GEO-TECH, INC.
ENGINEERING CONSULTANTS IN GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION MATERIALS TESTING

September 10, 2021
Project No. 21-7732.01.1

Denver Beck
Optimum Dealership Group, LLC
7400 S US Hwy 441
Ocala, Florida 34480

Reference: Optimum RV Service Center, 7400 S US Highway 441, Ocala, Florida
Geotechnical Site Exploration

Dear Mr. Beck:

As requested, Geo-Technologies, Inc. (Geo-Tech) has performed a site exploration at the project site. Services were conducted in accordance with our Proposal No. 11514 dated June 4, 2021.

The following report summarizes our findings, evaluations and recommendations. Generally accepted soils and foundation engineering practices were employed in the preparation of this report.

Geo-Tech appreciates the opportunity to provide our services for this project. Should you have any questions regarding the contents of this report or if we may be of further assistance, please do not hesitate to contact the undersigned.

Sincerely,

Grady N. Polk, E.I.
Staff Engineer

GNP/CAH/ca

CRAIG AUSTIN HAMPY LICENSE No 83240 STATE OF FLORIDA PROFESSIONAL ENGINEER

Craig A. Hampy, P.E.
Florida Registration No. 83240

Purposes
Purposes of this study were to explore the subsurface conditions in the proposed drainage retention and roadway/parking areas and provide geotechnical engineering site preparation recommendations to guide design and construction of the drainage retention areas and roadways/parking. Geo-Tech has also been asked to provide recommendations for lowering the estimated seasonal high water table.

Site Description
The project site is located on the northwest corner of the intersection at South Pine Avenue and SE 73rd Street in Ocala, Florida. At the time of our site exploration, the project site was covered with native trees and grasses. Boring Locations were provided to Geo-Tech by Kimley-Horn and Associates, Inc.

Exploration Program
Field exploration services for the geotechnical exploration consisted of the following:

Drainage Retention Areas

- Eight (8) direct push borings (DP-1 thru DP-8) to a depth of approximately fifteen (15) feet below existing site grade in the proposed drainage retention areas (ASTM D-6282). Direct Push borings were performed on June 21, 2021.

- Six (6) field horizontal and six (6) field vertical permeability tests in the proposed drainage retention areas. Permeability testing was performed on July 15, 2021.

Roadway/Parking Areas

- Five (5) direct push borings (P-1 thru P-5) to a depth of approximately six (6) feet below existing site grade in the proposed roadway/parking areas (ASTM D-6282). Direct Push borings were performed on June 21, 2021.

Sampling & Testing Descriptions

Auger Sampling
Auger borings were performed using the methodology outlined in ASTM D-4700. Auger boring sampling method consists of rotating an auger to advance the barrel into the ground. The operator may have to apply downward pressure to keep the auger advancing. When the barrel is filled, the unit is withdrawn from the cavity and a sample may be collected from the barrel.

Samples recovered during performance of our auger borings were visually classified in the field and representative portions of the samples were placed in containers and transported to our laboratory for further analysis.

Direct Push Sampling
Direct Push (DP) soil sampling method (ASTM D-6282) consists of advancing a sampling device into subsurface soils by applying static pressure, by applying impacts, or by applying vibration, or any combination thereof, to the above ground portion of the sampler extensions until sampler has

been advanced to the desired sampling depth. The sampler is recovered from the borehole and the sample removed from the sampler. The sampler is cleaned and the procedure repeated for the next desired sampling interval.

Sampling can be continuous for full depth borehole logging or incremental for specific interval sampling. Samplers used can be protected type for controlled specimen gathering or unprotected for general soil specimen collection. Direct push methods of soil sampling are used for geologic investigation, soil chemical composition studies, and water quality investigations. Continuous sampling is used to provide a lithological detail of the subsurface strata and to gather samples for classification and index.

Samples recovered during performance of our direct push borings were visually classified in the field and were transported to our laboratory for further analysis.

Findings

Drainage Retention Areas
Boring locations and general subsurface conditions found in our soil borings DP-1 thru DP-8 are graphically presented on the soil profiles in Appendix I. Horizontal lines designating the interface between differing materials found represent approximate boundaries. Transition between soil layers is typically gradual.

Soils found at our boring location DP-1 generally consisted of a surficial layer of fine sand approximately two (2) feet thick underlain by tree root debris, clayey sand, slightly sandy clay, and limestone to the depths pushed.

Soils found at our boring locations DP-2, DP-4, and DP-6 thru DP-8 generally consisted of a surficial layer of fine sand ranging from approximately three (3) feet to five and one-half (5½) feet thick underlain by clayey sand to the depths pushed.

Soils found at our boring locations DP-3 and DP-5 generally consisted of a surficial layer of fine sand ranging from approximately two (2) feet to four (4) feet thick underlain by clayey sand and slightly sandy clay to the depths pushed.

Ground water table levels were not found at our boring locations at the time of drilling.

Seasonal High Water Table Levels
Estimated seasonal high water table levels were found at depths ranging from approximately two (2) feet to five and one-half (5½) feet below existing site grade. Estimated seasonal high water table levels are indicated on the soil profiles at the appropriate depths.

Confining Layers
Confining layers were found at depths ranging from approximately nine and one-half (9½) feet below existing site grade to greater than the depths pushed. Confining layers are indicated on the soil profiles at the appropriate depths.

Permeability

Six (6) field horizontal and six (6) field vertical permeability tests were performed adjacent to our boring locations DP-1 thru DP-3 and DP-6 thru DP-8 at depths ranging from approximately one and one-half (1½) feet to three (3) feet below existing site grade. The resulting coefficients of horizontal and vertical permeabilities are noted on the soil profiles and in Table 1 below.

Table 1: Results of Permeability Testing

Boring No.	Depth of Test (feet)	KH Rate (feet/day)	KV Rate (feet/day)
DP-1	1.5	29.3	16.5
DP-2	3.0	19.4	10.8
DP-3	2.0	24.9	13.3
DP-6	2.0	20.4	12.3
DP-7	3.0	22.1	12.8
DP-8	3.0	17.2	9.3

Geo-Tech utilizes the U.S. Department of the Navy, Naval Facilities Engineering Command (1974) Standard methods for performing variable head tests to determine and calculate hydraulic conductivities.

Measured permeability rates should not be used for design purposes without an appropriate safety factor. Actual pond exfiltration rates will depend on many factors such as ground water mounding, pond bottom siltation, construction technique, and the amount of soil compaction during construction.

Roadway/Parking Areas

Boring locations and general subsurface conditions found in our soil borings P-1 thru P-5 are graphically presented on the soil profiles in Appendix I. Horizontal lines designating the interface between differing materials found represent approximate boundaries. Transition between soil layers is typically gradual.

Soils found at our boring locations P-1 thru P-5 generally consisted of a surficial layer of fine sand ranging from approximately two (2) feet to five (5) feet thick underlain by clayey sand to the depths drilled.

Ground water table levels were not found at our boring locations at the time of drilling. In Geo-Tech's opinion, groundwater levels are not expected to influence near surface construction. After periods of prolonged rainfall water may become perched above the clayey soils and deeper foundation systems may encounter a perched water condition.

Evaluations and Recommendations

Drainage Retention Areas

In Geo-Tech's opinion, the potential for lowering the ESHWTL is a possibility. Through a review of published and field data, the ESHWTL can potentially be lowered by undercutting the DRA. The other option would be to potentially reassess the existing published hydrologic group in order to provide a more site-specific hydrologic group by way of additional field permeabilities in the underlying soil stratums.

Roadway/Parking Areas

Based on the information from our borings, it is Geo-Tech's opinion that the upper fine sand soils appear to be suitable for roadway construction and will likely need to be stabilized prior to the addition of the limerock basecourse and asphalt pavement sections. However, if the final site grade is significantly lowered or if shallow pockets of sandy clay soils are found during the earthwork phase of construction, a minimum separation of two (2) feet should be maintained from the base of the stabilized subgrade to the top of the unsuitable clay soils. Stabilized subgrade should produce a minimum LBR of forty (40). Clayey sand soils found on site can be mixed with the upper fine sand soils.

Recommended Site Preparation

General Pavement Construction Recommendations

The following are our recommendations for overall site preparation and mechanical densification work for the pavement construction portion of the project, based on the anticipated construction and our boring results. These recommendations should be used as a guideline for the project general specifications, which are prepared by the Design Engineer. Site preparation and filling should be in accordance with the latest edition of the Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction and Standard Index 505.

1. The pavement area plus a five (5) foot margin should be stripped and cleared of surface vegetation, organic or root laden topsoil, and grubbed of roots and stumps. Organic soil or near surface clays and silts found and any other soils with organic content in excess of five (5) percent should be overexcavated or hauled elsewhere for restricted use as permitted by FDOT Indexes 500 and 505. A representative of our firm should observe the stripped grade to document adequate depth of stripping prior to filling.

2. The stripped area should be leveled sufficiently to permit equipment traffic, cut to grade if necessary, and then compacted using a large diameter, self-propelled, or tractor drawn vibratory roller. The vibratory drum roller should have a static drum weight of about four (4) tons and should be capable of exerting a minimum impact force of fifteen (15) tons. Careful observations should be made during proof-rolling to help identify any areas of soft yielding soils that may require over excavation and replacement. Care should be used when operating the compactor near existing structures to avoid transmissions of vibrations that could cause settlement damage or disturb occupants. Use of smaller vibratory or static compactor may be necessary in some instances. Construction operations that may be affected by vibration, such as pouring concrete, should be scheduled at times when nearby compaction operations are not taking place.

3. Prior to beginning compaction, soil moisture contents may need to be controlled in order to facilitate proper compaction. If additional moisture is necessary to achieve compaction objectives, then water should be applied in such a way that it will not cause erosion or removal of the subgrade soils. Moisture content within two (2) percentage points of the optimum indicated by the Modified Proctor test (ASTM D-1557) is recommended.

4. A minimum of ten (10) overlapping passes should be made by the vibratory drum roller across the stripped or cut ground surface. Compaction should continue to develop a minimum density requirement of ninety-eight (98) percent of the maximum Modified Proctor dry density established in accordance with ASTM D-1557, for a minimum depth of two (2) feet below the compacted surface, as determined by field density (compaction) test or in accordance with FDOT Index 505, whichever is higher.

