Subsoil Investigation Report

prepared by:

Federal Engineering & Testing, Inc.

Client:	Julien Watterlot
Contact:	Julien Watterlot
Address:	744 Middle River Drive Fort Lauderdale, FL 33304
Project:	Proposed Piling Recommendations for 2-Story Residence & Pool
Address:	1651 N Fort Lauderdale Beach Boulevard Fort Lauderdale, FL 33305
Date:	Thursday, April 7, 2022

Geotechnical | Materials Testing | Inspections | Environmental

Federal Engineering & Testing, Inc.
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www.fed-eng.com
3370 NE 5th Avenue Oakland Park, Florida 33334

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For Your Information

Our findings in this report are based on soil conditions encountered in the test bore locations only, proposed structure to be built, (if available at this stage), Florida Building Code requirements and standard engineering practices. If your report is preliminary (i.e. vacant land or building to be demolished) additional borings are required within the foot print of the proposed structure once the location & layout of the proposed structure is known.

Please read this report in its entirety and follow all recommendations. Failure to do so may result in the permitting agency (Building Department, etc.) withholding the Certificate of Occupancy. This will cause delays and additional costs. The Permitting Agency will require a final certification or signing off of the project prior to issuing the Certificate of Occupancy. All of our recommendations need to be followed to receive a final certification from F.E.T., including densities on each lift, demucking verification, piling inspection, etc., whichever recommendation applies to your project.

Please schedule us at least 24 hours in advance for all tests and inspections. If you choose to use another Engineering Firm, you must verify they will provide you with the proper certification in writing, as outlined in our report. Our firm will only provide a certification letter if it has verified all work as recommended in our report.

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Thursday, April 7, 2022

Job Order Number 22SB0221

Julien Watterlot
744 Middle River Drive
Fort Lauderdale, FL 33304
Attn.: Julien Watterlot

RE: **Subsoil Investigation**
Proposed Piling Recommendations for 2-Story Residence & Pool
1651 N Fort Lauderdale Beach Boulevard
Fort Lauderdale, FL 33305

Dear Sirs:

Pursuant to your request, Federal Engineering & Testing, Inc. has completed a subsoil investigation on 4/6/2022 at the above referenced site. The purpose of our investigation was to verify subsoil conditions relative to foundation preparation and design.

A total of three (3) SPT borings were performed according to ASTM D-1586, two (2) drilled down to a depth of forty feet (40) and one (1) drilled down to a depth of twenty feet (20) below the existing ground surface. (See attached field sketch for locations). The following is a general description of soil stratas for the subject site:

Depth		Description of Soils
From	To	
0"	6"	Topsoil & Vegetation
6"	14'	Light Reddish Brown Sand with Shells
14'	19'	Very Pale Brown Sand with Shells
19'	40'	Gray Sand with Shells

Groundwater table elevation was measured immediately at the completion of each boring and was found at an average depth of fourteen (14) feet below existing ground surface. Fluctuation in water level should be anticipated due to seasonal variations and run off as well as varying ground elevation, construction dewatering and pumping activities in the area. Site contractor must familiarize himself with site conditions in the event groundwater controls and dewatering is needed. Surface flooding may result under hurricane conditions and should be taken into consideration in the design of the project. The contractor shall make sure that groundwater levels on adjacent properties are not affected by the contractors dewatering activities. Specialty groundwater contractors shall be consulted for all work below the groundwater level.

The boring log(s) attached present a detailed description of the soils encountered at each location. The soil stratification shown on the boring log(s) is based on the examination of the recovered soil samples and interpretation of the driller's field log. It indicates only the approximate boundaries between soil types. The actual transitions between adjacent soil types may be gradual.

Based on our understanding of the proposed structure and the information obtained from our field boring logs; it is evident that deep foundation systems are needed to support the proposed new structure due to coastal construction zone foundation requirements.

