Central Florida Testing Laboratories, Inc.
Testing, Development and Research
12625 - 40th Street North Clearwater, Florida 33762

ENGINEERING BUSINESS NO. 1066 **GEOLOGY BUSINESS NO. 224**
TAMPA BAY AREA (727) 572-9797 **FLORIDA 1-800-248-CFTL** **FAX (727) 299-0023**

TOM GEORGE BOAT SALES
17116 US Highway 19 N, Clearwater
Maple Leaf Farms Sub E 450Ft of Lot 2 Less S 150Ft Thereof, Pinellas County
Geotechnical Services
August 2016

Report No. 219224

Prepared
for

Gulf Coast Consulting, Inc.
13825 Icot Boulevard, Suite 605
Clearwater, Florida 33760

Central Florida Testing Laboratories, Inc.

Testing Development and Research

12625 – 40TH STREET NORTH • CLEARWATER, FL 33762

ENGINEERING BUSINESS NO. 1066 GEOLOGY BUSINESS NO. 224

TAMPA BAY AREA (727) 572-9797 FLORIDA 1-800-248-CFTL FAX (727) 299-0023

August 15, 2016

Mr. Sean Cashen, P.E.
Gulf Coast Consulting, Incorporated
13825 Icot Boulevard, Suite 605
Clearwater, Florida 33760

Re: Tom George Boat Sales
17116 US Highway 19 North, Clearwater, Florida
Geotechnical Investigation for Planned Drainage Pond
CFTL Report No. 219224

Dear Mr. Cashen:

As authorized, our office has performed the requested geotechnical services within the proposed drainage pond planned in the southwest portion of the above noted project. This investigation consisted of one (1) standard penetration test (SPT) boring positioned approximately as shown on the enlarged aerial photograph of the site and a falling head permeability test on shallow soils.

For additional reference of this site, we are including an area map showing the location of the property with respect to the surrounding geographical area as well as large scale and small scale aerial photographs of the subject property, NRCS soils data, and the aforementioned enlarged aerial depicting the approximate location of the SPT boring and permeability test.

The purpose of these services was to provide permeability properties of shallow soils as well as define the soil profile to a depth of 20 feet below existing ground.
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Test Methods

The boring was done using sampling intervals in excess of those required by ASTM Specifications, D-1586, describing the Standard Penetration Test or "split-spoon" method of sampling.

Four samples were taken in the upper ten feet to provide greater definition within this zone. The penetration resistance testing and sample taking was accomplished with the use of a 2" O.D. sampler seated six inches into the bottom of the borehole and advanced an additional one-foot under the effort of a 140 pound hammer falling freely thirty inches. The number of blows required of the hammer to advance the sampler one foot into undisturbed material was noted as the blow count (N) of that particular stratum. Portions of each soil sample so taken, were

classified, sealed in moisture-proof containers and returned to our laboratories for verification of field classification.

The boring was advanced using a rotary drill rig, utilizing a recirculating bentonite drill fluid to maintain the borehole in noncohesive soils and to remove cuttings created by the drill bit. Upon completion the boreholes were sealed in accordance with SWFWMD regulations.

The permeability test was performed in accordance with FM (Florida Method) 5-513 on a re-compacted sample of granular fine sand obtained at a depth of -1.0 to -2.5 feet below existing ground.

Boring Results

Soils encountered in the boring consisted of granular fine grained sands with intermittent layers of silty sand to a depth of 20 feet. Starting at a depth of 5 feet, variable consistencies were recorded that ranged from very loose to medium dense, depending on depth. In general, the more granular soils were of slightly loose to medium dense consistency while the silty sands ranged from very loose to loose.

No cohesive soils that could be considered to represent a well-defined confining layer were encountered to the termination depth of the boring, 20 feet below the surface.

A static water table was recorded at a depth of 2.5 feet at the time the boring was performed, with no indicators of a historical seasonal high water table observed in the profile.

Permeability Results

As shown by the attached sieve analysis, the sample tested was determined to be poorly graded granular fine sand with very little fines, as evidenced by only 1 percent of the material passing the #200 sieve. Based on this grading, the soil would be classified as SP by the Unified Soil Classification System and A-3 by the AASHTO classification system.

A permeability rate of 1.05E cm/sec equating to 29.83 feet/day was established by running the Falling Head method described by procedure FM 5-513 of the *Florida Department of Transportation Manual of Florida Sampling and Testing Methods*.

