

**Client:** Design Kollaborative Architects  
**Contact:** Jeff Cassianis

**Address:** 61 NE 1st Street, Suite 2  
Pompano Beach, FL 33060

## Subsoil Investigation Report

*prepared by:*



*for:*

**Project:** Proposed 1-Story Addition

**Address:** 800 SW 36th Avenue  
Pompano Beach, FL 33069

**Date:** Wednesday, May 17, 2023

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## For Your Information

Our findings in this report are based on soil conditions encountered in the test bore locations only, proposed structure to be built, (if available at this stage), Florida Building Code requirements and standard engineering practices. If your report is preliminary (i.e. vacant land or building to be demolished) additional borings are required within the foot print of the proposed structure once the location & layout of the proposed structure is known.

Please read this report in its entirety and follow all recommendations. Failure to do so may result in the permitting agency (Building Department, etc.) withholding the Certificate of Occupancy. This will cause delays and additional costs. The Permitting Agency will require a final certification or signing off of the project prior to issuing the Certificate of Occupancy. All of our recommendations need to be followed to receive a final certification from F.E.T., including densities on each lift, demucking verification, piling inspection, etc., whichever recommendation applies to your project.

Please schedule us at least 24 hours in advance for all tests and inspections. If you choose to use another Engineering Firm, you must verify they will provide you with the proper certification in writing, as outlined in our report. Our firm will only provide a certification letter if it has verified all work as recommended in our report.

Wednesday, May 17, 2023

Job Order Number 23SB0263

**Design Kollaborative Architects**61 NE 1st Street, Suite 2  
Pompano Beach, FL 33060  
Attn.: Jeff CassianisRE: **Subsoil Investigation**  
Proposed 1-Story Addition  
800 SW 36th Avenue  
Pompano Beach, FL 33069

Dear Sirs:

Pursuant to your request, Federal Engineering & Testing, Inc. has completed a subsoil investigation on 5/17/2023 at the above referenced site. The purpose of our investigation was to verify subsoil conditions relative to foundation preparation and design.

A total of two (2) SPT borings were performed according to ASTM D-1586 drilled down to a depth of twenty-one feet (21) & seventeen (17) feet below the existing ground surface. (See attached field sketch for locations). The following is a general description of soil stratas for the subject site:

Depth		Description of Soils
From	To	
0"	6"	Topsoil & Vegetation
6"	10'	Brown Sand with Rock
10'	15'	Dark Brown Sand with Rock
15'	16'	Pale Brown Sand with Rock
16'	21'	Limerock (Refusal at 21' due to Limerock)

Groundwater table elevation was measured immediately at the completion of each boring and was found at an average depth of eleven (11) feet below existing ground surface. Fluctuation in water level should be anticipated due to seasonal variations and run off as well as varying ground elevation, construction dewatering and pumping activities in the area. Site contractor must familiarize himself with site conditions in the event groundwater controls and dewatering is needed. Surface flooding may result under hurricane conditions and should be taken into consideration in the design of the project. 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 a detailed description of the soils encountered at each location. 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.

From a geotechnical engineering perspective, the site is suitable for the construction of the proposed structure, provided that the surface sand layers are compacted in place and proof rolled. Localized areas of loose materials, if present, will become evident during site clearing, grubbing and proof rolling, and must be removed prior to filling operations.

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 design:

- 1) Strip the entire footings and building construction areas of topsoil and ground vegetation (when encountered) down to clean granular material. Any underground structures, utility lines, root systems and drainage trenches, etc. must be removed in their entirety from beneath the proposed construction areas. The city arborists should be contacted prior to any land clearing to verify compliance with any local codes.
- 2) Saturate and compact all construction areas with a heavy self propelled vibratory roller to a minimum of 95% of the ASTM D-1557 modified proctor method. Make a minimum of ten (10) passes with the roller in each direction.
- 3) 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 layer should not exceed 6 inches in thickness.
- 4) Backfill construction areas to proper elevation if needed using a clean granular material placed in lifts not to exceed twelve (12) inches in thickness and compacted as per item 2.
- 5) Representative samples of the on-site and proposed fill material should be collected and tested to determine the classification and compaction characteristics.
- 6) All construction fill material above the water table 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) and have a Unified Soil Classification (USCS) designation of GP, GW, GP-GM, GW-GM, SP or SW. No particle size greater than three (3) inches shall be used in the top 12 inches of the building pad.
- 7) Fill Material below the water table shall be washed free draining gravel such as FDOT No. 57 stone or equivalent to about 12 inches above the water table unless dewatering is used. When dewatering is used, 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).