Per the Florida Building Code, Chapter 18; deep foundation systems shall consist of one of the following alternatives:

Alternatives	Approximate Depth Driven	Size	Allowable Compression Pile Capacity in Tons	Allowable Tension Pile Capacity in Tons	Allowable Lateral Capacity In Tons
Pin Piles/ Push Piers	40' or Refusal	4 Inch	5 Tons	1 Ton	N/A
Helical Piles	40' BELS	3 Inch	12 Tons	6 Tons	N/A
Auger Cast Piles	40' BELS	12 Inch	25 Tons	12 Tons	1 Ton
Auger Cast Piles	40' BELS	14 Inch	35 Tons	17 Tons	2 Tons

BELS - Below Existing Land Surface

Estimated Lateral Load for a Pile Top Deflection of ¼ inch. Proposed pile length based on the existing ground elevations at the time of drilling. Pile length may vary depending on proposed grade beam elevations and inconsistent soil profiles. In the case of pin, helical and precast piles a minimum of four (4) test piles shall be driven to determine production pile length. All work shall be in accordance with the local Building Code and Coastal Zone Construction Requirements (if required).

Helical pile bearing capacity is dependent on helix numbers, size and spacing. The foundation contractor will be able to provide the most cost effective combination of helix designs. The above depths are the minimum depths required to achieve design capacities. Predrilling might be required to achieve design depths. These depths may vary considerably due to the non-homogeneous nature of the subsoil materials.

If the helical piles do not penetrate into the limerock layer and spin out on top of the rock layer, then predrilling will be required to penetrate down to design bearing depths and develop the proper torque capacities. Optional configurations of the helical assembly may provide for proper penetration of the limerock layers, including but not limited to square vs round bar assemblies or reconfiguration of the helix plates. Once the surface of the limerock layer is penetrated and the helix plates are engaged into the limerock layers, voids in the limerock layers may cause loss of the required torque capacities at various depths. Deeper installation depths may be needed in some areas to obtain the required design torque properties and bearing capacities due to possible void sections.

Refusal for helical piles is determined when the installation torque reaches the design capacity requirements. The depths that are considered refusal may vary from location to location. Final depths may be less than or greater than the depths provided in the piling table above. The helical piles are installed until the design installation torque is achieved. The helicals are installed to ultimate soil bearing capacity which is 2 times the allowable soil bearing capacity provided in the piling table above or 2 times the design bearing capacity specified in the plans.

If the helicals spin out on top of a dense limerock layer and the required installation torques are not achieved, then the helical pile capacity will be greatly reduced and only point end bearing capacity will be obtained. Load testing would be required if the piles spin out on top of the limerock layer to determine what bearing capacity is achieved due to the point end bearing loading of the pile.

For a pool structure, the helical pile installation depths should be a minimum of ten (10) feet below the bottom of the pool foundation / pool bottom areas.

All slabs and pool decks for the subject structure shall be designed as structural slabs spanning between supports and designed by a Florida Registered Structural Engineer and placed under the supervision of a Geotechnical Engineer. All work shall be conducted by an experienced Florida Licensed Specialty Piling Contractor. All piles shall be designed by a professional engineer and shall be placed under the supervision of our Geotechnical Engineer to verify compliance with our recommendations. If the pile is not reinforced over the entire length, we recommend a single #7 reinforcing steel bar be placed the full length of the pile to verify pile continuity.

In case of existing structures in the vicinity of the pile driving operation, care shall be taken not to create excessive vibration. Vibration levels shall be monitored to verify compliance with county regulations. Steps must be taken to prevent excessive vibrations. In the event excessive vibrations are experienced during construction, alternative driving methods shall be implemented (i.e.: predrilling, jetting, hydraulic push, etc…).

The minimum center to center spacing of piles or adjacent foundations shall be not less than twice the average diameter for round piles or 1-3/4 times the diagonal dimensions of rectangular piles, but in no case less than 30 inches. The installation of adjacent piles (located within 4 feet of each other) on the same working day is not recommended. We recommend that adjacent piles not be installed until the initial grouted pile has set overnight.

The grout used in the pile installation shall develop a minimum compressive strength of 4000 PSI at 28 days.

