



CITY OF TAMPA

Pam Iorio, Mayor

CONTRACT ADMINISTRATION DEPARTMENT

David L. Vaughn, AIA, Director

ADDENDUM NO. 4

DATE: August 22, 2007

Contract 7-C-69; River Garden Park Shoreline Restoration

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

- Item 1: **Work in locations designated as Alternate Reach 1,5,6 – CLARIFICATION:** The Base Bid shall include tree removal and demolition in locations designated as Reach 2, 3, and 4. The Alternate Bid shall include tree removal and demolition in locations designated as Reach 1, 5, and 6.
- Item 2: **Scour protection to be included in base or alternate bid – CLARIFICATION:** Scour protection and associated work shown adjacent to Reach 1 shall be included in the Alternate Bid
- Item 3: **Drawing C6 lineal footage stated in the treatment quantity – CLARIFICATION:** The total treatment length of 1,870 feet represents the distance along the shore at the waterline
- Item 4: **Drawing C6 listed quantities – CLARIFICATION:** The project is a lump sum bid; no adjustments to the contract value are anticipated.
- Item 5: **Sod Requirement – CLARIFICATION:** *Paspalum notatum* (Bahia grass – Argentine). Refer to Plans, L1 sheet 24 Plant Monitoring and Maintenance Plan #5 (D) Maintenance shall mean the removal of nuisance or exotic species. Nuisance species coverage must not exceed levels present within each restoration/enhancement area in the preconstruction condition.
- Item 6: **Plants monitoring and maintenance and warranty requirements – CLARIFICATION:** The contractor is responsible for proper installation of plants. The warranty shall be for 90% for a one year period. Monitoring and maintenance for permit compliance will be contracted separately by city of Tampa.
All restoration and enhancement areas shall be monitored by a qualified environmental scientist according to the following conditions:
1) A wetland enhancement completion report will be prepared and submitted within 30 days of completing construction and planting for the wetland creation and enhancement areas.
2) The wetland creation and enhancement areas will be deemed satisfactory upon the City's and agency inspection and approval of the areas.
3) Any replacement of plants or remediation of the planting area will be documented in a report to the City specifying what corrective actions were made and the location of such actions.

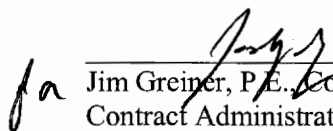
- Item 7: **Lay Down And Storage Area For Rip Rap And Supplies – CLARIFICATION:** A staging area shall be provided on the south end of the project at the Contractors request. The location and extents shall be determined by the City of Tampa Representative.
- Item 8: **Alternate TC and Sf Reaches 1,5,6– CLARIFICATION:** The Base Bid shall include turbidity curtains and silt fence in locations designated as Reaches 2, 3, and 4. The Alternative Bid shall include turbidity curtains and silt fence in locations designated as Reach 1, 5, and 6
- Item 9: **Tech Spec 02460-3 H Piles Unit of measure for payment– CLARIFICATION:** Payment shall be lump sum price as indicated on the proposal form.
- Item 10: **Soil Analysis/Borings in the area of the H Piles– CLARIFICATION:** a geotechnical report for the project site has been prepared by Professional Services Industries, Inc. (PSI). The reported information includes nine (9) boring locations and their corresponding soil profiles. See report for a figure showing the location of the borings.
- Item 11: **Specification SECTION 02460-4 H Piles 2.1.2 Pile points– CLARIFICATION:** Pile points shall be required on all piles as specified
- Item 12: **Specification SECTION 9957-4 3.4.1 Coating – CLARIFICATION:** Hot Dip Galvanizing shall not be accepted as an alternate to Coal Tar Epoxy Coating.
- Item 13: **Individual Unit Costs Or Lump Sum– CLARIFICATION:** Payment shall be lump sum price as specified on the proposal form
- Item 14: **Proposal page P-3, Base Bid lists restore approx 2,000 lf of shoreline – CLARIFICATION:** Refer to construction plans for specific details.
- Item 15: **Federal Funding Prevailing Wages – CLARIFICATION:** There are no federal funds associated with this project. Prevailing wages are not required.
- Item 16: **U.S.L.&H Insurance Coverage Required – CLARIFICATION:** will require proof of USL&H Coverage from the contractor on this project
- Item 17: **Builder’s Risk/Installation Floater Insurance – CLARIFICATION:** The Installation Floater is required. Builder’s Risk Insurance is not required.
- Item 18: **Field Office On Site – CLARIFICATION:** That will be at the discretion of the contractor.
- Item 19: **Required SWPP Plan, NPDES Permit and Permits – CLARIFICATION:** All permits that have been issued for this project can be found within the Technical specifications Appendix A. The Contractor is to secure any additional permits that may be required for construction such as an NPDES. Any permits required by the City of Tampa will be obtained by the City of Tampa and are not the responsibility of the Contractor.

