

FLORIDA

ENGINEERING & TESTING, INC.

Phone: (866) 781-6889 • Fax: (866) 784-8550
www.floridaengineeringandtesting.com
250 S.W. 13th Avenue
Pompano Beach, FL 33069

**REPORT OF
GEOTECHNICAL EXPLORATION**

FOR:

**Trinity Lutheran Church & School
400 N Swinton Avenue
Delray Beach, Florida**

PREPARED FOR:

**Proposed 2-Story Covered Walkway
400 N Swinton Avenue
Delray Beach, Florida**

PREPARED BY:

**Florida Engineering & Testing, Inc.
250 S.W. 13th Avenue
Pompano Beach, Florida 33069
(954) 781-6889**

ON:

January 4, 2022



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DISCLAIMER

Our report findings are based on present onsite soil conditions encountered. **It is imperative that you read our reports in their entirety and follow all recommendations as listed.** Failure to follow our recommendations, may result in delays and additional costs due to permitting agencies (Building Department, etc.) withholding a Certificate of Occupancy for your proposed structure(s).

All recommendations shall be followed in order to receive a final certification, which may include but not be limited to density testing per lift of fill material, demucking verifications, piling inspections. In addition, these reports are for foundation analysis only and shall not be used for excavating, backfilling, or pricing estimates.

Please schedule us at least 24 hours in advance for all tests and inspections. If you choose to use another engineering firm for further testing and inspections, it is your responsibility to ensure that they provide you with the proper certification in writing, as outlined in our report.



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January 4, 2022

Job Order No.: 22-137

Trinity Lutheran Church & School
400 N Swinton Avenue
Delray Beach, Florida

RE: SUBSOIL INVESTIGATION
Proposed 2-Story Covered Walkway
400 N Swinton Avenue
Delray Beach, Florida

Dear Sir or Madam;

Pursuant to your request, Florida Engineering & Testing, Inc., has completed a subsoil exploration on January 3, 2022, at the above referenced site. The purpose of our exploration was to verify subsoil conditions relative to the proposed structure(s) foundation preparation and design. Our recommendations are based on the assumption that the proposed structure(s) are as follows: two story covered walkway (approximately 600 square feet footprint).

Please note that this report only includes foundation recommendations for the above referenced structure(s). Any additional structures will require additional borings/analysis/evaluation and an additional engineering report, not covered under this current report.

A total of one (1) SPT boring(s) was performed according to ASTM D-1586 down to a depth(s) of twenty-five feet (25') (BEGl) below existing ground level (see attached field sketch for locations). Please see the attached SPT Test Boring Report(s) for soil profiles.

Groundwater table elevation was measured immediately at the completion of the boring and was found at a depth of fourteen feet (14') BEGL. Fluctuation in water levels should be anticipated due to surface runoff, tidal influences, seasonal variations, varying ground elevation, construction dewatering and pumping activities in the area. Site contractor must familiarize themselves with site conditions in the event groundwater controls and dewatering is needed. The contractor shall make sure that groundwater levels on adjacent properties are not affected by the contractors dewatering activities. Specialty groundwater contractors shall be consulted for all work below the groundwater level.

The boring log(s) attached present(s) a detailed description of the soils encountered at the test location(s). The soil stratification shown on the boring log(s) is based on the examination of the recovered soil samples and interpretation of the driller's field log(s). It indicates only the approximate boundaries between soil types. The actual transitions between adjacent soil types may be gradual.





