SOUTHERN EARTH SCIENCES
Geotechnical | Environmental | Materials Testing

MAWSS Spring Hill Reservoir

Mordecai Lane

Mobile, AL

Subsurface Investigation Report

Prepared for:
Mobile Area Water and Sewer System
SESI Project No: M25-164
May 30, 2025

SOUTHERN EARTH SCIENCES

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May 30, 2025

MOBILE AREA WATER AND SEWER SYSTEM
MAWSS Park Forest Plaza
4725 Moffett Road
Mobile, AL 36618

ATTENTION: Mr. Daryl Russell, P.E.

REFERENCE: Subsurface Investigation Report
MAWSS Spring Hill Reservoir
Mordecai Lane
Mobile, AL
SESI Project No: M25-164

Dear Mr. Russell,

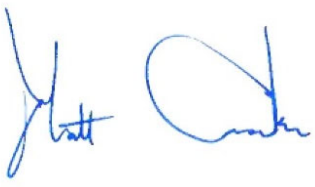
Southern Earth Sciences, Inc (SES) has completed the geotechnical subsurface investigation for the referenced project. This report presents our understanding of the available project information, presents the information collected in the subsurface investigation, and presents some geotechnical considerations related to demolishing the reservoir and regrading the site.

We appreciate this opportunity to be of service for this project. Please do not hesitate to contact us if you have any questions.

Sincerely,

SOUTHERN EARTH SCIENCES, INC.

Daniel S. McGough 2025.05.30 17:35:44 -05'00'



Daniel McGough
Senior Engineer
Registered, Alabama 36166

Matt Coaker, P.E.
Vice President
Registered, Alabama 30835

DM/MC

Attachments

MOBILE AREA WATER AND SEWER SYSTEM

Subsurface Investigation Report
MAWSS Spring Hill Reservoir
Mordecai Lane, Mobile, AL
SESI Project Number: M25-164
May 30, 2025

MOBILE AREA WATER AND SEWER SYSTEM
Subsurface Investigation Report
MAWSS Spring Hill Reservoir
Mordecai Lane, Mobile, AL
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1.0 PROJECT INFORMATION AND SITE DESCRIPTION

The reservoir owned by MAWSS on Mordecai Lane in Spring Hill is no longer used and has been drained for a number of years. We understand that MAWSS desires to obtain some basic geotechnical information about the site that can be provided to potential buyers of the property, who would be expected to demolish the reservoir and redevelop the site for other uses.

The location of the site is shown on a USGS topographic map in **Appendix 1**. The reservoir is roughly square in shape, and has raised earthen embankments around all four sides that are about 20 feet high. The reservoir has a flexible cover and a concrete and masonry liner. USGS topographic maps available back to 1940 indicate the reservoir at the current site. Historic accounts of the city water system suggest that some form of the reservoir has existed at the site since around 1900.

We were provided a copy of engineering drawings for modifications to the reservoir from 1960 and another set from 1974. The drawings indicate the reservoir as it existed just prior to the 1960 modifications consisted of two adjoining reservoirs formed by a perimeter embankment and a divider embankment. The 1960 drawings show the embankments having a top elevation of 216 with slopes inclined from about 4:1 to 5:1 and inside slopes inclined at 2:1 with a brick and plaster liner on the inside slopes and bottom of the reservoir. The 1960 drawings depict the perimeter embankment being raised toward the outside to a crest elevation of 220 and the outside slope steepened to 3:1. A concrete liner was added to the upper part of the inside slope that overlapped a portion of the brick liner on the inside slopes, and a concrete walkway added around the crest of the perimeter embankment. The 1974 drawings show removal of the divider embankment across the middle of the reservoir, with a new section of concrete liner in the area where the divider embankment was removed, and the addition of a floating, flexible cover over the reservoir.

Based on information provided to us by MAWSS, several retired 12 to 24 inch water lines are located underground on the east and west sides of the reservoir, and several water lines 8” to 30” in diameter are underground along the north side of the reservoir.

The outside slopes and crest of the reservoir are generally soil with grass. There is a concrete walkway and fence around the crest of the reservoir embankment. The area surrounding the outside of the reservoir embankment within the property that contains the reservoir is also generally grass with some larger trees and areas small trees and brush. There is a concrete sidewalk from an old decorative entrance gate on the west side of the reservoir property and concrete steps that climb the west side of the reservoir embankment.

2.0 FIELD INVESTIGATION AND LABORATORY TESTING

Five soil test borings were performed with a drill rig on the reservoir embankment to depths ranging from about 15 to 25 feet. In addition, the liner inside the reservoir was cored in 5 locations with an electric core drill, and then hand auger borings were extended to a depth of about 2 feet below the liner. The borings and coring were performed by SES field crews at the approximate locations shown on the Test Location Plan included in **Appendix 1**. Test locations were selected by SES engineering staff in locations that were accessible with the drilling equipment. The test locations have not been surveyed, and their precise location and elevations are not known. The locations depicted on the test location plan are estimated based on a handheld GPS device and their approximate distance and position relative to existing site features visible on the aerial image.

Soil borings with Standard Penetration Tests (SPTs) were advanced to a depths of approximately 15 to 25 feet below the existing ground surface using track mounted drilling equipment. Soil sampling and penetration testing in the soil test borings were performed in general accordance with ASTM Specification D 1586 using solid stem augers. At regular intervals during the process, the drill rods were removed, and soil samples were obtained with a standard 2-inch split tube sampler. Soils were sampled continuously to boring termination. Samples were examined by an engineer and classified in accordance with the Unified Soil Classification System. Soil descriptions and penetration resistances are shown on the appropriate Soil Boring Log sheets attached in **Appendix 2**. Logs of the hand auger borings are also included in **Appendix 2**. Photographs of the liner core samples are included in **Appendix 3**.

Representative portions of soil samples obtained during the investigation were transported to our laboratory for classification testing. Results of the laboratory testing are summarized in a table found in Appendix 4 with results also included on the boring logs. Tests performed included natural moisture content, Atterberg Limits, and particle size distribution to support determination of classifications by the USCS and AASHTO classification systems. Laboratory test results are included in **Appendix 4**.

3.0 GENERALIZED SUBSURFACE CONDITIONS

The subsurface descriptions below are generalized to highlight the major subsurface stratigraphy encountered across the site. The Boring Logs attached in **Appendix 2** present specific information at individual test locations including soil descriptions, stratification, and SPT N-values. This information is representative of conditions encountered at boring and sounding locations. Variations may occur and should be expected between test locations. The stratification represents the approximate boundary between subsurface materials as the actual transition may be gradual. The laboratory test data is also shown on the logs.

3.1 Soil Profile

The borings made on the embankment around the reservoir encountered topsoil at the ground surface ranging from 0 to 2 inches thick. Below the surface materials, the 4 borings B-1 through B-4 drilled from the top of the embankment encountered red and brown clayey sands and silty sands until the termination depth of the borings at depths ranging from 16.5 to 26.5 feet. The upper 17 to 20 feet of soils appeared to be existing fill materials comprising the existing embankment which were underlain by natural soils very similar in appearance and composition to the fill within the depths explored. SPT N-values in the existing fill materials ranged from 2 to 14 bpf, indicating a very loose to medium dense relative density. Most of the existing fill materials had SPT N-values in the range of 2 to 10 bpf, indicating a very loose to loose relative density and that these materials were generally placed with an erratic and overall low amount of compactive effort. Boring B-5 located lower on the west slope of the embankment similarly encountered loose, brown, silty sand existing fill to a depth of about 12 feet, underlain by medium dense, red, clayey sand until the boring was terminated at a depth of 16.5 feet.

3.2 Liner Core Samples and Liner Subgrade

The 5 core samples of the reservoir bottom liner consisted of a thin surface layer of sanded grout or plaster about 1/2 to 1 inches thick over 5 to 7 inches of concrete made with brick (or grouted pieces of brick). Some of the cores were relatively weak and brittle near their bottom and broke into several pieces when handled. The surface layer separated from the lower layer in some of the cores while in others it was well attached. Photographs of the core samples are included in **Appendix 3** of this report. The hand auger borings beneath the liner at the reservoir bottom encountered red, clayey sand and sandy clay to the explored depth of about 2 feet below the liner. Hand auger boring logs are included in **Appendix 2**.

3.3 Groundwater

Free groundwater was not encountered in the borings at the time of exploration. The soils sampled at most depths in the borings were moist at the time of the exploration. Soils in the borings at depths corresponding to elevations near the base of the embankment and reservoir bottom were commonly encountered as very moist to wet. Soils sampled in the hand auger borings at the bottom of the reservoir were also sampled as very moist to wet.

The site had received rainfall over the days preceding the work. The bottom of the reservoir was observed to retain a small depth of water (visually estimated to be 1 to 2 feet deep) following rainfall in the days prior to when the borings were drilled. The ponded water was generally gone within approximately 1 week of time between when the borings were drilled around the rim of the reservoir and the coring was done inside the reservoir from a combination of infiltration into the ground and evaporation.

Groundwater and saturated soil levels will fluctuate with weather conditions at the time of construction. The clayey and silty soils present at this site may create shallow perched water conditions after periods of rainfall.

Groundwater depths or elevations should be verified at the time of construction for cases where groundwater variations are potentially significant for construction. Fluctuation in the groundwater table will occur due to variances in rainfall, elevation, drainage, types of soil encountered and other factors not evident at the time measurements were made. Reference to depth has been made with respect to the existing ground surface encountered at the time of our field investigation. Groundwater levels encountered at each test location at the time of our investigation are shown on the appropriate Soil Boring Logs attached in **Appendix 2.**

4.0 DEMOLITION AND SITE GRADING CONSIDERATIONS

This section of the report provides interpretation of the information gathered in the subsurface investigation, and some preliminary geotechnical considerations related to demolition of the reservoir and regrading the site to tie into surrounding grades. The following information is intentionally brief and preliminary in nature and not intended to be a comprehensive set of recommendations for earthwork or site preparation for any future development of the site. No topographic survey of the site or information regarding future grading was provided. A more detailed geotechnical investigation and report that is appropriate for the type of development under consideration should be completed in the future.

