REPORT OF GEOTECHNICAL SUBSURFACE EXPLORATION

ROBERT KING HIGH PARK- NEW SOCCER FIELD
ADDITIONAL BORINGS

7025 WEST FLAGLER STREET

MIAMI, FLORIDA

-PREPARED BY-
MACTEC ENGINEERING AND CONSULTING, INC. (MACTEC)

5845 NW 158TH STREET
MIAMI LAKES, FLORIDA 33014

MACTEC PROJECT NO. 6785-07-1583 T-01

JANUARY 10, 2008

MACTEC

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engineering and constructing a better tomorrow

January 10, 2008

Mr. J.J. Fernandez
PBS & J
2001 NW 107th Avenue
Fourth Floor
Miami, Florida 33172-2507

Subject: **Report of Geotechnical Subsurface Exploration**
Robert King High Park – New Soccer Field
7025 West Flagler Street
Miami, Florida
MACTEC Project Number: 6785-07-1583 T-01

Dear Mr. Fernandez:

MACTEC Engineering and Consulting, Inc. (MACTEC), has completed the geotechnical services for the above referenced project. Our services were provided in accordance with the scope of services contained in our Proposal Number Prop07Miam T-284, dated July 27, 2007. Authorization was granted by Mr. Fernandez of PBS&J through a subcontract for professional services signed and mailed on December 13, 2007.

MACTEC completed three additional soil test borings (B-1 to B-3). B-1 was drilled below the proposed slab for bleachers to a depth of 20 feet below ground surface (bgs), B-2 was drilled at the proposed covered basketball court area to a depth of 10 feet bgs and B-3 was drilled at the proposed restroom building area to a depth of 20 feet bgs. Previously, MACTEC performed a report of geotechnical exploration at the subject site in May 2005.

The attached report presents a review of the project information provided to us, a description of the site and subsurface conditions encountered, and a summary of our foundation and earthwork recommendations for the subject project.

Our study indicated that the site is suitable for the proposed soccer field bleachers to be supported by a concrete slab, the covered basketball court and the toilet buildings to be supported by shallow foundations, provided that the site preparation is performed as discussed herein this report. The concrete slab for the soccer field bleachers and the shallow foundations for the covered basketball court and restroom facility may be designed considering an allowable soil bearing pressure of 2,500 pound per square foot (psf) if bearing on compacted structural fill or acceptable compacted existing soil. These recommendations are based on completing the other requirements outlined within this report.

MACTEC Engineering and Consulting, Inc.
5845 NW 158th Street • Miami Lakes, FL 33014 • Phone: 305.826.5588 • Fax: 305.826.1799
www.mactec.com

We have enjoyed assisting you and look forward to serving as your geotechnical consultant on the remainder of this project and on future projects. If you have any questions, please contact us at your earliest convenience.

Sincerely,

MACTEC ENGINEERING AND CONSULTING, INC.
Florida Board of Professional Engineers Authorization No. 6090

Melvinsky Ramirez,
Project Engineer

G. Thomas McDaniel, P.E.
Principal Geotechnical Engineer
Florida Registration 26158

10/2/08

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File (1 copy)

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1.0 INTRODUCTION

The purpose of this exploration was to develop information concerning the site and subsurface conditions in order to evaluate site preparation requirements for support of the proposed soccer field bleachers, a covered basketball court and restrooms building. This report briefly describes the field activities and presents the findings. The enclosed guideline recommendations for site preparation and foundation design and construction represent approaches that would be appropriate for the planned construction.

The purpose of this investigation was:

- to investigate the general subsurface conditions at the site:
- to interpret and review the subsurface conditions with respect to the proposed construction of the school; and
- to provide geotechnical engineering recommendations for foundation design.

This report represents an evaluation of site conditions based on traditional geotechnical procedures for site characterization. The recovered soil samples were not examined, either visually or analytically for chemical composition or environmental hazards.

We conducted a total of three soil test borings (B-1 to B-3). B-1 was drilled below the proposed slab for bleachers to a depth of 20 feet below ground surface (bgs), B-2 was drilled at the proposed covered basketball court area to a depth of 10 bgs and B-3 was located at the proposed restroom building area to a depth of 20 feet bgs.

2.0 PROJECT INFORMATION AND STRUCTURAL CONDITION

Project information has been provided by Mr. Fernandez of PBS&J in a facsimile dated July 26, 2007 and telephone conversation on July 27, 2007.

We have been been furnished with a survey map that show the approximate location of the requested boring test locations.

The site is located at 7025 West Flagler Street, in Miami, Florida. A site location map and field exploration plan is presented in Appendix A of this report.

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION

Prior to our explorations, we conducted a utility clearance to check for conflicts with existing utilities at the proposed boring locations. Then we conducted our subsurface exploration program that consisted of three soil borings within the proposed soccer field bleachers, covered basketball court and restroom building area.

The locations of the proposed borings were provided to us by Mr. Fernandez of PBS&J. The locations of the field tests are shown on the field exploration plan in Appendix A. The soil test borings locations were established in the field by our personnel using tape measurements, compass and existing landmarks. These locations should be considered accurate only to the degree implied by the method used to locate them. Ground surface elevation at the test locations have not been provided to us.

The test boring records in Appendix A graphically show the penetration resistances and present the soil descriptions for each test boring. These Soil Boring Records represent our interpretation of the subsurface conditions based on the field logs and visual examination of field samples by our engineer. The stratification lines and depth designations on the boring records represent the approximate boundaries between soil types. In some instances, the transition between soil types may be gradual. A brief description of the exploratory drilling and sampling techniques used is presented in the field procedures section of the appendix. Ground water conditions shown on the Soil Boring Records represent the conditions only at the time of our exploration.

4.0 SITE AND SUBSURFACE CONDITION

4.1 SITE CONDITIONS

The site for the proposed soccer field, covered basketball court and restroom building is located at 7025 West Flagler Street in Miami, Florida. The site topography was relatively flat with the site covered in grass, and a line of trees. Within the site, a road crossing the park was observed from south to north.