- Item 20: **Materials Salvage– CLARIFICATION**: The contractor shall dispose of all demolition materials and debris as specified.
- Item 21: **Testing Required -CLARIFICATION**: Contractor shall perform all testing indicated in the Contract Documents unless otherwise specified. Testing shall be at the Contractor's expense.
- Item 22: **Rip-Rap Transported by Floating Barges– CLARIFICATION**: required as Condition No. 2 of the EPC permit. It will be up to the contractor to decide where the loading station will be located.
- Item 23: **Pre-cast concrete panels – CLARIFICATION**: No additional detail shall be provided. Panels shall be sized to provide one-half (1/2) inch clear spacing between concrete and inside face of H-Pile.
- Item 24: **Cast-in-Place Concrete – CLARIFICATION**: Cast-in-place concrete shall conform to Specification Section 3302.
- Item 25: **Daily Water Quality Monitoring and Manatee Signs – CLARIFICATION**: Daily water quality monitoring will be required to assure the required conditions are met. Data sheets should be completed during each monitoring event to document data readings.
No signs will be required to be installed and maintained at the docking facility; however, temporary signs will be required prior to and during construction as stated under the following item.
- Item 26: **Limits of Award– CLARIFICATION**: The Base Bid shall include tree removal and demolition in locations designated as Reach 2, 3, and 4. The Alternate Bid shall include tree removal and demolition in locations designated as Reach 1, 5, and 6. The Base Bid shall include turbidity curtains and silt fence in locations designated as Reaches 2, 3, and 4. The Alternative Bid shall include turbidity curtains and silt fence in locations designated as Reach 1, 5, and 6.
- Item 27: **FDOT Specifications– CLARIFICATION**: The Contractor shall use the current FDOT specifications including supplemental specifications

This addendum shall be included in and attached to the inside cover of the Contract Documents by and upon which bids are submitted.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect.

Questions may be directed to Jim Greiner, P.E.; Telephone (813) 274-8598, fax (813) 274-8080, or e-mail Jim.Greiner@tampagov.net.

 _____
Jim Greiner, P.E., Contract Manager
Contract Administration Department

**GEOTECHNICAL ENGINEERING
SERVICES REPORT**

For the

**RIVERGARDEN PARK SHORELINE
STABILIZATION AND RESTORATION
TAMPA, FLORIDA**

Prepared for

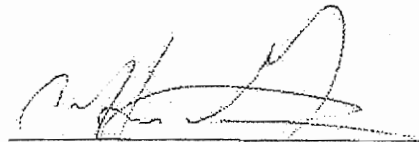
**Birkitt Environmental Services, Inc
110 S. Edison Ave
Tampa, FL 33606**

Prepared by

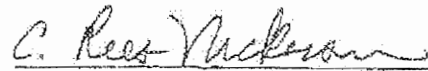
**Professional Service Industries, Inc.
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Telephone (813) 886-1075
Fax (813) 888-6514
Engineering Business No. 3684**

PSI Project No. 775-45356

November 1, 2004



**Conrad Ginther, EI
Staff Engineer**



**C. Rees Nickerson, P.E. 11/2/04
Chief Engineer
Florida License No. 35792**

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1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Authorization to proceed with this project was provided by the Beverly F. Birkitt in the form of a fully authorized contract between PSI and Birkitt Environmental Services, Inc on October 1, 2004. This study was conducted in accordance with our revised proposal for these services dated January 7, 2004, PSI Proposal No. 775-4G0013 (rev 01).

1.2 PROJECT DESCRIPTION

The project is located along the south bank of the Hillsborough River in Tampa, Florida. Portions of this shoreline are to be restored by various means, including marsh restoration, minimal structures with plantings, a terrace system, and a structural revetment/wall. The total length of shoreline is approximately 1,500 feet. The terrace and structural revetment/walls will be five feet or less in height.

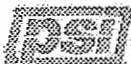
If any of this project description information is incorrect or has changed, please inform PSI so that we may amend, if appropriate, the recommendations presented in this report.

1.3 PURPOSE AND SCOPE OF WORK

The purpose of this study was to obtain information on the general subsurface conditions along the south bank of the Hillsborough River in order to determine basic soil parameters necessary for the wall design and general suitability of the site soils for use as fill materials. The subsurface materials encountered were evaluated with respect to the available project characteristics.

The following services have been provided in order to achieve the preceding objectives:

1. Reviewed readily available published topographic and soils information. This published information was obtained from the "Tampa, Florida" Quadrangle Map published by the United States Geological Survey (USGS) and the "Soil Survey of Hillsborough County, Florida" published by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS).
2. Executed a program of subsurface exploration consisting of subsurface sampling and field-testing. We performed a total of nine (9) Standard Penetration Test (SPT) borings. These borings extended to depths of 30 feet below the existing ground surface. In six of the SPT borings, SPT resistances were taken nearly continuously for the first 10 feet, and at 5 foot intervals thereafter. Due to the proximity of underground utilities, 3 of the borings were hand augered for the first four feet. SPT resistances were then measured nearly continuously from four to ten feet. Representative soil samples were obtained at each SPT test location.
3. Visually classified representative soil samples in the laboratory using the Unified Soil Classification System (USCS). Conducted a limited laboratory testing program. Identified soil conditions and formed an opinion of the site



soil stratigraphy at each boring location. Used obtained data to present soil parameters (friction angle, unit weight, phi angle, and bearing capacity).