4.1 Overview

The borings indicate the reservoir embankment is generally constructed of clayey sand and silty sand. The existing fill materials were erratically compacted with a low to moderate degree of compactive effort. The reservoir has an existing liner consisting of concrete and/or grouted masonry rubble on the bottom and interior side slopes that ranged in thickness from about 6 to 8 inches at the cored locations.

The soils beneath the base of the perimeter embankment and beneath the liner on the bottom of the pond area also consisted of clayey sands, silty sands, and some sandy clay within the depths explored. Soils encountered in several locations near the base elevation of the perimeter embankments and immediately underlying the liner at the bottom of the pond area were wet at the time of exploration. Rainwater tends to collect in the bottom of the reservoir area and then infiltrates slowly into the underlying clayey soils. Depending on prevailing weather conditions at the time of demolition and grading, wet soils near the bottom elevation of the pond area may require overexcavation and replacement to produce a stable subgrade or support fill compaction. The silty and clayey soils at the site will degrade and weaken when exposed to wet weather and construction traffic.

We expect that the embankments around the perimeter of the reservoir, as well as the liner, cover, underground pipes, and other ancillary structures will be demolished and removed from the site prior to its redevelopment. The bottom of the reservoir appears to be somewhat lower than the surrounding grades on average, so some amount of fill will likely need to be placed in the interior of the reservoir area to match the surrounding grades.

4.2 General Grading and Site Preparation Considerations

Effective drainage, including ditching and positive grading, should be established across the site during the initial stages of site grading, and modified as necessary during construction. Once adequate site drainage is in place, the initial step in site preparation should be the removal of all topsoil, surface organics, and liner material. Once all surface materials have been removed excavations should extend as required to reach desired rough final subgrade elevations for the site. The site has several areas with mature trees that will require grubbing and removal of roots and stumps. All excavations for root masses and stumps should be cleaned out and backfilled with well-compacted fill soils that meets project specifications. Similarly, underground pipes and other below-grade structures should be removed, and the trench excavations cleaned of loose material and debris, and the excavations backfilled with well-compacted fill that meets project specifications.

Exposed surfaces after site stripping and excavating to the planned subgrade elevations should be evaluated by visual inspection by a qualified engineer, or materials technician working under the direction of an engineer, and then proofrolled with a loaded dump truck. Areas containing unstable or unsuitable materials, or areas that pump or rut excessively when proofrolled should be overexcavated as needed to reach more stable material and then backfilled with well-compacted soil fill that meets project specifications for fill material for that specific location.

4.3 Existing Embankment Fill Soils

The embankment fill soils sampled in the borings were classified in USCS groups Clayey Sand (SC) and Silty Sand (SM) and AASHTO classifications of A-6 and A-2-4. Laboratory tests on selected samples indicated fines contents (% passing a No. 200 sieve) of 19 to 44 %, with 73 to 89% passing a No. 40 sieve. Atterberg limits tests indicate liquid limit (LL) values ranging from 26 to 34 % and Plasticity Indexes (PI) values ranging from non-plastic (NP) to 19%. The existing fill materials sampled were free of significant amounts of debris, organics, or deleterious materials. Moisture adjustment, either wetting or drying, may be required to achieve good compaction of these materials.

4.4 Backfill Considerations in Reservoir Area

The geometry of the existing reservoir causes rainwater to be collected and temporarily pond at the bottom of the reservoir. The rainwater then slowly evaporates and infiltrates through the liner and into the underlying soils. The reservoir was likely intentionally sited at this location in part due to the prevalence of the sandy clay and clayey sand to minimize water loss through infiltration through the bottom of the reservoir. The clayey soils present at the bottom of the pond will cause surface water

to pond in excavations and perched groundwater conditions at shallow depths following periods of wet weather. Once the reservoir embankment and liner are removed and the soils are exposed to dry weather, the wet soils would generally be expected to dry back to a more typical moist condition similar to the soils outside of the reservoir. However, the excavated pond area will tend to continue to hold water and stay wet following rainfall as long it is lower than the surrounding area even after removal of the liner and embankments. The soil moisture and groundwater conditions will vary with time and depending on prevailing weather conditions at the time of the demolition and grading.

Assuming conditions are similar to the time of our exploration, we expect that some amount of the soils beneath the liner and near the base elevation of the embankments will need to be undercut to remove wet and disturbed soils and to exposed more stable soils that will support compaction of new backfill material. While detailed site preparation requirements and fill specifications should be developed by the design team for any future redevelopment, we would generally advise that the pond area be backfilled with clayey sand soils having similar permeability characteristics as the surrounding soils to avoid creating an area that retains water below grade. The top of the clayey sand backfill should be graded with adequate slope and a slight crown to promote drainage. If the clayey fill is overlain by a more granular fill such as might be specified for a pavement or structural slab subgrade, then the top of the clayey soil should be sloped and crowned prior to placement of the overlying granular fill to promote drainage off the top of the clayey soil and avoid creating a perched water condition.

5.0 GENERAL COMMENTS AND LIMITATIONS

While the soil borings and core sample locations are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of the subsurface materials of the region are anticipated and may be encountered. The delineation between soil types shown on the logs is approximate and the description represents our interpretation of subsurface conditions at the designated test locations and on the date explored.

This report has been prepared to provide limited geotechnical data and information about subsurface conditions at the site related to demolition and rough regrading of the site following removal of the existing facilities. At the time of writing, no information was available regarding the expected grading plans or development planned for the site. Additional field exploration and a more comprehensive subsurface investigation report should be prepared for the site by future developers or buyers of the property that accounts for future development plans.

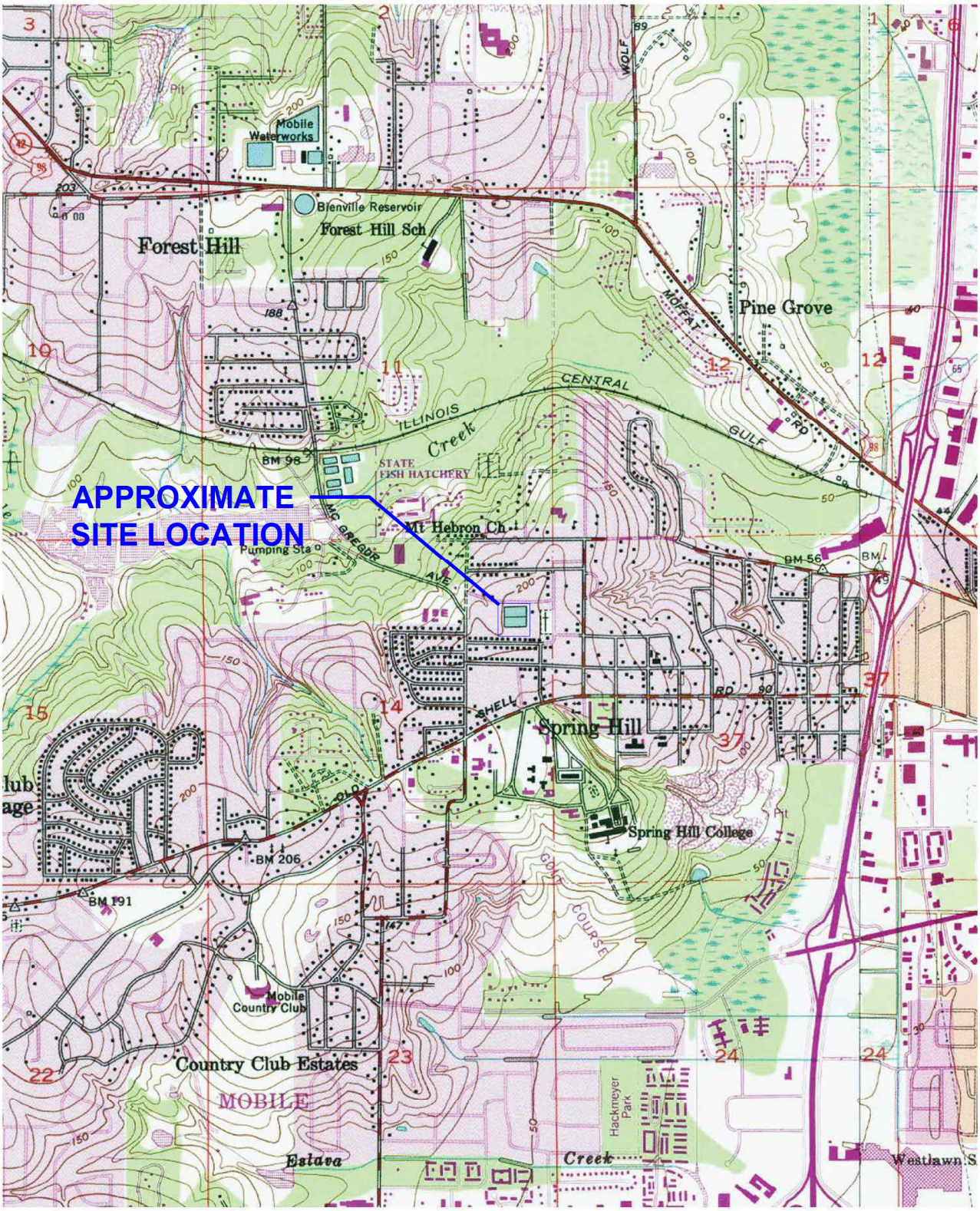
This report is intended for use with regard to the specific project and purposes discussed herein as we understand it at this time, and any substantial changes in the project should be brought to our attention so that we may determine how such changes may affect our interpretations and conclusions. Professional judgments on design alternatives and criteria are presented in this report. These are based partly on our evaluations of technical information gathered, partly on our understanding of the characteristics of the project being planned, and partly on our general experience with subsurface conditions in the area. We do not guarantee performance of the project in any respect, only that our engineering work and judgments rendered meet the standard of care of our profession.

