CITY OF MOBILE
Langan Lake Dredging (2016-3005-34)
Langan Park Stormwater Improvements (2021-2045-01)

ADDENDUM #1

This addendum includes responses to contractor questions, the pre-bid agenda and the Geotechnical memo and report (attachment "A"). This addendum consists of a total of 64 pages, including the cover page.

Instructions: Please acknowledge receipt of this addendum by signing this form and including it in your submittal on April 9, 2025.

Acknowledgment: I hereby acknowledge receipt of Addendum 1. I understand that failure to confirm the receipt of addenda may be cause for rejection of this submittal.

_____
Company

_____
Authorized Signature

_____
Date

Langan Lake Pre-Bid Meeting Questions – March 26, 2025

1. One pre-dredge survey has been completed. If another is determined to be needed, is it the contractor's responsibility? Yes
2. Are there key differences between the previous bid package and this package? The addendums put forth in the 1st bid where there were changes to the bid document, we have now reflected those inside the current document. The scope remains the same.
3. Is it to be bid based on lump sum and not unit price? The proposal is made up of unit price items as shown in bid form.
4. Are geotextile tubes necessary for the BU material to address invasive species, particularly the apple snail? Yes, the geotextile tubes shall be used for the BU area
5. There's potentially only one pit within the Three Mile watershed. Is there anywhere else that can be used because of the apple snail? It is the contractor's responsibility to secure disposal location. See page 69 #28f in the project manual.
6. Are we allowed to sample material in the lake? Yes. Please notify the City prior to and be aware of wildlife in the area.
7. Can the geotechnical report be provided? Yes, see attachment A
8. Will the contractor pool participating in the re-bid of the Langan Lake project be subject to the qualification criteria that was required in the initial bid? See page 62, section 102.02 in the project manual.
9. Does the language contained in Page 47, item 54 and page 48, item 55 establish that geotextile tubes are required to be used for the dewatering of sediment intended for on-site BU use. Yes, they shall be required in the BU area.
10. Would it be acceptable by the City to not use Geotubes at all on the project? No. Geotextile tubes are required in the beneficial use area. This would include the "Muck Excavation (Offsite Disposal)" Item taken to the parking lot as well as the "Muck Excavation For Beneficial Use" Item.
    a. If not using geotubes for the project is acceptable, how would we reflect this in our bid effectively? We want to ensure that the Base Bid option of using geotubes wouldn't get awarded without taking our alternate pricing without geotubes into consideration. See above
11. Does the City know what the original depth of Langan Lake was when it was built? No
12. Due to the specific time and day restrictions put in place that don't allow the contractor to work every calendar day. Would the City consider changing from 365 Calendar Days to 300 Working Days? See page 325, question #'s 3-6 in the project manual.
13. If apple snails are encountered in the dredge material that we are hauling outside of the 3-Mile Creek watershed, would an acceptable way of abating these snails be to place 3 foot of fill on top of the dredge material at the pit we choose to haul the material to? Refer to project manual, page 326, question #13.

PRE-BID MEETING AGENDA

PROJECT: Langan Lake Dredging (2016-3005-34) and Langan Park Stormwater Improvements (2021-2045-01)
DATE and TIME: March 26, 2025 at 2:30 pm
LOCATION: Mobile Government Plaza, Atrium, 1st Floor Multipurpose Room, 205 Government Street, Mobile, AL

AGENDA ITEMS:

I. Participants introductions and sign-in sheet
II. Project background and overview
III. DBE participation – City Ordinance 4-034-2018 and federal regulation 2 CFR 200.321
IV. UEI and SAM.gov registration requirements
V. City business license
VI. Overview of construction documents
VII. Q & A

ADMINISTRATIVE

1. This is the mandatory pre-bid meeting for contractors for the following City of Mobile project: Langan Lake Dredging (2016-3005-34) and Langan Park Stormwater Improvements (2021-2045-01). Please sign in on the provided sheet.

2. You have been provided a PowerPoint overview of the project. Please review this at your convenience and submit questions prior to the deadline.

3. The mandatory pre-bid meeting is being held for prime contractors. Only prime contractors in attendance are allowed to submit a bid for this project.

4. The Notice to Bidders indicates how the plans, specifications, and contract documents may be obtained or viewed. No bid packages will be issued to contractors later than twenty-four (24) hours after the pre-bid conference.

5. The bid opening date will be **Wednesday, April 9, 2025 at 2:30pm CT.**

   The City of Mobile will accept bids received by the **City Clerk of the City of Mobile, Government Plaza, 9th Floor, South Tower, 205 Government Street, Mobile, Alabama 36602.** The bids will be immediately opened and publicly read in the Government Plaza Multipurpose Room located on the 1st Floor. No faxed bids will be received. This project will be bid as a single prime contract. Bidders shall clearly indicate the following on the outside of their bid envelope:

   a. "Bid for Completion of Langan Lake Dredging City of Mobile Project No. 2016-3005-34 and Langan Park Stormwater Improvements City of Mobile Project No. 2021-2045-01, in the City of Mobile, Alabama"

b. Contractor's license number with Municipal & Utility (MU) major classification, Heavy Railroad (H/RR) or Specialty Construction (H/RR-S)- *Dredging.*

c. PLEASE NOTE:

- The entire bid document, including all addendums, must be included with your submission.
- Required item checklist (Page 1 of contract document) shall be completely filled out and signed
- For increased efficiency at bid opening, please place a tab on required items.

6. The deadline for contractors to submit written questions is **Monday, March 31, 2025** at **05:00 pm CT.** All contractor questions shall be formally submitted via email to Cody Reed, Engineering Project Manager (cody.reed@cityofmobile.org). Please ensure you have confirmation of receipt from Mr. Reed. Formal responses to questions and any required project addendum will be provided to all contractors by **Wednesday, April 2, 2025** by **COB.**

7. Contractors are asked to make all efforts to meet the Minority Business Requirements specified in the City Ordinance and Federal Regulations.
   a. See City Ordinance 4-034-2018 and federal regulation 2 CFR 200.321.
   b. Prime contractors must have clear, written documentation (e.g. time-stamped email) of attempts to solicit DBE subcontractors to team with them on this project, whether they accept or decline the offer to participate. This includes prime contractors with DBE status.
   c. A City of Mobile Subcontracting Plan must be submitted with the bid documents to be deemed a responsive bid. See form starting on page 74.
   d. For DBE goals and information, please contact:
      Archnique Kidd, Supplier Diversity Program Manager
      email: archnique.kidd@cityofmobile.org
      phone: (251) 208-7967

8. The Federal Funding and Accountability Act requires all applicants seeking federal subgrants and/or subcontracts to have a UEI number. See 2 CFR Part 25.300. An active SAM.gov registration is also required for all contractors and subcontractors. **Both UEI and proof of SAM.gov registration for contractor and subcontractors is required at time of bid opening for your bid to be deemed responsive.** Please see form on Page 317.
   a. We strongly suggest that any unregistered subcontractor apply for SAM.gov registration immediately to avoid issues with your bid package.

9. All prime contractors must be able to obtain a City of Mobile business license prior to the contract being executed.

BID OVERVIEW

10. The contract Base Bid will be lump sum as indicated in Item III. The award of the contract to the lowest responsible and responsive bidder will be based on the Total Bid Amount of the Base Bid PLUS any combination of Deduct Bid Item 1, Additive Bid Item 1, Additive Bid Item 2, Additive Bid Item 3 and Additive Bid Item 4.
11. Item III also delineates specific unit price items applicable to the project. Actual contract quantities for measured quantities may nominally increase based upon execution of work.
12. Item III of the specifications describes the general construction contract items and unit prices utilized in the Bid Form in more detail.

13. The award of this contract shall be approved by the Mobile City Council. It is anticipated that all contract approvals and execution of contract documents will be completed in a timely manner.
14. A bid bond in the amount of 5% of the bid shall accompany the formal proposal (Maximum amount of bond $10,000). For the selected contractor, a performance bond and payment bond in the amount of 100% of the contract price will be required. This information may also be found in the Instruction to Bidders section of the contract documents.
15. There is a total contract time of 365 calendar days. Additional construction schedule required to complete Additive Bid items associated with the Langan Lake Dredging (should the City have sufficient funding to award a portion or all of the Additive Bid items) will be as indicated in Item III. Failure to complete the project in the allotted time will result in the assessment of liquidated damages as provided for in section 108 of the Alabama Department of Transportation Standard Specifications for Highway Construction, 2022 edition, with all the latest additions and modifications of the Engineering Department of the City of Mobile.
16. Permits - ADEM (obtained), Army Corps (obtained)
17. Certified Payroll for contractor and subcontractors will be required. Documentation of payment (e.g. invoices, load tickets, etc.) to subcontractors must be provided with each estimate.