4. Collected groundwater level measurements and estimated seasonal high groundwater levels.
5. The results of the exploration have been used in the engineering analysis and the formulation of recommendations. The results of the subsurface exploration, including the recommendations and the data on which they are based, are presented in this written report prepared by a professional engineer.

The scope of our services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, bedrock, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors, colors, unusual or suspicious items or conditions are strictly for the information of our client.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE LOCATION AND DESCRIPTION

The site is located along the south bank of the Hillsborough River just north of W Columbus Drive in Tampa, FL. The project area is approximately 1500 feet of the south bank, which is to be improved by several means, including retaining walls, terracing, and a combination of structures and plantings in other areas. The topographic survey map published by the United States Geological Survey titled "Tampa, Florida" dated 1956 (photo revised 1987) was reviewed for ground surface features at the proposed project location. Based on this review, the natural ground surface elevation at the site area is approximately +10 to +20 feet, National Geodetic Vertical Datum (NGVD) of 1929.

2.2 SUBSURFACE CONDITIONS

The subsurface conditions were explored using nine (9) SPT borings, B-1 through B-9, drilled to a depth of 30 feet below the existing ground surface.

The borings were located in the field by PSI personnel measuring distances from existing site features according to drawings provided by Birkitt Environmental. The approximate boring locations are presented on Sheet 1.

The SPT borings were advanced utilizing rotary mud drilling methods and soil samples were routinely obtained at selected intervals during the drilling process. As each soil sample was removed, representative samples were placed in "air-tight" jars, and then transported to the PSI Tampa office for review by a geotechnical engineer for confirmation of the field classification. Drilling and sampling techniques were accomplished in general accordance with ASTM Standards.



The soil types encountered at the boring locations include:

STRATUM	SOIL DESCRIPTION	UNIFIED SOIL CLASSIFICATION
1	Clean to Slightly Silty Fine Sand	SP/ SP - SM
2	Clayey Sand to Sandy Clay	SC - CL
3	Sandy Clay to Clay	CL-CH
4	Weathered Limestone, Calcareous Clay	--
5	Organic Sand/Peat	--
6	Silty Clayey Sand	SM-SC

The previous description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The soil profiles included on Sheets 2 through 5 should be reviewed for specific information at individual boring locations. These profiles include soil descriptions, stratifications, penetration resistances and laboratory classification of soils. The stratifications shown on the boring profiles represent the conditions only at the actual boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

2.3 HILLSBOROUGH COUNTY SOIL SURVEY

The "Soil Survey of Hillsborough County, Florida" published by the USDA SCS was reviewed for general near surface soil information. This information indicates there is one (1) primary mapping unit within the proposed project area – Winder Fine Sand (59). Winder Fine Sand is nearly level and poorly drained with slopes from 0 to 2 percent. This soil type can exhibit seasonal high water levels at depths of 10 inches from ground surface.

2.4 GROUNDWATER INFORMATION

Groundwater levels were recorded immediately after drilling, during the time of the subsurface exploration. Groundwater was found at depths of 4 to 9 feet below the existing ground surface at the boring locations. It should be noted that groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences and fluctuations in the Hillsborough River. A seasonal effect will occur in which higher groundwater levels are normally recorded in rainy seasons. Fluctuations on the order of one foot should be anticipated. The seasonal high depth to groundwater at the boring locations is estimated to be from 3 to 4 feet below the existing ground surface. We recommend that the contractor determine the actual groundwater levels at the time of the construction to determine groundwater impacts on the construction procedures.



3.0 EVALUATION AND RECOMMENDATIONS

3.1 GENERAL

The following recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions encountered. If there are any changes in these project criteria, including project location on the site, a review must be made by PSI to determine if any modifications in the recommendations will be required. The findings of such a review should be presented in a supplemental report.

Once final design plans and specifications are available, a general review by PSI is strongly recommended as a means to check that the evaluations made in preparation of this report are correct and that earthwork and foundation recommendations are properly interpreted and implemented.

3.2 ON-SITE SOIL SUITABILITY

In general, the majority of the fine sand to slightly silty fine sand (United Classification System SP/SP-SM) can be moved and used for grading purposes, site leveling, general engineering fill, structural fill and backfill in other areas, provided the fill is free of organic materials, clay, debris or any other material deemed unsuitable for construction. In addition, some of the silty clayey sand may be suitable for use as fill, provided it has a fines content of less than 12%. The clayey sand/sandy clay (SC-CL), sandy clay to clay (CL-CH), and limestone materials are not suitable for use as structural fill. All fill should be placed in accordance with the recommendations provided in this report.