Based on our understanding of the proposed structure and the information obtained from our field boring log(s); we recommend the following procedures for foundation preparation:

- 1) Strip the entire construction areas plus two feet (2') past the outer perimeter of the structure of topsoil and ground vegetation (when encountered) down to clean granular material.
- 2) Saturate and compact all construction areas with a vibratory roller to a minimum of **95%** of the A.S.T.M. D-1557 modified proctor method. Make a minimum of ten (10) passes with the roller in each direction.
- 3) Backfill construction areas to proper elevation if needed using a clean granular material placed in lifts not to exceed twelve inches (12") in thickness and compacted as per item 2.
- 4) Care should be taken when using vibration in case of existing structures in the vicinity of the construction area. If vibration cannot be used for compaction, static compaction may be applied. However, in this case, the compacted layers should not exceed six inches (6") in thickness.
- 5) All construction fill material shall be clean granular soil, free of organics or other deleterious material, and shall contain no more than twelve (12) percent fines passing a U.S. Standard No. 200 sieve (0.075mm).
- 6) Representative samples of the on-site and proposed fill material should be collected and tested to determine the classification and compaction characteristics.
- 7) Verify all densification procedures by taking an adequate number of field density tests in each layer of compacted material and bottom of footing excavations. A minimum of 1 test must be performed for each 2,500sf, or fraction thereof, for each lift of compacted soil, with a minimum quantity of 3 tests per lift, whichever is greater. **This must be scheduled immediately after Tamp and Spray and/or Compaction but before steel placement. If steel is already in-place, it must be removed from all areas to be tested prior to performing densities.**
- 8) All Geotechnical work shall be performed under the supervision of a Geotechnical Engineer or his representative.
- 9) After the installation of any plumbing and electrical piping; we recommend that the disturbed areas be recompacted and additional density tests be performed to verify proper compaction of the disturbed areas.

Provided the above foundation recommendations are achieved and verified; it is our opinion that the proposed structure can be designed for a shallow foundation system with a permissible soil bearing pressure not to exceed 2,500 P.S.F. Bearing capacity certification requires satisfactory completion and verification of all the above foundation recommendations.

We recommend a minimum width of 16 inches for continuous footings and 30 inches for individual footings, even though the soil bearing pressure may not be fully developed in all cases. We recommend that the bottom of footings be at least 12 inches below the lowest adjacent finished grade.

It is our opinion that the floor slab system may be constructed as a slab on grade. We recommend that a vapor barrier be placed between the soil and concrete. We also recommend that the reinforcing steel mesh be placed at the approximate center of the slab for tensile support.



It was estimated that upon proper completion, long-term total settlements should be on the order of less than one inch. Differential settlements should be approximately one-half of the total settlement.

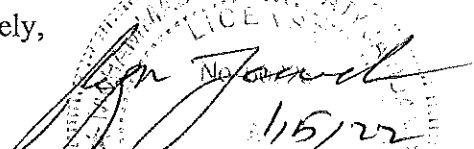
Provisions shall be made by the architect, engineer of record and contractor to address differential settlements when tying in new to existing structures. Mixing of different foundation types shall not be used unless provided with expansion joints to address differential settlement. If applicable, the seawall structure should be inspected to verify the structural integrity and prevent undermining due to the piling installation or excavation operations.

Regardless of the thoroughness of a Geotechnical exploration there is always a possibility that conditions may be different from those of the test location(s); therefore, Florida Engineering & Testing, Inc., does not guarantee any subsoil condition surrounding the bore test hole(s). For a more accurate portrayal of subsurface conditions, the site contractor should perform test pits. The discovery of any site or subsurface conditions during construction which substantially deviate from the information in our subsoil exploration should be reported to us immediately for our evaluation. In accepting this report, the client understands that all data from this soil boring report is intended for foundation analysis only and is not to be used for excavating, backfilling, or pricing estimates. The site contractor must familiarize themselves with the job site conditions prior to bidding.

As mutual protection to clients, the public, and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions, or extracts from or regarding our reports is reserved pending our written approval. All work must be conducted under the supervision of our Geotechnical engineer. All work shall be conducted in compliance with the Florida Building Code FBC and OSHA workers protection rules and all applicable Federal, State, County and City rules and Regulations.

Florida Engineering & Testing, Inc., appreciates the opportunity to be of service to you at this phase of your project. Should you have any questions or comments, please feel free to contact us at your earliest convenience.