4.2 SUBSURFACE CONDITIONS

4.2.1 General

The soil conditions outlined below highlight the major subsurface stratification. The test boring records in the appendix should be consulted for a detailed description of the subsurface conditions encountered at each boring location. When reviewing the boring records and the subsurface profile, it should be understood that soil conditions may vary between boring locations.

4.2.2 Soils

The generalized subsurface conditions encountered in the test borings, in the order of depth below the ground surface, follows:

Generally, the test borings encountered 2 to 4 feet of loose to medium dense sandy soil, from the ground surface to a depth of 2 to 4 feet below ground surface (bgs). This sandy soil consists of fine sand with few to little limerock fragments. Below the sandy soil, a tan to dark brown layer of soft Limestone was observed between depths of 2 to 8 feet. In borings B-3, a surface layer of sand with few silt (topsoil) was encountered below the surface to a depth of two feet. The sandy soil is underlain by a layer of Limestone to a depth of 8 feet bgs. Underlain the Limestone, a fine sand layer was observed to the termination depth of 20 feet bgs.

4.3 GROUNDWATER

The groundwater level was measured at the test boring locations at the time of drilling. In the test borings, the groundwater was encountered at depths ranging from approximately 4.0 to 4.5 feet below the existing ground surface, with an average depth of 4.1 feet. Fluctuation in the observed groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff, and other site-specific factors. Since groundwater level variations are anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based on the assumption that variations will occur.

Footings should bear at least 18 inches below the finished exterior grade in order to provide confinement for the fine sandy bearing soils. Interior footings may bear at nominal depths below the floor slab. It is generally advantageous; however, to design the foundations to bear as high as possible in order to reduce groundwater control requirements and associated costs during construction.

Minimum footings widths of 18 and 24 inches are recommended for continuous and individual footings, respectively, even though the allowable bearing pressure may not be fully developed in all cases. A density equivalent to at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557) should be achieved in the sandy footing bearing level soils.

Where footings bear directly on the surface of the limestone formation below a depth of generally 2 to 6 feet, probing of the bearing surface to detect soil-filled voids in the rock will be required in lieu of compaction testing. Any soil filled voids in the rock surface should be excavated to a depth of two to three diameters of the void and backfilled with concrete at the time of footing construction.

5.3 SETTLEMENT POTENTIAL

We have compared the field test data obtained in this exploration with our experience with similar structures and empirical relationships for bearing and settlement. We have estimated that the total settlement of the structures should be less than 1 inch using a bearing pressure on the order of 2,500 psf if bearing on compacted structural fill soils or acceptable compacted existing soils. Differential settlements (between adjacent columns or along the length of a continuous wall footing) should be approximately ½ of the total settlement.

5.4 GROUND FLOOR SLAB SUPPORT

The ground floor slab for the proposed soccer field bleachers, covered basketball court and restrooms may be constructed directly on a compacted structural fill subgrade, acceptable compacted existing soil subgrade. A modulus of subgrade reaction of 150 pci may be used to design the floor slab. A gravel frost barrier protection layer is not considered necessary. The sandy soils should be compacted to a density of at least 95 percent of the Modified Proctor maximum dry density to a depth of at least 12 inches. A vapor barrier should be installed on top of the subgrade to help reduce dampness on the surface of the floor slab. Consideration should be given to using two sheets of a vapor barrier material in order to reduce friction between the bottom of the slab and the top of the underlying subgrade so that associated shrinkage cracking in the concrete can be reduced. We recommend that slabs be jointed around columns and walls to permit slabs and foundations to settle differentially.

5.5 SITE PREPARATION

5.5.1 Surface Stripping

All vegetation, topsoil, roots, organic zones, asphalt and other deleterious material should be stripped and removed from the construction area for a distance of at least five feet beyond the exterior building limits and from all areas to be paved. It is recommended that the topsoil encountered in Boring B-3 be removed to a depth of approximately two feet below ground surface and at least five feet beyond the limits of the restroom building area.

5.5.2 Surficial Soil Compaction

After the site grades have been reasonably leveled, the exposed soils at the stripped surface in the construction areas should be compacted with overlapping passes of a relatively heavy weight vibratory drum roller having a total operating static weight (including fuel and water) of 20 tons and a drum diameter of 4 to 5 feet. Densities equivalent to at least 95 percent of the Modified Proctor Maximum Dry Density (ASTM D-1557) should be uniformly obtained to a depth of at least 12 inches below the compacted surface. Regardless of the degree of compaction achieved, a minimum of eight complete coverage's should be made in the building and pavement areas with the roller in order to help increase the density and improve the uniformity of the underlying bearing soils. The roller coverage's should be divided evenly into two perpendicular directions.

A MACTEC geotechnical engineer or experienced geotechnical technician should observe the fill material and the proofrolling operations as well as to check fill materials and the proofrolling operations to check for pockets of organics, deleterious, or other unsuitable material. If encountered during construction, these unsuitable materials should be removed and replaced with suitable compacted fill as discussed below.

5.5.3 Surface Water and Shallow Groundwater Control

The need for significant groundwater control is not anticipated for shallow foundation bearing on compacted fill or acceptable compacted existing soils. If required, however, groundwater can generally be lowered one to three feet by pumping from barrel sumps located in perimeter ditches or pits if gravity drainage cannot be established. All sump inlets should be located outside the bearing areas to avoid loosening of the fine sandy bearing soils. The groundwater level should be maintained at least one foot below the bottom of any excavations made during construction and two feet below the surface of any vibratory compaction operations. In areas where deeper groundwater drawdown or control is required or where more positive groundwater control is desired for prolonged periods, a single-stage, fully sanded vacuum well point system may be required.

The need for surface water runoff control should be anticipated during the site preparation and foundation construction process. Lack of proper controls could result in ponding of surface water in foundation bearing areas and on compaction surfaces. The ponded water, combined with machine or foot traffic during construction operations or other activities, could disturb otherwise acceptable soils or previously compacted soils, causing instability, pumping, and generally unacceptable conditions. The ponded water will also impede or prevent necessary soil compaction operations and make construction trafficability difficult.