5. Following satisfactory completion of the initial compaction on the existing grade, the pavement area may be brought up to finished subgrade levels if required. Fill should consist of fine sand with between three (3) to twelve (12) percent by dry weight passing a US Standard No. 200 sieve, free of rubble, organics, clay, debris, and other unsuitable material. **All structural fill should be pre-qualified prior to importing and placing.** Soils removed from the building cut areas can be used in this area also. Approved sand fill should be placed in loose lifts not exceeding twelve (12) inches in thickness and should be compacted to a minimum of ninety-eight (98) percent of the maximum Modified Proctor dry density. Density tests to confirm compaction should be performed in each fill lift before the next lift is placed.

6. Undercutting clayey soils should follow the recommendations in the previous section.

7. A representative from our firm should be retained to provide on-site observation of earthwork activities. The field technician would monitor the excavation of detrimental soil such as organics and plastic soils, placement of approved fills, proof-rolling and provide compaction testing. Density tests should be performed in surficial sands after proof rolling and in each fill lift thereafter. It is important that careful observation be made to confirm that the subsurface conditions are as we have discussed herein, and that foundation construction and fill placement is in accordance with our recommendations.

Flexible/Semi-Flexible Pavement Structure

Limerock could be considered as a base course for this site. Normal wet season groundwater levels should be controlled to at least eighteen (18) inches below a limerock base or associated stabilized subgrade (clean sand subgrade stabilized with a suitable imported cohesive soil), if one is used. Traffic loading conditions were not supplied to Geo-Tech at the time of this report writing, however, this design has been used as a general pavement section design and should be reviewed by Geo-Tech after loading conditions have been established.

As a guideline for pavement design, we recommended that the base course be a minimum of six (6) inches thick in standard parking areas and should be compacted to at least ninety-eight (98) percent of the Modified Proctor maximum dry density A stabilized subgrade (LBR= forty [40]) should be used below the limerock base course. Stabilized subgrade soils should be a minimum of eight (8) inches (standard pavement section) to twelve (12) inches (heavy pavement section) thick

and should be compacted to at least ninety-eight (98) percent of the Modified Proctor maximum dry density. Limerock should conform to FDOT specifications and should have a minimum LBR value of one-hundred (100), and should be compacted to at least ninety-eight (98) percent of the Modified maximum dry density (ASTM D-1557).

At a minimum, the asphaltic concrete wearing surface should consist of at least one and one-half (1½) inches of either Superpave 9.5 or Superpave 12.5 asphaltic concrete meeting current Florida Department of Transportation specifications and placement and compaction procedures. **Specific requirements for asphaltic concrete are outlined in sections 333 and 331 in FDOT Standard Specifications for Road and Bridge Construction – latest edition.** Superpave 9.5, although somewhat more expensive, offers increased stability. Superpave 12.5, which is more durable, should not be used unless the surface course is at least one and one-half (1½) inches thick because of the coarse aggregate. Superpave 9.5, which is somewhat finer aggregate, is also relatively durable and can be used in one (1) inch thickness. Superpave 9.5 or Superpave 12.5 is the preferred surface course. It is, however, important to point out that many combinations of asphaltic concrete, base course, and stabilized subgrade can be considered and that the above suggestions/guidelines are based only on our past experience with similar projects.

Rigid Pavement Structure

Experience has indicated that high quality concrete placed on compacted free draining clean natural or fill subgrade can provide satisfactory, long-term performance as a pavement wearing surface. Good performance and low maintenance is highly dependent on satisfactory subgrade drainage and closely spaced joints. A control pattern of fifteen (15) feet by fifteen (15) feet is highly recommended by the Florida Concrete Products Association. We suggest that there should be at least twenty-four (24) inches between the bottom of the surface course and the seasonal high groundwater table.

Pavement thickness and concrete design strength will depend on such variables as anticipated wheel loads, number of load applications, and the subgrade LBR value of the native soils. Based on our local experience, Geo-Tech recommends stabilizing the subgrade beneath all concrete pavements to a depth of twelve (12) inches and a minimum LBR of forty (40). Reinforcement should consist of 6"x 6"x10" gauge wire mesh.

The pavement areas should first be cleared and grubbed of any surface vegetation, tree root systems and organic topsoil. The stripped subgrade should be compacted to ninety-five (95) percent of the Modified Proctor maximum density (ASTM D-1557) to a depth of twelve (12) inches. Site raising fill should consist of clean sand, placed in twelve (12) inch lifts. Each lift compacted to ninety-five (95) percent of the Modified Proctor maximum dry density. The final twelve (12) inch lift shall consist of stabilized subgrade, compacted to ninety-eight (98) percent of the Modified Proctor maximum dry density.

Transverse reinforcement and load transfer devices should be employed as recommended by the Florida Concrete Products Association's design guidelines. Expansion joints should be incorporated into the pavement, at its juncture with building perimeters, manholes, inlet boxes, radii, and other appropriate locations. We also recommend control joints should be cut at fifteen (15) foot intervals in both directions to a depth of four (4) inches.

Table 2: Pavement Design Summary

Component	Asphalt		Concrete Heavy
	Standard	Heavy	
Stabilized Subgrade LBR 40	8 inches	12 inches	12 inches
Base Material Limerock LBR 100 (stone, sand/shell, etc.)	6 inches	9 inches	--
Asphalt Base Course	(not required)		
Leveling Binder Course	--	--	--
Surface Course	1½ inches	3 inches	8 inches

Note: This information shall not be used separately from the geotechnical report and should be reviewed by Geo-Tech when traffic loading conditions are established.

Closure/General Qualifications

This report has been prepared in order to aid evaluation of the project site and to assist various design professionals in the design of the drainage retention areas and roadways/parking areas. The scope is limited to the specific project and the location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil and foundation characteristics. In the event that any changes in present project concepts as outlined in this report are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified as necessary in writing by the soils and foundation engineer.

It is recommended that all construction operations dealing with earthwork and foundations be reviewed by our soil engineer to provide information on which to base a decision whether the design requirements are fulfilled in the actual construction. Evaluations and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the Boring Location Map, and from any other information discussed in this report. This report does not reflect any variations, which may occur between these borings. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. Variations in soil and rock conditions exist on most sites between boring locations. Groundwater levels may also vary from time to time. The nature and extent of variations may not become evident until the course of construction. If variations then appear evident, it will be necessary for a re-evaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of any variations.

APPENDIX I

SOIL PROFILES

Log of Borehole: DP-1

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	67.9		
1		**FINE SAND** BROWN FINE SAND (SP)		1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROX. 1.5 FEET = 29.3 FEET/DAY
2			65.9		FIELD VERTICAL PERMEABILITY RATE AT APPROX. 1.5 FEET = 16.5 FEET/DAY
3		**TREE ROOT** TREE ROOT DEBRIS		2	
4					
5			62.9		ESHWTL AT APPROX. 5.0 FEET
6		**CLAYEY SAND** LIGHT GREY AND BROWN CLAYEY SAND (SC)			
7				3	
8					
9					
10			57.9		CONFINING LAYER AT APPROX. 10.0 FEET
11		**SLIGHTLY SANDY CLAY** LIGHT GREEN AND REDDISH BROWN SLIGHTLY SANDY CLAY (CH)			
12				4	
13					
14			53.4		
15		**LIMESTONE** LIGHT BROWN LIMESTONE	52.9	5	
16		End of Borehole			
17					
18					
19					
20					

Ground Water Depth: GREATER THAN DEPTH PUSHED Drilled By: CC/JH

Drill Date: JUNE 18, 2021 Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: DP-2

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	71.5		
1–4		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	67.0	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROX. 3.0 FEET = 19.4 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROX. 3.0 FEET = 10.8 FEET/DAY ESHWTL AT APPROX. 4.5 FEET
5–15		**CLAYEY SAND** REDDISH BROWN AND GREY TO GREY AND BROWN CLAYEY SAND (SC)	56.5	2	
15		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED
16–20					

Ground Water Depth: GREATER THAN DEPTH PUSHED Drilled By: CC/JH

Drill Date: JUNE 18, 2021 Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 2 OF 13

Log of Borehole: DP-3

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	66.5		
1–4		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	62.5	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROX. 2.0 FEET = 24.9 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROX. 2.0 FEET = 13.3 FEET/DAY ESHWTL AT APPROX. 4.0 FEET
4–13		**CLAYEY SAND** REDDISH BROWN AND GREY TO GREY CLAYEY SAND (SC)	53.5	2	
13–15		**SLIGHTLY SANDY CLAY** LIGHT GREEN AND BROWN SLIGHTLY SANDY CLAY (CH)	51.5	3	CONFINING LAYER AT APPROX. 13.0 FEET
15		End of Borehole			

Ground Water Depth: GREATER THAN DEPTH PUSHED Drilled By: CC/JH

Drill Date: JUNE 18, 2021 Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: DP-4

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441
Project No: 21-7732.01.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: OPTIMUM RV
Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	64.7		
1–4		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	60.7	1	
4–15		**CLAYEY SAND** REDDISH BROWN AND GREY TO GREY AND BROWN CLAYEY SAND (SC)	49.7	2	ESHWTL AT APPROX. 4.0 FEET
15		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED

Ground Water Depth: GREATER THAN DEPTH PUSHED
Drill Date: JUNE 21, 2021
Drilled By: RD/TB
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: DP-5

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	64.5		
1		**FINE SAND** BROWN FINE SAND (SP)		1	
2			62.5		ESHWTL AT APPROX. 2.0 FEET
3		**CLAYEY SAND** BROWN AND LIGHT GREY TO LIGHT GREY AND BROWN CLAYEY SAND (SC)			
4					
5					
6				2	
7					
8					
9			55.0		
10		**SLIGHTLY SANDY CLAY** LIGHT GREEN AND REDDISH BROWN SLIGHTLY SANDY CLAY (CH)			CONFINING LAYER AT APPROX. 9.5 FEET
11					
12				3	
13					
14					
15			49.5		
16		End of Borehole			
17					
18					
19					
20					

Ground Water Depth: GREATER THAN DEPTH PUSHED Drilled By: RD/TB

Drill Date: JUNE 21, 2021 Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: DP-6

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441
Project No: 21-7732.01.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: OPTIMUM RV
Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	65.5		
1–3		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	62.5	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROX. 2.0 FEET = 20.4 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROX. 2.0 FEET = 12.3 FEET/DAY ESHWTL AT APPROX. 3.0 FEET
3–15		**CLAYEY SAND** BROWN AND GREY TO GREY CLAYEY SAND (SC)	50.5	2	
15		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED
16–20					