WORK

18. Construction activity is only allowed between the hours of 7:00 am to 5:00 pm. Material deliveries shall additionally be restricted to these hours. Because of the project's vicinity to residential homes, work outside of these hours is prohibited. Extension of these hours may be requested by the awarded contractor for City review.
19. Contractor will be responsible for conduct and decorum of their employees and subcontractors at all times. This includes required high-vis safety shirts, no profanity or objectionable behavior, and minimal disruption to neighborhood residents in the form of traffic along public streets.
20. Please see requirements for waste and debris in the construction area in contract documents under Item IX City Special Provisions.
21. Contractor and engineer will document, with preconstruction video, the condition of existing public streets leading to or associated with this project.
22. Any damage caused by the Contractor or his subcontractors to the existing bituminous asphalt surface and/or base structure on local streets leading to or associated with this project shall be repaired by the Contractor at no cost to the Owner, except for the west temporary disposal parking area. Due in part to the condition of the west temporary disposal parking area's existing asphalt and planned repairs, the Contractor will not be required to replace damaged asphalt (or material six inches under asphalt) that occurs due to construction in this area.
23. No offsite or on-street parking or staging is allowed.

UTILITIES

24. The contractor will be responsible for furnishing, at his own expense, all necessary potable water, electrical power, and sanitary facilities. Metered connections to MAWWS water utilities may be available upon request.
25. Access to the existing MAWWS water and sewer utilities shall be maintained at all times without

obstruction.

26. All existing utilities shall be protected at all times.

OVERVIEW OF CONSTRUCTION DOCUMENTS

- Review of project construction documents
- Important items:
    - Key differences between projects
    - Additive Bid Items
    - Deduct language
    - Use of geotextile tubes and methods proposed for other means of dewatering

END OF PRE-BID MEETING AGENDA

Notes:

Attachment “A”

Langan Park Lake Material Properties Memo and Report

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

Langan Park Lake Material Properties Memorandum

Date:	November 1, 2021
To:	The City of Mobile, Alabama
Copies to:	Mr. Lance Slater, The City of Mobile.
From:	Wade Burcham, Jeremy Gasser and Tom Fendley, Geosyntec Consultants, Inc.
Subject:	Langan Park Lake Material Properties Memorandum, City of Mobile, Mobile, Alabama

INTRODUCTION

This data memorandum (Memo) was prepared in support of the dredging design of Langan Park Lake (Site; Lake), a water storage and recreational facility at The City of Mobile's (City) Three Mile Creek Watershed, located in Mobile, Alabama.

This Memo: (i) summarizes the available geotechnical data from field and laboratory investigations conducted for the Site; (ii) discusses observed trends in the geotechnical properties of the stratigraphic units encountered at the Site; and (iii) provides information regarding the geotechnical parameters to be used for subsequent project bidding and dredging construction. It is organized to present the following: (i) Site background; (ii) field investigation and testing program; (iii) methodology; (iv) subsurface conditions; and (iv) summary of geotechnical parameters and recommendations.

All elevations presented in this Memo are based on the North American Vertical Datum of 1988 (NAVD 88). All Northings and Eastings presented in this Memo are based on the North American Datum of 1983 (NAD 83), Alabama State Plane, West Zone (US foot).

SITE BACKGROUND

The Langan Park (formerly Municipal Park) covers about 52 acres of the City's property west Mobile, AL, and includes a Lake (Langan Lake Park) and 20 heavily vegetated islands. The Site is bounded by Zeigler Boulevard to the North, Museum Drive to the South, Gaillard Drive to the West, and Spring Hill Avenue to the East. A map of the Site is presented in **Figure 1**.

The Lake is approximately 4100 feet long in the East-West direction extending from Gaillard Drive to Springhill Avenue, and varies in width from approximately 400 to 500 feet. The Lake is primarily divided into two sections, namely Upper Lake and Lower Lake, separated by a spillway approximately at Elevation 85.0 feet (EL. 85.0 ft). The combined footprint of the Upper Lake and the Lower Lake currently contains twenty (20) heavily vegetated islands. The water surface of the Upper Lake and Lower Lake are at, respectively, approximately EL. 83.0 ft and 74.0 ft.

It is Geosyntec's understanding that the Lake was once a source of water supply for the City of Mobile and a major recreation area for local residents. Over the years, the Lake has received sediments from the nearby Twelve Mile and Three Mile Creeks and has experienced an increase in invasive fauna and flora (e.g., the Chinese Tallow plant and the Island Apple snail). This has reduced the storage capacity and curtailed the recreational benefits of the Lake.

FIELD INVESTIGATION AND TESTING PROGRAM

From June 13 through June 18, 2017, Geotechnical Engineering-Testing, Inc. (GET) completed a geotechnical investigation of the in-situ sediments and subsurface soils in the Lake [GET, 2017]. The exploration included sampling of the uppermost 1.7 feet to 6.5 feet (average = 3.9 feet) sediments at 26 locations, namely MB-1 through MB-26 (shown in **Figure 1**). The 2017 GET report, which includes the boring logs developed for MB-1 through MB-26, are presented in **Attachment 1**. Per the 2017 GET report, "sampling of the soils in the lake was performed from a boat using sampling tubes that were pushed/driven to the termination depth." Furthermore, "soil samples recovered from the explorations were visually examined and laboratory soil mechanics tests were performed on selected samples." The results of the laboratory tests are summarized in **Table 1**.

METHODOLOGY

Soil index properties provide a general indication of the physical characteristics of a soil and are used for soil classification. The soil index properties collected during the 2017 GET investigation are: (i) moisture content (w_0) ; (ii) liquid limit (LL); (iii) plasticity index (PI); and (iv) fines content (FC; herein defined as the percentage by weight passing the #200 sieve or a diameter of 0.075

mm). The reported soil index properties (w_0, LL, PI, FC) are plotted against elevation, and a Casagrande plasticity chart is developed using the available LL and PI data.

Samples collected for index properties testing were classified by GET using the AASHTO (American Association of State Highway and Transportation Officials) Soil Classification System [GET, 2017]. For geotechnical design purposes, it is generally convenient to describe a soil using the Unified Soil Classification System (USCS). The reported AASHTO classifications are approximated to their respective USCS classifications using recommendations of AASHTO [2017] (summarized in **Attachment 2**).

SUBSURFACE CONDITIONS

The sediments encountered in the topmost four to five feet in the Upper Lake (including MB-1 through MB-3) were generally non-plastic and sandy, with AASHTO classification A-3 (0). The AASHTO soil classification chart is presented in **Attachment 3** for reference [AASHTO, 2008]. The depth to the mudline for boring locations MB-1 through MB-3 as measured from the water surface varied from 4.0 ft to 4.7 ft, with an average value of 4.4 ft.

The nature of the sediments in the Lower Lake were more variable. Up to approximately 300 feet east of the spillway, which included boring locations MB-4 through MB-6, the sediments encountered were similar to those encountered in the Upper Lake, i.e., non-plastic and sandy/silty (AASHTO A-2-4(0), A-1-b (0), A-3 (0)). The depth to the mudline for boring locations MB-4 through MB-6 as measured from the water surface varied from 2.3 ft to 4.4 ft, with an average value of 3.6 ft.

For the remainder of the Lower Lake, the uppermost sediments were a combination of: (i) non-plastic silty sand; (ii) low-plasticity silty/clayey sand; and (iii) low-plasticity silty/sandy clay. The following groups of boring locations appeared to show similar stratigraphy.

- MB-9, MB-11, MB-18, MB-24, MB-25, and MB-26: similar to sediments encountered at boring locations MB-4 through MB-6, i.e., non-plastic silty sand; AASHTO A-2-4(0), AASHTO A-3 (0).

- MB-8, MB-10, MB-13 through MB-15, MB-17, MB-20 through MB-22: the uppermost sediments were predominantly low-plasticity silty/clayey sand with AASHTO classification ranging from A-2-4 through A-7-6.

  The two samples collected from boring locations MB-17 (at EL. 67.0 ft) and MB-21 (at EL. 65.5 ft) were tested and classified as A-2-7 (AASHTO) (see boring logs in **Attachment**

1). Based on AASHTO [2017], these soils are likely to be a silty or clayey sand. However, from the reported values of moisture content (116.0 and 158.0 percent respectively), liquid limit (89 and 126 percent respectively), and plasticity index (54 and 104 percent respectively), it appears unlikely that the soils are a silty or clayey sand. Due to this discrepancy for soils collected at boring locations MB-17 and MB-21, they are not included in the analysis presented in this Memo.

- MB-7, MB-12, MB-16, MB-19 and MB-23: the uppermost sediments were predominantly low-plasticity clay with AASHTO classification ranging from A-6 through A-7-6.

The depth to the mudline as measured from the water surface varied from 1.9 ft to 7.6 ft, with an average value of 5.0 ft for MB-7 through MB-23. MB-24 through MB-26 had consistently lower values for depth to the mudline, respectively at 2.4 ft, 1.9 ft and 2.0 ft.

SUMMARY OF GEOTECHNICAL PARAMETERS AND RECOMMENDATIONS

The summary presented in this Memo are based on interpretations of the 2017 GET report to help with the dredging design and construction of Langan Park Lake.