This report is exclusively for the use and benefit of the addressee(s) identified on the first page of this report and is not for the use or benefit of, nor may it be relied upon by any other person or entity. The contents of this report may not be quoted in whole or in part or distributed to any person or entity other than the addressee(s) hereof without, in each case, advanced written consent.

APPENDIX 1

Site Location Map

Test Location Plan



MAWSS SPRING HILL RESERVOIR
MORDECAI LANE,
MOBILE, ALABAMA

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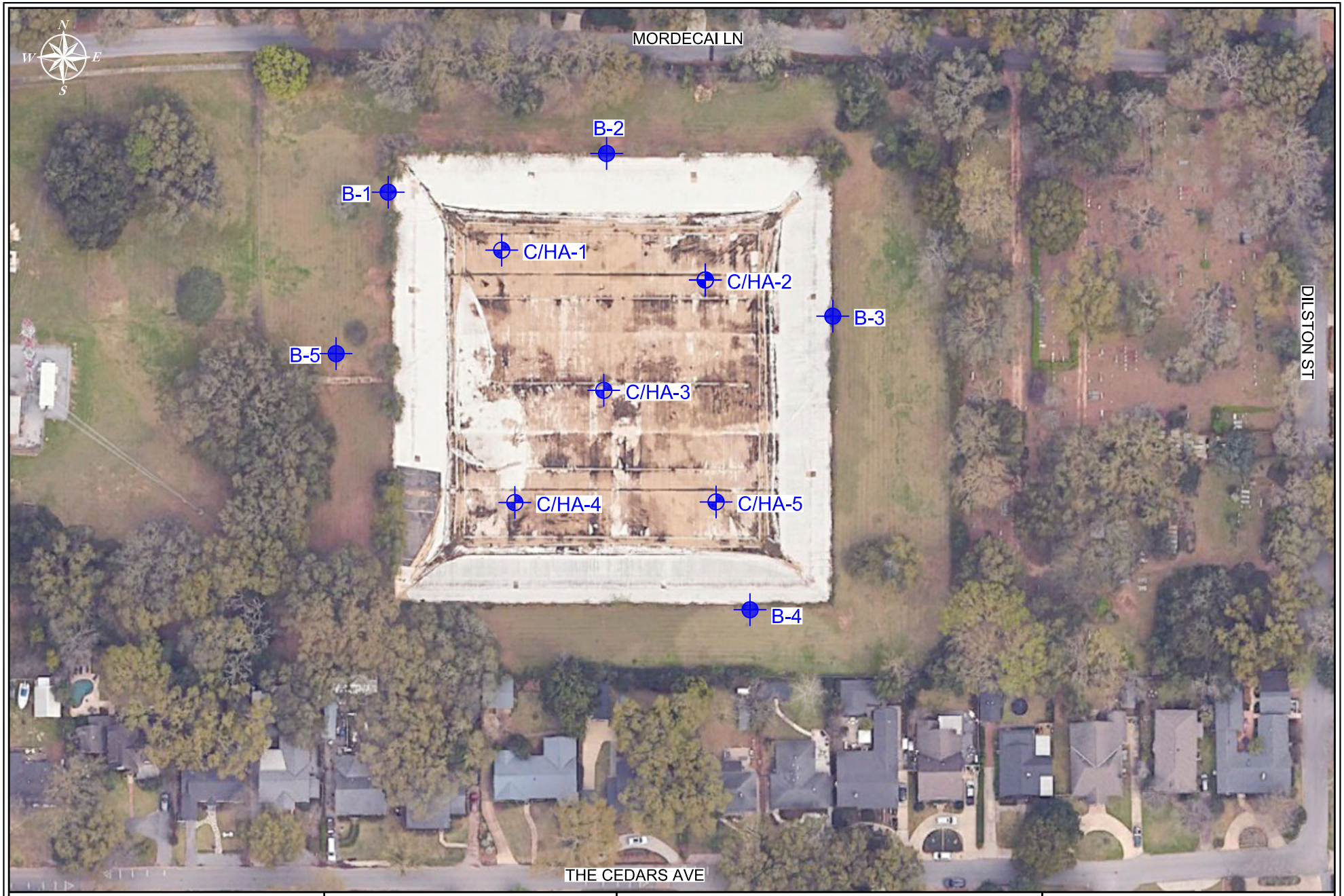
FIGURE 1 -
SITE LOCATION MAP
SESI JOB NO.: M25-164



NOT TO SCALE

CORE & HAND AUGER

SOIL TEST BORING

MAWSS SPRING HILL RESERVOIR
MOBILE, AL

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FIGURE 2 -
TEST LOCATION PLAN
SESI JOB #: M25-164

APPENDIX 2

Soil Boring Logs

Hand Auger Boring Logs

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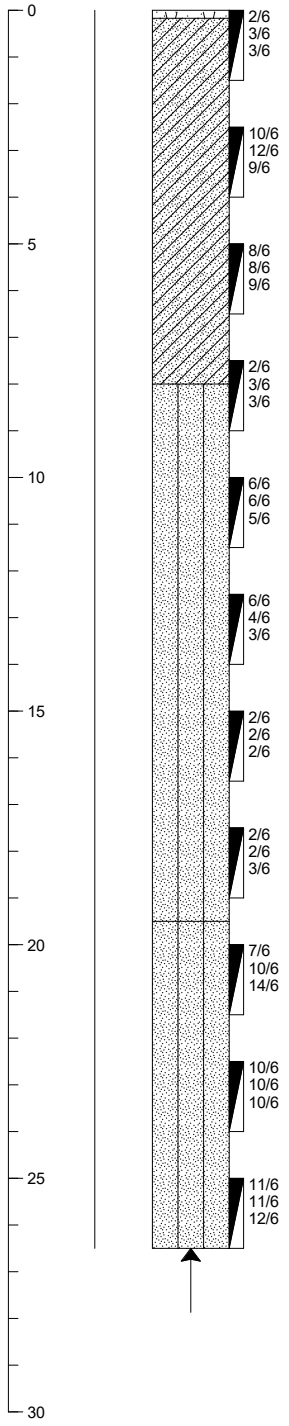
SOIL BORING LOG

BORING NO.: B-1
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: FLIGHT AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/10/25
DATE COMPLETED: 04/10/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/10/25
GEOL / ENGR: D. MCGOUGH
DRILLER: DERRICK



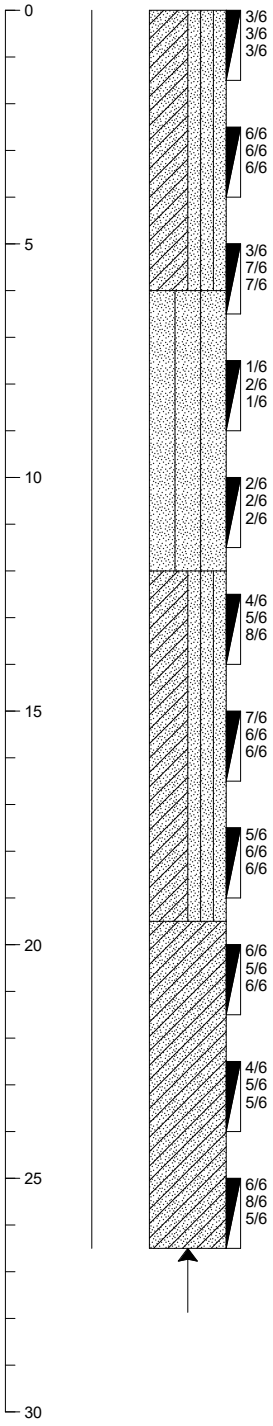
Elevation / Depth	USCS	Description	SPT N	Moist. %	LL %	PI %	% passing #200 / #40 sieve
0	SC	2" TOPSOIL / Loose to Medium Dense, Moist, Red, Clayey SAND (Fill)	6				
			21				
5			17	13.8	27	13	37 / 84
	SM	Loose to Medium Dense, Moist, Brown, Silty SAND (Fill)	6				
10			11	10.8	NP	NP	24 / 79
			7				
15			4				
			5				
20	SM	Medium Dense, Moist, Red, Slightly Clayey, Silty SAND and Clayey SAND	24				
			20				
25			23				
30							

Remarks: N30.70251
W88.14262

SOUTHERN EARTH SCIENCES

SOIL BORING LOG

BORING NO.: B-2
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: FLIGHT AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/10/25
DATE COMPLETED: 04/10/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/10/25
GEOL / ENGR: D. MCGOUGH
DRILLER: HILLARD



Elevation / Depth	USCS	Description	SPT N	Moist. %	LL %	PI %	% passing #200 / #40 sieve
	SM	Loose to Medium Dense, Moist, Red, Silty SAND and Clayey SAND (Fill)	6				
			12	15.1	NP	NP	30 / 73
	SM	Very Loose to Medium Dense, Moist, Brown, Silty SAND (Fill)	14				
			3	8.3	NP	NP	19 / 85
			4				
	SM	Medium Dense, Moist, Red Brown, Brown, Silty SAND and Clayey SAND (Fill)	13				
			12				
			12				
	SC	Medium Dense, Moist, Red, Clayey SAND	11				
			10				
			13				