Ground Water Depth: GREATER THAN DEPTH PUSHED
Drill Date: JUNE 21, 2021
Drilled By: RD/TB
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 6 OF 13

Log of Borehole: DP-7

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441
Project No: 21-7732.01.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: OPTIMUM RV
Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	70.5		
1–5		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	65.0	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROX. 3.0 FEET = 22.1 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROX. 3.0 FEET = 12.8 FEET/DAY ESHWTL AT APPROX. 5.5 FEET
6–15		**CLAYEY SAND** GREY AND REDDISH BROWN CLAYEY SAND (SC)	55.5	2	
15		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED

Ground Water Depth: GREATER THAN DEPTH PUSHED
Drill Date: JUNE 21, 2021
Drilled By: RD/TB
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 7 OF 13

Log of Borehole: DP-8

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441
Project No: 21-7732.01.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: OPTIMUM RV
Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	66.8		
1–4		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	62.3	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROX. 3.0 FEET = 17.2 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROX. 3.0 FEET = 9.3 FEET/DAY ESHWTL AT APPROX. 4.5 FEET
5–14		**CLAYEY SAND** BROWN AND GREY TO GREY AND REDDISH BROWN CLAYEY SAND (SC)	51.8	2	
15		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED
16–20					

Ground Water Depth: GREATER THAN DEPTH PUSHED
Drill Date: JUNE 21, 2021
Drilled By: RD/TB
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: P-1

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	76.20		
1		FINE SAND BROWN FINE SAND (A-3)		1	
2			74.20		
3		CLAYEY SAND BROWN CLAYEY SAND (A-2-6)			
4				2	
5					
6			70.20		
		End of Borehole			
7					
8					

Ground Water Depth: GREATER THAN DEPTH DRILLED

Drill Date: JUNE 21, 2021

Drilled By: CC/LE/JH

Drill Method: ASTM D-4700

Remarks: (A-3) AASHTO CLASSIFICATION SYSTEM

Soil Profile : 9 OF 13

Log of Borehole: P-2

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441
Project No: 21-7732.01.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	77.69		
0–3		**FINE SAND** BROWN FINE SAND (A-3)	74.69	1	
3–6		**CLAYEY SAND** BROWN CLAYEY SAND (A-2-6)	71.69	2	
6		End of Borehole			

Ground Water Depth: GREATER THAN DEPTH DRILLED
Drill Date: JUNE 21, 2021
Drilled By: CC/LE/JH
Drill Method: ASTM D-4700
Remarks: (A-3) AASHTO CLASSIFICATION SYSTEM

Log of Borehole: P-3

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	79.17		
		FINE SAND BROWN FINE SAND (A-3)		1	
2			77.17		
		CLAYEY SAND BROWN BROWN CLAYEY SAND (A-2-6) WITH LIMESTONE		2	
6			73.17		
		End of Borehole			
8					

Ground Water Depth: GREATER THAN DEPTH DRILLED
Drill Date: JUNE 21, 2021

Drilled By: CC/LE/JH
Drill Method: ASTM D-4700

Remarks: (A-3) AASHTO CLASSIFICATION SYSTEM

Soil Profile : 11 OF 13

Log of Borehole: P-4

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441
Project No: 21-7732.01.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	75.30		
		FINE SAND BROWN FINE SAND (A-3)			
5			70.30	1	
		CLAYEY SAND BROWN CLAYEY SAND (A-2-6)		2	
6			69.30		
		End of Borehole			
8					

Ground Water Depth: GREATER THAN DEPTH DRILLED
Drill Date: JUNE 21, 2021
Drilled By: CC/LE/JH
Drill Method: ASTM D-4700

Remarks: (A-3) AASHTO CLASSIFICATION SYSTEM

Soil Profile : 12 OF 13

Log of Borehole: P-5

Project: PROP. OPTIMUM RV SERVICE CENTER, 7400 S. US HWY 441 Project No: 21-7732.01.1

Boring Location: (SEE SITE PLAN) Engineer: NJH/DAC

Client: OPTIMUM RV Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	69.41		
1		FINE SAND BROWN FINE SAND (A-3)			
2				1	
3					
4					
5			64.41		
		CLAYEY SAND BROWN CLAYEY SAND (A-2-6)		2	
6			63.41		
		End of Borehole			
7					
8					

Ground Water Depth: GREATER THAN DEPTH DRILLED Drilled By: CC/LE/JH

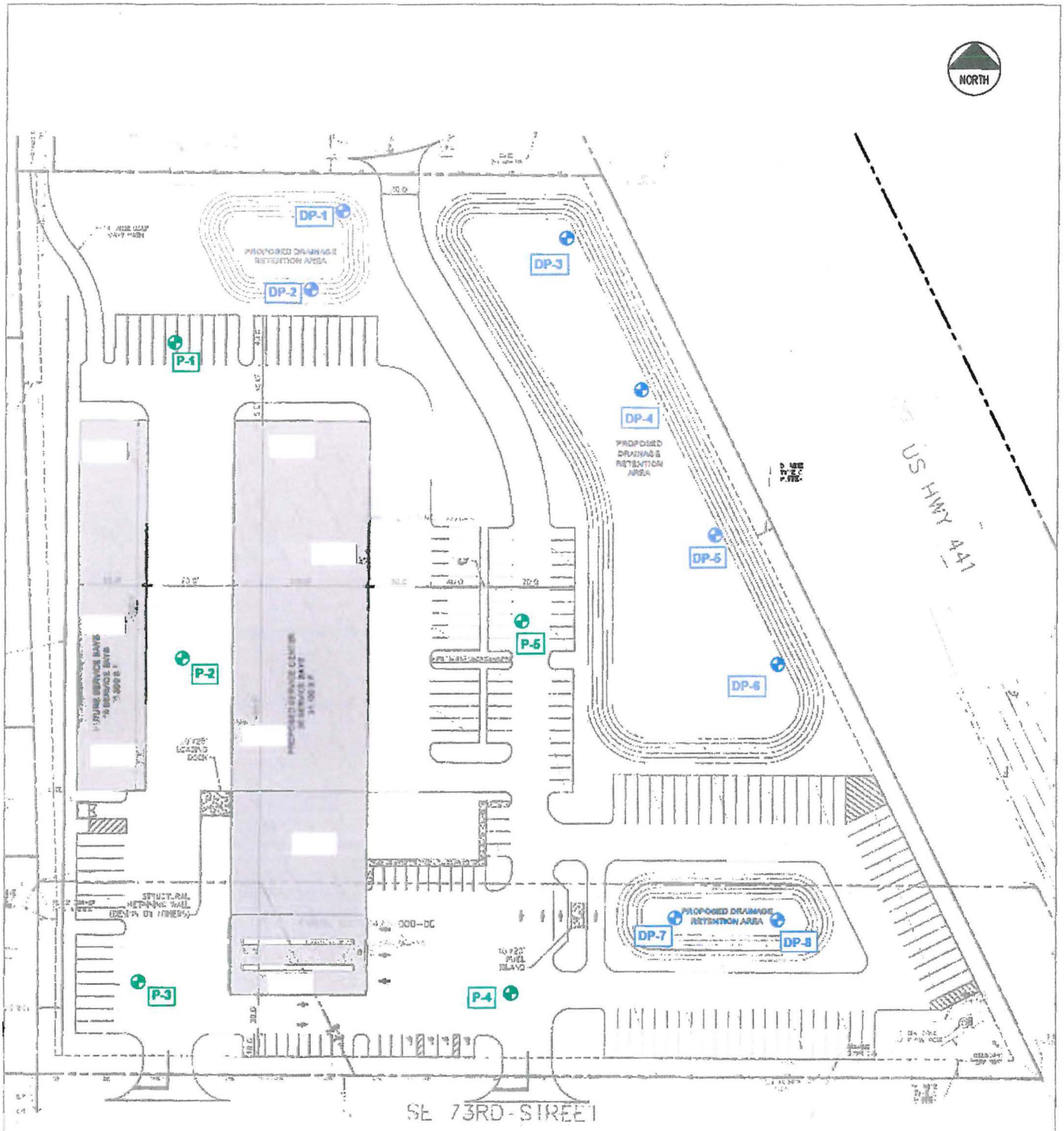
Drill Date: JUNE 21, 2021 Drill Method: ASTM D-4700

Remarks: (A-3) AASHTO CLASSIFICATION SYSTEM

Soil Profile : 13 OF 13

APPENDIX II

BORING LOCATION MAP



= APPROXIMATE DIRECT PUSH BORING LOCATION
= APPROXIMATE AUGER PUSH BORING LOCATION

OPTIMUM RV

PROPOSED OPTIMUM RV SERVICE CENTER
7400 SOUTH HIGHWAY 441
OCALA, FLORIDA

BORING LOCATION MAP

GEO-TECH, INC.
GEOTECHNICAL ENVIRONMENTAL
CONSTRUCTION MATERIALS TESTING GEOPHYSICAL EXPLORATION
1016 SE 3rd AVENUE, OCALA, FLORIDA 34471 ~ (352) 694-7711

PROJECT NO. 21-7732.01.1
SCALE: N.T.S.
DATE: 8/25/21
FIGURE: 1

GEO-TECH, INC.
ENGINEERING CONSULTANTS IN GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION MATERIALS TESTING

August 22, 2022
Project No. 22-7732.03.1

Denver Beck
Optimum Dealership Group, LLC
7400 S US Hwy 441
Ocala, Florida 34480

Reference: Proposed Drainage Retention Area (DRA) & Pavement Area, PID #36474-001-00
US Hwy 301, Marion County, Florida
Geotechnical Site Exploration

Dear Mr. Beck:

As requested, Geo-Technologies, Inc. (Geo-Tech) has performed a site exploration at the project site. Services were conducted in accordance with our Proposal No. 12639 dated July 14, 2022.

The following report summarizes our findings, evaluations and recommendations. Generally accepted soils and foundation engineering practices were employed in the preparation of this report.

Geo-Tech appreciates the opportunity to provide our services for this project. Should you have any questions regarding the contents of this report or if we may be of further assistance, please do not hesitate to contact the undersigned.

