

EASTCOAST TESTING & ENGINEERING, INC.

1900 NW 33rd Street - Bay #4
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Broward (954) 972.7645 (SOIL)

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JUNE 16, 2019

**REPORT OF GEOTECHNICAL EXPLORATION &
ENGINEERING ANALYSIS - RECOMMENDATION**

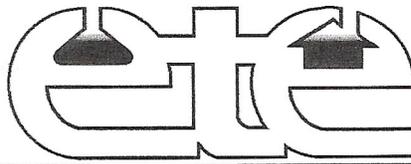
FOR

COMMUNITY SERVICES

TOWN OF SW RANCHES

PROPOSED FUTURE DEVELOPMENT / DRAINAGE

**SW 50th STREET
SW RANCHES, FLORIDA
BROWARD COUNTY, FLORIDA**



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June 16, 2019

**REPORT OF ENGINEERING STATEMENT for: Community Services - Town of SW
Ranches**

PROJECT : SUBSOIL INVESTIGATION for: Proposed Development / Drainage

**LOCATION: SW 50th Street & SW 182nd Terrace
SW Ranches, Florida
Broward County, Florida**

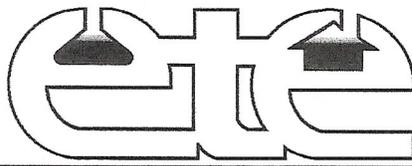
To Whom it May Concern;

As per your request we have completed the subsurface investigation at the above referenced project location. Two, (2) standard penetration test borings were performed at the above referenced site on June 11, 2019.

The test boring locations were determined by our client, and are indicated on the test boring report logs, and boring attached boring location map. A review of our boring logs indicate that beneath the surface the upper levels of subsoils are comprised of organic compressible muck in the top +/- 1.0 feet of depth. Below this upper layer our borings disclosed stratum of silty limestone fragments, and limestone fragments in a loose to dense consolidated state to +/-4.0 feet below the land surface grade. Underlying these subgrade soils our borings discovered multifarious stratum of limestone fragments in a dense to a very dense state of relative consolidation which extended to -5.5 feet below the existing surface grade elevation. These very dense weathered limestone formation terminated our subsurface exploration at five and one-half feet, maximum penetration due to refusal conditions.

As part of the geotechnical exploration for this project we reviewed the Soil Survey Map for Eastern Broward County, Florida. These maps revealed that at the time the survey was conducted, the soils in this area were described Ha, Hallandale fine sand. The Hallandale series consists of nearly level, very poorly drained sandy soils in broad flats east of the Everglades and west of the Atlantic Coastal Ridge. These soils formed in sandy marine sediment over limestone. Under natural conditions ponding may occur after heavy rains. During very dry periods water remains briefly in solution holes in the limestone. Near large drainage canals the water table fluctuates with the water level in the canals, and much of the time is below a depth of 20 inches.

Included with this complex in mapping are areas of Margate fine sand, Dania muck, and Plantation muck. In some areas a layer of organic material is on the surface.



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SW 50th Street & SW 182nd Terrace
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The boring location was determined by our client, and drill supervisor at the time of our investigation. The natural ground water table was discovered to exist to an elevation of +/-2'6" below the existing natural ground surface at the time of our boring. Fluctuation in the observed groundwater levels should be expected due to rainfall variations, seasonal climatic changes, construction activity and other on-site specific factors.

SUBSURFACE SOIL PROFILE AND PROPERTIES

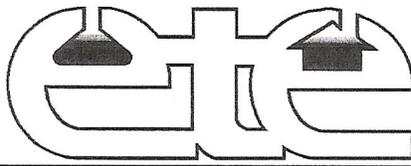
To assist in the drainage improvements for the proposed project, field modifications and/or renovations we have provided a general soil profile listed below.

FUTURE DEVELOPMENT / DRAINAGE IMPROVEMENTS for SW 50th Street - SW RANCHES, FL

General Soil Description	Depth of Strata	Average N	Approximate Relative Density	Nq	Phi
Very Dark Brown Fibrous Muck Little Limestone, (Pt)	0-1.0 feet	----	N/A	----	----
Silty Limestone Fragments & Limestone Fragments, (GM-GP)	1.0-4.0 feet	25	Medium Dense Dr=0.35	36	34
Limestone Fragments	4.0-5.5 feet	238+	Very Dense Dr=.85	<50	>40

Note: Refusal @ 5.5 Feet
Bottom of Borings @ 5.5 Feet, - (Nq after Terzaghi)

The standard penetration test borings were performed in accordance with Chapter 18 of the 2017 Florida Building Code, 6th Edition, ASTM D-1586, AASHTO, and the U.S. Department of Housing and Urban Development standard specifications.



