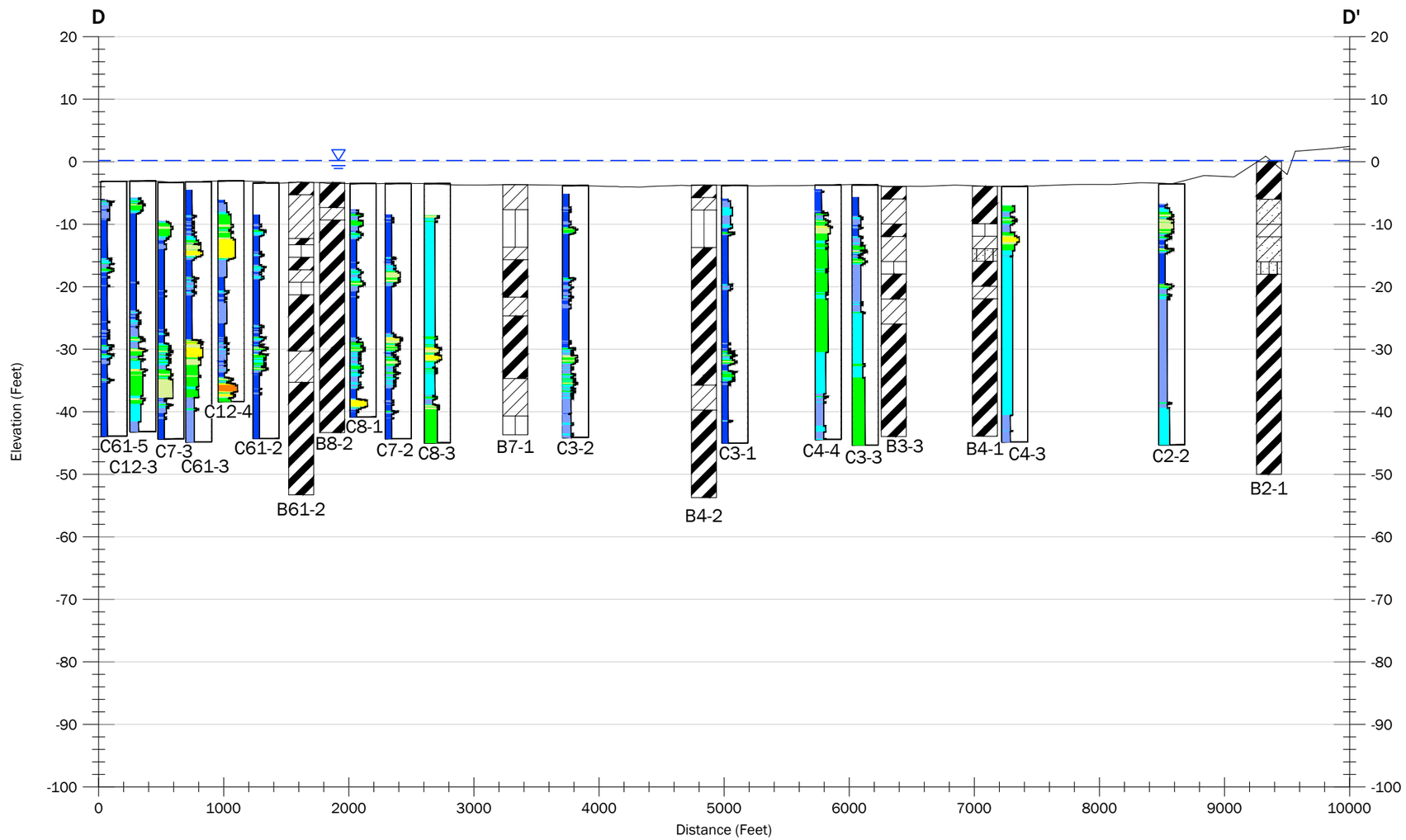
Subsurface Profile C-C'

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 6

P:\18\18274005\CAD\00\Geotech - Data Report\1827400500_F04a-4d_Cross Section.dwg TAB:Cross Section CC Date Exported: 02/28/19 - 16:11 by kcook



CPT Legend

- 1 - Sensitive, Fine Grained Soils
- 2 - Organic Soils, Peats
- 3 - Clay
- 4 - Clays & Silty Clays
- 5 - Silty Clays & Clayey Silts
- 6 - Clayey Silts & Sandy Silts
- 7 - Sandy Silts & Silty Sands
- 8 - Silty Sands & Sands
- 9 - Sands
- 10 - Sands & Gravelly Sands
- 11 - Very Stiff Fine Grained Soils*
- 12 - Sands & Clayey Sands*

*Overconsolidated or Cemented

Boring Legend

- CL - Silty Clay
- CH - Clay
- SM - Silty Sand
- ML - Silt
- SP-SM - Sand with Silt
- OH - Organic Clay
- SC-SM - Silty Clayey Sand
- SC - Clayey Sand
- CL-ML - Clayey Silt
- PT - Peat

1000 0 1000
Horizontal Scale in Feet

20 0 20
Vertical Scale in Feet
Vertical Exaggeration: 50X

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Ground Surface was Provided by Morris P Hebert, Dated: 10/26/2018

Subsurface Profile D-D'

Spanish Pass Ridge & Marsh Creation
Plaquemines Parish, Louisiana

GEOENGINEERS

Figure 7

P:\18\18274005\CAD\00\Geotech - Data Report\18274005 00 F04a-4d_Cross Section.dwg TAB:Cross Section DD Date Exported: 02/15/19 - 17:46 by kcook

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GEOENGINEERS

Figure B-1

Rev 06/2017

Drilled Start 10/29/2018 End 10/29/2018	Total Depth (ft) 50	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2614 Longitude -89.3663		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 3.5	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		12			1			CH	Gray clay with silt lenses, organic matter and wood pieces (very soft)	51	74.2	0.17	5	15	54	31		0.250
-5			14			2				Gray clay with ferrous stains and organic matter (very soft)	49	75.2	0.22	5	14				
	5		10			3				Gray clay with organic matter (very soft) (specific gravity = 2.689)	64	63.2				65	37		0.085
			28			4			SC	Gray clayey sand with silt	30							47	0.116
-10			27			5				Gray silty clayey sand	29	94.4	1.64	5	7				0.588
	10		20			6			CL	Gray silty clay with sand and sand layer (medium)	42								0.780
-15			26			7			SC	Gray clayey sand	27								0.744
	15		26			8				Gray clayey sand	28	100.1							0.726
-20			27			9			SM	Gray silty sand with clay layers	24							19	
	20		10	15		10			CH	Gray very sandy clay	40							52	
-25			20			11				Gray clay with sand and silty sand layers (very soft)	34							86	0.089
-30	25		27			12				Gray clay with silt layers (soft)	40	79.8	0.44	9	10				0.374
-35	30		28			13				Gray clay	72								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B2-1

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-2
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40		27			14				Gray clay with silt layers (soft)	52	73.4	0.42	12	8				
	40																	
45		22			15				Gray clay with silt pockets	65								
	45																	
50		28			16				Gray clay with silt layers	47	73.4							
	50																	

Log of Boring B2-1 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-2
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/28/2018 End 10/28/2018	Total Depth (ft) 40	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -3 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.264 Longitude -89.3757		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 2.0

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		19			1			CH	Gray clay with silt lenses (very soft)	44								0.200
-5			27	0.5		2			CL	Gray clay with sand (very soft to soft)	38	82.9	0.37	5	14	43	21		0.102
			23			3				Gray clay with silt (very soft to soft)	40	82.1	0.25	5	15				0.174
	5		16			4			CH	Gray clay with organic matter and 2 inch silt layer (very soft)	91								0.085
-10			11			5			CL	Gray clay with silt (very soft) (specific gravity = 2.658)	30	94.4				46	22		0.031
	10		8			6				Gray silty clay with sand pockets and organic matter (soft)	56								0.450
-15			20			7			ML	Gray silt	31	93.6	0.74	5	15	28	4		0.134
			25			8			CH	Gray clay (soft)	55								0.290
	15																		
-20			26			9				Gray clay (very soft)	77	55.6	0.17	5	4				0.196
			25			10			CL	Gray silty clay with silt layers (very soft)	32								0.094
	20																		
-25									CH										
			28			11				Gray clay with silt lenses (very soft)	78	57.2	0.16	5	11				0.183
	25																		
-30																			
			27			12				Gray clay (very soft)	61								0.250
	30																		
-35																			
			22			13				Gray clay with silt layers and trace sand	33							94	
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B3-3

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-3
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
-40																			
			28			14				Gray clay with silt pockets	53								
	40																		

Log of Boring B3-3 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-3
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/29/2018 End 10/29/2018	Total Depth (ft) 40	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -4 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2611 Longitude -89.3734		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 5.0

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		20			1			CH	Gray clay with roots									
			26			2				Gray clay with roots (very soft) (organic content =5.2%)	122								0.045
			23			3				Gray clay (very soft)	60	61.7	0.07	5	10	69	45		0.098
	5		17			4			ML	Gray sandy silt	30	88.8	1.68	5	15	26			0.076
			21			5			CL	Gray silty clay with sand (medium)	29								0.802
	10		10			6			SC-SM	Gray silty clayey sand with clay layers	28							24	0.423
			10			7			CH	Gray clay with silt layers (very soft)	70	62.4	0.09	5	15				0.250
	15		20			8				Gray clay (very soft) (specific gravity = 2.771)	90	49.3				94	67		0.200
			26			9			CL	Gray silty sandy clay (very soft to soft)	32	91.3	0.34	5	15				0.138
	20		10			10			CH	Gray clay with silt layers and sand pockets (very soft)	36							90	0.062
	25		28			11				Gray clay (soft)	62								0.334
	30		27			12				Gray clay with silt layers (very soft to soft)	76	56.4	0.23	9	7				0.388
	35		27	1.00		13				Gray clay with silt layers	89								

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B4-1

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-4
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
-40																			
			28			14				Gray clay with silt layers (very soft)	63	65.9	0.11	12	11				
	40																		

Log of Boring B4-1 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-4
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/29/2018 End 10/29/2018	Total Depth (ft) 50	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -4 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2582 Longitude -89.3806		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 4.0	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		20			1			CH	Gray clay with organic matter (very soft) (organic content = 6.5%)	171								0.111
-5			17			2			CL	Gray very silty clay (very soft)	39					33	11		
			17			3			ML	Gray sandy silt with clay	32	89.4	1.18	5	15	28	2		0.116
-10	5		22			4				Gray sandy silt with clay	32							67	
			28			5				Gray sandy silt	30	92.3	1.56	5	15	25	2		0.151
-15	10		28			6			CH	Gray clay with silt pockets (very soft)	59								0.138
			25			7				Gray clay (very soft)	67	60	0.09	5	10				0.098
			26			8				Gray clay with silt layers (very soft)	79								0.138
-20	15		28			9				Gray clay with silt layers (very soft)	48	77.6	0.11	5	14				0.250
			28			10				Gray clay with silt layers and sand pockets (very soft)	48								0.178
-25	20																		
			28			11				Gray clay with silt lenses (soft) (specific gravity = 2.686)	53	66.5				85	60		0.258
-30	25																		
			27			12				Gray clay with silt layers and shell fragments (very soft)	70	62.2	0.13	9	4				0.165
-35	30																		
									CL										
			25			13				Gray silty clay with silt layers	63								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B4-2

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-5
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35							CH										
40		24			14				Gray clay with silt layers (soft)	60	68.1	0.31	12	14				
	40																	
45		27			15				Gray clay	73								
	45																	
50		26			16				Gray clay (very soft)	65	61.1	0.22	15	13				
	50																	

Log of Boring B4-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-5
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/28/2018 End 10/28/2018	Total Depth (ft) 40	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -3 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2623 Longitude -89.3852		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 4.0	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		17			1			CL	Gray silty clay (very soft)	42	79.2	0.12	5	14	38	14		0.098
5			11			2				Gray silty clay with silt lenses and peat pockets (very soft)	49								0.094
			8			3			ML	Gray sandy silt									0.196
	5		25			4				Gray sandy silt	32					26		98	0.062
10			22	0.5		5				Gray sandy silt	30	92.6	1.32	5	8				0.107
	10		24			6			CL	Gray silty clay (very soft)	37					39	15		0.062
15			19			7			CH	Gray clay with silt lenses (soft) (specific gravity = 2.743)	75	57.6				88	60		0.316
	15		18			8				Gray clay with silt lenses and shell fragments (very soft)	58	66.7	0.18	5	9				0.156
20			28			9				Gray clay with shell fragments and silt lenses (very soft)	56								0.192
	20		24			10			CL	Gray silty clay with silt layers (soft to medium)	39	86.1	0.51	6	15				0.196
25									CH										
	25		28			11				Gray clay with silt lenses (soft)	59								0.356
30			28			12				Gray clay with silt layers (soft)	66	62.4	0.28	9	8				0.303
	30								CL										
35			28	1.0		13				Gray silty clay with trace sand (medium)	33	86.7	0.69	12	15				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B7-1

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-6
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
-40									ML										
		■	28			14				Gray sandy silt with clay layers	28							63	
	40																		

Log of Boring B7-1 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-6
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/27/2018	End 10/27/2018	Total Depth (ft) 40	Logged By DNF / Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) / Vertical Datum	-3 NAVD88	Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Triple Engine Airboat
Latitude / Longitude	29.2582 -89.3915	System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	3.0

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		26			1			CH	Gray clay with peat layers and organic matter (very soft to soft)	59	65.9	0.08	5	10	60	37		0.285
5			20			2				Gray clay with roots (very soft)	45	76.6	0.22	5	14				0.156
			26			3			CL	Gray silty clay with silt layers and sand layers (very soft)	35								0.241
	5		25			4			CH	Gray clay with silt lenses and a sandy silt layer (very soft to soft)	32	84.8	0.23	5	15				0.098
10			26			5				Gray clay with silt lenses (very soft) (specific gravity = 2.716)	55	64.2				63	41		0.236
	10		26			6				Gray clay with shell fragments (very soft)	76	57.4	0.22	5	6				0.192
15			16			7				Gray clay with shells and shell fragments (very soft)	49	70	0.06	5	11				
			13			8				Gray clay									
	15		27	0.75		9				Gray clay with silt layers and shell fragments (soft)	45								0.432
20			14			10				Gray clay (very soft)	66	61.1	0.13	6	11				0.134
	20																		
25			27			11				Gray clay with silt layers, shells, and shell fragments (very soft to soft)	60	65.2	0.24	8	9				0.263
	25																		
30			27			12				Gray clay with silty clay layers, silt layers and shell fragments (medium)	56								0.517
	30																		
35			28			13				Gray clay with silt layers (soft)	42	75.5	0.4	11	4				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B8-2

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-7
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
-40																		
		26			14				Gray clay with silt lenses	57								
	40																	

Log of Boring B8-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-7
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/25/2018 End 10/25/2018	Total Depth (ft) 50	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2625 Longitude -89.4056		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 3.3