Sincerely,

Grady N. Polk, E.I.
Staff Engineer

GNP/CAH/lso

CRAIG AUSTIN HAMPY LICENSE No 83240 STATE OF FLORIDA PROFESSIONAL ENGINEER

8/23/22

Craig A. Hampy, P.E.
Florida Registration No. 83240

Purposes
Purposes of this study were to explore the subsurface conditions in the proposed drainage retention and pavement areas and provide geotechnical engineering site preparation recommendations to guide design and construction of the drainage retention areas and pavement areas.

Site Description
The project site is located at Parcel No. 36474-001-00. The property is approximately two hundred and fifty (250) feet south and one hundred seventy-five (175) feet west of the intersection of US Highway 301 and SE 69th Lane in Ocala, Florida. At the time of our site exploration, the project site was covered with native trees and grasses.

Exploration Program
Field exploration services for the geotechnical exploration consisted of the following:

Drainage Retention Area

- Three (3) direct push borings (P-1 thru P-3) to a depth of approximately twenty (20) feet below existing site grade in the proposed drainage retention area (ASTM D-6282). Direct Push borings were performed on August 4, 2022.

- Three (3) field horizontal and three (3) field vertical permeability tests in the proposed drainage retention area. Permeability testing was performed on August 15, 2022.

Pavement Areas

- Three (3) direct push borings (R-1 thru R-3) to a depth of approximately six (6) feet below existing site grade in the proposed pavement areas (ASTM D-6282). Direct Push borings were performed on August 4, 2022.

Boring locations were provided to Geo-Tech by Kimley-Horn and Associates Engineering, Inc.

Sampling & Testing Descriptions

Direct Push Sampling
Direct Push (DP) soil sampling method (ASTM D-6282) consists of advancing a sampling device into subsurface soils by applying static pressure, by applying impacts, or by applying vibration, or any combination thereof, to the above ground portion of the sampler extensions until sampler has been advanced to the desired sampling depth. The sampler is recovered from the borehole and the sample removed from the sampler. The sampler is cleaned and the procedure repeated for the next desired sampling interval.

Sampling can be continuous for full depth borehole logging or incremental for specific interval sampling. Samplers used can be protected type for controlled specimen gathering or unprotected for general soil specimen collection. Direct push methods of soil sampling are used for geologic investigation, soil chemical composition studies, and water quality investigations. Continuous sampling is used to provide a lithological detail of the subsurface strata and to gather samples for classification and index.

Samples recovered during performance of our direct push borings were visually classified in the field and were transported to our laboratory for further analysis.

Findings

Drainage Retention Area

General subsurface conditions found in our soil borings P-1 thru P-3 are graphically presented on the soil profiles in Appendix I. Horizontal lines designating the interface between differing materials found represent approximate boundaries. Transition between soil layers is typically gradual.

Soils found at our boring locations generally consisted of a surficial layer of fine sand ranging from approximately one (1) to five (5) feet thick underlain by clayey sand and slightly sandy clay to the depths drilled.

Ground water table levels were not found at our boring locations at the time of drilling.

Seasonal High Water Table Levels

Estimated seasonal high water table levels were found at depths ranging from approximately one (1) to five (5) feet below existing site grade. Estimated seasonal high water table levels are indicated on the soil profiles at the appropriate depths.

Confining Layers

Confining layers were found at depths ranging from approximately eleven (11) to sixteen (16) feet below existing site grade. Confining layers are indicated on the soil profiles at the appropriate depths.

Permeability

Three (3) field horizontal and three (3) field vertical permeability tests were performed adjacent to our boring locations at a depth of approximately three (3) feet below existing site grade. The resulting coefficients of horizontal and vertical permeabilities are noted on the soil profiles.

Geo-Tech utilizes the U.S. Department of the Navy, Naval Facilities Engineering Command (1974) Standard methods for performing variable head tests to determine and calculate hydraulic conductivities.

Measured permeability rates should not be used for design purposes without an appropriate safety factor. Actual pond exfiltration rates will depend on many factors such as ground water mounding, pond bottom siltation, construction technique, and the amount of soil compaction during construction.

Pavement Areas

General subsurface conditions found in our soil borings R-1 thru R-3 are graphically presented on the soil profiles in Appendix I. Horizontal lines designating the interface between differing materials found represent approximate boundaries. Transition between soil layers is typically gradual.

Soils found at our boring locations R-1 and R-2 generally consisted of a surficial layer of fine sand to the depths drilled.

Soils found at our boring location R-3 generally consisted of a surficial layer of fine sand approximately four and one-half (4½) feet thick underlain by clayey sand to the depth drilled.

Ground water table levels were not found at our boring locations at the time of drilling. In Geo-Tech's opinion, groundwater levels may influence near surface construction. After periods of prolonged rainfall, water may become perched above the clayey soils and deeper foundation systems may encounter a perched water condition.

Evaluations and Recommendations

Pavement Areas
Based on the information from our borings, it is Geo-Tech's opinion that the upper fine sand soils appear to be suitable for roadway construction and will likely need to be stabilized prior to the addition of the limerock basecourse and asphalt pavement sections. However, if the final site grade is significantly lowered or if shallow pockets of clayey sand soils are found during the earthwork phase of construction, a minimum separation of two (2) feet should be maintained from the base of the stabilized subgrade to the top of the unsuitable clay soils. Stabilized subgrade should produce a minimum LBR of forty (40).

Recommended Site Preparation

Pavement Areas

General Pavement Construction Recommendations
The following are our recommendations for overall site preparation and mechanical densification work for the pavement construction portion of the project, based on the anticipated construction and our boring results. These recommendations should be used as a guideline for the project general specifications, which are prepared by the Design Engineer. Site preparation and filling should be in accordance with the latest edition of the Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction and Standard Index 505.

1. The pavement area plus a five (5) foot margin should be stripped and cleared of surface vegetation, organic or root laden topsoil, and grubbed of roots and stumps. Organic soil or near surface clays and silts found and any other soils with organic content in excess of five (5) percent should be overexcavated or hauled elsewhere for restricted use as permitted by FDOT Indexes 500 and 505. A representative of our firm should observe the stripped grade to document adequate depth of stripping prior to filling.

2. The stripped area should be leveled sufficiently to permit equipment traffic, cut to grade if necessary, and then compacted using a large diameter, self-propelled, or tractor drawn vibratory roller. The vibratory drum roller should have a static drum weight of about four (4) tons and should be capable of exerting a minimum impact force of fifteen (15) tons. Careful observations should be made during proof-rolling to help identify any areas of soft yielding soils that may require over excavation and replacement. Care should be used when operating

the compactor near existing structures to avoid transmissions of vibrations that could cause settlement damage or disturb occupants. Use of smaller vibratory or static compactor may be necessary in some instances. Construction operations that may be affected by vibration, such as pouring concrete, should be scheduled at times when nearby compaction operations are not taking place.

3. Prior to beginning compaction, soil moisture contents may need to be controlled in order to facilitate proper compaction. If additional moisture is necessary to achieve compaction objectives, then water should be applied in such a way that it will not cause erosion or removal of the subgrade soils. Moisture content within two (2) percentage points of the optimum indicated by the Modified Proctor test (ASTM D-1557) is recommended.

4. A minimum of ten (10) overlapping passes should be made by the vibratory drum roller across the stripped or cut ground surface. Compaction should continue to develop a minimum density requirement of ninety-eight (98) percent of the maximum Modified Proctor dry density established in accordance with ASTM D-1557, for a minimum depth of two (2) feet below the compacted surface, as determined by field density (compaction) test or in accordance with FDOT Index 505, whichever is higher.

5. Following satisfactory completion of the initial compaction on the existing grade, the pavement area may be brought up to finished subgrade levels if required. Fill should consist of fine sand with between three (3) to twelve (12) percent by dry weight passing a US Standard No. 200 sieve, free of rubble, organics, clay, debris, and other unsuitable material. **All structural fill should be pre-qualified prior to importing and placing.** Soils removed from the building cut areas can be used in this area also. Approved sand fill should be placed in loose lifts not exceeding twelve (12) inches in thickness and should be compacted to a minimum of ninety-eight (98) percent of the maximum Modified Proctor dry density. Density tests to confirm compaction should be performed in each fill lift before the next lift is placed.

6. Undercutting clayey soils should follow the recommendations in the previous section.

7. A representative from our firm should be retained to provide on-site observation of earthwork activities. The field technician would monitor the excavation of detrimental soil such as organics and plastic soils, placement of approved fills, proof-rolling and provide compaction testing. Density tests should be performed in surficial sands after proof rolling and in each fill lift thereafter. It is important that careful observation be made to confirm that the subsurface conditions are as we have discussed herein, and that foundation construction and fill placement is in accordance with our recommendations.

Flexible/Semi-Flexible Pavement Structure

Limerock could be considered as a base course for this site. Normal wet season groundwater levels should be controlled to at least eighteen (18) inches below a limerock base or associated stabilized subgrade (clean sand subgrade stabilized with a suitable imported cohesive soil), if one is used. Traffic loading conditions were not supplied to Geo-Tech at the time of this report writing, however, this design has been used as a general pavement section design and should be reviewed by Geo-Tech after loading conditions have been established.

As a guideline for pavement design, we recommended that the base course be a minimum of six (6) inches thick in standard parking areas and should be compacted to at least ninety-eight (98) percent of the Modified Proctor maximum dry density A stabilized subgrade (LBR= forty [40]) should be used below the limerock base course. Stabilized subgrade soils should be a minimum of eight (8) inches (standard pavement section) to twelve (12) inches (heavy pavement section) thick and should be compacted to at least ninety-eight (98) percent of the Modified Proctor maximum dry density. Limerock should conform to FDOT specifications and should have a minimum LBR value of one-hundred (100), and should be compacted to at least ninety-eight (98) percent of the Modified maximum dry density (ASTM D-1557).

At a minimum, the asphaltic concrete wearing surface should consist of at least one and one-half (1½) inches of either Superpave 9.5 or Superpave 12.5 asphaltic concrete meeting current Florida Department of Transportation specifications and placement and compaction procedures. **Specific requirements for asphaltic concrete are outlined in sections 333 and 331 in FDOT Standard Specifications for Road and Bridge Construction – latest edition.** Superpave 9.5, although somewhat more expensive, offers increased stability. Superpave 12.5, which is more durable, should not be used unless the surface course is at least one and one-half (1½) inches thick because of the coarse aggregate. Superpave 9.5, which is somewhat finer aggregate, is also relatively durable and can be used in one (1) inch thickness. Superpave 9.5 or Superpave 12.5 is the preferred surface course. It is, however, important to point out that many combinations of asphaltic concrete, base course, and stabilized subgrade can be considered and that the above suggestions/guidelines are based only on our past experience with similar projects.