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SW 50th Street & SW 182nd Terrace
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CONSTRUCTION PLAN & 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.

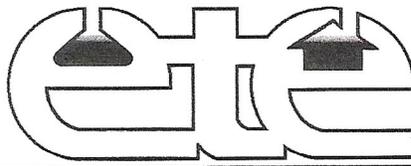
CONSTRUCTION RELATED SERVICES

We recommend the owner retain Eastcoast Testing & Engineering, Inc. to perform construction materials testing and observations on this site. Field tests and observations include foundation and pavement subgrades by performing quality assurance testing on the placement of compacted structural fills, and pavement courses. We can also provide concrete testing, pavement section testing, structural steel testing, general construction observation services, and Special Inspection services.

LIMITATIONS

Our geotechnical exploration study has been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering conclusions and practices. EastCoast Testing & Engineering, Inc., (ETE) is not responsible for any independent conclusions, opinions or recommendations made by others based on the data contained in this report.

This report does not reflect any variations which may occur away from the soil borings. The discovery of any subsurface conditions which deviates from the data obtained during this geotechnical investigation should be reported to us for further analysis and evaluation.



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This testing program is only representative of the area tested. Shall unusual or varying conditions be encountered during construction, further engineering services will be required.

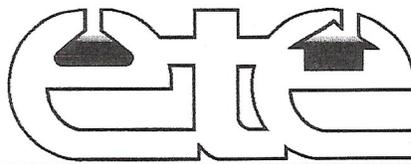
The Standard Penetration Test ASTM D-1586

The Standard Penetration Test is the most commonly employed tool utilized to identify in-situ subsurface soil conditions. The "N" values obtained from the boring provide an accurate estimation of internal soil characteristics such as relative density, internal shear strength, angle of internal friction, and the approximate range of the soil's unit weight. These "N" values represent the resistance of a 2 inch diameter split spoon sampler driven by a 140 pound hammer free falling 30 inches. Each drive of the 24 inch long split spoon is divided into four six inch increments. The second and third increments are totaled to produce the "N" value found on your report.

The Standard Penetration Test also allows for the recovery of soil samples which are returned to our laboratory and visually examined and classified. The SPT samples are available for laboratory testing if requested. Samples are generally held for 90 days unless otherwise directed by the client.

An approximate ground water table is obtained from the borehole upon completion of the drilling procedures. This water table is useful in the general evaluation of particular soil conditions, and may give the contractor some insight into what can be anticipated during construction. It should be noted that the ground water level will fluctuate seasonally. This level may also be affected by local draw-downs, soil conditions, and the watersheds contribution to the underlying aquifer. It should not be construed to be a measure of the soils permeability, or of the de-watering characteristics of the site.

Although the standard penetration test is one of the most reliable methods used to identify soil characteristics and types, it may only represent a small fraction of the materials actually deposited at the site. As is common industry practice, we have assumed a uniformity of profile between borings to provide a subsoil profile for engineering purposes. This profile is strictly based on the data obtained from the borings, and if unusual or varying conditions are found we should be notified immediately.



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Page #5. Lab #7191435
SW 50th Street & SW 182nd Terrace
SW Ranches, Florida

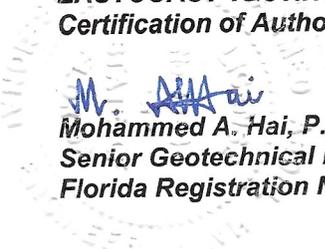
A test is expressly representative of the immediate location tested, and the reliability of the conclusions are a direct result of the quantity of tests performed. Any variation in location may reveal similarly some changes in the depth, thickness, texture, and conditions of the stratum encountered.

Unless specifically stated otherwise, and specifically directed and prearranged by the client, all elevations are taken with respect to the existing ground surface at the time of testing. Boring locations are usually obtained in the field by pacing off distances and approximating right angles to landmarks and property corners. More precise locations may be obtained from on site surveys and placement of the boring locations by a Land Surveyor, Registered in the State of Florida. These services are provided at additional costs and are beyond the scope of this report.

The data presented herein was obtained for the specific purposes stated in this report, and should not be misconstrued to apply to any other circumstance, project, or ancillary use unless so specified and addressed by the engineer of record.

Thank you for using EASTCOAST TESTING AND ENGINEERING for your geotechnical needs. Should you need further assistance with this or any other project, please contact this office.