Remarks: N30.70262
W88.14206

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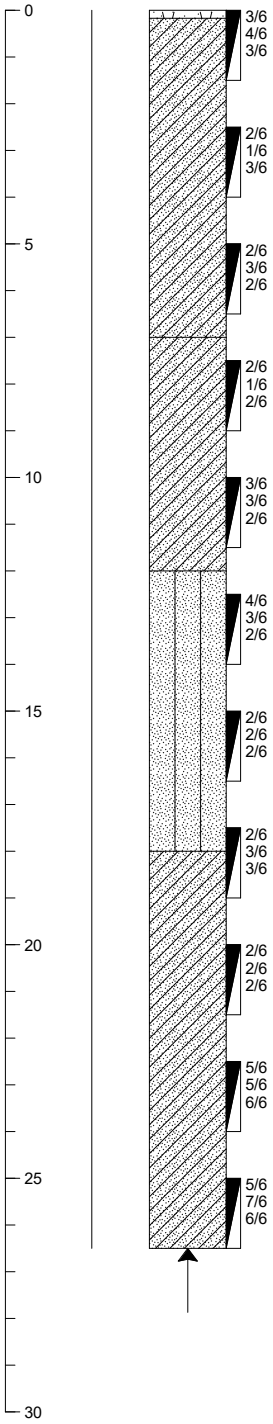
SOIL BORING LOG

BORING NO.: B-3
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: FLIGHT AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/10/25
DATE COMPLETED: 04/10/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/10/25
GEOL / ENGR: D. MCGOUGH
DRILLER: P. BYRD



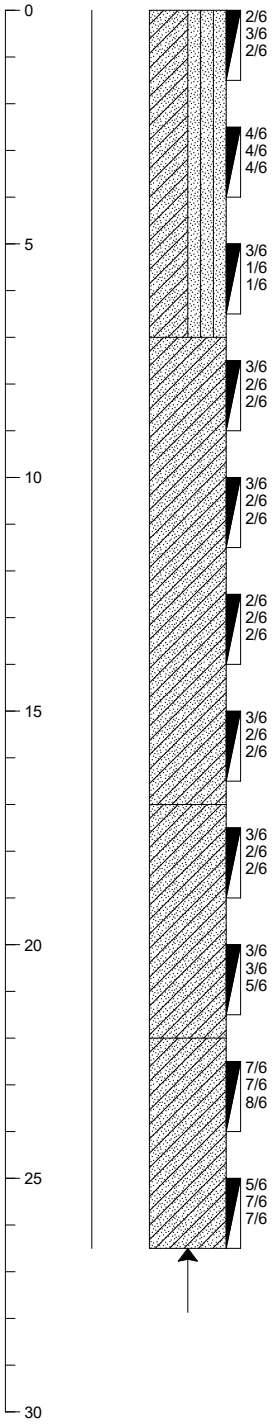
Elevation / Depth	USCS	Description	SPT N	Moist. %	LL %	PI %	% passing #200 / #40 sieve
	SC	2" TOPSOIL / Very Loose to Loose, Moist, Red, Clayey SAND (Fill)	7				
			4				
			5	17.6	32	16	38 / 83
	SC	Very Loose to Loose, Moist, Orange, Brown, Clayey SAND (Fill)	3				
			5				
	SM	Very Loose to Loose, Moist, Brown, Silty SAND (Fill)	5				
			4				
	SC	Loose to Medium Dense, Moist to Wet, Red Brown, Clayey SAND	6				
			4	18.8	33	19	39 / 85
			11				
			13				

Remarks: N30.70231
W88.14132

SOUTHERN EARTH SCIENCES

SOIL BORING LOG

BORING NO.: B-4
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: FLIGHT AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/10/25
DATE COMPLETED: 04/10/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/10/25
GEOL / ENGR: D. MCGOUGH
DRILLER: P. BYRD



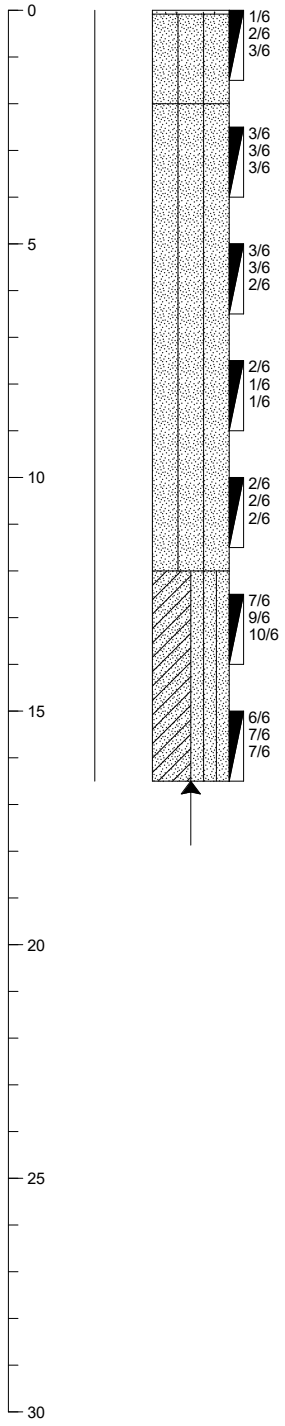
Elevation / Depth	USCS	Description	SPT N	Moist. %	LL %	PI %	% passing #200 / #40 sieve
0	SC	Very Loose to Loose, Moist, Red, Brown, Clayey SAND, some Silty SAND (Fill)	5				
			8				
5			2				
	SC	Loose, Moist, Red, Brown, Clayey SAND (Fill)	4				
			4				
10			4	16.6	26	11	44 / 89
			4				
15	SC	Loose, Moist to Wet, Red, Brown, Clayey SAND	4				
			8	21.8	34	14	42 / 87
20	SC	Medium Dense, Moist, Red, Clayey SAND	15				
			14				
25							
30							

Remarks: N30.70149
W88.14159

SES SOUTHERN EARTH SCIENCES

SOIL BORING LOG

BORING NO.: B-5
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: FLIGHT AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/10/25
DATE COMPLETED: 04/10/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/10/25
GEOL / ENGR: D. MCGOUGH
DRILLER: P. BYRD



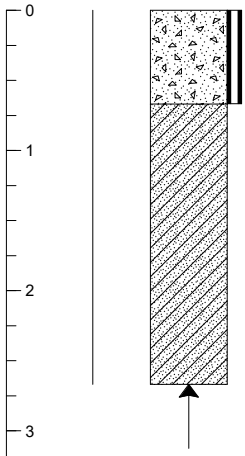
Elevation / Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	Description	SPT N
0		SM	1" TOPSOIL	
			Loose, Moist, Red, Slightly Clayey, Silty SAND, with trace brick fragments and gravel, trace organics (Fill)	5
		SM	Loose to Very Loose, Moist, Brown, Silty SAND (Fill)	6
5				5
				2
10				4
		SC	Medium Dense, Moist, Red, Slightly Clayey, Silty SAND and Clayey SAND	19
15				14
20				
25				
30				

Remarks: N30.70218
W88.14285

SOUTHERN EARTH SCIENCES

HAND AUGER BORING LOG

BORING NO.: Core/HA-1
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: CORE & HAND AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/16/25
DATE COMPLETED: 04/16/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/16/25
GEOL / ENGR: D. MCGOUGH
DRILLER: TRAY & DERRICK

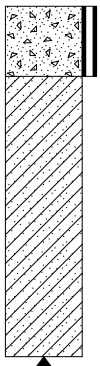
Elevation / Depth	Soil Symbols Sampler Symbols	USCS	Description
0			Cored Liner: 7.5" to 8" thick Core (1" Sand Grout over 7" Concrete with Brick Pieces)
1		SC	Red, very moist to wet, clayey SAND
2			
3			
4			
5			
6			
7			
8			
9			
10			

Remarks: N30.70242
W88.14232

SES SOUTHERN EARTH SCIENCES

HAND AUGER BORING LOG

BORING NO.: Core/HA-2
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: CORE & HAND AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/16/25
DATE COMPLETED: 04/16/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/16/25
GEOL / ENGR: D. MCGOUGH
DRILLER: TRAY & DERRICK

Elevation / Depth	Soil Symbols Sampler Symbols	USCS	Description
0			Cored Liner: 6" thick Core (1" Sand Grout over 5" Concrete with Brick Pieces)
1		SC	Red, very moist to wet, sandy CLAY to clayey SAND
2			
3			
4			
5			
6			
7			
8			
9			
10			

Remarks: N30.70226
W88.14181

SES SOUTHERN EARTH SCIENCES

HAND AUGER BORING LOG

BORING NO.: Core/HA-3
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: CORE & HAND AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/16/25
DATE COMPLETED: 04/16/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/16/25
GEOL / ENGR: D. MCGOUGH
DRILLER: TRAY & DERRICK

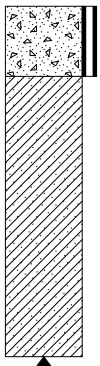
Elevation / Depth	Soil Symbols Sampler Symbols	USCS	Description
0			Cored Liner: 5-3/4" thick Core (3/4" Sand Grout over 5" Concrete with Brick Pieces)
1		SC	Red, very moist to wet, sandy CLAY to clayey SAND
2			
3			
4			
5			
6			
7			
8			
9			
10			

Remarks: N30.70219
W88.14201

SES SOUTHERN EARTH SCIENCES

HAND AUGER BORING LOG

BORING NO.: Core/HA-4
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: CORE & HAND AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/16/25
DATE COMPLETED: 04/16/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/16/25
GEOL / ENGR: D. MCGOUGH
DRILLER: TRAY & DERRICK