Rigid Pavement Structure

Experience has indicated that high quality concrete placed on compacted free draining clean natural or fill subgrade can provide satisfactory, long-term performance as a pavement wearing surface. Good performance and low maintenance is highly dependent on satisfactory subgrade drainage and closely spaced joints. A control pattern of fifteen (15) feet by fifteen (15) feet is highly recommended by the Florida Concrete Products Association. We suggest that there should be at least twenty-four (24) inches between the bottom of the surface course and the seasonal high groundwater table.

Pavement thickness and concrete design strength will depend on such variables as anticipated wheel loads, number of load applications, and the subgrade LBR value of the native soils. Based on our local experience, Geo-Tech recommends stabilizing the subgrade beneath all concrete pavements to a depth of twelve (12) inches and a minimum LBR of forty (40). Reinforcement should consist of 6"x 6"x10 gauge wire mesh.

The pavement areas should first be cleared and grubbed of any surface vegetation, tree root systems and organic topsoil. The stripped subgrade should be compacted to ninety-five (95) percent of the Modified Proctor maximum density (ASTM D-1557) to a depth of twelve (12) inches. Site raising fill should consist of clean sand, placed in twelve (12) inch lifts. Each lift compacted to ninety-five (95) percent of the Modified Proctor maximum dry density. The final twelve (12) inch lift shall consist of stabilized subgrade, compacted to ninety-eight (98) percent of the Modified Proctor maximum dry density.

Transverse reinforcement and load transfer devices should be employed as recommended by the Florida Concrete Products Association's design guidelines. Expansion joints should be incorporated into the pavement, at its juncture with building perimeters, manholes, inlet boxes, radii, and other appropriate locations. We also recommend control joints should be cut at fifteen (15) foot intervals in both directions to a depth of four (4) inches.

Table 1: Pavement Design Summary

Component	Asphalt		Concrete Heavy
	Standard	Heavy	
Stabilized Subgrade LBR 40	8 inches	12 inches	12 inches
Base Material Limerock LBR 100 (stone, sand/shell, etc.)	6 inches	9 inches	--
Asphalt Base Course	(not required)		
Leveling Binder Course	--	--	--
Surface Course	1½ inches	3 inches	8 inches

Note: This information shall not be used separately from the geotechnical report and should be reviewed by Geo-Tech when traffic loading conditions are established.

Closure/General Qualifications

This report has been prepared in order to aid evaluation of the project site and to assist various design professionals in the design of the drainage retention area and pavement areas. The scope is limited to the specific project and the location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil and foundation characteristics. In the event that any changes in present project concepts as outlined in this report are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified as necessary in writing by the soils and foundation engineer.

It is recommended that all construction operations dealing with earthwork and foundations be reviewed by our soil engineer to provide information on which to base a decision whether the design requirements are fulfilled in the actual construction. Evaluations and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the Boring Location Map, and from any other information discussed in this report. This report does not reflect any variations, which may occur between these borings. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. Variations in soil and rock conditions exist on most sites between boring locations. Groundwater levels may also vary from time to time. The nature and extent of variations may not become evident until the course of construction. If variations then appear evident, it will be necessary for a re-evaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of any variations.

APPENDIX I

SOIL PROFILES

Log of Borehole: P-1

Project: PARCEL NO. 36474-001-00, US HIGHWAY 301, OCALA, FL
Project No: 22-7732.03.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
1		FINE SAND BROWN FINE SAND (SP)	1.0	1	ESHWTL AT APPROX. 1.0 FOOT
2–10		CLAYEY SAND YELLOWISH BROWN AND GREY CLAYEY SAND (SC)		2	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 3.0 FEET = 7.0 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROXIMATELY 3.0 FEET = 4.0 FEET/DAY
11			11.0		CONFINING LAYER AT APPROX. 11.0 FEET
12–19		SLIGHTLY SANDY CLAY GREY AND YELLOWISH BROWN SLIGHTLY SANDY CLAY (CH)		3	
20			20.0		
21		End of Borehole			
22					

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 4, 2022
Drilled By: RD/CF
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: P-2

Project: PARCEL NO. 36474-001-00, US HIGHWAY 301, OCALA, FL
Project No: 22-7732.03.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–5		FINE SAND BROWN FINE SAND (SP)	5.0	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 3.0 FEET = 13.2 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROXIMATELY 3.0 FEET = 8.4 FEET/DAY ESHWTL AT APPROX. 5.0 FEET
5–16		CLAYEY SAND YELLOWISH BROWN AND GREY CLAYEY SAND (SC)	16.0	2	
16–20		SLIGHTLY SANDY CLAY GREY AND YELLOWISH BROWN SLIGHTLY SANDY CLAY (CH)	20.0	3	CONFINING LAYER AT APPROX. 16.0 FEET
20		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 4, 2022
Drilled By: RD/CF
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: P-3

Project: PARCEL NO. 36474-001-00, US HIGHWAY 301, OCALA, FL
Project No: 22-7732.03.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		FINE SAND BROWN FINE SAND (SP)	4.5	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 3.0 FEET = 8.5 FEET/DAY FIELD VERTICAL PERMEABILITY RATE AT APPROXIMATELY 3.0 FEET = 5.1 FEET/DAY ESHWTL AT APPROX. 4.5 FEET
5–16		CLAYEY SAND YELLOWISH BROWN AND GREY CLAYEY SAND (SC)	16.0	2	
16–20		SLIGHTLY SANDY CLAY GREY AND YELLOWISH BROWN SLIGHTLY SANDY CLAY (CH)	20.0	3	CONFINING LAYER AT APPROX. 16.0 FEET
20		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 4, 2022
Drilled By: RD/CF
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 3 OF 6

Log of Borehole: R-1

Project: PARCEL NO. 36474-001-00, US HIGHWAY 301, OCALA, FL
Project No: 22-7732.03.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–6		FINE SAND BROWN FINE SAND (A-3)		1	
6		End of Borehole	6.0		
7					
8					
9					
10					

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 4, 2022
Drilled By: RD/CF
Drill Method: ASTM D-6282

Remarks: (A-3) AASHTO SOIL CLASSIFICATION SYSTEM

Log of Borehole: R-2

Project: PARCEL NO. 36474-001-00, US HIGHWAY 301, OCALA, FL
Project No: 22-7732.03.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
		FINE SAND BROWN FINE SAND (A-3)		1	
6			6.0		
		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 4, 2022
Drilled By: RD/CF
Drill Method: ASTM D-6282

Remarks: (A-3) AASHTO SOIL CLASSIFICATION SYSTEM

Soil Profile : 5 OF 6

Log of Borehole: R-3

Project: PARCEL NO. 36474-001-00, US HIGHWAY 301, OCALA, FL
Project No: 22-7732.03.1
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		FINE SAND BROWN FINE SAND (A-3)	4.5	1	
4–6		CLAYEY SAND YELLOWISH BROWN CLAYEY SAND (A-2-6)	6.0	2	
6		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 4, 2022
Drilled By: RD/CF
Drill Method: ASTM D-6282

Remarks: (A-3) AASHTO SOIL CLASSIFICATION SYSTEM

Soil Profile : 6 OF 6

APPENDIX II

BORING LOCATION MAP


GEO-TECH, INC.
■GEOTECHNICAL ■ENVIRONMENTAL
■CONSTRUCTION MATERIALS TESTING ■GEOPHYSICAL EXPLORATION
1016 SE 3rd AVENUE, OCALA, FLORIDA 34471 ~ (352) 694-7711
BORING LOCATION MAP
PROPOSED DRAINAGE RETENTION AREA (DRA) & PAVEMENT AREA
PID #35474-001-00 US HWY 301
MARION COUNTY, FLORIDA
OPTIMUM DEALERSHIP GROUP, LLC
PROJECT NO. 22-7732.03.1
SCALE: N.T.S.
DATE: 8/18/2022
FIGURE: 1
D.R.A. PROFILES (TYP.)
+/- 80'
+/- 80'
P-1
P-2
P-3
R-1
R-2
R-3
PAVEMENT PROFILES (TYP.)
NORTH
APPROXIMATE DIRECT PUSH BORING LOCATION (ROADWAY)
APPROXIMATE DIRECT PUSH BORING LOCATION (DRAINAGE RETENTION AREA)

GEO-TECH, INC.
ENGINEERING CONSULTANTS IN GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION MATERIALS TESTING

February 17, 2022
Project No. 21-7732.02.2

Mr. Denver Beck
Optimum Dealership Group, LLC
7400 S US Hwy 441
Ocala, Florida 34480

Reference: Optimum RV Service Center DRA Expansion, 7400 S US Highway 441
Ocala, Florida
Soil Profiles and Permeability Testing, Proposed Drainage Retention Area

Dear Mr. Beck:

As requested, Geo-Technologies, Inc. (Geo-Tech) has performed a site exploration at the project site. Services were conducted in accordance with our Proposal No. 12032 dated December 17, 2021.

The following report summarizes our findings and evaluations. Generally accepted soils and foundation engineering practices were employed in the preparation of this report.

Geo-Tech appreciates the opportunity to provide our services for this project. Should you have any questions regarding the contents of this report or if we may be of further assistance, please do not hesitate to contact the undersigned.

Sincerely,

Gerald W. Green, Jr.
Soil & Water Scientist

GWG/CAH/ca

CRAIG AUSTIN HAMPY LICENSE No 83240 STATE OF FLORIDA PROFESSIONAL ENGINEER

Craig A. Hampy, P.E.
Florida Registration No. 83240

Purposes of Exploration
Purposes of this study were to explore the subsurface conditions in the proposed drainage retention expansion area and provide soil profiles, estimated seasonal high water table levels, depths to confining layers and permeability rates to guide design of the drainage retention area.

Site Description
The project site is located at the existing southern DRA at 7400 S US Highway 441 in Ocala, Florida. At the time of our site exploration, the project site was covered with native trees and grasses. Boring locations were provided to Geo-Tech by Kimley-Horn and Associates, Inc.

