Hallandale Beach
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REQUEST FOR PROPOSAL
(RFP) # FY 2015-2016-010

CONSULTANT COMPETITIVE NEGOTIATION ACT
(CCNA)
ARCHITECTURAL AND ENGINEERING SERVICES
GOLDEN ISLES TENNIS CENTER AND GOLDEN ISLES PARK

EXHIBIT B

REPORT OF GEOTECHNICAL EXPLORATION GOLDEN ISLES TENNIS COMPLEX AND DOG PARK

REPORT OF
GEOTECHNICAL EXPLORATION

GOLDEN ISLES TENNIS COMPLEX AND DOG PARK
424 LAYNE BOULEVARD
HALLANDALE BEACH, FLORIDA

FOR

CITY OF HALLANDALE BEACH
400 SOUTH FEDERAL HIGHWAY
HALLANDALE BEACH, FLORIDA 33009

PREPARED BY

NUTTING ENGINEERS OF FLORIDA, INC.
2051 NW 112TH AVE
SUITE NO. 126
MIAMI, FLORIDA 33172

PROJECT NO.: 213.16

JANUARY 2016

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January 19, 2016

Mr. Gregg Harris
City of Hallandale Beach
400 South Federal Highway
Hallandale Beach, Florida 33009
Phone: (954) 451-3029
Email: gharris@cohb.org

Subject: Report of Geotechnical Exploration
Golden Isles Tennis Complex and Dog Park
424 Layne Boulevard
Hallandale Beach, Florida

Dear Mr. Harris,

Nutting Engineers of Florida, Inc. performed a geotechnical exploration for the proposed new construction at the above referenced site. The purpose of this exploration was to obtain information concerning the site and subsurface conditions at specific locations in order to provide site preparation and foundation design recommendations for support of the proposed construction. This report presents our findings and recommendations.

PROJECT INFORMATION

Per your email dated December 15, 2015 and review of the conceptual site plan provided by your office, we understand that preliminary plans for this project include the construction of a restroom facility, pro shop area, and reconfiguring the existing tennis courts at the referenced site. Additional improvements included paved parking areas. We anticipate that final grades will be within one to two feet of existing grades.

We note that if any of our understandings or assumptions are incorrect, we should be notified so that we can re-evaluate our analysis and may amend our recommendations accordingly.

GENERAL SUBSURFACE SOIL CONDITIONS

Subsurface Soil Exploration

The exploration of subsurface conditions included site observation and Standard Penetration Test borings (ASTM D-1586). Nutting Engineers of Florida, Inc. has performed a total of three (3) Standard Penetration Test borings (ASTM D-1586) to depths of 30 feet below the existing

ground surface in order to evaluate the subsurface soil conditions. Furthermore, one (1) 'Usual Open-Hole' exfiltration test was performed in accordance with South Florida Water Management District (SFWMD) specifications to a depth of six feet below the existing ground surface.

The locations of the tests are indicated on the attached Boring Location Plan. Individual test boring reports are presented in the Appendix of this report. The test locations were established in the field using approximate methods; namely, a measuring wheel and available surface controls.

Test Boring Results

The appended test boring logs present information and descriptions of the subsurface conditions at each specific test boring location. In general, test boring logs indicate loose to medium dense fine sand and limestone fragments to depths of approximately four to ten feet. Beneath this, the borings encountered limestone and sand to a depth of approximately thirteen feet underlain by soft to medium hard limestone to a depth of thirty feet below ground surface, the maximum depth explored. It should be noted soft silt and peat were encountered in boring location B-2 from approximately four to thirteen feet below ground surface.

A detailed description of the soil/rock profile is presented in the test boring records provided in the Appendix. The Standard Penetration Test N-values are used to evaluate the relative density of granular soils. The correlation of penetration resistance with relative density is presented in the Soil Classification Criteria attached in the Appendix.

Ground Water

The immediate groundwater level was measured at the boring locations at the time of drilling. The groundwater level was encountered at an approximate depth of four and a half to seven feet below the existing ground surface. The immediate depth to groundwater measurements presented in this report may not provide a reliable indication of stabilized or longer term depth to groundwater at this site.