The variation with elevation of the soil index properties collected during the 2017 GET investigation (i.e., w_0, FC, LL and PI) is shown in **Figure 2**. The Casagrande plasticity chart developed using the available LL and PI data is shown in **Figure 3**. Due to the questionable nature of the data available for soils collected at boring locations MB-17 and MB-21, they are not included in the analysis presented in this Memo.

Based on the 2017 GET investigation and Geosyntec's interpretation of the available geotechnical data, three (3) main stratigraphic units (units) could be identified at the Site:

1. A brown sand layer, termed "Sand"

2. A brown/gray silty/clayey sand layer, termed "Silty Sand", and

3. A gray sandy clay/clay layer, termed "Sandy Clay".

The geotechnical properties of the units are summarized in **Table 2.**

The Sand unit consists of a non-plastic sand, with 14% by weight of fines on average. This unit is classified as A-1-b through A-2-4 (AASHTO), and SW/SP/SM/ML (USCS). It is generally encountered in the Upper Lake and up to about 300 ft east of the spillway. The Sand unit does not appear to be present in the Lower Lake.

In general, the uppermost stratigraphic unit encountered in the Lower Lake is the Silty Sand unit (except at boring locations MB-12, MB-16 and MB-19). This unit consists of a low-plasticity sand, with average fines content of 32% by weight. Due to its higher fines content, this unit has, on average, a LL of 51% and a PI of 28%. The Silty Sand unit is classified as A-2-4 through A-7-6 (AASHTO), and CL/SC/SM/ML (USCS). In general (at boring locations MB-8, MB-10, MB-11, MB-14, MB-15, MB-17, MB-18, MB-21, MB-22, MB-24 through M-26), the bottom of the Silty Sand unit could not be identified. Where the bottom of this unit could be identified, its thickness varies 1 ft at MB-9 and MB-23, to 3.5 ft at MB-13. It is noted that the Silty Sand unit is not identified at boring locations MB-12, MB-16 and MB-19.

Beneath the Silty Sand unit and at select locations (MB-7, MB-12, MB-16, MB-19 and MB-23) lies the Sandy Clay unit, a low-plasticity clay with on average 56% by weight of fines. This unit has, on average, a LL of 64% and a PI of 20%. The Sandy Clay unit is classified as A-6 through A-7-6 (AASHTO), and CL/SC (USCS). The distinguishing feature between the Silty Sand and the Sandy Clay units is the fines content. The thickness of the Sandy Clay unit varies, and could not be determined using the data from the 2017 GET report. The soil sample collected from boring location MB-17 (at EL. 67.0 ft) appears to have a higher moisture content (123.0 percent) than other representative soil samples from the Sandy Clay unit, which is possibly due to the presence of organics below EL. 67.0 ft.

Potential construction-related cost reduction through beneficial reuse of the sediments at the Site can be assessed with the 2017 GET data supplemented with additional targeted field data and/or laboratory testing. For example, the Sand and Silty Sand units could be reused for roadway fill or subgrade (separately or as a mixture), provided they are free of organics and meet the density-moisture requirements for the proposed reuse. The following items may be of use in further assessing the beneficial reuse of the sediments at the Site:

- Identify the thicknesses of, and better classify the units encountered at the Site, namely Sand, Silty Sand and Sandy Clay, including the possible presence of organics below EL. 67.0 ft.

- Obtain the geotechnical properties of the materials to be dredged out (e.g., unit weight), and reused.

- Delineate zones within the Lower Lake to assess ease of dredging and beneficial reuse potential.

REFERENCES

AASHTO (2008). AASHTO M 145: Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

AASHTO (2017). AASHTO LRFD Bridge Design Specifications. 8th Edition, September 2017.

GET (2017). Soils Explorations and Geotechnical Engineering Studies – Langan Park Lake. Geotechnical Engineering-Testing, Inc, GET Project No. 17-173.

* * * * *

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

TABLES

Table 1. Summary of 2017 Field Investigation
Lake Langan,
Mobile, AL.

Boring[1]	Northing[2] (ft)	Easting[2] (ft)	Top of Boring Elevation/ Water Elevation[2] (ft)	Bottom of Boring Elevation[2] (ft)	Mudline Elevation[2] (ft)	Mid Sample Elevation[2] (ft)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Passing #200 Sieve (%)	AASHTO Soil Classification System		Elevation Clay First Encountered[2] (ft)
MB-1	257138	1760418	83.0	74.2	78.3	76.5	18.0	NP	NP	2.5	A-3 (0)	Fine Sand	--
MB-2	256944	1760433	83.0	71.9	78.4	75.0	24.0	NP	NP	4.8	A-3 (0)	Fine Sand	--
MB-3	256756	1760474	83.0	73.7	79.0	76.5	26.0	NP	NP	2.7	A-3 (0)	Fine Sand	--
MB-4	257214	1760937	75.5	69.3	71.3	70.5	47.0	NP	NP	25.4	A-2-4(0)	Silty or Clayey Sand	--
MB-5	257020	1760936	75.5	69.4	71.1	70.0	4.0	NP	NP	1.8	A-1-b (0)	Sand	--
MB-6	256760	1760757	75.5	67.8	73.2	70.5	33.0	NP	NP	5.5	A-3 (0)	Fine Sand	--
MB-7	257297	1761247	75.5	67.8	70.0	68.0	61.0	53	35	74.6	A-7-6 (26)	Clay	69.5
MB-8	257219	1761147	75.5	68.0	70.8	70.0	59.0	38	15	42	A-6 (3)	Clay	--
MB-9	257139	1761246	75.5	68.5	71.3	70.5	50.0	NP	NP	19.4	A-2-4(0)	Silty or Clayey Sand	70.0
MB-10	257055	1761146	75.5	67.9	70.9	70.5	59.0	28	10	44.4	A-4 (1)	Silt	--
MB-11	256994	1761245	75.5	67.6	70.9	69.5	44.0	NP	NP	25.7	A-2-4(0)	Silty or Clayey Sand	--
MB-12	257362	1761493	75.5	67.4	70.0	69.0	123.0[3]	41	20	55	A-7-6 (8)	Clay	70.0
MB-13	257223	1761493	75.5	67.2	70.7	69.0	78.0	47	22	39.2	A-7-6 (4)	Clay	67.5
MB-14	257096	1761492	75.5	67.6	70.1	69.0	63.0	29	7	34.9	A-2-4(0)	Silty or Clayey Sand	--
MB-15	257136	1761911	75.5	67.6	69.6	68.5	64.0	36	14	24.5	A-2-6 (0)	Silty or Clayey Sand	--
MB-16	257412	1762238	75.5	67.1	71.1	70.0	36.0	33	15	51.8	A-6 (5)	Clay	71.0
MB-17[4]	257174	1762535	75.5	65.5	68.5	67.0	116.0	89	54	28.6	A-2-7 (6)	Silty or Clayey Sand	--
MB-18	257414	1763039	75.5	67.3	71.2	69.0	64.0	NP	NP	11.2	A-2-4(0)	Silty or Clayey Sand	--
MB-19	257195	1763085	75.5	66.8	71.1	69.5	47.0	31	11	51.2	A-6 (3)	Clay	71.0
MB-20	257503	1763322	75.5	64.7	68.8	67.5	33.0	31	10	38.5	A-4 (1)	Silt	66.4
MB-21[4]	257394	1763322	75.5	62.8	67.9	65.5	158.0	126	104	0.6	A-2-7 (0)	Silty or Clayey Sand	--
MB-22	257273	1763321	75.5	64.0	69.0	68.0	52.0	36	12	29.8	A-2-6 (0)	Silty or Clayey Sand	--
MB-23	257182	1763321	75.5	63.0	68.6	68.0	53.0	53	30	49.6	A-7-6 (11)	Clay	67.4
MB-24	257097	1763320	75.5	68.5	73.1	71.0	28.0	NP	NP	6.9	A-3 (0)	Fine Sand	--
MB-25	257405	1763495	75.5	67.7	73.6	71.0	53.0	NP	NP	23.6	A-2-4(0)	Silty or Clayey Sand	--
MB-26	257211	1763478	75.5	67.7	73.5	71.0	48.0	NP	NP	34.1	A-2-4(0)	Silty or Clayey Sand	--

AASHTO - American Association of State Highway and Transportation Officials
ft - feet
NP - non plastic
USCS - Unified Soil Classification System

Note:
1. The data presented are reported by Geotechnical Engineering Testing, Inc. [GET, 2017].
2. Northing and Easting are in North American Datum of 1983 (NAD83), Alabama State Plane, West Zone, US Foot. Elevations are in North American Vertical Datum of 1988 (NAVD88).
3. High moisture content indicates possible presence of organic material.
4. Data collected at these boring locations appears to be questionable.

Table 2. Summary of Geotechnical Properties
Lake Langan,
Mobile, AL.