5.5.4 Structural Filling and Backfilling

Structural fill, as required, may then be placed in lifts not exceeding 12 inches in loose thickness when using the roller described previously. Each lift should be thoroughly compacted with the vibratory roller until densities equivalent to at least 95 percent of the Modified Proctor Maximum Dry Density are uniformly obtained. The structural fill, in those areas not accessible with the roller, should be compacted with a vibratory plate, or a small walk behind vibratory roller, and should be placed in lifts not to exceed 4 inches in loose thickness.

Structural fill should consist of an inorganic, non-plastic, granular soil containing less than 10 percent material passing the No. 200 mesh sieve (relatively clean sand or a crushed limestone with a 3-inch maximum particle size with a Unified Soil classification of GP, GW, SP, SW, SP-GM, SW-GM, SW-SM or SP-SM.

5.6 PAVEMENT DESIGN CONSIDERATIONS

These pavement recommendations presented are considered minimum for the site, soil and traffic conditions expected. The final pavement thickness design should be determined by the project Civil Engineer using information obtained during the subsurface exploration program and an analysis of anticipated traffic conditions. Sandy or crushed limerock fill soils should be acceptable for construction and support of a flexible (limerock or crushed concrete base) pavement section, after proper subsurface preparation. We are assuming that sufficient fill is placed on this site to maintain at least a two foot separation between the bottom of the pavement base and the ground water level.

5.7 PAVEMENT SUBGRADE

The pavement subgrade should be compacted to a minimum depth of 12 inches to at least 98 percent of the Modified Proctor maximum dry density (ASTM D-1557). Any fill utilized to elevate the cleared pavement areas to subgrade elevation should consist of reasonably clean fine sands or crushed limerock, uniformly compacted to 98 percent of the Modified Proctor maximum dry density (ASTM D1557). Any new fill used as pavement subgrade should be stabilized with the addition of limerock or similar materials, if necessary, until an LBR of at least 40 is achieved.

5.8 PAVEMENT BASE COURSE

Pavement base is generally comprised of three common material types: limerock, crushed concrete, and soil cement. We recommend that you consider either limerock or crushed concrete for the base.

Limerock base material should meet FDOT requirements, including compaction to 98 percent of its maximum dry density as determined by the Modified Proctor Test (ASTM D-1557) and a minimum Limerock Bearing Ratio (LBR) of 100 percent. Crushed concrete should have an LBR value of 100 percent and be graded in accordance with Florida Department of Transportation (FDOT) Standard Specification Section 204. As a guideline for pavement design, we recommend that the base materials be a minimum of six inches thick under automobile parking areas and eight inches thick elsewhere.

5.8 ASPHALTIC CONCRETE

It is recommended that at least 1½ inches of asphaltic concrete be utilized for light duty pavements and 2 inches for heavier duty pavements. Type S-I or S-III should be utilized because of their durability qualities. If Type S-I is selected the asphalt should be placed at least 1½ inches thick because of the larger size of its coarse aggregate. The asphaltic concrete should meet standard FDOT material requirements and placement procedures as outlined in the current FDOT "Standard Specifications for Road and Bridge Construction." The asphalt should be compacted to a minimum of 96 percent of the Marshall maximum laboratory unit weight.

5.9 RIGID CONCRETE PAVEMENT

It is suggested that a rigid pavement, at least 6-inches thick, be utilized in dumpster areas including the areas in which dumpster trucks or other large vehicles load, backup and turn around. This pavement section is also recommended in the drive-thru area.

5.10 FOUNDATION BEARING SURFACE PREPARATION

The upper 12 inches of sandy bearing soils in the footing excavation bottoms should be compacted to densities equivalent to 95 percent of the Modified Proctor Maximum Dry Density. Compaction or recompaction of the footing excavation bearing level soils (if loosened by the excavation process) can probably be best achieved by making several passes with a relatively light weight, walk-behind vibratory sled or roller.

5.11 GENERAL CONSTRUCTION MONITORING AND TESTING GUIDELINES

Prior to initiating compaction operations, we recommend that representative samples of the structural fill material to be used and acceptable exposed in-place soils be collected and tested to determine their compaction and classification characteristics. The maximum dry density, optimum moisture content, gradation and plasticity characteristics should be determined. These tests are needed for compaction quality control of the structural fill and existing soils and to determine if the fill material is acceptable.

A representative number of in-place field density testes should be performed in the compacted existing soils and in each lift of structural fill or backfill to confirm that the required degree of compaction has been obtained. In-place density tests should also be performed at representative locations in the bearing level soils in the footing excavation bottoms.

We recommend that at least one density test be performed for every 2,500 square feet of compacted existing soils, subgrade, and each lift of compacted fill. In addition, we recommend that at least one density test be performed for every 75 square feet of spread footing bearing area, and for every 50 lineal feet of continuous footing.

5.12 CONSTRUCTION PLANS AND SPECIFICATIONS REVIEW

It is recommended that this office be provided the opportunity to make a general review of the foundation and earthwork plans and specifications prepared from the recommendations presented in this report. Our report has been written in a guideline recommendation format and is not appropriate for use as a specification-type format. It is recommended that this report not be made a part of the contract documents; however, it should be made available to prospective contractors for information purposes.

5.13 SAMPLE STORAGE

The soil and rock samples retrieved during this exploration will be kept at our office for a period of three months from the date of this report. Soil samples will then be discarded.