Water table elevations can vary dramatically with time through rainfall, droughts, storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data **should not** be relied upon alone for project design considerations.

Further information regarding stabilized groundwater elevations at the site could be developed upon specific request. Additional evaluation might include monitoring of peizomenters, survey of the project area for evidence of current groundwater elevation influences such as well fields, obvious construction dewatering, tidal activity, flood control canals and other surface water bodies.

Exfiltration Results

One 'Usual Open-Hole' exfiltration test was performed in accordance with South Florida Water Management District (SFWMD) specifications to a depth of six feet below the existing ground surface. The test was performed in order to determine the hydraulic conductivity of the in situ subsurface soils to evaluate drainage requirements for the project, by others.

The hydraulic conductivity value was found to be 6.23×10^{-5} cubic feet per second, per square foot, per foot of head. Detailed soil descriptions and flow rates are presented in the Appendix.

ANALYSIS AND RECOMMENDATIONS

The borings performed for this project revealed a soil profile consisting mainly of sand and limestone. As discussed previously, silt and peat were noted within the profile of test boring B-2 and test pits should be performed in this vicinity prior to construction in order to evaluate additional recommendations.

In order to properly prepare the foundation soils for shallow foundations utilizing a bearing pressure of 3,000 pounds per square foot, an undercut and intense compaction (i.e. demucking) program will need to be accomplished in this area prior to construction. The remaining three quadrants exhibited soil conditions suitable for shallow foundations with typical construction procedures.

Alternatively, a deep foundation system of piles may be utilized for support of the structure. The actual alternative used for the project will depend upon structural feasibility, costs, and possibly other factors that are not presently known to Nutting Engineers. It is necessary that all interested parties partake in meetings to better understand the foundation alternatives as well as being aware of the varying pros and cons for each alternative.

Preparation of the site to receive the new development should include clearing and stripping of unwanted vegetation, grubbing of vegetative root systems, and topsoil materials. This should be followed with the placement and compaction of the structural fill to attain the required construction grades. Subgrade preparation, and fill placement should be completed in accordance with the recommendations presented in this report. A representative of the geotechnical engineer should observe the site preparation procedures to ensure the engineering intent is accomplished.

Site Preparation

We recommend that the existing site be cleared and stripped of the unwanted vegetative top soil to a lateral distance of at least 5 feet beyond the exterior of the proposed parking areas. The excavated top soils containing grass, roots and vegetative materials should not be deposited within the construction site and should be transported away from the construction perimeter.

Upon completion of the stripping operations, the entire parking area should then be proof-rolled and compacted with at least 20 overlapping passes of a vibratory compactor having a minimum dynamic force of 10 tons. The roller coverages should be equally divided into two perpendicular directions. The compactor should operate at the high frequency at a maximum speed of 2 feet per second (a slow walk pace). Rolling should continue until no further settlement is visually discernible at the subgrade surface.

Densities equivalent to at least 98 percent of the modified proctor maximum dry density (ASTM-D1557) should also be achieved to a depth of at least 12 inches below the compacted surface. A Frequent wetting of the subgrade may be necessary during the rolling operations to prevent drying and loosening of the upper 6 to 12 inches of soil.

Additional fill that is required may then be placed in maximum loose lifts of 12 inches, and compacted until densities equivalent to at least 98 percent of the maximum dry density has been uniformly obtained. Density tests to confirm compaction should be performed in each fill lift before the next lift is placed. Any fill indicating less than above compaction requirements should be recompacted until the required density is obtained.

Fill should consist of fine sand with less than 10% passing the No. 200 sieve, free of rubble, organics, clay, debris and other unsuitable material. Prior to initiating compaction operations, we recommend that representative samples of the structural fill material to be used and acceptable in-place soils be collected and tested to determine their compaction and classification characteristics. Fill should be tested and approved by Nutting Engineers prior to acquisition and placement. 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.