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		16			1			CL	Dark gray silty clay with roots (very soft)	43	81.1	0.18	5	14	40	15		0.196
-5			24			2				Gray very silty clay with sand (very soft)	42					31	8	71	0.062
	5		8			3				Dark gray very silty clay (soft)	34	94.7	0.31	5	10	34	12		
			7			4				Gray very silty clay with roots	72					34	10		
-10			10			5			ML	Gray clayey silt with clay and trace sand	32	76.5	0.88	5	10	27	2	96	0.232
	10		26			6			CL	Gray silty clay with silt lenses (very soft)	34								0.107
-15			25			7			CH	Gray clay with silt layers (soft)	49	72.5	0.31	5	7				0.307
	15		24	0.5		8				Gray clay with silt lenses and shell fragments (very soft to soft)	54								0.232
			23			9				Gray clay with silt layers (very soft)	34	72.3	0.19	5	15				
-20						10			CL-ML	Gray clayey silt	30								0.659
			22			11			CH	Gray clay with silt layers (very soft)	38	81	0.16	6	15				0.151
	20																		
-25			22			12				Gray clay with silt layers (very soft)	60	66	0.22	8	15				0.241
	25																		
-30			28			13				Gray clay (very soft)	75								0.214
	30																		
-35			28			14				Gray clay with silt layers (soft)	50	73.8	0.36	11	10				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B11-3

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-8
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35								CL										
40			26			15				Gray sandy clay with silt and silt layers	27	99.1	1.26	12	15				
	40																		
45			26			16				Gray sandy clay with silt	41								
	45								CH										
50			25			17				Gray clay with silt layers (soft)	59	66.9	0.26	12	15				
	50																		

Log of Boring B11-3 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-8
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/26/2018 End 10/26/2018	Total Depth (ft) 80	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2579 Longitude -89.3996		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 3.8

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		7			1			PT	Dark brown peat (organic content = 24.8%)	476								
-5			5			2			CL	Gray very silty clay	43					31	8		
	5		11			3			ML	Gray silt with clay	38	82.4	0.37	5	15	30	6		0.098
-10			13			4			CH	Gray clay (very soft)	51								0.031
			24			5				Gray clay with organic matter (very soft)	60	65.4	0.21	5	7				0.169
	10		26			6			CL-ML	Gray clayey silt with silt layers and silt seams	32	91.2	1.62	5	15	26	5		0.085
-15			24			7			CH	Gray clay with sand lenses and silt pockets (very soft)	37								0.205
	15		24			8				Gray clay with silt layers and silt pockets (very soft)	62	65.1	0.23	5	7			100	0.214
			22			9				Gray clay (very soft)	74								0.214
-20			23			10				Gray clay with silt layers (soft)	65	62.1	0.25	6	7				0.325
	20																		
-25			24			11				Gray clay with silt lenses (very soft) (specific gravity = 2.641)	66	59.4				77	50		0.192
	25																		
-30			24			12				Gray clay with silty sand pockets (very soft)	54								0.218
	30																		
-35			24			13				Gray clay with silt layers (soft)	39	81.5	0.27	11	15				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B12-1

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-9
Sheet 1 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
-40		22			14				Gray clay with silt lenses and 2-inch sand layer in middle	52								
	40																	
-45		25			15				Gray clay with silt layers (soft)	48	78	0.42	14	10				
	45																	
-50		26			16				Gray clay with occasional silt lenses	43								
	50																	
-55		25			17				Gray clay (soft)	54	70	0.3	17	15				
	55																	
-60		25			18				Gray clay	66								
	60																	
-65		23			19				Gray clay (medium)	67	62.9	0.53	20	6				
	65																	
-70		18			20				Gray clay with silt seams	67								
	70																	
-75		22			21				Gray clay with silt layers (medium)	60	65.8	0.9	23	4				
	75																	

Log of Boring B12-1 (continued)

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-9
Sheet 2 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
80			24	0.50		22				Gray clay (medium)	51								
	80																		

Log of Boring B12-1 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-9
Sheet 3 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/26/2018 End 10/26/2018	Total Depth (ft) 50	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2586 Longitude -89.4064		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 2.9

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		22			1			OH	Brown organic clay with peat (very soft) (organic content = 4.4%)	285								0.085
-5			23			2			CL	Gray silty clay with sand and silt layers (stiff)	32	87.9	1.98	5	15				0.241
			1			3				Gray silty clay	20								
	5		19			4				Gray clay with silt and silt layers (very soft)	42	79.1	0.14	5	14	49	26		0.125
-10			25			5			CH	Gray clay (very soft) (specific gravity = 2.771)	81	53.9				83	57		0.129
	10		23			6				Gray clay with silt lenses (very soft)	60	68.4	0.08	5	9				0.089
-15			22			7			CL	Gray clay with silt (very soft)	45								0.187
	15		13			8				Gray clay with silt and silt layers (very soft)	37	82	0.21	5	15	42	21		0.151
			26			9			CH	Gray clay (soft)	75								0.263
-20			18			10				Gray clay with silt layers (very soft)	44	68.4	0.22	6	10				0.227
	20																		
-25			24			11				Gray clay (very soft)	79								0.151
	25								CL										
-30			21			12				Gray clay with silt and silt layers (very soft)	59	72.5	0.2	9	15				0.076
	30																		
-35			22			13				Gray clay with silt and silt layers (medium)	61	66.4	0.76	11	10				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B15-1

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-10
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40		28			14			SM	Gray clay with silt Gray silty sand with clay layers and clay pockets	26							41	
	40							CH										
45		26			15				Gray clay with silt layers (soft)	40	83.3	0.4	14	14				
	45																	
50		26			16				Gray clay with silt layers (medium)	51	72.3	0.61	15	3				
	50																	

Log of Boring B15-1 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-10
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/18/2018 End 10/18/2018	Total Depth (ft) 40	Logged By ECK Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2598 Longitude -89.4182		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 2.5	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		15			1			OH	Gray organic clay	171					152	115		
-5			16			2				Gray organic clay (very soft)	164	30.3	0.07	5	7	158	120		
	5		17			3				Gray organic clay (very soft) (specific gravity = 2.666)	161	31.8				179	131		0.200
			19			4			CH	Gray clay with roots and stems (very soft)	59	64.3	0.16	5	12				
-10			20			5				Gray clay with shells (very soft)	72								0.232
	10		19			6				Gray clay with shell fragments (very soft)	48	70.8	0.18	5	4				0.227
-15			18			7				Gray clay (soft)	59								0.365
			20			8				Gray and brown clay (soft)	83	53.4	0.26	5	3				0.263
	15		16			9				Gray clay (soft)	86								0.325
-20			20			10				Gray clay with organic matter and wood pieces (soft)	63	63.7	0.32	6	4				0.321
	20																		
-25			17			11				Gray clay (soft)	65								0.365
	25																		
-30									CL										
			20			12				Gray silty clay (soft)	35	90	0.35	9	15				0.254
	30																		
-35			22			13				Gray silty clay	27								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B24-4

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-11
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
40			22			14				Gray clay with silt and sand layers (soft)	47	70	0.37	12	4			81	
	40																		

Log of Boring B24-4 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-11
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/17/2018 End 10/17/2018	Total Depth (ft) 50	Logged By ECK Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -1 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2568 Longitude -89.4237		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 3.0

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		21			1			ML	Gray silt with clay and peat pockets	33	90.9	0.46	5	11	27	3		0.080
			13			2				Gray sandy silt	30							62	0.544
-5			19			3			CH	Gray clay (very soft)	70								0.218
	5		14			4				Gray clay with shell fragments (very soft)	70	61.8	0.16	5	8	92	64		0.227
-10			21			5			CL-ML	Gray clayey silt with shells									0.160
	10		18			6			CH	Gray clay with sandy silt layers (very soft)	45					59	38	89	0.223
			22			7				Gray clay with silt pockets (very soft)	81	56	0.23	5	5				0.245
-15			21	0.5		8				Gray clay with silt pockets and sand pockets (soft)	67								0.299
	15		19			9				Gray clay with organic matter (soft)	99	47				105	73		0.405
-20			20	0.5		10				Gray clay (soft)	82								0.361
	20								CL										
-25			17			11				Gray silty clay with sand pockets (very soft)	39	86.2	0.2	7	15				0.205
	25																		
-30			11			12				Gray silty clay									
	30																		
-35			19			13				Gray sandy clay with silt (medium)	29	102							0.740
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B30-1

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-12
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
									CH										
40			22			14				Gray clay (very soft to soft)	53	73.3	0.19	12	15				0.272
	40																		
45			22	0.5		15				Gray clay (soft)	62	64.1	0.38	13	8				0.330
	45																		
50			21	0.5		16				Gray clay (soft)									0.388
	50																		

Log of Boring B30-1 (continued)

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-12
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/17/2018 End 10/17/2018	Total Depth (ft) 50	Logged By ECK Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2524 Longitude -89.4308		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 2.5	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		20			1			CH	Gray clay with silt lenses, roots, and stems (very soft)	48	70	0.12	5	12	71	46		
-5			22			2				Gray clay with silt lenses, organic matter, and shells (very soft)	48								0.107
			22			3			CL	Gray sandy clay	29							61	0.570
	5		21			4				Gray sandy clay	29							60	
-10									CH	Gray clay with silt lenses and shell fragments (very soft)	46	72.5	0.15	5	7	52	32		0.169
			21			5				Gray clay with silt lenses (very soft) (specific gravity = 2.707)	54	62.5				66	42		0.178
	10		20			6				Gray clay with silt lenses (very soft)	72	56.5	0.12	5	7				0.187
-15			21			7				Gray clay with silt pockets, sand pockets, and shells (soft)	68								0.437
			16			8				Gray clay with organic matter (very soft)	78								0.147
	15		20			9				Gray clay with wood fragments (very soft)	68	59.6	0.16	5	8	76	53		
-20			22			10				Gray clay with 3-inch wood layer at bottom (soft)	60								0.307
	20																		
-25									CL										
			21			11				Gray silty clay with sand (soft)	34							84	0.348
	25																		
-30									CL-ML										
			22			12				Gray clayey silt with organic matter	48					48	11	96	0.316
	30																		
-35									CH										
			22			13				Gray clay (soft)	63	62.5	0.29	10	7				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B30-4

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-13
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
-40			22			14				Gray clay	47								
	40																		
-45			22			15				Gray clay (very soft)	58	64.7	0.24	13	12				
	45																		
-50			22			16				Gray clay	67								
	50																		

Log of Boring B30-4 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-13
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 10/15/2018	End 10/16/2018	Total Depth (ft)	80	Logged By / Checked By	ECK / ARS	Driller	Specialized Environmental Resources, LLC	Drilling Method	Wet Rotary
Surface Elevation (ft) / Vertical Datum	-1 / NAVD88		Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Triple Engine Airboat				
Latitude / Longitude	29.2551 / -89.441		System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	1.0				

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		17			1			CH	Gray clay with organic matter (very soft)	64								0.089
			19			2				Gray clay with silt lenses and organic matter (very soft) (organic content = 2.2%)	81	53.4	0.07	5	6	61	39		0.094
-5			16			3				Gray clay with organic matter and shells (very soft)	73								0.111
	5		16			4			CL	Gray clay with silt and shell fragments (very soft)	49	70.9	0.1	5	11	49	30		0.165
-10			18			5			CH	Gray clay with silt layers and trace organic matter (very soft)	43							92	0.187
	10		20			6				Gray clay with silt lenses and organic matter (very soft)	65	60.8	0.13	5	5				0.196
			22			7				Gray clay with silt lenses, organic matter, and shells (very soft)	80								0.196
-15			21			8				Gray clay with silt lenses (very soft) (organic content = 2.9%)	81	53.9	0.16	5	7				0.232
	15		22			9				Gray clay with calcareous nodules (very soft)	83								0.236
-20			22			10				Gray clay with calcareous nodules (very soft)	80								0.223
	20																		
-25			16			11				Gray clay with silt lenses and organic matter (very soft to soft)	61	65.2	0.15	7	11				0.267
	25																		
-30			15			12				Gray clay with silty sand lenses	50								
	30																		
-35			20			13				Gray clay (very soft)	60								0.223
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B37-2

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-14
Sheet 1 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
-40	40	20			14				Gray clay (very soft to soft)	65	60	0.17	12	6				0.276
-45	45	21	0.5		15				Gray clay (soft)	55								0.356
-50	50	19	0.5		16				Gray clay (soft)	66	59.4	0.4	15	6				
-55	55	20	0.75		17				Gray clay (medium) (specific gravity = 2.793)	61	63.4				87	59		
-60	60	19	1.0		18				Gray clay (soft to medium)	56	66.3	0.49	18	6				
-65	65	21	0.75		19				Gray clay (medium)	59								
-70	70	18	1.0		20				Gray clay (soft to medium)	56	66	0.36	20	15				
-75	75	14	1.5		21				Gray clay (stiff)	52								

Log of Boring B37-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-14
Sheet 2 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
-80	80		21	0.75		22				Gray clay with silty sand lenses (medium)	62	63	0.62	23	4				

Log of Boring B37-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-14
Sheet 3 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/13/2018 End 10/14/2018	Total Depth (ft) 40	Logged By ECK Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2534 Longitude -89.4504		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 2.5

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		16			1			OH	Gray organic clay with peat (very soft)	204	27.3	0.09	5	12	177	127		
-5			17			2				Gray organic clay with peat (very soft) (organic content = 18.0%)	231					232	172		0.143
	5		9			3			ML	Gray silt with clay and organic matter	39							98	0.067
			10			4				Gray silt with clay layers	40					31	4	99	0.085
-10			22			5				Gray sandy silt with clay	44	89.6				29	2		0.147
	10		21			6			CH	Gray clay with silt lenses, organic matter, and calcareous nodules (very soft)	94								0.174
-15			22			7				Gray clay with silt layers (very soft) (specific gravity = 2.704)	45	72.5				56	35		0.192
	15		22			8				Gray clay with sand layers (soft)	71	66.4	0.09	5	13				0.187
			14			9			CL	Gray clay with silt (soft)	41								0.294
-20									SM	Gray silty sand with calcareous nodules Gray silty sand									
			11	5		10 11			CH	Gray clay	23							14	
	20																		
-25			19			12				Gray clay (soft)	73	59.3	0.27	7	5				0.312
	25																		
-30			22			13				Gray clay with shells (soft)	62								0.272
	30																		
-35			22			14				Gray clay (soft)	56	69.2	0.35	10	9				0.272
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B37-4

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-15
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40		21			15				Gray clay	62								
	40																	

Log of Boring B37-4 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-15
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/15/2018 End 10/15/2018	Total Depth (ft) 50	Logged By ECK Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -1 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2507 Longitude -89.4418		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 1.5