APPENDIX A: Figures and Field Exploratory Data

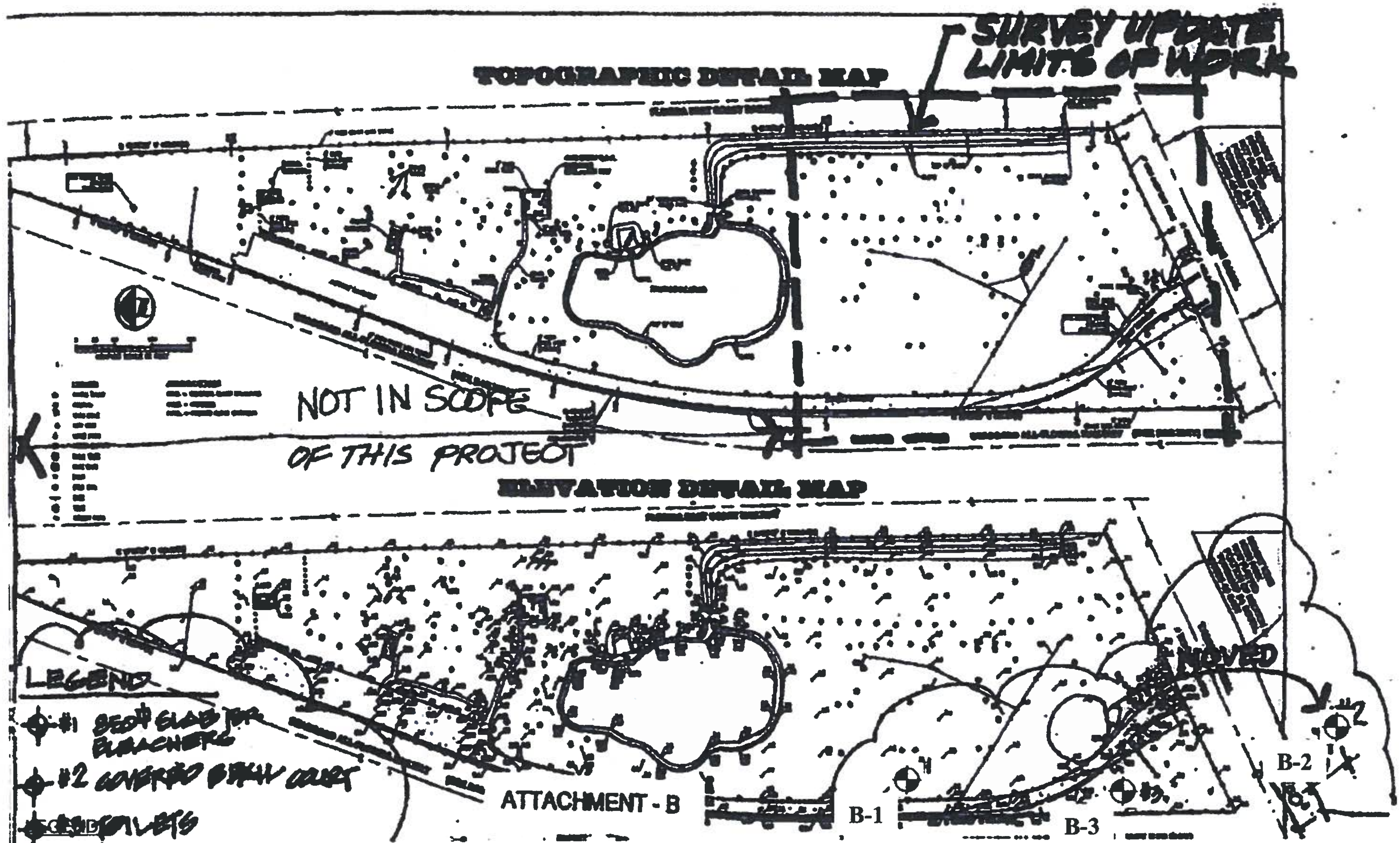
Site Location Map
Field Exploration Plan
Generalized Subsurface Profile
Test Boring Records
Key Classification and Symbols
Field Procedures

APPENDIX B: Laboratory Test Results

Grain size Analysis
Laboratory Procedures

MACTEC Project No 6785-07-1583

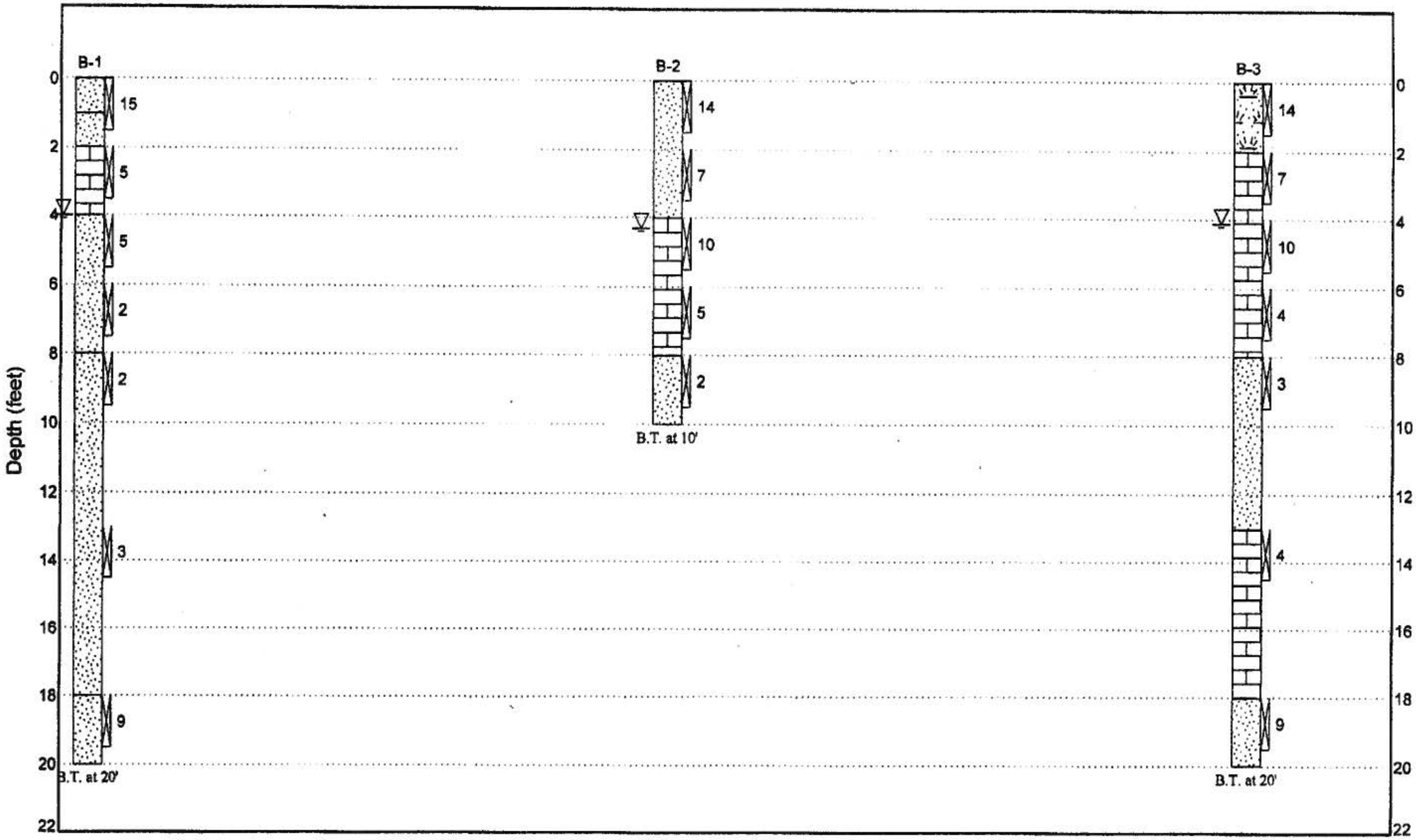
ROBERT KING HIGH PARK - NEW SOCCER FIELD 7025 WEST FLAGLER STREET, MIAMI, FLORIDA	MACTEC	SITE LOCATION MAP DRAWN BY: K.M. DATE: 01/10/2008 CHECKED BY: MK SCALE: NTS



