FLORIDA INTERNATIONAL UNIVERSITY
DEPARTMENT OF CONSTRUCTION MANAGEMENT
BCN 3727
CONSTRUCTION SITEWORK

HANDOUT #1

COMMON SIEVE TYPES AND MESH OPENINGS

Sieve Size Designation	U. S. Standard		Tyler Standard		British Standard	
	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
#4	0.187	4.76	0.185	4.70	—	—
#8	0.0937	2.38	0.093	2.362	0.081	2.057
#10	0.0661	1.68	0.065	1.651	0.0661	1.676
#20	0.0331	0.84	0.0328	0.833	—	—
#40	0.0106	0.42	—	—	—	—
#60	0.0098	0.25	0.0097	0.246	0.0099	0.251
#100	0.0059	0.149	0.0058	0.147	0.0060	0.152
#200	0.0029	0.074	0.0029	0.074	0.0030	0.076
#270	0.0021	0.053	0.0021	0.053	—	—
#400	0.0015	0.037	0.0015	0.038	—	—

LABORATORY NO.: 114719

DATE: 11/1/04

[redacted]

REPORT OF IN-PLACE SOIL DENSITY TESTS

CLIENT: [redacted]
ADDRESS: [redacted]
PROJECT: PROPOSED REMODEL: [redacted] NE [redacted], FT. LAUD., FL
SOIL DESCRIPTION: GREY SAND, TRACE ROCK

MAX. DRY DENSITY 109.7 LBS. / CU. FT. | OPTIMUM MOISTURE 10.8 % | METHOD OF TEST ASTM D-1557 "A"

DATE OF TEST	TEST NO.	TEST LOCATION	LIFT NO.	FIELD MOISTURE %	IN-PLACE DENSITY (LBS./CU. FT.) WET	DRY	% COMPACT
10/29/04	1	Center of garage	Final	8.6	122.8	113.1	103.
"	2	Porch, living area slab	"	7.5	114.8	106.8	97.

ABOVE TESTS REPRESENT THE IN-PLACE DENSITY AT TEST LOCATION. TEST DEPTH WAS 10 INCHES. THESE TESTS SHOULD NOT BE USED AS AN INDICATOR OF SOIL DENSITY BELOW TEST DEPTH. THE ABOVE TESTS DO ____ MEET THE REQUIRED 95 % OF MAXIMUM DRY DENSITY.
TECHNICIAN: M. Krouskroup

SOUTHEASTERN ENGINEERING & TESTING LABORATORY
RONALD A. BAIER, P.E. 11/1/04

SOUTHEASTERN ENGINEERING
& TESTING LABORATORY
A MEMBER OF THE
SOUTHEASTERN ENGINEERING GROUP, INC.

