



Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

September 21, 2005
File Number 05-55-9638

Bayfair Holdings, LLC
3717 West North B Street
Tampa, Florida 33609

Attention: Mr. Ernie Angelilli

Subject: **Report of Preliminary Subsurface Soil Exploration**
60-Acre Tract of Land
Brandon, Florida

Dear Mr. Angelilli:

Ardaman & Associates, Inc. is pleased to submit this report of our preliminary subsurface soil exploration for the above referenced project. Our services were provided in general accordance with those outlined in our Proposal No. 05-p183 (revised), dated July 22, 2005, and authorized by Mr. Alan Hoeksema, Senior Vice President, with the signing of our Proposal/Project Acceptance and Agreement form on July 22, 2005. The purpose of this exploration was to preliminarily evaluate the general stratification and engineering properties of the subsurface soils at the subject site. A limited lineament study has also been performed for the subject site.

This Report of Preliminary Subsurface Soil Exploration was prepared for the exclusive use of Bayfair Holdings, LLC and their consultants. The conclusions and recommendations made herein are applicable only to those structures and facilities described herein. This geotechnical study was performed in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. The assessment of site environmental conditions for the presence of pollutants in the soil, rock, or groundwater at this site was beyond the scope of this exploration.

EXECUTIVE SUMMARY

Bayfair Holdings, LLC is contemplating the development of a 55-acre tract of land located between South Lakewood Drive and Pauls Drive in Brandon, Florida. A smaller 5-acre tract of land located along the east side of Pauls Drive, east of the larger tract of land will also be developed. The development may include residential and commercial development up to 6 stories in height.

Nine test borings were performed on a widely-spaced grid pattern across the larger tract of land to evaluate the general soil types. A tenth test boring was performed on the smaller tract of land. These borings found loose to dense sands from the land surface to 11 to 12 feet. The sands were underlain by sandy clays and clays to the limestone. The surface of the limestone depth was variable, but was generally deeper than 40 feet below land surface. A limited lineament study revealed published lineament lines may bisect on the northwest quadrant of the site. Various thickness soft silt and clay zones were found between the depths of 30 and 40 feet.

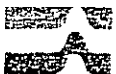
The site soils appear to be suitable to support the intended development with proper site preparation. The risk of future sinkhole development appears to be low and no greater than other properties in Brandon. Shallow foundations appear to be a reasonable choice for the lightly loaded residential and commercial buildings 3-stories or less. Heavier structures will require deep foundations such as piles or drilled shafts. An alternative is to use ground improvement techniques, such as vibro-replacement (stone columns), to improve the bearing capacity of the upper sands and clays. Higher bearing capacities can be achieved allowing the use of shallow foundations for the 6-story structures.

A more detailed discussion of the study and its findings follows.

PROJECT INFORMATION

Project information was provided by during a telephone conversation with Mr. Joe Amon of our Tampa Office and via an email on July 20, 2005. This information consisted of a brief description of the subject project and a summary of the requested scope of services, as well as a site location map. We understand the subject project will consist of the development of a 55-acre tract of land located between South Lakewood Drive and Pauls Drive in Brandon, Hillsborough County, Florida. An additional 5-acre tract of land is located along the east side of Pauls Drive, across from the larger tract of land. We also understand that this site will be developed as a multi-use development, including the 6-story condominiums and may include 2 to 3-story residential structures and up to 6-story commercial office structures.

Since no decision has been made on the types or sizes of structures, load information is not available. For the purposes of this study, we assumed structures would have loads similar to the following:



Up to 3-Story Residential Structures

Column Loads	Up to 100 kips
Wall Loads	Up to 3 kips per linear foot
Floor Loads	Up to 100 pounds per square foot

Up to 6-Story Residential Structures

Column Loads	Up to 700 kips
Wall Loads	Up to 8 kips per linear foot
Floor Loads	Up to 150 pounds per square foot

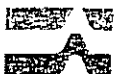
We have also assumed that 2 to 5 feet of fill will required to meet finished floor elevations.

SITE LOCATION AND CONDITIONS

A representative of **Ardaman & Associates** conducted a site reconnaissance on August 15, 2005, to observe and document the surface conditions, and to determine the location of the proposed soil test borings. Any apparent surface indications that would potentially affect development were noted. During the time of the exploration the site was primarily utilized as pastureland, with several dairy buildings located in the eastern portion of the larger tract of land, along Pauls Drive. The smaller tract of land, located along the eastern side of Pauls Drive, was overgrown with trees.

The topographic survey map published by the USGS entitled "Brandon, Florida Quadrangle", dated 1987, was reviewed for ground surface features at the proposed project location (see Figure 1 presented in the Appendix of this report). Based on this review, the natural ground surface elevation ranges from +30 to +45 feet National Geodetic Vertical Datum of 1929 (NGVD). The natural ground surface appears to slope from north to south towards a drainage feature that runs along the southern portion of the larger tract of land.

In addition, the "Soil Survey of Hillsborough County, Florida", published by the USDA Soil Conservation Service (SCS) in 1989, was reviewed for general near-surface soil information within the general project vicinity. This information indicates that the upper soils across the subject site consisted of several different soil types. Candler fine sands (0 to 5 percent slopes) are located in the northern portion of the site, while Seffner fine sands area located in the southern portion. A small area in the eastern portion of the site contained Orlando fine sands (0 to 5 percent slopes); while a small area of Basinger, Holopaw and Samsula soils (depressional) are located in the southeast corner of the site. In the far western portion of the



larger tract of land, Myakka fine sands are located in the northern half, while Malabar fine sands are in the southern half. The majority of the upper soils located across the smaller tract of land, located east of Pauls Drive, consist of Myakka fine sands. A summary of these soil types is as follows:

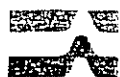
Soil ID & Soil Name	Hydrologic Group	SHWL (inches bls)	Drainage	Soil Location
7 – Candler fine sand	A	> 72	Excessively drained	On the uplands
47 – Seffner fine sand	C	18 to 42	Somewhat poorly drained	On the rims of depression and on broad, low ridges on the flatwoods
35 – Orlando fine sand	A	> 72	Well drained	On the uplands
5 – Basinger, Holopaw and Samsula soils	D	+24 to 12	Very poorly drained	In swamps and depressions on the flatwoods
29 – Myakka fine sand	B/D	0 to 10	Poorly drained	On broad plains on the flatwoods
27 – Malabar fine sand	B/D	0 to 12	Poorly drained	In low-lying sloughs and shallow depressions on the flatwoods

Ardaman also performed a lineament study of the subject site to evaluate the potential for on-site sinkhole activity. A Lineament is a linear topographic feature of regional extent that is believed to reflect crustal structure. As part of this lineament study, we reviewed the topographic survey map published by the USGS entitled "Brandon, Florida Quadrangle". We also reviewed the Fracture Pattern of the Northern Portion of the Florida Peninsula map, prepared by the State Board of Conservation Florida Geological Survey, which illustrates lineament lines. Based on our study, several lineament features were identified in the vicinity of the subject site. Projecting lineament lines, an intersection of these lines was noted on the northwest quadrant of the site. Sinkholes have also been documented within a few miles of the site. Figure 1, presented in the Appendix, illustrates these lineament features and documented sinkhole activity.

FIELD EXPLORATION

Boring Locations

The soil test locations and depths were selected by our office. For this preliminary study, we chose a grid-like spacing of 9 test locations across the larger tract of land and one test location on the smaller tract. The actual test locations were established in the field by **Ardaman & Associates** representatives using taped measurements from nearby structures, roads and/or other features and aerial photographs. The approximate test locations are shown on the Test Location Plan (Figure 2) presented in the Appendix of



this report, and should be considered accurate only to the degree implied by the method used. If more precise locations are desired, we suggest that you contact your registered surveyor. It is important to note that ground surface elevations at the test locations were neither furnished nor determined.

Standard Penetration Test

Six Standard Penetration Test (SPT) soil borings (B-1, B-2, B-3, B-5, B-7 and B-9) were drilled across the larger tract of the subject site to evaluate the stratification and engineering properties of the subsurface soils. The SPT soil borings were drilled with the use of a CME Power Drill Rig using Bentonite "Mud" drilling procedures. The SPT soil borings extended to the approximate depths of 50 to 60 feet below the existing ground surface. The target depth was 50 feet but when unusual or soft soils were encountered, the boring was extended to competent soil/rock strata. Soil sampling was performed in general accordance with the procedures outlined in ASTM Standard D-1586. These procedures are also summarized in the Appendix of this report.

