BTL Engineering Services, Inc.

5802 N. Occident Street P.O. Box 15718 Tampa, Florida 33684
(813) 884-0755 - Hillsborough (727) 733-9347 - Pinellas (727) 846-1703 - Pasco (813) 886-5377 - Fax

November 19, 2013

Mr. Lawrence E. Mills, PE, PLS, LEED AP
Mills & Associates Inc.
3242 Henderson Boulevard, Suite 300
Tampa, Florida 33609

Re: Subsurface Investigation
Proposed Linebaugh Avenue Pump Station
East Linebaugh Avenue & North 10th Street
Tampa, FL
BTL Job No. 1636-13-1637

Dear Mr. Mills:

BTL Engineering Services, Inc. has completed a subsurface investigation at the referenced project site located in Tampa, Florida. This report describes the project site, discusses methods of testing, presents investigation results and provides geotechnical recommendations for proposed pump station.

Please feel free to request any further information or clarifications that may be needed. Thank you for choosing *BTL Engineering Services, Inc.*, to perform this subsurface investigation. We would be pleased to assist you further in other phases of geotechnical engineering and construction testing as project needs develop.

Sincerely,

BTL ENGINEERING SERVICES, INC.
CA 2352

M. A. Hai 11/19/2013

Mohammed A. Hai, P.E.
Vice President
FL Registration No. 59345

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APPENDICES

EXECUTIVE SUMMARY[1]

BTL Engineering Services, Inc. has completed a geotechnical exploration on the proposed Linebaugh Avenue Pump Station, located at East Linebaugh Avenue & North 10th Street, Tampa, Florida. The results of our findings are briefly summarized below. The text of this report should be reviewed for discussion of these items.

1. *BTL Engineering Services, Inc*. performed one (1) standard penetration test (SPT) boring to a depth of 40 feet below ground surface (BGS) within the proposed pump station footprint at locations indicated in the Boring Location Plan (Appendix B). Generally, the soil profile consists of medium dense to loose to very loose fine sand to a depth of 9 feet, loose clayey sand to a depth of 21 feet, very loose fine sand to a depth of 27 feet, firm sandy clay to a depth of 32 feet and underlain by soft weathered limestone to hard limestone up to the boring termination depth of 40 feet BGS. The soil strength of the soils excluding limestone layers revealed with standard penetration resistance values (N-values) ranging from 3 to 12 blows per foot (bpf). The soil strength of the limestone layers revealed with N-values ranging from 7 to in excess of 50 bpf.

2. Based on the loose to very loose subsurface soil conditions encountered in our soil investigation, we recommend that sufficient shoring should be placed for excavation to a depth of 20 feet BGS for the proposed wet well. A well point system around the proposed wet well excavation or sump pump should be installed to lower the ground water table at least 2 feet below the bottom of wet well excavation depth. The hydraulic excavation (manhole) bracing system may be installed for soil support for the excavation to install new precast wet well. Groundwater table was recorded at a depth of 11 feet BGS after 24-hour stabilization period.

3. Based on the subsurface soil conditions at the foundation level of wet well, we recommend a 6-inch thick layer of #57 size either concrete or rock be placed at the bottom of the proposed wet well to provide firm support and reduce potential differential settlement.

4. Upon completing the recommended site preparation, it is our opinion that if any building is planned it can be supported on shallow foundations on existing suitable bearing soils or structural fill. A net allowable soil bearing pressure of up to 2,000 pounds per square foot may be utilized for footing designs when the footings bear 16-inches to 24-inches below the finished grade.

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1 This Executive Summary is not intended to be used or relied upon without reference to the entire report and cannot otherwise be properly understood and interpreted. It is provided solely for the convenience of the Client and not as a substitute for the report or review of the report.

1.0 AUTHORIZATION

Mr. Lawrence E. Mills, PE, PLS, LEED AP, Mills & Associates Inc. requested our testing services through correspondence and telephone conversations with BTL Engineering staff. *BTL Engineering Services, Inc*. was retained by Mr. Lawrence E. Mills, PE, PLS, LEED AP, *Mills & Associates Inc.* to perform a geotechnical exploration on the project site. After receiving an email authorization dated October 30, 2013 from Mr. Lawrence E. Mills, PE, PLS, LEED AP, *Mills & Associates Inc.* a geotechnical exploration was performed.