Elevation / Depth	Soil Symbols Sampler Symbols	USCS	Description
0			Cored Liner: 6" Thick Core (1/2 to 3/4" Sand Grout over 5 to 5-1/2" Concrete with Brick Pieces)
		CL	Red, very moist to wet, sandy CLAY
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

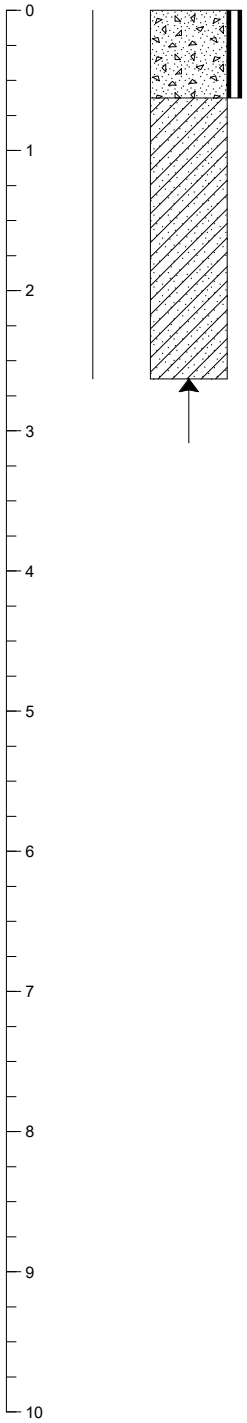
Remarks: N30.70154
W88.14193

SES SOUTHERN EARTH SCIENCES

HAND AUGER BORING LOG

BORING NO.: Core/HA-5
PROJECT: MAWSS SPRINGHILL RESERVOIR
PROJECT NO.: M25-164
PROJECT LOCATION: MOBILE, AL
METHOD: CORE & HAND AUGER
BORING LOCATION: SEE TEST LOCATION PLAN
BORING ELEVATION: EXISTING GROUND
DATE DRILLED: 04/16/25
DATE COMPLETED: 04/16/25
WATER LEVEL: NOT ENCOUNTERED
WATER LEVEL DATE: 04/16/25
GEOL / ENGR: D. MCGOUGH
DRILLER: TRAY & DERRICK

Elevation / Depth	Soil Symbols Sampler Symbols	USCS	Description
0			Cored Liner: 7-1/2" thick Core (5/8"-1" Sand Grout over 6-1/2" Concrete made with Brick Pieces)
1		SC	Red, very moist to wet, sandy CLAY to clayey SAND
2			
3			
4			
5			
6			
7			
8			
9			
10			



Remarks: N30.70179
W88.14188

SES SOUTHERN EARTH SCIENCES

APPENDIX 3

Liner Core Photographs

Core HA-1

MAWSS Spring Hill Reservoir Mordecai Lane, Mobile, AL SES Project No. M25-164	SES SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Liner Core Photographs

Core HA-2

MAWSS Spring Hill Reservoir Mordecai Lane, Mobile, AL SES Project No. M25-164	SES SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Liner Core Photographs

Core HA-3

MAWSS Spring Hill Reservoir Mordecai Lane, Mobile, AL SES Project No. M25-164	SES SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Liner Core Photographs

Core HA-4

MAWSS Spring Hill Reservoir Mordecai Lane, Mobile, AL SES Project No. M25-164	SES SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Liner Core Photographs

Core HA-5

MAWSS Spring Hill Reservoir Mordecai Lane, Mobile, AL SES Project No. M25-164	SES SOUTHERN EARTH SCIENCES Geotechnical | Environmental | Materials Testing	Liner Core Photographs

APPENDIX 4

Laboratory Test Summary

Particle Size Distribution Reports

SOUTHERN EARTH SCIENCES

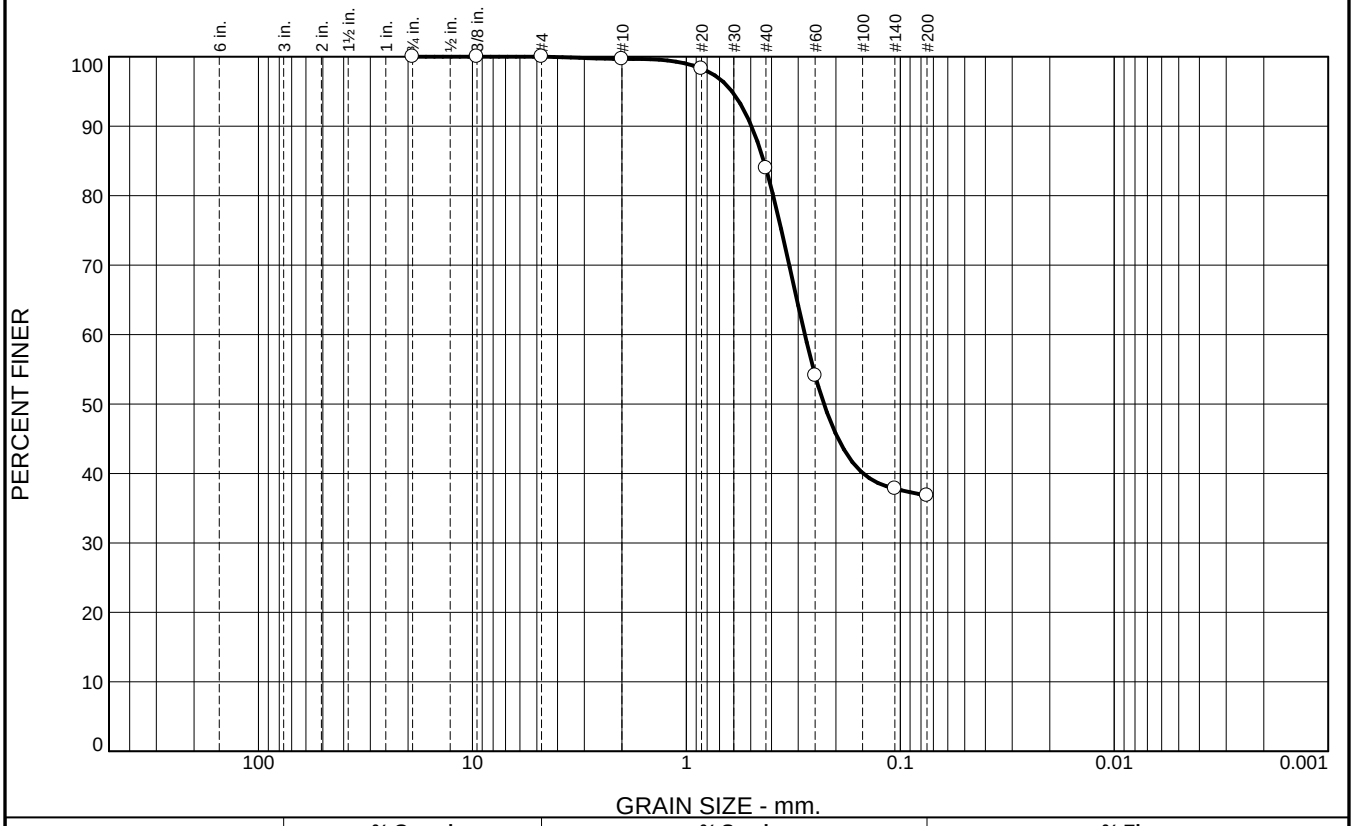
Laboratory Test Data Summary

SOUTHERN EARTH SCIENCES

Client:	MAWSS	**Date:**	04/23/25
Project:	MAWSS Springhill Reservoir	**Project No:**	M25-164

Test Location	Sample	Sample Depth (ft)	USCS Classification	AASHTO Classification	Moisture Content (%)	Atterberg Limits		Passing No. 200 (%)	Passing No. 40 (%)
						LL	PI		
B-1	S-3	5.0-6.5	SC	A-6(1)	13.8	27	13	36.8	84.0
B-1	S-5	10.0-11.5	SM	A-2-4(0)	10.8	NV	NP	23.6	78.7
B-2	S-2	2.5-4.0	SM	A-2-4(0)	15.1	NV	NP	30.4	73.3
B-2	S-4	7.5-9.0	SM	A-2-4(0)	8.3	NV	NP	19.1	84.5
B-3	S-3	5.0-6.5	SC	A-6(2)	17.6	32	16	38.1	82.9
B-3	S-9	20.0-21.5	SC	A-6(3)	18.8	33	19	38.8	84.6
B-4	S-6	12.5-14.0	SC	A-6(1)	16.6	26	11	43.9	89.1
B-4	S-9	20.0-21.5	SC	A-6(2)	21.8	34	14	42.0	87.2

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	15.7	47.2	36.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	100.0		
#4	100.0		
#10	99.7		
#20	98.3		
#40	84.0		
#60	54.1		
#140	37.8		
#200	36.8		

* (no specification provided)

Material Description

RED CLAYEY SAND

Atterberg Limits

PL= 14 LL= 27 PI= 13

Coefficients

D_{90}= 0.4962 D_{85}= 0.4347 D_{60}= 0.2795
D_{50}= 0.2275 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