Cone Penetrometer Test

A total of four continuous Cone Penetrometer Test (CPT) penetrations were performed to depths of 28 to 50 feet. Three penetrations (CPT-4, CPT-6 and CPT-8) were performed across the larger tract of the subject site and one penetration (CPT-10) was performed on the smaller tract of the subject site, east of Pauls Road to further evaluate the stratification and engineering properties of site soils. . Cone exploration techniques were selected in order to improve the quality and continuity of data for evaluation of subsurface conditions. Cone technology is in wide use and is recognized as a superior method for site soils characterizations, especially when thin layers of soft soil might affect performance or excavation safety. Since there is a possibility that lightly loaded structures may be placed on this site, we chose to include the more accurate CPT exploration technique. This test continuously samples the soil for strength and other properties from the ground surface to termination depth. This data more accurately characterizes soil conditions and allows for a more accurate (less conservative) prediction of shallow foundation performance. The CPT penetrations were performed in general accordance with the procedures outlined in ASTM Standard D-3441. These procedures are summarized in the Appendix of this report.



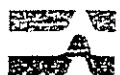
LABORATORY TESTING

The field soil boring logs and recovered soil samples were transported to our Tampa office following the completion of the field exploration activities. The recovered soil samples were examined in our laboratory by a geotechnical engineer to identify the engineering characteristics of the soil and rock. The visual classification of the soil samples was performed using the current Unified Soil Classification System in general accordance with the procedures outlined in ASTM Standard D-2488. Since the samples obtained were granular in nature, and otherwise readily identifiable, laboratory testing was deemed unnecessary at the time of our analysis.

SUBSURFACE CONDITIONS

The delineation of the vertical extent of individual soil strata, the identification of pertinent soil engineering properties, where applicable, and a description of each geologic layer discovered in the course of this geotechnical study is given in the soil boring profiles illustrated on the Soil Boring Logs and the sounding profiles illustrated on the Penetration Sounding Logs. The Soil Boring Logs and Penetration Sounding Logs are presented in the Appendix of this report. The soil boring profiles were prepared by a geotechnical engineer based upon a combination of his technical review of the field soil boring logs, his visual classification of the recovered soil samples, while the sounding profiles were prepared by the engineer based upon his technical review of the field penetration sounding logs. It should be noted that the stratification lines shown are used to indicate a transition from one soil type to another. The actual boundary between the illustrated soil strata may be gradual or indistinct. Consequently, the stratification boundary lines, shown on the soil profiles, represent our best estimate of the location of the transition between distinct soil strata. They are in no way intended to designate a depth of exact geological change. Furthermore, the recommendations contained in this report are based on the contents of the soil profiles. While the borings and penetrations are representative of subsurface conditions at their respective locations and vertical reaches, local variations which are characteristic of the subsurface materials of the region, or which may be due to man-made alteration of the native geologic conditions, may be encountered. A sheet defining the terms and symbols used on the profiles is included in the Appendix of this report.

Typically, the subsurface soil conditions encountered consisted of sandy soils from the ground surface to depths ranging from 10 to 27 feet below the existing ground surface. These sands were underlain with clayey soils extending to depths of 32 to 51 feet. The limestone formation was encountered beneath the



clayey soils. At the majority of the test locations, clay layers were intermixed in the sandy soils, while sand layers were intermixed with the clay layers. Clayey soils were also encountered within the limestone formation.

It should be noted that a layer of very soft material was encountered between the depths of 47 and 51.5 feet below the existing ground surface in boring B-1. A 50% loss of drilling fluid was recorded at 51 feet. In the boring B-2, a layer of very soft sandy clay was encountered within the limestone formation at 38 to 47 feet. The drill rods dropped 9 feet in this layer under the weight of the rods. A 100% loss of drilling fluid was recorded at a depth of 38 feet, at the top of the very soft sandy silt layer. A layer of very soft sandy silt was encountered in boring B-5 between the depths of 32 and 39 feet. A 50% loss of drilling fluid was recorded at a depth of 39 feet. CPT data found loose to dense sands in the upper 20 feet underlain by soft to firm clays. The CPT also found soft zones within the clay/limerock strata, but they were generally 1 to 2 feet thick.

As indicated on the Soil Boring Logs, the measured borehole water levels ranged from 3 to 5 feet below the existing ground surface at the time of the field exploration. These water level readings may differ from the actual stable groundwater table due to variations in the permeability of soil layers. The degree of accuracy of the reported water levels is also related to the time allowed for the borehole water level to come to equilibrium. Consequently, if a water table is not indicated, it does not necessarily mean that groundwater does not exist within the vertical reach of the borehole. Finally, it should be noted that fluctuations in the ground water level may occur due to variations in rainfall and other environmental or physical factors at the time measurements are made.

PRELIMINARY EVALUATION

The following preliminary evaluation and recommendations are based on the project information provided, our experience with similar projects and the subsurface soil conditions encountered during this geotechnical study.

As previously indicated, the subsurface soil conditions typically consisted of sandy soils underlain with clayey soils. The clays generally overlay the limestone formation, but it is common to find layers of clay and sand intermixed with the limestone. The limited lineament study identified several lineament features



in the vicinity of the subject site with a possible crossing of these lines on the northwest quadrant of the site. Numerous sinkholes have also been recorded in the vicinity primarily to the east of this site.

The subsurface soil conditions also indicate karst (solution) activity has occurred across the subject site. This karst activity appears to have been historical; and did not find raveling conditions in the test holes. The thick clay layers encountered across the site would indicate a low potential for future karst activity since these clay layers will restrict the sands above from raveling into voids in the limestone formation, which is the most common mechanism for sinkhole to occur.

The ancient limestone surface found below a depth of 40 feet was at one time was exposed, and therefore subjected to weathering. As the ancient seas rose, water deposited the clays and silts found in our test borings. Being depositional, these clays may range from very soft to stiff, depending on how they were deposited. These clays are sufficiently deep that shallow, spread footings for light residential structures should not be affected by the clays. On the other hand, the clays will influence the performance of large, heavily loaded shallow and deep foundations.

OPINIONS

Based on our evaluation and analyses, the soils encountered on this property pose no greater risk to development than other properties in the Brandon area. Foundation selection will be based on structural load magnitude and allowable settlement requirements.

Shallow Foundations:

For residential development up to 3-stories and commercial development up to 2-stories, shallow spread footings will be the most likely foundation. Design bearing pressures will be on the order of 2,500 to 3,000 pounds per square foot. We estimate maximum settlement range of $\frac{3}{4}$ to $1\frac{1}{4}$ inches, with much of this occurring during construction. Preparation of building sites will be surface compaction up to 95% Modified Proctor dry density.

Deep Foundations:

For heavily-loaded commercial or residential structures, shallow foundations may be too large to be practical, and settlement influenced by the deeper clays may be excessive. Deep foundations, such as auger cast piles and drilled shafts are possible, although they do have limitations. The soft areas within the



limestone are problematic. Piles or shafts tipped above these zones may not perform adequately, therefore forcing these elements deeper into the limestone. It should be noted that with depth comes additional costs.

An alternative is vibro-replacement, also known as stone columns. This technique improves the soil above the limestone to allow all foundation loads to be carried by the upper soils. The technique uses a vibratory probe to densify the existing soils in place and to place crushed rock to result in a soil/rock column. Bearing capacity of site soils improved in this manner would range from 5,000 to 7,000 pounds per square foot. In the past four months, structures up to 8-stories have been placed on this system at significant cost savings over pins and drilled shafts.

Pavement:

Surficial sand soils, free of organics, should provide suitable subgrades for pavement structures. We generally find that these soils will yield Limerock Bearing Rates (LBR) values of 20 to 40 when compacted to 98% of Modified Proctor. This will support a flexible pavement system. Lightly loaded pavements will generally consist of 1 ½ inches of asphalt over 6 to 8 inches of crushed limestone or crushed concrete base. More heavily loaded or more trafficked pavements may require 2 to 2 ½ inches of asphalt over 8 inches crushed stone or crushed concrete base.

In conclusion, we find these site soils capable of supporting the intended developments when properly prepared. Shallow foundations are available for lightly loaded residential and commercial structures. Soil improvements such as stone columns would allow shallow foundations for the larger structures, such as those up to 6-stories considered for this site. Sinkhole risk is low on this property and no more than other property in the Brandon area.

CLOSURE

The preliminary recommendations provided above are based in part on project information provided to us, and they only apply to this specific project and site. When a detailed development plan has been created for the subject site, including size and locations of proposed buildings, we recommend performing a complete geotechnical study to address the needs of the development plan. We will be happy to provide a proposal to perform the complete geotechnical study.

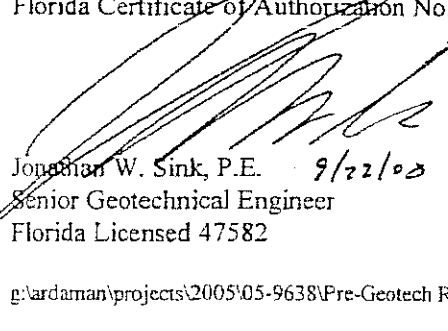


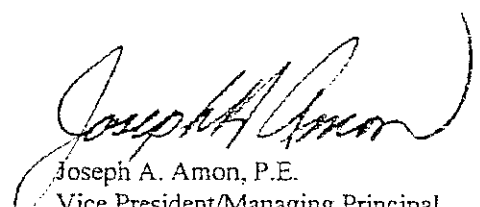
Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between borings will be different from those at specific boring locations and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may alter the soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team along with timely recommendations to solve any problems created. We recommend that the owner retain **Ardaman & Associates** to provide construction consulting and testing services based upon our familiarity with the project and the subsurface conditions.