B-3 Approximate test boring location and designation

MACTEC Project No. 6785-07-1583

ROBERT KING HIGH PARK - NEW SOCCER FIELD 7025 WEST FLAGLER STREET, MIAMI, FLORIDA	MACTEC	FIELD EXPLORATION LOCATION PLAN	
		DRAWN BY: K.M.	DATE: 01/10/2008
		CHECKED BY: MK	SCALE: NTS



Note: Natural ground surface elevation not available at time of drilling.

MACTEC

GENERALIZED SUBSURFACE PROFILE

PROJECT NAME: Robert King High Park
PROJECT NO.: 6785-07-1583
PROJECT LOC.: Miami, FL

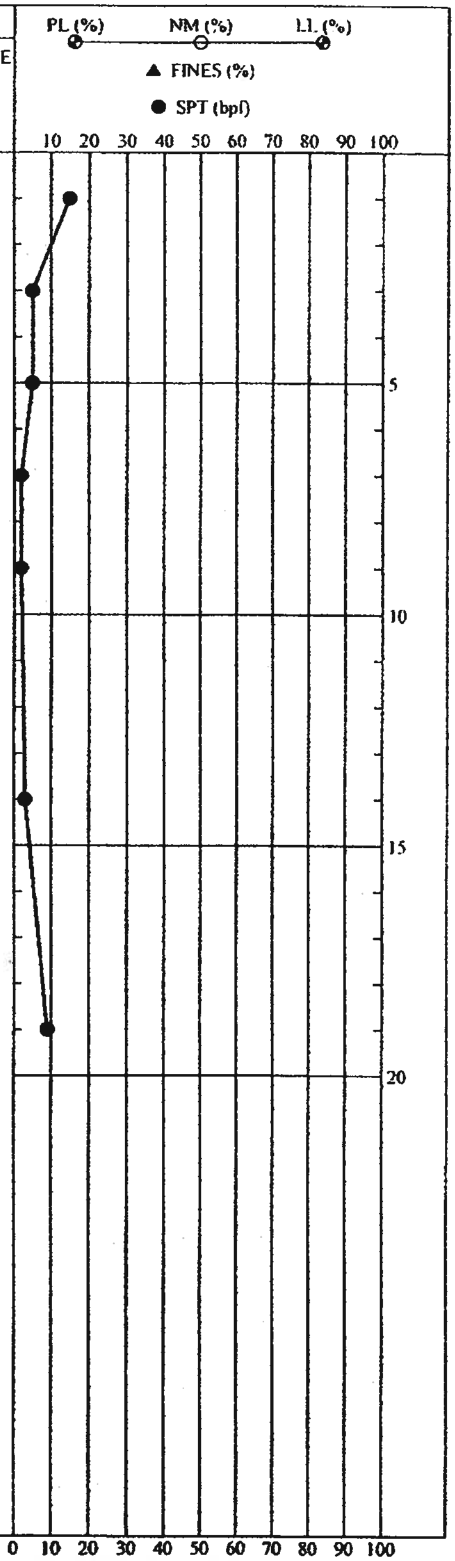
SOIL-MIA-2 07-1583 ROBERT KING HIGH PARK.GPJ MIA-LAW.GDT 12/27/07

SOIL CLASSIFICATION AND REMARKS

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

ELEV (ft): NATURAL GROUND SURFACE ELEVATION NOT AVAILABLE AT TIME OF DRILLING

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	SAMPLES N-COUNT (1st 6" - 2nd 6" - 3rd 6")	N-VALUE
0	Brown, fine SAND with few to little limerock fragments, medium dense, poorly graded, dry (SP)		
	Gray, fine SAND with few to little limerock fragments, medium dense, poorly graded (SP)	5-6-9	15
	Dark Brown, fine SAND with some limestone fragments and little to few silt, loose, wet. (SP-SM)	4-2-3	5
	Light tan, fine SAND with some to little sandstone fragments, loose, wet (SP)		
5		2-2-3	5
	-Very loose	1-1-1	2
	Light tan, fine SAND with few limestone fragments, very loose, wet (SP)	2-1-1	2
10			
	-Loose	2-2-1	3
15			
	Light tan, fine SAND, medium dense, wet (SP)	4-4-5	9
20	Boring Terminated at 20 Ft. Depth		
25			
30			



DRILLER: N. Vasquez (MACTEC)
EQUIPMENT: CME-55 (Automatic Hammer)
METHOD: Standard Penetration Test ASTM D-1586
HOLE DIA.: 3 inches
REMARKS:
ROTARY DRILLING:
GROUND WATER LEVEL: 4 feet
Checked By: KL Date: 1/11/08