Stratigraphic Unit	Avg. Moisture Content (%)	Avg. Liquid Limit (%)	Avg. Plasticity Index (%)	Avg. Passing #200 Sieve (%)	AASHTO Soil Classification System	Interpreted USCS Classification [3]
Sand	37 (4 - 64)	NP	NP	14 (2 - 34)	A-1-b through A-2-4	SW/SP/SM/ML
Silty Sand	54 (33 - 78)	35 (28 - 47)	13 (7 - 22)	36 (25 - 44)	A-2-4 through A-7-6	CL/SC/SM/ML
Sandy Clay [2]	64 (36 - 123)	42 (31- 53)	20 (11- 35)	56 (50 - 75)	A-6 through A-7-6	CL/SC

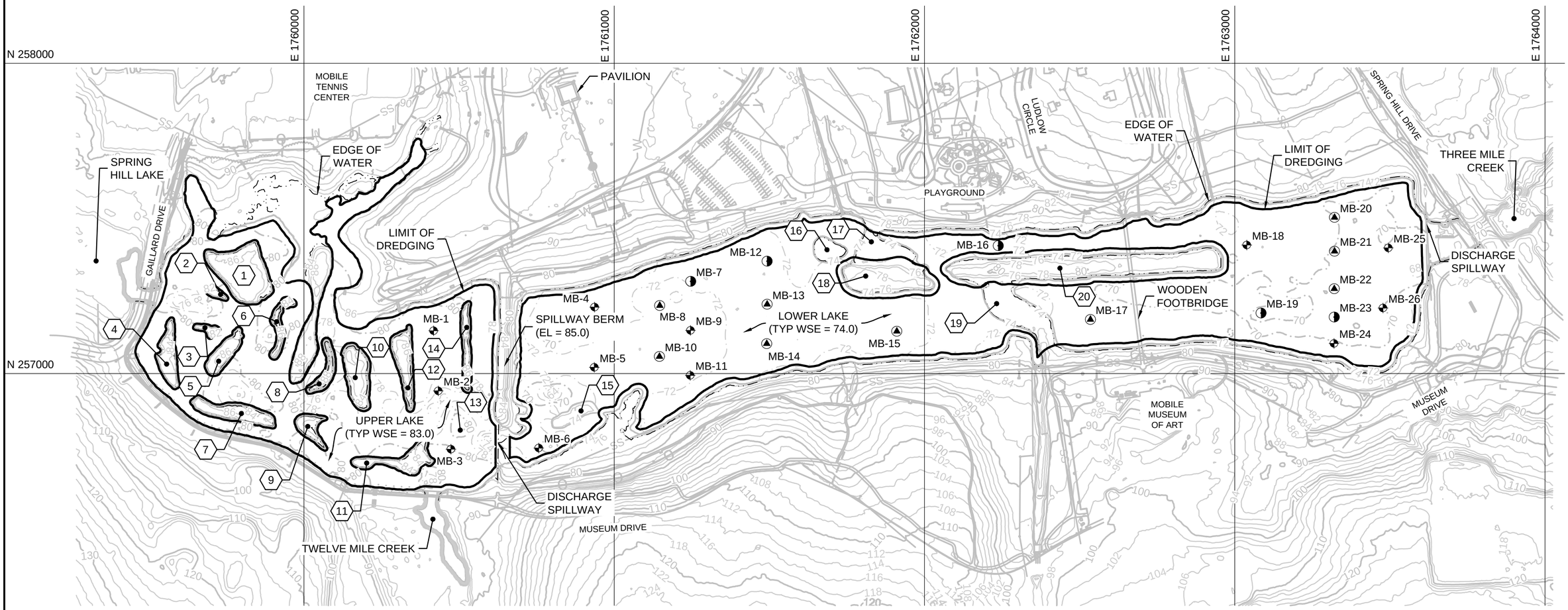
AASHTO - American Association of State Highway and Transportation Officials
Avg. - average
NP - non plastic
USCS - Unified Soil Classification System

Note:
1. Average values are presented, with the range of values shown shown in brackets, ( ).
2. This stratigraphic unit was encountered at MB-7, MB-9, MB-12, MB-13, MB-16, MB-19, MB-20 and MB-23.
3. Interpretation based AASHTO [2017].
4. Data available for soil samples collected at MB-17 and MB-21 is questionable, and is not included in the summary presented in this table.

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

FIGURES



NOTES:

1. HORIZONTAL COORDINATES PRESENTED IN THIS DRAWING ARE NORTH AMERICAN DATUM OF 1983, ALABAMA WEST STATE PLANE.
2. NORTHING AND EASTING ARE IN NORTH AMERICAN DATUM OF 1983 (NAD83), ALABAMA STATE PLANE, WEST ZONE, US FOOT. ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. THE WATER SURFACE ELEVATIONS (WSE) SHOWN ARE TYPICAL, AND ARE LIKELY TO VARY.
5. BORING DATA PRESENTED ARE REPORTED BY GEOTECHNICAL ENGINEERING TESTING, INC. (GET, 2017).

LEGEND

- LIMITS OF DREDGING
- EDGE OF WATER
- (1) LAKE DESIGNATION NUMBER
- BORINGS WHERE UPPERMOST UNIT ENCOUNTERED WAS SAND, BASED ON GET (2017)
- BORINGS WHERE UPPERMOST UNIT ENCOUNTERED WAS SILTY SAND, BASED ON GET (2017)
- BORINGS WHERE UPPERMOST UNIT ENCOUNTERED WAS SANDY CLAY, BASED ON GET (2017)

N

0 250 500

SCALE IN FEET

GEOTECHNICAL BORING LOCATION
LAKE LANGAN DREDGE DESIGN
CITY OF MOBILE

Geosyntec consultants

FIGURE 1

PROJECT NO: GK8247 | NOVEMBER 2021

C:_GEOPW\DS01\DMS\04294\GK8247.01-FIG-004

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

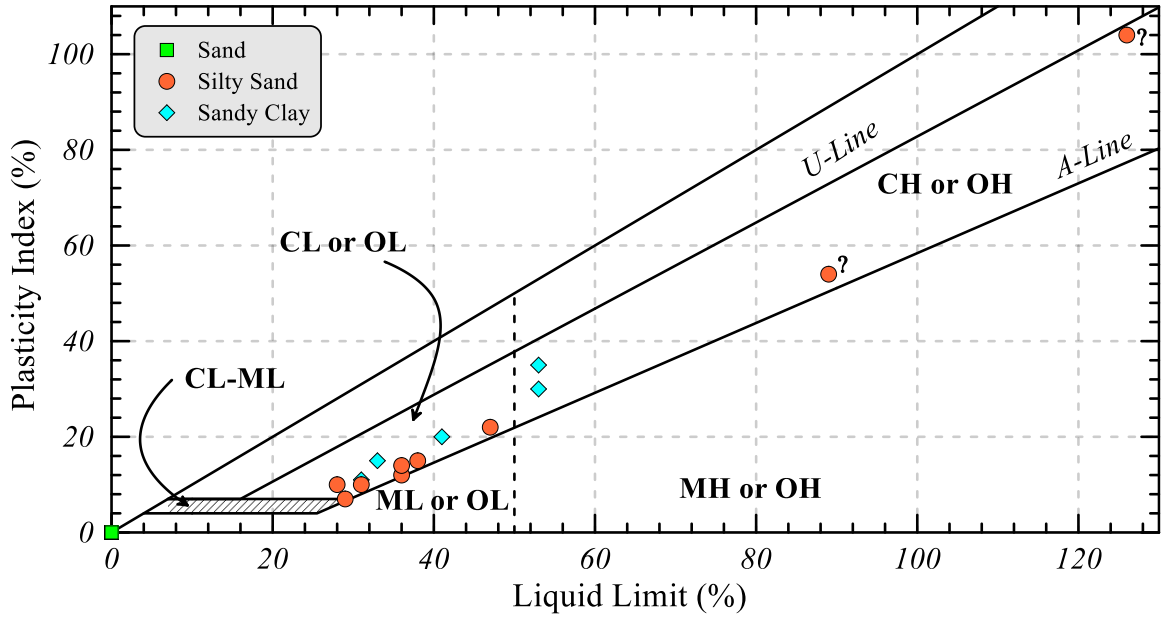


Figure 2. Casagrande plasticity chart

Note:
Questionable data from MB-17 and MB-21 are marked with the symbol "?"