We appreciate the opportunity to be of service to **Bayfair Holdings, LLC** on this important project. Should you have any questions in regards to this report, or if we can be of any further assistance, please contact this office.

Very truly yours,

ARDAMAN & ASSOCIATES, INC.
Florida Certificate of Authorization No. 00005950


Jonathan W. Sink, P.E. 9/22/05
Senior Geotechnical Engineer
Florida Licensed 47582


Joseph A. Amon, P.E.
Vice President/Managing Principal
Florida Licensed 43576

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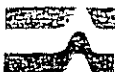
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Appendix: Figure 1 – Limited Lineament Study
Figure 2 – Test Location Plan
Key to Classifications and Symbols
Soil Boring Logs
CPT Sounding Logs
Field Testing Procedures

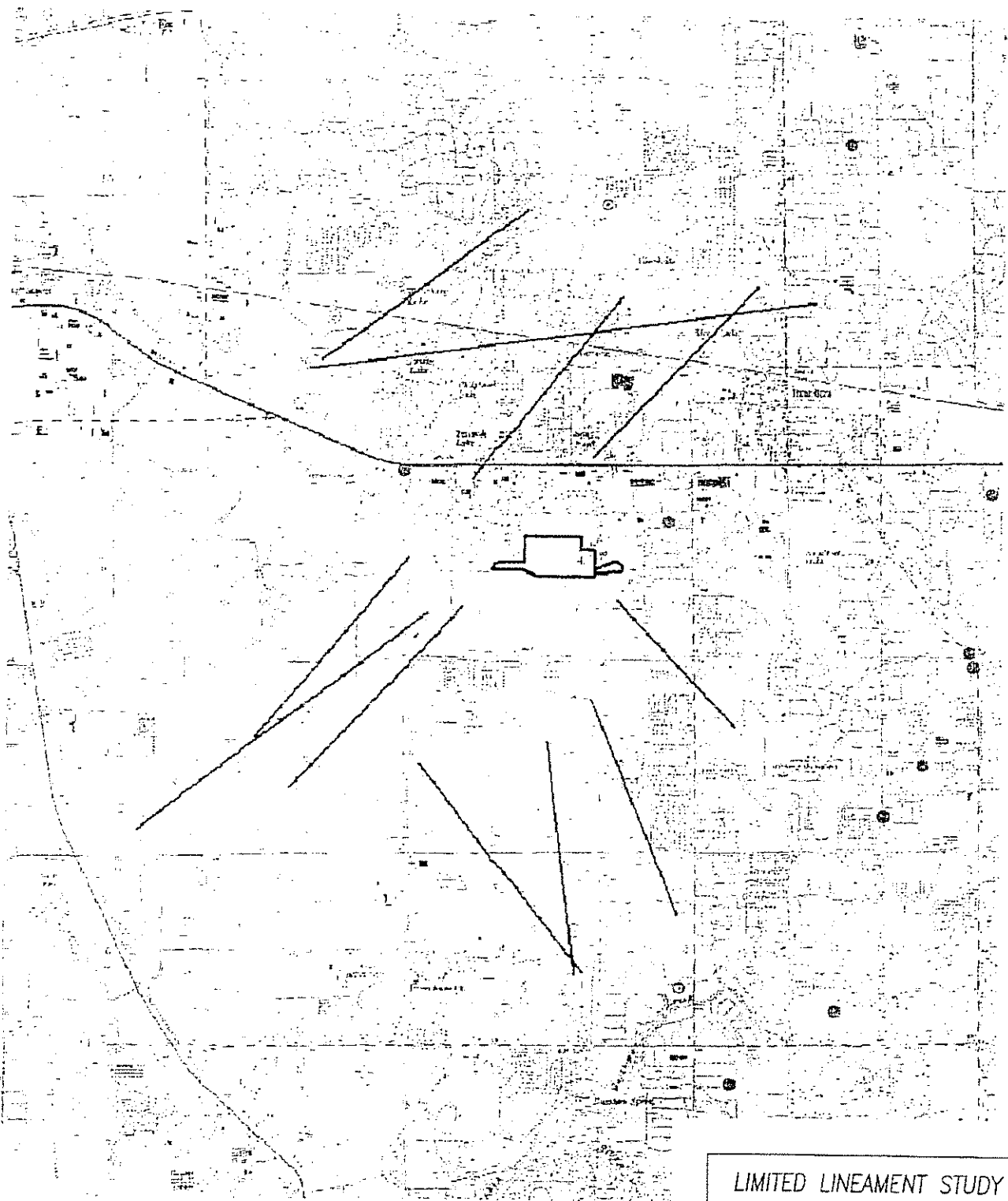


Ardaman & Associates, Inc.

APPENDIX



Ardaman & Associates, Inc.



LEGEND

- FGS REPORTED SINKHOLES
- / LIMITED LINEAMENT SURVEY



NOT TO SCALE

LIMITED LINEAMENT STUDY



Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

60 - ACRE TRACT OF LAND
BRANDON, FLORIDA

DRAWN BY: AID	CHECKED BY: JWS	DATE: 9/20/05
FILE NO. 05-9638	APPROVED BY:	FIGURE: 1



SCALE: 1" = 250'

TEST LOCATION PLAN



Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

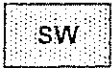



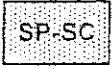

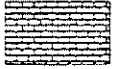




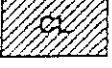
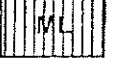
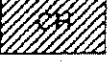

BAYFAIR PROPERTIES, INC.
PAULS ROAD
BRANDON, FLORIDA

DRAWN BY: ATD	CHECKED BY: JWS	DATE: 8/29/05
FILE NO.: 05-9638	APPROVED BY:	FIGURE: 2

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	NO. OF BLOWS, N	RELATIVE DENSITY	PARTICLE SIZE IDENTIFICATION	
SANDS	0 - 4	Very Loose	BOULDERS:	Greater than 3300 mm
	5 - 10	Loose	COBBLES	75 mm to 300 mm
	11 - 30	Medium Dense	GRAVEL: Coarse -	19.0 mm to 75 mm
	31 - 50	Dense	Fine -	4.75 mm to 19.0 mm
	Greater Than 50	Very Dense	SANDS: Coarse -	2.00 mm to 4.75 mm
			Medium -	0.425 mm to 2.00 mm
			Fine -	0.075 mm to 0.425 mm
			CLAYS & SILTS	Less than 0.075 mm
	NO. OF BLOWS, N	CONSISTENCY		
CLAYS & SILTS	0 - 2	Very Soft		
	3 - 4	Soft		
	5 - 8	Firm		
	9 - 15	Stiff		
	16 - 30	Very Stiff		
	Greater Than 30	Hard		
			NO. OF BLOWS, N	COMPETENCY
			10 - 20	Soft
			21 - 50	Medium
			51 - 50/3"	Hard
			Greater than 50/3"	Very hard

KEY OF SOIL CLASSIFICATION

	Well Graded Sands		Poorly Graded Sands		Limestone Formation
					Weathered Limerock
	Slightly Clayey Sands		Slightly Silty Sands		Limestone Formation
					Hard Limestone
	Clayey Sands		Silty Sands		Fill
	Low Plasticity Inorganic Clays		Low Plasticity Inorganics Silts		
	High Plasticity Inorganic Clays		High Plasticity Inorganic Silts		

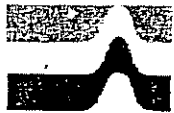
KEY TO DRILLING SYMBOLS

▼	Water Table at Time of Drilling	WH/24"	Sampler advanced 24" under weight of hammer
▽	Water Table after 24-Hours	WR/24"	Sampler advanced 24" under weight of rod
◄	Loss of Drilling Fluids	'50/1"	Blows for 1-inch of penetration in soil

Notes:

While the borings are representative of subsurface conditions at their respective locations and vertical reaches, local variations which are characteristic of the subsurface materials of the region, or which may be due to man-made alteration of the native geologic conditions, may be encountered.

The water levels shown on the soil boring logs represent the groundwater surfaces encountered on the dates shown. The water levels shown may differ from the actual stable groundwater table due to variations in the permeability of soil layers. The degree of accuracy of the reported water levels is also related to the time allowed for the borehole water level to come to equilibrium. Consequently, if a water level is not indicated, it does not necessarily mean that groundwater does not exist within the vertical reach of the borehole. Finally, it should be noted that fluctuations in the ground water level may occur due to variations in rainfall and other environmental or physical factors at the time measurements are made.



ARDAMAN & ASSOCIATES, INC.

Geotechnical, Environmental and Materials Consultants
3925 Coconut Palm Drive, Suite 115, Tampa, Florida 33619

SOIL BORING LOG

PROJECT: 60 Acre Tract

CITY: Brandon

CLIENT: Bayfair Properties, Inc.