Pavements

Upon completion of the above area specific site preparation procedures, the following would apply within proposed pavement areas. A stabilized subgrade having a minimum LBR of 40 shall be placed to a depth of at least twelve inches below the base course. The base course will range from six inches within parking stall areas to eight inches within drive areas, and should have a minimum LBR of 100. The minimum twelve inches of stabilized subgrade should be compacted to an equivalent density of 98 percent of the modified Proctor maximum dry density (ASTM D-1557). The base material should be compacted to 98 percent of the modified Proctor maximum dry density. The pavement material and thickness should be based on design requirements.

GENERAL INFORMATION

Prior to initiating compaction operations, we recommend that representative samples of the structural fill material to be used and acceptable 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 tests 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.

We suggest that the Geotechnical Engineer inspect and approve all foundation bearing surfaces and floor sub-grades prior to placement of reinforcing steel, concrete or pavement.

The vibratory compaction equipment will cause vibrations that could be felt by persons within adjacent buildings and may cause cosmetic damage to the structures. The contractor should exercise due care during performance of the vibratory compaction work.

The assessment of the site environmental conditions or the presence of pollutants in the soil, rock or groundwater of the site is beyond the proposed scope of this exploration. If you desire, ***Nutting Environmental of Florida, Inc.***, can perform an environmental assessment of the project site.

Changes in the submitted project details or the discovery of any site or varying subsurface conditions prior to and/or during construction which deviate from the data obtained in this exploration should be immediately reported to us so that the condition or change can be evaluated and appropriate action taken. We request the opportunity to review the final plans and specifications to assure that the intent of the recommendations of this report is properly interpreted and incorporated.

Our client for this geotechnical evaluation was:

City of Hallandale Beach
400 South Federal Highway
Hallandale Beach, Florida 33009

This report is prepared exclusively for the use of the ***client*** and other members of the design team for specific application to this project at the above referenced site. The conclusions provided by ***Nutting Engineers of Florida, Inc.***, are based solely on the information presented in this report. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

The recommended construction phase inspection by the Geotechnical Engineer will provide continuity in the implementation and interpretation of the recommendations contained in this report. For this reason, we believe that this inspection service should be provided by ***Nutting Engineers of Florida, Inc.*** We would also like to offer our services for quality control testing

and inspection of proposed construction, i.e., foundation bearing surfaces, soils, concrete, steel and roofing materials as well as threshold inspections.