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

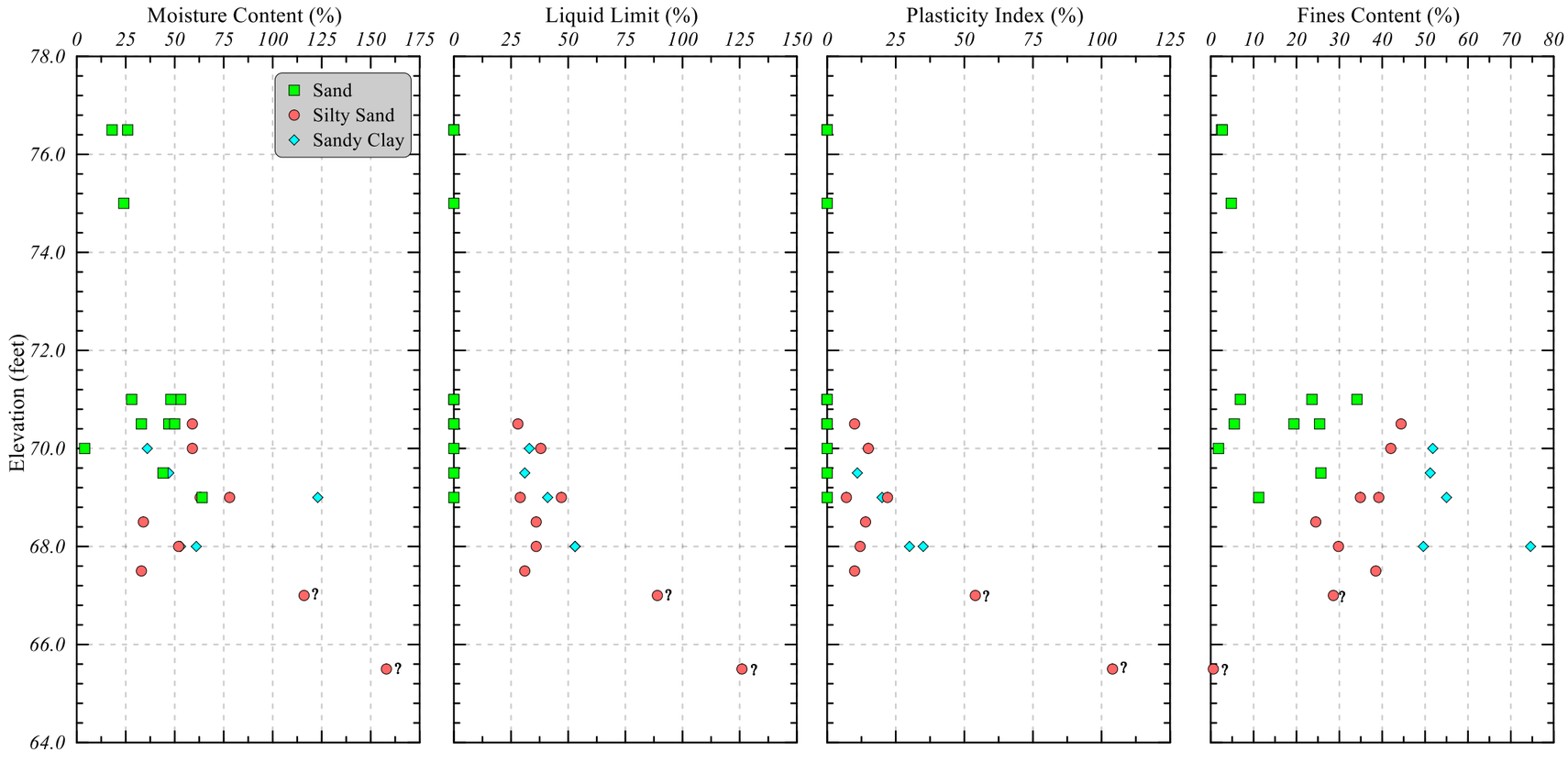


Figure 3. Soil Index Properties Variation with Elevation

Note:
Questionable data from MB-17 and MB-21 are marked with the symbol "?"

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

ATTACHMENT 1
2017 GET REPORT

GEOTECHNICAL ENGINEERING TESTING, INC.

~ Geotechnical Evaluations ~ Construction Materials Testing ~ Geosciences ~ Infrastructure Management Services ~

SOILS EXPLORATIONS AND GEOTECHNICAL ENGINEERING STUDIES
CITY OF MOBILE
LANGAN PARK LAKE

Professional Services Since 1974

904 Butler Drive, Mobile, AL 36693

251.666.7197 FAX: 251.666.7380

www.geoengr.com

Geotechnical Engineering-Testing, Inc.

PROFESSIONAL ENGINEERS

Geotechnical Evaluations - Geosciences - Construction Materials - Pavement Management

July 12, 2017

City of Mobile
Engineering Department
205 Government Street
Mobile, Alabama 36633

Attn: Mr. Janic Terry, P. E.

Re: Soils Explorations and Geotechnical Engineering Studies
City of Mobile
Langan Park Lake
GET Project No. 17-173

Dear Mr. Terry:

Geotechnical Engineering-Testing, Inc. (GET) has completed the soils exploration and geotechnical investigation of the insitu sediment soils in the Langan Park Lake in Mobile, Alabama. We understand that the data from this investigation will be utilized for the proposed dredging of the lake to provide additional capacity, clean much of the surface organics and remove the invasive species of apple snails. This report has been performed in general accordance with the proposed scope of work dated March 6, 2017 that was revised on April 6, 2017.

This document constitutes the geotechnical report for the design phase services which may be used in support of project design and construction activities. Details of the soils explorations and geotechnical engineering studies are presented in the report and appendices.

Should questions arise regarding our findings and recommendations, or if additional information is needed, please let us know.

Sincerely,

GEOTECHNICAL ENGINEERING-TESTING, INC.

Curt Doyle, P.E.
Principal Engineer
Alabama License No. 25733
Date: 7/12/2017

TABLE OF CONTENTS

I. INTRODUCTION

Geotechnical Engineering-Testing, Inc. (GET) has completed the authorized soils explorations and geotechnical investigation of sediment within the lake at Langan Park in Mobile, Alabama. Sediment samples were collected and evaluated to determine material types and suitability for future beneficial use. The sediments collected in the lake have likely been carried in from Three Mile Creek that passes from west to east through the lake, Twelve Mile Creek that terminates at the southwest corner of the lake, and two unnamed tributaries that terminate on both the south and north sides near the center of the lake. A small concrete lined drainage ditch also outfalls to the lake on the northeast side of the lake. In addition to the channel erosion of these creeks, some of the deposition has likely occurred due to the erosion from unpaved roads, the development of residential and commercial properties and general stormwater runoff since the construction of the lake. A topographic location map for the area has been included in Appendix A of this report.

The soils explorations included sampling the lake sediment at 26 locations. Sampling tubes were pushed into the sediment to depths of 6.1 to 12.7 ft deep, as measured from the water surface. Soil samples recovered from the explorations were visually examined and laboratory soil mechanics tests were performed on selected samples. For additional information, 74 soundings were taken to measure water depth at randomly selected locations. The geotechnical engineering studies included planning the soils explorations program, evaluating the soils exploration data, making quantity estimates of material that may be suitable for use in embankment construction, and the preparation of this report of our findings. Our professional services for this project have been performed, findings obtained, and recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The details of the soils explorations and geotechnical studies that we have performed are provided in the following sections of this report.

II. GENERAL DESCRIPTION

The lake is approximately 4100 ft long in the east-west direction extending from Gaillard Drive where Three Mile Creek enters the lake on the west side to the earthen dam with a concrete spillway on the east side of the lake near Springhill Avenue. The lake varies in width from about 400 to 500 ft.

Approximately 1100 ft east of Gaillard Drive, a spillway crosses the width of the lake creating an upper lake. The upper portion of the lake generally maintains a water level elevation of +81 ft to +83 ft and the lower portion of the lake generally maintains a water level elevation of +74 ft to +75.5 ft.

On the west side of the spillway (within the upper lake), numerous small islands exist. Many of these islands have likely developed due to the deposition of sediments from Three Mile Creek. Near the center of the lower lake a small island approximately 1200 ft in length and 75 ft in width exists. This island has been present for at least 50 years and was probably original to the lake when constructed. Crossing the eastern half of the center island and the full width of the lake is a wooden pedestrian bridge.

III. GENERAL SUBSURFACE CONDITIONS

The sampling of the soils in the lake was performed from a boat using sampling tubes that were pushed/driven to the termination depth. The lake was generally cross sectioned at five locations and these samples were generally taken at 300 to 500 ft intervals. Additional borings were selected in areas to provide additional data. The approximate sampling locations were determined using hand held GPS equipment. The approximate sample locations have been shown on a map included in Appendix B of this report. Based upon the soils encountered we have divided the lake into three separate areas.

The soils explorations performed in AREA 1, the western third of the lake (the upper lake and approximately the western most 300 ft of the lower lake), indicated by sampling points MB-1 thru MB-6 that the water depth was generally 4 to 5 ft. The lake bottom in this area generally consisted of clean sandy (SP or A-1-b and A-3) soils that generally meet the criteria for Underwater Backfill. In general, these sands were sampled to a depth of at

least 5 ft below the mudline. Generally, the sample tubes could only penetrate 5 to 6 ft into these sands. Therefore, the total quantity of sand at these points can be expected to be greater than that shown on the logs of boring.

Explorations performed in AREA 2, defined as the area extending from about 350 ft east of the western spillway to about 450 ft west of the earthen dam and spillway on the east end of the lake indicated the water depth was about 4 to 7 ft deep. The sampling points MB-7 through MB-19 indicated the sediment in this area was widely variable with a mix of silty sands (SM or A-2), clayey sands (SC or A-4) and sandy clay (CL or A-6 and A-7-6) soils. There was no real consistency to the deposition of the soils within this area.