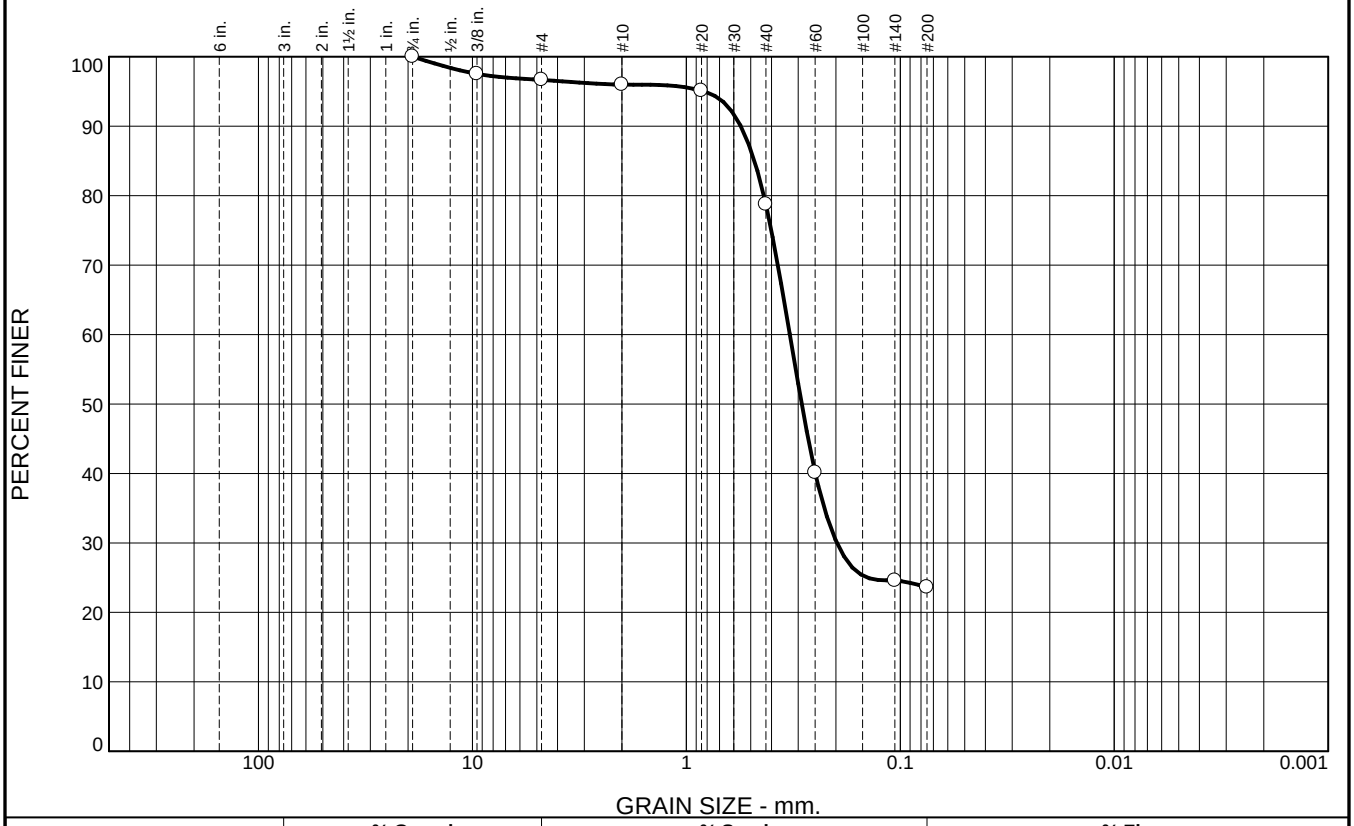
Source of Sample: B-1 **Depth:** 5.0'-6.5'
Sample Number: S-3 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	0.7	17.3	55.1	23.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	97.5		
#4	96.7		
#10	96.0		
#20	95.1		
#40	78.7		
#60	40.1		
#140	24.6		
#200	23.6		

* (no specification provided)

Material Description

TAN SILTY SAND

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.5566 D_{85}= 0.4807 D_{60}= 0.3284
D_{50}= 0.2890 D_{30}= 0.1979 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

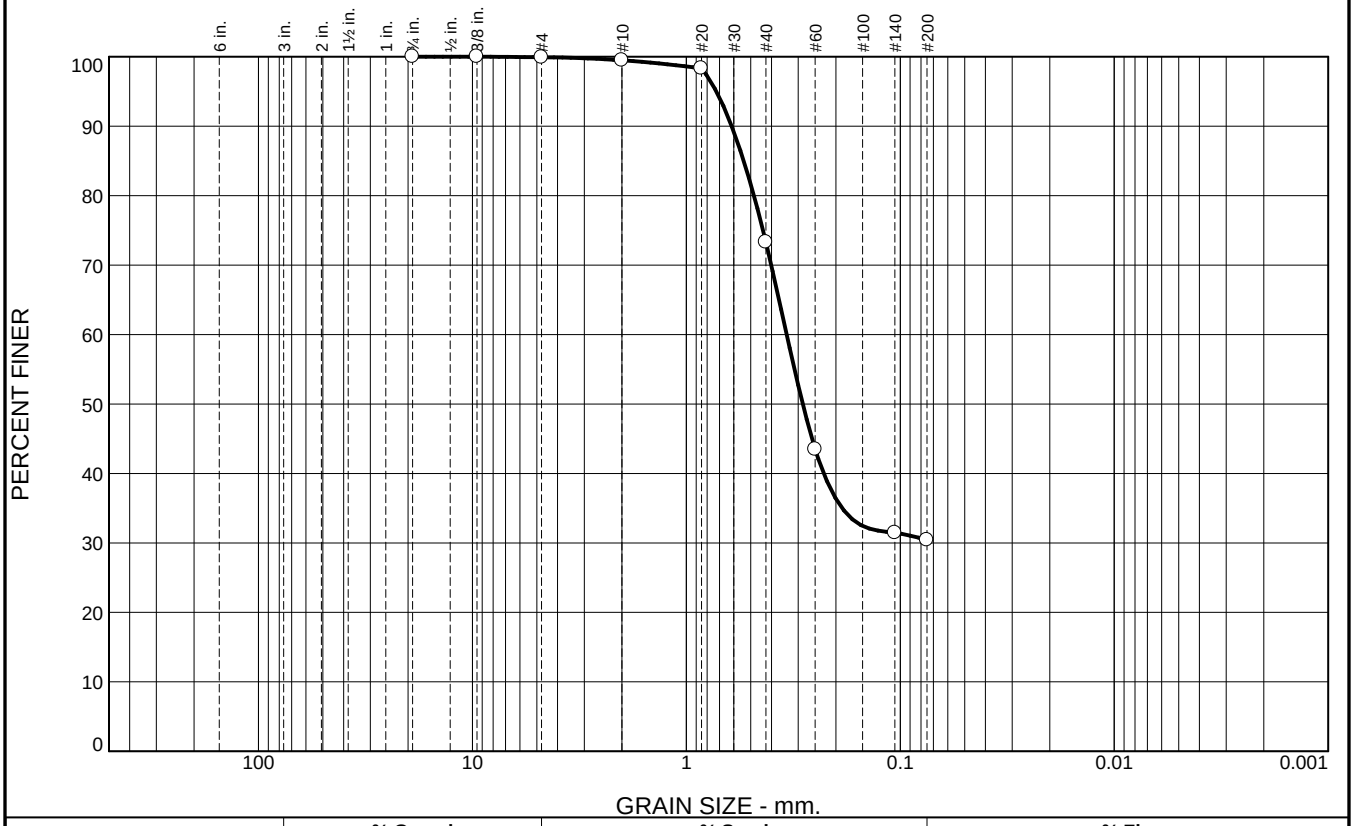
Source of Sample: B-1 **Depth:** 10.0'-11.5'
Sample Number: S-5 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	26.2	42.9	30.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	100.0		
#4	99.9		
#10	99.5		
#20	98.3		
#40	73.3		
#60	43.5		
#140	31.5		
#200	30.4		

* (no specification provided)

Material Description

RED SILTY SAND

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.6140 D_{85}= 0.5395 D_{60}= 0.3397
D_{50}= 0.2858 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

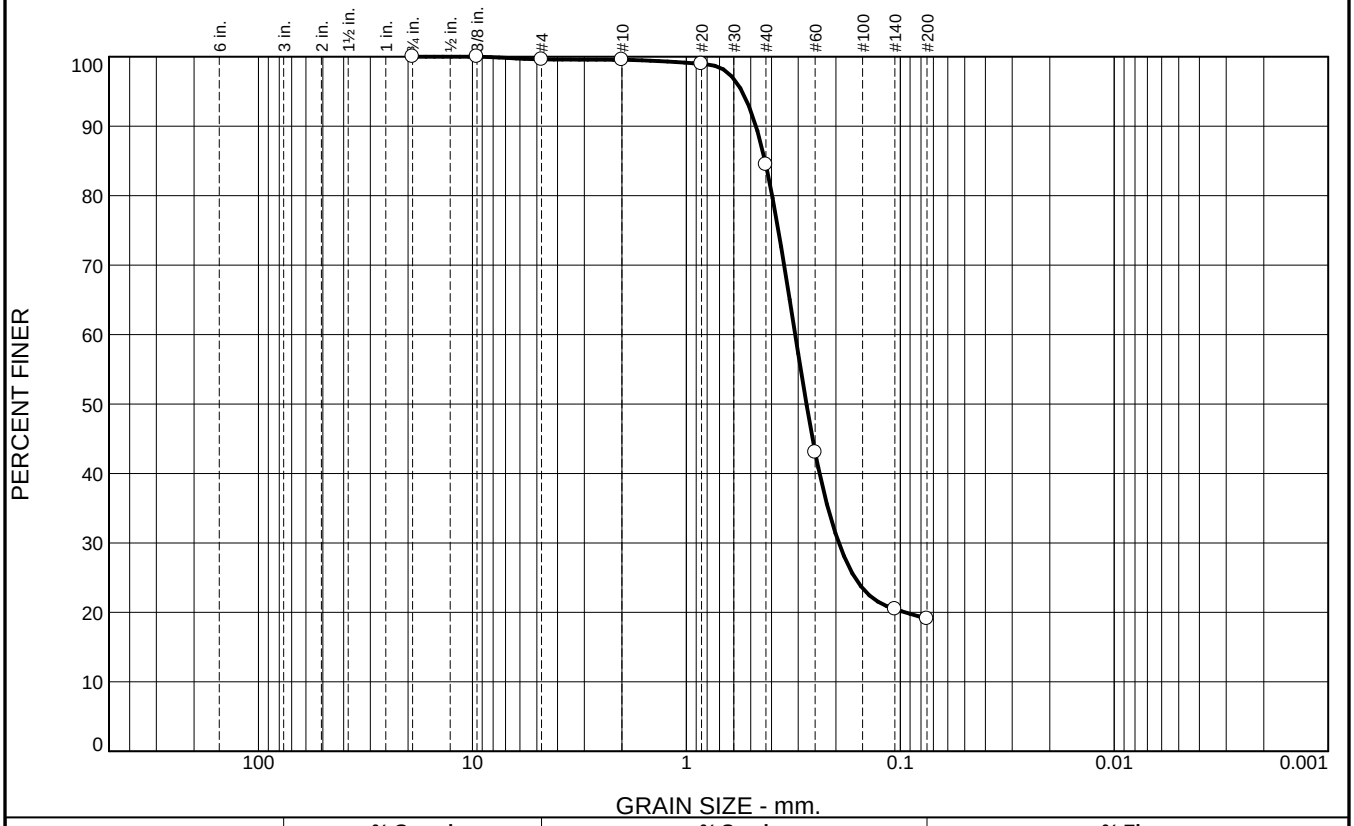
Source of Sample: B-2 **Depth:** 2.5'-4.0'
Sample Number: S-2 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.0	15.1	65.4	19.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	100.0		
#4	99.6		
#10	99.6		
#20	99.0		
#40	84.5		
#60	43.1		
#140	20.5		
#200	19.1		

