

**ADDENDUM NO 1
2024-12
FARNELL RD.**

****Note**** The geotechnical report was used as a design aid only, and is not meant to be used for construction or estimating. The information provided herein is for informational purposes only. No guarantees regarding its completeness, accuracy, or applicability to your specific situation are implied. Any action you take based on this information is at your own risk.



Cal -Tech Testing, Inc.

- Engineering
- Geotechnical
- Environmental

LABORATORIES

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October 14, 2024

Mr. Ryan D. Asmus, P.E.
North Florida Professional Services, Inc.
P.O. Box 3823
Lake City, Florida 32056

**RE: Geotechnical Engineering Exploration & Field Soil Permeability Testing Report
Access Road off Howell Road
Lake City, Florida
Cal-Tech Testing Inc. Project No. 24-00428-01**

Dear Mr. Ryan D. Asmus, P.E.:

This report presents the results of our geotechnical engineering exploration and field soil permeability testing for the proposed Access Road off Howell Road in Lake City, Florida.

The purposes of the exploration were to determine and evaluate the general subsurface soil conditions including soil permeability parameters and provide foundation recommendations for traffic signal Strain Concrete Poles.

SITE AND PROJECT INFORMATION

Based on observations during our field work and information in the drawings and sketches you provided to us, the sites are vacant portions of land proposed for construction of the proposed access road stormwater retention ponds and installation of the traffic signal Strain Concrete Poles.

SUBSURFACE SOIL EXPLORATION

Per your request and authorization, our subsurface soil exploration was performed between October 3 and 7, 2024, and consisted of drilling four (4) Standard Penetration Test (SPT) boring to a depth of 25 ft. at the traffic signal Strain Pole locations (S1 to S4) and four (4) SPT borings to a depth of 15 ft. at stormwater retention pond locations (B1 to B4). An auxiliary hand-auger boring B4a was also drilled in proximity to B4. In addition, we performed four (4) field soil permeability tests next to boring locations B1, B2 and B4. No permeability test was performed next to boring B3 due to the near-impervious nature of encountered soils. The boring locations were laid out by our field crew from GPS coordinates provided by you using a hand-held device. 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 continuous-flight auger, a rotary wash technique and automatic 140-lb hammer. The split-spoon sampling was performed continuously in the upper 10 ft. and at 5 ft. intervals thereafter to the termination depth of the borings. The penetration test was performed by driving a 2-inch O.D. split spoon sampler with the automatic 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-values, 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.

All soil samples were delivered to our geotechnical laboratory for classification by our geotechnical engineer in accordance with the Unified Soil Classification System (USCS).

The field soil permeability tests were performed using a casing driven 0.5 ft. from the bottom of 0.5 ft. (B1 and B2) and 1.5 ft. (B4) deep hand-augered boreholes next to the indicated boring locations. During each test 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.

SUBSURFACE SOIL CONDITIONS

GENERALIZED SUBSURFACE SOIL PROFILE

The generalized subsurface soil profile inferred from the results of the field exploration consists of a 1-ft to 9-ft thick SAND stratum underlain by CLAYEY SAND to the explored depth of the borings.

The SPT N-values (increased 28% to account for the automatic hammer higher efficiency) indicate a predominate Loose (i.e. $5 < N < 10$) relative density of the strata upper 4 ft. to 6 ft. and Medium Dense (i.e. $11 < N < 30$), thereafter, throughout the remainder explored depths.

Details of the subsurface soil strata laboratory test results, classification and recorded SPT blows/foot (N-value) are presented in the log of borings enclosed in this report.

Groundwater

No groundwater was observed at the completion of the borings. The United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) indicates groundwater 42 inches to deeper than 80 inches below natural grades for the soil map units covering the explored locations.

Observation of soil particles coated with typical yellowish and reddish iron oxide allowed estimation of the Seasonal High Groundwater Table (SHGWT) at a depth of about 6 inches (B1, B2 and B3) and 1.5 ft. (B4).

SOIL PERMEABILITY

Analyses of the data obtained during the field soil permeability tests indicate the following results:

Test No.	Estimated SHGWT (ft.)	Test Depth (ft.)	(K_{vu}) ¹ (ft/day)	(K_h) ² (ft/day)	Fillable Porosity (%)	Hydrologic Soil Group (HSG)
B1	0.50	0.5	2.7	6.0	0	B/D
B2	0.50	0.5	3.2	7.1	0	B/D
B3	0.67	0.5	Not Performed	Not Performed	0	Not Applicable
B4 ³	1.50	1.5	4.6	10.3	20	B/D

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

Note 2: K_h = Soil Estimated Horizontal Hydraulic Conductivity.

Note 3: SHGWT at 1 ft. depth at auxiliary boring B4a with confining layer at 3 ft. depth

The confining stratum (SILTY SAND and CLAYEY SAND) was encountered at a depth of 1.5 ft. (B1 and B2), 1 ft. (B3) and 3 ft. (B4).