Conclusions

Based on the findings of this investigation, soils within the planned drainage pond can be expected to be predominantly granular in nature with silty soils also present within the profile to a depth of 20 feet below existing ground. The permeability rate established by the Falling Head method was determined to be

1.05E-02 or 29.83 feet/day. This rate would be considered fairly rapid and reflects the lack of "fines" as determined by the sieve analysis results. A static water table of 3.0 feet below existing ground was recorded at the time of our testing while no soil related indicators of historical seasonal high water levels were observed.

The NRCS lists the area of the pond as *Basinger and Urban land* with estimates of SHWT ranging from 0 to -1.0.

Please be aware that other factors such as overall development of the surrounding area, drainage improvements consisting of ponds, swales, and underdrain systems, along with changes in weather patterns can influence ground water as well as seasonal high ground water levels. For this reason, we suggest that any public records relating to stormwater ponds in the area of the property be reviewed to provide additional information that may be helpful in design of the planned drainage system. Two ponds were observed to the west of the subject property that could provide useful information relating to seasonal high water levels.

Limitations

This investigation and report deals only with the soil zones and strata located within the area represented from the ground surface to the termination depth of the borings. This investigation was not intended to address any environmental concerns that may exist with the site.

It is not intended to predict or accept responsibility for sinkhole development. Other means of subsurface investigations including, but not limited to, deep structural borings, rock coring, geophysical studies, ground penetrating radar or resistivity surveys are used for sinkhole potential determinations and are out of the scope of this investigation.

Generally accepted soil mechanics and foundation engineering practices were utilized in the preparation of this report; and no other warranty, either expressed or implied is made as to the recommendations provided.

This report is for the exclusive use of our client and may not contain sufficient information for other uses, such as quantity take-offs, or for interpretation by other parties for bidding purposes. In the event conclusions and/or recommendations based on our data are made by others, such conclusions and/or recommendations are not our responsibility unless we have been given an opportunity to review and concur with them.

If the boring location was not staked by a registered land surveyor but was located by our drill crew, the following method was used:

Distances are generally measured using a 100-foot tape measure with right angle approximation used to turn corners. Scaling from prints or surveys with reference

points shown on the plan or geographical references will produce a degree of accuracy that is typically +/- 5% for length and +/- 10 degrees for angles.

Soil strata delineations are estimated in the field by color changes, texture differences and penetration resistance values. These may be more gradual transitions than those shown on the boring log representations of strata delineations.

The ground water depth determination shown on the bottom of the boring log was measured in the borehole at the time of drilling, unless noted otherwise. This depth does not reflect seasonal high water levels and would fluctuate as expected with variations in rainfall or other factors not present at the time of our soils investigation.

The boring data represents only that data obtained during this investigation at the approximate locations shown on the site schematic, plan or aerial photograph.

Should significant variations of soil or subsurface conditions exist between boring locations and be encountered by future exploratory work or site preparation efforts, our office should be notified so that supplemental borings or data gathering determinations can be made to update our report and recommendations at a minimal expense to our client.

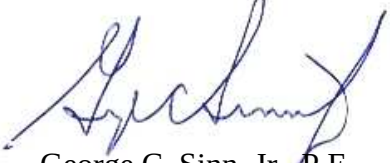
It is the responsibility of our client to inform our office of these variations if possible modifications of the report is warranted.

This report is general in nature, unless specific geotechnical data or recommendations were asked to be addressed. However, we would be pleased to answer any questions concerning comments or recommendations made in this report.

We appreciate the opportunity to have been of service. If any further evaluation of the site or testing services are needed, either prior to or during construction, please do not hesitate to contact our office.

Sincerely,

CENTRAL FLORIDA TESTING LABORATORIES, INC.