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		21			1			PT	Dark gray peat (very soft) (organic content = 18.8%)	306								0.134
			21			2			OH	Gray organic clay with wood pieces (very soft)	170	30.8	0.08	5	5	140	106		0.187
-5	5		22			3				Gray organic clay with wood pieces (very soft) (organic content = 8.2%)	158	32.7	0.09	5	5				0.125
			22			4				Gray organic clay (very soft)	188								0.232
-10			21			5			CH	Gray clay with organic matter (very soft)	90	50.2	0.11	5	3	67	43		0.160
	10		20			6				Gray clay with organic matter (very soft)	120								0.147
			15			7				Gray clay with silt lenses and organic matter (very soft) (specific gravity = 2.703)	107	45				105	72		0.165
-15			18			8				Gray clay with organic matter (very soft)	83	56	0.1	5	4				0.151
	15		17			9				Gray clay with calcareous nodules (very soft)	74								0.147
-20			18			10				Gray clay with silt laminations and shell fragments (very soft)	59	71.7	0.13	6	11				0.151
	20																		
									CL-ML										
-25			21			11				Gray clayey silt with sand and sandy silt layers	36								0.053
	25																		
									CH										
-30			22			12				Gray clay with silt lenses and silt pockets (very soft to soft)	59	69.2	0.2	9	7			98	0.299
	30																		
-35			22			13				Gray clay with silt lenses (very soft)	49								0.236
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B38-3

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-16
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40		21			14				Gray clay (soft)	59	65.7	0.33	12	5				0.428
	40																	
45		20			15				Gray clay with calcareous nodules (soft)	65								0.361
	45																	
50		20			16				Gray clay (soft)	69	59.8	0.38	15	6				0.316
	50																	

Log of Boring B38-3 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-16
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/14/2018 End 10/15/2018	Total Depth (ft) 50	Logged By ECK Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -3 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2617 Longitude -89.4683		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 1.5

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		21			1			CH	Gray clay with wood pieces (very soft)	158	37.8	0.15	5	7	80	51		0.169
5			20			2				Gray clay (very soft)	64								0.183
	5		18			3				Gray clay (very soft)	94	53	0.1	5	8				0.156
10			18			4				Gray clay with silty clay pockets and organic matter (very soft)	66								0.134
			22			5				Gray clay with silt layers (very soft)	33	93.1	0.17	5	15	58	35		0.245
	10		16			6				Gray clay with organic matter (soft) (organic content = 7.8%)	167								0.348
15			20			7				Gray clay with silty clay layers (very soft)	43	74.5	0.17	5	6				0.214
			19			8				Gray clay with silt lenses and organic matter (soft)	64								0.356
	15		17			9			ML	Dark gray sandy silt	33							75	0.045
20			20			10				Gray silt with sand and clay lenses	31					27	2	88	0125
	20																		
25									CH										
			19			11				Gray clay with silt laminations (very soft)	75	59.8	0.156	7	13				0.156
	25																		
30			21			12				Gray clay with shell fragments (very soft) (specific gravity = 2.700)	55	67.5				68	42		0.241
	30																		
35			21			13				Gray clay (soft)	52								0.267
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B39-1

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-17
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40																		
		21			14				Gray clay (very soft)	70	61.2		12	10				0.245
	40																	
45																		
		22			15				Gray clay (soft)	57								0.299
	45																	
50																		
		20			16				Gray clay (soft)	53	70.5	0.356	15	9				0.356
	50																	

Log of Boring B39-1 (continued)

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-17
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/14/2018 End 10/14/2018	Total Depth (ft) 50	Logged By ECK Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -4 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2573 Longitude -89.459		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 3.5	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		17			1			OH	Dark gray organic clay with peat (very soft) (organic content = 19.2%)	143					240	179		0.062
			18			2				Dark gray organic clay with peat (very soft)	259	20.3	0.08	5	11				0.134
			20			3				Gray organic clay with wood (very soft)	181								0.049
	5		20			4			CH	Gray clay with wood (very soft)	98	44	0.05	5	7	94	66		
			22			5			ML	Gray silt with clay pockets (specific gravity = 2.675)	47	75.9				32	7		0.134
	10		21			6			CH	Gray clay with organic matter and calcareous nodules (very soft)	93	45.7	0.07	5	5				0.111
			22			7				Gray clay with calcareous nodules (very soft)	94	47.3	0.07	5	7	95	66		0.111
			22			8				Gray clay with organic matter (very soft)	125								0.151
	15		22			9				Gray clay with calcareous nodules (very soft)	85	52.7	0.12	5	7				0.147
			21			10				Gray clay with silt lenses (very soft)	53								0.156
	20		20			11				Gray clay with silt layers (very soft)	72	58.8	0.2	7	7				0.223
	25		21			12				Gray clay (very soft)	80								0.192
	30		21			13				Gray clay with silt lenses (very soft)	62	61.4	0.18	10	13				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B39-5

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-18
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
40			20			14				Gray clay	76								
	40																		
45			19			15				Gray clay (very soft)	59	64.3	0.24	13	10				
	45																		
50			21			16				Gray clay with silt lenses	49								
	50																		

Log of Boring B39-5 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-18
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/19/2018 End 10/19/2018	Total Depth (ft) 52	Logged By CKH Checked By ARS	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) 1 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2504 Longitude -89.4568		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 2.8

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
0	0		26			1			OH	Gray organic clay with peat (organic content = 14.0%)	274								
			26			2			CL	Gray clay with silt (very soft)	46	72.8	0.08	5	9	42	19		0.151
			24			3				Gray clay with silt (very soft)	38								0.147
-5	5		24			4			ML	Gray silt with clay	33	86.2	0.3	5	15	37	10		0.196
			25			5			CL	Gray silty clay (very soft)	45								0.138
-10	10		2			6				Gray silty clay									
			18			7				Gray sandy clay with silt (soft)	28	96.4			11			63	0.307
			24			8				Gray sandy clay	25							56	
-15	15		5	5		9			SC	Gray clayey sand	23							49	
			13	6		10				Gray clayey sand									
						11			CL	Gray clay with silt	47							96	
-20	20																		
			10			12				Gray silty clay	31								
-25	25																		
			22			13				Gray clay with sand and sand layers (soft)									0.374
-30	30																		
			21	0.5		14				Gray clay with sand and silt (soft)	54								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B42-2

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-19
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
-35									SC-SM										
			25	0.75		15				Gray silty clayey sand	27							26	
	40																		
-40									CL										
			26			16				Gray silty clay with sand (medium)	30	91.5	0.53	13	7				
	45																		
-45																			
			0							No sample recovered									
	50		27			17				Gray clay with silt and sand	41								
-50																			

Log of Boring B42-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-19
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 11/2/2018	End 11/2/2018	Total Depth (ft)	50	Logged By / Checked By	DNF / ARS	Driller	Specialized Environmental Resources, LLC	Drilling Method	Wet Rotary
Surface Elevation (ft) / Vertical Datum	1 / NAVD88		Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Marsh Buggy				
Latitude / Longitude	29.2526 / -89.4692		System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	Groundwater not observed				

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
0	0		29			1			CH	Gray clay with organic matter (very soft)	86					82	58		0.031
			24			2			OH	Gray organic clay (very soft) (organic content = 14.7%)	205								0.151
	5		18			3			CH	Gray clay with organic matter (very soft)	127	38.7	0.07	5	8	122	85		0.120
-5			19			4				Gray clay with wood and organic matter (very soft) (organic content = 5.4%)	203								0.080
			28			5				Gray clay with organic matter (very soft)	89	49.9	0.08	5	9	97	68		0.138
	10		25			6				Gray clay (very soft)	72								0.156
-10			24			7			ML	Gray sandy silt	28	97.5	3.46	5	15			62	0.036
			10			8				Gray sandy silt with clay	34	85.6	0.49	5	15			68	0.285
	15																		
-15			24			9			SP-SM	Gray sand with silt	26								0.535
			20			10				Gray sand with silt	21								0.802
	20																		
-20									SM	Gray silty sand									
			8	WOH		11					27							23	
	25																		
-25									CL										
			25			12				Gray clay with silt, sand layers, and sand pockets (medium)	26								0.521
	30																		
-30									SP-SM										
			26			13				Gray sand with silt	22								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B48-4

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-20
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
-35								ML										
		26			14				Gray silt with clay (specific gravity = 2.722)	30	95.1				28	4		
	40																	
-40																		
		27			15				Gray sandy silt	28	95.7	3.5	14	15				
	45																	
-45																		
								CL										
		28			16				Gray clay with silt (medium)	35	82.5	0.77	15	4				
	50																	

Log of Boring B48-4 (continued)

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-20
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled	Start 10/19/2018	End 10/19/2018	Total Depth (ft)	80	Logged By / Checked By	CKH / ARS	Driller	Specialized Environmental Resources, LLC	Drilling Method	Wet Rotary
Surface Elevation (ft) / Vertical Datum	-3 / NAVD88		Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Triple Engine Airboat				
Latitude / Longitude	29.2495 / -89.477		System Datum	Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft)	3.0				

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		25			1			CH	Gray clay with organic matter (organic matter = 9.7%)	113					87	59		
5			26			2				Gray clay with organic matter	130								
	5		23			3				Gray clay with organic matter (very soft)	115	41.2	0.1	5	5	116	82		0.129
10			24			4				Gray clay with organic matter (very soft) (specific gravity = 2.638)	123	39				120	88		0.125
			22			5				Gray clay with organic matter	95								
	10		25			6				Gray clay with organic lenses (very soft)	129	37.8	0.16	5	4	140	101		0.200
15			26			7				Gray clay with 3-inch silty sand layer at bottom	45							95	
			15			8			SM	Gray silty sand	26							21	
	15		18	0.5		9			ML	Gray sandy silt with organic lenses and peat layer	50							85	
20			28			10			CH	Gray clay with silt layers (very soft)	65	66.7	0.19	6	11				0.200
	20																		
25									CL										
			0							No sample recovered									
	25		27			11				Gray silty clay with sand pockets (very soft to soft)	41	79.7	0.27	8	15				0.218
30									CH										
			28			12				Gray clay (very soft)	51								0.187
	30																		
35																			
			28			13				Gray clay with silt lenses (very soft to soft)	50	74.8	0.32	10	11				0.196
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B48-7

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-21
Sheet 1 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
-40									CL										
			28	0.75		14				Gray sandy clay	30								
	40																		
-45									SP-SM										
			28	1.5		15				Gray sand with silt	28							9	
	45																		
-50									CL										
			27			16				Gray silty clay with sand lenses and sand pockets (stiff)	25	99.1	1.22	15	151			62	
	50																		
-55																			
			24			17				Gray silty clay with sand pockets	33								
	55																		
-60									CH										
			25	0.5		18				Gray clay with 4-inch sandy silt layer (soft to medium)	28								
	60																		
-65									CL										
			24			19				Gray silty clay (medium)	24	100	0.78	19	15				
	65																		
-70																			
			0							No sample recovered									
	70		26	0.5		20				Gray clay with silt (medium)	29								
-75																			
			26	1.0		21				Gray silty clay (medium)	29	95.8	0.93	22	15				
	75																		

Log of Boring B48-7 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-21
Sheet 2 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
		23	0.5		22				Gray sandy clay (medium)	19								
	80																	

Log of Boring B48-7 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-21
Sheet 3 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/27/2018 End 10/27/2018	Total Depth (ft) 50	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2651 Longitude -89.3914		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 3.0

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		20			1			CH	Gray clay with silt layers and organic matter (very soft)	50	68.4	0.14	5	14	72	46		0.192
-5			15			2			CL	Gray silty clay with silt layers (soft)	30	87.9	0.27	5	15				
	5		26			3				Gray silty clay with shell fragments and organic matter (very soft)	47								0.053
			22			4				Gray silty clay with silt layers, wood and sand at bottom (very soft)	33	83.7	0.15	5	15	41	23		0.802
-10			24			5				Gray sandy clay with silt and a 2 inch sand layer	28							53	
						6			CH	Gray clay with silt layers (very soft to soft)	66	63.1	0.2	5	9				0.263
	10		11			7			ML	Gray sandy silt with clay	26							57	0.374
-15			16			8			CH	Gray clay with silt pockets, shell fragments and organic matter (very soft)	88	52.3	0.15	5	4				
	15		26			9			CL	Gray silty clay with silt layers and shell fragments (medium)	32	93.7	0.78	5	15				0.120
			25			10			ML	Gray silt with clay, shells and wood fragments (specific gravity = 2.678)	36	88.1				29	2		0.178
-20			26	2.0		11			CH	Gray clay with silt lenses and 3-inch sandy clay layer at bottom (medium)	44								0.552
	20																		
-25			25			12				Gray clay with silt layers and sand layers (soft)	50	75.3	0.3	8	12				0.276
	25																		
-30									CL										
			25			13				Gray silty clay with sand lenses and 2 inch sand layer (soft)	34								0.495
	30																		
-35									CH										
			21			14				Gray clay with silt layers (soft)	61	66.4	0.26	11	9				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B61-2

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-22
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40		28			15				Gray clay with sand lenses	71								
	40																	
45		17			16				Gray clay with silt layers (very soft)	61	62.6	0.16	14	11				
	45																	
50		24			17				Gray clay with shell fragments (very soft)	56	66.5	0.17	15	14				
	50																	

Log of Boring B61-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-22
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/24/2018 End 10/24/2018	Total Depth (ft) 50	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -1 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2671 Longitude -89.4063		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 1.9

Notes: Cement-Bentonite Grout Full Depth

Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
0		16			1		CL	Gray very silty clay with sand and organic matter	35					33	11		
		18			2			Gray silty clay with trace sand (very soft)	39					36	12	93	0.027
5		9			3		ML	Gray silt with clay	36	85.1	0.47	5	15	31	5		0.080
		28			4		CL	Gray silty clay with sand and silt layers (very soft to soft)	40	85.1	0.28	5	15				0.134
10		23			5		CH	Gray clay with silt layers (very soft to soft)	52	71.2	0.25	5	10	52	26		0.018
		24			6			Gray clay with shell fragments and occasional silt lenses (very soft)	71								0.196
		24			7		CL	Gray clay with silt and sand lenses (very soft to soft)	31	88.9	0.31	5	15				0.196
15		26			8		ML	Gray silt with clay and 2 inch silty sand layer at top (specific gravity = 2.683)	41	81.3				34	8		0.151
		23			9		CH	Gray clay with silt layers and silt lenses	44					59	37		
20		23			10			Gray clay with silt layers (soft)	42	72.9	0.28	6	10				0.388
25		28			11			Gray clay with silt layers (soft)	62	63.1	0.35	8	2				0.348
							CL										
30		26			12			Gray silty clay with silt layers (medium)	34	86.8	0.53	9	15				0.143
							CH										
35		26			13			Gray clay with silt lenses	48								

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B62-1

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-23
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
40						14				Gray clay with silt layers and 1 inch silty sand layer at bottom (soft)	43	80.5	0.41	12	8				
	40																		
45			0							No sample recovered									
	45		26			15				Gray clay	46								
50			28	0.75		16				Gray clay (soft)	59	65.9	0.34	15	7				
	50																		

Log of Boring B62-1 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-23
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/27/2018 End 10/27/2018	Total Depth (ft) 40	Logged By DNF Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Triple Engine Airboat
Latitude 29.2643 Longitude -89.4008		System Datum Geographic NAD83 (feet)		Depth of water to mudline at time of exploration (ft) 2.5