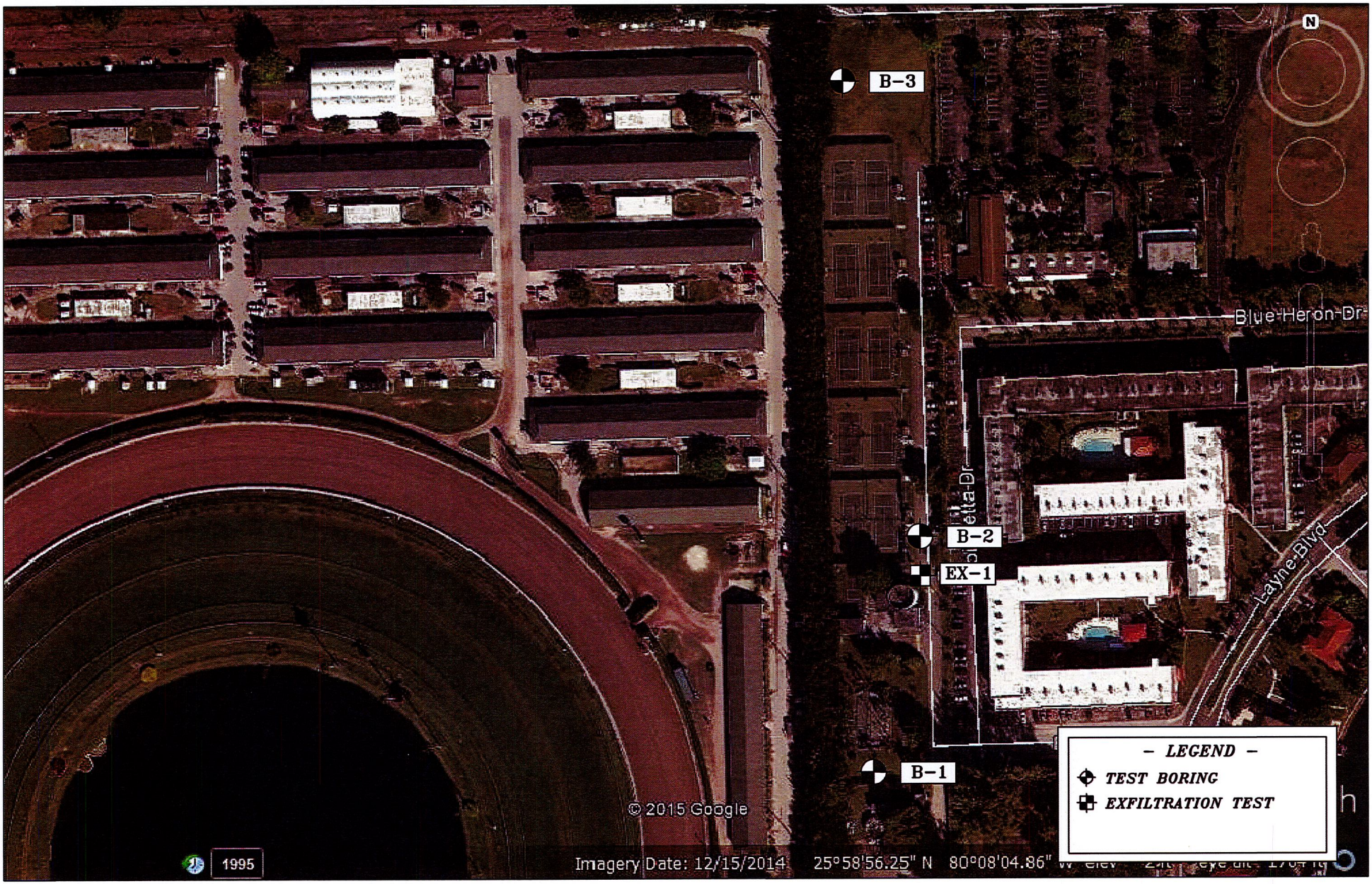
We appreciate the opportunity to provide these services for you and look forward to completing this and other projects with you. If we can be of any further assistance with the design or construction services, or if you need additional information, please feel free to contact us at your convenience.

Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

1/19/16

Paul C. Catledge, P.E. #68448
Senior Engineer

Attachments: Boring Location Plan
Test Boring Reports
Exfiltration Test Results
Soil Classification Criteria
Limitations of Liability



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GOLDEN ISLES TENNIS COMPLEX & DOG PARK
424 LAYNE BOULEVARD
HALLANDALE BEACH, FLORIDA

APPROXIMATE TEST LOCATIONS

NOT TO SCALE

FIGURE 1

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1310 Neptune Drive
Boynton Beach Fl. 33426
Telephone: 561-736-4900
Fax: 561-737-9975

BORING NUMBER B-1

PROJECT NUMBER 213.16

CLIENT City of Hallandale Beach

PROJECT NAME Golden Isles Tennis Complex & Dog Park

PROJECT LOCATION 424 Layne Boulevard, Hallandale Beach, FL

DATE STARTED 12/29/15 COMPLETED 12/29/15

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY J R Precision Drilling CHECKED BY P. Catledge

∇ AT TIME OF DRILLING 6.9 ft ft

APPROXIMATE LOCATION OF BORING **As located on site plan**

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		Brown fine SAND and LIMESTONE FRAGMENTS	SS 1	4-6-6-5	12
			SS 2	2-3-9-11	12
5			SS 3	9-9-10-16	19
		∇ Brown LIMESTONE and fine SAND	SS 4	10-10-7-7	17
10			SS 5	4-5-6-7	11
15			SS 6	5-5-6-7	11
20		Lt. brown fine SAND and LIMESTONE	SS 7	3-4-2-2	6
25		Brown LIMESTONE	SS 8	3-3-3-3	6
30			SS 9	4-5-3-4	8
		Bottom of hole at 30.0 feet.			