- 8) Verify all densification procedures by taking an adequate number of field density tests in each layer of compacted material. Density tests shall be performed on the slab areas, footing areas, interior bearing wall footings and column pad footings. This must be scheduled immediately after Tamp and Spray and/or Compaction, but before Reinforcing Steel Placement. If reinforcing steel is already in-place, it must be removed from all areas to be tested prior to performing densities.
- 9) After the installation of any plumbing and electrical piping; we recommend that the disturbed area be recompact and additional densities tests be performed to verify proper compaction of the disturbed areas.
- 10) All of the above Geotechnical work shall be performed under the supervision of Federal Engineering & Testing's geotechnical engineer or his representative to verify compliance with our specifications and the Florida Building Code. Please call us at 954-784-2941 for scheduling.
- 11) In the event of existing structures, existing footings or proposed drainage lines, provisions shall be made by the structural engineer and site contractor to protect all footings from undermining and exposure. The geotechnical engineer shall be notified of these conditions to evaluate the applicability of his recommendations.

The above foundation recommendations being achieved and verified; it is our opinion that the proposed structure be designed for a shallow foundation system with a permissible soil bearing pressure not to exceed 2500 P.S.F. Building pad certification requires satisfactory completion and verification of all the above foundation recommendations.

Slabs placed upon compacted fill may be designed using a modulus of subgrade reaction value of 200 pci. The following soil parameters shall be used for retaining wall designs:

• Soil unit weight moist-----	110 pcf
• Soil unit weight buoyant-----	48 pcf
• Angle of internal friction-----	30°
• Active Earth pressure coefficient (Ka)-----	0.33
• Passive Earth pressure coefficient (Kp)-----	3.0
• Angle of wall friction for steel piles-----	30°
• Angle of wall friction for concrete / brick walls-----	20°
• Angle of wall friction for uncoated steel-----	15°

Excavations shall not extend within one (1) foot of the angle of repose next to existing footings or structures unless underpinned. Trenching shall be in compliance with the Florida Building Code, OSHA and Trench Safety Act requirements. Shorings shall be designed and inspected by a Florida licensed professional engineer.

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.

Detailed settlement analysis was beyond the scope of this report. Comparing the field test data obtained in this exploration with our experience with structures similar to those proposed for this project, the estimated magnitude of these settlements is 0.5 to 1 inch. Due to the granular nature of the subsurface materials, the foundation settlements should occur as the loads are applied and should be virtually negligible by the end of the building shell completion.

All outside ground surfaces must be sloped away from the structure to avoid water accumulation and ponding. All rain waters shall be discharged away from all building foundations. Verify all water, sewer, plumbing, sprinkler and drainage lines are properly functioning with no leaks in the vicinity of the foundation.

Regardless of the thoroughness of a geotechnical exploration, there is always the possibility that conditions may be different from those of the test locations; therefore, Federal Engineering & Testing, Inc. does not guarantee any subsoil condition between the bore test holes. A site plan showing the location of the proposed structure was provided at the time the soil borings were performed. All tests locations were drilled at the location marked by the client. Once plans and specifications have been finalized and drawn, Federal Engineering & Testing, Inc. shall be provided a copy of the finalized plans and specifications for review. For a more accurate portrayal of subsurface conditions, the site contractor should perform test pits. If different conditions are encountered, Federal Engineering & Testing Inc., shall be notified to review the findings and make any recommendations as needed. In accepting this report the client understands that all data from the soil borings 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.

Environmental analysis of the soil materials is not part of the scope of services. If environmental analysis of the soils is required, we can provide a proposal for performing an environmental analysis of the soil materials. For Environmental due diligence, a Phase I and/or Phase II Environmental Site Assessment is recommended.

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.

Federal Engineering & Testing, Inc. appreciates the opportunity to be of service to you at this phase of your project. Please feel free to contact us if we may be of further service to you.

This item has been digitally signed and sealed by Keith LeBlanc P.E. on 5-19-2023 using a digital signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

## Appendices

### SPT Test Boring Report

**Client:** Design Kollaborative Architects  
**Project:** Proposed 1-Story Addition  
**Address:** 800 SW 36th Avenue  
Pompano Beach, FL 33069

**Date of Test:** May 17, 2023  
**Hole No.:** B-1  
**Location:** See Attached Drawing

Depth (FT)	Soil Descriptions	Hammer Blows		"N"
1	0" - 6" Topsoil & Vegetation	3	2	4
2		2	4	
3		3	5	9
4		4	4	
5	6" - 8' Dark Brown Sand	6	4	9
6		5	7	
7		5	8	12
8		4	8	
9	8' - 11' Brown Sand	5	5	11
10		6	9	
11		A	A	A
12		A	A	
13	11' - 17' Limerock (Refusal at 17' due to Limerock)	A	A	A
14		A	A	
15		13	22	51
16		29	50+	
17		A	A	
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