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		10			1			CH	Gray clay with silt layers and peat (very soft)	57	66.4	0.11	5	12				0.174
-5			20			2			CL	Gray silty clay (very soft)	42	78	0.15	5	15	40	16		
	5		22			3				Gray very silty clay with sand (very soft) (specific gravity = 2.633)	40	82				34	10		0.107
			23			4				Gray silty clay with silt lenses (very soft)	35	84.4	0.24	5	15	38	13		0.245
-10			20			5			CH	Gray clay with silt layers (very soft)	53	68.9	0.2	5	12				0.192
	10		8			6				Gray clay with shells and peat pockets (very soft)	48								0.209
-15			15			7			CL	Gray silty clay with silt layers (very soft)	39	83.9	0.21	5	15				
	15		14			8				Gray silty clay with silt layers and sand layers (soft)	30	93	0.48	5	7				
			27			9			CH	Gray clay with peat and shell fragments (soft)	83								0.348
-20			24			10				Gray clay with silt lenses and shell fragments (very soft)	71	59.2	0.16	6	10				0.196
	20																		
-25			22			11				Gray clay with shell fragments (very soft)	74								0.160
	25																		
-30			27			12				Gray clay with silt layers and shell fragments (soft to medium)	52	73.2	0.27	9	8				0.365
	30																		
-35			27			13				Gray clay with silt layers	64								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B62-3

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-24
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
40			27			14				Gray clay with silt layers and shell fragments (soft)	48	75	0.38	12	15				
	40																		

Log of Boring B62-3 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-24
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/22/2018 End 10/22/2018	Total Depth (ft) 50	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2633 Longitude -89.411		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 2.8	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		18			1			CH	Gray clay with roots and organic matter (soft) (organic content = 6.0%)	93								0.285
-5			18			2			CL	Gray silty clay with sand and organic matter (very soft)	52					38	14		0.107
	5		24			3				Gray clay with silt and silt lenses (very soft)	40	80.4	0.16	5	14	42	19		0.178
			28			4			CH	Gray clay with silt lenses (very soft)	62								0.062
-10			15			5				Gray clay (very soft)	79	55	0.12	5	7	88	61		0.205
	10		22			6			CL	Gray clay with silt and silt lenses (very soft to soft)	38	83	0.28	5	15				0.129
-15			4			7				Gray very silty with shell fragments	36					33	12		
			27			8			CH	Gray clay with silt layers (very soft)	58	70.1	0.1	5	13				0.085
	15		28			9			ML	Gray silt with clay layers and trace organic matter	30	91.4	1.25	5	15				0.267
-20			26			10			CH	Gray and brown clay with silt lenses (very soft) (specific gravity = 2.644)	75	55.6				93	63		0.218
	20																		
-25			23			11				Gray clay with organic matter and shell fragments (very soft to soft)	62	58.4	0.32	8	5				0.147
	25																		
									CL										
-30			24	0.50		12				Gray silty clay with silt layers and clay layers (soft)	39								0.303
	30																		
									CH										
-35			23			13				Gray clay with silt layers (soft)	44	74.9	0.25	11	14				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B63-3

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-25
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
40			26			14				Gray clay	71								
	40																		
45			19			15				Gray clay (very soft)	74	57.8	0.2	14	11				
	45																		
50			25			16				Gray clay	66								
	50																		

Log of Boring B63-3 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-25
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/20/2018 End 10/20/2018	Total Depth (ft) 40	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -2 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2657 Longitude -89.4157		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 3.0	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		23			1			CL	Gray clay with silt and roots (very soft) (organic content = 0.9%)	36	75.7	0.04	5	15	47	26		0.085
-5			20			2			CH	Gray clay with silt layers and roots (very soft)	65	65.9	0.1	5	8				0.143
	5		27			3				Gray clay with silt layers and silt pockets (very soft)	59								0.187
			25			4				Gray clay with silt layers (very soft)	46	73.9	0.13	5	14				0.160
-10			20			5				Gray clay with silt lenses (very soft)	62	62.6	0.1	5	8	71	47		0.236
	10		25			6				Gray clay with silty sand lenses (very soft)	79								0.218
-15			20			7				Gray clay with silt lenses (very soft to soft)	44	78.9	0.18	5	10				0.285
	15		27			8				Gray clay with sand lenses and shell fragments (soft)	70								0.250
			28			9				Gray clay with silt seams (very soft to soft)	85	54.5	0.21	5	5				0.263
-20			23			10				Gray clay (soft)	78								0.303
	20																		
-25			28			11			CL	Gray silty clay (very soft to soft)	41	81.8	0.27	7	15	38	14		0.187
	25																		
-30			26			12			CH	Gray clay with sand lenses (soft)	65								0.303
	30																		
-35			27			13				Gray clay with silt seams (very soft)	57	69.5	0.23	10	9				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B63-4

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-26
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\18274005OO.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
40		27			14				Gray clay	66								
	40																	

Log of Boring B63-4 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-26
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/22/2018 End 10/22/2018	Total Depth (ft) 80	Logged By CKH Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -3 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2687 Longitude -89.4194		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 5.0	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		0						CH	No sample recovered									
-5			21			1				Gray clay with roots and organic matter	77					55	31		
			20			2				Gray clay with shells and organic matter (very soft)	66	64.3	0.06	5	7				0.062
	5		23			3				Gray clay with shells and organic matter (very soft)	59					53	33	99	0.058
-10			24			4				Gray clay with silt lenses (very soft)	76	57.5	0.11	5	7				0.129
	10		22			5			CL	Gray clay with silt and silt lenses (very soft) (specific gravity = 2.724)	37	77.8				43	24		0.196
-15			16	0.50		6				Gray silty clay (very soft)	38	83	0.2	5	15				0.076
			23			7			CH	Gray clay with organic matter (very soft)	92								0.080
	15																		
-20			24			8				Gray clay with organic matter (very soft)	77	56	0.15	6	7	55	29		0.178
			26			9				Gray clay with organic matter (very soft)	83								0.196
	20																		
-25																			
			26			10				Gray clay with silt layers (very soft)	51	75.8	0.17	8	15				0.169
	25																		
-30									CL										
			28			11				Gray silty clay with sand (very soft)	33	88.3							0.174
	30																		
-35									CH										
			27			12				Gray clay with silt lenses (soft)	61	64.9	0.29	11	8				
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B64-2

GEOENGINEERS

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-27
Sheet 1 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																	
-40																		
		27			13				Gray clay	65								
	40																	
-45																		
		27			14				Gray clay with silt layers (very soft)	61	69	0.19	14	14				
	45																	
-50																		
		27			15				Gray clay	75								
	50																	
-55																		
		26			16				Gray clay with ferrous nodules (medium)	59	65.2	0.52	17	6				
	55																	
-60																		
		22			17				Gray clay with ferrous nodules	59								
	60																	
-65																		
		24			18				Gray clay with ferrous nodules (medium)	56	67.9	0.54	20	8				
	65																	
-70																		
		26			19				Gray clay with ferrous nodules	59								
	70																	
-75																		
		28			20				Gray clay with ferrous nodules (medium)	58	67	0.7	23	3				
	75																	

Log of Boring B64-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-27
Sheet 2 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
			28			21				Gray clay	57								
	80																		

Log of Boring B64-2 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-27
Sheet 3 of 3

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Drilled Start 10/18/2018 End 10/18/2018	Total Depth (ft) 50	Logged By ECK Checked By ARS/JTH	Driller Specialized Environmental Resources, LLC	Drilling Method Wet Rotary
Surface Elevation (ft) -1 Vertical Datum NAVD88		Hammer Data Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Triple Engine Airboat	
Latitude 29.2616 Longitude -89.422		System Datum Geographic NAD83 (feet)	Depth of water to mudline at time of exploration (ft) 1.0	

Notes: Cement-Bentonite Grout Full Depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	0		19			1			CH	Gray clay with sand lenses, silt lenses, and roots (very soft)	35	77.8	0.18	5	11	64	41	79	0.134
			11			2			CL	Gray very silty clay with sand (very soft to soft)	37	79	0.15	5	15	30	7		0.316
-5			18			3			CH	Gray clay with silty sand lenses and organic matter (soft)	53								0.361
	5		16			4				Gray clay with organic matter (very soft)	74	57.7	0.1	5	11	73	46		0.129
			13			5			CL	Gray clay with sand and silt layers (very soft)	28							80	0.160
-10	10		14			6				Gray clay with silt and silty sand layers (very soft to soft)	36	85.6	0.41	5	15				0.143
			22			7				Gray silty clay with sand (soft)	33							83	0.325
						8			CH	Gray clay with silty sand lenses (soft)	81	58.2	0.31	5	4				
-15			22			9				Gray clay with silty sand lenses and shells (soft)	79								0.446
	15		18			10			CL	Gray clay with silt and shells (very soft to soft)	36	87.1	0.43	5	15			98	0.205
-20			17			11				Gray sandy silty clay (soft)	39								0.290
	20								CH										
-25			21			12				Gray clay with silt lenses (soft)	61	69.1	0.27	7	10				0.272
	25																		
-30			19			13				Gray clay with sandy silt lenses (very soft)	42	79.1	0.23	9	14				0.209
	30																		
-35			20			14				Gray clay with sandy silt lenses	42								
	35																		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on GPS (Rec), Vertical approximated based on Topographic Survey
*Indicates a remold was used for strength testing.

Log of Boring B64-5

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-28
Sheet 1 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot or Pocket Pen (TSF)	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	LABORATORY DATA: Water Content, %	Dry Density, (pcf)	Shear Strength, (KSF)	Confining Pressure, (PSI)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Passing No. 200 Sieve, %	Minivane Shear Strength (KSF)
	35																		
40	40		20			15				Gray clay with silt lenses (soft)	53	70.4	0.47	12	6				
45	45		21			16				Gray clay with sand lenses and silt lenses	46								
50	50		21			17				Gray clay with silt layers (medium)	60	66.6	0.71	15	4				

Log of Boring B64-5 (continued)

GeoEngineers

Project: Spanish Pass Ridge and Marsh Creation
Project Location: Plaquemines Parish, Louisiana
Project Number: 18274-005-00

Figure B-28
Sheet 2 of 2

Date:2/14/19 Path:P:\18\18274005\GINT\1827400500.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_LAB_MUDLINE

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B2-1	0.0 - 2.0	Very soft gray clay with silt lenses, organic matter, and wood pieces (CH)	UU AL MV	51.0	112.1	74.2	54	23	31		0.17		14.8	5.0	B	0.250	
B2-1	2.0 - 4.0	Very soft gray clay with ferrous stains and organic matter (CH)	UU	48.9	112.0	75.2					0.22		13.6	5.0	B		
B2-1	4.0 - 6.0	Very soft gray clay with organic matter (CH)	AL CONS SG MV	64.4	103.9	63.2	65	28	37							0.085	SG=2.689
B2-1	6.0 - 8.0	Gray clayey sand with silt (SC)	-200 MV	29.5						47.3						0.116	
B2-1	8.0 - 10.0	Gray silty clayey sand (SC)	UU AL MV	29.0	121.9	94.4	NP	NP	NP		1.64		7.3	5.0	B	0.588	
B2-1	10.0 - 12.0	Medium gray silty clay with sand and sand layer (CL)	MV	41.8												0.780	
B2-1	12.0 - 14.0	Gray clayey sand (SC)	MV	27.1												0.744	
B2-1	14.0 - 16.0	Gray clayey sand (SC)	UU MV	27.9	128.1	100.1										0.726	
B2-1	16.0 - 18.0	Gray silty sand with clay layers (SM)	-200	24.4						18.6							
B2-1	18.5 - 20.0	Gray very sandy clay (CL)	-200	39.5						51.9							
B2-1	23.0 - 25.0	Very soft gray clay with sand and silty sand layers (CL)	-200 MV	33.5						86.2						0.089	
B2-1	28.0 - 30.0	Soft gray clay with silt layers (CH)	UU MV	39.5	111.3	79.8					0.44		10.1	9.0	B	0.374	
B2-1	33.0 - 35.0	Gray clay (CH)		71.7													
B2-1	38.0 - 40.0	Soft gray clay with silt layers (CH)	UU	52.2	111.7	73.4					0.42		7.6	12.0	B		
B2-1	43.0 - 45.0	Gray clay with silt pockets (CH)		65.4													
B2-1	48.0 - 50.0	Gray clay with silt layers (CH)	UU	46.8	107.8	73.4											

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-1

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B3-3	0.0 - 2.0	Very soft gray clay with silt lenses (CH)	MV	43.9												0.200	
B3-3	2.0 - 4.0	Very soft to soft gray clay with sand (CL)	UU AL MV	38.3	114.7	82.9	43	22	21		0.37		14.3	5.0	B	0.102	
B3-3	4.0 - 6.0	Very soft to soft gray clay with silt (CL)	UU MV	39.6	114.5	82.1					0.25		14.6	5.0	B	0.174	
B3-3	6.0 - 8.0	Very soft gray clay with organic matter and 2" silt layer (CH)	MV	91.3												0.085	
B3-3	8.0 - 10.0	Very soft gray clay with silt (CL)	AL CONS SG MV	30.0	122.7	94.4	46	24	22							0.031	SG=2.658
B3-3	10.0 - 12.0	Soft gray silty clay with sand pockets and organic matter (CL)	MV	56.1												0.450	
B3-3	12.0 - 14.0	Gray silt (ML)	UU AL MV	30.8	122.5	93.6	28	24	4		0.74		15.0	5.0	B	0.134	
B3-3	14.0 - 16.0	Soft gray clay (CH)	MV	54.7												0.290	
B3-3	16.0 - 18.0	Very soft gray clay (CH)	UU MV	77.1	98.5	55.6					0.17		3.8	5.0	MS	0.196	
B3-3	18.0 - 20.0	Very soft gray silty clay with silt layers (CL)	MV	32.2												0.094	
B3-3	23.0 - 25.0	Very soft gray clay with silt lenses (CH)	UU MV	78.4	102.0	57.2					0.16		10.6	5.0	B	0.183	
B3-3	28.0 - 30.0	Very soft gray clay (CH)	MV	60.7												0.250	
B3-3	33.0 - 35.0	Gray clay with silt layers and trace sand (CH)	-200	32.8						93.9							
B3-3	38.0 - 40.0	Gray clay with silt pockets (CH)	MC	52.7													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-2