Previously GET provided the geotechnical investigation for the pedestrian bridge as part of an ALDOT project for the City. Six borings were performed as part of this investigation from both land and barge mounted drill equipment. One boring was performed on each side of the lake, one boring was performed on the center island and three borings were performed on a pontoon barge along the bridge. The borings were performed to depths of about 30 to 40 ft below ground/water surface. These borings indicated the soils to be widely variable with interbedded layers of sands and clays. There appeared to be no definitive bottom layer.

In AREA 3 defined as from about 450 ft west of the earthen dam and spillway on the east end of the lake to the east end of the lake, represented by sampling points MB-20 through B-26. At sampling points MB-20 through MB-23, the water depths ranged from 6.5 to 7.5 ft and at sampling points MB-24 through MB-26, the water depths ranged from 2.0 to 2.5 ft. At most of these locations, the sediment soils were generally silty sand (SM or A-2 and A-3) with some minor areas of clayey sand (SC or A-7) soils. In general, these sands were sampled to a depth of at least 5 ft below the mudline. Generally, the sample tubes could only penetrate 5 to 6 ft into these sands. Therefore, the total quantity of sand at these points can be expected to be greater than that shown on the logs of boring.

It should be noted that water elevation recorded during the sampling event was at approximately elevation +75.5 in the lower lake and at approximately elevation +83.5 ft in the upper lake and the water level during the sounding event was approximately elevation +74.5 ft in the lower lake and at approximately elevation +82.8 ft in the upper lake. Tables

indicating the approximate locations of borings and soundings and the measured water depth and approximate ground elevation have been included in Appendices C and D of this report, respectively.

IV. EVALUATIONS AND RECOMMENDATIONS

We understand that the City of Mobile is planning to dredge the lake to increase the holding capacity of the lake. As part of this dredging operation, we have been informed that a minimum 2 ft of the material will be dredged to remove the invasive species of apple snails that are within the lake. Additionally, the City would like to would like to utilize any suitable sediment that has been deposited into the lake for future beneficial use.

To make an estimate of the quantity of suitable borrow material, we have divided the lake into the three areas described above based upon the soil types encountered and used the average thickness of suitable material within each of these areas to obtain our estimate. Suitable materials are defined as sands, silty sands and clayey sands with classification of A-1-b, A-2-4, A-3 or A-4. In AREA 1, represented by MB-1 through MB-6, an average thickness of 5 ft of suitable material was used in our quantity estimate. The actual thickness of the sands in this area will likely exceed 5 ft. In AREA 2, represented by MB-7 through MB-20, the soils were very inconsistent and were predominantly clayey sand and sandy clay soils that are unsuitable for construction purposes. In AREA 3, represented by B-21 through B-26, an average thickness of 5 ft of suitable material was used in our quantity estimate. The actual thickness of the sands in this area will likely exceed 5 ft.

The table below provides our estimates of suitable material that may be excavated from the various areas of the lake:

AREA	ESTIMATED AREA (SQUARE FT)	ESTIMATED THICKNESS OF SUITABLE MATERIAL (FT)	ESTIMATED VOLUME (CUBIC YARDS)
1	630,000	5	100,000
2	840,000	0	0
3	170,000	5	30,000

Based upon our estimates, there is approximately 130,000 cubic yards of suitable material that may be excavated from the lake. In approximately half of the lake, the soils were generally considered unsuitable for construction purposes. However, if the clay soils are properly mixed with the sands they could be utilized as embankment fill material for roadway construction.

We understand that the City of Mobile is planning to place a small dredge into the lake and pump the material into geotubes on the shoreline that would allow the water to drain from the soils. This would have the added benefit of removing the small invasive species of the apple snails

The use of a dredge will tend to blend the soils more in the excavation process and identifying the extents of the bottom of the sand soils will be difficult to identify. This operation will need to be closely monitored to prevent mixing of soils if it is the desire of the city to reutilize the clean sandy materials. Although much of the dredge material from AREA 2 may be clayey soils that are generally considered unsuitable, if properly mixed with the sand soils the properties of this material can be improved and utilized as embankment fill. If mixed soils are utilized in construction, additional considerations may be required with regards to the embankment design and construction.

V. SOILS EXPLORATIONS PROGRAM

A total of 26 sampling points were selected for the soils exploration program. The sampling locations were selected by representatives of GET, the City of Mobile engineering staff and the design engineer, Larry Dorsey, P.E. of Dorsey & Dorsey Engineering, Inc. A handheld GPS was used to determine the sampling locations in the field. Samples were generally collected at 300 to 500 ft intervals and are identified on the map included in Appendix B of this report.

The soil samples were collected by driving a 1 inch diameter steel tube through the water into the soils at the lake bottom. The samples were advanced to "refusal". Refusal generally occurred due to the dense nature of the sediment sands or because trees or limbs were encountered. The sample tubes were sealed and transported to the laboratory. Water depths were recorded at each of the sampling points.

At the laboratory, the tubes were cut, samples extracted and the soils were visually examined and classified. Logs of Boring were prepared for each sampling point based upon visual classifications of the soils extracted and/or laboratory test results. These Logs of Boring are included in Appendix E of this report.

The boring logs and related information are based on the logs prepared after soil extraction from the sampling tubes and visual examination of selected samples in the laboratory. The delineation between soil types shown on the logs is approximate and the description represents the interpretation of subsurface conditions at the designated sampling point on the particular date the sample was collected. The soil conditions at many of these locations could change significantly due to a heavy rainfall event or additional sedimentation.

Laboratory soil mechanics tests have been performed on selected soil samples recovered from the explorations to determine some of the physical properties of the respective soils encountered at the project site. These tests included moisture content, grain size, and Atterberg limits. The tests have been performed in general accordance with standard laboratory soil testing procedures. The results of these tests are shown on the Logs of Boring opposite the respective samples tested and in the Summary of Laboratory Tests included in Appendix F of this report.

Portions of samples extracted from the tubes were collected and taken by Envirochem Laboratories for chemical analyses.

VI. CONCLUSION

This report concludes the services authorized for this project. Geotechnical Engineering-Testing, Inc. appreciates this opportunity to be of service the City of Mobile.

Should there be any questions regarding the findings or opinions presented by this report, please let us know.

Source – Google Earth

GEOTECHNICAL ENGINEERING TESTING, INC.

Boring Location Map
Langan Park Lake
Mobile County

CITY OF MOBILE
LANGAN PARK LAKE
APPROXIMATE BORING LOCATIONS
WATER ELEVATION - +75.5 (LOWER LAKE), +83.0 (UPPER LAKE)

BORING #	LATITUDE	LONGITUDE	NORTHING	EASTING	APPROXIMATE WATER DEPTH (ft)	APPROXIMATE BOTTOM ELEVATION (ft)
MB-1	30° 42.321"	88° 09.726"	257138	1760418	4.7	78.3
MB-2	30° 42.289"	88° 09.723"	256944	1760433	4.6	78.4
MB-3	30° 42.258"	88° 09.715"	256756	1760474	4.0	79.0
MB-4	30° 42.334"	88° 09.627"	257214	1760937	4.2	71.3
MB-5	30° 42.302"	88° 09.627"	257020	1760936	4.4	71.1
MB-6	30° 42.259"	88° 09.661"	256760	1760757	2.3	73.2
MB-7	30° 42.348"	88° 09.568"	257297	1761247	5.5	70.0
MB-8	30° 42.335"	88° 09.587"	257219	1761147	4.7	70.8
MB-9	30° 42.322"	88° 09.568"	257139	1761246	4.2	71.3
MB-10	30° 42.308"	88° 09.587"	257055	1761146	4.6	70.9
MB-11	30° 42.298"	88° 09.568"	256994	1761245	4.6	70.9
MB-12	30° 42.359"	88° 09.521"	257362	1761493	5.5	70.0
MB-13	30° 42.336"	88° 09.521"	257223	1761493	4.8	70.7
MB-14	30° 42.315"	88° 09.521"	257096	1761492	5.4	70.1
MB-15	30° 42.322"	88° 09.441"	257136	1761911	5.9	69.6
MB-16	30° 42.368"	88° 09.379"	257412	1762238	4.4	71.1
MB-17	30° 42.329"	88° 09.322"	257174	1762535	7.0	68.5
MB-18	30° 42.369"	88° 09.226"	257414	1763039	4.3	71.2
MB-19	30° 42.333"	88° 09.217"	257195	1763085	4.4	71.1
MB-20	30° 42.384"	88° 09.172"	257503	1763322	6.7	68.8
MB-21	30° 42.366"	88° 09.172"	257394	1763322	7.6	67.9
MB-22	30° 42.346"	88° 09.172"	257273	1763321	6.5	69.0
MB-23	30° 42.331"	88° 09.172"	257182	1763321	6.9	68.6
MB-24	30° 42.317"	88° 09.172"	257097	1763320	2.4	73.1
MB-25	30° 42.368"	88° 09.139"	257405	1763495	1.9	73.6
MB-26	30° 42.336"	88° 09.142"	257211	1763478	2.0	73.5
B-1	30° 42.385"	88° 09.301"	257513	1762647	NORTH EDGE	
B-2	30° 42.3741"	88° 09.300"	257446	1762652	4.8	70.5
B-3	30° 42.358"	88° 09.297"	257349	1762667	ISLAND	
B-4	30° 42.342"	88° 09.295"	257252	1762677	6.0	69.3
B-5	30° 42.325"	88° 09.292"	257149	1762692	4.0	71.3
B-6	30° 42.310"	88° 09.290"	257058	1762702	SOUTH EDGE	