The USDA NRCS Hydrology National Engineering Handbook criteria was used to assign the Hydrologic Soil Group (HSG) shown in the preceding table.

GEOTECHNICAL ENGINEERING RECOMMENDATIONS

Strain Concrete Poles

Strain Concrete Poles should be designed in accordance with the Florida Department of Transportation (FDPT) Design Standards Index No. 17725. In accordance with the FDOT Standard Plans Instructions-Index 641-010, the strain pole's minimum foundation depth below final grade depends on the pole moment in kip*ft and subsurface soil parameters as indicated in the following table:

Boring No.	Depth (ft)	N Value ¹	Angle of Internal Friction (degrees)	Unsaturated/Saturated Unit weight (lb/ft ³)
S1	0-3	6	31	118.0/56.1
S1	3-13	28	30	132.0/69.6
S1	13-25	15	28	128.0/65.6
S2	0-6	10	32	118.0/56.1
S2	6-13	23	28	132.0/69.6
S2	13-25	10	27	128.0/65.6
S3	0-13	4	28	115.0/52.6
S3	13-25	9	27	126.0/63.6
S4	0-6	4	30	118.0/56.1
S4	6-25	17	28	126.0/63.6

Note1: N value averaged and increased 28% for automatic hammer higher efficiency.

LIMITATIONS

Information on subsurface soil strata and groundwater levels shown on the logs represent conditions encountered only at the locations indicated and at the time of the exploration. If different conditions are encountered during construction, they should be immediately brought to our attention for evaluation as they may affect our recommendations.

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 (1 sheet)
Boring Logs (8 sheets)



A handwritten signature in blue ink, appearing to read "Mike Stalvey, Jr.", written over a horizontal line.

Mike Stalvey, Jr.
Vice-President



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BORING LOCATION PLAN
Access Road off Howell Road
Lake City, Florida

Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring B4 Page 1 of 1
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Date(s) Drilled: 10/3/24	Logged By: KS	Checked By: IM
Drilling Method: Continuous Flight Auger	Drill Bit Size/Type: 3-in dia. CFA	Total Depth of Borehole: 15 feet bgs
Drill Rig Type: BK 51HD	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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'44.08" W82°46'31.67"	

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.)
Light yellowish brown SAND (SP)		0	1	X	1-1-1-1	2	Sample Type: 2-in Split Spoon SHGWT estimated at 1.5 ft.
Yellowish red SILTY SAND (SM)		2	2	X	1-2-2-2	4	
Yellowish red and gray CLAYEY SAND (SC)		5	3	X	2-2-3-4	5	
		4	4	X	5-5-7-8	12	
		5	5	X	6-7-8-8	15	
		10					
Bottom of Boring at 15 ft.		15	6	X	2-3-4	7	
		20					
		25					
		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring B1 Page 1 of 1
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Date(s) Drilled: 10/3/24	Logged By: KS	Checked By: IM
Drilling Method: Continuous Flight Auger	Drill Bit Size/Type: 3-in dia. CFA	Total Depth of Borehole: 15 feet bgs
Drill Rig Type: BK 51HD	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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'31.66" W82°35'55.95"	

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 red SAND (SP)		0					Sample Type: 2-in Split Spoon
Yellowish red CLAYEY SAND (SC)		1	1	X	1-3-2-3	5	SHGWT estimated at 6 inches
		2	2	X	2-2-4-5	6	Sample 2 Fines content=38.9%
		5	3	X	3-5-8-10	13	
		4	4	X	7-9-11-13	20	
		10	5	X	13-15-17-20	32	Sample 5 Fines content=31.6%
Gray CLAYEY SAND (SC)		15	6	X	5-7-9	7	
Bottom of Boring at 15 ft.		15					
		20					
		25					
		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring B2 Page 1 of 1
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Date(s) Drilled: 10/3/24	Logged By: KS	Checked By: IM
Drilling Method: Continuous Flight Auger	Drill Bit Size/Type: 3-in dia. CFA	Total Depth of Borehole: 15 feet bgs
Drill Rig Type: BK 51HD	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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'30.77" W82°35'57.69"	

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 red SAND (SP)		0					Sample Type: 2-in Split Spoon
Yellowish red CLAYEY SAND (SC)		1	1	X	2-2-2-2	4	SHGWT estimated at 6 inches
		2	2	X	3-4-5-7	9	
		5	3	X	4-5-6-6	11	
		4	4	X	10-10-10-10	20	
		10	5	X	9-9-10-11	19	
		15	6	X	3-5-5	10	
Bottom of Boring at 15 ft.		15					
		20					
		25					
		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring B3 Page 1 of 1
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Date(s) Drilled: 10/4/24	Logged By: KS	Checked By: IM
Drilling Method: Continuous Flight Auger	Drill Bit Size/Type: 3-in dia. CFA	Total Depth of Borehole: 15 feet bgs
Drill Rig Type: BK 51HD	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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'42.86" W82°35'58.79"	