2.0 SCOPE

The scope of our services included the following items:

1. A visual reconnaissance of the site from a geotechnical standpoint;
2. Conducting one (1) standard penetration test (SPT) boring to a depth of 40 feet below ground surface (BGS) within the proposed pump station footprint to assess subsurface soil conditions;
3. Classification of the soil samples obtained during our fieldwork program;
4. Analyzing the existing soil conditions with respect to the proposed construction;
5. Preparing this report to document the results of the fieldwork program, general information regarding soil types and to provide geotechnical recommendations for proposed pump station, and evaluation of recovered soils or groundwater.

3.0 PURPOSE

The primary purposes of the geotechnical exploration was to determine the general type and condition of the subsurface materials at the project site, and to provide recommendations for site work, geotechnical recommendations for proposed pump station, and evaluation of recovered soils or groundwater.

4.0 SITE AND PROJECT DESCRIPTION

The project site is located at East Linebaugh Avenue & North 10th Street, Tampa, Florida (Appendix A). A site plan provided by the client was used to determine the general boundaries of the project site. The project site is relatively level ground surface. An existing pump station, which will be removed, presently occupies the project site. Based on the client's provided information, a precast circular wet well of about 8 feet diameter and 20 feet deep will be installed at the proposed pump station at the project site. BTL Engineering staff performed the SPT boring at the location indicated on the provided site plan.

If the above information is significantly different than we anticipated, please inform *BTL Engineering Services, Inc.*, so that we may review our recommendations with respect to any modifications.

5.0 FIELD EXPLORATION METHODS

5.1 Standard Penetration Test Boring

BTL Engineering Services, Inc. performed the standard penetration test (SPT) boring on November 8, 2013, using a Diedrich D-25 Standard Penetration Test drill rig to advance SPT borings. The Standard Penetration Test (SPT) boring permits soil classification of samples retained during the test and allows the standard penetration resistance to be determined at selected depth intervals. These data permit estimation of soil properties such as continuity, strength, compressibility, and permeability. Drilling and standard penetration tests are performed in general conformance with ASTM D-1586.

In performing the SPT test, borings are advanced to the desired test depth by rotary drilling methods whereupon the drill bit is withdrawn and the penetration test performed using a standard 1.4-inch I.D., 2.0-inch O.D., split-barrel sampler. Spacing between each test interval varies by no more than 2.0 feet in the top 10 feet of each boring and by not more than 5.0 feet at depths greater than 10 feet. Conventional rotary drilling procedures were utilized along with a bentonite drilling fluid to stabilize the borehole.

A 140-pound hammer falling 30 inches drives the sampler. Because of disturbance effects, the number of blows required to drive the sampler the first six inches is not considered in the standard penetration test value. The SPT value is based on the second and third 6-inch increments and this resistance is designated the "penetration resistance." Penetration resistance is an index of the soil strength and density that is used in engineering design. After each penetration test, the driller classifies the split-barrel sample according to color, texture, material type and moisture content. A portion of each sample is collected in a sealed container and transported to the laboratory where it is further examined to verify field condition. The samples are temporarily stored in the laboratory for future reference.

6.0 SUBSURFACE EXPLORATION

6.1 Subsurface Conditions

BTL Engineering Services, Inc. performed one (1) standard penetration test (SPT) boring to a depth of 40 feet below ground surface (BGS) within the proposed pump station footprint at locations indicated in the Boring Location Plan (Appendix B). Generally, the soil profile consists of medium dense to loose to very loose fine sand to a depth of 9 feet, loose clayey sand to a depth of 21 feet, very loose fine sand to a depth of 27 feet, firm sandy clay to a depth of 32 feet and underlain by soft weathered limestone to hard limestone up to the boring termination depth of 40 feet BGS. The soil strength of the soils excluding limestone layers revealed with standard penetration resistance values (N-values) ranging from 3 to 12 blows per foot (bpf). The soil strength of the limestone layers revealed with N-values ranging from 7 to in excess of 50 bpf.