COUNTY: Hillsborough

FILE NO.: 05-55-9638

ELEVATION: N/A

REMARKS: N/A

WATER LEVEL: 4.8 feet

BORING NO.: B-1

TOTAL DEPTH: 60 feet

START DATE: 8/15/05

FINISHED DATE: 8/15/05

DRILLER/RIG: Swint/CME

BORING TYPE: SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH		1st	2nd	3rd					
1	0 / 2.0		2	4	4	8		2.0	SP	Loose gray fine sand
2	2.0 / 4.0		9	10	9	19			SP	Medium dense dark gray organically-stained fine sand
		5.0						4.8 ▼		
3	4.0 / 6.0		4	6	5	11		6.0	SC	Loose dark gray organically-stained clayey fine sand
4	6.0 / 8.0		4	5	4	9		8.0		
5	8.0 / 10.0	10.0	4	12	12	24			SP	Medium dense light brown fine sand
								13.0		
6	14.0 / 15.5	15.0	3	5	7	12			SP-SC	Medium dense orange and gray slightly clayey fine sand
								17.0		
7	19.0 / 20.5	20.0	3	4	4	8			CL	Firm orange and gray sandy clay
								22.0		
8	24.0 / 25.5	25.0	3	2	2	4			SM	Very loose orange silty fine sand
								27.0		
9	29.0 / 30.5	30.0	2	2	3	5			CL	Soft to firm tan and orange clay and sandy clay



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Geotechnical, Environmental and Materials Consultants
3925 Coconut Palm Drive, Suite 115, Tampa, Florida 33619

SOIL BORING LOG

PROJECT: 60 Acre Tract
CLIENT: Bayfair Properties, Inc.
FILE NO.: 05-55-9638
REMARKS: N/A

CITY: Brandon
COUNTY: Hillsborough
ELEVATION: N/A
WATER LEVEL: 4.8 feet

BORING NO.: B-1
TOTAL DEPTH: 60 feet
START DATE: 8/15/2005
FINISHED DATE: 8/15/2005
DRILLER/RIG: Swint/CME
BORING TYPE: SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)		SOIL DESCRIPTION AND REMARKS (United Soil Classification System)
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH		1st	2nd	3rd					
10	34.0 / 35.5	35.0	1	2	3	5				
11	39.0 / 40.5	40.0	1	1	2	3			CL	Soft to firm tan and orange clay and sandy clay
12	44.0 / 45.5	45.0	2	6	6	12		42.0	CL	Stiff light tan silty calcareous clay with limeroch fragments
13	49.0 / 50.5	50.0	1	1 1/2"	—	1 1/2"		47.0		No Recovery, very soft material
								51.5		◀ 50% loss of Drilling Fluid at 51 feet
								53.5		Possible Limestone Formation
14	54.0 / 55.5	55.0	WR/6"	5	3	8			ML	Firm gray silt
15	59.0 / 60.5	60.0	1	1	30	31		57.0	CL	Hard tan silty calcareous clay with limeroch fragments
								60.5		END OF BORING



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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-2
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	55 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/2005
REMARKS:	N/A	WATER LEVEL:	Not Measured	FINISHED DATE:	8/15/2005
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH	(feet)	1st	2nd	3rd					
1	0 / 2.0		2	2	1	3		2.0	SP	Very loose dark brown fine sand with some roots
2	2.0 / 4.0		2	2	1	3				
		5.0								
3	4.0 / 6.0		1	2	2	4			SP	Very loose to loose brown fine sand
4	6.0 / 8.0		2	3	4	7				
5	8.0 / 10.0		3	7	9	16		9.5		
		10.0								
								12.0	SP-SC	Medium dense brown slightly clayey fine sand
6	14.0 / 15.5	15.0	7	7	8	15				
7	19.0 / 20.5	20.0	1	2	3	5			SC	Loose to medium dense tan and brown clayey fine sand
								22.0		
8	24.0 / 25.5	25.0	1	2	4	6			CH	Firm tan clay
								27.0		
9	29.0 / 30.5	30.0	3	4	5	9			CL	Stiff tan and gray sandy clay



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SOIL BORING LOG

BORING NO.: B-2
TOTAL DEPTH:
START DATE: 8/15/2005
FINISHED DATE: 8/15/2005
DRILLER/RIG: Swint/CME
BORING TYPE: SPT

PROJECT: 60 Acre Tract CITY: Brandon
CLIENT: Bayfair Properties, Inc. COUNTY: Hillsborough
FILE NO.: 05-55-9638 ELEVATION: N/A
REMARKS: N/A WATER LEVEL: Not Measured

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH	(feet)	1st	2nd	3rd					
								32.0	CL	Stiff tan and gray sandy clay
10	34.0 / 35.5	35.0	50/6"	—	—	50/6"				Hard tan weathered limestone
								38.0		100% loss of Drilling Fluid at 38 feet
11	39.0 / 40.5	40.0	WR/9'	—	—	WR/9'			ML	Very soft gray sandy silt
12	44.0 / 45.5	45.0						47.5		
13	49.0 / 50.5	50.0	8	5	2	7				Soft to medium tan weathered limestone
14	54.0 / 55.5	55.0	9	13	23	36		55.5		End Of Boring
15	59.0 / 60.5	60.0								



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SOIL BORING LOG

PROJECT: 60 Acre Tract
CLIENT: Bayfair Properties, Inc.
FILE NO.: 05-55-9638
REMARKS: N/A

CITY: Brandon
COUNTY: Hillsborough
ELEVATION: N/A
WATER LEVEL: Approx 3 feet

BORING NO.: B-3
TOTAL DEPTH: 50 feet
START DATE: 8/15/2005
FINISHED DATE: 8/15/2005
DRILLER/RIG: Swint/CME
BORING TYPE: SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH		1st	2nd	3rd					
1	0 / 2.0		2	2	1	3		3.0 ▼	SP	Very loose dark gray organically-stain fine sand with roots
2	2.0 / 4.0		1	2	3	5				
3	4.0 / 6.0	5.0	2	1	3	4			SP	Loose brown to tan fine sand
4	6.0 / 8.0		2	2	4	6		8.5		
5	8.0 / 10.0	10.0	6	10	7	17			SC	Very stiff gray sandy clay
								12.0		
6	14.0 / 15.5	15.0	1	1	1	2			SM	Very loose tan silty fine sand
								17.0		
7	19.0 / 20.5	20.0	1	2	1	3			SC	Very loose slightly clayey fine sand
								22.0		
8	24.0 / 25.5	25.0	1	2	2	4			CL	Tan clay
								27.0		
9	29.0 / 30.5	30.0	1	2	2	4			CL	Soft to stiff tan silty calcareous clay with limerock fragments



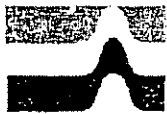
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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-3
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/2005
REMARKS:	N/A	WATER LEVEL:	Approx 3 feet	FINISHED DATE:	8/15/2005
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)					DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE		
No.	DEPTH		1st	2nd	3rd			
10	34.0 / 35.5	35.0	4	6	8	14		
11	39.0 / 40.5	40.0	3	6	4	10		Soft to stiff tan silty calcareous clay with limrock fragments
							43.0	100% loss of Drilling Fluid at 43 feet
12	44.0 / 45.5	45.0	8	14	11	25		Medium to hard tan weathered limestone
13	49.0 / 50.5	50.0	8	35	50/5"	50/5"	50.5	End Of Boring
14	54.0 / 55.5	55.0						
15	59.0 / 60.5	60.0						



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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-5
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/05
REMARKS:	N/A	WATER LEVEL:	Not Measured	FINISHED DATE:	8/15/05
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH	(feet)	1st	2nd	3rd					
1	0 / 2.0		2	3	3	6				
2	2.0 / 4.0		2	1	1	2			SP	Very loose to loose light brown fine sand
		5.0								
3	4.0 / 6.0		2	2	2	4		6.0		
4	6.0 / 8.0		2	4	5	9		8.0	SC	Loose brown clayey fine sand
5	8.0 / 10.0		6	6	8	16				
		10.0							SP-SC	Medium dense tan and brown slightly clayey fine sand
								12.0		
6	14.0 / 15.5	15.0	2	2	2	4			CL	Soft brown and tan silty clay
								17.0		
7	19.0 / 20.5	20.0	2	3	4	7			CH	Firm brown clay
								22.0		
8	24.0 / 25.5	25.0	2	1	3	4			CL	Soft tan to light brown silty calcareous clay with limerock fragments
								27.0		
9	29.0 / 30.5	30.0	1	2	4	6			CL	Firm tan to light brown sandy silty clay