Sincerely,


1/5/22
Reza Javidan, P.E.
Florida Engineering & Testing, Inc.
Florida Reg. No. 602230
Certificate of Authorization No. 6923

SPT Test Boring Report

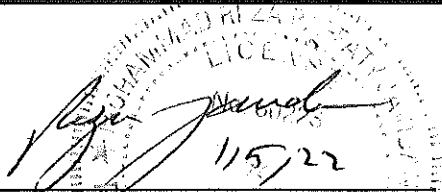
Client: Trinity Lutheran Church & School Hole No: B-1
 Project: Proposed 2-Story Covered Patio Date: 1/3/2022
 Address: 400 N Swinton Avenue Delray Beach, Florida
 Location: See Attached Field Sketch

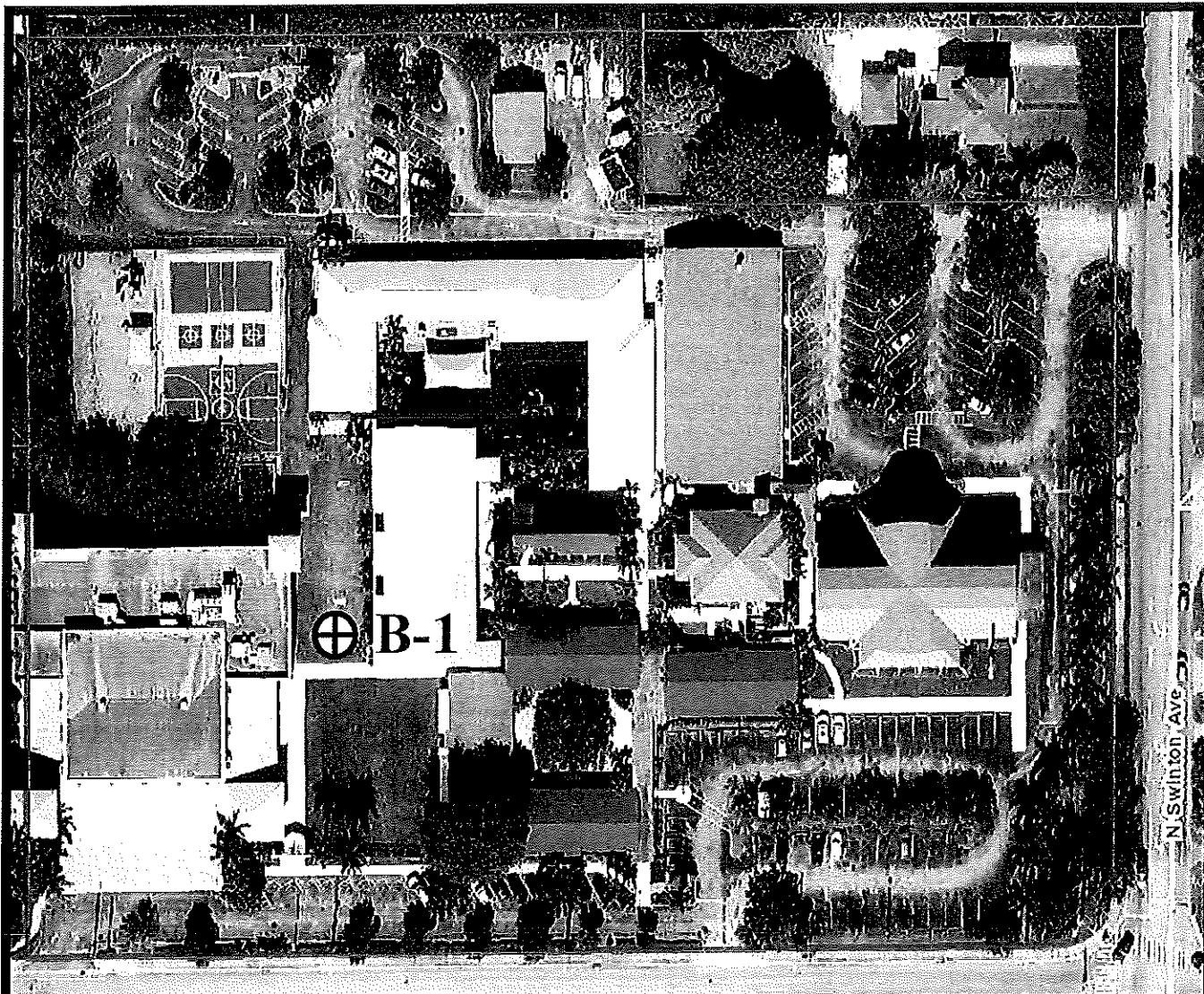
Depth (Ft)	Soil Descriptions	Hammer Blows	N	Penetration "N" Value			
				10	20	30	40
0' - 3'	Brown Fine Sand	2 2	5				
		3 2					
3' - 5'	Grayish Brown Fine Sand	3 3	7				
		4 6					
5' - 8'	Brown Fine Sand	5 5	9				
		4 7					
8' - 10'	Brown Fine Sand	6 6	10				
		4 7					
10' - 12'	Brown Fine Sand	7 8	16				
		8 11					
12' - 14'	Brown Fine Sand	-- --	A				
		-- --					
14' - 16'	Brown Fine Sand	10 8	18				
		10 12					
16' - 18'	Brown Fine Sand	-- --	A				
		-- --					
18' - 20'	Brown Fine Sand	9 9	21				
		12 14					
20' - 22'	Brown Fine Sand	-- --	A				
		-- --					
22' - 24'	Brown Fine Sand	12 12	25				
		13 15					
24' - 26'	End of Boring						
26' - 28'							
28' - 30'							