Exploration Program
Field exploration services for the geotechnical exploration consisted of the following:

- Six (6) auger borings (B-1 thru B-6) to depths ranging from approximately four (4) to eight (8) feet below existing site grade in the proposed drainage retention expansion area (ASTM D-4700). Auger borings were performed on January 11, 2022.

- Six (6) field horizontal permeability tests in the proposed drainage retention expansion areas. Permeability testing was performed on February 14, 2022.

Sample and Testing Description

Auger Sampling
Auger borings were performed using the methodology outlined in ASTM D-4700. Auger boring sampling method consists of rotating an auger to advance the barrel into the ground. The operator may have to apply downward pressure to keep the auger advancing. When the barrel is filled, the unit is withdrawn from the cavity and a sample may be collected from the barrel.

Samples recovered during performance of our auger borings were visually classified in the field and representative portions of the samples were placed in containers and transported to our laboratory for further analysis.

Gradation (-200) Testing
A specimen of soil is washed over a seventy-five (75) µm (No. 200) sieve. Clay and other particles that are dispersed by the wash water, as well as water-soluble materials, are removed from the soil during the test. The loss in mass resulting from the wash treatment is calculated as mass percent of the original sample and is reported as the percentage of material finer than a seventy-five (75) µm (No. 200) sieve by washing.

Findings
Boring locations and general subsurface conditions found in our soil borings are graphically presented on the soil profiles in Appendix I. Horizontal lines designating the interface between differing materials found represent approximate boundaries. Transition between soil layers is typically gradual.

Soils found at our boring locations B-1 and B-3 thru B-6 generally consisted of a surficial layer of fine sand ranging from approximately one (1) to four (4) feet thick underlain by clayey sand to the depths drilled.

Soils found at our boring location B-2 generally consisted of a surficial layer clayey sand to the depth drilled.

Ground water table levels were found at our boring locations B-1, B-3, and B-6 at depths ranging from approximately five and one-half (5½) feet to eight (8) feet below the existing site grade.

Seasonal High Water Table Levels
Estimated seasonal high water table levels were found at depths ranging from the existing site grade to greater than the depth drilled. Estimated seasonal high water table levels are indicated on the soil profiles at the appropriate depths.

Confining Layers
Confining layers were not found within the depths drilled at our boring locations.

Permeability
Six (6) field horizontal permeability tests were performed adjacent to our boring locations at a depth of approximately one (1) foot below existing site grade. The resulting coefficients of horizontal permeabilities are noted on the soil profiles and in Table 1 below.

Table 1: Results of Permeability Testing

Boring No.	Depth of Test (feet)	K_H Rate (feet/day)
B-1	1.0	10.8
B-2	1.0	0.6
B-3	1.0	11.8
B-4	1.0	0.6
B-5	1.0	15.7
B-6	1.0	16.9

Geo-Tech utilizes the U.S. Department of the Navy, Naval Facilities Engineering Command (1974) Standard methods for performing variable head tests to determine and calculate hydraulic conductivities.

Measured permeability rates should not be used for design purposes without an appropriate safety factor. Actual pond exfiltration rates will depend on many factors such as ground water mounding, pond bottom siltation, construction technique, and the amount of soil compaction during construction.

Laboratory Testing Results

Gradation (-200)

Clayey sand soils found at our boring locations B-1, B-3, B-5, and B-6 yielded passing fines ranging from thirty-three (33) to forty-three (43) percent on the samples tested. We refer the reader to Table 2 and the attached soil profiles for the various soils found.

Table 2: Results of Gradation Testing

Boring No.	Depth of Test (feet)	Percent Passing (%)
B-1	5.0	43.0
B-3	5.0	39.0
B-5	4.0	33.0
B-6	5.0	38.0

Closure/General Qualifications

This report has been prepared in order to aid evaluation of the project site and to aid various design professionals in design of the drainage retention expansion area. The scope is limited to the specific project and the location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil characteristics.

Analyses submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the Boring Location Map, and from any other information discussed in this report. This report does not reflect any variations, which may occur between these borings. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. However, it is a well known fact that variations in soil and rock conditions exist on most sites between boring locations, and also such situations as groundwater levels vary from time to time. The nature and extent of variations may not become evident until the course of construction.

APPENDIX I

SOIL PROFILES

Log of Borehole: B-1

Project: PROPOSED SOUTH DRA, OPTIMUM RV SERVICE CENTER
Project No: 21-7732.02.2
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		FINE SAND BROWN FINE SAND (SP)	4.0	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 1.0 FOOT = 10.8 FEET/DAY ESHWTL AT APPROXIMATELY 4.0 FEET
4–8		CLAYEY SAND GREY CLAYEY SAND (SC)	8.0	2	% PASS -200 SIEVE AT APPROXIMATELY 5.0 FEET = 43.0
8		End of Borehole			BORING TERMINATED AT APPROXIMATELY 8.0 FEET DUE TO WATER TABLE CONFINING LAYER GREATER THAN DEPTH PUSHED
9–10					

Ground Water Depth: AT APPROXIMATELY 8.0 FEET
Drill Date: JANUARY 11, 2022
Drilled By: RD/DB
Drill Method: ASTM D-4700

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: B-2

Project: PROPOSED SOUTH DRA, OPTIMUM RV SERVICE CENTER
Project No: 21-7732.02.2
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

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1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		ESHWTL AT EXISTING SITE GRADE
1		CLAYEY SAND GREY AND BROWN CLAYEY SAND (SC)			FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 1.0 FOOT = 0.6 FEET/DAY
2				1	
3					
4			4.0		BORING TERMINATED AT APPROXIMATELY 4.0 FEET DUE TO LIMESTONE CONFINING LAYER GREATER THAN DEPTH PUSHED
		End of Borehole			
5					
6					
7					
8					
9					
10					

Ground Water Depth: NOT FOUND
Drill Date: JANUARY 11, 2022
Drilled By: RD/DB
Drill Method: ASTM D-4700

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 2 OF 6

Log of Borehole: B-3

Project: PROPOSED SOUTH DRA, OPTIMUM RV SERVICE CENTER
Project No: 21-7732.02.2
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		FINE SAND BROWN FINE SAND (SP)	4.0	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 1.0 FOOT = 11.8 FEET/DAY
4–5.5		CLAYEY SAND BROWN CLAYEY SAND (SC)	5.5	2	% PASS -200 SIEVE AT APPROXIMATELY 5.0 FEET = 39.0 BORING TERMINATED AT APPROXIMATELY 5.5 FEET DUE TO WATER TABLE ESHWTL AND CONFINING LAYER GREATER THAN DEPTH PUSHED
6		End of Borehole			

Ground Water Depth: AT APPROXIMATELY 5.5 FEET
Drill Date: JANUARY 11, 2022
Drilled By: RD/DB
Drill Method: ASTM D-4700

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 3 OF 6

Log of Borehole: B-4

Project: PROPOSED SOUTH DRA, OPTIMUM RV SERVICE CENTER
Project No: 21-7732.02.2
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
		FINE SAND BROWN FINE SAND (SP) WITH LIMESTONE	1.0	1	
1		CLAYEY SAND BROWN AND GREY CLAYEY SAND (SC)			ESHWTL AT APPROXIMATELY 1.0 FOOT FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 1.0 FOOT = 0.6 FEET/DAY
2				2	
3					
4			4.0		BORING TERMINATED AT APPROXIMATELY 4.0 FEET DUE TO LIMESTONE CONFINING LAYER GREATER THAN DEPTH PUSHED
		End of Borehole			
5					
6					
7					
8					
9					
10					

Ground Water Depth: NOT FOUND
Drill Date: JANUARY 11, 2022
Drilled By: RD/DB
Drill Method: ASTM D-4700

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 4 OF 6

Log of Borehole: B-5

Project: PROPOSED SOUTH DRA, OPTIMUM RV SERVICE CENTER
Project No: 21-7732.02.2
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
1		FINE SAND BROWN FINE SAND (SP) WITH LIMESTONE		1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 1.0 FOOT = 15.7 FEET/DAY
2					
3			3.0		
4		CLAYEY SAND BROWN CLAYEY SAND (SC)		2	% PASS -200 SIEVE AT APPROXIMATELY 5.0 FEET = 33.0
5			5.5		
6		End of Borehole			BORING TERMINATED AT APPROXIMATELY 5.5 FEET DUE TO LIMESTONE ESHWTL AND CONFINING LAYER GREATER THAN DEPTH PUSHED
7					
8					
9					
10					

Ground Water Depth: NOT FOUND
Drill Date: JANUARY 11, 2022
Drilled By: RD/DB
Drill Method: ASTM D-4700

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 5 OF 6

Log of Borehole: B-6

Project: PROPOSED SOUTH DRA, OPTIMUM RV SERVICE CENTER
Project No: 21-7732.02.2
Boring Location: (SEE SITE PLAN)
Engineer: NJH/CAH
Client: OPTIMUM RV
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		FINE SAND BROWN FINE SAND (SP)	4.0	1	FIELD HORIZONTAL PERMEABILITY RATE AT APPROXIMATELY 1.0 FOOT = 16.9 FEET/DAY
4–7.5		CLAYEY SAND BROWN CLAYEY SAND (SC)	7.5	2	% PASS -200 SIEVE AT APPROXIMATELY 5.0 FEET = 38.0
7.5		End of Borehole			BORING TERMINATED AT APPROXIMATELY 7.5 FEET DUE TO WATER TABLE ESHWTL AND CONFINING LAYER GREATER THAN DEPTH PUSHED
8–10					

Ground Water Depth: AT APPROXIMATELY 7.5 FEET
Drill Date: JANUARY 11, 2022
Drilled By: RD/DB
Drill Method: ASTM D-4700

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 6 OF 6

APPENDIX II

BORING LOCATION MAP

APPENDIX II

BORING LOCATION MAP

= APPROXIMATE AUGER BORING LOCATION

OPTIMUM RV

PROPOSED SOUTH DRA
OPTIMUM RV SERVICE CENTER
OCALA, FLORIDA

BORING LOCATION MAP

PROJECT NO. 21-7732.02.2

SCALE: N.T.S.