▲ SPT N VALUE ▲ 10 20 30 40

PL MC LL 20 40 60 80

☐ FINES CONTENT (%) ☐ 20 40 60 80

TEST NUTTING BOREHOLE 2-213.16 CITY OF HALLANDALE BEACH - GOLDEN ISLES TENNIS COMPLEX & DOG PARK.GPJ GINT US.GDT 1/19/16

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BORING NUMBER B-2

PROJECT NUMBER 213.16

CLIENT City of Hallandale Beach

PROJECT NAME Golden Isles Tennis Complex & Dog Park

PROJECT LOCATION 424 Layne Boulevard, Hallandale Beach, FL

DATE STARTED 12/29/15 COMPLETED 12/29/15

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY J R Precision Drilling CHECKED BY P. Catledge

∇ AT TIME OF DRILLING 4.4 ft ft

APPROXIMATE LOCATION OF BORING **As located on site plan**

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		1-inch ASPHALT			
		Brown fine SAND and LIMESTONE FRAGMENTS (FILL)	SS 1	16-11-10-12	**21**
			SS 2	8-6-5-3	**11**
5		∇ Brown SILT	SS 3	2-1-WOH	
		Brown fine SAND, trace limestone	SS 4	WOH	
		Brown PEAT, LIMESTONE and fine SAND	SS 5	WOH-4-3	
10					
		Brown LIMESTONE	SS 6	4-5-7-8	**12**
15					
			SS 7	6-9-7-7	**16**
20					
			SS 8	7-4-4-3	**8**
25					
			SS 9	12-17-31-22	**48**
30		Bottom of hole at 30.0 feet.			

▲ SPT N VALUE ▲ 10 20 30 40

PL MC LL 20 40 60 80

☐ FINES CONTENT (%) ☐ 20 40 60 80

TEST NUTTING BOREHOLE 2-213.16 CITY OF HALLANDALE BEACH - GOLDEN ISLES TENNIS COMPLEX & DOG PARK.GPJ GINT US.GDT 1/19/16

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BORING NUMBER B-3

PROJECT NUMBER 213.16

CLIENT City of Hallandale Beach **PROJECT NAME** Golden Isles Tennis Complex & Dog Park

PROJECT LOCATION 424 Layne Boulevard, Hallandale Beach, FL

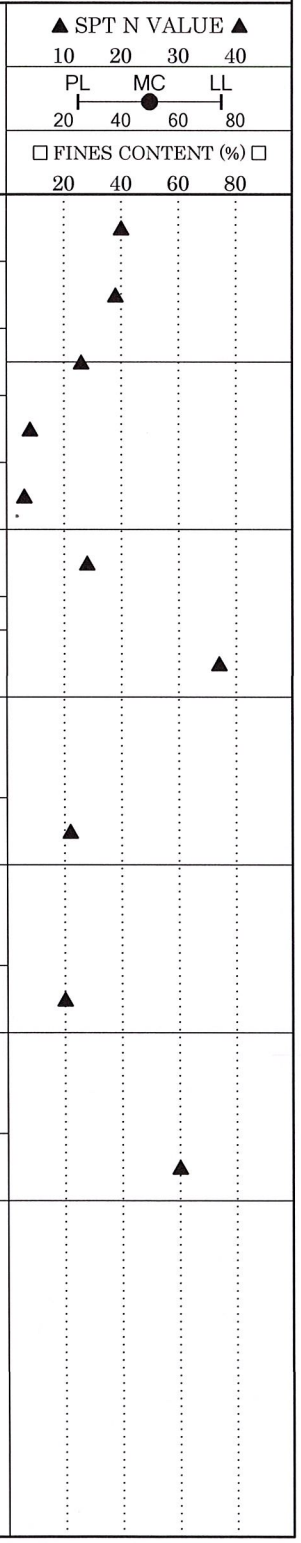
DATE STARTED 12/29/15 COMPLETED 12/29/15 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

