



ENGINEERING CONSULTANTS IN GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION MATERIALS TESTING

October 2, 2025
Project No. 25-3006.220.2

Paul Constable
City of Ocala - Engineering Department
1805 NE 30th Avenue, Building 700
Ocala, Florida 34470

Reference: Surface Depression, NE 17th Road Right-of-Way, Ocala, Florida
Geotechnical Site Evaluation

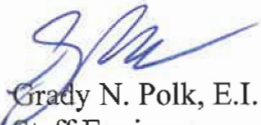
Dear Mr. Constable:

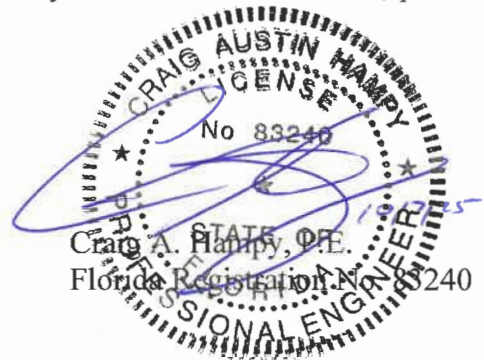
Geo-Technologies, Inc. (Geo-Tech) completed a geotechnical evaluation of the site as requested by you. Services were conducted in accordance with portions of Geo-Tech Proposal No. 16046 dated September 24, 2025 and our recommendations presented in previously issued Geo-Tech Report Project No. 25-3006.220.1 dated September 10, 2025.

Our findings, evaluations and remediation recommendations are presented in the following report. 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



Purposes of Exploration

Purposes of this evaluation were to characterize subsurface soil conditions adjacent to the observed surface depression and to provide applicable remediation recommendations based on our findings.

Site Description

The site is the north right-of-way of NE 17th Road located approximately three hundred (300) feet southwest of the intersection of NE 17th Road and NE 12th Avenue in Ocala, Florida.

Geo-Tech observed a surface depression approximately four (4) feet long, two (2) feet wide and twenty-nine (29) feet deep at the site on our initial site visit. We refer you to the Boring Location Map presented in Appendix II for the approximate surface depression location.

Geo-Tech understands that approximately twenty-five (25) cubic yards of grout material was placed into the surface depression by others prior to our arrival to the site.

Field Exploration Program

Field exploration services for this geotechnical site evaluation consisted of the following:

- One (1) standard penetration test (SPT) boring (B-1) to a depth of approximately forty-two (42) feet below site grade adjacent to the surface depression (ASTM D1586). SPT boring B-1 was performed on September 30, 2025.

Standard Penetration Test (SPT) Boring Description

SPT borings were performed in accordance with ASTM D1586. This SPT boring method consists of a split-barrel sampler driven into the subsurface soils by a one hundred and forty (140) pound hammer falling thirty (30) inches. The number of blows required to drive the sampler one (1) foot, after seating six (6) inches, is the designated resistance or N-Value and is an index to soil strength and consistency.

Soil samples recovered during the performance of our SPT boring were visually classified in the field. Representative soil samples were placed in containers and transported to our laboratory for further analysis.

Findings

General subsurface conditions found in boring B-1 are presented on the soil profile in Appendix III. Horizontal lines depicted on the soil profile designate approximate boundaries between soils.

Soils found in boring B-1 generally consisted of a surficial layer of fine sand approximately two (2) feet thick underlain by slightly sandy clay and limestone to the depth drilled.

A weight-of-hammer (WOH) zone was found in boring B-1 between depths of approximately twenty-nine (29) to thirty-two (32) feet below existing site grade.

Groundwater was not found within ten (10) feet below existing site grade in boring B-1 at the time of drilling.

Evaluations

Geo-Tech observed indications of subsurface sinkhole type activity in boring B-1 between depths ranging from approximately twenty-nine (29) to thirty-two (32) feet below existing site grade.

Most sinkhole activity in Florida is the result of subterranean erosion (raveling) of subsurface soils into solution channels and cavities in the underlying limestone. This erosion is generally caused by downward seepage of groundwater (recharge) into the limestone aquifer along with downward migration of subsurface soils. This erosion propagates upward toward the ground surface as a sinkhole develops and can cause WOH zones as found in boring B-1. These zones can cause settlement to structures placed above them.

Remediation Recommendations

Geo-Tech recommends placing small boulders ranging from approximately six (6) to eight (8) inches in diameter in the bottom of the surface depression until the boulders are at an elevation high enough to be visible from the ground surface. Grout material should then be pumped into the surface depression until the grout material elevation is high enough to keep surface water runoff from ponding.

Geo-Tech also recommends remediation of the subsurface sinkhole type activity found in boring B-1 to consist of deep soil stabilization by means of low slump, sand-cement compactive grout. Six (6) injection pipes should be installed on a ten (10) foot grid pattern around boring location B-1. Additional injection pipes may be added depending on grout intakes. We refer the reader to the Grout Injection Plan presented in Appendix I for proposed grout pipe injection locations. Please note that injection pipes may be relocated in the field in order to avoid underground utilities.