Water Level: 11' 0" Below Land Surface

A = Auger

### SPT Test Boring Report

**Client:** Design Kollaborative Architects  
**Project:** Proposed 1-Story Addition  
**Address:** 800 SW 36th Avenue  
Pompano Beach, FL 33069

**Date of Test:** May 17, 2023

**Hole No.:** B-2

**Location:** See Attached Drawing

Depth (FT)	Soil Descriptions	Hammer Blows		"N"
1	0" - 6" Topsoil & Vegetation	3	4	11
2		7	3	
3		5	8	18
4		10	6	
5	6" - 10' Brown Sand with Rock	7	7	12
6		5	6	
7		4	12	25
8		13	18	
9	10' - 15' Dark Brown Sand with Rock	12	8	19
10		11	15	
11		A	A	A
12		A	A	
13	10' - 15' Dark Brown Sand with Rock	A	A	A
14		A	A	
15	15' - 16' Pale Brown Sand with Rock	7	10	19
16		9	12	
17	16' - 21' Limerock (Refusal at 21' due to Limerock)	A	A	A
18		A	A	
19		A	A	A
20		A	A	
21		50+	-	50+
22				
23				
24				
25				
26				
27				
28				
29				
30				

Water Level: 11' 0" Below Land Surface

A = Auger



**Site Location Map**

**Federal Engineering & Testing Inc.** 3370 NE 5th Avenue, Oakland Park, FL 33334 (954) 784-2941

Client: Design Kollaborative Architects  
Test: Subsoil Investigation  
(site map is not to scale)

Project: Proposed 1-Story Addition  
Project Address: 800 SW 36th Avenue  
Pompano Beach, FL 33069



**Soil Boring Location Map**

**Federal Engineering & Testing Inc.** 3370 NE 5th Avenue, Oakland Park, FL 33334 (954) 784-2941

Client: Design Kollaborative Architects  
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(site map is not to scale)

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## Soil Classifications

Correlation of Penetration Resistance with Relative Density and Consistency					
Sands					
Dynamic Cone Penetrometer <i>Penetrometer Resistance</i>		Standard Penetration <i>Hammer Blows</i>		Relative Density	
	0 - 10		0 - 4		Very Loose
	11 - 25		5 - 10		Loose
	26 - 45		11 - 20		Firm
	45 - 75		21 - 30		Very Firm
	76 - 120		31 - 50		Dense
	> 120		> 50		Very Dense

Silts & Clay					
Dynamic Cone Penetrometer <i>Penetrometer Resistance</i>		Standard Penetration <i>Hammer Blows</i>		Relative Density	
	0 - 6		0 - 2		Very Soft
	7 - 15		3 - 5		Soft
	16 - 30		6 - 10		Firm
	31 - 45		11 - 15		Stiff
	46 - 90		16 - 30		Very Stiff
	91 - 150		31 - 50		Hard

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

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

Particle Size	
Boulder	> 12 in
Cobble	3 - 12 in
Gravel	4.76 mm - 3 in
Sand	0.074 mm - 4.76 mm
Silt	0.005 mm - 0.074 mm
Clay	< 0.005 mm

Silt - Clay Quantity Modifiers	
Slightly Silty / Clayey	0 - 5 %
Silty / Clayey	5 - 30 %
Very Silty / Clayey	30 - 50 %

## Drilling & Sampling Procedures

The soil borings were installed in accordance with Standard Penetration Tests procedures as set forth in ASTM D-1586. Representative samples were collected utilizing spilt-barrel techniques in accordance with the procedures set forth in "Penetration Tests and Spilt-Barrel Sampling of Soil in ASTM D-1586. The following field tests, measurements and laboratory analysis were performed/collected during the installation of each soil boring.

### Penetration Tests

During the sampling procedures, Standard Penetration Tests were performed at five (5) foot intervals to obtain the standard penetration value (N) of the subsurface soil. The standard penetration value (N) is identified as the number of blows of a 140-pound hammer falling thirty (30) inches, required to advance the spilt-barrel sampler one (1) foot into the subsurface soil. The sampler was lower into the bottom of the previously cleaned drill hole and advanced by blows from the hammer. The number of blows was recorded for each of the three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers.