Respectfully Submitted;
EASTCOAST TESTING & ENGINEERING, INC.
Certification of Authorization #3425

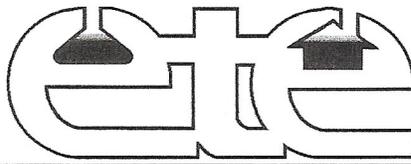

M. Hai 6/16/2019
Mohammed A. Hai, P.E.
Senior Geotechnical Engineer
Florida Registration No. 59345

C Smith
Craig Smith, President

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APPENDIX

TEST BORING LOGS
BORING LOCATION MAP
SITE LOCATION MAP
WEB SOIL SURVEY



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TEST BORING REPORT

LABORATORY NUMBER: <u>7191435-A</u>	BORING NUMBER: <u>1</u>
CLIENT: <u>COMMUNITY SERVICES, (SW RANCHES)</u>	CUSTOMER # <u>-</u>
PROJECT: <u>SW 50th STREET DRAINAGE IMPROVEMENTS PROJECT</u>	CREW CHIEF: <u>H.E.</u>
PROJECT ADDRESS: <u>SW 50th STREET & SW 182nd TERRACE - SW RANCHES, FLORIDA</u>	DRILLER: <u>K.W</u>
BORING LOCATION: <u>18301 SW 50th STREET - AS MARKED IN FIELD BY CLIENT REPRESENTATIVE</u>	DRILL RIG # <u>F-350</u>
GROUND WATER: <u>2'6"</u> DATE: <u>06/11/19</u> ELEV: <u>N/F</u>	CASING: <u>NA</u>

SURVEY NOT GIVEN UNLESS NOTED: (B.E.G.) BELOW EXISTING GRADE LOCATIONS: ~ APPROX UNLESS STAKED

DEPTH FEET	SAMPLE NUMBER	BORING NUMBER: <u>1</u>	PAGE NUMBER: <u>1</u>	N VALUES	SPT BLOWS PER 6"
		VISUAL SOIL CLASSIFICATION/AASHTO M145/ASTMD2487			
1	1	VERY DARK BROWN FIBROUS MUCK LITTLE LIMESTONE, (PT)			1 1
2	2	TAN SILTY LIMESTONE FRAGMENTS, (GM)		7	6 4
3	3	TAN LIMESTONE FRAGMENTS, (GP)			6 20
4				34	14 14
5	4	TAN LIMESTONE FRAGMENTS, (GP)			18 55
6				155+	100+
7					
8					
9					
10		BOTTOM OF BORING @ 5.5 FEET, (REFUSAL)			
11					
12					
13					
14					
15					
16					

STANDARD PENETRATION TEST BORING: BLOWS PER FOOT ON 2" O.D. SAMPLER WITH A 140 LB. HAMMER FALLING 30"

SOIL INVESTIGATION & SAMPLING BY AUGER BORINGS: A.S.T.M. D 1452/STANDARD PENETRATION TEST: ASTM D1586. THE SAMPLES COLLECTED CONSTITUTE A MINUTE PERCENTAGE OF THE SUBSOILS AT THE SITE. AS A MUTUAL PROTECTION THE SOILS WILL BE STORED IN OUR LABORATORY FACILITIES FOR A MAXIMUM OF THREE (3) MONTHS. THE OWNER, ARCHITECT AND/OR ENGINEER ARE ENCOURAGED TO VISUALLY INSPECT SAMPLES PRIOR TO PURCHASE OF PROPERTY AND DESIGN OF THE STRUCTURE.

**RESPECTFULLY SUBMITTED,
EASTCOAST TESTING & ENGINEERING, INC.,
CERTIFICATE OF AUTHORIZATION #3425**

M. A. Hai 6/16/2019

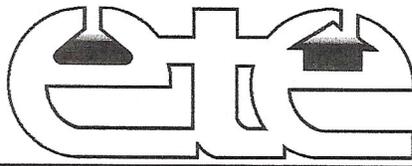
**MOHAMMED A. HAI, P.E.
SENIOR GEOTECHNICAL ENGINEER
FLORIDA REGISTRATION No. 59345**

Craig Smith

CRAIG SMITH, PRESIDENT

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TEST BORING REPORT

LABORATORY NUMBER: 7191435-B	BORING NUMBER: 2
CLIENT: COMMUNITY SERVICES, (SW RANCHES)	CUSTOMER # -
PROJECT: SW 50th STREET DRAINAGE IMPROVEMENTS PROJECT	CREW CHIEF: H.E.
PROJECT ADDRESS: SW 50th STREET & SW 182nd TERRACE - SW RANCHES, FLORIDA	DRILLER: K.W
BORING LOCATION: 18311 SW 50th STREET - AS MARKED IN FIELD BY CLIENT REPRESENTATIVE	DRILL RIG # F-350
GROUND WATER: 2'6" DATE: 06/11/19 ELEV: N/F	CASING: NA