Grout shall be utilized to seal loose zones to depths of approximately thirty-two (32) feet below the existing site grade. Geo-Tech estimates grout quantities for this project to range between fifty (50) to eighty (80) cubic yards. Grout mix specifications and pumping procedures are presented in Appendix I. The Grouting Contractor should present submittals to Geo-Tech for approval.

Closure/General Qualifications

This report has been prepared in order to aid in the evaluation of the site. The scope of this geotechnical site evaluation is limited to this specific project and the location described herein.

Evaluations and remediation recommendations submitted in this report are based on our findings from the soil boring performed. Soil, limestone and groundwater conditions may vary adjacent to our boring location. These possible variations were not taken into consideration for this report. However, variations may become evident during the remediation. Geo-Tech should be informed if variations are encountered during remediation so our evaluations and recommendations can be reviewed.

APPENDIX I

COMPACTION GROUTING SPECIFICATIONS
&
GROUT INJECTION PLAN

Compaction Grouting Specifications

General

The following grouting specifications are for stabilization and improvement of deep subsurface soil conditions at the project site as indicated in the Recommendations section of this report.

Scope

The scope of work consists of furnishing all labor, equipment and materials and performing all work connected with the injection of the cementaceous grout to fill, seal and stabilize subsurface soils.

Subsurface Soil Stabilization

The subsurface soils stabilization program shall consist of pumping sand-cement grout with suitable chemical additives to the recommended depths and at pressures necessary to fill, stabilize and cement subsurface soils in order to minimize the potential for future subsidence.

Contractor

The compaction grouting Contractor shall submit their qualifications to Soil Engineer and the Owner. The Contractor shall have at least five (5) years of experience in similar deep and shallow compaction grouting jobs and shall submit references of their activities. The Contractor shall submit a project schedule to Soil Engineer for approval prior to mobilization to the site. The Contractor shall also provide sufficient labor and equipment to ensure the project site is protected from pedestrians and non-essential construction vehicles by means of caution tape and/or protective fencing in order to provide a safe working environment for construction and non-construction personnel.

Equipment

- a. Grout Injection Equipment: A continuous flow, positive displacement model with a pugmill type mixing vat having a minimum shaft speed of sixty (60) rpm and incorporated as an integral part of the mudjack equipment. Alternate equipment may be used at the discretion of Geo-Tech.
- b. Mixer: (If On-Site Mixing is Used) Machine driven rotary mixer with a minimum seven (7) cubic foot capacity; agitate during pumping operations.
- c. Injection Pipes: Minimum diameter two (2) inch I.D., Maximum Diameter four (4) inch I.D.
- d. Pressure Gauge: Sufficient size (4-inch face) in order to be legible while monitoring grouting pressures from a safe distance.

Grout Mixture

The mixture used for grouting shall be a creamy consistency which will permit the grout mixture, when set aside in a standard concrete test mold, to show less than one percent of the mixture height of free water on the surface after standing not less than twelve (12) hours. The grout mixture shall have a time of efflux (ASTM C939-81) greater than thirty-five (35) seconds. Geo-Tech recommends utilizing a compaction grout mix option as presented in Table 1 below. Please

note that either mix option may be used subject to minor variation of any constituent if found necessary to meet the above requirements.

Table 1 Compaction Grout Mix Options

Constituent	Mix A	Mix B
Fly Ash (Gs = 2.5)	500 pounds	n/a
Cement (Gs = 3.15)	500 pounds	900 pounds
Water	55 gallons	55 gallons
Sand (Gs = 2.65)	2,300 pounds	2,300 pounds
Darex (or equal)	1 ounce	1 ounce
WRDA-79 (or equal)	45 ounces	45 ounces

Note: Quantities presented in Table 1 are for one (1) cubic yard of material.

Grout Mixture and Placement

Facilities shall be provided to accurately measure ingredients in each batch of grout if on-site mixing is used. Ingredients shall be thoroughly mixed and immediately pumped to the grout pipes through a flexible hose connection not more than two hundred fifty (250) feet long.

Compaction Grouting Procedure

- The scope of this compaction grout program includes grouting at pipe locations on approximately ten (10) foot centers. However, the program may be modified by the Soil Engineer as dictated by the actual field conditions encountered. Some injection pipe locations may be deleted and/or alternate locations may be added to the program if directed by the Soil Engineer.
- Grout pipes shall be installed to refusal conditions. The Contractor shall rotary drill (using a Bentonite slurry) the injection pipes to a minimum depth of fifteen (15) feet and then either drill or drive, at the discretion of the Soil Engineer, to the refusal depth. Any other method of installation shall not be accepted unless approved by the Soil Engineer.
- Grouting operations may begin following satisfactory installation of injection pipes. The rate of pumping shall not exceed six (6) cubic feet per minute. Pumping pressures should range between one-hundred (100) to one-hundred fifty (150) psi at the tip of the casing. The in-line pressure gauge should be of sufficient size in order to be legible while monitoring grouting pressures from a safe distance (4-inch face).
- Shallow grouting may be performed at the discretion of the Soil Engineer to re-level concrete slabs, footings or other structures.
- All grouting operations shall be monitored by a Geo-Tech representative.