4761 SW 51 ST., DAVIE, FL 33314-5503
PHONE: 954/584-4322 FAX: 954/584-4338
DAYTONA BEACH: 386/252-6878
WWW.SEETL.COM

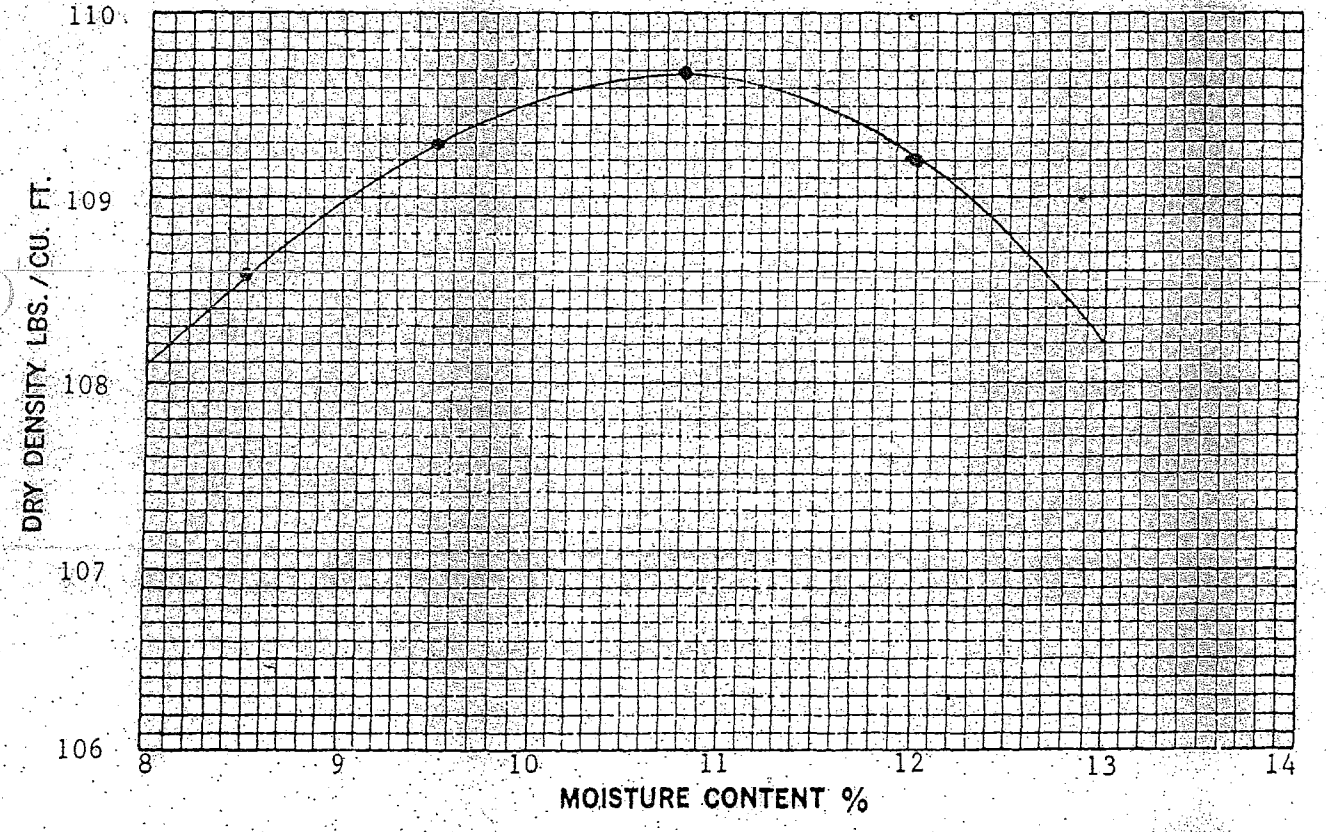
LABORATORY NO.: 114720
JOB NO.: N/A
DATE: 11/1/04
AUTHORIZATION NO.: N/A

REPORT OF
MOISTURE - DENSITY RELATIONSHIP OF SOIL

CLIENT: [redacted]
ADDRESS: [redacted] FORT LAUDERDALE, FL

PROJECT: PROPOSED REMODEL: [redacted]
LOCATION: FILL @ GARAGE AND LIVING AREA
SOIL DESCRIPTION: GREY SAND, TRACE OF ROCK
METHOD OF TEST: astm D-1557 "A"

MOISTURE — DENSITY RELATIONSHIP CURVE



Optimum Moisture 10.8 % Max. Dry Density 109.7 lbs. / cu. ft.

SOUTHEASTERN ENGINEERING
& TESTING LABORATORY
11/01/04
RONALD A. BAYER, P.E.

SOUTHEASTERN ENGINEERING TESTING LABORATORY
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November 1, 2004 BCEI FILE NO: 04J04

REPORT OF BEARING CAPACITY OPINION

Mr. John Heller, CHIEF BUILDING OFFICIAL
CITY OF FORT LAUDERDALE BLDG DEPT
300 NW 1st Avenue
Fort Lauderdale, FL 33301

RE: [redacted] **RESIDENCE RENOVATIONS** **PERMIT NO:** [redacted]
[redacted]
Fort Lauderdale, FL

Dear Sir:

This is to confirm that technicians from Southeastern Engineering & Testing Laboratories, Inc. have conducted a standard penetration test (SPT) geotechnical subsoil investigation in accordance with ASTM D-1586, and soil density tests pursuant to ASTM D-2922 and D-1557, at the above referenced project, reports of which were submitted to you under separate cover. In-place soil density tests conducted according to ASTM D-2922 on the final lift of the compacted building pad were found to meet the recommended 95% of maximum dry density, as determined by ASTM D-1557.

Based on the results of the subsoil investigation and the density tests, it is our opinion that these soils appear substantially adequate to support the proposed construction on a shallow foundation of poured-in-place reinforced concrete spread and continuous footings designed utilizing an allowable bearing capacity of 2500 PSF in order to limit total settlement to one (1") inch or less, in accordance with Meyerhof Theory.

Due to the fact, however, that soils are generally naturally deposited materials, formed under variable conditions, it must be realized that major subsurface discontinuities may occur within very short distances. While we feel that our test results represent general project site conditions with respect to both type and density of soils, our office does not warrant or imply that soil test data collected are indicative of subsurface conditions except at the test location. Only a limited geotechnical evaluation of this site has been requested and performed and represents an accurate appraisal of site conditions, based upon careful interpretation of physical data, to the extent reasonably possible.