* (no specification provided)

Material Description

TAN BROWN SILTY SAND

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.4730 D_{85}= 0.4288 D_{60}= 0.3101
D_{50}= 0.2747 D_{30}= 0.1940 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

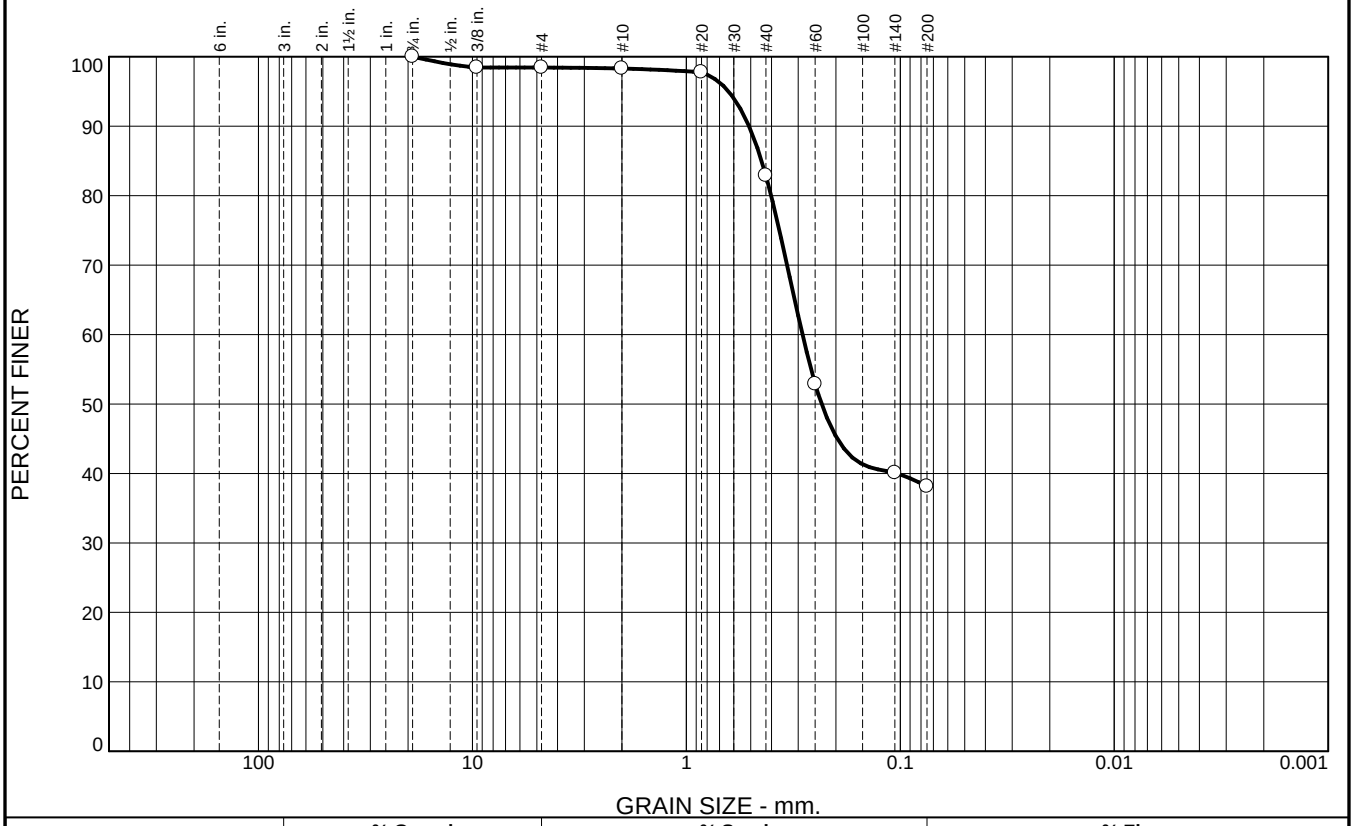
Source of Sample: B-2 **Depth:** 7.5'-9.0'
Sample Number: S-4 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	0.1	15.4	44.8	38.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	98.4		
#4	98.4		
#10	98.3		
#20	97.8		
#40	82.9		
#60	52.9		
#140	40.1		
#200	38.1		

* (no specification provided)

Material Description

RED CLAYEY SAND

Atterberg Limits

PL= 16 LL= 32 PI= 16

Coefficients

D_{90}= 0.5097 D_{85}= 0.4451 D_{60}= 0.2866
D_{50}= 0.2333 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

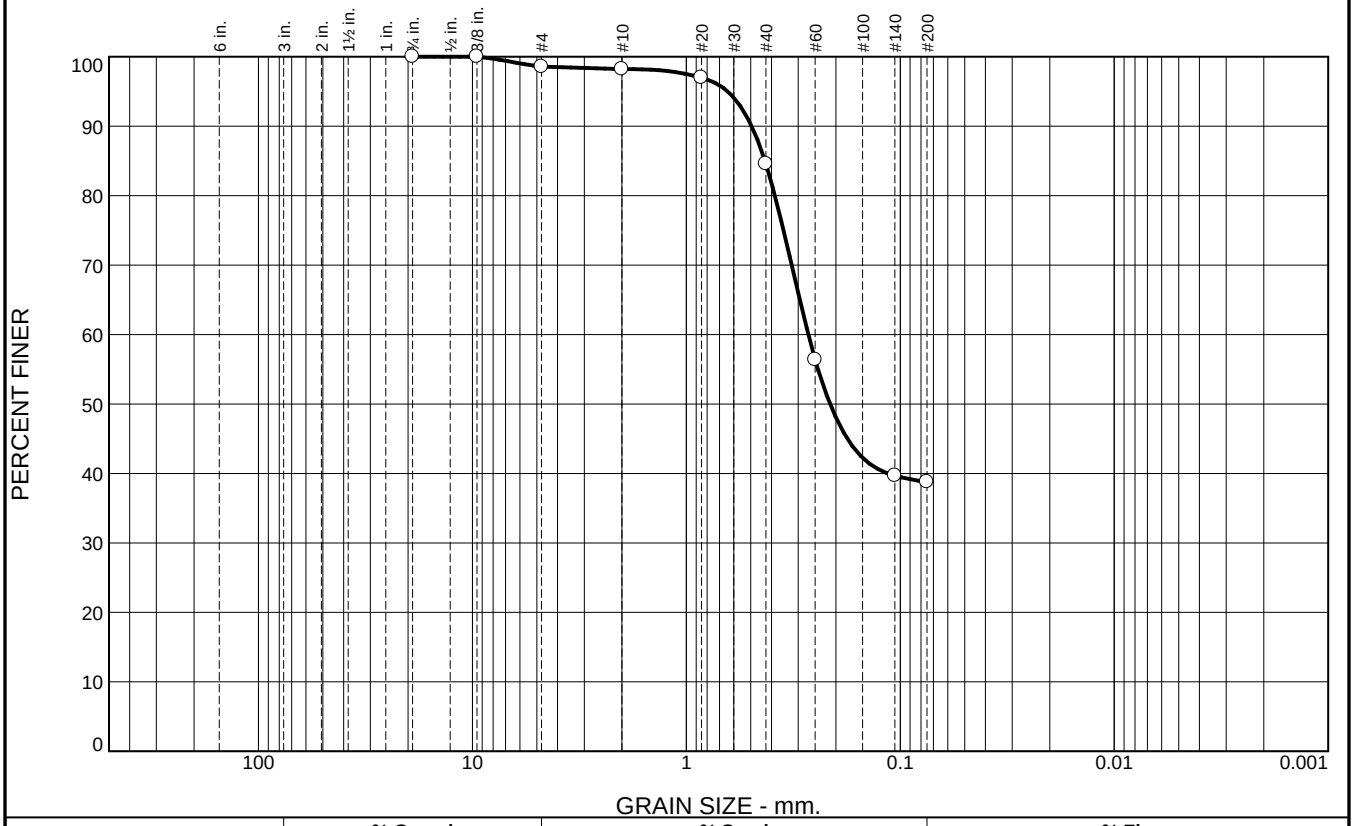
Source of Sample: B-3 **Depth:** 5.0'-6.5'
Sample Number: S-3 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	0.4	13.6	45.8	38.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	100.0		
#4	98.6		
#10	98.2		
#20	97.0		
#40	84.6		
#60	56.4		
#140	39.7		
#200	38.8		