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B4-1	2.0 - 4.0	Very soft gray clay with roots (CH)	ORG MV	121.7												0.045	OC=5.2%
B4-1	4.0 - 6.0	Very soft gray clay (CH)	UU AL MV	59.5	98.3	61.7	69	24	45		0.07		9.6	5.0	B	0.098	
B4-1	6.0 - 8.0	Gray sandy silt (ML)	UU AL MV	29.6	115.1	88.8	26	27	NP		1.68		15.0	5.0	B	0.076	
B4-1	8.0 - 10.0	Medium gray silty clay with sand (CL)	MV	29.2												0.802	
B4-1	10.0 - 12.0	Gray silty clayey sand with clay layers (SC-SM)	-200 MV	27.6						23.7						0.423	
B4-1	12.0 - 14.0	Very soft gray clay with silt layers (CH)	UU MV	69.6	105.8	62.4					0.09		15.0	5.0	B	0.250	
B4-1	14.0 - 16.0	Very soft gray clay (CH)	AL CONS SG MV	89.7	93.5	49.3	94	27	67							0.200	SG=2.771
B4-1	16.0 - 18.0	Very soft to soft gray silty sandy clay (CL)	UU MV	31.9	120.3	91.3					0.34		15.0	5.0	B	0.138	
B4-1	18.0 - 20.0	Very soft gray clay with silt layers and sand pockets (CH)	-200 MV	36.3						89.9						0.062	
B4-1	23.0 - 25.0	Soft gray clay (CH)	MV	61.9												0.334	
B4-1	28.0 - 30.0	Very soft to soft gray clay with silt layers (CH)	UU MV	76.1	99.4	56.4					0.23		6.6	9.0	B	0.388	
B4-1	33.0 - 35.0	Gray clay with silt layers (CH)		88.6													
B4-1	38.0 - 40.0	Very soft gray clay with silt layers (CH)	UU	63.0	107.4	65.9					0.11		10.6	12.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAm
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-3

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B4-2	0.0 - 2.0	Very soft gray clay with organic matter (CH)	ORG MV	170.7												0.111	OC=6.5%
B4-2	2.0 - 4.0	Gray very silty clay (CL)	AL MC	39.3			33	22	11								
B4-2	4.0 - 6.0	Gray sandy silt with clay (ML)	UU AL MV	32.3	118.3	89.4	28	26	2		1.18		15.0	5.0	B	0.116	
B4-2	6.0 - 8.0	Gray sandy silt with clay (ML)	-200	32.0						66.9							
B4-2	8.0 - 10.0	Gray sandy silt (ML)	UU AL MV	29.9	119.9	92.3	25	23	2		1.56		15.0	5.0	B	0.151	
B4-2	10.0 - 12.0	Very soft gray clay with silt pockets (CH)	MV	58.9												0.138	
B4-2	12.0 - 14.0	Very soft gray clay (CH)	UU MV	66.8	100.1	60.0					0.09		10.3	5.0	B	0.098	
B4-2	14.0 - 16.0	Very soft gray clay with silt layers (CH)	MV	79.4												0.138	
B4-2	16.0 - 18.0	Very soft gray clay with silt layers (CH)	UU MV	47.8	114.6	77.6					0.11		13.8	5.0	B	0.250	
B4-2	18.0 - 20.0	Very soft gray clay with silt layers and sand pockets (CH)	MV	48.2												0.178	
B4-2	23.0 - 25.0	Soft gray clay with silt lenses (CH)	AL CONS SG MV	53.2	101.9	66.5	85	25	60							0.258	SG=2.686
B4-2	28.0 - 30.0	Very soft gray clay with silt layers and shell fragments (CH)	UU MV	70.0	105.8	62.2					0.13		4.4	9.0	B	0.165	
B4-2	33.0 - 35.0	Gray silty clay with silt layers (CL)		63.2													
B4-2	38.0 - 40.0	Soft gray clay with silt layers (CH)	UU	60.4	109.3	68.1					0.31		14.0	12.0	B		
B4-2	43.0 - 45.0	Gray clay (CH)		72.5													
B4-2	48.0 - 50.0	Very soft gray clay (CH)	UU	65.2	100.9	61.1					0.22		13.3	15.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-4

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B7-1	0.0 - 2.0	Very soft gray silty clay (CL)	UU AL MV	42.4	112.7	79.2	38	24	14		0.12		14.3	5.0	B	0.098	
B7-1	2.0 - 4.0	Very soft gray silty clay with silt lenses and peat pockets (CL)	MV	49.1												0.094	
B7-1	4.0 - 6.0	Gray sandy silt (ML)	MV													0.196	
B7-1	6.0 - 8.0	Gray sandy silt (ML)	-200 AL MV	32.4			26	27	NP	97.6						0.062	
B7-1	8.0 - 10.0	Gray sandy silt (ML)	UU AL MV	29.8	120.2	92.6	NP	NP	NP		1.32		7.8	5.0	MS	0.107	
B7-1	10.0 - 12.0	Very soft gray silty clay (CL)	AL MV MC	37.1			39	24	15							0.062	
B7-1	12.0 - 14.0	Soft gray clay with silt lenses (CH)	AL CONS SG MV	75.4	101.0	57.6	88	28	60							0.316	SG=2.743
B7-1	14.0 - 16.0	Very soft gray clay with silt lenses and shell fragments (CH)	UU MV	57.5	105.1	66.7					0.18		8.8	5.0	B	0.156	
B7-1	16.0 - 18.0	Very soft gray clay with shell fragments and silt lenses (CH)	MV	56.2												0.192	
B7-1	18.0 - 20.0	Soft to medium gray silty clay with silt layers (CL)	UU MV	39.3	119.8	86.1					0.51		15.0	6.0	B	0.196	
B7-1	23.0 - 25.0	Soft gray clay with silt lenses (CH)	MV	59.0												0.356	
B7-1	28.0 - 30.0	Soft gray clay with silt layers (CH)	UU MV	65.6	103.3	62.4					0.28		7.5	9.0	B	0.303	
B7-1	33.0 - 35.0	Medium gray silty clay with trace sand (CL)	UU	32.6	115.0	86.7					0.69		15.0	12.0	MS		
B7-1	38.0 - 40.0	Gray sandy silt with clay layers (ML)	-200	28.2						63.0							Sand ran -200 and UU on 33'-35'

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-5

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B8-2	0.0 - 2.0	Very soft to soft gray clay with peat layers and organic matter (CH)	UU AL MV	58.5	104.4	65.9	60	23	37		0.08		10.4	5.0	B	0.285	
B8-2	2.0 - 4.0	Very soft gray clay with roots (CH)	UU MV	45.4	111.4	76.6					0.22		13.6	5.0	B	0.156	
B8-2	4.0 - 6.0	Very soft gray silty clay with silt layers and sand layers (CL)	MV	34.9												0.241	
B8-2	6.0 - 8.0	Very soft to soft gray clay with silt lenses and a sandy silt layer (CH)	UU MV	31.8	111.8	84.8					0.23		15.0	5.0	B	0.098	
B8-2	8.0 - 10.0	Very soft gray clay with silt lenses (CH)	AL CONS SG MV	55.3	99.7	64.2	63	22	41							0.236	SG=2.716
B8-2	10.0 - 12.0	Very soft gray clay with shell fragments (CH)	UU MV	76.4	101.2	57.4					0.22		5.6	5.0	B	0.192	
B8-2	12.0 - 14.0	Very soft gray clay with shells and shell fragments (CH)	UU	48.5	103.9	70.0					0.06		10.8	5.0	B		
B8-2	16.0 - 18.0	Soft gray clay with silt layers and shell fragments (CH)	MV	44.9												0.432	
B8-2	18.0 - 20.0	Very soft gray clay (CH)	UU MV	66.4	101.8	61.1					0.13		10.6	6.0	B	0.134	
B8-2	23.0 - 25.0	Very soft gray clay with silt layers, shells, and shell fragments (CH)	UU MV	59.9	104.2	65.2					0.24		8.6	8.0	B	0.263	
B8-2	28.0 - 30.0	Medium gray clay with silty clay layers, silt layers, and shell fragments (CH)	MV	55.5												0.517	
B8-2	33.0 - 35.0	Soft gray clay with silt layers (CH)	UU	41.6	106.9	75.5					0.40		4.0	11.0	B		
B8-2	38.0 - 40.0	Gray clay with silt lenses (CH)	MC	56.5													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAm
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-6

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B11-3	0.0 - 2.0	Very soft dark gray silty clay with roots (CL)	UU AL MV	42.6	115.7	81.1	40	25	15		0.18		13.6	5.0	B	0.196	
B11-3	2.0 - 4.0	Very soft gray very silty clay with sand (CL)	-200 AL MV	42.4			31	23	8	71.4						0.062	
B11-3	4.0 - 6.0	Soft dark gray very silty clay (CL)	UU AL	34.3	127.1	94.7	34	22	12		0.31		9.6	5.0	MS		
B11-3	6.0 - 8.0	Gray very silty clay with roots (CL)	AL	71.5			34	24	10								
B11-3	8.0 - 10.0	Gray silt with clay and trace sand (ML)	UU -200 AL MV	32.3	101.2	76.5	27	25	2	95.6	0.88		9.8	5.0	B	0.232	
B11-3	10.0 - 12.0	Very soft gray silty clay with silt lenses (CL)	MV	33.6												0.107	
B11-3	12.0 - 14.0	Soft gray clay with silt layers (CH)	UU MV	48.6	107.8	72.5					0.31		6.8	5.0	B	0.307	
B11-3	14.0 - 16.0	Very soft to soft gray clay with silt lenses and shell fragments (CH)	MV	53.5												0.232	
B11-3	16.0 - 17.0	Very soft to soft gray clay with silt layers (CH)	UU	33.5	96.5	72.3					0.19		15.0	5.0	B		
B11-3	17.0 - 18.0	Gray clayey silt (CL-ML)	MV	29.7												0.659	
B11-3	18.0 - 20.0	Very soft gray clay with silt layers (CH)	UU MV	37.6	111.5	81.0					0.16		14.6	6.0	B	0.151	
B11-3	23.0 - 25.0	Very soft gray clay with silt layers (CH)	UU MV	59.8	105.5	66.0					0.22		14.6	8.0	B	0.241	
B11-3	28.0 - 30.0	Very soft gray clay (CH)	MV	75.1												0.214	
B11-3	33.0 - 35.0	Soft gray clay with silt layers (CH)	UU	49.9	110.5	73.8					0.36		9.8	11.0	B		
B11-3	38.0 - 40.0	Stiff gray sandy clay with silt and silt layers (CL)	UU	27.4	126.2	99.1					1.26		15.0	12.0	B		
B11-3	43.0 - 45.0	Gray sandy clay with silt (CL)		40.7													
B11-3	48.0 - 50.0	Soft gray clay with silt layers (CH)	UU	58.8	106.1	66.9					0.26		15.0	12.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-7

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B12-1	0.0 - 2.0	Dark brown peat (PT)	ORG	475.8													OC=24.8%
B12-1	2.0 - 4.0	Gray very silty clay (CL)	AL	43.0			31	23	8								
B12-1	4.0 - 6.0	Gray silt with clay (ML)	UU AL MV	38.1	113.8	82.4	30	24	6		0.37		15.0	5.0	B	0.098	
B12-1	6.0 - 8.0	Very soft gray clay (CH)	MV	50.5												0.031	
B12-1	8.0 - 10.0	Very soft gray clay with organic matter (CH)	UU MV	59.8	104.5	65.4					0.21		6.6	5.0	B	0.169	
B12-1	10.0 - 12.0	Gray clayey silt with silt layers and seams (CL-ML)	UU AL MV	32.0	120.3	91.2	26	21	5		1.62		15.0	5.0	B	0.085	
B12-1	12.0 - 14.0	Very soft gray clay with sand lenses and silt pockets (CH)	MV	36.8												0.205	
B12-1	14.0 - 16.0	Very soft gray clay with silt layers and silt pockets (CH)	UU -200 MV	61.6	105.2	65.1				99.7	0.23		7.3	5.0	B	0.214	
B12-1	16.0 - 18.0	Very soft gray clay (CH)	MV	73.5												0.214	
B12-1	18.0 - 20.0	Soft gray clay with silt layers (CH)	UU MV	64.9	102.4	62.1					0.25		6.6	6.0	B	0.325	
B12-1	23.0 - 25.0	Very soft gray clay with silt lenses (CH)	AL CONS SG MV	66.1	98.6	59.4	77	27	50							0.192	SG=2.641
B12-1	28.0 - 30.0	Very soft gray clay with silty sand pockets (CH)	MV	53.8												0.218	
B12-1	33.0 - 35.0	Soft gray clay with silt layers (CH)	UU	39.2	113.5	81.5					0.27		14.5	11.0	B		
B12-1	38.0 - 40.0	Gray clay with silt lenses and 2" sand layer in middle (CH)		52.3													
B12-1	43.0 - 45.0	Soft gray clay with silt layers (CH)	UU	47.5	115.1	78.0					0.42		10.3	14.0	B		
B12-1	48.0 - 50.0	Gray clay with occasional silt lenses (CH)		43.2													
B12-1	53.0 - 55.0	Soft gray clay (CH)	UU	53.7	107.7	70.0					0.30		15.0	17.0	B		
B12-1	58.0 - 60.0	Gray clay (CH)		66.0													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-8

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B12-1	63.0 - 65.0	Medium gray clay (CH)	UU	66.8	105.0	62.9					0.53		6.3	20.0	B		
B12-1	68.0 - 70.0	Gray clay with silt seams (CH)		66.7													
B12-1	73.0 - 75.0	Medium gray clay with silt layers (CH)	UU	60.0	105.3	65.8					0.90		3.7	23.0	MS		
B12-1	78.0 - 80.0	Gray clay (CH)		51.4													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-9

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B15-1	0.0 - 2.0	Very soft brown organic clay with peat (OH)	ORG MV	285.0												0.085	OC=4.4%
B15-1	2.0 - 4.0	Stiff gray silty clay with sand and silt layers (CL)	UU MV	31.6	115.6	87.9					1.98		15.0	5.0	B	0.241	
B15-1	4.0 - 6.0	Gray silty clay (CL)	MC	20.2													Bag sample
B15-1	6.0 - 8.0	Very soft gray clay with silt and silt layers (CL)	UU AL MV	42.3	112.6	79.1	49	23	26		0.14		14.0	5.0	B	0.125	
B15-1	8.0 - 10.0	Very soft gray clay (CH)	AL CONS SG MV	80.7	97.4	53.9	83	26	57							0.129	SG=2.771
B15-1	10.0 - 12.0	Very soft gray clay with silt lenses (CH)	UU MV	60.4	109.6	68.4					0.08		9.3	5.0	B	0.089	
B15-1	12.0 - 14.0	Very soft gray clay with silt (CL)	MV	45.1												0.187	
B15-1	14.0 - 16.0	Very soft gray clay with silt and silt layers (CL)	UU AL MV	36.8	112.2	82.0	42	21	21		0.21		14.8	5.0	B	0.151	
B15-1	16.0 - 18.0	Soft gray clay (CH)	MV	75.0												0.263	
B15-1	18.0 - 20.0	Very soft gray clay with silt layers (CH)	UU MV	44.1	98.6	68.4					0.22		9.5	6.0	B	0.227	
B15-1	23.0 - 25.0	Very soft gray clay (CH)	MV	78.6												0.151	
B15-1	28.0 - 30.0	Very soft gray clay with silt and silt layers (CL)	UU MV	59.1	115.3	72.5					0.20		14.8	9.0	B	0.076	
B15-1	33.0 - 35.0	Medium gray clay with silt and silt layers (CL)	UU	61.4	107.2	66.4					0.76		9.6	11.0	B		
B15-1	38.5 - 40.0	Gray silty sand with clay layers and pockets (SM)	-200	26.0						40.7							
B15-1	43.0 - 45.0	Soft gray clay with silt layers (CH)	UU	39.6	116.3	83.3					0.40		13.8	14.0	B		
B15-1	48.0 - 50.0	Medium gray clay with silt layers (CH)	UU	50.9	109.1	72.3					0.61		3.4	15.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-10