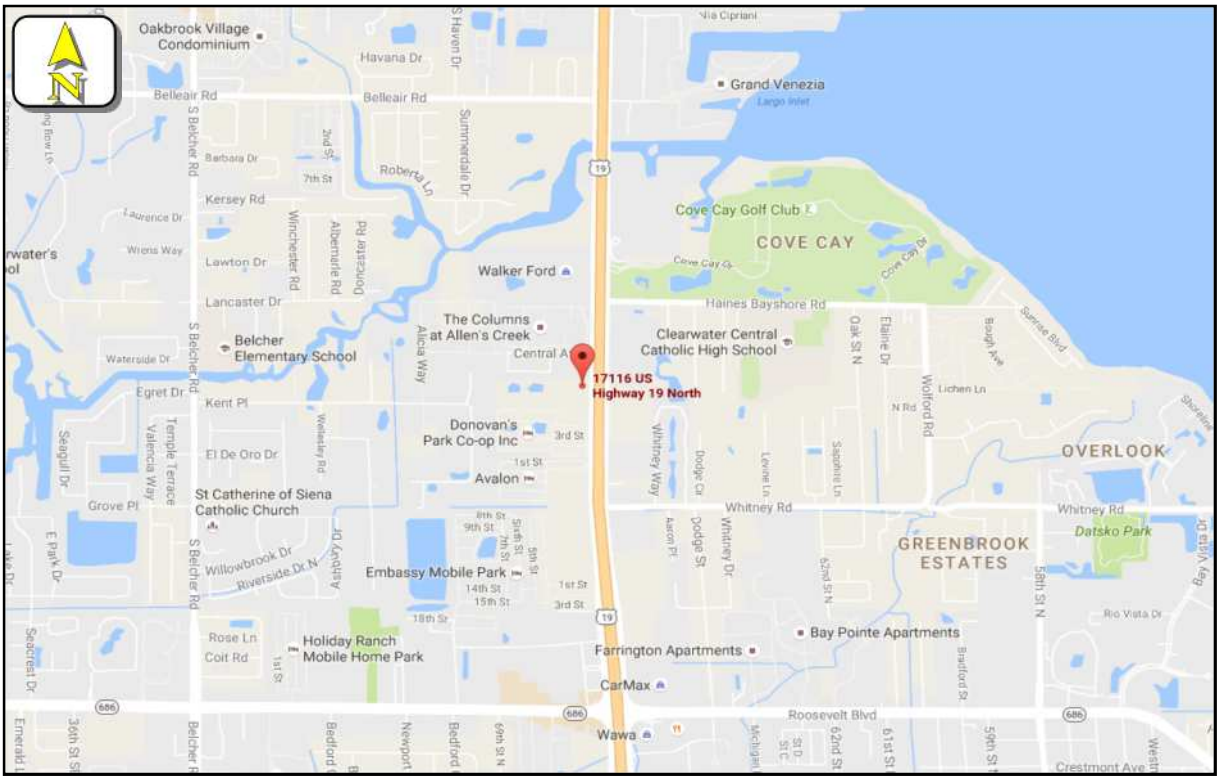
George C. Sinn, Jr., P.E.
Digitally signed by: George C. Sinn, Jr., P.E.
DN: CN = George C. Sinn, Jr., P.E. C = AD O = Central Florida Testing Laboratories, Inc, OU = President/ Principal Engineer
Date: 2016.08.17 15:42:43 -04'00'

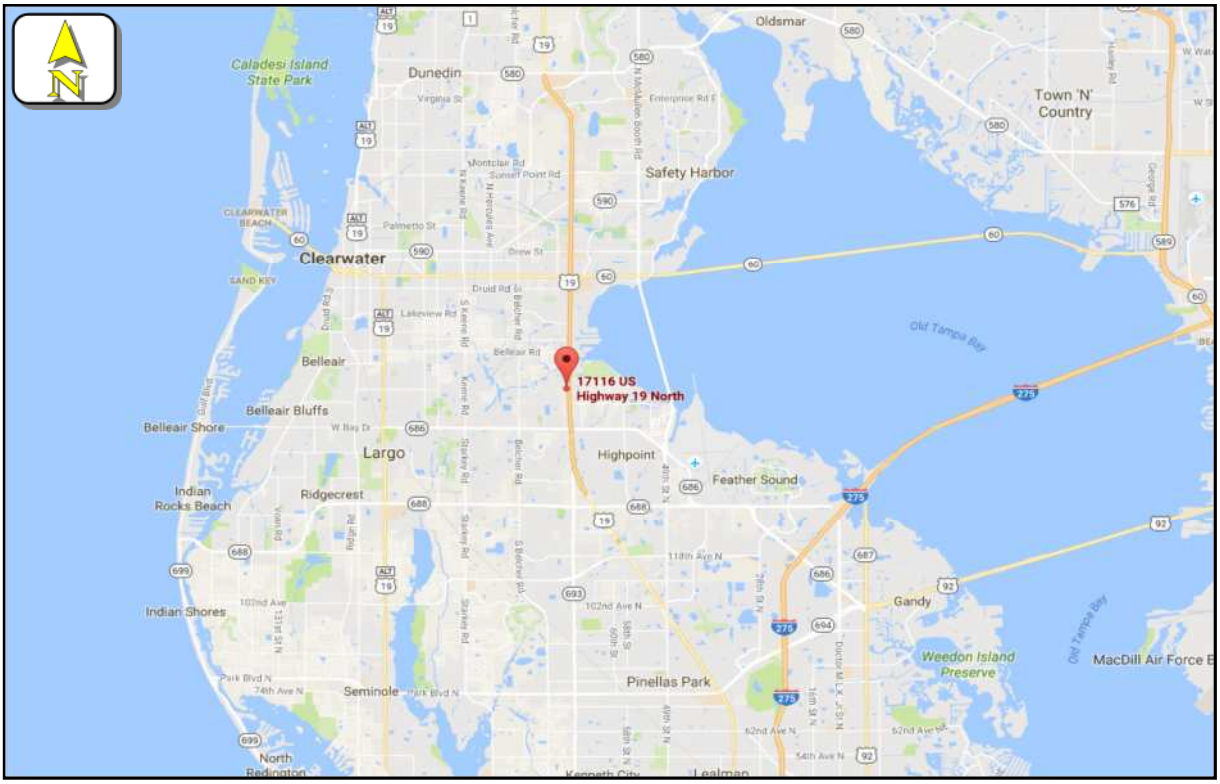
George C. Sinn, Jr., P.E.
President/Principal Engineer
FLN 16911
GCS/tg