Respectfully submitted,

11/04/04

RONALD A. BAIER, P.E.
Consulting Geotechnical Engineer
Florida Reg. No. 16211

SOUTHEASTERN ENGINEERING & TESTING LABORATORY, INC.
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SERVICE DATE: 1/13/04
JOB NO: 2004-04
INVOICE NO: 26340
TECH: M.C. Krouskroup

REPORT OF GEOTECHNICAL INVESTIGATION UTILIZING PENETRATION TESTS & SPLIT-BARREL SAMPLING OF SOILS, ASTM D 1586

CLIENT: [redacted]
[redacted] SW [redacted] Avenue
Davie, FL 33330

PROJECT: **PROPOSED NEW [redacted] RESIDENCE**
FLORIDA FRUIT LANDS COMPANY SUBDIVISION No. 1
TRACTS [redacted]
Davie, FL

INTRODUCTION

Pursuant to your request and authorization, we have performed an evaluation of standard penetration tests and split-barrel sampling of soils conducted on January 13, 2004, at the above referenced project, for the purpose of performing a limited subsoil exploration of the site in connection with the proposed construction, in order to assist in the formulation of foundation recommendations, and we are herewith submitting our report in this regard.

TEST PROCEDURE

The tests were conducted in accordance with ASTM D 1586 utilizing a SIMCO 2400 SK drill rig by driving a standard 2" O.D., 1-3/8" I.D. split-barrel penetration spoon into undisturbed soil using a 140-pound drop hammer falling a height of thirty [30"] inches. The penetration resistance was logged in blows per six [6"] inches of penetration and appears on the boring logs accompanying this report. The number of blows required to drive the sampler one [1'] foot after seating six [6"] inches is designated as the Penetration Resistance or, "N" Value, of the soil. This value provides an estimate of *in-situ* soil strength and density at a given depth.

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TEST PROCEDURE (con't)

Soil samples, which were recovered, are used for visual subsoil identification per ASTM D 2488, Description and Identification of Soils (Visual-Manual Procedure).

The detailed subsurface conditions encountered at the test locations are described on the boring logs. The limits of separation between strata represent approximate boundaries and the changes between materials may be gradual.

This limited subsurface investigation was conducted by performing four (4) Standard Penetration Test (SPT) borings at locations determined by the Client. The boring locations are noted on the attached boring logs. The laboratory engineering team determined the depth of the exploratory borings.

The test borings, which were situated in proximity to the proposed building area, were advanced to a maximum proposed test depth of fifteen (15') feet below land surface (BLS), which is, in our opinion, within the soil bearing load zone of influence of structures of the proposed configuration.

SITE DESCRIPTION

The project site is comprised of a vacant 28.8 Acre tract of land located at [redacted] Street, in the [redacted] area of the Town of Davie, Florida. The property is relatively flat and contains a cover of weeds and orange trees in the areas where the exploratory borings were conducted. The elevation of the proposed building pad area appears to be approximately three (3') feet below desired construction grade.

PROJECT DESCRIPTION

The proposed construction will consist primarily of a two-story conventional, poured-in-place reinforced concrete (PIPRC), concrete masonry unit (CMU) structure, which is to be utilized as a new single-family residence.

SITE GEOLOGY

The geologic formations occurring within the southwestern Broward County area in which the project is located range in age from Pleistocene through early Miocene and include (youngest to oldest): the Miami oolite (Miami Limestone), the Anastasia formation, the Fort Thompson formation, and the Tamiami formation.

The Miami oolite is generally a white to yellowish oolitic limestone containing large amounts of sands and shells. This latter formation is either very thin or entirely absent in much of the coastal area, which is primarily mantled by the Pamlico sand deposit.

SITE GEOLOGY (con't)

The Tamiami and Anastasia formations are quite similar in composition, and it is very difficult to detect or distinguish differences between them. These formations are composed chiefly of alternating beds or lenses of sandy limestone or calcareous sandstone, sand, shells, and sand clay or marl.

The Biscayne aquifer (source of all fresh ground water in Broward County) is a generalized term of reference and includes all of the stratigraphic units discussed above. It extends from near ground surface to more than two hundred [200'] feet below mean sea level (includes the upper portion of the Tamiami formation). This aquifer is unconfined, and the level of ground water in the area represents its upper extent or boundary. The lower boundary of the aquifer is at the base of the upper more permeable strata of the Tamiami formation.

SOIL DESCRIPTION

A review of the boring logs attached hereto reveals a subsurface soil profile in the area of the proposed project which is somewhat consistent throughout the site and primarily consists of, in descending order, a surficial deposit of up to nine (9") inches in thickness of **black sandy muck** underlain by a stratum of **very loose, fine grain sand** to approximately seven to twelve (7'-12') feet BLS, overlying interbedded strata of **medium dense to dense calcareous sand, cemented calcareous sand and limerock** to the termination of the explored depths.

CONCLUSIONS & RECOMMENDATIONS

Based upon the results of this limited subsoil exploration, as discussed above and described in the attached boring logs, it is our opinion that the soils encountered during SPT implementation, **except for the surficial deposits of sandy muck,** consist of **cohesionless granular soils which are sufficiently consolidated, with the application of a soil modification program consisting of stripping, excavation, back-filling and surficial vibro-compaction**, to adequately support the proposed new construction on a shallow foundation designed in accordance with Section 1819 of the Florida Building Code (FBC) utilizing an allowable bearing capacity of 2500 PSF, to limit total settlement to not more than the one (1") inch or less, in accordance with Meyerhof Theory.

Consequently, in order to prepare the building pad for the proposed structure, we recommend the following site preparation procedure:

1. Strip the proposed building area to within at least five (5') feet beyond the proposed construction perimeter. **Completely remove the cover of vegetative growth and the surficial deposits of black sandy muck observed in the SPT borings, as discussed above, down to the clean sand.**

CONCLUSIONS & RECOMMENDATIONS (con't)

2. During the clearing process to remove the unsuitable soils, discard the organic soils and, if possible, stockpile the clean, granular soils for reuse as backfill. Examine the entire stripped and cleared building area to be sure that no pockets of topsoil, organic sand, muck, silt, peat, roots, vegetation, trash or other deleterious material, if encountered, remain in the construction area. **If the above-described condition is found, the limits of the deleterious materials must be excavated to their perimeters and depth until all these materials are removed. Grade the pad to a level condition.**

3. After the proposed construction area has been cleared, excavated and graded, **saturate the entire pad area,** and use a heavy, self-propelled vibratory roller **(DYNAPAC CA251, or equivalent)** to surface vibro-compact **("proof-roll")** the in-situ soils utilizing a minimum time-rate of compaction of 0.5 minutes per square yard of surface area to be compacted. The compactor must operate at full drum cycle atnd move at its slowest trans-lateral speed. Subsequently, backfill the pad area to desired depth as described in "4." below, and compact as before. **We recommend that in-place soil density tests be taken in accordance with ASTM D-2922 in the proposed footing and slab areas after the completion of the compaction, a minimum of one [1] test for every 2000 sq. ft. of pad area, or fraction thereof (2 tests minimum).** The in-place density must achieve at least **95%** of maximum Modified Proctor dry density as determined by ASTM D-1557.

4. Additional stockpiled or imported backfill material to be added to the site to achieve a minimum grade elevation, **if required,** should be placed in **loose lifts of twelve [12"] inches thick, maximum.** The soils should be moistened to plus or minus 2% of optimum moisture as determined by ASTM D-1557 and compacted to **95%** of maximum Modified Proctor dry density. Again, a minimum of in-place soil density tests, as described in 3., above, should be made on each lift of fill.

5. **A qualified Geotechnical Engineer or Soils Technician must be present during all earthwork operations to ensure compliance with these recommendations if it is desired that this office verify bearing capacity determination. Post-Compaction SPTs must be taken after completion of earthwork to verify soil-bearing capacity, as noted above.**

6. Fill material utilized should consist of clean granular soils containing no organics with no more than 30% rock and no rock larger than two [2"] inches in diameter less than 24 inches below the bottom of the anticipated floor slab and footings, and three (3") inches in diameter overall.

CONCLUSIONS & RECOMMENDATIONS (con't)

7. It should be noted that half of the compaction effort should be 90 degrees to the original direction of compaction.

8. **In all cases where vibro-compaction is utilized, care must be taken not to cause damage to adjacent structures or their contents. Monitor all adjacent structures for signs of distress and, if noted, discontinue use of vibro-compaction and contact this office for further recommendations.**

9. The bottom of each footing should be located so as to conform to FBC requirements in order to ensure the necessary lateral confinement of the footing and the corresponding surcharge effect.

10. After the excavation for the footings is made, the underground utilities have been installed and the footing and slab areas are properly graded, restore the compaction on these areas, if required, using a self-propelled roller or plate compactor (**WACKER DPU 6055**, or equivalent). The compaction should be applied uniformly to achieve 95% of maximum Modified Proctor dry density in the footing and slab areas.

LIMITATIONS

Due to the fact that soils are generally naturally deposited materials, formed under variable conditions, it must be realized that major subsurface discontinuities may occur within very short distances. It is unlikely that the dispersed tests used for this investigation revealed all subsurface conditions. **Our office does not warrant or imply that the data collected on our boring logs are indicative of subsurface conditions except at the locations where borings were taken.**

In addition, as a matter of record, in order to avoid possible misunderstanding, only a limited geotechnical evaluation of this site has been requested and performed, and represents an accurate appraisal of site conditions based upon careful interpretation of physical data, to the extent reasonably possible.