Site walls, retaining walls, A/C slabs, any other miscellaneous equipment slabs and any underground structures such as grease traps, septic systems, etc. must be supported on pile foundations, unless the deleterious material (i.e.: silt, muck, peat, etc…) is excavated in its entirety and replaced with compacted washed gravel such as pea rock or #57 stone below the water table elevations and clean granular materials above the water table.

Excavations shall not extend within one (1) foot of the angle of repose next to existing footings or structures unless underpinned. Trenching shall be in compliance with the Florida Building Code, OSHA and Trench Safety Act requirements. Shorings shall be designed and inspected by a Florida licensed professional engineer.

Provisions shall be made by the architect, engineer of record and contractor to address differential settlements when tying in new to existing structures. Mixing of different foundation types shall not be used unless provided with expansion joints to address differential settlement.

All outside ground surfaces must be sloped away from the structure to avoid water accumulation and ponding. All rain waters shall be discharged away from all building foundations. Verify all water, sewer, plumbing, sprinkler and drainage lines are properly functioning with no leaks in the vicinity of the foundation.

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Regardless of the thoroughness of a geotechnical exploration, there is always the possibility that conditions may be different from those of the test locations; therefore, Federal Engineering & Testing, Inc. does not guarantee any subsoil condition between the bore test holes. A site plan showing the location of the proposed structure was not provided at the time the soil borings were performed. Once plans and specifications have been finalized and drawn, Federal Engineering & Testing, Inc. shall be provided a copy of the finalized plans and specifications for review. For a more accurate portrayal of subsurface conditions, the site contractor should perform test pits. If different conditions are encountered, Federal Engineering & Testing Inc., shall be notified to review the findings and make any recommendations as needed. In accepting this report the client understands that all data from the soil borings is intended for foundation analysis only and is not to be used for excavating, backfilling or pricing estimates. The site contractor must familiarize themselves with the job site conditions.

Environmental analysis of the soil materials is not part of the scope of services. If environmental analysis of the soils is required, we can provide a proposal for performing an environmental analysis of the soil materials. For Environmental due diligence, a Phase I and/or Phase II Environmental Site Assessment is recommended.

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.

Federal Engineering & Testing, Inc. appreciates the opportunity to be of service to you at this phase of your project. Please feel free to contact us if we may be of further service to you.

Sincerely,

KEITH JOHN LEBLANC LICENSE No. 59394 STATE OF FLORIDA PROFESSIONAL ENGINEER

4/7/22

Keith LeBlanc, P.E.
Federal Engineering & Testing, Inc.
Florida Reg. No. 59394
Certificate of Authorization # 5471

Federal Engineering & Testing, Inc.

Appendices

Federal Engineering & Testing, Inc.

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SPT Test Boring Report

Client: Julien Watterlot
Project: Proposed Piling Recommendations for 2-Story Residence & Pool
Address: 1651 N Fort Lauderdale Beach Boulevard
Fort Lauderdale, FL 33305

Date of Test: April 6, 2022
Hole No.: B-1
Location: See Attached Drawing

Depth (FT)	Soil Descriptions	Hammer Blows		"N"
1	0" - 6" Topsoil & Vegetation	2	1	3
2		2	4	
3		3	5	9
4		4	6	
5		6	6	14
6		8	9	
7		10	10	19
8	6" - 14'6" Light Reddish Brown Sand with Shells	9	12	
9		11	13	25
10		12	14	
11		A	A	A
12		A	A	
13		A	A	A
14		A	A	
15		13	16	31
16		15	18	
17		A	A	A
18	14'6" - 20' Gray Sand with Shells	A	A	
19		A	A	A
20		A	A	
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

Water Level: 14'6" Below Land Surface

A = Auger

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SPT Test Boring Report

Client: Julien Watterlot
Project: Proposed Piling Recommendations for 2-Story Residence & Pool
Address: 1651 N Fort Lauderdale Beach Boulevard
Fort Lauderdale, FL 33305