August 15, 2016

Maps

Various





Central Florida Testing Laboratories, Inc.

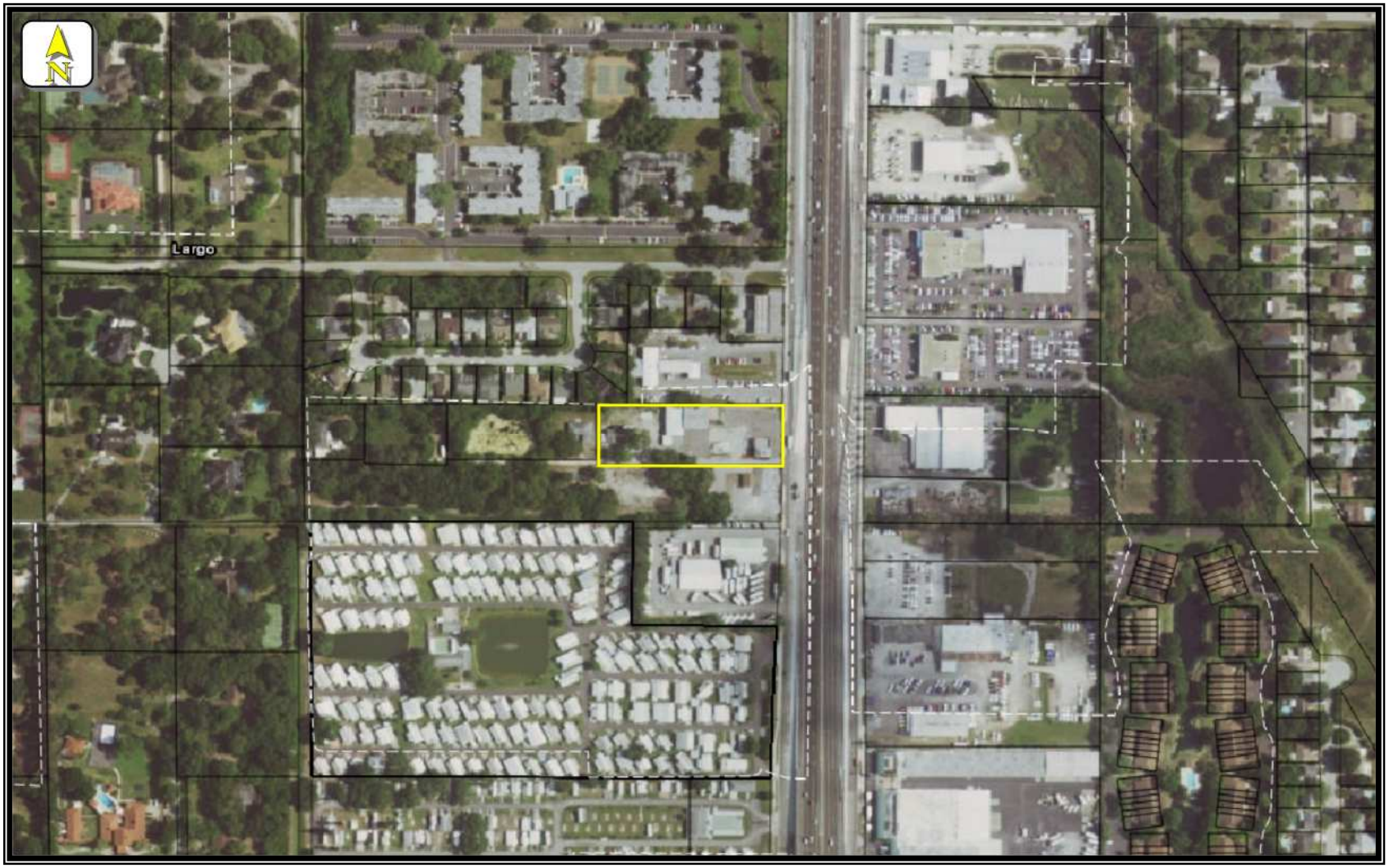
TOM GEORGE BOAT SALES
17116 US Highway 19 N
Clearwater, Florida 33764
Report No: 219224