Groundwater table was recorded at a depth of 11 feet BGS after 24-hour stabilization period. Fluctuation in groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff, re-direction of water flow as a result of natural or by anthropogenic activities and other site-specific factors. For a more precise description of the conditions encountered within the soil test boring, we refer you to the boring log sheet included in the Appendix C to this report.

6.2 Soil Survey Information

The Soil Survey of Hillsborough County indicates that natural shallow soils at the site are categorized as Map Units 55 & 61. Map Unit 55- Tavares-Urban land complex, 0 to 5 percent slopes and Map Unit 61- Zolfo fine sand. Map Unit 55 is composed of Tavares soils (50%), Urban land (35%) and minor units (15%). Map Unit 61 is composed of zolfo fine sand (94%) and minor unit (6%). The estimated historic Seasonal High Ground Water Table (SHGWT) are ranging from 2 feet to greater than 6 feet BGS for soil unit 61 and from 3.5 feet to greater than 6 feet BGS for soil unit 55. The general major soil descriptions as described in the Soil Survey are presented in the following table.

Summary of Soil Survey of Hillsborough County						
Map Unit 55- Tavares-Urban Land Complex, 0 to 5 percent slopes						
Soil Unit	Classification			Seasonal High Ground Water Table		
Tavares	Depth	USCS	AASHTO	Depth	Type	Months
	(inches)			(feet)		
	0 - 6	SP, SP-SM	A-3	3.5	None	June - Dec
	6 - 80	SP, SP-SM	A-3			
Map Unit 61- Zolfo fine sand						
Soil Unit	Classification			Seasonal High Ground Water Table		
Zolfo	Depths,	USCS	AASHTO	Depth	Type	Months
	(inches)			(feet)		
	0 - 3	SP-SM	A-2-4, A-3	2.0	None	June - Aug
	3 - 60	SM, SP-SM	A-2-4, A-3			
	60 - 80	SM, SP-SM	A-2-4, A-3			

Note: The Soil Survey does not provide the above information for Urban land

7.0 DISCUSSION AND RECOMMENDATIONS

The following recommendations are based on our understanding of the proposed construction, the data obtained in our soil test boring, visual soil classification, a site reconnaissance, and our experience with subsurface conditions similar to those encountered at the project site.

7.1 Site Preparation

Based on the existing soil layers found in the subsurface soil profile, the following geotechnical site preparation is recommended. The site inspection by an experienced geotechnical engineer or his representative from this office will be recommended to perform field density testing.

1. Initial site preparation should consist of performing clearing, grubbing and removal of topsoil in order to remove trees, vegetation, and associated root systems to a depth of their vertical reach. This should be done within and to a minimum distance of 5 feet beyond the perimeter of the proposed development footprint, if area permits. The stripped topsoil should be stockpiled on-site for later usage in landscape (non-structural) areas only.

2. Upon completion of the clearing, grubbing and removal of topsoil as noted above, perform proofrolling with a vibratory roller. We recommend a moderate weight vibratory drum roller having a total operating static weight (including fuel and water) of at least 5 tons and a drum diameter of 3 to 3.5 feet. Regardless of the degree of compaction achieved, a minimum of **6** perpendicular overlapping passes should be made in the development area with the compaction equipment in order to increase the density and improve the uniformity of the underlying loose sandy soils. Upon completion of the proofrolling, density tests shall be performed to confirm a minimum compaction compliance of **95** percent of modified proctor maximum density (ASTM D-1557). The roller coverages should be divided

evenly into two perpendicular directions, where possible. Additional passes may be necessary if compliance compaction is not achieved.

3. Place fill material in uniform lifts of 12 inches, to reach finished grade. The fill material should be inorganic (classified as SP, SW, GP, GW, SP-SM, SW-SM, GP-GM, GW-GM) containing not more than 5 percent (by weight) organic materials. Fill materials with silt-size soil fines in excess of 12% should not be used. Place fill in maximum 12-inch lifts and compact each lift to a minimum density of **95** percent of the Modified Proctor maximum dry density (ASTM D-1557) with a vibratory roller as mentioned in item #2.