Date of Test: April 6, 2022
Hole No.: B-2
Location: See Attached Drawing

Depth (FT)	Soil Descriptions		Hammer Blows		"N"
1	0" - 6"	Topsoil & Vegetation	1	2	4
2			2	2	
3			3	4	7
4			3	6	
5			5	6	13
6			7	7	
7			9	8	18
8	6" - 14'	Light Reddish Brown Sand with Shells	10	12	
9			11	14	26
10			12	13	
11			A	A	A
12			A	A	
13			A	A	A
14			A	A	
15			12	14	29
16			15	17	
17	14' - 19'	Very Pale Brown Sand with Shells	A	A	A
18			A	A	
19			A	A	A
20			A	A	
21			14	16	31
22			15	18	
23			A	A	A
24			A	A	
25			A	A	A
26			A	A	
27			17	19	39
28			20	22	
29			A	A	A
30	19' - 40'	Gray Sand with Shells	A	A	
31			A	A	A
32			A	A	
33			18	23	44
34			21	25	
35			A	A	A
36			A	A	
37			A	A	A
38			A	A	
39			22	26	49
40			23	25	

Water Level: 14'6" Below Land Surface

A = Auger

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Client: Julien Watterlot
Project: Proposed Piling Recommendations for 2-Story Residence & Pool
Address: 1651 N Fort Lauderdale Beach Boulevard
Fort Lauderdale , FL 33305

Date of Test: April 6, 2022
Hole No.: B-3
Location: See Attached Drawing

Depth (FT)	Soil Descriptions	Hammer Blows	"N"
1	0" - 6" Topsoil & vegetation	5 5	11
2		6 8	
3		7 7	15
4		8 10	
5		7 9	19
6		10 12	
7		11 12	22
8	6" - 15' Light Reddish Brown Sand with Shells	10 13	
9		12 14	27
10		13 16	
11		A A	A
12		A A	
13		A A	A
14		A A	
15		14 18	33
16		15 16	
17		A A	A
18	15' - 20' Very Pale Brown Sand with Shells	A A	
19		A A	A
20		A A	
21		16 17	34
22		17 18	
23		A A	A
24		A A	
25		A A	A
26		A A	
27		20 19	37
28		18 22	
29		A A	A
30	20' - 40' Gray Sand with Shells	A A	
31		A A	A
32		A A	
33		21 25	45
34		20 23	
35		A A	A
36		A A	
37		A A	A
38		A A	
39		22 25	48
40		23 26	