3.3 ENGINEERED FILL

Material required for backfilling excavations and other engineered fills for the project should consist of clean sand that is free of organic matter and other deleterious substances. It should have a fines content that does not exceed 12 percent (i.e. less than 12 percent by dry weight passing the U.S. Standard Number 200 sieve). The slightly silty fine sand and fine sands encountered in the soil borings will be suitable for use as fill materials.

Engineered fill should be placed at a moisture content near optimum and in uniform lifts not exceeding 12 inches in loose thickness. It should be thoroughly compacted to at least 95 percent of its ASTM D-1557 maximum dry density. Compaction to 90% of a modified Proctor will be acceptable in non-structure areas.

3.4 ORGANIC SOILS

Organic sand or peat was encountered from depths of 3 to 6 feet in boring B-9 (organic content 21%). In boring B-8 from 4 to 6 feet, the sands encountered have an organic content of 6%. Since the area around boring B-8 & B-9 is proposed to be improved with minimal structures and plantings, this material may not require special treatment. If settlement tolerant structures such as MSE walls are employed and are less than five feet in height, overexcavation and backfill with structural fill will not be necessary. If



encountered elsewhere in the project area, soils of organic content greater than 5% should be wasted and replaced with suitable backfill material, preferably clean freely draining sand (fines content <12%).

3.5 SOIL PARAMETERS AND BEARING CAPACITIES

Based on samples taken in the field and SPT N-values measured at the time of exploration, general soil properties such as unit weight, phi angle, cohesion, earth pressure coefficients and bearing capacities (cohesion) have been estimated and are presented beginning on Sheet 2.

With proper subgrade preparation, column footings and continuous footings beneath bearing walls can be designed for a net allowable soil bearing pressure of 500 to 2,500 pounds per square foot (psf), based on dead load plus design live load provided footings are founded below the organic soils encountered in borings B-8 and B-9 and below the weight hammer (WH) soils encountered in boring B-7. Minimum dimensions of 24 inches for square footings and 18 inches for continuous footings should be used in foundation design for the proposed retaining walls to reduce localized settlement, which could result from variations in the subsurface materials. Footings should be located at a depth of at least 18 inches below the final grade.

Based on our understanding of the foundation loads, we have estimated settlement for shallow foundations supported on ground improved by the compaction process. We estimate total foundation settlements will be less than one inch when supported on a shallow foundation system. Differential settlement between unequally loaded/adjacent foundations is anticipated to be on the order of one half of the total movement.

3.6 SITE PREPARATION

The following are our recommendations for overall site preparation. These recommendations should be used as a guideline for the project general specifications prepared by the design engineer.

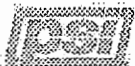
1. Any organics or vegetation, fill material, and construction related debris present within the proposed structure area should be removed. At a minimum, it is recommended that the clearing operations extend at least 5 feet beyond the development perimeters.
2. It is recommended that the natural ground be compacted to a minimum depth of 1 foot below stripped grade, to a dry density of at least 95% of the modified Proctor maximum dry density within the proposed structures. Groundwater levels should be maintained to at least 2 feet below the lowest area to be compacted.
3. Following satisfactory completion of the initial compaction, the structure area may be brought up to finished subgrade levels, as needed, using structural fill. Imported fill should consist of fine sand with less than 12% passing the No. 200 sieve, free of rubble, organics, clay, debris and other unsuitable material. Fill should be tested and approved prior to acquisition. Approved sand fill should be placed in loose lifts not exceeding 12 inches in thickness and should be compacted to a minimum density of



95% of the modified Proctor maximum dry density. Density tests to confirm compaction should be performed in each fill lift before the next lift is placed.

4. Prior to beginning compaction, soil moisture contents may need to be controlled in order to facilitate proper compaction. If additional moisture is necessary to achieve compaction objectives, then water should be applied in such a way that it will not cause erosion or removal of the subgrade soils. A moisture content within the percentage range needed to achieve compaction is recommended prior to compaction of the natural ground and fill.
5. After compaction, the foundation excavations can begin. All foundation excavations should be observed by the geotechnical engineer or a representative to explore the extent of any loose, soft, or otherwise undesirable materials. If the foundation excavations appear suitable as load bearing materials, the bottom of the foundation excavations should be compacted to a minimum density of 95% of the modified Proctor maximum dry density for a minimum depth of one foot below the bottom of the footing depth, as determined by field density compaction tests. In some areas, very clayey sands or sandy clays may be encountered at the footing levels, particularly in the area near boring B-3. This soil should be suitable for footing support, provided it is firm and unyielding. *If the clayey materials are soft or plastic, they should be excavated to a foot below footing grade and backfilled with clean sand placed in 6 inch lifts and compacted to 95% of the soils modified Proctor dry density.* Backfill soils placed adjacent to footings or walls should be carefully compacted with a vibratory plate compactor to avoid damaging the footings or walls. Approved sand fills to provide foundation embedment constraint should be placed in loose lifts not exceeding 6 inches and should be compacted to a minimum density of 95% of the modified Proctor maximum dry density.
6. If soft pockets or debris are encountered in the footing excavations, the unsuitable materials should be removed and the proposed footing elevation may be re-established by backfilling after the undesirable material has been removed. This backfilling may be done with a very lean concrete or with a well-compacted, suitable fill such as clean sand, gravel, or crushed FDOT No. 57 or FDOT No. 67 stone. Backfill should be compacted to a minimum density of 95% of the modified Proctor maximum dry density.
7. Immediately prior to reinforcing steel placement, it is suggested that the bearing surfaces of all footing areas be compacted using hand operated mechanical tampers. In this manner, any localized areas that have become loose due to excavation operations should be adequately recompacted.