DATE: 1/14/2022

FIGURE: 1

GEO-TECH, INC.
■GEOTECHNICAL ■ENVIRONMENTAL
■CONSTRUCTION MATERIALS TESTING ■GEOPHYSICAL EXPLORATION
1016 SE 3rd AVENUE, OCALA, FLORIDA 34471 ~ (352) 694-7711

GEO-TECH, INC.
ENGINEERING CONSULTANTS IN GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION MATERIALS TESTING

May 11, 2023
Project No. 23-9559.01.1

Denver Beck
Optimum Dealership Group, LLC
7400 S US Hwy 441
Ocala, FL 34480

Reference: Optimum RV Service Center, S US 441, Ocala, Florida
Karst Sensitive and Geologic Assessment

Dear Mr. Beck:

Geo-Technologies, Inc. (Geo-Tech) performed a karst sensitive and geologic assessment at the site per your request. Services were conducted in accordance with our Proposal No. 13373 dated March 30, 2023.

Geo-Tech appreciates the opportunity to provide our services for this project. Should you have any questions regarding the contents of this report or if we may be of further assistance, please do not hesitate to contact the undersigned.

Sincerely,

Coy W. Johanning
Staff Engineer

CWJ/CAH/lso

Craig A. Hampy, P.E.
Florida Registration No. 83240

016 S.E. 3RD AVENUE, OCALA, FLORIDA 34471 • PHONE: (352) 694-7711 • FAX: (352) 694-7733

Purposes of Assessment
Purposes of this assessment were to observe and help determine karst sensitivity of the site.

Site Description
The Project site is located at the following parcel numbers: 36431-003-00, 36474-000-00, 36474-001-00, 36475-000-00, 36512-000-00, 36514-000-00, 36547-000-00, 36547-001-00, 36547-002-00, 36549-000-00, 36549-001-00, 36549-001-01, and 36549-002-00 in Ocala, Florida. At the time of our site exploration, the site was covered with native trees and grasses.

Exploration Program
On April 20, 21, 24, and 25, 2023, Geo-Tech performed a site visit to determine if any karst features could be observed at or within two hundred (200) feet of the site boundaries. Based on our observations, no karst features were found within the project site boundaries.

Published Data
According to the U.S. Department of Agriculture (USDA) Soil Conservation Survey for Marion County, Florida, soils at the site are mapped as Adamsville sand, 0 to 5 percent slopes, Udalfic Arents, 15 to 60 percent slopes, Arredondo sand, 0 to 5 percent slopes, Candler sand, 0 to 5 percent slopes, and Kendrick loamy sand, 0 to 5 percent slopes. Review of the USDA Soil Resource Report indicated one (1) karst feature, K-3, within the project site and two (2) karst features, K-1 and K-2, within two hundred (200) feet of the project site. We refer the reader to the Custom Soils Resource Report presented in Appendix I and the Karst Feature Location Map presented in Appendix III.

A review of the USGS Topographic Map did not indicate any rock outcroppings or sinkholes at or within two hundred (200) feet of project site. We refer the reader to the USGS Topographic Map presented in Appendix II.

A review of the Potentiometric Surface Map indicated that the project site ranges from approximately forty (40) to forty-two (42) feet (NGVD 29). In addition, the Potentiometric Surface Map did not indicate any mapped sinkholes at or within two hundred (200) feet of the site boundaries. We refer the reader to the USGS Potentiometric Surface Map presented in Appendix II.

Evaluations
Based on our site observations and review of the published data at or within two hundred (200) feet of the project site, it is Geo-Tech's opinion that this site is average in karst sensitivity within a reasonable professional probability.

Geo-Tech recommends performing SPT borings in the area of karst features K-3 to determine the stability of the karst feature should construction occur in this area.

SPT borings are not recommended at this time for the karst features K-1 and K-2 located offsite as they are located on private property.

Closure/General Qualifications
This report has been prepared in order to aid evaluation of the site and to assist various design professionals in the design of the site. The scope is limited to the specific project and the location described herein.

APPENDIX I

CUSTOM SOILS RESOURCE REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Marion County Area, Florida

Optimum Dealership Group, LLC, Optimum RV Service Center, S US 441

May 8, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

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 1:15,800.

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:
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: Marion County Area, Florida
Survey Area Data: Version 20, Sep 1, 2022

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

Date(s) aerial images were photographed: Jan 9, 2022—Feb 10, 2022

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Adamsville sand, 0 to 5 percent slopes	0.3	0.2%
8	Udalfic Arents, 15 to 60 percent slopes	12.4	8.8%
9	Arredondo sand, 0 to 5 percent slopes	75.4	53.6%
22	Candler sand, 0 to 5 percent slopes	2.4	1.7%
44	Kendrick loamy sand, 0 to 5 percent slopes	50.2	35.7%
Totals for Area of Interest		**140.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Marion County Area, Florida

2—Adamsville sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1vhdd
Elevation: 20 to 150 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Adamsville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Adamsville

Setting

Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: sand
C - 6 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G154XB131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G154XB131FL)
Hydric soil rating: No

Minor Components

Pomona, non-hydric

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G154XB141FL)
Hydric soil rating: No

Pompano

Percent of map unit: 4 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G154XB141FL)
Hydric soil rating: Yes

Candler

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Tavares

Percent of map unit: 3 percent
Landform: Flats on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL)
Hydric soil rating: No

8—Udalfic Arents, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: 1vhdm
Elevation: 20 to 200 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 276 to 306 days

Farmland classification: Not prime farmland

Map Unit Composition

Udalfic arents and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udalfic Arents

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

C - 0 to 80 inches: sandy clay loam

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.57 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G154XB999FL)
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 12 percent
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: No

9—Arredondo sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2ttlt
Elevation: 40 to 150 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 276 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Arredondo and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arredondo

Setting

Landform: Hills on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: sand
E - 7 to 65 inches: sand
Bt1 - 65 to 70 inches: loamy sand
Bt2 - 70 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Minor Components

Candler

Percent of map unit: 7 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Gainesville

Percent of map unit: 7 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Sparr

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Other vegetative classification: Upland Hardwood Hammock (R154XY008FL), Sandy soils on rises and knolls of mesic uplands (G154XB131FL)
Hydric soil rating: No

Sinkhole

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: Unranked

Rock outcrop

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex

Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: Unranked

22—Candler sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2t3z1
Elevation: 10 to 260 feet
Mean annual precipitation: 47 to 56 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 280 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Candler and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candler

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, interfluve, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian deposits and/or sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: sand
E - 6 to 63 inches: sand
E and Bt - 63 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL), Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Minor Components

Millhopper
Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL)
Hydric soil rating: No

Tavares
Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave, convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G154XB121FL)
Hydric soil rating: No

44—Kendrick loamy sand, 0 to 5 percent slopes

Map Unit Setting
National map unit symbol: 2y7n2
Elevation: 30 to 300 feet
Mean annual precipitation: 44 to 56 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Farmland of local importance

Map Unit Composition
Kendrick and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendrick

Setting

Landform: Ridges, knolls, fluviomarine terraces
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits over loamy marine deposits

Typical profile

A - 0 to 7 inches: loamy sand
E - 7 to 28 inches: fine sand
Bt - 28 to 73 inches: sandy clay loam
BC - 73 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Forage suitability group: Sandy over loamy soils on knolls and ridges of mesic uplands (G154XB211FL)
Other vegetative classification: Sandy over loamy soils on knolls and ridges of mesic uplands (G154XB211FL), Upland Hardwood Hammock (R154XY008FL)
Hydric soil rating: No

Minor Components

Arredondo

Percent of map unit: 5 percent
Landform: Ridges on fluviomarine terraces, hills on fluviomarine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Gainesville

Percent of map unit: 5 percent
Landform: Ridges on fluviomarine terraces

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Lochloosa

Percent of map unit: 5 percent
Landform: Knolls on fluviomarine terraces, ridges on fluviomarine terraces
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Upland Hardwood Hammock (R154XY008FL), Sandy over loamy soils on rises and knolls of mesic uplands (G154XB231FL)
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

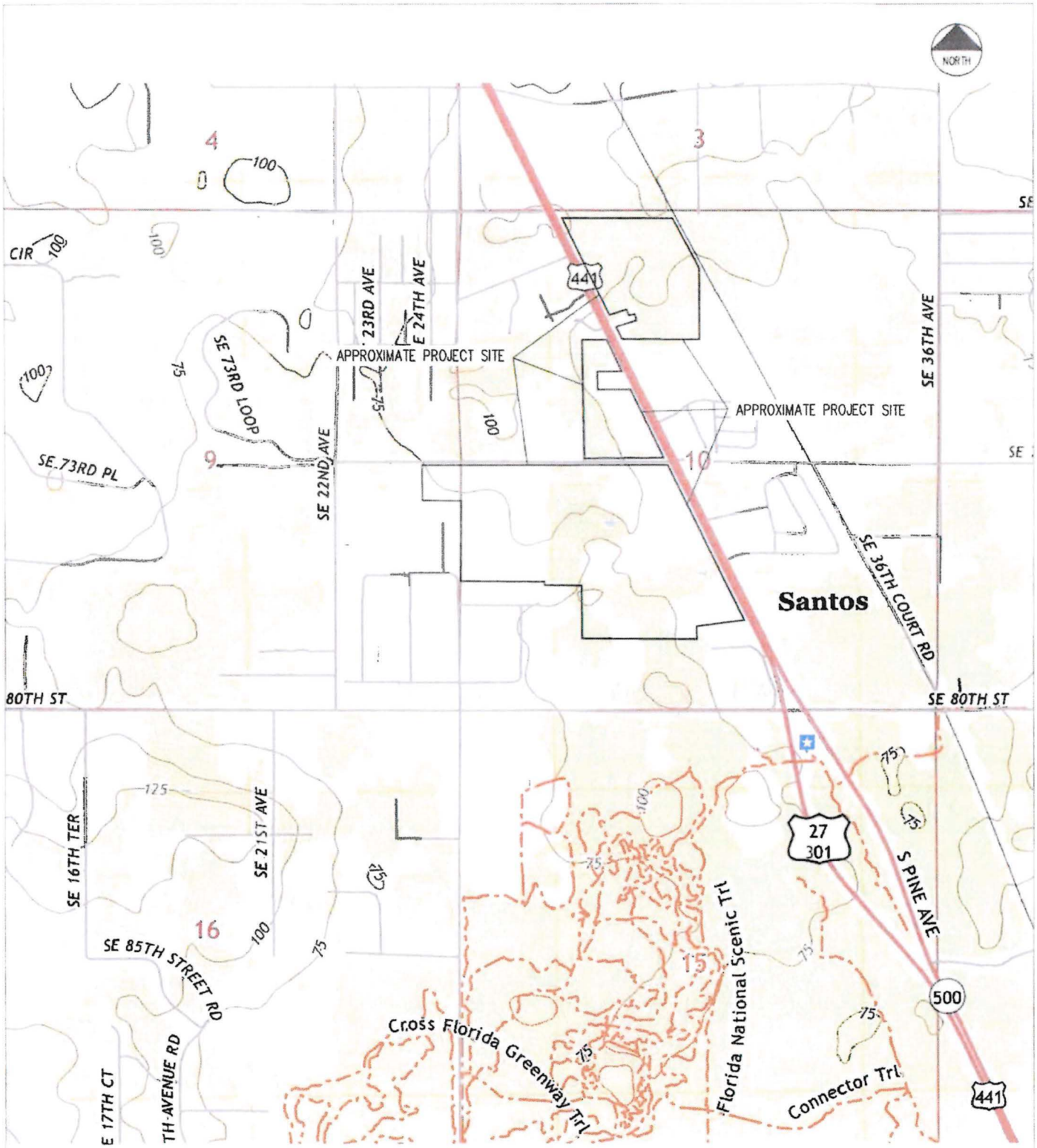
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX II