### Water Level Measurements

Water Level depths were obtained during the test boring operations. In relatively pervious soils, such as sandy soils, the indicated depths are usually reliable groundwater levels. Seasonal variations, tidal conditions, temperature, land-use and recent rainfall conditions may influence the depths to groundwater levels.

### Soil Properties / Classification

All samples collected were classified in accordance with the Unified Soil Classification System criteria to determined soil material properties and compared with published literature of the USDA Soil Conservation Survey.

### Ground Surface Elevations

Ground surface elevations have not been provided for the proposed boring locations. Therefore, all references to depth of the various strata and materials encountered were from existing grade at the time of the drilling operations.

## Limitations of Liability

### *Warranty*

We warrant that the services performed by Federal Engineering and Testing, Inc. (F.E.T.) 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 F.E.T. 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. Reports are not intended for 3rd party use.

### *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 F.E.T. 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, F.E.T. 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.

### *Ownership of Tests / Reports*

All test results and/or reports prepared by F.E.T. pursuant to this agreement and/or Addendum(s) thereto, shall remain the property of F.E.T. until all monies due and owing to F.E.T. under this Agreement and/or Addendum(s) thereto, are paid in full.

### *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.

### *Analysis and Recommendations cont.*

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. 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. Soil boring(s) on unmarked vacant property or existing structure(s) to be demolished is considered preliminary with further boring(s) to be performed after proposed building pad is staked out. 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, F.E.T. must 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 F.E.T. 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 client whether that work is being carried out in general conformance with the plans and specifications.

### *Limitations of Report*

Federal Engineering & Testing, Inc. shall have no liability, in contract, tort or otherwise, for any inaccuracy, defect, or omission in interpreting this report and shall not in any event have any liability for lost profits or any other indirect, special, incidental, consequential, exemplary or punitive damages. In the event of future conflict between owners and contractors the following applies: F.E.T.(s) legal and/or company representation and preparation for representation fees will be billed on an hourly rate, i.e. deposition, expert witness, etc. F.E.T. has no obligation to amend its conclusions or recommendations after the date of this report. Any alterations or changes in the location of the project should be brought to our attention at the earliest convenience for review and applicability of this report.

## Partial List of Services

### Geotechnical Engineering Services

**Soil / Aggregate Tests**

Soil Borings  
Density Compaction Tests  
Grain Size Analysis  
Moisture Contents  
Soil Classifications  
Limerock Bearing Ratios  
Florida Bearing Values  
Specific Gravity  
Carbonate Analysis  
Hydraulic Conductivity  
Organic Contents  
L.A. Abrasion

**FDOT Inspections**

QC Management  
Earthwork Inspections  
QC Concrete Inspections  
QC Asphalt Inspections

**Field Inspection Services**

Fill & Quality Control Inspections  
Demucking Inspections  
Building Inspections  
Pile Driving Inspections  
Pile Load Tests  
Steel Inspection  
Threshold Inspection  
Bolt Inspection  
Weld Inspection  
Vibration Monitoring

**Geotechnical Engineering**

Foundation Engineering  
Foundation Design & Recommendation  
Subsoil Investigation  
Pile Load Calculations  
Piling Installation Monitoring

**Asphalt Services**

Backscatter Density Tests  
Extractions & Gradations  
Marshall Limits  
Bulk Specific Gravity  
Cores for Thickness Determination  
Asphalt Pavement Monitoring  
Asphalt Assessment

**Concrete Tests**

Concrete Strength Testing  
Slump Tests  
Windsor Probe Testing  
Schmidt Hammer Testing  
Core Testing  
Air Content  
Concrete Unit Weight  
Flexural Strength Testing

### Environmental Engineering Services

**Phase I Site Assessments**

Site Inspections  
Research of Property Records

**Phase II Site Assessments**

Phase I Follow up on Contaminated Sites  
Installation of Monitoring Wells  
Soil Borings  
Soil and Ground Water Analysis

**Lead Base Paint Surveys**

Report and Analysis  
Air Monitoring

### Roof Testing & Inspection Services

TAS 105 Field Fastener Withdrawal Test  
TAS 106 Tile Uplift Test  
TAS 124 Bell Chamber / Bonded Pull Test  
TAS 126 Moisture Survey  
Windload Calculation  
Drainage Calculations  
Lightweight Concrete placement Inspection  
Roof Assessment / Evaluation  
Cap Sheet Inspection  
Fastener Spacing Inspection  
Tile/ Shingle/ Standing Seam Inspection  
Base Sheet Installation Inspection  
Insurance Mitigation  
Retrofit Mitigation/ Certification  
Roof Drainage Calculations