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.)
Reddish brown SAND with silt (SP-SM)		0					Sample Type: 2-in Split Spoon
Yellowish red CLAYEY SAND (SC)		1	1	X	2-2-2-3	4	SHGWT estimated at 8 inches Sample 2 Fines content=26.6%
		2	2	X	2-3-3-4	6	
		5	3	X	2-4-4-6	8	
		4	4	X	5-6-7-8	13	
		5	5	X	6-6-8-7	14	
		10					
		15	6	X	4-5-6	11	
Bottom of Boring at 15 ft.		15					
		20					
		25					
		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring S2 Page 1 of 1
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Date(s) Drilled: 10/4/24	Logged By: KS	Checked By: IM
Drilling Method: Rotary Wash	Drill Bit Size/Type: Drag Bit	Total Depth of Borehole: 25 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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'32.85" W82°35'50.04"	

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.)
Dark yellowish brown SAND (SP)		0	1	X	4-5-6-6	11	Sample Type: 2-in Split Spoon
			2	X	4-4-3-2	7	
		5	3	X	1-2-4-5	6	
Yellowish red CLAYEY SAND (SC)			4	X	8-8-9-11	17	Sample 4 Fines content=35.4%
			5	X	8-9-10-10	19	
		10					
Pinkish gray CLAYEY SAND (SC)			6	X	3-3-4	7	Sample 6 Fines content=31.2%
		15					
			7	X	2-3-4	7	Sample 7 Fines content=28.3%
		20					
Light gray CLAYEY SAND (SC)			8	X	4-4-6	10	Sample 8 Fines content=17.4%
		25					
Bottom of Boring at 25 ft.							
		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring S3 Page 1 of 1
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Date(s) Drilled: 10/4/24	Logged By: KS	Checked By: IM
Drilling Method: Rotary Wash	Drill Bit Size/Type: Drag Bit	Total Depth of Borehole: 25 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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'31.25" W82°35'50.06"	

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.)
Dark yellowish brown SILTY SAND (SM)		0	1	X	1-2-3-4	5	Sample Type: 2-in Split Spoon
Yellowish brown SAND with silt (SP-SM)		2	2	X	3-2-2-2	4	Sample 2 Fines content=10.5%
Yellowish brown SILTY SAND (SM)		5	3	X	1-1-1-1	2	Sample 3 Fines content=14.8%
			4	X	1-1-1-1	2	
Yellowish red CLAYEY SAND (SC)		10	5	X	1-1-1-1	2	
		15	6	X	3-5-6	11	
Gray CLAYEY SAND (SC)		20	7	X	2-2-4	6	
		25	8	X	2-2-3	5	
Bottom of Boring at 25 ft.		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring S1 Page 1 of 1
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Date(s) Drilled: 10/7/24	Logged By: KS	Checked By: IM
Drilling Method: Rotary Wash	Drill Bit Size/Type: Drag Bit	Total Depth of Borehole: 25 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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'33.05" W82°35'51.66"	

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 red SAND (SP)		0					
		1	1	X	1-2-3-2	5	Sample Type: 2-in Split Spoon
		2	2	X	2-4-5-8	9	
Yellowish red CLAYEY SAND (SC)		5	3	X	6-9-9-14	18	
		10	4	X	10-14-14-17	28	
		15	5	X	15-16-17-14	33	
		20	6	X	6-6-7	13	
Light gray SILTY SAND with yellowish red mottles (SM)		20	7	X	5-5-6	11	
		25	8	X	4-5-6	11	
Bottom of Boring at 25 ft.		25					
		30					

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Project: Access Road off Howell Road Project Location: Lake City, Florida Project Number: 24-00428-01	Cal-Tech Testing, Inc. 3309 SR 247 Lake City, Florida 32024	Log of Boring S4 Page 1 of 1
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Date(s) Drilled: 10/7/24	Logged By: KS	Checked By: IM
Drilling Method: Rotary Wash	Drill Bit Size/Type: Drag Bit	Total Depth of Borehole: 25 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: NA
Borehole Backfill: Soil cuttings	Location: N29°59'31.41" W82°35'51.48"	

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 red SAND (SP)		0	1	X	1-1-2-2	3	Sample Type: 2-in Split Spoon
Yellowish brown SAND (SP)		2	2	X	3-2-2-2	4	
Yellowish red SAND (SP)		5	3	X	1-1-1-2	2	
Yellowish red SILTY SAND (SM)		4	4	X	4-5-6-7	11	
Gray and yellowish red CLAYEY SAND (SC)		5	5	X	7-8-10-11	18	
Gray CLAYEY SAND (SC)		10	6	X	4-7-10	17	
Gray CLAYEY SAND (SC)		15	7	X	3-5-7	12	
Bottom of Boring at 25 ft.		20	8	X	5-5-5	10	
		25					
		30					

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END OF ADDENDUM NO. 1
(Please acknowledge receipt of Addendums)