Legend

Subject Property
Population Center
Land
Sand
Woodlands
Park
Interstate
Toll Highway
US Highway
State Route
Local Road
Major Connector
Wate
Intermittent Lake
Wetland
River/Canal
Intermittent River
Railroa
d

Figure 1 - Location

2014 Aerial Photograph of Site



2014 Aerial Photograph of Site


82° 44' 4" W
82° 43' 47" W
27° 55' 45" N
27° 55' 36" N
329340
329380
329420
329460
329500
329540
329580
329620
329660
329700
329740
329780
3090580
3090540
3090500
3090460
3090420
3090380
3090340
3090300
Southern Oak Cir
1st St
Us Highway 19 N
19
17
26
6
Map Scale: 1:2,040 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 30 60 120 180
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pinellas County, Florida
Survey Area Data: Version 12, Nov 19, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 17, 2013—Feb 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Pinellas County, Florida (FL103)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
6	Basinger soils and Urban land	3.4	20.2%
17	Myakka soils and Urban land	8.1	48.3%
26	Pomello soils and Urban land, 0 to 5 percent slopes	5.3	31.5%
Totals for Area of Interest		**16.7**	**100.0%**

Content of organic matter in the surface layer: Low
Natural fertility: Low
Parent material: Sandy marine sediments

Characteristics of the Urban Land

Urban land consists of high-density residential developments, commercial buildings, streets, highways, parking lots, and other types of impervious ground cover. The areas of Astatula soil that are not covered by impervious material are too small to be delineated separately at the scale of mapping and are mostly grassy areas.

Minor Components

Dissimilar soils:
- Scattered areas of the somewhat poorly drained Adamsville soils and the moderately well drained Tavares soils

Similar soils:
- Scattered areas that have a slope of less than 5 percent

Land Use

Dominant use: Urban development
Other uses: Recreation
Suitability for urban development: See tables 9a and 9b
Suitability for recreational development: See tables 6a and 6b
Suitability for wildlife habitat: Not rated
Suitability for woodland: Not rated

Interpretive Groups

Land capability classification: Astatula—7s; Urban land—not rated
Ecological community: Longleaf Pine-Turkey Oak Hills

6—Basinger soils and Urban land

Setting

Landscape: Lower Coastal Plain
Landform: Sloughs
Shape of areas: Irregular
Size of areas: 10 to more than 50 acres

Composition

Basinger and similar soils: 25 to 65 percent
Urban land: 35 to 75 percent
Dissimilar soils: 1 to 5 percent

Typical Profile of the Basinger Soil

Surface layer:
0 to 5 inches—very dark gray fine sand

Subsurface layer:
5 to 14 inches—light gray fine sand that has brownish yellow mottles

Subsoil:
14 to 36 inches—yellowish brown fine sand that has light gray and grayish brown mottles
36 to 58 inches—light brownish gray fine sand that has yellowish brown and dark grayish brown mottles
58 to 80 inches—light gray fine sand

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Rapid
Available water capacity: Very low
Seasonal high water table: Apparent, at the surface to a depth of 1 foot from June through February
Shrink-swell potential: Low
Flooding: None
Surface runoff class: Very low
Content of organic matter in the surface layer: Low
Natural fertility: Low
Parent material: Sandy marine sediments

Characteristics of the Urban Land

Urban land consists of high-density residential developments, commercial buildings, streets, highways, parking lots, and other types of impervious ground cover. The areas of Basinger soil that are not covered by impervious material are too small to be delineated separately at the scale of mapping and are mostly grassy areas. The Urban land dominates this map unit, except for a small area that remains in native condition in the northeast corner of the county.