Water Level: 14' Below Land Surface

A = Auger

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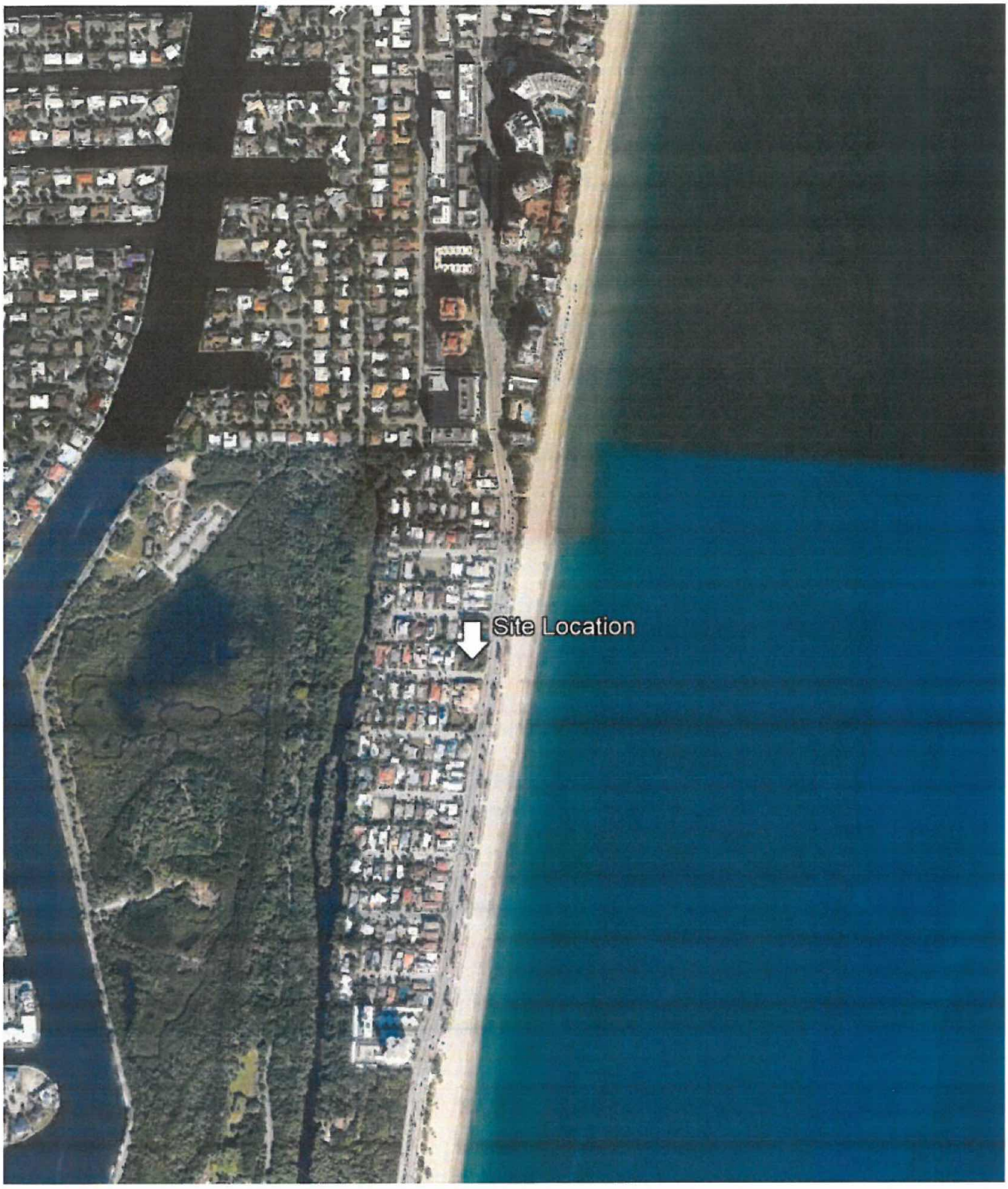