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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-5
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/2005
REMARKS:	N/A	WATER LEVEL:	Not Measured	FINISHED DATE:	8/15/2005
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)					DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE		
No.	DEPTH		1st	2nd	3rd			
							32.0	CL Firm tan to light brown sandy silty clay
10	34.0 / 35.5	35.0	WH/18"	-	-	WH/18"		ML Very soft tan sandy silt
							39.0	50% loss of Drilling Fluid at 39 feet
11	39.0 / 40.5	40.0	4	4	4	8		CL Firm to very stiff tan silty calcareous clay with limestone fragments
12	44.0 / 45.5	45.0	10	4	17	21	47.0	
13	49.0 / 50.5	50.0	50/5.5"	-	-	50/5.5"	50.5	Hard tan weathered limestone
								End Of Boring
14	54.0 / 55.5	55.0						
15	59.0 / 60.5	60.0						



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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-7
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/05
REMARKS:	N/A	WATER LEVEL:	Not Measured	FINISHED DATE:	8/15/05
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH	(feet)	1st	2nd	3rd					
1	0 / 2.0		2	2	2	4			SP	Very loose to loose brown fine sand
2	2.0 / 4.0		3	3	3	6		4.0		
3	4.0 / 6.0	5.0	3	5	6	11		6.0	SC	Medium dense brown clayey fine sand
4	6.0 / 8.0		7	11	10	21		8.0	CL	Very stiff brown and tan sandy clay
5	8.0 / 10.0	10.0	6	8	11	19			SC	Medium dense brown clayey fine sand
								12.0		
6	14.0 / 15.5	15.0	3	4	6	10			CH	Stiff brown clay
								17.0		
7	19.0 / 20.5	20.0	2	2	4	6			CH	Firm gray and brown clay with phosphate nodules
								22.0		
8	24.0 / 25.5	25.0	3	3	4	7			SC	Loose light gray silty clayey fine sand
								27.0		
9	29.0 / 30.5	30.0	2	2	4	6			CL	Firm tan silty clay



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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-5
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/2005
REMARKS:	N/A	WATER LEVEL:	Not Measured	FINISHED DATE:	8/15/2005
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)					DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE		
No.	DEPTH		1st	2nd	3rd			
							32.0	OL Firm tan to light brown sandy silty clay
10	34.0 / 35.5	35.0	WH/18"	—	—	WH/18"		ML Very soft tan sandy silt ← 50% loss of Drilling Fluid at 39 feet
							39.0	
11	39.0 / 40.5	40.0	4	4	4	8		OL Firm to very stiff tan silty calcareous clay with limestone fragments
							47.0	
12	44.0 / 45.5	45.0	10	4	17	21		Hard tan weathered limestone
							50.5	
13	49.0 / 50.5	50.0	50/5.5"	—	—	50/5.5"		End Of Boring
14	54.0 / 55.5	55.0						
15	59.0 / 60.5	60.0						



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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-7
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/05
REMARKS:	N/A	WATER LEVEL:	Not Measured	FINISHED DATE:	8/15/05
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE	BLOWS/6 INCHES			"N"	UD			
No.	DEPTH	(feet)	1st	2nd	3rd	VALUE	SAMPLE			
								32.0	CL	Firm tan silty clay
10	34.0 / 35.5	35.0	2	1	1	2			SM	Very soft brown and tan silty fine sand with limerock fragments
								39.0		
11	39.0 / 40.5	40.0	14	13	20	33			CL	Hard tan silty calcareous clay with limerock fragments
								47.0		
12	44.0 / 45.5	45.0	13	18	17	35				
								50.5		
13	49.0 / 50.5	50.0	50/2"	--	--	50/2"				Hard tan weathered limestone
14	54.0 / 55.5	55.0								End Of Boring
15	59.0 / 60.5	60.0								



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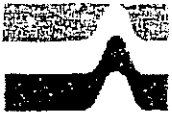
SOIL BORING LOG

PROJECT: 60 Acre Tract
CLIENT: Bayfair Properties, Inc.
FILE NO.: 05-55-9638
REMARKS: N/A

CITY: Brandon
COUNTY: Hillsborough
ELEVATION: N/A
WATER LEVEL: Approx 5 feet

BORING NO.: B-9
TOTAL DEPTH: 50 feet
START DATE: 8/15/05
FINISHED DATE: 8/15/05
DRILLER/RIG: Swint/CME
BORING TYPE: SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH		1st	2nd	3rd					
1	0 / 2.0		1	1	2	3		2.0	SP	Very loose dark gray organically-stained fine sand with roots
2	2.0 / 4.0		2	1	2	3			SP	Very loose to loose gray fine sand
		5.0						5.0 ▼		
3	4.0 / 6.0		2	3	4	7		6.0		
4	6.0 / 8.0		3	3	5	8			SP	Loose to medium dense light brown fine sand
5	8.0 / 10.0	10.0	4	6	9	15				
								11.0		
									CL	Stiff brown and gray silty clay
6	14.0 / 15.5	15.0	3	3	9	12				
								17.0		
7	19.0 / 20.5	20.0	1/12"	-	1	1			SM	Very loose tan slightly silty fine sand with some cemented sands
								22.0		
8	24.0 / 25.5	25.0	1	2	2	4			CH	Soft tan clay
								27.0		
									CL	Firm brown and tan sandy clay
9	29.0 / 30.5	30.0	2	3	4	7				



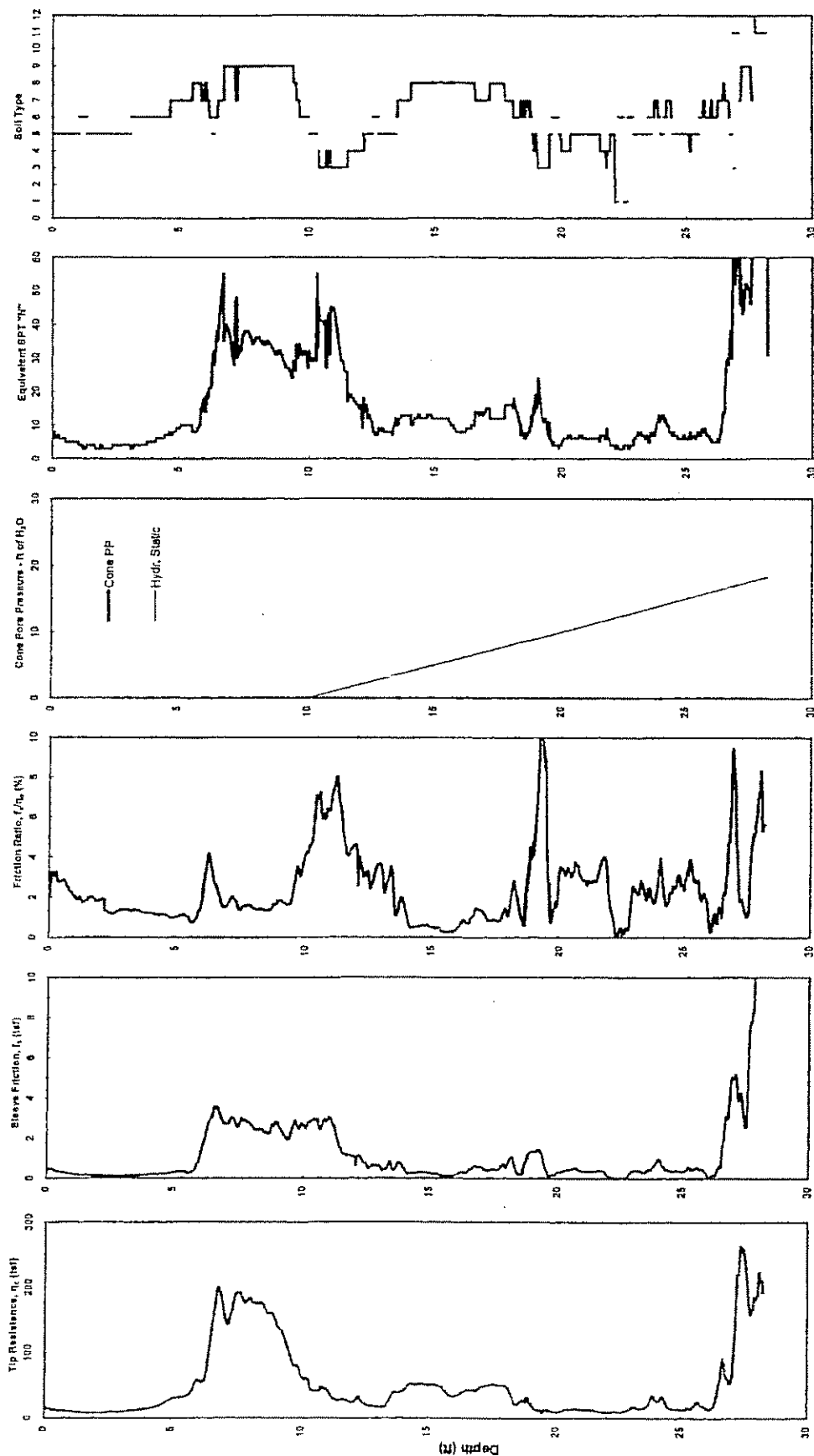
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SOIL BORING LOG