Minor Components

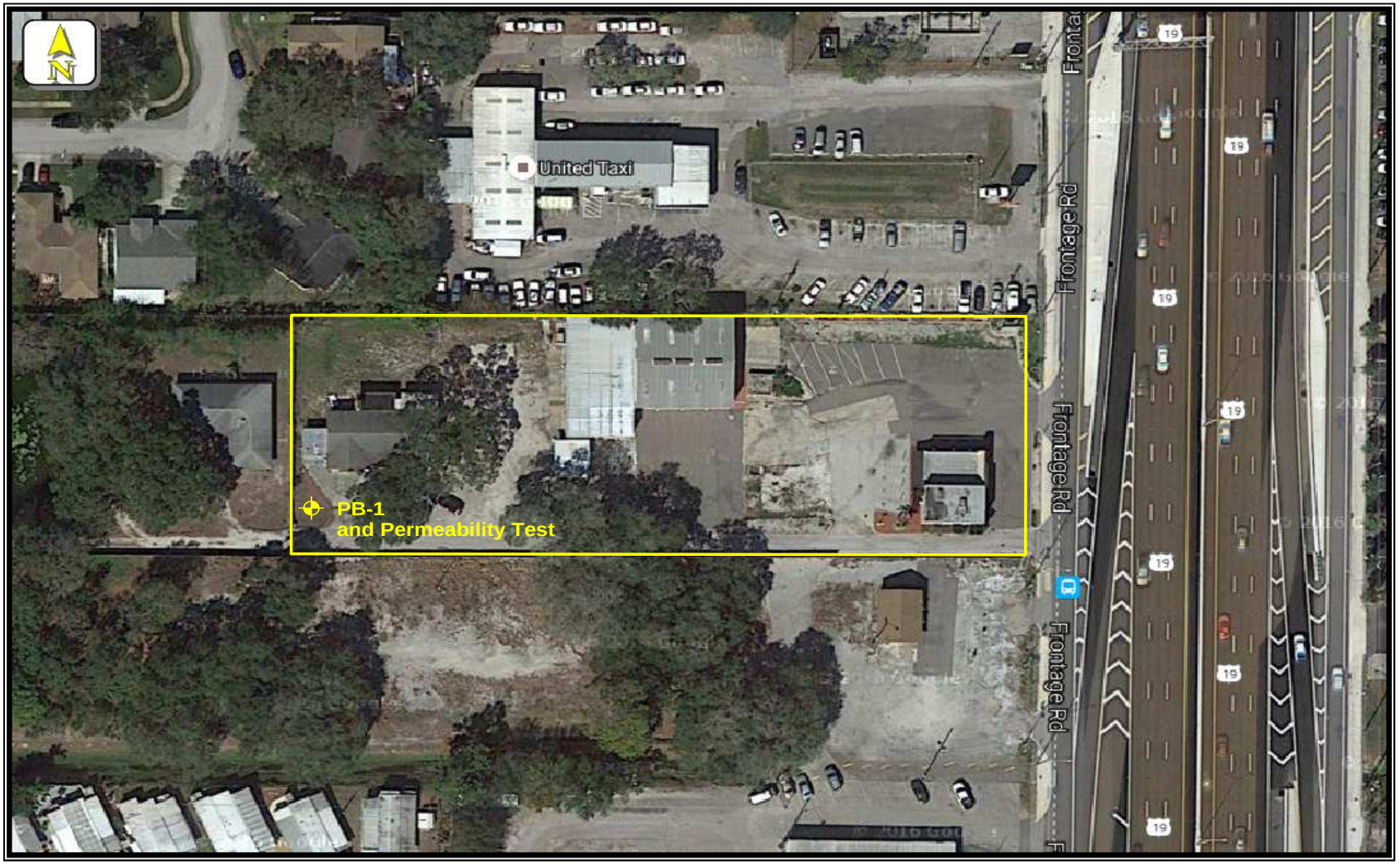
Dissimilar soils:
- Scattered areas of the very poorly drained Anclote and Placid soils

