



Cal -Tech Testing, Inc.

- Engineering
- Geotechnical
- Environmental

LABORATORIES

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December 12, 2023

Mr. Maram Al-Dada, P.E.
Infrastructure Consulting Engineering
5550 W. Idlewild Avenue, Suite 115
Tampa, Florida 33634

**RE: Add'l Geotechnical Eng. Exploration & Field Soil Permeability Testing Report
Ocala International Airport-North Access Road, Stormwater Retention Pond
Ocala, Florida
Cal-Tech Testing Inc. Project No. 23-00522-01**

Dear Mr. Maram Al-Dada, P.E.:

This report presents the results of our additional geotechnical engineering exploration and field soil permeability testing for the proposed Ocala International Airport north access road stormwater retention pond in Ocala, Florida.

SITE AND PROJECT INFORMATION

Based on observations during our field work and the Site Plan dated November 2023, the site is vacant land within the airport's property planned for the development of a north entrance road and associated stormwater retention pond. Further information indicates the bottom of the pond is expected at approximately elevation of el. +68.8 ft. and the current existing ground surface elevation is at approximately el. +74.7 ft.

ADDITIONAL SUBSURFACE SOIL EXPLORATION

Per your request, the subsurface soil exploration, performed on December 11, 2023, consisted of drilling two (2) Standard Penetration Test (SPT) borings (B1 and B2) to a depth of 20 ft. at locations laid out by our field crew from Global Positioning System (GPS) coordinates provided by you and using a hand-held device. In addition, we performed two (2) field soil permeability tests were next to the SPT boring locations. Refer to the enclosed Boring Location Plan.

We contacted Sunshine State One Call of Florida to mark out existing, known underground utilities prior to the beginning of our field exploration.

The SPT borings were advanced using rotary drilling techniques with split-spoon sampling performed continuously in the upper 10 ft. and at 5 ft. intervals thereafter to the termination depth of the borings at 20 ft. The penetration test was performed by driving a 2-inch O.D.

split spoon sampler with a manual hammer falling 30 inches. The number of hammer blows required to drive the sampler a total of 24 inches (upper 10 ft.) and 18 inches in 6-inch increments were recorded in boring logs. The penetration resistance, N-value, is the summation of the second and third 6-inch increments and is used to derive soil engineering parameter indexes from empirical correlations. The boreholes were backfilled with soil cuttings at completion.

The field soil permeability tests were performed by driving a casing 0.5 ft. from the bottom of 4.5 ft. deep hand-augered boreholes next to the SPT boring locations B1 and B2 and prior to introducing drilling mud. During the tests and after soil saturation we recorded the volume required to keep water at the top of the casing at 5 minutes intervals for 30 minutes.

The boreholes were grouted at completion and the soil samples were delivered to our geotechnical laboratory for visual classification by our geotechnical engineer in accordance with the Unified Soil Classification System (USCS).

SUBSURFACE SOIL CONDITIONS

SUBSURFACE SOIL PROFILE

Based on the result of the field exploration, the subsurface soil profile consists of an 8-ft- to 12-ft-thick SAND (SP) stratum underlain by a CLAYEY SAND (SC) to the termination depth of boring B1 and about 6-ft-thick SILTY SAND (SM) and a bottom SAND (SP) at boring B2.

Groundwater

No groundwater was encountered prior to introducing the drilling mud at the boring depth of 10 ft. The US Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS) indicates groundwater depth deeper than 80 inches for the map unit covering the explored area.

Typical yellowish and reddish iron oxide coated soil particles, observed at a depth of about 7.5 ft, allow to estimate the Seasonal High Groundwater Table (SHGWT) depth at boring location B1.

The absence of SHGWT signs to a depth of 10 ft. and the presence of the SILTY SAND stratum at a depth of about 12 ft. allow estimation of the SHGWT at a depth between 10 ft. and 12 ft. at boring location B2.

SOIL PERMEABILITY

Analyses and evaluations of the data obtained during the field work indicate the following results:

Test No.	Estimated SHGWT (ft.)	Test Depth (ft.)	(K_{vu})¹ (ft/day)	(K_h)² (ft/day)	Fillable Porosity (%)	Confining Layer Depth (ft)	Hydrologic Soil Group (HSG)
B1	7.5	4.5	2.1	4.7	30	8.0 (SC)	A
B2	10-12	4.5	5.6	12.6	30	12.0 (SM)	A

Note 1: K_{vu}= Soil Unsaturated Hydraulic Conductivity.