A representative from our firm should be retained to provide on-site observation of earthwork and ground modification activities. Density tests should be performed in the top foot of compacted existing ground, each fill lift, and the bottom of foundation excavations. It is important that PSI be retained to observe that the subsurface conditions are as we have discussed herein and that foundation construction, ground modification, and fill placement is in accordance with our recommendations.



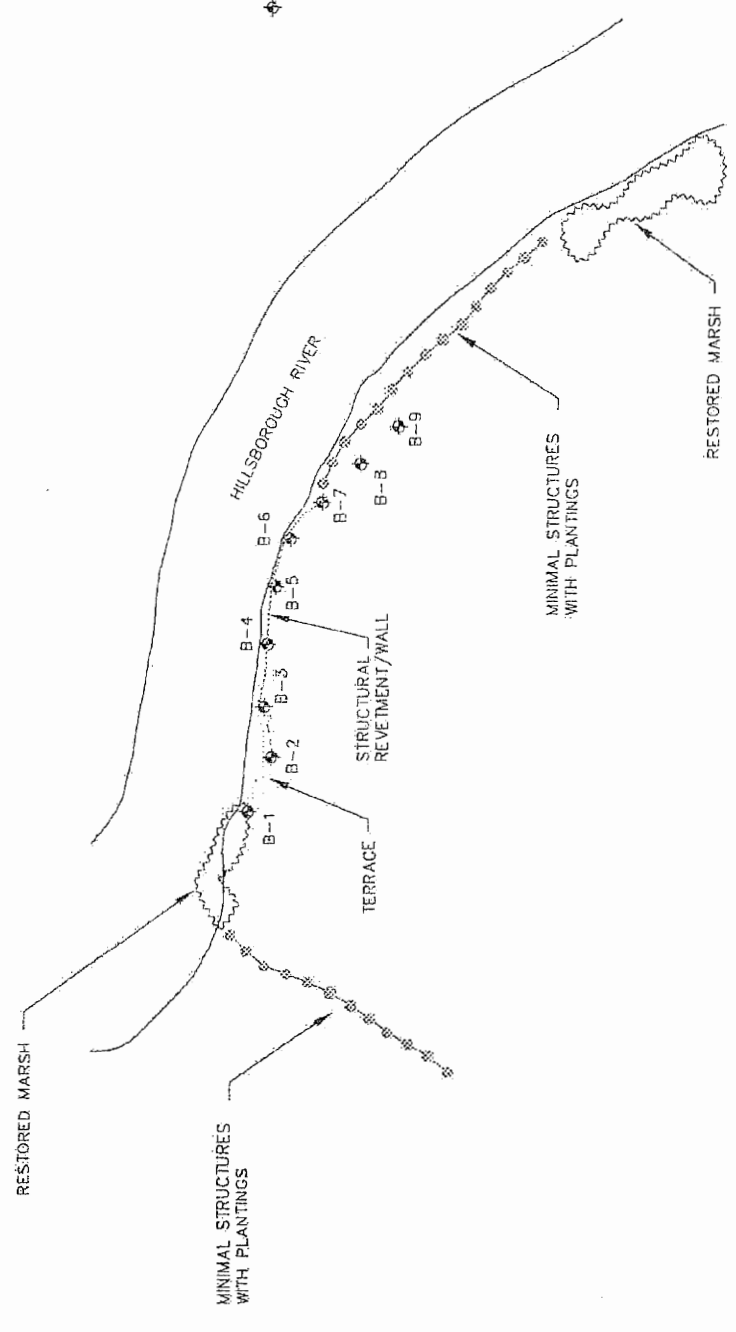
4.0 REPORT LIMITATIONS

The *Geotechnical Engineer* warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. Florida is underlain by a soluble limestone formation, which can dissolve, resulting in the formation of sinkholes. An evaluation of this site for the potential for sinkhole development is beyond the scope of this study.

The recommendations submitted are based on the available subsurface information obtained by PSI and design details furnished by Birkitt Environmental Services, Inc and their consultants for the proposed project. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the geotechnical recommendations for the project.

After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Birkitt Environmental Services, Inc and its consultants for the specific application to proposed Rivergarden Park shoreline stabilization and restoration in Tampa, Florida.