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B24-4	0.0 - 2.0	Gray organic clay (OH)	AL MC	170.9			152	37	115								Bag sample
B24-4	2.0 - 4.0	Very soft gray organic clay (OH)	UU AL	163.8	79.9	30.3	158	38	120		0.07		6.6	5.0	B		
B24-4	4.0 - 6.0	Very soft gray organic clay (OH)	AL CONS SG MV	160.7	82.9	31.8	179	48	131							0.200	SG=2.666
B24-4	6.0 - 8.0	Very soft gray clay with roots and stems (CH)	UU	58.7	102.1	64.3					0.16		11.8	5.0	B		
B24-4	8.0 - 10.0	Very soft gray clay with shells (CH)	MV	72.3												0.232	
B24-4	10.0 - 12.0	Very soft gray clay with shell fragments (CH)	UU MV	48.4	105.2	70.8					0.18		4.4	5.0	B	0.227	
B24-4	12.0 - 14.0	Soft gray clay (CH)	MV	59.1												0.365	
B24-4	14.0 - 16.0	Soft gray and brown clay (CH)	UU MV	83.2	97.8	53.4					0.26		3.4	5.0	MS	0.263	
B24-4	16.0 - 18.0	Soft gray clay (CH)	MV	86.1												0.325	
B24-4	18.0 - 20.0	Soft gray clay with organic matter and wood pieces (CH)	UU MV	62.8	103.6	63.7					0.32		3.5	6.0	MS	0.321	
B24-4	23.0 - 25.0	Soft gray clay (CH)	MV	64.7												0.365	
B24-4	28.0 - 30.0	Soft gray silty clay (CL)	UU MV	35.0	121.5	90.0					0.35		15.0	9.0	B	0.254	
B24-4	33.0 - 35.0	Gray silty clay (CL)		26.5													
B24-4	38.0 - 40.0	Soft gray clay with silt and sand layers (CL)	UU -200	46.7	102.7	70.0				81.0	0.37		4.4	12.0	MS		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-11

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B30-1	0.0 - 2.0	Gray silt with clay and peat pockets (ML)	UU AL MV	33.2	121.1	90.9	27	24	3		0.46		10.6	5.0	B	0.080	
B30-1	2.0 - 4.0	Gray sandy silt (ML)	-200 AL MV	30.3			NP	NP	NP	62.4						0.544	
B30-1	4.0 - 6.0	Very soft gray clay (CH)	MV	70.2												0.218	
B30-1	6.0 - 8.0	Very soft gray clay with shell fragments (CH)	UU AL MV	69.7	104.9	61.8	92	28	64		0.16		8.3	5.0	MS	0.227	
B30-1	8.0 - 10.0	Gray clayey silt with shells (CL-ML)	MV													0.160	
B30-1	10.0 - 12.0	Very soft gray clay with sandy silt layers (CH)	-200 AL MV	45.3			59	21	38	88.6						0.223	
B30-1	12.0 - 14.0	Very soft gray clay with silt pockets (CH)	UU MV	81.4	101.5	56.0					0.23		5.1	5.0	MS	0.245	
B30-1	14.0 - 16.0	Soft gray clay with silt pockets and sand pockets (CH)	MV	67.4												0.299	
B30-1	16.0 - 18.0	Soft gray clay with organic matter (CH)	AL CONS SG MV	98.7	93.4	47.0	105	32	73							0.405	SG=2.734
B30-1	18.0 - 20.0	Soft gray clay (CH)	MV	82.2												0.361	(Disturbed)
B30-1	23.0 - 25.0	Very soft gray silty clay with sand pockets (CL)	UU MV	38.6	119.5	86.2					0.20		15.0	7.0	B	0.205	
B30-1	33.0 - 35.0	Medium gray sandy clay with silt (CL)	UU MV	28.5	131.1	102.0										0.740	
B30-1	38.0 - 40.0	Very soft to soft gray clay (CH)	UU MV	52.9	112.0	73.3					0.19		14.6	12.0	MS	0.272	
B30-1	43.0 - 45.0	Soft gray clay (CH)	UU MV	62.0	103.9	64.1					0.38		8.1	13.0	B	0.330	
B30-1	48.0 - 50.0	Soft gray clay (CH)	MV													0.388	

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-12

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B30-4	0.0 - 2.0	Very soft gray clay with silt lenses, roots, and stems (CH)	UU AL	48.1	103.6	70.0	71	25	46		0.12		11.8	5.0	B		
B30-4	2.0 - 4.0	Very soft gray clay with silt lenses, organic matter, and shells (CH)	MV	48.4												0.107	
B30-4	4.0 - 6.0	Gray sandy clay (CL)	-200 MV	28.9						60.5						0.570	
B30-4	6.0 - 7.0	Gray sandy clay (CL)	-200	29.0						59.8							
B30-4	7.0 - 8.0	Very soft gray clay with silt lenses and shell fragments (CH)	UU AL MV	46.0	105.8	72.5	52	20	32		0.15		7.1	5.0	B	0.169	
B30-4	8.0 - 10.0	Very soft gray clay with silt lenses (CH)	AL CONS SG MV	54.1	96.3	62.5	66	24	42							0.178	SG=2.707
B30-4	10.0 - 12.0	Very soft gray clay with silt lenses (CH)	UU MV	71.5	97.0	56.5					0.12		7.1	5.0	B	0.187	
B30-4	12.0 - 14.0	Soft gray clay with silt pockets, sand pockets, and shells (CH)	MV	67.7												0.437	
B30-4	14.0 - 16.0	Very soft gray clay with organic matter (CH)	MV	77.6												0.147	Disturbed
B30-4	16.0 - 18.0	Very soft gray clay with wood fragments (CH)	UU AL	68.2	100.3	59.6	76	23	53		0.16		7.6	5.0	B		
B30-4	18.0 - 20.0	Soft gray clay with 3" wood layer @ bottom (CH)	MV	59.6												0.307	
B30-4	23.0 - 25.0	Soft gray silty clay with sand (CL)	-200 MV	34.4						84.0						0.348	
B30-4	28.0 - 30.0	Gray clayey silt with organic matter (CL-ML)	-200 AL MV	48.0			48	37	11	96.1						0.316	
B30-4	33.0 - 35.0	Soft gray clay (CH)	UU	62.8	101.8	62.5					0.29		6.8	10.0	MS		
B30-4	38.0 - 40.0	Gray clay (CH)	MC	46.8													
B30-4	43.0 - 45.0	Very soft gray clay (CH)	UU	58.0	102.2	64.7					0.24		12.1	13.0	B		
B30-4	48.0 - 50.0	Gray clay (CH)	MC	67.3													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-13

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B37-2	0.0 - 2.0	Very soft gray clay with organic matter (CH)	MV	64.4												0.089	
B37-2	2.0 - 4.0	Very soft gray clay with silt lenses and organic matter (CH)	UU AL ORG MV	81.0	96.7	53.4	61	22	39		0.07		6.3	5.0	B	0.094	OC=2.2%
B37-2	4.0 - 6.0	Very soft gray clay with organic matter and shells (CH)	MV	73.4												0.111	
B37-2	6.0 - 8.0	Very soft gray clay with silt and shell fragments (CL)	UU AL MV	48.5	105.3	70.9	49	19	30		0.10		10.8	5.0	B	0.165	
B37-2	8.0 - 10.0	Very soft gray clay with silt layers and trace organics (CH)	-200 MV	43.3						91.6						0.187	
B37-2	10.0 - 12.0	Very soft gray clay with silt lenses and organic matter (CH)	UU MV	65.3	100.5	60.8					0.13		5.1	5.0	B	0.196	
B37-2	12.0 - 14.0	Very soft gray clay with silt lenses, organic matter, and shells (CH)	MV	79.5												0.196	
B37-2	14.0 - 16.0	Very soft gray clay with silt lenses (CH)	UU ORG MV	80.8	97.4	53.9					0.16		7.3	5.0	B	0.232	OC=2.9%
B37-2	16.0 - 18.0	Very soft gray clay with calcareous nodules (CH)	MV	83.3												0.236	
B37-2	18.0 - 20.0	Very soft gray clay with calcareous nodules (CH)	MV	80.0												0.223	
B37-2	23.0 - 25.0	Very soft to soft gray clay with silt lenses and organic matter (CH)	UU MV	61.0	104.9	65.2					0.15		11.1	7.0	B	0.267	
B37-2	28.0 - 30.0	Very soft to soft gray clay with silty sand lenses (CH)		49.5													
B37-2	33.0 - 35.0	Very soft gray clay (CH)	MV	59.8												0.223	
B37-2	38.0 - 40.0	Very soft to soft gray clay (CH)	UU MV	65.4	99.3	60.0					0.17		6.3	12.0	B	0.276	
B37-2	43.0 - 45.0	Soft gray clay (CH)	MV	54.5												0.356	
B37-2	48.0 - 50.0	Soft gray clay (CH)	UU	66.3	98.9	59.4					0.40		6.3	15.0	MS		
B37-2	53.0 - 55.0	Gray clay (CH)	AL CONS SG	60.8	101.9	63.4	87	28	59								SG=2.793
B37-2	58.0 - 60.0	Soft gray clay (CH)	UU	55.9	103.4	66.3					0.49		6.0	18.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-14

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B37-2	63.0 - 65.0	Gray clay (CH)		59.0													
B37-2	68.0 - 70.0	Soft gray clay (CH)	UU	55.6	102.6	66.0					0.36		14.6	20.0	B		
B37-2	73.0 - 75.0	Gray clay (CH)		52.1													
B37-2	78.0 - 80.0	Medium gray clay with silty sand lenses (CH)	UU	61.6	101.9	63.0					0.62		3.5	23.0	AS(45)		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-15

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B37-4	0.0 - 2.0	Very soft gray organic clay with peat (OH)	UU AL	203.6	82.8	27.3	177	50	127		0.09		11.8	5.0	B		
B37-4	2.0 - 4.0	Very soft gray organic clay with peat (OH)	AL ORG MV	231.4			232	60	172							0.143	OC=18.0%
B37-4	4.0 - 6.0	Gray silt with clay and organic matter (ML)	-200 MV	39.3						97.9						0.067	
B37-4	6.0 - 8.0	Gray silt with clay layers (ML)	-200 AL MV	40.4			31	27	4	99.2						0.085	
B37-4	8.0 - 10.0	Gray sandy silt with clay (ML)	UU AL MV	43.5	128.5	89.6	29	27	2							0.147	
B37-4	10.0 - 12.0	Very soft gray clay with silt lenses, organic matter, and calcareous nodules (CH)	MV	94.1												0.174	
B37-4	12.0 - 14.0	Very soft gray clay with silt layers (CH)	AL CONS SG MV	45.3	105.3	72.5	56	21	35							0.192	SG=2.704
B37-4	14.0 - 16.0	Very soft gray clay with sand layers (CH)	UU MV	71.0	113.5	66.4					0.09		13.3	5.0	B	0.187	
B37-4	16.0 - 17.5	Soft gray clay with silt (CL)	MV	41.1												0.294	
B37-4	17.5 - 18.0	Gray silty sand with calcareous nodules (SM)															
B37-4	18.5 - 18.8	Gray silty sand (SM)	-200	22.6						13.8							
B37-4	18.8 - 20.0	Gray clay (CH)															
B37-4	23.0 - 25.0	Soft gray clay (CH)	UU MV	73.2	102.7	59.3					0.27		4.9	7.0	MS	0.312	
B37-4	28.0 - 30.0	Soft gray clay with shells (CH)	MV	62.1												0.272	
B37-4	33.0 - 35.0	Soft gray clay (CH)	UU MV	56.2	108.1	69.2					0.35		8.8	10.0	MS	0.272	
B37-4	38.0 - 40.0	Gray clay (CH)		61.8													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-16

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B38-3	0.0 - 2.0	Very soft dark gray peat (PT)	ORG MV	306.0												0.134	OC=18.8%
B38-3	2.0 - 4.0	Very soft gray organic clay with wood pieces (OH)	UU AL MV	169.7	83.2	30.8	140	34	106		0.08		5.3	5.0	B	0.187	
B38-3	4.0 - 6.0	Very soft gray organic clay with wood pieces (OH)	UU ORG MV	157.8	84.4	32.7					0.09		4.7	5.0	B	0.125	OC=8.2%
B38-3	6.0 - 8.0	Very soft gray organic clay (OH)	MV	188.3												0.232	
B38-3	8.0 - 10.0	Very soft gray clay with organic matter (CH)	UU AL MV	89.5	95.1	50.2	67	24	43		0.11		3.3	5.0	B	0.160	
B38-3	10.0 - 12.0	Very soft gray clay with organic matter (CH)	MV	119.6												0.147	
B38-3	12.0 - 14.0	Very soft gray clay with silt lenses and organic matter (CH)	AL CONS SG MV	106.5	92.9	45.0	105	33	72							0.165	SG=2.703
B38-3	14.0 - 16.0	Very soft gray clay with organic matter (CH)	UU MV	83.0	102.5	56.0					0.10		4.0	5.0	B	0.151	
B38-3	16.0 - 18.0	Very soft gray clay with calcareous nodules (CH)	MV	73.5												0.147	
B38-3	18.0 - 20.0	Very soft gray clay with silt laminations and shell fragments (CH)	UU MV	59.3	114.3	71.7					0.13		11.0	6.0	B	0.151	
B38-3	23.0 - 25.0	Gray clayey silt with sand and sandy silt layers (CL-ML)	MV	35.9												0.053	
B38-3	28.0 - 30.0	Very soft to soft gray clay with silt lenses and silt pockets (CH)	UU -200 MV	58.5	109.6	69.2				97.7	0.20		7.1	9.0	B	0.299	
B38-3	33.0 - 35.0	Very soft gray clay with silt lenses (CH)	MV	49.4												0.236	
B38-3	38.0 - 40.0	Soft gray clay (CH)	UU MV	59.0	104.5	65.7					0.33		4.7	12.0	B	0.428	
B38-3	43.0 - 45.0	Soft gray clay with calcareous nodules (CH)	MV	64.5												0.361	
B38-3	48.0 - 50.0	Soft gray clay (CH)	UU MV	68.9	101.0	59.8					0.38		5.8	15.0	MS	0.316	