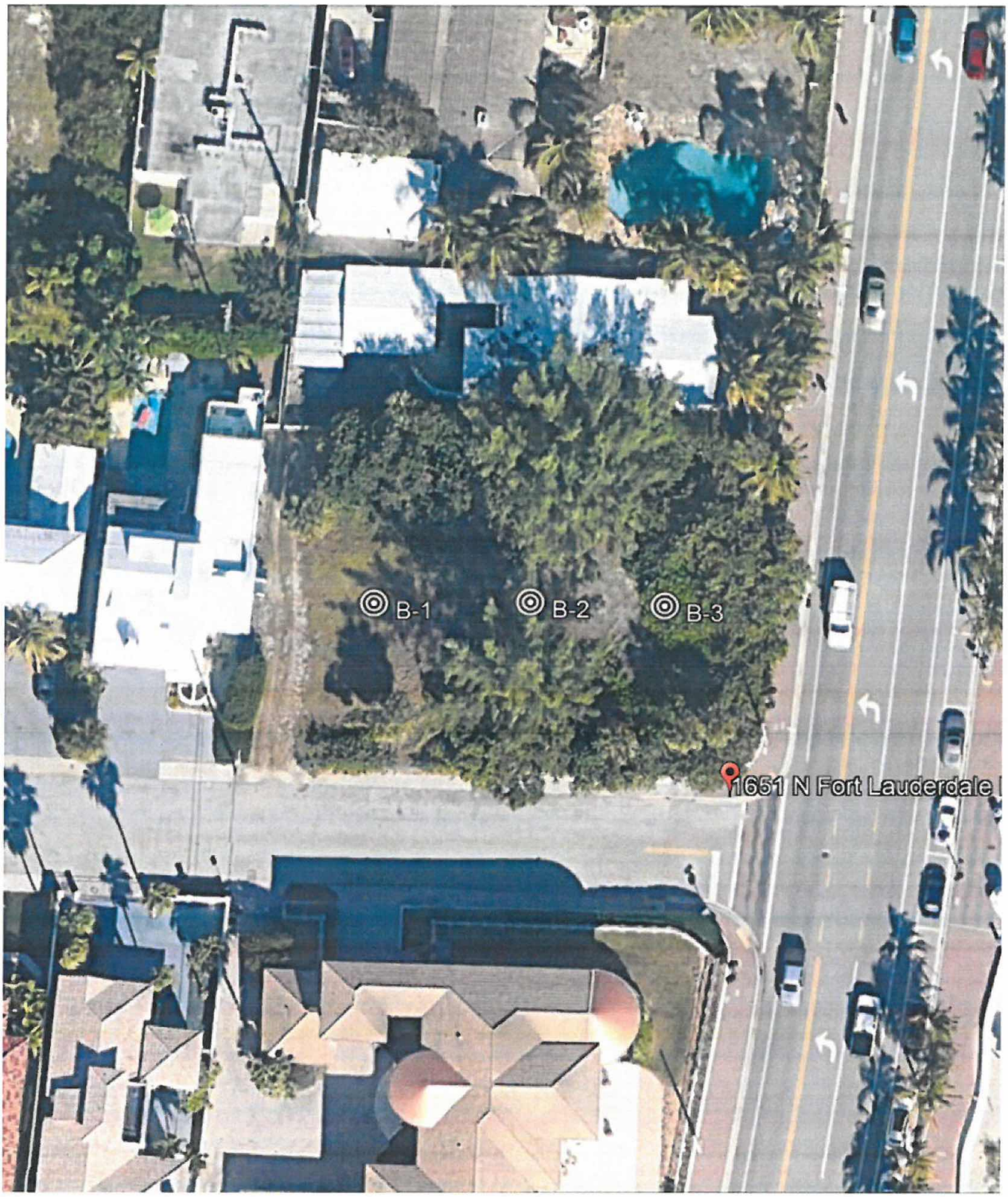
Site Location Map

Federal Engineering & Testing Inc. *3370 NE 5th Avenue, Oakland Park, FL 33334 (954) 784-2941*

Client: Julien Watterlot
Test: Subsoil Investigation
(site map is not to scale)

Project: Proposed Piling Recommendations for 2-Story
Project Address: 1651 N Fort Lauderdale Beach Boulevard
Fort Lauderdale, FL 33305

Federal Engineering & Testing, Inc.



Soil Boring Location Map

Federal Engineering & Testing Inc. *3370 NE 5th Avenue, Oakland Park, FL 33334 (954) 784-2941*

Client: Julien Watterlot
Test: Subsoil Investigation
(site map is not to scale)

Project: Proposed Piling Recommendations for 2-Story
Project Address: 1651 N Fort Lauderdale Beach Boulevard
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Soil Classifications

Correlation of Penetration Resistance with Relative Density and Consistency		
Sands		
Dynamic Cone Penetrometer *Penetrometer Resistance*	Standard Penetration *Hammer Blows*	Relative Density
0 - 10	0 - 4	Very Loose
11 - 25	5 - 10	Loose
26 - 45	11 - 20	Firm
45 - 75	21 - 30	Very Firm
76 -120	31 - 50	Dense
> 120	> 50	Very Dense

Silts & Clay		
Dynamic Cone Penetrometer *Penetrometer Resistance*	Standard Penetration *Hammer Blows*	Relative Density
0 - 6	0 - 2	Very Soft
7 - 15	3 - 5	Soft
16 - 30	6 - 10	Firm
31 - 45	11 - 15	Stiff
46 - 90	16 - 30	Very Stiff
91 - 150	31 - 50	Hard

Rock Hardness Description	
Soft	Rock core crumbles when handled
Medium	Can break core with your hands
Moderately Hard	Thin edges of rock core can be broken with fingers
Hard	Thin edges of rock core cannot be broken with fingers
Very Hard	Rock core rings when struck with a hammer