PROJECT:	60 Acre Tract	CITY:	Brandon	BORING NO.:	B-9
CLIENT:	Bayfair Properties, Inc.	COUNTY:	Hillsborough	TOTAL DEPTH:	50 feet
FILE NO.:	05-55-9638	ELEVATION:	N/A	START DATE:	8/15/05
REMARKS:	N/A	WATER LEVEL:	Approx 5 feet	FINISHED DATE:	8/15/05
				DRILLER/RIG:	Swint/CME
				BORING TYPE:	SPT

SAMPLE		STANDARD PENETRATION TEST (ASTM D-1586)						DEPTH (feet)	SOIL DESCRIPTION AND REMARKS (United Soil Classification System)	
		SCALE (feet)	BLOWS/6 INCHES			"N" VALUE	UD SAMPLE			
No.	DEPTH		1st	2nd	3rd					
								32.0	CL	Firm brown and tan sandy clay
10	34.0 / 35.5	35.0	1	1	2	3			CL	Soft brown silty sandy clay
11	39.0 / 40.5	40.0	6	3	2	5		39.0	CL	Firm light tan silty calcareous clay with limeroch fragments
12	44.0 / 45.5	45.0	7	7	15	22		42.0	CL	Medium to hard light tan weathered limestone
13	49.0 / 50.5	50.0	50/6"	--	--	50/6"		50.5		End Of Boring
14	54.0 / 55.5	55.0								
15	59.0 / 60.5	60.0								



Artisan & Associates, Inc.
Geotechnical, Environmental and
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60-Acre Tract of Land
Brandon, Florida

Job No. 05-9638 Test Date: 8/16/05

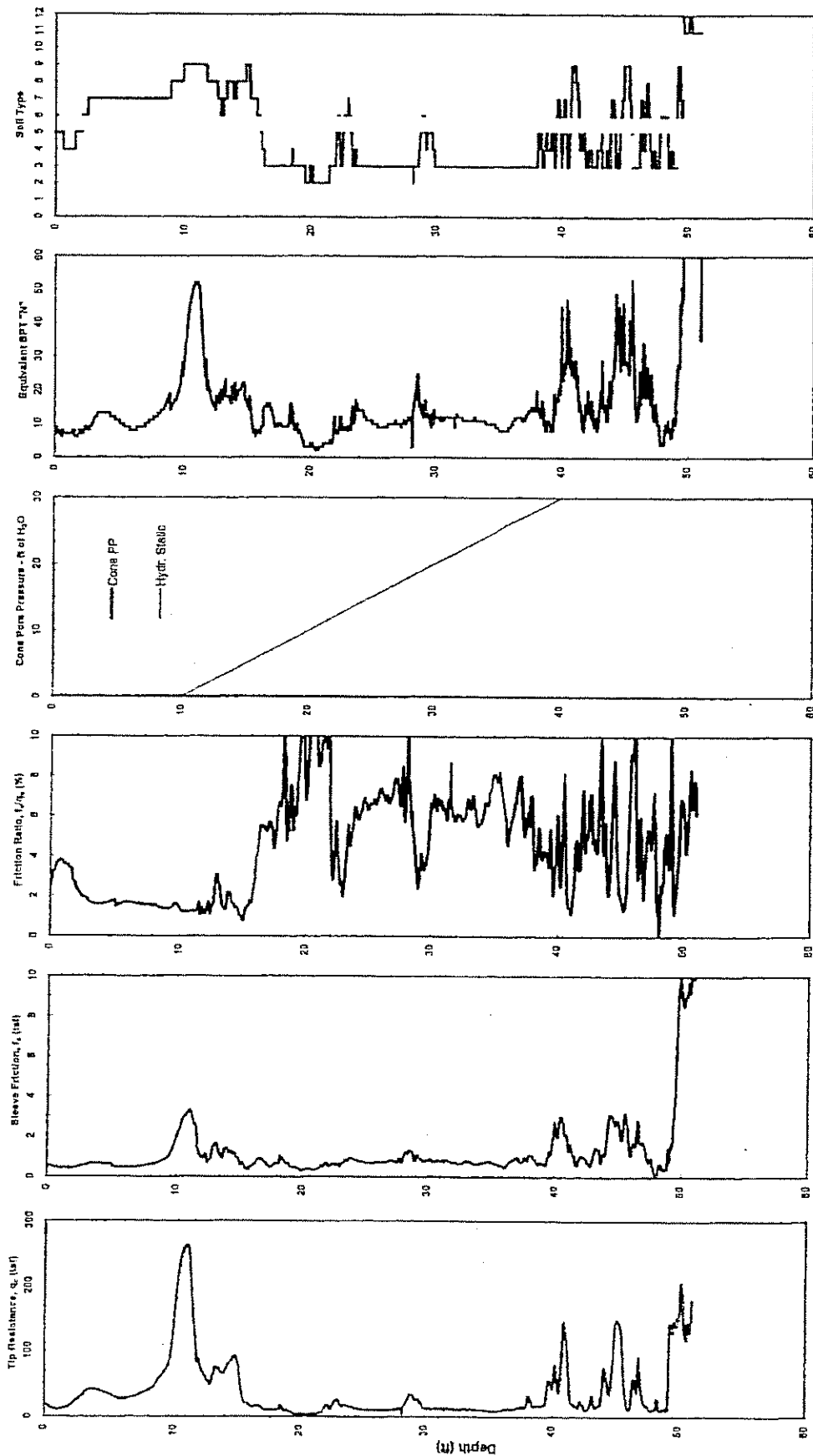
Cone Penetration Log: CPT-4

Estimated Depth of Groundwater: Unknown

Notes: Wisco Cone, Pore pressure at u.

Soil ID #	Soil Description	Soil ID #	Soil Description	Soil ID #	Soil Description
1	Sensitive Fine Grained	7	Sand to Silty Sand	13	SP/SC
2	Organic Material	8	Sand to Silty Sand	14	SP
3	Clay	9	Sand	15	SP/SW
4	Silty Clay to Clay	10	Gravelly Sand to Sand	16	SP/3W
5	Clayey Silt to Silty Clay	11	Very Silty Fine Grained	17	OC Clay
6	Silty Sand to Silty Silt	12	Sand to Clayey Sand	18	Cemented

Soil Classification by Robertson et al., 1990



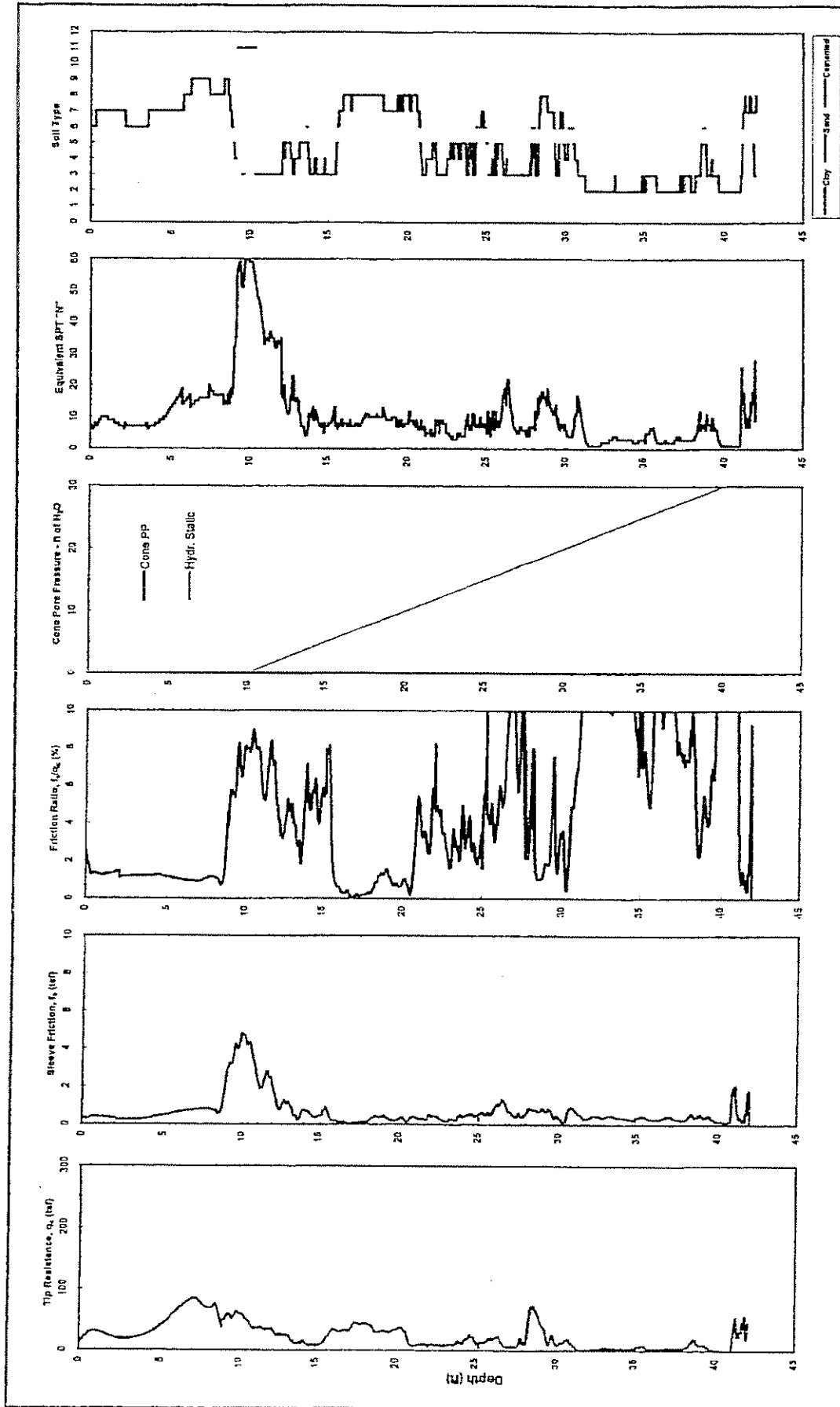
Artisan & Associates, Inc. Geotechnical, Environmental and Materials Consultants		60-Acre Tract of Land Brandon, Florida	
Cone Penetration Log: CPT-6 Estimated Depth of Groundwater: Unknown		Job No. 05-9638	Test Date: 8/16/05