LOGGED BY J R Precision Drilling CHECKED BY P. Catledge ∇ AT TIME OF DRILLING 4.6 ft ft

APPROXIMATE LOCATION OF BORING **As located on site plan**

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		Brown fine SAND and LIMESTONE FRAGMENTS (FILL)	SS 1	7-13-7-6	**20**
			SS 2	5-8-11-8	**19**
5		∇ Brown fine SAND and LIMESTONE FRAGMENTS	SS 3	9-7-6-4	**13**
		Brown LIMESTONE FRAGMENTS and fine SAND	SS 4	3-2-2-1	**4**
		Brown fine SAND and LIMESTONE FRAGMENTS, some silt	SS 5	1-1-2-2	**3**
10		Brown fine SILTY SAND and LIMESTONE	SS 6	4-4-10-12	**14**
		Brown LIMESTONE	SS 7	4-18-19-11	**37**
15					
20			SS 8	6-6-5-6	**11**
25			SS 9	5-4-6-5	**10**
30			SS 10	3-3-27-15	**30**
		Bottom of hole at 30.0 feet.			



TEST NUTTING BOREHOLE 2-213.16 CITY OF HALLANDALE BEACH - GOLDEN ISLES TENNIS COMPLEX & DOG PARK.GPJ GINT US.GDT 1/19/16

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Report of Exfiltration Test

Client: City of Hallandale Beach
Project: Golden Isles Tennis Complex & Dog Park
Location: 424 Layne Boulevard, Hallandale Beach, FL

Order No 213.16
Report No 1
Date: 12/29/16

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 4.4'

Casing Diameter: 4"
Tube Depth: 6'

Sample Location: As located on site plan

Material:

	0'- 0.08'	1-inch ASPHALT
	0.08'- 4'	Brown fine SAND and BASECOURSE (FILL)
	4'- 6'	Brown SILT

One Minute Increme	Pump Rate in Gal/Min
1	0.5
2	0.7
3	0.7
4	0.5
5	0.5
6	0.5
7	0.5
8	0.5
9	0.5
10	0.5

$K = 6.23 \times 10^{-5}$ cfs/ft^{2}ft.head

SOIL AND ROCK CLASSIFICATION CRITERIA

SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Soft
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
N≥ 100	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
25≤ N ≤ 100	Medium hard to hard	
5≤ N ≤ 25	Soft to medium hard	

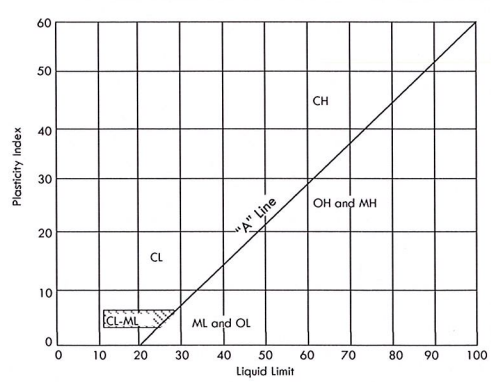
PARTICLE SIZE

Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

DESCRIPTION MODIFIERS

0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions			Group Symbols	Typical names	Laboratory classification criteria		
Coarse-grained soils (More than half of material is *larger* than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gavels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than five percent.....GW, GP, SW, SP; More than 12 percent.....GM, GC, SM, SC; 5 to 12 percent.....*Borderline* cases requiring dual systems**	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GW* d / u	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual system.
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. more than 7	
Fine-grained soils (More than half 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 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 or high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT	Peat and other highly organic soils			



Plasticity Chart

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LIMITATIONS OF LIABLILITY

WARRANTY

We warranty that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. ***No other warranties, expressed or implied, are made***. While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. ***Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately*** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. ***The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.*** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.