Sand Quantity Modifiers	
Very Slight Trace	0 - 2 %
Slight Trace	2 - 5 %
Trace	5 - 10 %
Little Trace	10 - 15 %
Some	15 - 30 %
With	> 30 %

Particle Size	
Boulder	> 12 in
Cobble	3 - 12 in
Gravel	4.76 mm - 3 in
Sand	0.074 mm - 4.76 mm
Silt	0.005 mm - 0.074 mm
Clay	< 0.005 mm

Silt - Clay Quantity Modifiers	
Slightly Silty /Clayey	0 - 5 %
Silty / Clayey	5 - 30 %
Very Silty / Clayey	30 - 50 %

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Drilling & Sampling Procedures

The soil borings were installed in accordance with Standard Penetration Tests procedures as set forth in ASTM D-1586. Representative samples were collected utilizing spilt-barrel techniques in accordance with the procedures set forth in "Penetration Tests and Spilt-Barrel Sampling of Soil in ASTM D-1586. The following field tests, measurements and laboratory analysis were performed/collected during the installation of each soil boring.

Penetration Tests

During the sampling procedures, Standard Penetration Tests were performed at five (5) foot intervals to obtain the standard penetration value (N) of the subsurface soil. The standard penetration value (N) is identified as the number of blows of a 140-pound hammer falling thirty (30) inches, required to advance the spilt-barrel sampler one (1) foot into the subsurface soil. The sampler was lower into the bottom of the previously cleaned drill hole and advanced by blows from the hammer. The number of blows was recorded for each of the three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers.

Water Level Measurements

Water Level depths were obtained during the test boring operations. In relatively pervious soils, such as sandy soils, the indicated depths are usually reliable groundwater levels. Seasonal variations, tidal conditions, temperature, land-use and recent rainfall conditions may influence the depths to groundwater levels.

Soil Properties / Classification

All samples collected were classified in accordance with the Unified Soil Classification System criteria to determined soil material properties and compared with published literature of the USDA Soil Conservation Survey.

Ground Surface Elevations

Ground surface elevations have not been provided for the proposed boring locations. Therefore, all references to depth of the various strata and materials encountered were from existing grade at the time of the drilling operations.

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Limitations of Liability

Warranty

We warrant that the services performed by Federal Engineering and Testing, Inc. (F.E.T.) are conducted in a manner consistent with the level of skill and care ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranties, expressed or implied, are made. While the services of F.E.T. are an integral and valuable part of the design and construction process, we do not warrant, guarantee, or insure the quality or completeness of services or satisfactory performance provided by other members of the construction process and/or the construction plans and specifications which we have not prepared, nor the ultimate performance of building site materials. As 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. Reports are not intended for 3rd party use.

Subsurface Exploration

Subsurface exploration is normally accomplished by test borings. The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata and groundwater data. The log represents conditions specifically at the location and time the boring was made. The boundaries between different soil strata are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling. The transitions between soil stratum are often gradual. Water level readings are made at the time the boring was performed and can change with time, precipitation, canal levels, local well drawdown, and other factors. Regardless of the thoroughness of a Geotechnical exploration there is always a possibility that conditions may be different from those of the test locations; therefore F.E.T. does not guarantee any subsoil condition surrounding the bore test holes. For a more accurate portrayal of subsurface conditions, the site contractor should perform tests pits. If different conditions are encountered, F.E.T. shall be notified to review the findings and make any recommendations as needed.

Laboratory and Field Tests

Tests are performed in accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test report indicates the measurements and determinations actually made.

Ownership of Tests / Reports

All test results and/or reports prepared by F.E.T. pursuant to this agreement and/or Addendum(s) thereto, shall remain the property of F.E.T. until all monies due and owing to F.E.T. under this Agreement and/or Addendum(s) thereto, are paid in full.

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 is not intended to determine the cost of construction or to stand alone as construction specifications.

Analysis and Recommendations cont.