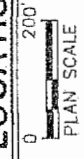




LEGEND

◆ Approximate SPT boring location

BORING LOCATION PLAN



DATE	AN
CHECKED	CHG
APPROVED	MEM
SCALE	NOTED

GEO TECHNICAL SERVICES
**RIVERGARDEN PARK SHORELINE
 STABILIZATION AND RESTORATION**
 TAMPA, FLORIDA

PSI Information
 To Build On
 Integrity - Consistency - Feeding

DATE: OCT 04 PROJECT: 775-45356 SHEET: 1

LEGEND

- ① Dark brown clean to slightly silty SAND (SP/SF-SM)
- ② Dark gray, brown, clayey SAND to sandy clay (SC-CL)
- ③ Blue-green sandy clay to clay (CL-CH)
- ④ Weathered LIMESTONE/ calcareous clay
- ⑤ Organic sand/ PEAT
- ⑥ Dark gray silty clayey SAND (SM--SC)

- A With rock fragments
- B Partially indurated
- C With organic fragments
- D With clay fragments

SP Unified Soil Classification System (ASTM D 2487)
 group symbol as determined by visual review

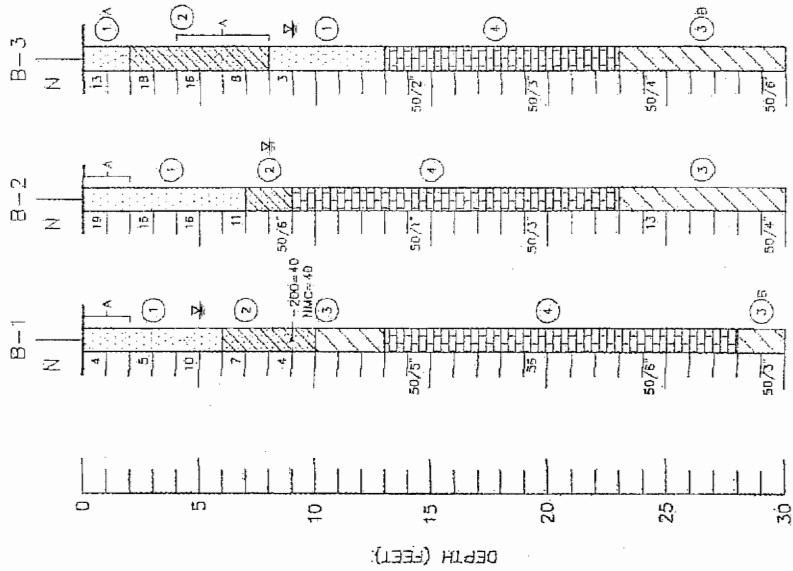
- N SPT N-value in blows/foot
- Groundwater level, October 2004
- 50/6" Fifty blows for six inches
- 200 Fines passing No. 200 sieve (%)
- NMC Natural Moisture Content (%)
- OC Organic Content (%)
- LL Liquid Limit (%)
- PI Plasticity Index (%)

GEOTECHNICAL SERVICES
**RIVERGARDEN PARK SHORELINE
 STABILIZATION AND RESTORATION**
 TAMPA, FLORIDA

IBSI Information
 To Build On
 Consulting & Testing

DATE OCT 04 PROJECT 775-45356 SHEET 2

BORING NUMBER	DEPTH (FEET)	SPT "N" RANGE	SOIL CLASSIFICATION	APPROXIMATE WEIGHT (%)		SOIL ANGLE OF FRICTION (DEGREES)	COHESION (PSF)	EARTH PRESSURE COEFFICIENT	
				T SAT	U SUBMERGED			ACTIVE	PASSIVE
B-1	0-6	4-10	SP/SF-SU	105	42.6	26	0	.147	2.86
	6-10	7	CL-CH	110	57.6	0	500	1.00	1.00
	10-15	50-50/3	WL-S	135	72.6	0	15000	1.00	1.00
	15-25	50/3	CL-CH	125	82.6	0	25000	1.00	1.00
B-2	0-7	9-7	SP/SF-SH	110	47.6	30	0	.333	3.00
	7-8	6-3	SC	125	57.6	0	10000	1.00	1.00
	8-9	50/30/1	SL-CL	125	62.6	0	8150	1.00	1.00
	9-10	11-12	SP/SF-SH	110	47.6	30	0	.333	3.00
B-3	0-2	13	SP/SF-SH	110	47.6	30	0	.333	3.00
	2-5	8-16	SC-CL	120	57.6	0	1400	1.00	1.00
	5-13	50/2-50/3	SP/SF-SH	135	72.6	0	15000	1.00	1.00
	13-30	50/8-50/4	CL-CH	125	82.6	0	10000	1.00	1.00



SOIL PROFILES

VERTICAL SCALE

DATE OCT 04 PROJECT 775-45356 SHEET 2

LEGEND

- ① Dark brown clean to slightly silty SAND (SP/SP-SM)
- ② Dark gray, brown, clayey SAND to sandy clay (SC-CL)
- ③ Blue-green sandy clay to clay (CL-CH)
- ④ Weathered LIMESTONE/ calcareous clay
- ⑤ Organic sand/ PEAT
- ⑥ Dark gray silty clayey SAND (SM-SC)