4. Perform compliance tests within the fill either at a frequency of not less than one test per 2,500 square feet per lift, or at a minimum of 3 tests per lift, whichever is greater or conforming Section 125-8 –Backfilling of the current FDOT Standard Specifications For Road and Bridge Construction and City of Tampa requirements.

5. Upon completion of the building footing (**if any**) excavation and prior to placement of reinforcing steel and concrete, we recommend compaction of the bottom of the footings with the vibratory compactor over each footing. The bottom of footings shall be examined by the engineer or his representative to determine if the soil is vertically free of all organic and/or deleterious material, and if the compaction and soil pressures are achieved or if additional compaction is required. Perform compliance tests within the footings either as noted in section 7.5 or in accordance with FDOT and City of Tampa requirements.

6. The contractor shall take into account the final contours and grades as established by the plan when executing his backfilling and compaction operations.

Using vibratory compaction equipment at this site may disturb adjacent structures. Care shall be taken during the excavation, proofrolling and compaction operations to insure existing homes, any adjacent structures and utilities are not adversely affected.

7.2 Geotechnical Recommendations (if applicable)

Upon completing the recommended site preparation, it is our opinion that if any building is planned can be supported on shallow foundations on existing suitable bearing soils or structural fill. A net allowable soil bearing pressure of up to 2,000 pounds per square foot may be utilized for footing designs when the footings bear 16-inches to 24-inches below the finished grade.

Based on the log of borings, site soil improvement as noted above and our experience with this type of soil, *BTL Engineering Services, Inc*. recommends that a maximum wall load of 5 kips per linear foot for continuous footings and a maximum isolated column load of 50 kips may be used for design purpose.

7.3 Floor Slab (if applicable)

Following proper site preparation, as previously described, it is our opinion that a conventional slab-on-grade may be utilized for any building if it is planned. We recommend that the floor subgrade in the building pad areas be proofrolled and soil density be measured by a geotechnical engineer or his representative prior to floor slab concreting.

We suggest that a vapor barrier be placed immediately beneath the floor slab according to project specifications to reduce moisture migration through the concrete slab. Based on experience on similar soil types, an estimated sub-grade modulus of 120 lb/in^3 may be used to design the slab.

7.4 Structural Fill Placement

The on-site excavated soils to a depth of 9 feet BGS should generally be suitable for reuse as engineered fill with proper moisture control. Fill placed in confined areas that cannot be reached by the large roller should be compacted by lightweight vibratory equipment that can operate in confined areas. The fill loose lift thickness should be reduced to 6 inches. Each lift should be thoroughly compacted with the compaction equipment until densities equivalent to at least **95** percent of the Modified Proctor maximum dry density (ASTM D-1557) are uniformly obtained.

7.5 Compliance Testing (if applicable)

Density tests should be used to control subgrade and fill compaction. Density tests should be performed at the subgrade level, at each fill lift and at the bottom of the footing elevations to assure uniform compaction.

A minimum testing frequency of one density test per 2,500 square feet of each lift or 3 tests per lift, whichever is greater should be used. Additional testing should be performed in the excavated footing areas to confirm that excavation operations have not loosened the subgrade. A minimum of one density test per 100 linear foot of load bearing wall and on each column pad should be performed.

7.6 Excavation Conditions

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better insure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that all excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures.

In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

7.7 Excavation Bracing System – Precast Wet Well

A precast circular wet well of about 8 feet diameter and 20 feet deep will be installed at the proposed pump station at the project site. Based on the subsurface soil condition at the foundation level of wet well, we recommend a 6-inch thick layer of #57 size either concrete or rock be placed at the bottom of the proposed wet well to provide firm support and reduce potential differential settlement.

Based on the loose to very loose subsurface soil conditions encountered in our soil investigation, we recommend that sufficient shoring should be placed for excavation to a depth of 20 feet BGS for the proposed wet well. A well point system around the proposed wet well excavation or sump pump should be installed to lower the ground water table at least 2 feet below the bottom of wet well excavation depth. The hydraulic excavation (manhole) bracing system may be installed for soil support for the excavation to install new precast wet well.