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-17

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B39-1	0.0 - 2.0	Very soft gray clay with wood pieces (CH)	UU AL MV	157.9	97.6	37.8	80	29	51		0.15		7.1	5.0	MS	0.169	
B39-1	2.0 - 4.0	Very soft gray clay (CH)	MV	64.4												0.183	
B39-1	4.0 - 6.0	Very soft gray clay (CH)	UU MV	93.8	102.7	53.0					0.10		7.8	5.0	MS	0.156	
B39-1	6.0 - 8.0	Very soft gray clay with silty clay pockets and organic matter (CH)	MV	65.9												0.134	
B39-1	8.0 - 10.0	Very soft gray clay with silt layers (CH)	UU AL MV	33.2	124.0	93.1	58	23	35		0.17		15.0	5.0	B	0.245	
B39-1	10.0 - 12.0	Soft gray clay with organic matter (CH)	ORG MV	166.6												0.348	OC=7.8%
B39-1	12.0 - 14.0	Very soft gray clay with silty clay layers (CH)	UU MV	42.9	106.5	74.5					0.17		6.3	5.0	B	0.214	
B39-1	14.0 - 16.0	Soft gray clay with silt lenses and organic matter (CH)	MV	63.7												0.356	
B39-1	16.0 - 18.0	Dark gray sandy silt (ML)	-200 MV	32.6						74.6						0.045	
B39-1	18.0 - 20.0	Gray silt with sand and clay lenses (ML)	-200 AL MV	30.5			27	25	2	87.9						0.125	
B39-1	23.0 - 25.0	Very soft gray clay with silt laminations (CH)	UU MV	74.5	104.3	59.8					0.16		13.1	7.0	B	0.156	
B39-1	28.0 - 30.0	Very soft gray clay with shell fragments (CH)	AL CONS SG MV	54.8	104.5	67.5	68	26	42							0.241	SG=2.700
B39-1	33.0 - 35.0	Soft gray clay (CH)	MV	51.7												0.267	
B39-1	38.0 - 40.0	Soft gray clay (CH)	UU MV	70.4	104.3	61.2					0.28		10.1	12.0	B	0.245	
B39-1	43.0 - 45.0	Soft gray clay (CH)	MV	56.6												0.299	
B39-1	48.0 - 50.0	Soft gray clay (CH)	UU MV	52.7	107.7	70.5					0.36		8.8	15.0	B	0.356	

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-18

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B39-5	0.0 - 2.0	Very soft dark gray organic clay with peat (OH)	AL ORG MV	142.7			240	61	179							0.062	OC=19.2%
B39-5	2.0 - 4.0	Very soft dark gray organic clay with peat (OH)	UU MV	259.1	72.8	20.3					0.08		11.1	5.0	B	0.134	
B39-5	4.0 - 6.0	Very soft gray organic clay with wood (OH)	MV	181.2												0.049	
B39-5	6.0 - 8.0	Very soft gray clay with wood (CH)	UU AL	98.3	87.2	44.0	94	28	66		0.05		7.3	5.0	B		
B39-5	8.0 - 10.0	Gray silt with clay pockets (ML)	AL CONS SG MV	46.8	111.5	75.9	32	25	7							0.134	SG=2.675
B39-5	10.0 - 12.0	Very soft gray clay with organic matter and calcareous nodules (CH)	UU MV	92.8	88.2	45.7					0.07		4.7	5.0	B	0.111	
B39-5	12.0 - 14.0	Very soft gray clay with calcareous nodules (CH)	UU AL MV	93.9	91.8	47.3	95	29	66		0.07		7.3	5.0	B	0.111	
B39-5	14.0 - 16.0	Very soft gray clay with organic matter (CH)	MV	125.2												0.151	
B39-5	16.0 - 18.0	Very soft gray clay with calcareous nodules (CH)	UU MV	85.2	97.6	52.7					0.12		6.6	5.0	B	0.147	
B39-5	18.0 - 20.0	Very soft gray clay with silt lenses (CH)	MV	53.0												0.156	
B39-5	23.0 - 25.0	Very soft gray clay with silt layers (CH)	UU MV	72.4	101.4	58.8					0.20		6.6	7.0	B	0.223	
B39-5	28.0 - 30.0	Very soft gray clay (CH)	MV	80.3												0.192	
B39-5	33.0 - 35.0	Very soft gray clay with silt lenses (CH)	UU	61.9	99.5	61.4					0.18		13.1	10.0	B		
B39-5	38.0 - 40.0	Gray clay (CH)		75.5													
B39-5	43.0 - 45.0	Very soft gray clay (CH)	UU	59.4	102.6	64.3					0.24		10.1	13.0	MS		
B39-5	48.0 - 50.0	Gray clay with silt lenses (CH)		49.1													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-19

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B42-2	0.0 - 2.0	Gray organic clay with peat (OH)	ORG	273.8													OC=14.0%
B42-2	2.0 - 4.0	Very soft gray clay with silt (CL)	UU AL MV	45.8	106.1	72.8	42	23	19		0.08		9.1	5.0	B	0.151	
B42-2	4.0 - 6.0	Very soft gray clay with silt (CL)	MV	38.0												0.147	
B42-2	6.0 - 8.0	Gray silt with clay (ML)	UU AL MV	32.8	114.5	86.2	37	27	10		0.30		15.0	5.0	B	0.196	
B42-2	8.0 - 10.0	Very soft gray silty clay (CL)	MV	45.2												0.138	
B42-2	10.0 - 12.0	Gray silty clay (CL)															
B42-2	12.0 - 14.0	Soft gray sandy clay with silt (CL)	UU -200 MV	28.4	123.8	96.4				62.7						0.307	
B42-2	14.0 - 16.0	Gray sandy clay (CL)	-200	25.0						55.9							
B42-2	16.0 - 17.5	Gray clayey sand (SC)	-200	23.3						49.1							
B42-2	19.0 - 19.5	Gray clay with silt (CL)	-200	46.9						95.7							
B42-2	23.0 - 25.0	Gray silty clay (CL)		31.3													
B42-2	28.0 - 30.0	Soft gray clay with sand and sand layers (CL)	MV													0.374	
B42-2	33.0 - 35.0	Gray clay with sand and silt (CL)		54.2													
B42-2	38.0 - 40.0	Gray silty clayey sand (SC-SM)	-200	26.6						25.9							
B42-2	43.0 - 45.0	Medium gray silty clay with sand (CL)	UU	29.8	118.8	91.5					0.53		7.3	13.0	B		
B42-2	50.0 - 52.0	Gray clay with silt and sand (CL)		40.9													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-20

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B48-4	0.0 - 2.0	Very soft gray clay with organic matter (CH)	AL MV	85.8			82	24	58							0.031	
B48-4	2.0 - 4.0	Very soft gray organic clay (OH)	ORG MV	204.5												0.151	OC=14.7%
B48-4	4.0 - 6.0	Very soft gray clay with organic matter (CH)	UU AL MV	126.8	87.8	38.7	122	37	85		0.07		7.8	5.0	B	0.120	
B48-4	6.0 - 8.0	Very soft gray clay with wood and organic matter (CH)	ORG MV	202.6												0.080	OC=5.4%
B48-4	8.0 - 10.0	Very soft gray clay with organic matter (CH)	UU AL MV	89.1	94.4	49.9	97	29	68		0.08		8.5	5.0	MS	0.138	
B48-4	10.0 - 12.0	Very soft gray clay (CH)	MV	72.1												0.156	
B48-4	12.0 - 14.0	Gray sandy silt (ML)	UU -200 MV	28.3	125.2	97.5				61.8	3.46		15.0	5.0	B	0.036	
B48-4	14.0 - 16.0	Gray sandy silt with clay (ML)	UU -200 MV	34.2	114.8	85.6				68.0	0.49		15.0	5.0	B	0.285	UU: Slumping badly
B48-4	16.0 - 18.0	Gray sand with silt (SP-SM)	MV	25.9												0.535	
B48-4	18.0 - 20.0	Gray sand with silt (SP-SM)	MV	21.3												0.802	
B48-4	23.5 - 25.0	Gray silty sand (SM)	-200	26.9						23.0							
B48-4	28.0 - 30.0	Medium gray clay with silt, sand layers and sand pockets (CL)	MV	26.1												0.521	
B48-4	33.0 - 35.0	Gray sand with silt (SP-SM)		21.6													
B48-4	38.0 - 40.0	Gray silt with clay (ML)	AL CONS SG	29.6	123.2	95.1	28	24	4								SG=2.722
B48-4	43.0 - 45.0	Gray sandy silt (ML)	UU	28.0	122.5	95.7					3.50		15.0	14.0	B		UU: Slumping badly
B48-4	48.0 - 50.0	Medium gray clay with silt (CL)	UU	34.8	111.2	82.5					0.77		4.1	15.0	MS		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-21

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B48-7	0.0 - 2.0	Gray clay with organic matter (CH)	AL ORG	112.7			87	28	59								OC=9.7%
B48-7	2.0 - 4.0	Gray clay with organic matter (CH)		130.4													
B48-7	4.0 - 6.0	Very soft gray clay with organic matter (CH)	UU AL MV	115.0	88.5	41.2	116	34	82		0.10		4.5	5.0	B	0.129	
B48-7	6.0 - 8.0	Very soft gray clay with organic matter (CH)	AL CONS SG MV	122.6	86.9	39.0	120	32	88							0.125	SG=2.638
B48-7	8.0 - 10.0	Gray clay with organic matter (CH)		95.9													
B48-7	10.0 - 12.0	Very soft gray clay with organic lenses (CH)	UU AL MV	129.2	86.6	37.8	140	39	101		0.16		4.1	5.0	B	0.200	
B48-7	12.0 - 14.0	Gray clay with 3" silty sand layer @ bottom (CH)	-200	44.8						95.2							
B48-7	14.0 - 16.0	Gray silty sand (SM)	-200 AL	26.2			NP	NP	NP	20.9							
B48-7	16.0 - 18.0	Gray sandy silt with organic lenses and peat layer (ML)	-200	49.7						84.9							
B48-7	18.0 - 20.0	Very soft gray clay with silt layers (CH)	UU MV	65.3	110.2	66.7					0.19		10.6	6.0	B	0.200	
B48-7	25.0 - 27.0	Very soft to soft gray silty clay with sand pockets (CL)	UU MV	41.3	112.7	79.7					0.27		15.0	8.0	B	0.218	
B48-7	28.0 - 30.0	Very soft gray clay (CH)	MV	50.9												0.187	
B48-7	33.0 - 35.0	Very soft to soft gray clay with silt lenses (CH)	UU MV	49.8	112.1	74.8					0.32		10.8	10.0	B	0.196	
B48-7	38.0 - 40.0	Gray sandy clay (CL)		29.9													
B48-7	43.0 - 45.0	Gray sand with silt (SP-SM)	-200	27.6						9.1							
B48-7	48.0 - 50.0	Stiff gray silty clay with sand lenses and sand pockets (CL)	UU -200	24.9	123.9	99.1				62.2	1.22		15.0	15.0	B		
B48-7	53.0 - 55.0	Gray silty clay with sand pockets (CL)		33.5													
B48-7	58.0 - 60.0	Gray clay with 4" sandy silt layer (CH)		28.2													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-22

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B48-7	63.0 - 65.0	Medium gray silty clay (CL)	UU	24.5	124.5	100.0					0.78		15.0	19.0	B		
B48-7	70.0 - 72.0	Gray clay with silt (CL)		29.2													
B48-7	73.0 - 75.0	Medium gray silty clay (CL)	UU	28.9	123.6	95.8					0.93		14.8	22.0	B		
B48-7	78.0 - 80.0	Gray sandy clay (CL)		18.6													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/18/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-23

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B61-2	0.0 - 2.0	Very soft gray clay with silt layers and organic matter (CH)	UU AL MV	49.5	102.3	68.4	72	26	46		0.14		14.3	5.0	B	0.192	
B61-2	2.0 - 4.0	Soft gray silty clay with silt layers (CL)	UU	30.4	114.6	87.9					0.27		14.8	5.0	B		
B61-2	4.0 - 6.0	Very soft gray silty clay with shell fragments and organic matter (CL)	MV	47.2												0.053	
B61-2	6.0 - 8.0	Very soft gray silty clay with silt layers, wood and sand at bottom (CL)	UU AL MV	33.1	111.4	83.7	41	18	23		0.15		14.5	5.0	B	0.802	Minivane off due to sand at bottom
B61-2	8.0 - 9.0	Gray sandy clay with silt and a 2" sand layer (CL)	-200	27.9						53.4							
B61-2	9.0 - 10.0	Very soft to soft gray clay with silt layers (CH)	UU MV	65.6	104.5	63.1					0.20		9.3	5.0	B	0.263	
B61-2	10.0 - 12.0	Gray sandy silt with clay (ML)	-200 AL MV	25.8			NP	NP	NP	57.0						0.374	
B61-2	12.0 - 14.0	Very soft gray clay with silt pockets, shell fragments and organic matter (CH)	UU	88.1	98.4	52.3					0.15		4.2	5.0	B		
B61-2	14.0 - 16.0	Medium gray silty clay with silt layers and shell fragments (CL)	UU MV	32.1	123.8	93.7					0.78		14.3	5.0	B	0.120	
B61-2	16.0 - 18.0	Gray silt with clay, shells and wood fragments (ML)	AL CONS SG MV	35.9	119.8	88.1	29	27	2							0.178	SG=2.678
B61-2	18.0 - 20.0	Medium gray clay with silt lenses and 3" sandy clay layer at bottom (CH)	MV	43.5												0.552	
B61-2	23.0 - 25.0	Soft gray clay with silt layers and sand layers (CH)	UU MV	49.9	112.8	75.3					0.30		11.5	8.0	B	0.276	
B61-2	28.0 - 30.0	Soft gray silty clay with sand lenses and 2" sand layer (CL)	MV	33.7												0.495	
B61-2	33.0 - 35.0	Soft gray clay with silt layers (CH)	UU	60.9	106.9	66.4					0.26		8.8	11.0	B		
B61-2	38.0 - 40.0	Gray clay with sand lenses (CH)		71.3													
B61-2	43.0 - 45.0	Very soft gray clay with silt layers (CH)	UU	60.6	100.5	62.6					0.16		11.3	14.0	B		
B61-2	48.0 - 50.0	Very soft gray clay with shell fragments (CH)	UU	55.8	103.6	66.5					0.17		14.3	15.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-24