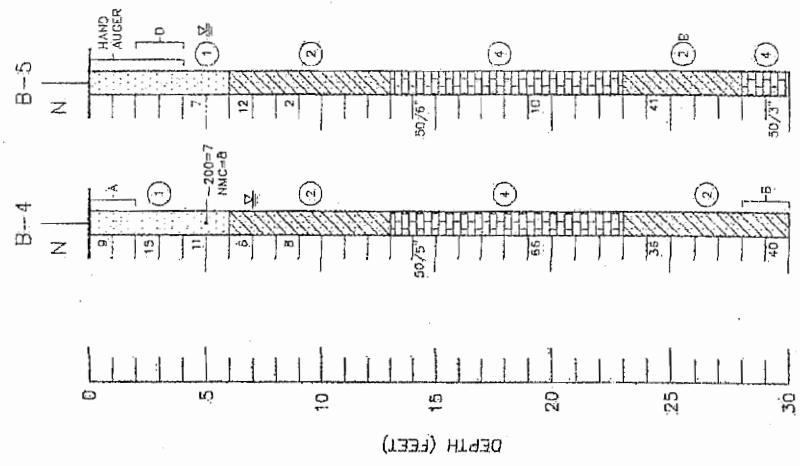
- A With rock fragments
- B Partially indurated
- C With organic fragments
- D With clay fragments

SP Unified Soil Classification System (ASTM D 2487)
group symbol as determined by visual review

- N SPT N-value in blows/foot
- ☼ Groundwater level, October 2004
- 50/6* Fifty blows for six inches
- 200 Fines passing No. 200 sieve (%)

- NMC Natural Moisture Content (%)
- OC Organic Content (%)
- LL Liquid Limit (%)
- PI Plasticity Index (%)

BORING NUMBER	DEPTH (FEET)	SPT 'N' RANGE	SOIL CLASSIFICATION	APPROXIMATE WEIGHT (PCF)		SOIL ANGLE OF FRICTION (DEGREES)	COHESION (PSF)	EARTH PRESSURE COEFFICIENT	
				1 SAT	1 SUBMERGED			ACTIVE (Kc)	PASSIVE (Kp)
B-4	0-5	9-15	SP/SP-SM	115	47.6	30	0	333	300
	6-13	6-8	SC/CL	125	52.6	0	700	1000	1000
	13-23	66-50/S*	WLS	135	72.5	0	15000	1000	1000
B-5	0-6	7	SP/SP-SM	105	42.5	39	0	347	203
	6-13	2-12	SC/CL	115	52.6	0	700	1000	1000
	13-23	10-27/6*	WLS	125	62.6	0	4100	1000	1000
	23-30	50/S*	WLS	135	72.6	0	15000	1000	1000



SOIL PROFILES



DATE	AN
CHECKED	CHG
APPROVED	MEM
SCALE	NOTED

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LEGEND

- ① Dark brown clean to slightly silty SAND (SP/SP-SM)
- ② Dark gray, brown, clayey SAND to sandy clay (SC-CL)
- ③ Blue-green sandy clay to clay (CL-CH)
- ④ Weathered LIMESTONE / calcareous clay
- ⑤ Organic sand/ PEAT
- ⑥ Dark gray silty clayey SAND (SM-SC)

- A With rock fragments
- B Partially indurated
- C With organic fragments
- D With clay fragments

SP Unified Soil Classification System (ASTM D 2487)
group symbol as determined by visual review

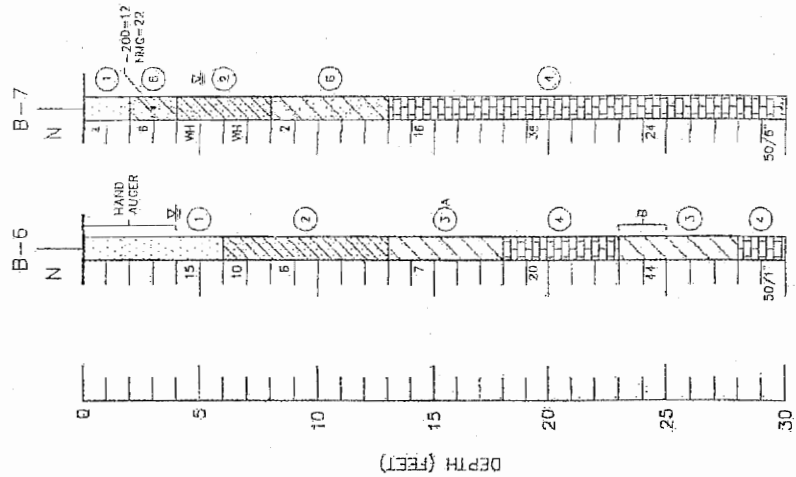
- N SPT N-value in blows/foot
- GW Groundwater level, October 2004
- 50/6* Fifty blows for six inches
- 200 Fines passing No. 200 sieve (%)
- HMC Natural Moisture Content (%)
- oc Organic Content (%)
- LL Liquid Limit (%)
- PI Plasticity Index (%)