Similar soils:
- Scattered areas that contain shell fragments below a depth of 40 inches

Land Use

Dominant use: Urban development
Other uses: Recreation
Suitability for urban development: See tables 9a and 9b
Suitability for recreational development: See tables 6a and 6b
Suitability for wildlife habitat: See table 7
Suitability for woodland: See table 4 and tables 5a to 5e

Approximate Test Location



Pond Boring and Permeability Results

Central Florida Testing Laboratories, Inc.
EB#1066 GB#224

Client: Gulf Coast Consulting, Inc.
Project: Tom George Boat Sales
Location: 17116 US Highway 19 N
City / State: Largo, Florida

Report No: 219224
Log of Borehole: PB-1
Date Drilled: 08/03/2016

ENGINEERING BUSINESS NO. 1066 GEOLOGY BUSINESS NO. 224

Depth	Strata Symbol	Subsurface Profile Description	Consistency	Blow Count	N value	Standard Penetration Test (blows/ft) 0 20 40 60 80 100	Lab/ Notes
0		Ground Surface					
		Sand Gray (10YR 6/1), fine grained					
		Sand Light brownish gray (10YR 6/2), fine grained		HA			
		Sand Pale brown (10YR 6/3), fine grained		HA			
5		***Sand*** Reddish yellow (5YR 7/8), fine grained	slightly loose	1-3-5	8		
		Silty Sand Gray (10YR 6/1), fine grained	loose	3-3-3	6		
10		***Sand*** Light gray (10YR 7/1), fine grained	medium dense	6-7-8	15		
15		***Silty Sand*** Brown (10YR 5/3), fine grained	very loose	1-1-1	2		
20		***Sand*** Light gray (10YR 7/1), fine grained	medium dense	6-9-12	21		
		End of Boring					
25							

Notes: NRCS Designation: Basinger/Urban land
NRCS SHGWT: 0' to -1.0'
CFTL SHGWT: Not distinguishable

HA = Hand Auger
No loss of drill fluid circulation

Water Table: 2.5' bls (HA)
Ground Elevation: Existing
Drilled by: AC/JS
Compiled by: PG

Drill Method: Rotary
Sampling Method: Splitspoon ASTM D-1586

Central Florida Testing Laboratories, Inc.

Testing, Development and Research

12625 40th St. N. CLEARWATER, FL 33762

Tampa Bay Area: (727) 572-9797 Florida: 1-800-248-CFTL FAX: (727) 299-0023

LAB NO.:	**219224**	SAMPLED BY:	**AC/DY**
MATERIAL:	**Pale brown fine sand**	SAMPLED FROM:	**-1.0' to -2.5'**
PROJECT:	**Tom George Boat Sales**	DATE SAMPLED:	**8/3/16**
SOURCE OF SUPPLY:		TESTED BY:	**LAB**
CONTRACTOR:		DATE TESTED:	**8/5/16**
CLIENT:	**Gulf Coast Consulting, Incorporated**	DATE REPORTED:	**8/8/16**
REPORTS TO:	**Gulf Coast Consulting, Incorporated**		

SIEVE ANALYSIS

(ASTM C-136)

SIEVE	% PASSING
3/8"	100.0
No. 4	98.7
No. 10	98.6
No. 20	98.3
No. 30	97.3
No. 40	92.6
No. 50	80.1
No. 60	72.2
No. 80	50.7
No. 100	34.3
No. 200	1.0

FALLING HEAD PERMEABILITY TEST DATA

FM 5-513 (88)

Dry Density of Permeability Sample Tested:	98.9	pcf
Standard Proctor of Original Sample:	101.4	pcf
Percent of Standard Proctor:	97.5	%
Length of Soil Sample (L) -	14.61	cm
Elapsed Time (t) -	5.0	min
Starting Head (h0) -	78.11	cm
Finishing Head (h1) -	29.53	cm
Cross-Sectional Area of Sample (A) -	41.85	sq cm
Cross-Sectional Area of Burette (a) -	10.95	sq cm
Water Temperature -	27.0	deg C
Viscosity of Water at T temperature (uT) -	0.8502	
Viscosity of Water at 20 deg. C (u20) -	1.00	

k20^ = (2.3aL/At)log(h0/h1)(uT/u20) =	**1.05E-02**	**cm/sec**
	29.83	**ft/day**