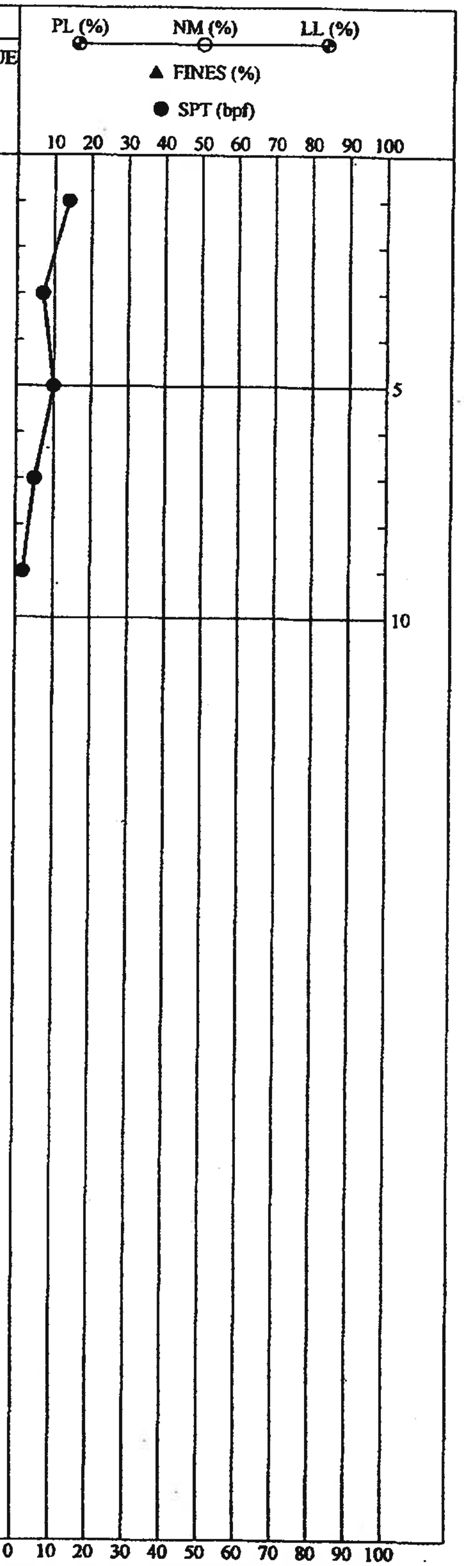
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT NAME: Robert King High Park
PROJECT LOC.: Miami, FL
PROJECT No.: 6785-07-1583
DRILLED: 12-20-2007
BORING No.: B-1

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)	SAMPLES TYPE	N-COUNT (1st 6" 2nd 6" 3rd 6")	N-VALUE
0	Light tan, fine SAND with few limerock fragments, medium dense, poorly graded, dry (SP)		NATURAL GROUND SURFACE ELEVATION NOT AVAILABLE AT TIME OF DRILLING	X	3-8-6	14
	-Brown to tan, loose			X	2-3-4	7
	Tan, LIMESTONE with few fine sand and silt, very soft, wet (LS) ∇			X	4-4-6	10
5				X	3-2-3	5
	Light tan, fine SAND with few sandstone fragments, very loose, wet (SP)			X	1-1-1	2
10	Boring Terminated at 10 Ft. Depth					
15						
20						
25						
30						



SOIL-2 07-1583 ROBERT KING HIGH PARK.GPJ MIA-LAW.GDT 12/27/07

DRILLER: N. Vasquez (MACTEC)
EQUIPMENT: CME-55 (Automatic Hammer)
METHOD: Standard Penetration Test ASTM D-1586
HOLE DIA.: 3 inches
REMARKS:
ROTARY DRILLING:
GROUND WATER LEVEL: 4.3 feet
Checked By: lcl Date: 1/10/08

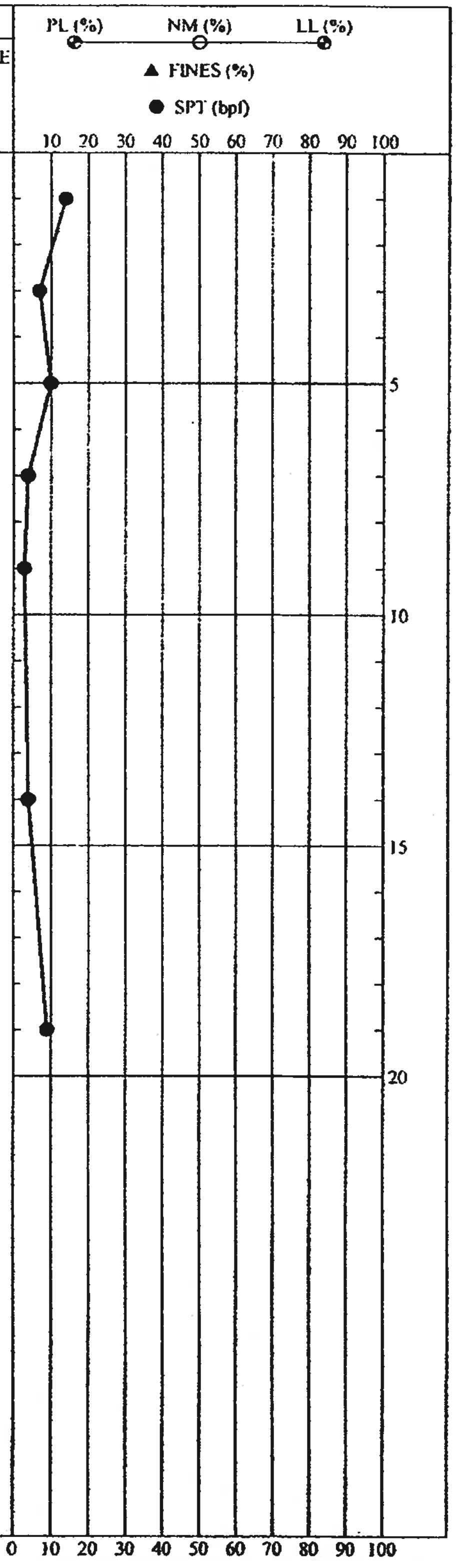
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT NAME: Robert King High Park
PROJECT LOC.: Miami, FL
PROJECT No.: 6785-07-1583
DRILLED: 12/20/2007
BORING No.: B-2