For an excavation bracing system design, we recommend that a constant earth pressure equal to $0.80K_a\gamma H$, where K_a is the co-efficient of active earth pressure, γ is the unit weight of in-situ soil, and H is the depth of the excavation. Based on our experience with similar soils and field data, we recommend the following Table 1 summarizing the ultimate equivalent fluid pressures to be used in preliminary design for in-situ soils for temporary excavation bracing design.

TABLE 1 - SUMMARY OF ULTIMATE EQUIVALENT FLUID PRESSURES (Excavation Bracing)

Pressure Conditions	Co-efficient of Earth Pressure	Ultimate Equivalent Fluid Pressure
Active (K_a)	0.36	36 psf/ft
At-rest (K_o)	0.53	53 psf/ft
Passive (K_p)	2.77	277 psf/ft

These ultimate equivalent fluid pressures were calculated by the Rankine method using a soil unit weight of 100 lb/ft^3, a conservative angle of internal friction of 28 degrees, and zero effective cohesion.

8.0 PAVEMENT RECOMMENDATIONS (IF APPLICABLE)

8.1 General Components

We have not performed limerock bearing ratio (LBR) and maximum dry density tests on existing soils from roadway areas (to determine the soil parameter needed for pavement design.

We believe that a conventional flexible (asphalt surface) pavement section can be used for the internal roadway areas. The following structural sections are typically used for light duty asphalt pavement.

Light duty asphalt pavement sections are usually used for conventional roadway and parking areas with an average gross weight of 4,000 pounds contributed by cars and light pickup trucks.

Light Duty Asphalt Pavement	
Wearing Course	1.5-inch Type S-1 or S-3 asphalt concrete
Base Course	6- inch limerock (LBR = 100 minimum)
Subgrade	12-inch stabilized subgrade material (LBR = 40 minimum)

These pavement thicknesses given are intended as a guideline only, as the pavement should be designed specifically for the vehicle load intensities and frequencies anticipated during the design life of the project.

We also recommend pavement consisting of a concrete slab (4,000 psi) at least 6 inches thick placed over a prepared subgrade for heavy trucks (if applicable) will maneuver even if asphalt paving is used elsewhere on the project. Concrete pavement sections may be reinforced with at least 6 inch x 6 inch W1.4 x W1.4 welded wire mesh or equivalent. Reinforcement of concrete with wire mesh does not prevent cracking of the concrete in any way. The purpose of the wire mesh is to inhibit shrinkage cracks that occur in concrete. Wire mesh should be located approximately 2 inches from the surface of the slab, not at the bottom where it is commonly found.

8.2 Subgrade Course

The subgrade or embankment fill is the layer that supports the structural pavement section. Subgrade and embankment fill should be placed and compacted in compliance to specifications presented later in the pavement site preparation procedure section of this report.

We recommend subgrade material be compacted to 98 percent of the Modified Proctor maximum dry density value (AASHTO T-180). The subgrade material should have a minimum Limerock Bearing Ratio (LBR) of 40. Perform compliance tests on the stabilized subgrade for full depth either at a frequency of one test per 300 linear feet or in accordance with FDOT and City of Tampa requirements.

8.3 Base Course

The base course is the portion of the pavement section between the surface course and stabilized subbase / subgrade.

We recommend the base course be limerock with a minimum LBR of 100. The crushed concrete should be placed in lifts no greater than 6 inches and compacted to at least 98 percent of the Modified Proctor maximum dry density value (AASHTO T-180). Perform compliance tests on the base course either at a frequency of one test per 300 linear feet or in accordance with FDOT and City of Tampa requirements.

8.4 Surface Course

The surface course is the portion of the pavement section, which is exposed directly to traffic. In the light duty areas where there is occasional truck traffic, but predominantly passenger cars, we recommend using 1.5 inches of asphaltic concrete, which has a stability of 1,500 pounds.

Samples of the materials delivered to the project should be tested to verify that the aggregate gradation and asphalt content satisfies the mix design specifications. Asphalt should be compacted to a minimum of 95 percent of the laboratory density. Perform compliance tests on the surface course, by coring to evaluate the material thickness and to perform laboratory densities, either at a frequency of one test per 500 linear feet or in accordance with FDOT and City of Tampa requirements.

8.5 Pavement Site Preparation

Upon review of the site soil data, our recommendations of site preparation for pavement are noted below.