CITY OF MOBILE
LAKE AT LANGAN PARK
APPROXIMATE SOUNDING LOCATIONS
WATER ELEVATION - +74.6 (LOWER LAKE), +82.8 (UPPER LAKE)

BORING #	LATITUDE	LONGITUDE	NORTHING	EASTING	APPROXIMATE WATER DEPTH (ft)	APPROXIMATE BOTTOM ELEVATION (ft)
S-1	30° 42.381"	88° 09.273"	257488	1762793	1.8	72.8
S-2	30° 42.375"	88° 09.276"	257452	1762777	3.8	70.8
S-3	30° 42.369"	88° 09.285"	257416	1762730	2.6	72.0
S-4	30° 42.386"	88° 09.307"	257519	1762615	3.1	71.5
S-5	30° 42.371"	88° 09.325"	257429	1762521	2.6	72.0
S-6	30° 42.373"	88° 09.340"	257442	1762442	1.5	73.1
S-7	30° 42.368"	88° 09.352"	257412	1762379	3.5	71.1
S-8	30° 42.371"	88° 09.369"	257430	1762290	1.4	73.2
S-9	30° 42.368"	88° 09.387"	257413	1762196	2.8	71.8
S-10	30° 42.370"	88° 09.412"	257426	1762065	3.0	71.6
S-11	30° 42.359"	88° 09.417"	257359	1762038	1.3	73.3
S-12	30° 42.342"	88° 09.408"	257256	1762085	1.9	72.7
S-13	30° 42.330"	88° 09.416"	257183	1762042	1.9	72.7
S-14	30° 42.314"	88° 09.435"	257087	1761942	2.6	72.0
S-15	30° 42.324"	88° 09.463"	257148	1761796	2.5	72.1
S-16	30° 42.339"	88° 09.483"	257240	1761692	2.3	72.3
S-17	30° 42.382"	88° 09.500"	257501	1761604	1.3	73.3
S-18	30° 42.382"	88° 09.473"	257500	1761746	8.9	65.7
S-19	30° 42.373"	88° 09.462"	257445	1761803	0.8	73.8
S-20	30° 42.367"	88° 09.473"	257409	1761745	0.4	74.2
S-21	30° 42.367"	88° 09.494"	257410	1761635	0.8	73.8
S-22	30° 42.374"	88° 09.531"	257454	1761442	0.9	73.7
S-23	30° 42.362"	88° 09.530"	257381	1761446	2.5	72.1
S-24	30° 42.340"	88° 09.530"	257247	1761446	2.3	72.3
S-25	30° 42.304"	88° 09.526"	257029	1761465	3.0	71.6
S-26	30° 42.295"	88° 09.544"	256975	1761371	2.1	72.5
S-27	30° 42.310"	88° 09.557"	257066	1761303	1.6	73.0
S-28	30° 42.328"	88° 09.574"	257176	1761215	2.1	72.5
S-29	30° 42.351"	88° 09.599"	257316	1761085	2.2	72.4
S-30	30° 42.330"	88° 09.613"	257189	1761011	2.3	72.3
S-31	30° 42.297"	88° 09.619"	256989	1760978	1.5	73.1
S-32	30° 42.286"	88° 09.638"	256923	1760878	3.2	71.4
S-33	30° 42.270"	88° 09.659"	256827	1760767	1.6	73.0
S-34	30° 42.287"	88° 09.668"	256930	1760721	7.7	66.9

S-35	30° 42.304"	88° 09.669"	257033	1760716	2.0	72.6
S-36	30° 42.322"	88° 09.670"	257143	1760712	5.9	68.7
S-37	30° 42.321"	88° 09.650"	257136	1760816	5.8	68.8
S-38	30° 42.340"	88° 09.646"	257251	1760838	3.4	71.2
S-39	30° 42.379"	88° 09.258"	257475	1762872	2.3	72.3
S-40	30° 42.371"	88° 09.244"	257427	1762945	1.7	72.9
S-41	30° 42.385"	88° 09.238"	257511	1762976	0.6	74.0
S-42	30° 42.380"	88° 09.213"	257480	1763108	2.8	71.8
S-43	30° 42.363"	88° 09.201"	257377	1763170	2.8	71.8
S-44	30° 42.312"	88° 09.170"	257067	1763330	0.9	73.7
S-45	30° 42.319"	88° 09.193"	257110	1763210	3.6	71.0
S-46	30° 42.322"	88° 09.225"	257129	1763043	3.6	71.0
S-47	30° 42.317"	88° 09.276"	257100	1762775	2.3	72.3
S-48	30° 42.319"	88° 09.298"	257113	1762660	3.1	71.5
S-49	30° 42.318"	88° 09.320"	257108	1762545	2.7	71.9
S-50	30° 42.320"	88° 09.338"	257120	1762451	2.0	72.6
S-51	30° 42.330"	88° 09.335"	257181	1762467	2.0	72.6
S-52	30° 42.343"	88° 09.365"	257261	1762310	2.1	72.5
S-53	30° 42.350"	88° 09.315"	257301	1762572	0.8	73.8
S-54	30° 42.350"	88° 09.334"	257302	1762473	0.9	73.7
S-55	30° 42.341"	88° 09.325"	257247	1762520	3.6	71.0
S-56	30° 42.351"	88° 09.309"	257307	1762604	1.1	73.5
S-57	30° 42.341"	88° 09.304"	257247	1762630	3.8	70.8
S-58	30° 42.342"	88° 09.289"	257252	1762708	3.1	71.5
S-59	30° 42.353"	88° 09.286"	257319	1762724	0.6	74.0
S-60	30° 42.353"	88° 09.257"	257318	1762876	1.4	73.2
S-61	30° 42.339"	88° 09.253"	257233	1762897	3.9	70.7
S-62	30° 42.347"	88° 09.227"	257281	1763033	4.1	70.5
S-63	30° 42.344"	88° 09.695"	257277	1760582	3.8	79.0
S-64	30° 42.337"	88° 09.696"	257234	1760576	3.4	79.4
S-65	30° 42.320"	88° 09.703"	257131	1760539	1.1	81.7
S-66	30° 42.307"	88° 09.699"	257053	1760559	3.8	79.0
S-67	30° 42.293"	88° 09.696"	256968	1760574	4.2	78.6
S-68	30° 42.278"	88° 09.700"	256877	1760553	1.8	81.0
S-69	30° 42.275"	88° 09.712"	256859	1760490	1.3	81.5
S-70	30° 42.296"	88° 09.718"	256986	1760459	1.1	81.7
S-71	30° 42.203"	88° 09.731"	256423	1760388	2.1	80.7
S-72	30° 42.316"	88° 09.712"	257108	1760492	3.3	79.5
S-73	30° 42.327"	88° 09.722"	257174	1760440	2.8	80.0
S-74	30° 42.339"	88° 09.715"	257247	1760477	2.7	80.1

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/13/17

BORING DEPTH: 8.8 FT.

BORING ELEV.: 83 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-1

BORING LOCATION:
N 30° 42.321'
W 88° 09.726'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.7' Water										
5		Brown sand	1			18	NP	NP		2.5		A-3 (0)
		B.T. @ 8.8 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/13/17

BORING DEPTH: 11.1 FT.

BORING ELEV.: 83 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-2

BORING LOCATION:
N 30° 42.289'
W 88° 09.723'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.6' Water										
5		Brown sand	1			24	NP	NP		4.8		A-3 (0)
10		B.T. @ 11.1 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/13/17

BORING DEPTH: 9.3 FT.