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS (SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.)	LEGEND	ELEV (ft)	SAMPLES: TYPE	N-COUNT (1st 6" 2nd 6" 3rd 6")	N-VALUE
0	Dark brown, fine SAND with few limerock fragments, medium dense, dry (TOPSOIL)		NATURAL GROUND SURFACE ELEVATION NOT AVAILABLE AT TIME OF DRILLING	X	4-6-8	14
	Tan, LIMESTONE with few fine sand, very soft, dry (LS)			X	3-4-3	7
	Tan, fine SAND with some limestone fragments and few silt, medium dense, dry (SP-SM)			X	3-5-5	10
5	Tan, LIMESTONE with little fine sand, very soft, dry (LS)			X	2-2-2	4
	White, fine SAND with few sandstone fragments, loose, wet (SP)			X	1-2-1	3
10						
	Tan, LIMESTONE with few to little fine sand, very soft, wet (LS)			X	2-2-2	4
15						
	White, fine SAND with few to trace of limestone fragments, medium dense, wet (SP			X	5-4-5	9
20	Boring Terminated at 20 Ft. Depth					
25						
30						



SOIL-2 6785-07-1583 ROBERT KING HIGH PARK.GPJ MIA-LAW.GDT 1-11-08

DRILLER: N. Vasquez (MACTEC)
EQUIPMENT: CME-55 (Automatic Hammer)
METHOD: Standard Penetration Test ASTM D-1586
HOLE DIA.: 3 inches
REMARKS:
ROTARY DRILLING:
GROUND WATER LEVEL: 4.1 feet
Checked By: ILL Date: 1/11/08

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT NAME: Robert King High Park
PROJECT LOC.: Miami, FL
PROJECT No.: 6785-07-1583
DRILLED: 12-20-2000
BORING No.: B-3

MACTEC

KEY CLASSIFICATION AND SYMBOLS

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

GRANULAR MATERIAL	SPT N VALUE (BLOWS/FOOT)		SILTS AND CLAYS	SPT N VALUE (BLOWS/FOOT)	
RELATIVE DENSITY	SAFETY HAMMER	AUTOMATIC HAMMER	CONSISTENCY	SAFETY HAMMER	AUTOMATIC HAMMER
VERY LOOSE	0 - 4	0 - 3	VERY SOFT	0 - 2	0 - 1
LOOSE	5 - 10	4 - 8	SOFT	3 - 4	2 - 3
MEDIUM DENSE	11 - 30	9 - 24	FIRM	5 - 8	4 - 6
DENSE	31 - 50	25 - 40	STIFF	9 - 15	7 - 12
VERY DENSE	> 50	> 40	VERY STIFF	16 - 30	13 - 24
			HARD	> 30	> 24

ROCK HARDNESS DESCRIPTION

VERY SOFT	Rock core crumbles when handled **N < 20**
SOFT	Can break core easily with hands **N = 21-30**
MEDIUM HARD	Can break core with hands **N = 31-45**
MODERATELY HARD	Thin edges of rock can be broken with fingers **N = 46-60**
HARD	Thin edges of rock cannot be broken with fingers **N = 61-100**
VERY HARD	Rock core rings when struck with a hammer (cherts) **N > 50/2"**

MODIFIERS

APPROXIMATE PERCENTAGE	MODIFIERS
0 to 5%	Trace
5% to 10%	Few
15% to 25%	Little
30% to 45%	Some

The modifiers provide our estimate of the percentages of gravel, sand and fines (silt or clay size particles).

SYMBOLS	DESCRIPTION
UD	Undisturbed sample (UD) recovered.
100/2"	N, Number of blows (100) to drive the support spoon or cone a number of inches (2").
NX, 4", 6"	Corel Barrel sizes which obtain cores 2-1/8", 3-7/8", and 5-7/8" diameter respectively.
65%	Percentage (65) of rock core and soil sample recovered
RQD	Rock Quality Design - Percent of rock core 4 or more inches long
▼	Water table at least 24 hours after drilling
△	Water table one hour or less after drilling
◀	Loss of drilling fluid

MAJOR DIVISIONS			GROUP SYMBOLS		TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)		GW	Well graded gravels, gravel - sand mixtures, little or no fines.
				GP	Poorly graded gravels or gravel - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)		GM	Silty gravels, gravel - sand - silt mixtures.
				GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)		SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)		SM	Silty sands, sand - silt mixtures
				SC	Clayey sands, sand - clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts and with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils.

	Undisturbed Sample (UD)		Auger Cuttings
	Split Spoon Sample (SS)		Bulk Sample
	Rock Core (RC)		Crandall Sampler
	Dilatometer		Pressure Meter
	Packer		No Recovery
	Water Table at time of drilling		Water Table after 24 hours
WOH - Weight of Hammer			

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

KEY TO SYMBOLS AND DESCRIPTIONS

MACTEC

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

FIELD PROCEDURES

Test Borings - The test borings were made in general accordance with ASTM-D-1586, "Penetration Test and Split-Barrel Sampling of Soils." The borings were advanced using either 3 ¼ -inch I.D. Hollow Stem Augers filled or a 3-inch ID casing (or 6-inch ID casing in borings with rock coring) and a rotary drilling process with water or bentonite drilling fluid circulated in the boreholes to flush the cuttings. At regular intervals, the drilling tools were removed and soil samples were obtained with a standard 1.4-inch I.D., 2.0 inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted, is an index to the soil strength and density.

Representative portions of the soil samples, obtained from the sampler, were placed in glass jars and transported to our laboratory. The samples were then examined by an engineer in order to confirm the field classifications.