Soil ID # 1 Sensitive Fine Grained 2 Organic Material 3 Clay 4 Silty Clay to Clay 5 Clayey Silt to Silty Clay 6 Silty Sand to Sandy Silt	Soil Description Sand to Silty Sand Sand to Silty Sand Sand Gravelly Sand to Sand Very Silty Fined Grained Sand to Clayey Sand	Soil ID # 7 8 9 10 11 12	Soil Description Sand to Silty Sand Sand to Silty Sand Sand Gravelly Sand to Sand Very Silty Fined Grained Sand to Clayey Sand	UCS CH/CH OH CH CLMH MHCL SC	UCS SP/SC SP SP SP/SC SP/SC CC Clay Cemented
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Notes: Witness Cone, Pore pressure at 10m

Soil Classification by Robinson et al. 1978

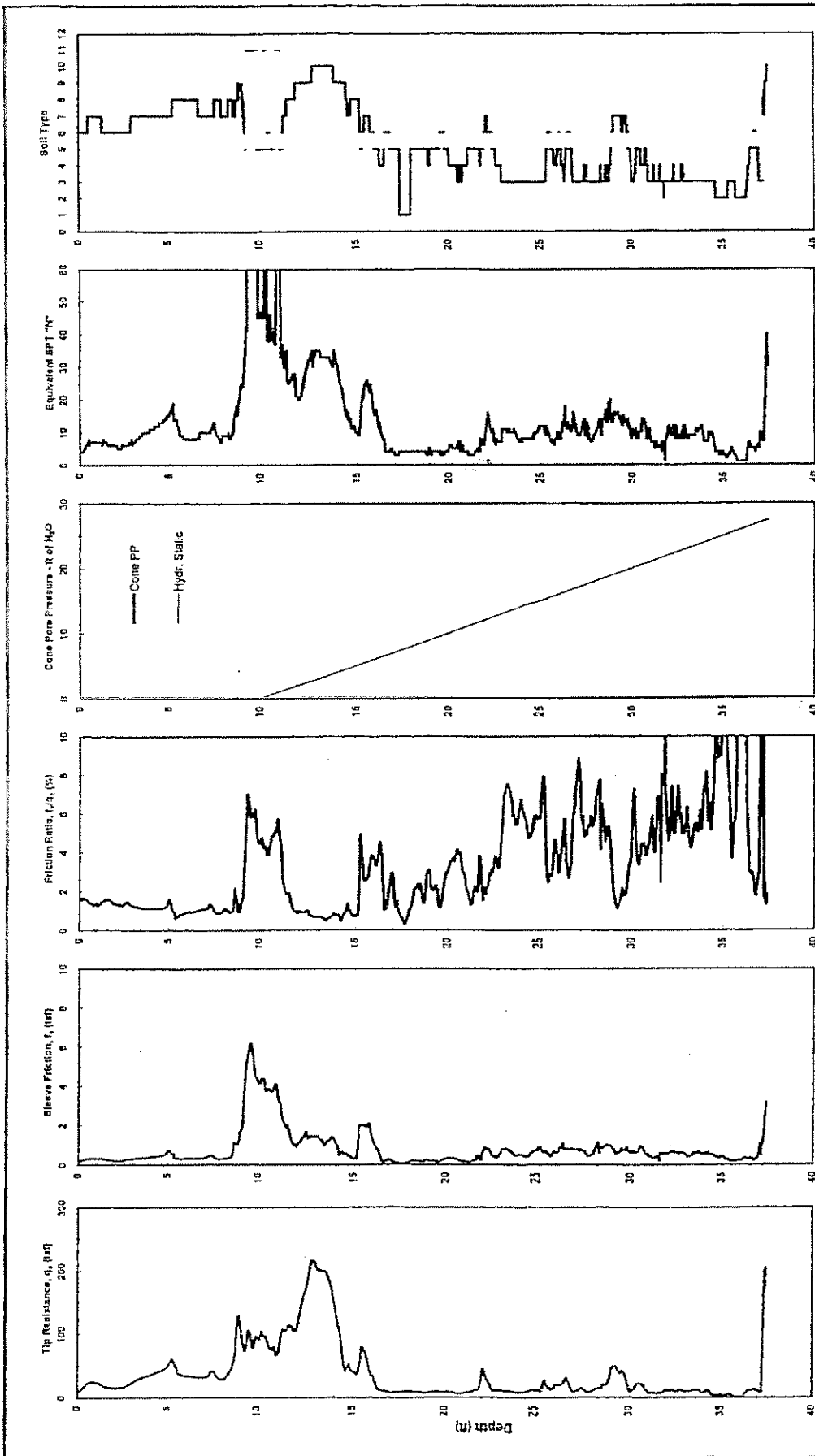
ID #s 11 and 12 are Over Consolidated or Cemented



Soil ID. # 1 Sensitive Fine Grained 2 Organic Material 3 Clay 4 Silty Clay to Clay 5 Clayey Silt to Silty Clay 6 Silty Sand to Sandy Silt		Soil ID. # 7 Sand to Silty Silt 8 Sand to Silty Sand 9 Sand 10 Gravelly Sand to Sand 11 Very Silty Fined Grained 12 Sand to Clayey Sand		UCS OHCH OH CH CU/MH MH/CL SC		UCS SP/SC SP SP/GW SP/GW CC Clay Cemented		Soil Description Sand to Silty Silt Sand to Silty Sand Sand Gravelly Sand to Sand Very Silty Fined Grained Sand to Clayey Sand		Notes: Wassa Cone, Pore pressure at u,		Job No. 05-9638		Test Date: 8/16/05		60-Acre Tract of Land Brandon, Florida		Ardatton & Associates, Inc. Geotechnical, Environmental and Materials Consultants		Cone Penetration Log: CPT-8 Estimated Depth of Groundwater: Unknown	
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Soil Classification by Robertson et al. 1989

I.D. #s 11 and 12 are Over Consolidated or Cemented



Soil Classification by Robertson et al. 1998 ID. #s 11 and 12 are Over Consolidated or Cemented		Notes: Water Cone, Pore pressure at u_1		Soil Classification by Robertson et al. 1998 ID. #s 11 and 12 are Over Consolidated or Cemented	
Soil ID. #	Soil Description	Soil ID. #	Soil Description	Soil ID. #	Soil Description
1	Sensitive Fine Grained	7	Sand to Silty Sand	UCS	SP/SC
2	Organic Material	8	Sand to Silty Sand		SP
3	Clay	9	Sand		SP/GW
4	Silty Clay to Clay	10	Gravelly Sand to Sand		SP/GW
5	Clayey Silt to Silty Clay	11	Very Stiff Fined Grained		OC Clay
6	Silty Sand to Sandy Silt	12	Sand to Clayey Sand		Cemented

Ardenian & Associates, Inc.
 Geotechnical, Environmental and
 Materials Consultants

60-Acre Tract of Land
 Brandon, Florida

Cone Penetration Log: CPT-10
 Estimated Depth of Groundwater: Unknown

Job No. 05-9638

Test Date: 8/18/05

FIELD TESTING PROCEDURES

Prior to initiating the field activities, the Sunshine State One-Call of Florida, Inc. Call Center (Call Sunshine) was notified of our intent to perform soil test boring, utilizing a drill rig. The location, date, and other operation particulars were provided to allow participating utility companies the opportunity to mark the location of their buried lines, prior to our field activities. No conflicts with underground utilities were encountered at the boring locations.

Cone Penetrometer Test (MCPT)

The site exploration program for this project includes the use of Cone Penetrometer Test (CPT) procedures in general accordance with ASTM D-3441. Cone exploration techniques were selected in order to improve the quality and continuity of data for evaluation of subsurface conditions. CPT technology is in wide use nationally and internationally, and is recognized as a superior method for site soils characterization, especially when thin layers of soft soil might affect foundation performance or excavation safety.