1. The proposed construction limits should be cleared, stripped and grubbed of all construction debris, trees, and vegetation and associated root systems to a depth of

their vertical reach. This should be done within and to a distance of 5 feet beyond the road perimeter and parking space (if any).

2. Prior to any fill operations, the existing ground surface should be compacted. We recommend a medium weight roller be used to prepare the site for the proposed pavement section. Upon completion of the proof-rolling, density tests should be performed either at a frequency of one test per 300 linear feet or in accordance with FDOT and City of Tampa requirements to confirm a minimum compaction compliance of 98 percent of modified proctor maximum density (AASHTO T-180).

3. Place fill material, as required. The subgrade should have at least 12 inches of stabilized subgrade material with a minimum Limerock Bearing Ratio (LBR) of 40. The fill material should be inorganic (classified as SP/GW) containing not more than 5 percent (by weight) organic materials. Fill materials with silt-size soil fines in excess of 10% should not be used. Place fill in maximum 12-inch lifts and compact each lift to a minimum density of **98** percent of the Modified Proctor maximum dry density (AASHTO T-180) with a roller as mentioned previously.

4. Perform compliance tests within the fill either at a frequency of one test per 300 linear feet per lift in the pavement areas, or at a minimum of two test locations, whichever is greater or in accordance with FDOT and City of Tampa requirements.

5. The contractor shall take into account the final contours and grades as established by the paving and drainage plan when executing any backfilling and / or compaction operations.

Using vibratory compaction equipment at this site may disturb adjacent structures. Care shall be taken during the proofrolling and compaction operations to insure any adjacent structures and utilities are not adversely affected.