* (no specification provided)

Material Description

TAN RED CLAYEY SAND

Atterberg Limits

PL= 14 LL= 33 PI= 19

Coefficients

D_{90}= 0.4953 D_{85}= 0.4292 D_{60}= 0.2690
D_{50}= 0.2129 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(3)

Remarks

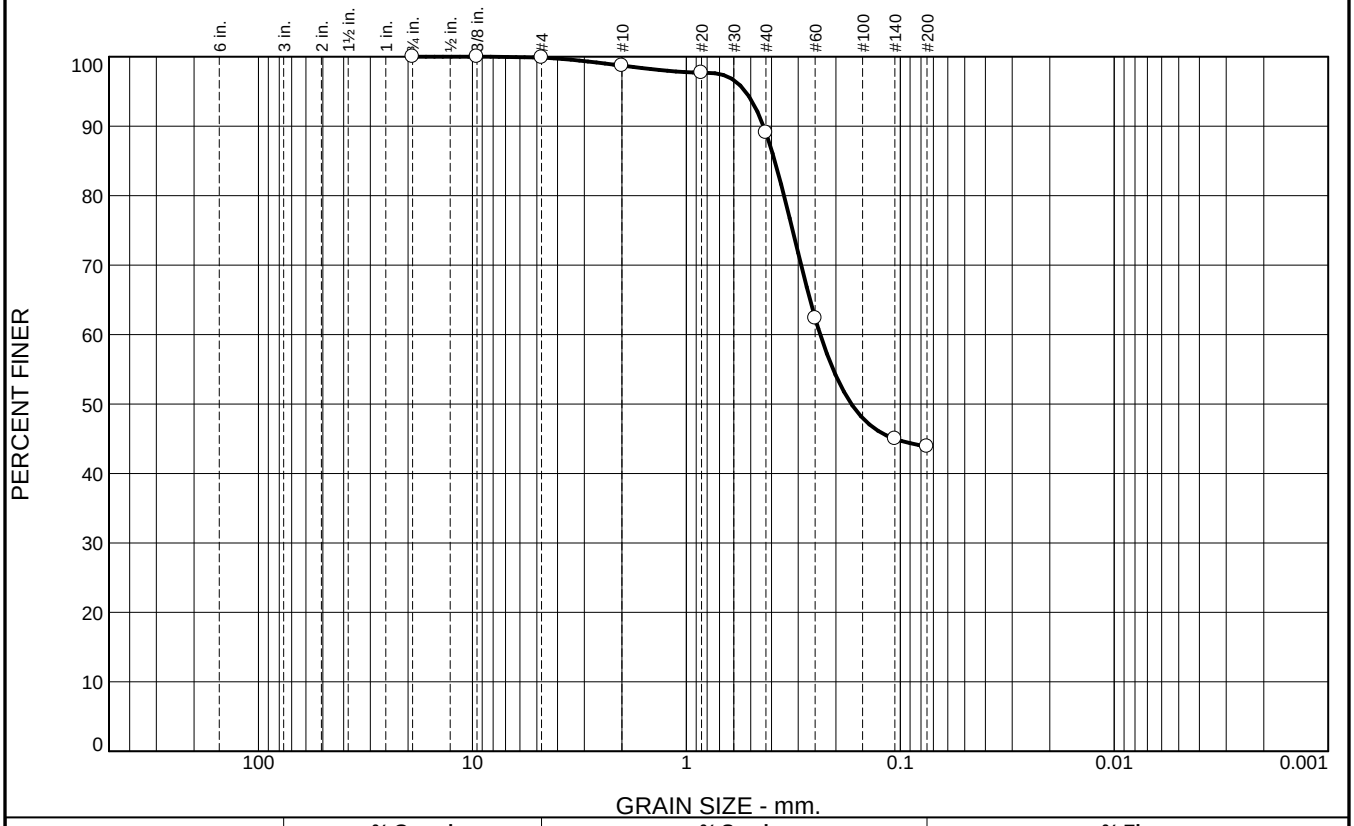
Source of Sample: B-3 **Depth:** 20.0'-21.5'
Sample Number: S-9 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	1.2	9.6	45.2	43.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	100.0		
#4	99.9		
#10	98.7		
#20	97.7		
#40	89.1		
#60	62.4		
#140	45.0		
#200	43.9		

* (no specification provided)

Material Description

TAN RED CLAYEY SAND

Atterberg Limits

PL= 15 LL= 26 PI= 11

Coefficients

D_{90}= 0.4358 D_{85}= 0.3862 D_{60}= 0.2368
D_{50}= 0.1692 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(1)

Remarks

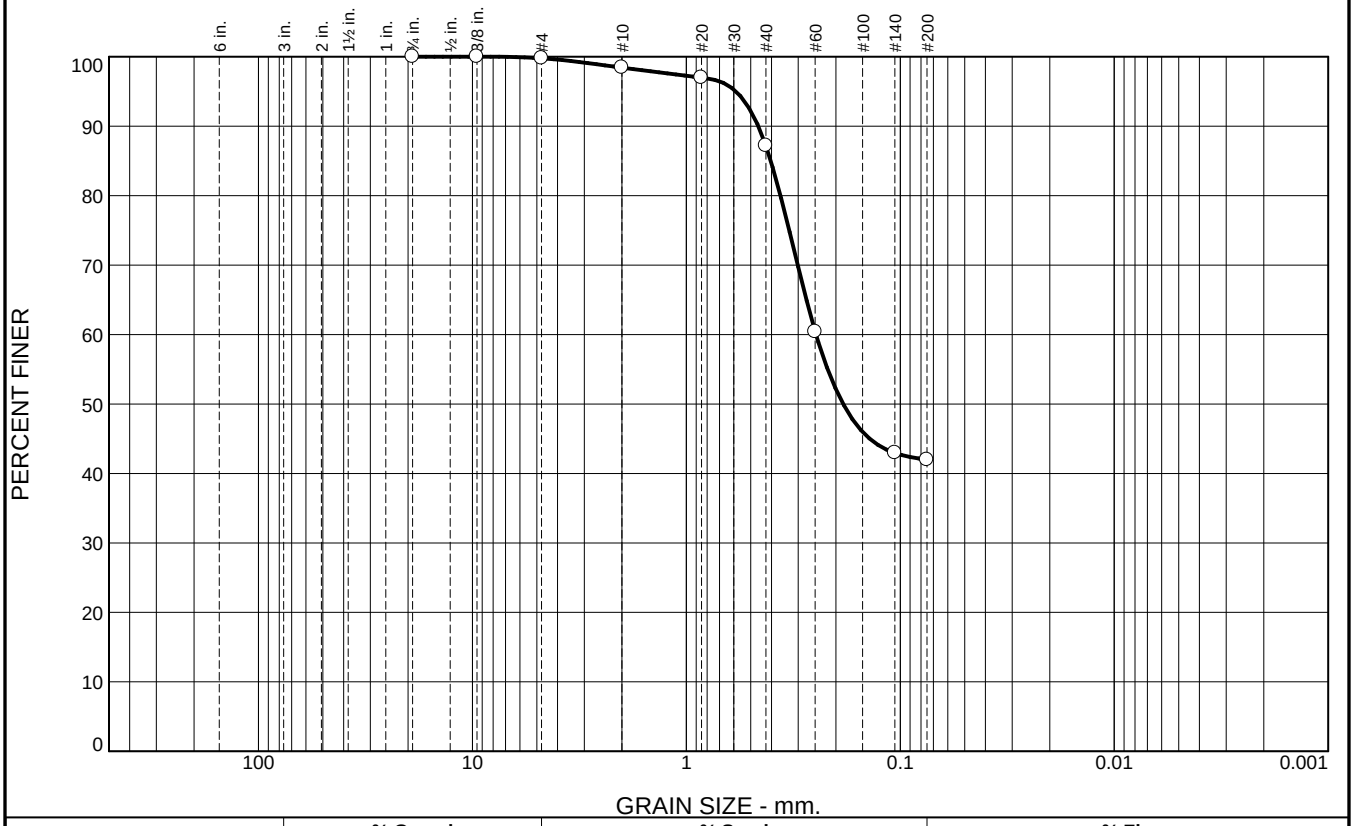
Source of Sample: B-4 **Depth:** 12.5'-14.0'
Sample Number: S-6 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	1.4	11.2	45.2	42.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
3/8"	100.0		
#4	99.8		
#10	98.4		
#20	97.0		
#40	87.2		
#60	60.4		
#140	43.0		
#200	42.0		

* (no specification provided)

Material Description

TAN RED CLAYEY SAND

Atterberg Limits

PL= 20 LL= 34 PI= 14

Coefficients

D_{90}= 0.4611 D_{85}= 0.4032 D_{60}= 0.2478
D_{50}= 0.1850 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(2)

Remarks

Source of Sample: B-4 **Depth:** 20.0'-21.5'
Sample Number: S-9 **Date:**

SOUTHERN EARTH SCIENCES
Mobile, Alabama

Client: MAWSS
Project: MAWSS SPRINGHILL RESERVOIR

Project No: M25-164 **Figure**