Procedures for use of the friction sleeve cone penetrometer in Florida were developed at the University of Florida in the early 1970's.¹ In 1974, Ardaman & Associates, Inc. developed the Piezo-Cone system for site explorations in difficult soils,² and has been a leader in the application of Piezo-Cone technology for site characterization and foundation design. Many others have recognized that the cone penetrometer is the best system for exploration of soil conditions for foundation design. Typical comments about the cone from others are: "Cone and piezocone penetration tests are widely utilized technologies for in-situ investigation of soil deposits."³ "Among the various in situ test methods currently available, the cone penetration test (CPT) is becoming increasingly popular especially because it is reliable, fast, economical and gives continuous detailed soil profiles."⁴ "Over the two decades since its introduction into the United States, the CPT has now established its position as a routine, reliable, and expedient means for site characterization, stratigraphic profiling, evaluation of soil engineering parameters, and geotechnical design."⁵

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- 1 "Guidelines for Cone Penetration Test Performance and Design" Report FHWA-TS-78-209, Federal Highway Administration, Washington, D.C., Schmertmann, J.H., 1978.
 - 2 "The Piezometer Probe", In-Situ Measurement of Soil Properties, Vol. I (ASCE), NC State, Raleigh, Wissa, A.E.Z, Martin, R.T., and Garlanger, J.E., 1975.
 - 3 Penetrometers for Soil Permeability and Chemical detection, P. W. Mayne, PhD, PE and S. E. Burns, PhD, PE; Report to National Science Foundation and U.S. Army Research Office, Georgia Institute of Technology School of Civil and Environmental Engineering, July 1998.
 - 4 A Continuous Intrusion Electronic Miniature Cone Penetration Test System, M. T. Tumay, PhD, P. U. Kurup, PhD and R. L. Boggess; Geotechnical Site Characterization, Robertson & Mayne (eds) © 1998 Balkema, Rotterdam, ISBN 90 54 10 939 4.
 - 5 U.S. National Report on CPT, Mayne, P.W., Mitchell, J. K., Auxt, J.A. and Yilmaz, R. "Proceedings, Cone Penetration Testing (CPT'95), Vol. 1, Linkoping, Sweden, USNS/ISSMFE, Oct 1995, 263-276.



FIELD TESTING PROCEDURES

The characteristics of the Piezo-Cone Penetrometer, PCPT, are as follows:

	<u>CPT</u>
Tip Area:	10.0 cm ²
Friction Sleeve:	150 cm ²
Piezometric Element:	U ₁ , below the cone tip, 6.4 x 6.4 mm cylinder

The PCPT is inserted and extracted by a high capacity hydraulic jack mounted in a 24 ton truck, but in certain applications, the PCPT may be inserted using a drill rig. The cone data acquisition system consists of electronic load cells to measure tip resistance, sleeve friction and pore water pressure. A portable computer is used to collect the load cell data. A complete suite of load cell readings is recorded at least every one second. The correlation with soil properties is detailed in Reference 4, and in a subsequent paper presented to the Transportation Research Board 77th Annual Meeting, Committee A2K01, Soil and Rock Instrumentation by Kurup and Tumay. Calibration testing by **Ardaman & Associates, Inc.** and many university researchers has shown that the PCPT testing provided finer resolution of soil profile variations than SPT borings due to the continuity of the measurements. In addition, the PCPT was proven to provide reliable measurement of soil strength.

Extensive testing of the PCPT by **Ardaman & Associates** in Florida with correlations between SPT boring, CPT and PCPT data has proven that the PCPT can provide more vertically detailed site characterization data and better data for definition of soil engineering properties than Standard Penetration Test borings.

STANDARD PENETRATION TEST

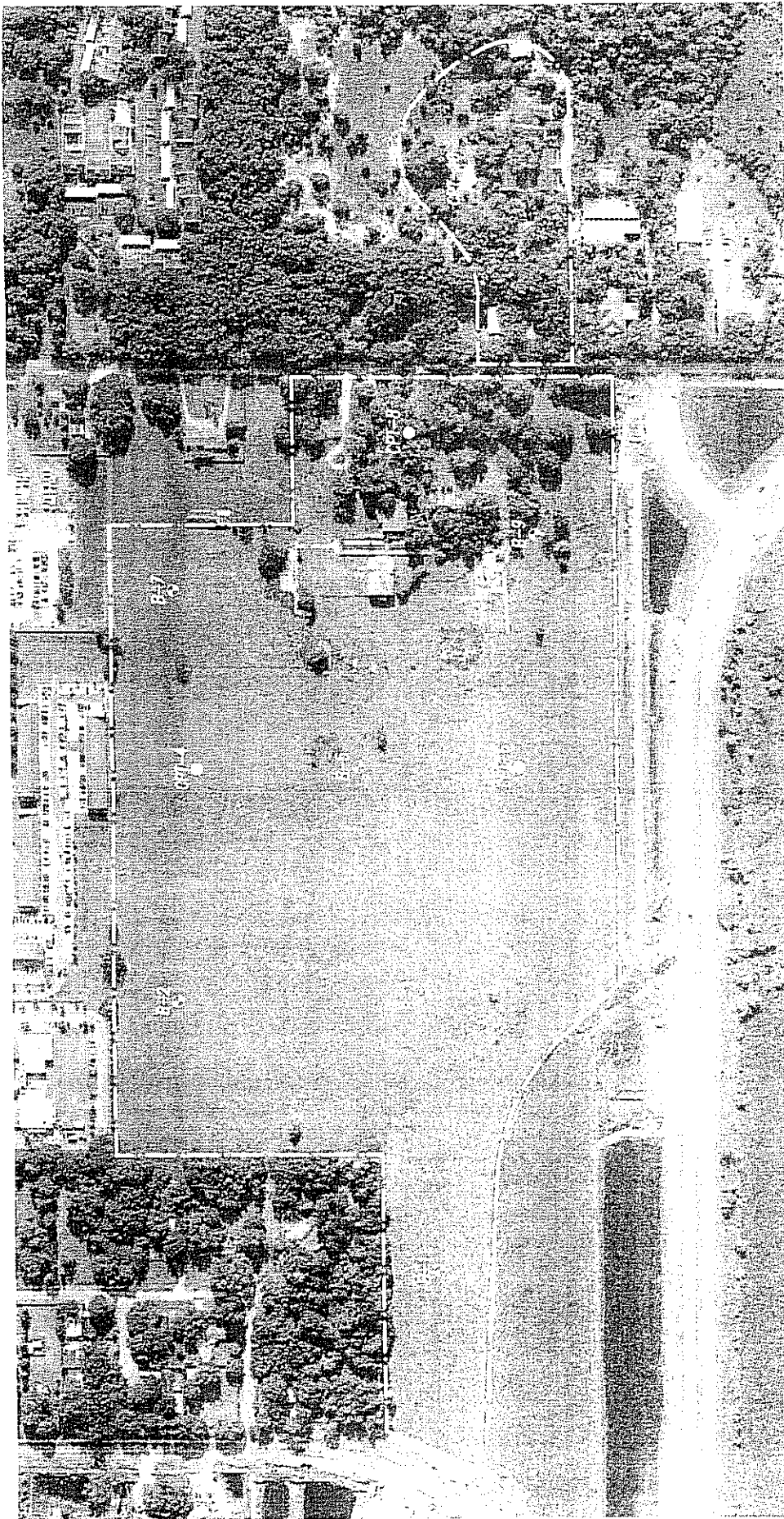
The Standard Penetration Test is a widely accepted method of in-situ testing of foundation soils (ASTM D 1586). A 2-foot long, 2-inch outside diameter (1-3/8-inch inside diameter), split-barrel ("spoon") sampler, attached to the end of drilling rods, is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each six inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load. The N-value is considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive soils.

The tests are usually performed at 5-foot intervals. However, more frequent or continuous testing is done by our firm through depths where a more accurate definition of the soils is required. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. Usually, the circulating fluid, which is a bentonite drilling mud, also serves to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or to prevent the loss of circulating fluid.

Representative split-spoon samples from soils at every 5 feet of drilled depth and from every different stratum are brought to our laboratory in airtight jars for further evaluation and testing, if necessary. Samples not used in testing are stored for at least 60 days prior to being discarded. After completion of a test boring, the hole is kept open until a steady state ground water level is recorded. The hole is then

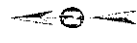
sealed if necessary and backfilled.





LEGEND

- APPROXIMATE LOCATION OF SPT BORINGS
- APPROXIMATE LOCATION OF CPT SOUNDINGS



SCALE: 1" = 250'

TEST LOCATION PLAN	
BAITARS PROPERTIES, INC. PAULS ROAD BRANDON, FLORIDA	
DATE: 11/1/05	SCALE: 1" = 250'
BY: J.P. SUTTER	NO. 2