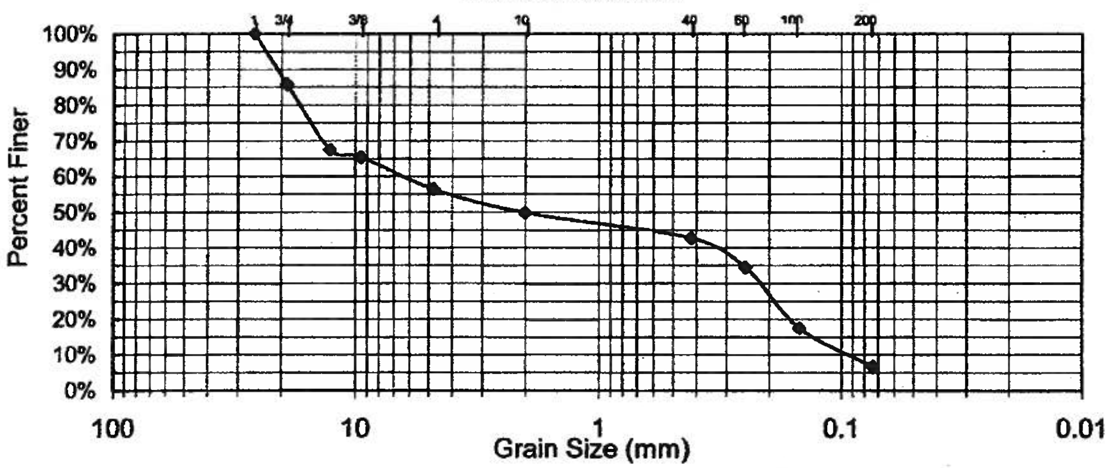
MACTEC

5845 NW 158th Street
Miami Lakes, Florida 33014

Grainsize Analysis

Project:	Robert King Park	Project #:	6785-07-1583
Tested by:	J. Rodriguez	Test Date:	27-Dec-07
Sample Description:		Boring No.:	
		Sample No.:	B-1
Checked By: / Date:	1/10/08 lcL	Depth/ Elevation	2'-4'

Grain Size Distribution



Sieve Size	Particle Size (mm)	Weight Retained	Percent Retained	Percent Passing
1"	25.7		0%	100%
3/4"	19	36.41	14%	86%
1/2	12.7	83.98	33%	67%
3/8	9.51	89.43	35%	65%
4	4.76	112.61	44%	56%
10	2	129.62	50%	50%
40	0.42	147.89	57%	43%
60	0.25	169.03	65%	35%
100	0.149	213.01	82%	18%
200	0.074	241.01	93%	7%
PAN				

Total Weight Before Wash =	258.2
Percent finer than # 200 sieve by wash method =	7%
Unified Soil Classification System	SP-SM
ASSHTO Soil Classification System	N/A

Remarks:

Test results are in general compliance with the following standards

ASTM D-422, D-2216, D-2974

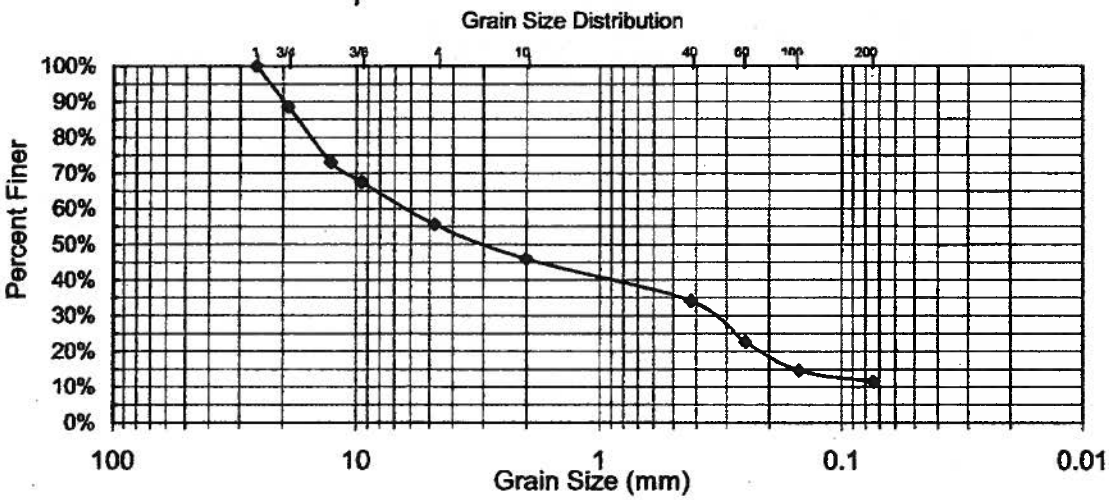
AASHTO T-11, T-27, T-265, T-267

MACTEC

5845 NW 158th Street
Miami Lakes, Florida 33014

Grainsize Analysis

Project:	Robert King Park	Project #:	6785-07-1583
Tested by:	J. Rodriguez	Test Date:	27-Dec-07
Sample Description:		Boring No.:	
		Sample No.:	B-3
Checked By: / Date:	1/10/08 kL	Depth/ Elevation	4'-6'



Sieve Size	Particle Size (mm)	Weight Retained	Percent Retained	Percent Passing
1"	25.7		0%	100%
3/4"	19	24.91	11%	89%
1/2	12.7	58.91	27%	73%
3/8	9.51	71.14	33%	67%
4	4.76	97.13	44%	56%
10	2	118.10	54%	46%
40	0.42	143.94	66%	34%
60	0.25	169.05	77%	23%
100	0.149	186.63	85%	15%
200	0.074	193.39	89%	11%
PAN				

Total Weight Before Wash =	218.48
Percent finer than # 200 sieve by wash method =	11%
Unified Soil Classification System	SP-SM
ASSHTO Soil Classification System	N/A

Remarks:

Test results are in general compliance with the following standards

ASTM D-422, D-2216, D-2974

AASHTO T-11, T-27, T-265, T-267

LABORATORY PROCEDURES

Grain Size Distribution - The grain size tests were performed to determine the particle size and distribution of the sample tested. The sample was dried, weighed, and washed over a No. 200 mesh sieve. The dried sample was then passed through a standard set of nested sieves to determine the grain size distribution of the soil particles coarser than the No. 200 sieve. This test is similar to that described by ASTM D-422.