BORING ELEV.: 83 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-3

BORING LOCATION:
N 30° 42.258'
W 88° 09.715'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4' Water										
5		Brown sand	1			26	NP	NP		2.7		A-3 (0)
10		B.T. @ 9.3 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 6.2 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-4

BORING LOCATION:
N 30° 42.334'
W 88° 09.627'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.2' Water										
5		Gray silty sand	1			47	NP	NP		25.4		A-2-4 (0)
		B.T. @ 6.2 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 6.1 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-5

BORING LOCATION:
N 30° 42.302'
W 88° 09.627'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.4' Water										
5		Brown sand w/ gravel	1			4	NP	NP		1.8		A-1-b (0)
		B.T. @ 6.1 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 7.7 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-6

BORING LOCATION:
N 30° 42.259'
W 88° 09.661'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		2.3' Water										
5		Brown sand with silt	1			33	NP	NP		5.5		A-3 (0)
		B.T. @ 7.7 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 7.7 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-7

BORING LOCATION:
N 30° 42.348'
W 88° 09.568'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		5.5' Water										
5		Gray clayey sand	1									
		Gray fat clay	2			61	53	35		74.6		A-7-6 (26)
		B.T. @ 7.7 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 7.5 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-8

BORING LOCATION:
N 30° 42.335'
W 88° 09.587'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.7' Water										
5		Gray clayey sand	1			59	38	15		42.0		A-6 (3)
		Gray sand	2									
		B.T. @ 7.5 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 7 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-9

BORING LOCATION:
N 30° 42.322'
W 88° 09.568'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.2' Water										
5		Gary silty sand	1			50	NP	NP		19.4		A-2-4 (0)
		Gray clay	2									
		B.T. @ 7 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 7.6 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-10

BORING LOCATION:
N 30° 42.308'
W 88° 09.587'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.6' Water										
5		Grey clayey sand	1			59	28	10		44.4		A-4 (1)
		Gray sand	2									
		B.T. @ 7.6 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/14/17

BORING DEPTH: 7.9 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-11

BORING LOCATION:
N 30° 42.298'
W 88° 09.568'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.6' Water										
5		Brown & gray silty sand	1			44	NP	NP		25.7		A-2-4 (0)
		B.T. @ 7.9 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 8.1 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-12

BORING LOCATION:
N 30° 42.359'
W 88° 09.521'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		5.5' Water										
5		Gray clay w/ sand	1			123	41	20		55.0		A-7-6 (8)
		Brown sand	2									
		B.T. @ 8.1 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 8.3 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-13

BORING LOCATION:
N 30° 42.336'
W 88° 09.521'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.8' Water										
5		Gray clayey sand	1			78	47	22		39.2		A-7-6 (4)
		Gray clay	2									
		B.T. @ 8.3 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 7.9 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-14

BORING LOCATION:
N 30° 42.315'
W 88° 09.521'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		5.4' Water										
5		Brown silty clayey sand	1			63	29	7		34.9		A-2-4 (0)
		B.T. @ 7.9 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 7.9 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-15

BORING LOCATION:
N 30° 42.322'
W 88° 09.441'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0												
		5.9' Water										
5		Brown & gray clayey sand	1			64	36	14		24.5		A-2-6 (0)
		B.T. @ 7.9 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 8.4 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-16

BORING LOCATION:
N 30° 42.368'
W 88° 09.379'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.4' Water										
5		Gray clay w/ sand	1			36	33	15		51.8		A-6 (5)
		Gray clay	2									
		B.T. @ 8.4 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 10 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-17

BORING LOCATION:
N 30° 42.329'
W 88° 09.322'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		7' Water										
5												
		Gray clayey sand	1			116	89	54		28.6		A-2-7 (6)
10		B.T. @ 10 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 8.2 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-18

BORING LOCATION:
N 30° 42.369'
W 88° 09.226'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.3' Water										
5		Gray sand with silt	1			64	NP	NP		11.2		A-2-4 (0)
		B.T. @ 8.2 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/17/17

BORING DEPTH: 8.7 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-19

BORING LOCATION:
N 30° 42.333'
W 88° 09.217'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		4.4' Water										
5		Gray clay w/ sand	1			47	31	11		51.2		A-6 (3)
		Gray clay	2									
		B.T. @ 8.7 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 10.8 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-20

BORING LOCATION:
N 30° 42.384'
W 88° 09.172'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0												
		6.7' Water										
5												
		Gray clayey sand	1			33	31	10		38.5		A-4 (1)
10		Gray clay	2									
		B.T. @ 10.8 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 12.7 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-21

BORING LOCATION:
N 30° 42.366'
W 88° 09.172'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_I	S.P.T. N_C	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0												
		7.6' Water										
5												
10		Gray sand	1			158	126	104		0.6		A-2-7 (0)
		B.T. @ 12.7 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 11.5 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-22

BORING LOCATION:
N 30° 42.346'
W 88° 09.172'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0												
		6.5' Water										
5		Gray clayey sand	1			52	36	12		29.8		A-2-6 (0)
10		Gray sand	2									
		B.T. @ 11.5 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 12.5 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-23

BORING LOCATION:
N 30° 42.331'
W 88° 09.172'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0												
		6.9' Water										
5												
		Gray clayey sand	1			53	53	30		49.6		A-7-6 (11)
10		Gray sandy clay	2									
		B.T. @ 12.5 FT										
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 7 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-24

BORING LOCATION:
N 30° 42.317'
W 88° 09.172'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		2.4' Water										
5		Brown sand with silt	1			28	NP	NP		6.9		A-3 (0)
		B.T. @ 7 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 7.8 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-25

BORING LOCATION:
N 30° 42.368'
W 88° 09.139'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_I	S.P.T. N_C	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		1.9' Water										
5		Brown silty sand				53	NP	NP		23.6		A-2-4 (0)
		B.T. @ 7.8 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

PROJECT NAME: LANGAN PARK

G.E.T. PROJ. NUMBER: 17-173

PROJECT LOCATION: MOBILE, ALABAMA

DRILL RIG:

DRILL METHOD:

DRILL CREW: SW, RS(LOGGER)

DATE DRILLED: 6/18/17

BORING DEPTH: 7.8 FT.

BORING ELEV.: 75.5 FT.

DATUM:

WATER DEPTH:

REMARKS:

GEOTECHNICAL ENGINEERING TESTING, INC.

BORING NUMBER: MB-26

BORING LOCATION:
N 30° 42.336'
W 88° 09.142'

DEPTH IN FEET	LOG	DESCRIPTION	SAMPLE NO.	S.P.T. N_f	S.P.T. N_c	W.C. %	ATTERBERG LIMITS L.L.	ATTERBERG LIMITS P.I.	DRY UNIT WT. pcf	% MINUS #200	SHEAR STRENGTH tsf	AASHTO CLASS
0		2' Water										
5		Brown silty sand	1			48	NP	NP		34.1		A-2-4 (0)
		B.T. @ 7.8 FT										
10												
15												
20												

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

MOD DEEP BORING LOG W/ AASHTO 17-173 LANGAN PARK.GPJ GETI_AL.GDT 7/12/17

ATTACHMENT 2
AASHTO to USCS Soil Classification

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

Basic Soil Type (1)	ASTM D2487	AASHTO M 145
Sn (Gravelly sand, SW)	SW, SP (2) GW, GP sands and gravels with 12% or less fines	A-1, A-3 (2)
Si (Sandy silt, ML)	GM, SM, ML also GC and SC with less than 20% passing a No. 200 sieve	A-2-4, A-2-5, A-4
Cl (Silty clay, CL)	CL, MH, GC, SC also GC and SC with more than 20% passing a No. 200 sieve	A-2-6, A-2-7, A-5, A-6

1. The soil classification listed in parentheses is the type that was tested to develop the constrained soil modulus values in Table 12.12.3.5-1. The correlations to other soil types are approximate.
2. Uniformly graded materials with an average particle size smaller than a No. 40 sieve shall not be used as backfill for thermoplastic culverts unless specifically allowed in the contract documents and special precautions are taken to control moisture content and monitor compaction levels.

Equivalent ASTM and AASHTO Soil Classifications [AASHTO, 2017]

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

ATTACHMENT 3
AASHTO Classification

Geosyntec consultants

26148 Captial Drive, Suite E
Daphne, AL 36526
PH 251.230.6324
FAX 678.202.9501
www.geosyntec.com

General Classification	Granular Materials (35 Percent or Less Passing 75 µm)							Silt-Clay Materials (More Than 35 Percent Passing 75 µm)			
Group Classification	A-1			A-2							A-7
	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7-5, A-7-6
Sieve analysis, percent passing:											
2.00 mm (No. 10)	50 max	—	—	—	—	—	—	—	—	—	—
0.425 mm (No. 40)	30 max	50 max	51 min	—	—	—	—	—	—	—	—
75 µm (No. 200)	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min	36 min	36 min
Characteristics of fraction passing 0.425 mm (No. 40)											
Liquid limit	—		—	40 max	41 min	40 max	41 min	40 max	41 min	40 max	41 min
Plasticity index	6 max		NP	10 max	10 max	11 min	11 min	10 max	10 max	11 min	11 min[a]
Usual types of significant constituent materials	Stone fragments, gravel and sand		Fine sand	Silty or clayey gravel and sand				Silty soils		Clayey soils	
General rating as subgrade	Excellent to Good							Fair to Poor			

[a] Plasticity index of A-7-5 subgroup is equal to or less than LL minus 30. Plasticity index of A-7-6 subgroup is greater than LL minus 30. (See Figure 2.)

Classification of Soils and Soil-Aggregate Mixtures [AASHTO, 2008]