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BORING NUMBER	DEPTH (FEET)	SPT 'N' RANGE	SOIL CLASSIFICATION	APPROXIMATE SOIL WEIGHT (pcf)		SUM OF ANGLES OF FRICTION (DEGREES)	COHESION (PSF)	EARTH PRESSURE COEFFICIENT	
				T SAT	γ SUBMERGED			ACTIVE (ka)	PASSIVE (kp)
B-6	0-5	15	SP/SC-SM	110	47.5	30	0	133	3,000
	5-13	10-17	SC-CL	115	52.6	0	500	1,000	1,000
	13-18	7	CL-CH	125	52.6	0	575	1,000	1,000
	18-28	44	CL-CH	135	52.6	0	5,000	1,000	1,000
B-7	0-1	1-6	SP/SP-SM	105	42.5	29	0	147	288
	1-4	0	SC-CL	105	42.5	0	0	1,000	1,000
	4-11	16-23	SM-SC	100	37.6	26	400	1,910	2,560
	11-28	50/6*	ML-S	135	72.5	0	5,000	1,000	1,000



SOIL PROFILES

VERTICAL SCALE

PREPARED BY	AN
CHECKED BY	CHG
APPROVED BY	MEM
SCALE	NOTED

LEGEND

- ① Dark brown clean to slightly silty SAND (SP/SP-SM)
- ② Dark gray, brown, clayey SAND to sandy clay (SC-CL)
- ③ Blue-green sandy clay to clay (CL-CH)
- ④ Weathered LIMESTONE/ calcareous clay
- ⑤ Organic sand/ PEAT
- ⑥ Dark gray silty clayey SAND (SM-SC)

- A With rock fragments
- B Partially indurated
- c With organic fragments
- b With clay fragments

SP Unified Soil Classification System (ASTM D 2487)
group symbol as determined by visual review

- N SPT N-value in blows/foot
- ⚡ Groundwater level, October 2004
- 50/5' Fifty blows for six inches
- 200 Fines passing No. 200 sieve (%)
- NMC Natural Moisture Content (%)
- OC Organic Content (%)
- LL Liquid Limit (%)
- PI Plasticity Index (%)

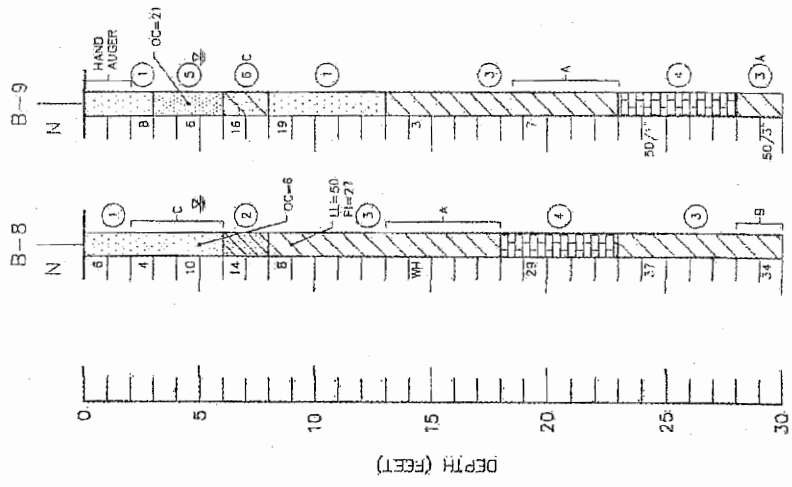
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DESIGNED BY	AN
CHECKED BY	CHC
APPROVED BY	MEM
SCALE	NOTED

BORING NUMBER	DEPTH (FEET)	SPT N-RANGE	SOIL CLASSIFICATION	APPROXIMATE WEIGHT (POUND)		SOIL OF ANALYSIS (NEE/REFS)	COHESION (PSI)	EARTH PRESSURE COEFFICIENT	
				WET	DRY			ACTIVE	PASSIVE
B-8	0-5	1-10	SP/SP-SM	105	62.8	26	0	0.347	2.08
	5-8	1-4	SC-CL	120	57.5	0	1480	1.00	1.00
	8-13	3-8	CL-CH	110	71.5	0	4000	1.00	1.00
	13-30	3-4-37	CL-CH	125	62.8	0	4000	1.00	1.00
B-9	0-3	6	SP/SP-SM	105	62.8	26	0	0.347	2.08
	3-8	6	PEAT	105	42.8	0	0	1.00	1.00
	8-8	16	SM-SC	110	47.6	30	0	0.333	3.00
	8-13	3-7	SP/SP-SM	110	57.6	30	825	1.00	3.00
B-9	13-28	50/3'	W.S.	135	72.8	0	15000	1.00	1.00
	28-30	50/3'	SC-CL	125	62.8	0	20000	1.00	1.00



SOIL PROFILES

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VERTICAL SCALE