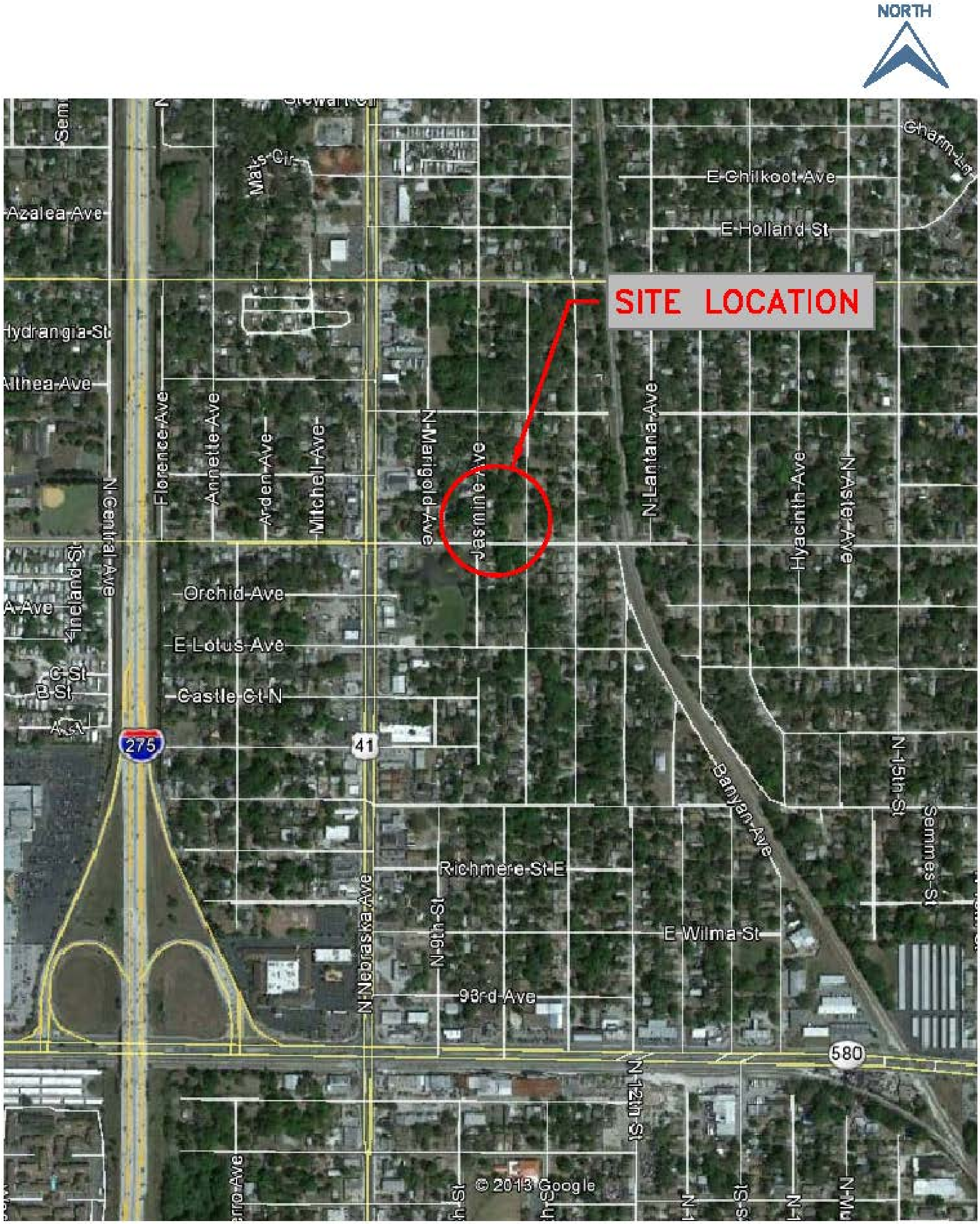
9.0 LIMITATIONS

This report is for the exclusive use of ***Mills & Associates Inc.*** and the other designers of the project, and may only be applied to this specific project. Our conclusions and recommendations have been prepared using generally accepted standards of Geotechnical Engineering practice. No other warranty is expressed or implied. Our firm is not responsible for conclusions, opinions or recommendations of others.

Our conclusions and recommendations are based upon preliminary information furnished to us, data obtained from the testing program and our past experience. They do not reflect variations in subsurface conditions that may exist in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon "on-site" observations of the conditions. The recommendations contained herein, must be considered preliminary and limited.

APPENDIX A

Site Location Map



Sheet:	Project:	Title:
1 of 1	East Linebaugh Ave & North 10th St Pump Station	Site Location Map
Date:	Hillsborough Co Folio: 1441700000	Job Number:
11/11/2013	Tampa, FL	1636-13-1637
Drawn: SW Checked: MH	Client: Mills & Associates	Scale: Not to Scale

BTL Engineering Services, Inc.

APPENDIX B

Boring Location Plan

NORTH

Note:
All Locations & Measurements are Approximate

LEGEND:

SPT BORING

Sheet: 1 of 1	Project: East Linebaugh Ave & North 10th St Pump Station	Title: Boring Location Plan	**BTL Engineering Services, Inc.**
Date: 11/11/2013	Hillsborough Co Folio: 1441700000 Tampa, FL	Job Number: 1636-13-1657	[illegible] Tampa, Florida [illegible] (813) [illegible]-Hillsborough (727) [illegible]-Pinellas (727) [illegible]-Pasco / (813) [illegible]-Fax
Drawn: SW Checked: MH	Client: Mills & Associates	Scale: Not to Scale	

APPENDIX C

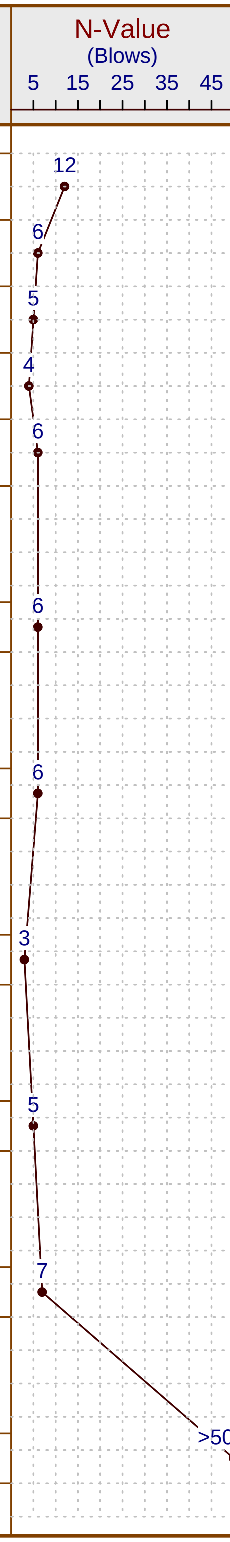
Logs of SPT Borings

BTL Engineering Services, Inc.
P.O. Box 15718, Tampa, FL 33684
5802 N. Occident St.,Tampa, FL 33614
Phone: (813) 884-0755
Fax: (813) 886-5377