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DEPTH FEET	SAMPLE NUMBER	BORING NUMBER: 2 VISUAL SOIL CLASSIFICATION/AASHTO M145/ASTMD2487	PAGE NUMBER: 1 DEPTH	N VALUES	SPT BLOWS PER 6"	
1	1	VERY DARK BROWN FIBROUS MUCK LITTLE LIMESTONE, (PT)	0.0"-12"		4	6
2	2	TAN LIMESTONE FRAGMENTS, (GP)	1.0-5.5'	24	18	22
3					30	20
4				35	15	25
5					25	65
6				165+	100+	
7						
8						
9						
10		BOTTOM OF BORING @ 5.5 FEET, (REFUSAL)				
11						
12						
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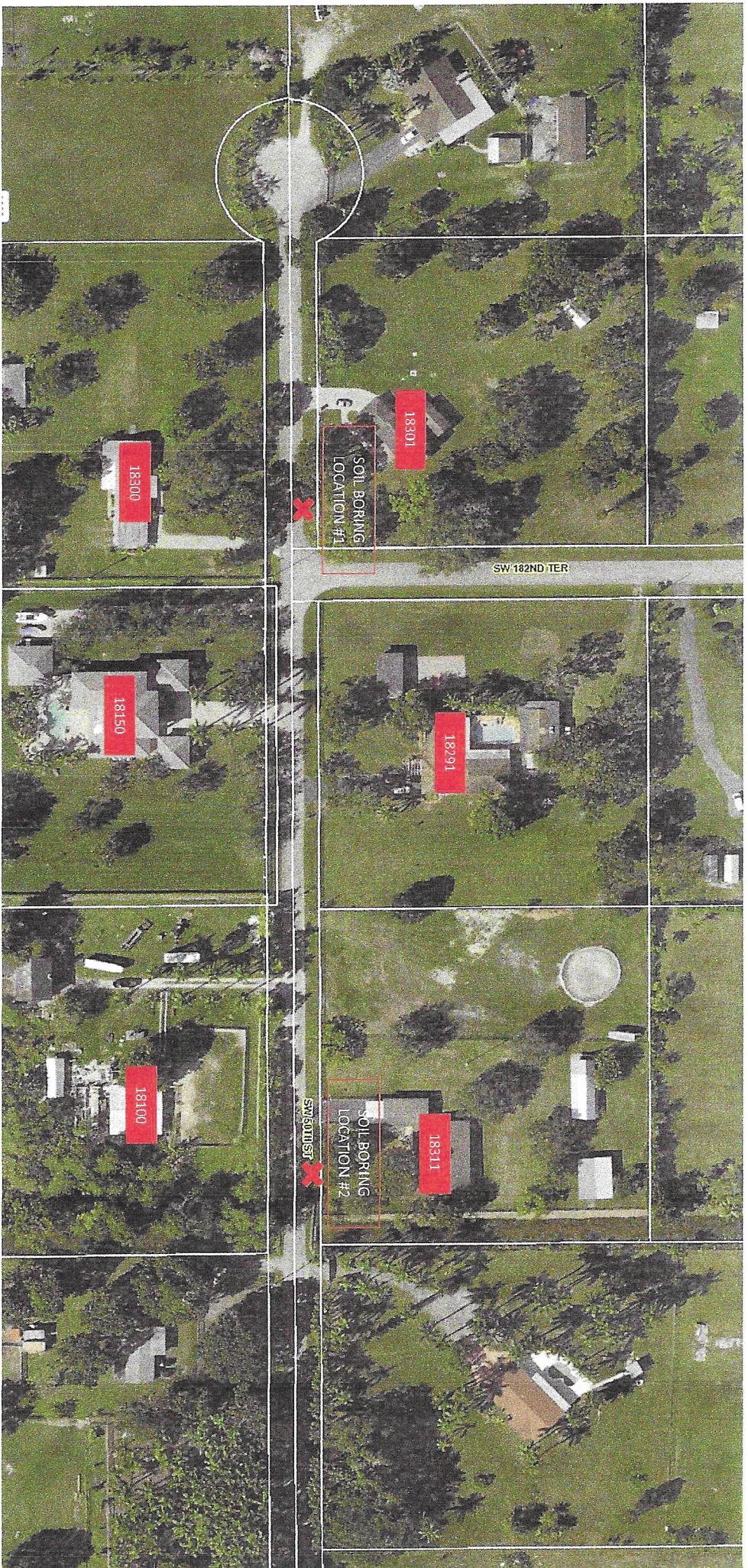
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SW 50TH STREET DRAINAGE IMPROVEMENT PROJECT
SOIL BORING LOCATIONS