Note 2: K_h= Soil Estimated Horizontal Hydraulic Conductivity.

The estimated SHGWT and USDA NRCS Hydrology National Engineering Handbook criteria were used to assign the Hydrologic Soil Group (HSG) shown.

LIMITATIONS

Information on subsurface strata and groundwater levels shown on the logs represent conditions encountered only at the locations indicated and at the time of the exploration.

CLOSURE

It has been a pleasure working with you and we look forward to continuing providing our geotechnical engineering and construction materials testing expertise on this and future projects.

Sincerely,

Cal-Tech Testing, Inc.

Ivan E. Marciano, P.E.
Sr. Geotechnical Engineer

Enclosures:

Boring Location Plan
Boring Logs



A handwritten signature in blue ink, consisting of a stylized first name and a more complex last name.

Mike Stalvey, Jr.
Vice-President

**BORING LOCATION PLAN**

Ocala International Airport-North Access Road, Stormwater
Retention Pond
Ocala, Florida

CAL-TECH TESTING, INC.


P.O. BOX 1625

Lake City, Florida 32056-1625





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Project: Ocala In'l Airport-North Access Road, Stormwater Retention Pond Project Location: Ocala, Florida Project Number: 23-00522-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring B1 Page 1 of 1
Date(s) Drilled 12/11/23 Drilling Method Rotary Wash Drill Rig Type Mud Bug Groundwater Level and Date Measured Not Encountered Borehole Backfill Grout	Logged By BS Drill Bit Size/Type Drag Bit Drilling Contractor Cal-Tech Testing, Inc. Sampling Method(s) Split Spoon Location N29°11'04.11" W82°13'52.61"	Checked By IM Total Depth of Borehole 20 feet bgs Approximate Surface Elevation Referred to ground surface Hammer Data 40 lb. rope & cathead

MATERIAL DESCRIPTION	Symbol Log	Depth (ft)	Sample No.	Sample Type	Blow Counts/0.5 ft	N Value (blows/ft)	REMARKS (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, Etc.)
Yellowish brown SAND (SP)		0	1	X	1-2-1-1	3	Sample Type: 2-in Split Spoon SHGWT estimated at 7.5 ft.
		2	2	X	1-1-1-1	2	
		5	3	X	1-1-1-1	2	
Light brownish yellow SAND (SP)		4	4	X	2-2-2-1	4	
Reddish yellow SAND (SP)		5	5	X	3-3-4-7	7	
Gray CLAYEY SAND (SC) with reddish yellow mottles		10	6	X	4-7-8	15	
		15	7	X	4-5-6	11	
Bottom of Boring at 20 ft.		20					
		25					

Project: Ocala In't Airport-North Access Road, Stormwater Retention Pond	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring B2 Page 1 of 1
Project Location: Ocala, Florida		
Project Number: 23-00522-01		
Date(s) Drilled: 12/11/23	Logged By BS	Checked By IM
Drilling Method: Rotary Wash	Drill Bit Size/Type: Drag Bit	Total Depth of Borehole: 20 feet bgs
Drill Rig Type: Mud Bug	Drilling Contractor: Cal-Tech Testing, Inc.	Approximate Surface Elevation: Referred to ground surface
Groundwater Level and Date Measured: Not Encountered	Sampling Method(s): Split Spoon	Hammer Data: 40 lb. rope & cathead
Borehole Backfill: Grout	Location: N29°11'05.81" W82°13'52.52"	

MATERIAL DESCRIPTION	Symbol Log	Depth (ft)	Sample No.	Sample Type	Blow Counts/0.5 ft	N Value (blows/ft)	REMARKS (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, Etc.)
Yellowish brown SAND (SP)		0	1	X	1-2-1-2	3	Sample Type: 2-in Split Spoon SHGWT estimated between 10 ft. and 12 ft. Slightly harder drilling from 12 ft.
		2	2	X	1-2-1-1	3	
		5	3	X	1-1-1-1	2	
		4	4	X	1-1-2-1	3	
Light brownish yellow SAND (SP)		5	5	X	2-2-2-3	4	
		10					
Reddish yellow SILTY SAND (SM)		15	6	X	6-7-8	15	
White SAND (SP)		20	7	X	7-9-10	19	
Bottom of Boring at 20 ft.		20					
		25					

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