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B62-1	0.0 - 2.0	Gray very silty clay with sand and organic matter (CL)	AL MC	35.3			33	22	11								
B62-1	2.0 - 4.0	Very soft gray silty clay with trace sand (CL)	-200 AL MV	38.6			36	24	12	93.4						0.027	
B62-1	4.0 - 6.0	Gray silt with clay (ML)	UU AL MV	35.7	115.5	85.1	31	26	5		0.47		15.0	5.0	B	0.080	UU: Sample slumping
B62-1	6.0 - 8.0	Very soft to soft gray silty clay with sand and silt layers (CL)	UU MV	39.7	118.9	85.1					0.28		15.0	5.0	B	0.134	
B62-1	8.0 - 10.0	Very soft to soft gray clay with silt layers (CH)	UU AL MV	51.8	108.1	71.2	52	26	26		0.25		10.1	5.0	B	0.018	
B62-1	10.0 - 12.0	Very soft gray clay with shell fragments and occasional silt lenses (CH)	MV	70.7												0.196	
B62-1	12.0 - 14.0	Very soft to soft gray clay with silt and sand lenses (CL)	UU MV	30.5	115.9	88.9					0.31		15.0	5.0	B	0.196	UU: Sample slumping
B62-1	14.0 - 16.0	Gray silt with clay and 2" silty sand layer at top (ML)	AL CONS SG MV	40.8	114.5	81.3	34	26	8							0.151	SG=2.683
B62-1	16.0 - 18.0	Gray clay with silt layers and silt lenses (CH)	AL MC	44.2			59	22	37								
B62-1	18.0 - 20.0	Soft gray clay with silt layers (CH)	UU MV	42.2	103.7	72.9					0.28		10.3	6.0	MS	0.388	
B62-1	23.0 - 25.0	Soft gray clay with silt layers (CH)	UU MV	61.7	101.9	63.1					0.35		2.3	8.0	MS	0.348	
B62-1	28.0 - 30.0	Medium gray silty clay with silt layers (CL)	UU MV	33.8	116.2	86.8					0.53		15.0	9.0	B	0.143	UU: Sample slumping
B62-1	33.0 - 35.0	Gray clay with silt lenses (CH)		47.8													
B62-1	38.0 - 40.0	Soft gray clay with silt layers and 1" silty sand layer at bottom (CH)	UU	42.5	114.8	80.5					0.41		7.6	12.0	B		
B62-1	45.0 - 47.0	Gray clay (CH)		45.5													
B62-1	48.0 - 50.0	Soft gray clay (CH)	UU	59.0	104.8	65.9					0.34		7.3	15.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-25

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B62-3	0.0 - 2.0	Very soft gray clay with silt layers and peat (CH)	UU MV	56.7	104.1	66.4					0.11		11.6	5.0	B	0.174	
B62-3	2.0 - 4.0	Very soft gray silty clay (CL)	UU AL	42.2	110.9	78.0	40	24	16		0.15		14.6	5.0	B		
B62-3	4.0 - 6.0	Very soft gray very silty clay with sand (CL)	AL CONS SG MV	40.2	115.0	82.0	34	24	10							0.107	SG=2.633
B62-3	6.0 - 8.0	Very soft gray silty clay with silt lenses (CL)	UU AL MV	35.1	114.1	84.4	38	25	13		0.24		14.6	5.0	B	0.245	
B62-3	8.0 - 10.0	Very soft gray clay with silt layers (CH)	UU MV	52.7	105.2	68.9					0.20		11.8	5.0	B	0.192	
B62-3	10.0 - 12.0	Very soft gray clay with shells and peat pockets (CH)	MV	48.0												0.209	
B62-3	12.0 - 14.0	Very soft gray silty clay with silt layers (CL)	UU	39.0	116.7	83.9					0.21		15.0	5.0	B		
B62-3	14.0 - 16.0	Soft gray silty clay with silt layers and sand layers (CL)	UU	29.6	120.5	93.0					0.48		6.8	5.0	B		
B62-3	16.0 - 18.0	Soft gray clay with peat and shell fragments (CH)	MV	83.2												0.348	
B62-3	18.0 - 20.0	Very soft gray clay with silt lenses and shell fragments (CH)	UU MV	70.8	101.0	59.2					0.16		10.3	6.0	B	0.196	
B62-3	23.0 - 25.0	Very soft gray clay with shell fragments (CH)	MV	73.8												0.160	
B62-3	28.0 - 30.0	Soft to medium gray clay with silt layers and shell fragments (CH)	UU MV	52.0	111.3	73.2					0.27		7.6	9.0	B	0.365	
B62-3	33.0 - 35.0	Gray clay with silt layers (CH)		64.3													
B62-3	38.0 - 40.0	Soft gray clay with silt layers and shell fragments (CH)	UU	48.0	111.0	75.0					0.38		15.0	12.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-26

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B63-3	0.0 - 2.0	Soft gray clay with roots and organic matter (CH)	ORG MV MC	92.9												0.285	OC=6.0%
B63-3	2.0 - 4.0	Very soft gray silty clay with sand and organic matter (CL)	AL MV MC	52.1			38	24	14							0.107	
B63-3	4.0 - 6.0	Very soft gray clay with silt and silt lenses (CL)	UU AL MV	40.4	112.9	80.4	42	23	19		0.16		13.5	5.0	B	0.178	
B63-3	6.0 - 8.0	Very soft gray clay with silt lenses (CH)	MV	61.5												0.062	
B63-3	8.0 - 10.0	Very soft gray clay (CH)	UU AL MV	78.7	98.3	55.0	88	27	61		0.12		6.8	5.0	B	0.205	
B63-3	10.0 - 12.0	Very soft to soft gray clay with silt and silt lenses (CL)	UU MV	38.2	114.8	83.0					0.28		15.0	5.0	MS	0.129	UU: Sample slumping
B63-3	12.0 - 14.0	Gray very silty clay with shell fragments (CL)	AL MC	36.3			33	21	12								
B63-3	14.0 - 16.0	Very soft gray clay with silt layers (CH)	UU MV	57.9	110.7	70.1					0.10		12.5	5.0	B	0.085	UU: Sample slumping
B63-3	16.0 - 18.0	Gray silt with clay layers and trace organics (ML)	UU MV	29.8	118.7	91.4					1.25		15.0	5.0	B	0.267	UU: Sample slumping
B63-3	18.0 - 20.0	Very soft gray and brown clay with silt lenses (CH)	AL CONS SG MV	75.1	97.4	55.6	93	30	63							0.218	SG=2.644
B63-3	23.0 - 25.0	Very soft to soft gray clay with organic matter and shell fragments (CH)	UU MV	62.4	94.8	58.4					0.32		5.3	8.0	B	0.147	
B63-3	28.0 - 30.0	Soft gray silty clay with silt layers and clay layers (CL)	MV	38.8												0.303	
B63-3	33.0 - 35.0	Soft gray clay with silt layers (CH)	UU	44.3	108.0	74.9					0.25		14.3	11.0	B		
B63-3	38.0 - 40.0	Gray clay (CH)		70.6													
B63-3	43.0 - 45.0	Very soft gray clay (CH)	UU	74.4	100.9	57.8					0.20		11.3	14.0	B		
B63-3	48.0 - 50.0	Gray clay (CH)		66.2													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-27

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B63-4	0.0 - 2.0	Very soft gray clay with silt and roots (CL)	UU AL ORG MV	36.3	103.2	75.7	47	21	26		0.04		15.0	5.0	B	0.085	OC=0.9%, UU: Sample slumping
B63-4	2.0 - 4.0	Very soft gray clay with silt layers and roots (CH)	UU MV	64.5	108.4	65.9					0.10		8.1	5.0	B	0.143	
B63-4	4.0 - 6.0	Very soft gray clay with silt layers and silt pockets (CH)	MV	58.8												0.187	
B63-4	6.0 - 8.0	Very soft gray clay with silt layers (CH)	UU MV	45.6	107.6	73.9					0.13		13.6	5.0	B	0.160	
B63-4	8.0 - 10.0	Very soft gray clay with silt lenses (CH)	UU AL MV	62.3	101.5	62.6	71	24	47		0.10		7.8	5.0	B	0.236	
B63-4	10.0 - 12.0	Very soft gray clay with silty sand lenses (CH)	MV	79.2												0.218	
B63-4	12.0 - 14.0	Very soft to soft gray clay with silt lenses (CH)	UU MV	44.2	113.7	78.9					0.18		10.1	5.0	B	0.285	
B63-4	14.0 - 16.0	Soft gray clay with sand lenses and shell fragments (CH)	MV	69.6												0.250	
B63-4	16.0 - 18.0	Very soft to soft gray clay with silt seams (CH)	UU MV	85.4	100.9	54.5					0.21		4.7	5.0	MS	0.263	
B63-4	18.0 - 20.0	Soft gray clay (CH)	MV	77.8												0.303	
B63-4	23.0 - 25.0	Very soft to soft gray silty clay (CL)	UU AL MV	40.5	115.0	81.8	38	24	14		0.27		15.0	7.0	B	0.187	
B63-4	28.0 - 30.0	Soft gray clay with sand lenses (CH)	MV	64.6												0.303	
B63-4	33.0 - 35.0	Very soft gray clay with silt seams (CH)	UU	56.6	108.8	69.5					0.23		9.3	10.0	B		
B63-4	38.0 - 40.0	Gray clay (CH)		65.5													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-28

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B64-2	2.0 - 4.0	Gray clay with roots and organic matter (CH)	AL MC	77.2			55	24	31								
B64-2	4.0 - 6.0	Very soft gray clay with shells and organic matter (CH)	UU MV	65.5	106.5	64.3					0.06		7.3	5.0	B	0.062	
B64-2	6.0 - 8.0	Very soft gray clay with shells and organic matter (CH)	-200 AL MV	58.9			53	20	33	98.6						0.058	
B64-2	8.0 - 10.0	Very soft gray clay with silt lenses (CH)	UU MV	75.6	101.0	57.5					0.11		7.1	5.0	B	0.129	
B64-2	10.0 - 12.0	Very soft gray clay with silt and silt lenses (CL)	AL CONS SG MV	37.0	106.6	77.8	43	19	24							0.196	SG=2.724
B64-2	12.0 - 14.0	Very soft gray silty clay (CL)	UU MV	38.0	114.6	83.0					0.20		15.0	5.0	B	0.076	UU: Sample slumping
B64-2	14.0 - 16.0	Very soft gray clay with organic matter (CH)	MV	91.6												0.080	
B64-2	16.0 - 18.0	Very soft gray clay with organic matter (CH)	UU AL MV	77.0	99.1	56.0	55	26	29		0.15		7.1	6.0	B	0.178	
B64-2	18.0 - 20.0	Very soft gray clay with organic matter (CH)	MV	82.9												0.196	
B64-2	23.0 - 25.0	Very soft gray clay with silt layers (CH)	UU MV	51.3	114.7	75.8					0.17		14.5	8.0	B	0.169	
B64-2	28.0 - 30.0	Very soft gray silty clay with sand (CL)	UU MV	32.9	117.4	88.3										0.174	
B64-2	33.0 - 35.0	Soft gray clay with silt lenses (CH)	UU	60.9	104.4	64.9					0.29		7.8	11.0	B		
B64-2	38.0 - 40.0	Gray clay (CH)		65.3													
B64-2	43.0 - 45.0	Very soft gray clay with silt layers (CH)	UU	60.9	111.0	69.0					0.19		14.1	14.0	B		
B64-2	48.0 - 50.0	Gray clay (CH)		74.6													
B64-2	53.0 - 55.0	Medium gray clay with ferrous nodules (CH)	UU	59.1	103.7	65.2					0.52		5.6	17.0	AS(60)		
B64-2	58.0 - 60.0	Gray clay with ferrous nodules (CH)		59.3													
B64-2	63.0 - 65.0	Medium gray clay with ferrous nodules (CH)	UU	55.7	105.7	67.9					0.54		8.3	20.0	MS		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

AASHTO ACCREDITED

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-29

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B64-2	68.0 - 70.0	Gray clay with ferrous nodules (CH)		58.5													
B64-2	73.0 - 75.0	Medium gray clay with ferrous nodules (CH)	UU	58.3	106.0	67.0					0.70		3.3	23.0	AS(70)		
B64-2	78.0 - 80.0	Gray clay (CH)		57.2													

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Slickensided = SLS Vertical Shear = VS Bulge = B Angle Shear = AS Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 2/14/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-30

Soil Boring ID	Depth Interval (ft)	D2488 Visual Description	Test Type	D2216 Moisture (%)	D2166/D2850 Unit Weight (PCF) Wet	D2166/D2850 Unit Weight (PCF) Dry	D4318 Atterberg Limits LL	D4318 Atterberg Limits PL	D4318 Atterberg Limits PI	D422/D1140 /D6913 %<#200 Sieve	D2166/D2850 Shear Strength (KSF)	D2166/D2850 Remolded Strength (KSF)	D2166/D2850 Failure Strain (%)	D2166/D2850 Confining Pressure (PSI)	D2166/D2850 Failure Type	D4648 Mini Vane Shear Strength (KSF)	Comments
B64-5	0.0 - 2.0	Very soft gray clay with sand lenses, silt lenses, and roots (CH)	UU -200 AL MV	35.0	104.9	77.8	64	23	41	79.0	0.18		11.3	5.0	B	0.134	
B64-5	2.0 - 4.0	Very soft to soft gray very silty clay with sand (CL)	UU AL MV	36.6	107.9	79.0	30	23	7		0.15		15.0	5.0	B	0.316	
B64-5	4.0 - 6.0	Soft gray clay with silty sand lenses and organic matter (CH)	MV	53.0												0.361	
B64-5	6.0 - 8.0	Very soft gray clay with organic matter (CH)	UU AL MV	73.5	100.1	57.7	73	27	46		0.10		10.8	5.0	B	0.129	
B64-5	8.0 - 10.0	Very soft gray clay with sand and silt layers (CL)	-200 MV	27.8						80.3						0.160	
B64-5	10.0 - 12.0	Very soft to soft gray clay with silt and silty sand layers (CL)	UU MV	35.6	116.1	85.6					0.41		15.0	5.0	B	0.143	
B64-5	12.0 - 13.0	Soft gray silty clay with sand (CL)	-200 MV	33.4						83.2						0.325	
B64-5	13.0 - 14.0	Soft gray clay with silty sand lenses (CH)	UU	80.7	105.1	58.2					0.31		4.0	5.0	B		
B64-5	14.0 - 16.0	Soft gray clay with silty sand lenses and shells (CH)	MV	78.9												0.446	
B64-5	16.0 - 18.0	Very soft to soft gray clay with silt and shells (CL)	UU -200 MV	35.6	118.1	87.1				98.1	0.43		15.0	5.0	B	0.205	
B64-5	18.0 - 20.0	Soft gray sandy silty clay (CL)	MV	38.5												0.290	
B64-5	23.0 - 25.0	Soft gray clay with silt lenses (CH)	UU MV	61.3	111.4	69.1					0.27		10.3	7.0	B	0.272	
B64-5	28.0 - 30.0	Very soft gray clay with sandy silt lenses (CH)	UU MV	42.0	112.4	79.1					0.23		14.3	9.0	B	0.209	
B64-5	33.0 - 35.0	Gray clay with sandy silt lenses (CH)		42.2													
B64-5	38.0 - 40.0	Soft gray clay with silt lenses (CH)	UU	53.2	107.9	70.4					0.47		5.8	12.0	B		
B64-5	43.0 - 45.0	Gray clay with sand lenses and silt lenses (CH)		45.5													
B64-5	48.0 - 50.0	Medium gray clay with silt layers (CH)	UU	60.1	106.6	66.6					0.71		3.9	15.0	B		

Disclaimer: The results presented relate only to those samples tested.
Note: ASTM standard identification numbers shown above each test description.

Multiple Shear = MS Vertical Shear = VS Angle Shear = AS
Slickensided = SLS Bulge = B Crumble = C

Technical Responsibility: Karen Allen
Title: QAM
Date: 1/31/19

AASHTO ACCREDITED

Summary of Lab Results
Project No.: 18274-005-00

Spanish Pass Ridge and Marsh Creation

Plaquemines Parish, Louisiana

GEOENGINEERS

Figure C-31