In accepting this report the client understands that all data from the soil boring is intended for foundation analysis only and is not to be used for excavating, backfilling or pricing estimates. In accepting this report the client understands that all data from the soil boring is intended for foundation analysis only and is not to be used for excavating, backfilling or pricing estimates. The site contractor must familiarize themselves with the job site conditions. Soil boring(s) on unmarked vacant property or existing structure(s) to be demolished is considered preliminary with further boring(s) to be performed after proposed building pad is staked out. Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations may exist between borings and may not become evident until construction. If variations are then noted, F.E.T. must be contacted 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 of the site. Any significant changes in the nature, design, or location of the site improvements must be communicated to F.E.T. so that the Geotechnical analysis, conclusions, and recommendations can be appropriately adjusted.

Construction Observations

Construction observation and testing is an important element of Geotechnical services. The Geotechnical Engineer's Field Representative (Field Rep.) 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 Field Rep. 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 Field Rep. is only collecting data for our Engineer to review. The Field Rep. is responsible for his/her safety only, but has no responsibility for the safety of other personnel and/or the general public at the site. If the Field Rep. does not feel that the site is offering a safe environment for him/her, the Field Rep. will stop his/her observation/ testing until he/she deems the site is safe. The Field Rep. is an important member of a team whose responsibility is to observe the test and work being done and report to the client whether that work is being carried out in general conformance with the plans and specifications.

Limitations of Report

Federal Engineering & Testing, Inc. shall have no liability, in contract, tort or otherwise, for any inaccuracy, defect, or omission in interpreting this report and shall not in any event have any liability for lost profits or any other indirect, special, incidental, consequential, exemplary or punitive damages. In the event of future conflict between owners and contractors the following applies: F.E.T.(s) legal and/or company representation and preparation for representation fees will be billed on an hourly rate, i.e. deposition, expert witness, etc. F.E.T. has no obligation to amend its conclusions or recommendations after the date of this report. Any alterations or changes in the location of the project should be brought to our attention at the earliest convenience for review and applicability of this report.

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Partial List of Services

Geotechnical Engineering Services

Soil / Aggregate Tests
Soil Borings
Density Compaction Tests
Grain Size Analysis
Moisture Contents
Soil Classifications
Limerock Bearing Ratios
Florida Bearing Values
Specific Gravity
Carbonate Analysis
Hydraulic Conductivity
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Building Inspections
Pile Driving Inspections
Pile Load Tests
Steel Inspection
Threshold Inspection
Bolt Inspection
Weld Inspection
Vibration Monitoring

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Foundation Engineering
Foundation Design & Recommendation
Subsoil Investigation
Pile Load Calculations
Piling Installation Monitoring

Asphalt Services
Backscatter Density Tests
Extractions & Gradations
Marshall Limits
Bulk Specific Gravity
Cores for Thickness Determination
Asphalt Pavement Monitoring
Asphalt Assessment

Concrete Tests
Concrete Strength Testing
Slump Tests
Windsor Probe Testing
Schmidt Hammer Testing
Core Testing
Air Content
Concrete Unit Weight
Flexual Strength Testing

Environmental Engineering Services

Phase I Site Assessments
Site Inspections
Research of Property Records

Phase II Site Assessments
Phase I Follow up on Contaminated Sites
Installation of Monitoring Wells
Soil Borings
Soil and Ground Water Analysis

Lead Base Paint Surveys
Report and Analysis
Air Monitoring

Roof Testing & Inspection Services

TAS 105 Field Fastener Withdrawal Test
TAS 106 Tile Uplift Test
TAS 124 Bell Chamber / Bonded Pull Test
TAS 126 Moisture Survey
Windload Calculation
Drainage Calculations
Lightweight Concrete placement Inspection
Roof Assessment / Evaluation
Cap Sheet Inspection
Fastener Spacing Inspection
Tile/ Shingle/ Standing Seam Inspection
Base Sheet Installation Inspection
Insurance Mitigation
Retrofit Mitigation/ Certification
Roof Drainage Calculations

CMEC AASHTO R18 Accredited
aci
MIAMI-DADE COUNTY Approved Laboratory
FDOT