COMMUNITY SERVICES

SW 50th STREET DRAINAGE IMPROVEMENTS
SW 182 TERRACE & SW 50th STREET - SW RANCHES, FL

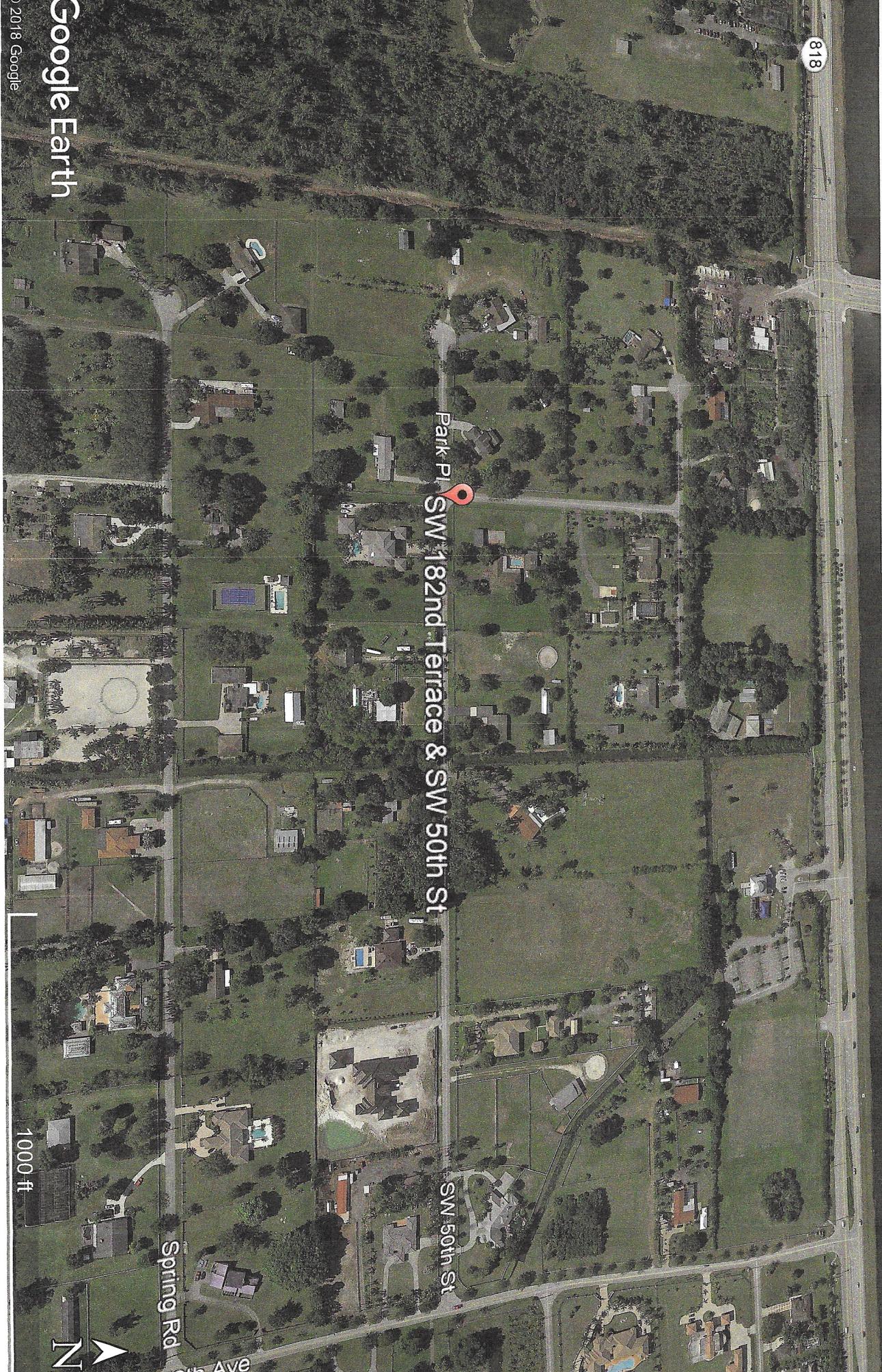
SITE LOCATION MAP



Legend



SW 182nd Terrace & SW 50th St



SW 178th Ave

1000 ft

Google Earth

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