Water Level: 14' BEGL

As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

A = Auger
 Ref = Refusal
 BEGL = Below Existing Ground Level
 0 = Weight of Hammer


Reza Javidan, P.E.
Florida Engineering & Testing, Inc.
 Florida Reg. No. **60223**
 Certificate of Authorization No. **6923**



⊕ B-1

N Swinton Ave



Field Sketch

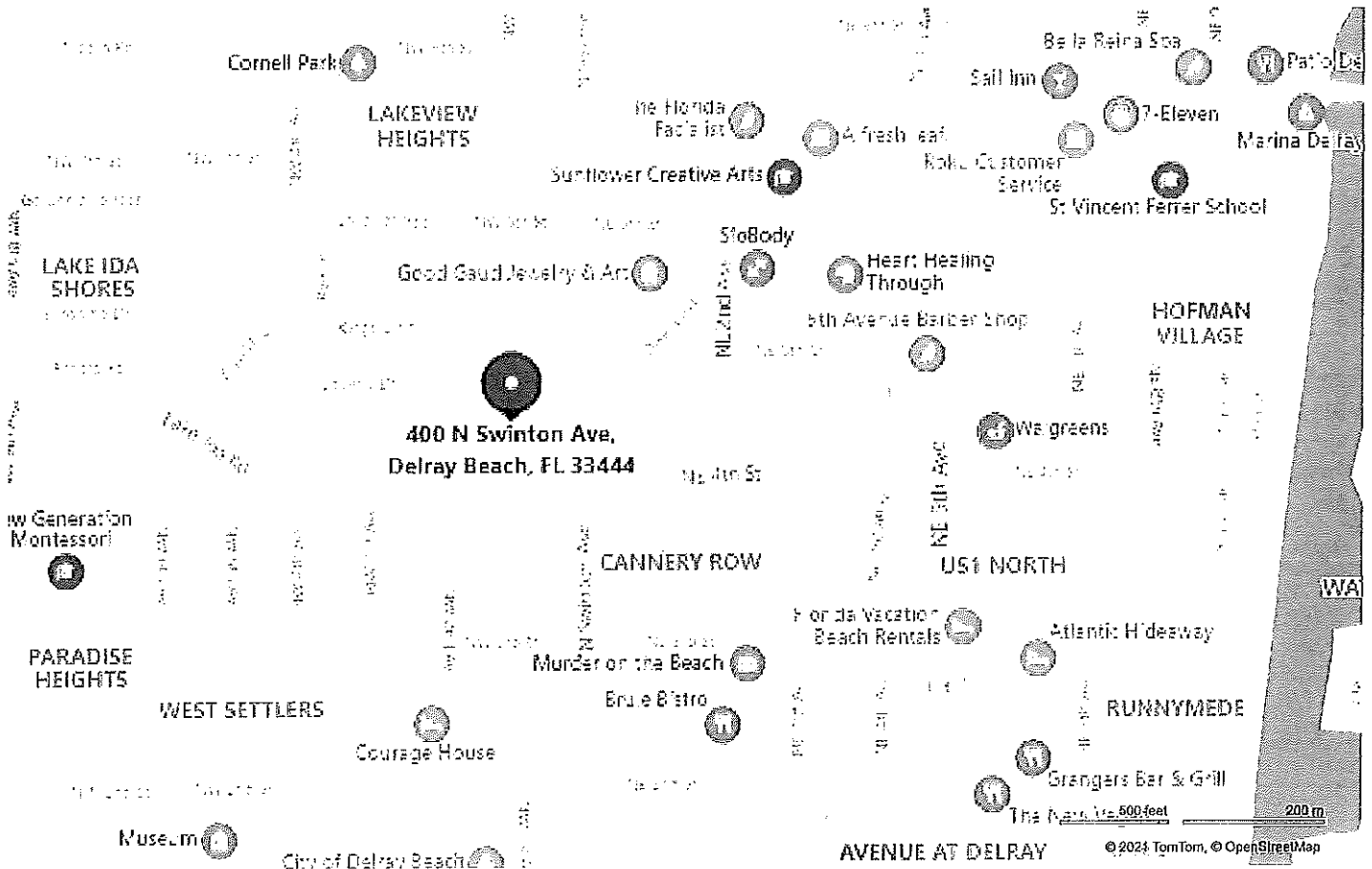
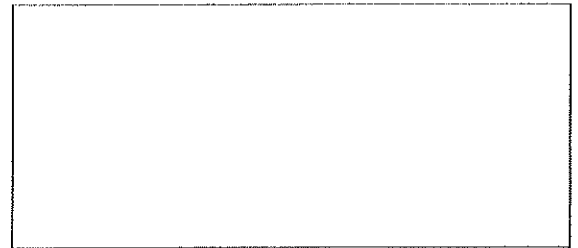
Not to Scale

400 N Swinton Avenue

Delray Beach, Florida

400 N Swinton Ave, Delray Beach, FL 33444

Location: 26.46995, -80.074341





GENERAL NOTES

- Soil boring(s) on unmarked vacant property or existing structure(s) to be demolished should be considered preliminary with further boring(s) to be performed after building pad(s) are staked out.
- As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.
- It is not our field inspector's responsibility to supervise, schedule, or stop any phase of the project. His/her responsibility is limited by the duties stated in the contract.
- It is the client's responsibility to provide adequate safety for the site and personnel.

KEY CLASSIFICATIONS & SYMBOLS

Correlation of Penetration Resistance with Relative Density and Consistency

	<u>Dynamic Cone Penetrometer (Penetrometer Resistance)</u>	<u>Standard Penetration (Hammer Blows)</u>	<u>Relative Density</u>
Sands	0 - 10	0 - 3	Very Loose
	10 - 25	3 - 8	Loose
	25 - 45	8 - 15	Firm
	45 - 75	15 - 25	Very Firm
	75 - 120	25 - 40	Dense
	> 120	> 40	Very Dense

Particle Size

Boulder	> 12in
Cobble	3 - 12in
Gravel	4.75mm - 3in
Sand	0.075mm - 4.75mm
Silt/Clay	< 0.075mm