Soil Engineer Monitoring

The Soil Engineer will monitor the compaction grouting operations and represent the Owner to assure compliance with the specifications outlined above and the duties discussed below. The Soil Engineer shall recommend intervals of grouting and shall decide if additional or less grout is necessary.

- a. The Soil Engineer can stop the grouting operation at any time if the operation does not comply with the abovementioned specifications or if the work is unsuitable. The Soil Engineering will not be responsible for damage to the lawn, landscape areas or structures due to grouting procedures.
- b. The Soil Engineer will make all measurements of grout heave, settlement and grout quantity pumped. The Soil Engineer will maintain daily records of the grouting operation for the benefit of the Owner and Contractor. The grout quantity recorded by the Soil Engineer shall be considered the final amount of grout pumped for billing purposes. The Contractor will be responsible for laser equipment necessary to monitor at least three (3) locations continuously during the grouting operation.
- c. The Soil Engineer shall observe any vertical movement of the ground during the grouting operation. The grouting operation shall cease and observations shall continue for thirty (30) minutes if a momentary downward movement is observed. Pumping shall be resumed at a lower rate of discharge if the ground does not return to its original grade. The grouting operation shall cease if upward movement is observed.
- d. The Contractor shall exercise care when grouting beneath and adjacent to existing structures. The Contractor is responsible for ensuring that the grouting operation does not cause unnecessary damage to existing structures.
- e. Grouting operations shall cease and the Soil Engineer shall be notified when grout injection pipes in undeveloped areas are ten (10) feet or shallower measured from existing grade, when grout injection pipes in close proximity to existing buildings are fifteen (15) feet or shallower measured from existing grade and when grout injection pipes adjacent to in-ground pools are twenty (20) feet or shallower from existing site grade. Grouting operations shall cease and the Soil Engineer shall be notified when grout injection pipes in close proximity to existing buildings are fifteen (15) feet or shallower measured from existing grade. These points may be abandoned or relocated by the Soil Engineer.

Considerations

Unit prices per cubic yard of grout, per foot for pipe installation/removal and per day of shallow grouting shall be applicable to quantities over or under the estimated amounts.

APPENDIX II

SOIL PROFILE

Exhibit C - Geo-Tech Report

CONTRACT# CIP/260112

GEO-TECH, INC.

ENGINEERING CONSULTANTS

1016 SE 3rd Avenue
Ocala, Florida
352.694.7711

WWW.GEOTECHFL.COM

Project: SURFACE DEPRESSION, NE 17TH RD RIGHT-OF-WAY, OCALA Project No: 25-3006.220.2

Boring Location: (SEE BORING LOCATION MAP)

Engineer: CAH

Client: CITY OF OCALA - ENGINEERING DEPARTMENT

Enclosure: BORING MAP

Depth (ft)	Symbol	Description	Consistency	Depth/Elev.	Number	Type	Blows/ft	Standard Penetration Test N-Values
0		Ground Surface		0.0				
1		FINE SAND	HAND AUGERED	2.0				
2		BROWN FINE SAND (SP)	POSSIBLE UTILITIES (0.0' - 4.0')	4.0				
3		SLIGHTLY SANDY CLAY						
4		GRAY AND YELLOWISH BROWN SLIGHTLY SANDY CLAY (CH)						
5		LIMESTONE	23 BLOWS - 12"		1		23	23
6		LIGHT BROWN LIMESTONE	26 BLOWS - 12"		2		26	26
7			48 BLOWS - 12"		3		48	48
8								
9								
10								
11								
12								
13								
14			19 BLOWS - 12"		4		19	19
15								
16								
17								
18								
19			39 BLOWS - 12"		5		39	39
20								
21								
22								
23								
24			44 BLOWS - 12"		6		44	44
25								
26								
27								
28								
29			WOH (29.0' - 32.0')		7		0	0
30								
31								
32								
33								
34			6 BLOWS - 12"		8		6	6
35								
36								
37								
38								
39			3 BLOWS - 12"		9		3	3
40								
41			50 BLOWS - 1"		10		50	50
42				42.0				
43		End of Borehole						
44								
45								

Groundwater Depth: GREATER THAN 10.0 FEET

Drill Date: SEPTEMBER 30, 2025

Drilled By: CM/DS/AM/KH

Drill Method: ASTM D1586

Remarks: UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 1 OF 1

APPENDIX III

BORING LOCATION MAP



CITY OF OCALA - ENGINEERING DEPARTMENT

SURFACE DEPRESSION
NE 17TH ROAD RIGHT-OF-WAY
OCALA, FLORIDA

GROUT INJECTION PLAN

GEO-TECH, INC.

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

PROJECT NO.
25-3006.220.2

SCALE: N.T.S.

DATE: 10-2-25

FIGURE: 1



CITY OF OCALA - ENGINEERING DEPARTMENT SURFACE DEPRESSION NE 17TH ROAD RIGHT-OF-WAY 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. 25-3006.220.2
		SCALE: N.T.S.
		DATE: 10-1-25
		FIGURE: 2