Borehole Log: SPT-1

Project No: 1636-13-1637
Project: East Linebaugh Ave & North 10th St Pump Station
Address: Hillsborough Co Folio: 1441700000
Client: Mills & Associates

Depth (ft)	Description	Stratum	Water Table	Sample	Blow	N-Value (Blows)
0	Ground Surface	0.0				
0–4	Loose to Medium Dense Gray Fine SAND (SP)	-4.0		1	3-7-5-5	12
				2	3-3-3-4	6
4–9	Very Loose to Loose White Fine SAND (SP)	-9.0		3	3-3-2-3	5
				4	2-2-2-2	4
				5	3-3-3-4	6
9–21	Loose Light Gray Clayey SAND (SC)	-21.0	GW @ 11'	6	3-3-3	6
				7	4-3-3	6
21–27	Very Loose Pale Brown Fine SAND (SP)	-27.0		8	2-1-2	3
27–32	Firm Dark Brown Sandy CLAY (CL)	-32.0		9	2-2-3	5
32–36	Soft Weathered LIMESTONE (LS)	-36.0		10	4-3-4	7
36–40	Hard LIMESTONE (LS)	-40.0		11	50/4"	>50
40	End of Borehole					



Remarks:

NOTE:

GW - Ground Water Table
NE - Not Established
NF - Not Found
DD-Destructively Drilled

N - Value equals sum of second and third blow count increments

Drill Method: Mud Rotary	Driller: T. Hannum - Orlando	Hole size: 3"
Drill Rig: Diedrich D-25	Date: 11/8/2013	Datum: Ground Surface
Drill Rod: AWJ	Location: See Location Plan	Sheet: 1 of 1

APPENDIX D

Important Information About Your Geotechnical Report and Limitations and Reproductions

IMPORTANT INFORMATION
ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is passed on a subsurface plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and its orientation; physical concomitants such as access roads, parking lots, and underground utilities and the level of additional risk which the client assumed by the virtue of limitations imposed upon the exploratory system. To help costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of this report may affect his recommendations.

Unless your consulting geotechnical engineer indicates otherwise, your *geotechnical report should be not used*:

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- When the size or configuration of the proposed structure is altered;
- When the location or orientation of the proposed structure is modified;
- When there is a change of ownership, or
- For application to adjacent site.

A geotechnical engineer cannot accept responsibility for problems which may develop if he is not consulted after factors considered in his report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by the geotechnical engineer who then renders an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those opined to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, now matter how comprehensive, can reveal what is hidden by earth, rock, and time. For example, the actual interface between materials may be far more gradual or abrupt that the report indicates, and actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultant through the construction state*, to identify variance, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which exist at the time of subsurface exploration, *construction decisions should not be based on the geotechnical engineering report which may be affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept appraised for any such events, and should be consulted to determine if additional tests are necessary.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review their adequacy.

LIMITATIONS

- This investigation and analysis covers only the soil zones and deposits associated with the subsurface investigation. It is not intended to include deep soil or rock strata where cavities or caverns may exist. Furthermore, this study does not deal with or accept responsibility of the possibility of sinkhole development. Deep structural borings, geophysical investigation, or resistivity surveys must be conducted in order to evaluate the structural conditions and stability of soil and rock formations and is beyond the scope of this investigation.

- The preliminary findings in this report are based on analysis of the soils from each of the indicated borings with an interpolation of soil conditions and assumption of reasonable variation in the soil uniformity and properties between boring locations.

- Should any condition at variance with our report or different than those shown by borings be encountered during future explorations, we should be notified immediately so that supplemental data can be provided at minimal cost to our client.

- It is the responsibility of the client to see that these findings are brought to the attention of those concerned.

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