Modifiers – Silt/Clay

0 - <5%	N/A
5 - 12%	Slightly Silty/Clayey
12 - 30%	Silty/Clayey
30 - 50%	Very Silty/Clayey

Silts & Clay	0 - 6	0 - 2	Very Soft
	6 - 15	2 - 5	Soft
	15 - 30	5 - 10	Firm
	30 - 45	10 - 15	Stiff
	45 - 90	15 - 30	Very Stiff
	90 - 150	30 - 50	Hard

Modifiers – Other Inclusions

0 - 2%	Very Slight Trace
2 - 5%	Slight Trace
5 - 10%	Trace
10 - 15%	Little
15 - 30%	Some
> 30%	With

Rock Hardness Description

Soft	Rock core crumbles when handled.
Medium	Can break core with your hands.
Moderately Hard	Thin edges of rock core can be broken with fingers.
Hard	Thin edges of rock core cannot be broken with fingers.
Very Hard	Rock core rings when struck with a hammer.



LIMITATIONS OF LIABILITY

WARRANTY

We warrant that the services performed by Florida Engineering and Testing, Inc., are conducted in a manner consistent with the level of skill and care ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranties, expressed or implied, are made. While the services of Florida Engineering & Testing, Inc., are an integral and valuable part of the design and construction process, we do not warrant, guarantee, or insure the quality or completeness of services or satisfactory performance provided by other members of the construction process and/or the construction plans and specifications which we have not prepared, nor the ultimate performance of building site materials.

As mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings. The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata and groundwater data. The log represents conditions specifically at the location and time the boring was made. The boundaries between different soil strata are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling. The transitions between soil stratum are often gradual. Water level readings are made at the time the boring was performed and can change with time, precipitation, canal levels, local well drawdown, and other factors.

Regardless of the thoroughness of a Geotechnical exploration there is always a possibility that conditions may be different from those of the test locations; therefore Florida Engineering & Testing, Inc., does not guarantee any subsoil condition surrounding the bore test holes. For a more accurate portrayal of subsurface conditions, the site contractor should perform tests pits. If different conditions are encountered, Florida Engineering & Testing, Inc., shall be notified to review the findings and make any recommendations as needed.

LABORATORY AND FIELD TESTS

Tests are performed in accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test report indicates the measurements and determinations actually made.

ANALYSIS AND RECOMMENDATIONS

The Geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it is not intended to determine the cost of construction or to stand alone as construction specifications. In accepting this report the client understands that all data from the soil boring is intended for foundation analysis only and is not to be used for excavating, backfilling or pricing estimates. The site contractor must familiarize themselves with the job site conditions.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations may exist between borings and may not become evident until construction. If variations are then noted, Florida Engineering & Testing, Inc., should be contacted so that field conditions can be examined and recommendations revised if necessary.

The Geotechnical report states our understanding as to the location, dimensions, and structural features proposed of the site. Any significant changes in the nature, design, or location of the site improvements must be communicated to Florida Engineering & Testing, Inc., so that the Geotechnical analysis, conclusions, and recommendations can be appropriately adjusted.

CONSTRUCTION OBSERVATIONS

Construction observation and testing is an important element of Geotechnical services. The Geotechnical Engineer's Field Representative (Field Rep.) is the "owner's representative" observing the work of the contractor, performing tests, and reporting data from such tests and observations. The Geotechnical Engineer's Field Representative does not direct the contractor's construction means, methods, operations, or personnel. The Field Rep. does not interfere with the relationship between the owner and the contractor, and except as an observer, does not become a substitute owner on site. The Field Rep. is only collecting data for our Engineer to review.

The Field Rep. is responsible for his/her safety only, but has no responsibility for the safety of other personnel and/or the general public at the site. If the Field Rep. does not feel that the site is offering a safe environment for him/her, the Field Rep. will stop his/her observation/ testing until he/she deems the site is safe. The Field Rep. is an important member of a team whose responsibility is to observe the test and work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications.