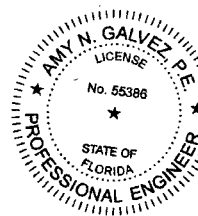


Pelican Square
Section 30, Township 40S, Range 43E
Village of Tequesta, Florida

Preliminary Water Management Calculations

Prepared: April 2018
Revised May 2018

Amy N Galvez
13:23:21 2018.08.21
'00'04-



This item has been electronically signed and sealed by Amy N. Galvez using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Simmons & White, Inc.
2581 Metrocentre Boulevard West
Suite 3
West Palm Beach, Florida 33407
Cert. Of Authorization 3452

Project Summary:

The subject parcel is located between Canal Court and Inlet Court, west of US-1 in the Village of Tequesta, Florida and contains approximately 1.05 acres. The current addresses are 691 and 19626 N. US. Highway 1, 3471 Inlet Court and 3486 Canal Court, and the Property Control Numbers for the subject parcel are

60-43-40-30-58-001-0000

60-43-40-30-58-002-0000

60-43-40-30-58-003-0000

60-43-40-30-58-004-0000

The site is currently vacant with an alley that will be vacated. Proposed site development consists of the construction of office space with apartments above and one townhouse building.

Proposed Land Use:

There is a significant grade differential existing on the site and a retaining wall be required along the east property line for the proposed development. The FFE for the buildings on the west half of the property will have a three to four foot difference with the building on the east half of the property.

Building / roof area = 0.24 acres

Parking / Impervious areas = 0.40 acres

Open space area = 0.41 acres

Total area = 1.05 acres

Water Quality:

1) 1" Over the site:

$$1.05\text{ac (1")} = 1.05 \text{ ac-in Required Water Quality}$$

2) 2 ½" x % Impervious:

$$\frac{(1.05 \text{ ac} - 0.24 \text{ ac} - 0.41 \text{ ac}) \times 2 \frac{1}{2}" \times 1.05 \text{ ac}}{(1.05 \text{ ac} - 0.24 \text{ ac})}$$

$$= \underline{1.3 \text{ ac-in Required Water Quality}} \quad \underline{10.7 \text{ ac-in Provided in Trench}}$$

Ground Storage:

The soil storage value used is based on the SFWMD maximum allowable soil storage value of 14.68" since the site is located on the coastal dune and the proposed grades are mostly greater than ten feet above the control elevation for the area. Per the attached geotechnical report information, the soil type is St. Lucie, Paola, Urban land complex (Map Unit ID 41) and the USDA Soil Survey describes this soil type as consisting of sandy marine deposits located on knolls on marine terraces, with excessively drained sands noted to be present to depths in excess of 80 inches below grade, and with a water table deeper than 80 inches. Also, the soil borings indicate that the water table elevation is greater than 10 feet below existing grade.

$$S = \frac{(0.41 \text{ ac}) \times (14.68")}{1.05 \text{ ac}}$$

$$S = 5.73"$$

Site Runoff Calculations:

The project's location on the Coastal Dune presents the opportunity for the project to meet (and exceed) local governing agency requirements through the use of on-site exfiltration trench. This project is designed as a zero discharge site for up to and including the 100 year 3 day storm event, which is stored completely within the exfiltration trench.

P = 16" Total rainfall for 100 year, 3 day event

S = 5.73" Ground storage on site

Calculate total runoff from 100 year, 3 day event:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

Q = 10.7 ac-in Volume required to be stored in on-site exfiltration trench.

10.7 ac-in Provided in Exfiltration Trench

Exfiltration trench recovery time:

The calculations below are to show the recovery rate for the exfiltration trench based on the volume for the 100 year, 3 day storm event. Calculations are based on flow through 170 feet of 5 foot x 10 foot exfiltration trench with top elevation = 10.5 and $(k) = 4.9 \times 10^{-4}$. Refer to enclosed exfiltration trench calculations for other dimensions:

$$Q_{\text{Bottom}} = (k)(H_2)(10 \text{ ft})(170 \text{ ft})$$

$$Q_{\text{Bottom}} = 5.8 \text{ cfs}$$

$$Q_{\text{Sides}} = (k)(170 \text{ ft})(H_2 \times D_U - 0.5 \times D_U^2 + H_2 \times D_S)$$

$$Q_{\text{Sides}} = 1.9 \text{ cfs}$$

$$\text{Total Flow through Trench} = Q_{\text{Bottom}} + 2 \times Q_{\text{Sides}}$$

$$= \underline{9.6 \text{ cfs}}$$

Volume required to be stored in trench:

$$10.7 \text{ Ac-in} \times \frac{43,560 \text{ sf}}{\text{Ac}} \times \frac{1 \text{ ft}}{12 \text{ in}} = 38,841 \text{ ft}^3$$

Time for recovery of exfiltration trench:

$$= \frac{38,841 \text{ ft}^3}{9.6 \text{ ft}^3/\text{sec} \times 3600 \text{ sec/hr}}$$

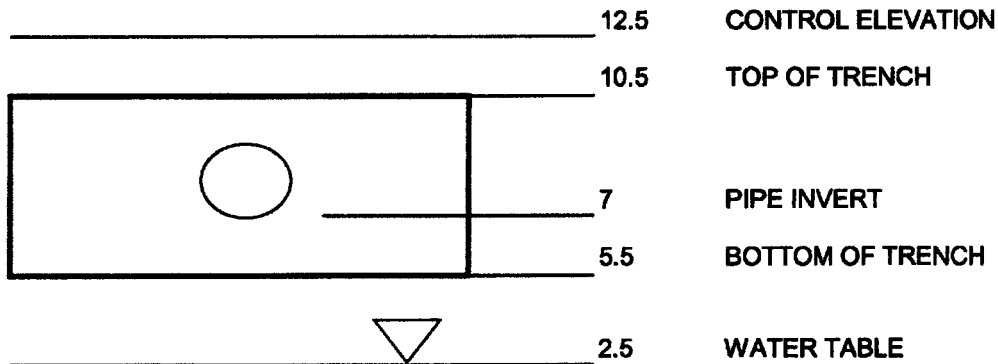
$$= \underline{1.1 \text{ hrs}}$$

SIMMONS & WHITE INC.
METROCENTRE BLVD. WEST, SUITE 3
WEST PALM BEACH, FLORIDA 33407
CERTIFICATE OF AUTHORIZATION #3452
EXFILTRATION TRENCH LENGTH CALCULATION

JOB NO: 17-137
DATE: 4/18/2018

$$L = \frac{V}{K(H_2 W + 2 H_2 D_U - D_U^2 + 2 H_2 D_S) + (1.39 \times 10^{-4}) W D_U}$$

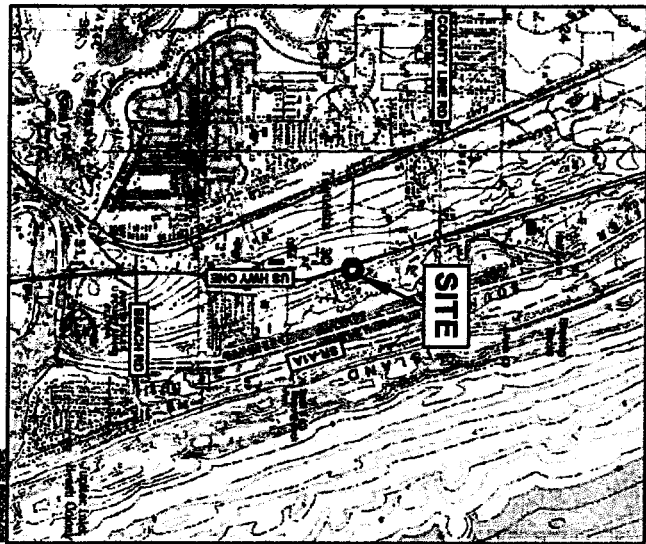
V= VOLUME TO BE TREATED	10.7 AC-IN
W= WIDTH OF TRENCH	10 FT
K= HYDRAULIC CONDUCTIVITY	0.00049 CFS/SF-FT
H2= DEPTH TO WATER TABLE FROM CONTROL ELEVATION	7.0 FT
DU= NON-SATURATED TRENCH DEPTH	5.0 FT
DS= SATURATED TRENCH DEPTH	0.0 FT
L= REQUIRED TRENCH LENGTH	<u>169.04</u> FT



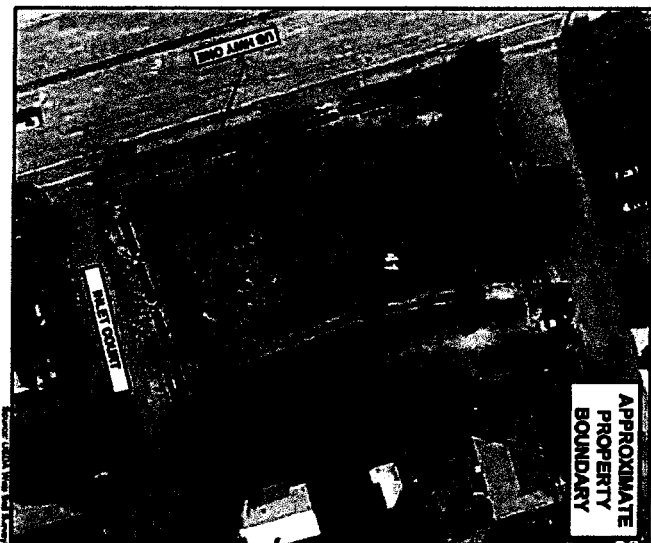
2016 AERIAL PHOTOGRAPH



USGS TOPOGRAPHIC MAP
(1983 USGS Quadrangle Map of "Jupiter, Florida")



USDA SOIL SURVEY MAP



NOT TO SCALE

...within
Section 30
Township 40 South
Range 43 East

USDA SOIL TYPES ON SUBJECT SITE
(Source: USDA Web Soil Survey)
41: St. Lucie-Peache-Urban land complex,
0 to 8 percent slopes



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SITE VICINITY MAPS

GEOLOGICAL ENGINEERING EVALUATION
PROPOSED 3-STORY MIXED-USE BUILDINGS
1-ACRE (±) VACANT PROPERTY
NORTHEAST CORNER OF US HWY ONE & PALM BLVD
TEQUESTA, PALM BEACH COUNTY, FL

Drawn by: PCA
Checked by: DPA
ADCE File No: 17-280

Date: August 2017
Date: August 2017
Figure No. 1

Map Unit Legend

Palm Beach County Area, Florida (FL811)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
41	St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes	3.2	100.0%
Totals for Area of Interest		3.2	100.0%

Palm Beach County Area, Florida

41—St. Lucie-Paola-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1j7ds

Elevation: 10 to 20 feet

Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 70 to 77 degrees F

Frost-free period: 358 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

St. lucie and similar soils: 35 percent

Paola and similar soils: 33 percent

Urban land: 30 percent

Minor components: 2 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of St. Lucie

Setting

Landform: Knolls on marine terraces, ridges on marine terraces

Landform position (three-dimensional): Side slope, interfluvium

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 5 inches: sand

C - 5 to 80 inches: sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not
assigned (G156AC999FL)
Hydric soil rating: No

Description of Paola

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 3 inches: sand
E - 3 to 20 inches: sand
C - 20 to 80 inches: sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very
high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0
to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not
assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified

Other vegetative classification: Forage suitability group not
assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Pomello

Percent of map unit: 1 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not
assigned (G156AC999FL)
Hydric soil rating: No




Palm beach

Percent of map unit: 1 percent
Landform: Dunes on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not
assigned (G156AC999FL)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Palm Beach County Area, Florida
Survey Area Data: Version 12, Sep 14, 2016

NOTES AND LEGEND

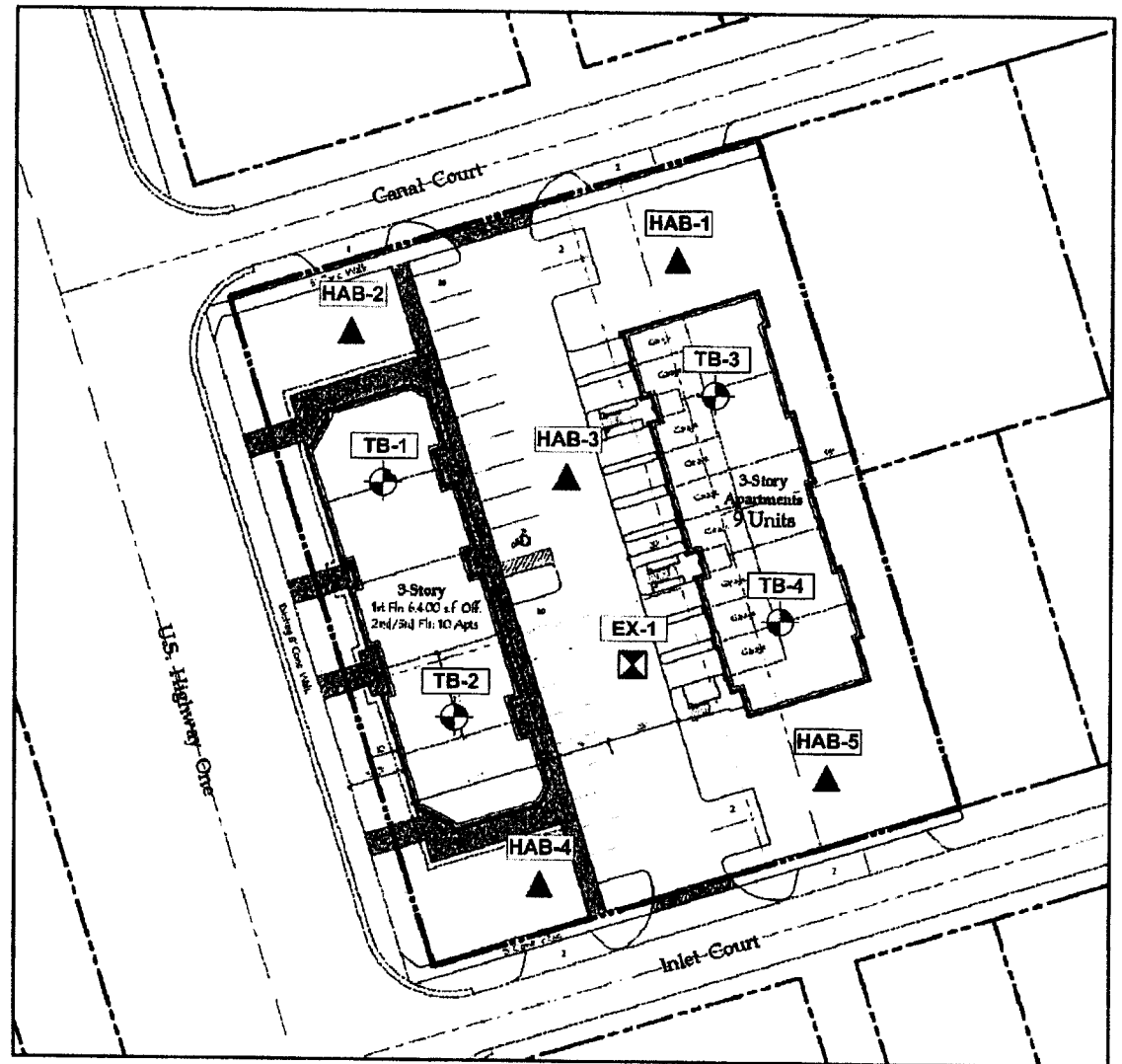
- TB-#**
 Standard Penetration Test Boring
HAB-#
 Hand Auger Boring
EX-#
 SFWMO Exfiltration Test

Shown and noted field work locations are approximate. All field work locations were located using the provided site plan, obtained aerial photographs, existing site features, and tape/wheel measurements. The shown field work locations should be considered accurate only to the degree implied by the method of measurement used.

Figure No. 2 Source:
Conceptual Development Plan by
Gentile Glas Holloway O'Mahoney & Associates, Inc.



APPROXIMATE SCALE (11x17): 1"=40'
 0 20 40
 FEET



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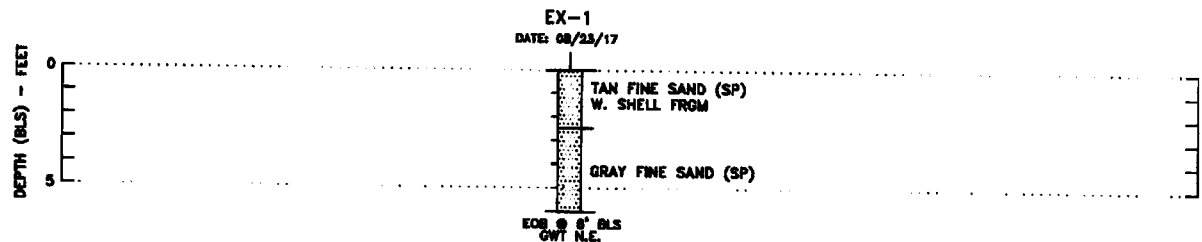
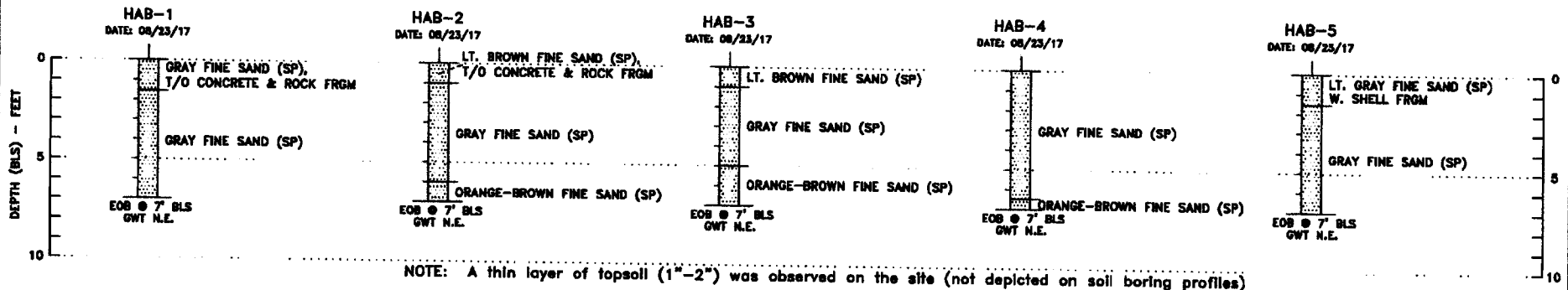
FIELD WORK LOCATION PLAN

GEOTECHNICAL ENGINEERING EVALUATION
 PROPOSED 3-STORY MIXED-USE BUILDINGS
 1-ACRE (+/-) VACANT PROPERTY
 NORTHEAST CORNER OF US HWY ONE & INLET COURT
 TEQUESTA, PALM BEACH COUNTY, FL

Drawn by: PGA
 Checked by: DPA
 AACE File No: 17-200

Date: August 2017
 Date: August 2017

Figure No. 2

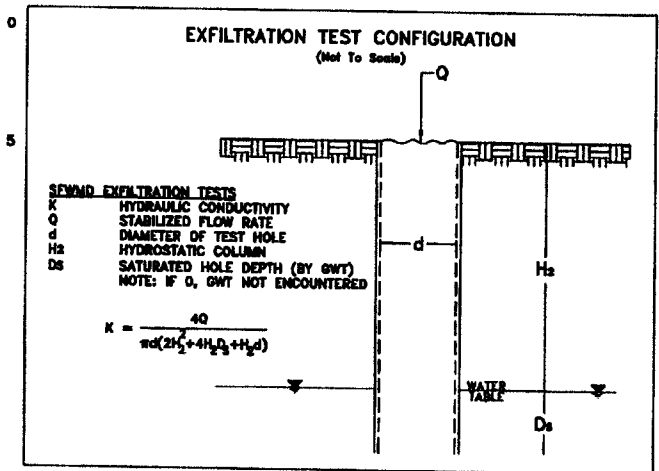


TEST SUMMARY (EX-1):

$Q = 1.5 \times 10^{-2}$ CFS
 $d = 0.5$ FT
 $H_2 = 6.0+$ FT
 $D_s = 0.0$ FT

$K = 4.9 \times 10^{-4}$ CFS/SQFT - FT HEAD

We recommend using a Factor of Safety of 2 when using this value in the design of drainage improvements.



GRAPHICAL LEGEND:

FINE SAND (SP)

PROJECT NOTES:

TB-# STANDARD PENETRATION TEST [SPT] BORING (ASTM D1586)
 HAB-# HAND AUGER BORING (ASTM D1452)
 EX-# SFVMD EXFILTRATION TEST
 N SPT RESISTANCE IN BLOWS PER FOOT
 L.L. GROUNDWATER TABLE (FT. BELOW EXIST. GRADE) AT TIME DRILLED
 EOB END OF BORING
 GWT N.E. GROUNDWATER TABLE NOT ENCOUNTERED
 BLS BELOW LAND SURFACE

SP: UNIFIED SOIL CLASSIFICATION SYSTEM [USCS]
 USCS GROUPS DETERMINED BY VISUAL CLASSIFICATION
 EXCEPT FOR NOTED LABORATORY TESTS
 MC NATURAL MOISTURE CONTENT IN PERCENT (ASTM D2216)
 -200 PERCENT PASSING NO. 200 SIEVE SIZE [PERCENT FINES] (ASTM D1140)



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Certificate of Authorization No. 26794

**SOIL BORING PROFILES AND
EXFILTRATION TEST RESULT**

GEOTECHNICAL ENGINEERING EVALUATION
 PROPOSED 3-STORY MIXED-USE BUILDINGS
 1-ACRE (+/-) VACANT PROPERTY
 NORTHEAST CORNER OF US HWY ONE & INLET COURT
 TEQUERTA, PALM BEACH COUNTY, FL

Drawn by: PGA
 Checked by: DPA
 AACE File No: 17-208

Date: August 2017
 Date: August 2017

Sheet No. 2