USGS TOPOGRAPHIC MAP
&
USGS POTENTIOMETRIC SURFACE MAP



OPTIMUM DEALERSHIP GROUP, LLC

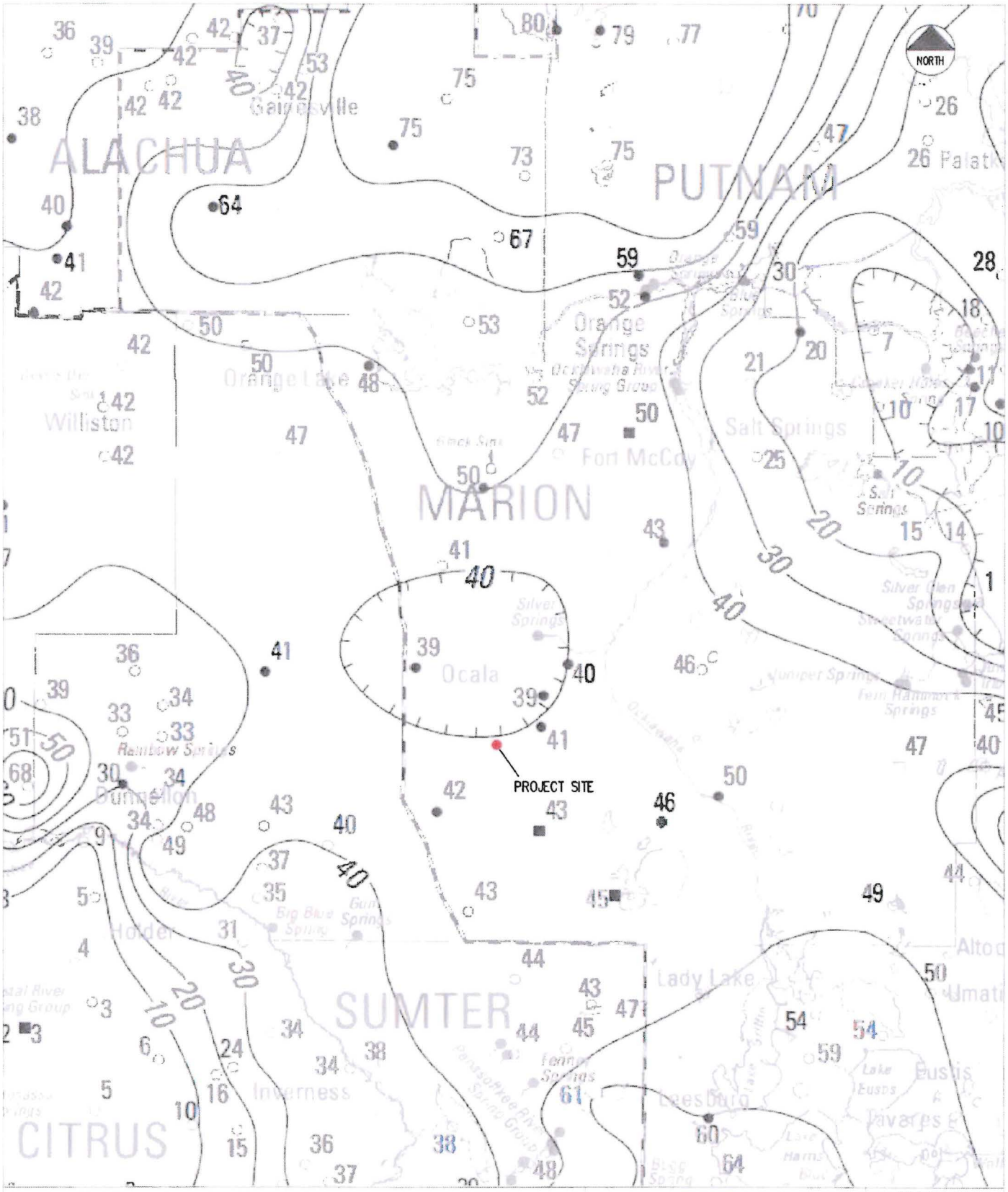
OPTIMUM RV SERVICE CENTER
SOUTH US 441
OCALA, FLORIDA

USGS TOPOGRAPHIC MAP

GEO-TECH, INC.

GEOTECHNICAL ENVIRONMENTAL
CONSTRUCTION MATERIALS TESTING GEOPHYSICAL EXPLORATION
1016 SE 3rd AVENUE, OCALA, FLORIDA 34471 ~ (352) 694-7711

PROJECT NO.	23-9559.01.1
SCALE:	N.T.S.
DATE:	5/8/2023
FIGURE:	1



OPTIMUM DEALERSHIP GROUP, LLC

OPTIMUM RV SERVICE CENTER
SOUTH US 441
OCALA, FLORIDA

USGS POTENTIOMETRIC SURFACE MAP

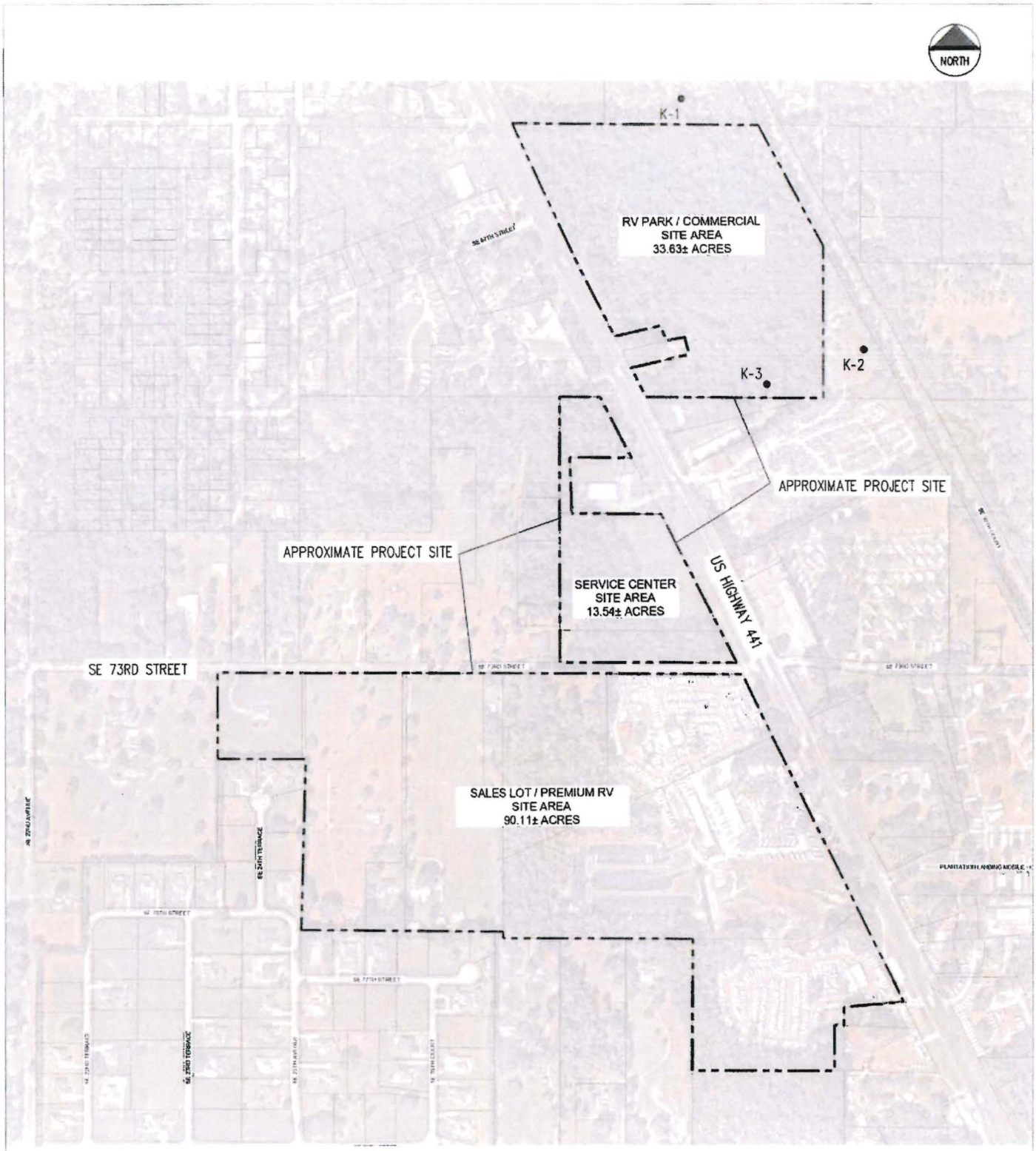
GEO-TECH, INC.

GEOTECHNICAL ENVIRONMENTAL
CONSTRUCTION MATERIALS TESTING GEOPHYSICAL EXPLORATION
1015 SE 3rd AVENUE, OCALA, FLORIDA 34471 ~ (352) 694-7711

PROJECT NO.	23-9559.01.1
SCALE:	N.T.S.
DATE:	5/8/2023
FIGURE:	2

APPENDIX III

KARST FEATURE LOCATION MAP



● = APPROXIMATE KARST FEATURE LOCATION

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KARST FEATURE LOCATION MAP

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PROJECT NO.	23-9559.01.1
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FIGURE:	3