



GEOTECHNICAL ENGINEERING SERVICES REPORT

Velocity Project Number: 17-358

Project:

13498 Caribbean Boulevard
Fort Myers, Lee County, Florida
Strap #: 29-43-26-05-00090.0180

Client:

Mr. Chester Young
Hans Wilson & Associates, Inc.
1938 Hill Avenue
Fort Myers, FL 33901

Date: May 10, 2018

TABLE OF CONTENTS

SALUTATION	3
1.0 INTRODUCTION	3
1.1 Project Description	3
1.2 Purpose & Scope of Services.....	3
2.0 METHODOLOGY & FINDINGS	4
2.1 Site Features	4
2.2 Field Exploration Program	4
2.3 Laboratory Examination.....	4
2.4 Subsurface Soil Conditions.....	4
2.5 Groundwater.....	5
3.0 EVALUATION.....	5
4.0 LIMITATIONS	5
4.1 Unanticipated Conditions	5
4.2 Boring Logs & Figures.....	5
4.3 Reliance.....	5
4.4 Standard of Care	6
4.5 Reproduction	6
4.6 Out of Scope Considerations	6
5.0 CLOSING & CERTIFICATION	6

FIGURES

Figure 1 Project Location Plan

Figure 2 Boring Location Plan

BORING LOGS





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May 10, 2018

Subject: Geotechnical Engineering Services Report

13498 Caribbean Boulevard
Fort Myers, Lee County, Florida
Strap #: 29-43-26-05-00090.0180
Velocity Project Number: 17-358

Dear Mr. Young:

Velocity Engineering Services, LLC (Velocity) is pleased to submit this Geotechnical Engineering Services Report for the project referenced above. It has been our pleasure to work with you on this project.

1.0 INTRODUCTION

1.1 Project Description

Velocity understands that the proposed project will consist of a seawall design at the subject property. The client requested a geotechnical exploration program consisting of 1 test boring to a depth of 30 feet below the ground surface (BGS).

Velocity was provided with an Overall Site Plan, 1 page, dated 11/15/2017, by Hans Wilson & Associates Inc. showing the proposed boring location.

No other plans or construction details were available to Velocity at the time of this report.

1.2 Purpose & Scope of Services

The purpose of this exploration program was to evaluate the subsurface soil and groundwater conditions relative to the proposed seawall. Velocity therefore performed the following scope of services:

- ✓ Obtaining the necessary drilling permits, obtaining utility locates from Sunshine 811, and mobilizing a drill rig and crew to the site.
- ✓ Locating the test boring in the field based on measured or estimated distances from existing structures and/or GPS coordinates.
- ✓ Performing one (1) Standard Penetration Test (SPT) borings to a depth of thirty (30) feet below the ground surface (BGS).

- ✓ Grouting the test boring in accordance with regulatory requirements.
- ✓ Visually classifying the soil samples recovered from the test boring.
- ✓ Performing engineering analyses and preparing a Geotechnical Report for the project.

2.0 METHODOLOGY & FINDINGS

2.1 Site Features

The project site is vacant (grassy) and generally level. Its use classification is vacant governmental per the Lee County Property Appraiser. The existing seawall is leaning outward and there is a depression in the soils along the back side of the seawall. The site is bordered by a canal to the north, single-family residences to the east and west, and Caribbean Boulevard to the south. The approximate site location is depicted in Figure 1, Project Location Plan.

2.2 Field Exploration Program

The test boring was performed in general accordance with ASTM D1586 *“Standard Test Method for Standard Penetration Test (SPT) and Split Barrel Sampling of Soils”*. This procedure uses a 140 pound hammer with a 30 inch drop to drive a 2 inch (outside) diameter hollow tube called a “split-spoon”. The number of hammer blows required to drive the split-spoon 12 inches is called the “N Value” and is an indication of the relative density of the soil(s). The split-spoon also captures samples of the soil(s) so they can be retrieved.

The approximate boring location is depicted in Figure 2, Boring Location Plan.

2.3 Laboratory Examination

The soil samples retrieved during the field exploration program were visually examined in general accordance with ASTM D2488 *“Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)”*. Each soil sample was classified in general accordance with the Unified Soil Classification System (USCS), modified as necessary to describe typical southwest Florida soils. Additional laboratory testing was not included in our scope of services, nor was it deemed necessary at this time.

The soil samples will be retained at Velocity’s office for 30 days from the date of this report. The samples will then be disposed of unless other arrangements, such as the client taking possession of them or Velocity retaining them beyond this date, have been agreed upon in writing.

2.4 Subsurface Soil Conditions

The subsurface soil conditions at the site generally consist of very loose to loose sand (SP), sand with silt (SP-SM), silty sand (SM), and weathered limestone (WLS) from the existing ground surface to the boring termination depth of approximately 30 feet BGS. Detailed records of each boring are attached to this report.



2.5 Groundwater

At the time of our field exploration program, the ground water depth was measured at approximately 5.5 feet below the existing ground surface in the test borings. The ground water measurements were obtained prior to initiation of mud rotary drilling.

Fluctuation in groundwater depths should be anticipated due to seasonal changes, local rainfall, surface water runoff, tidal influences, and other site-specific considerations. Ponding of storm water should be anticipated after heavy rain events. These ground water depths and possible fluctuations should be considered when planning any excavations at the site. Dewatering may be required to facilitate the proposed construction.

3.0 EVALUATION

The client requested that Velocity provide the unit weight and angle of internal friction for each of the soil layers encountered in the test borings. As requested, Velocity has provided the estimated dry unit weight (ϕ) and angle of internal friction (γ) for each soil layer on the individual boring logs attached to this report. It should be noted that, for soils below the water table, the unit weight of water (62.4 pcf) should be subtracted from the dry unit weight to obtain the effective unit weight.

4.0 LIMITATIONS

4.1 Unanticipated Conditions

Velocity cannot be responsible for any unanticipated conditions that may be discovered on the site that were not encountered in our test borings. However, should any such unanticipated conditions be discovered, Velocity should be notified of them immediately in writing so that we may observe them and review their impact upon our recommendations presented herein.

If any of the project details stated herein are modified or changed, Velocity must be notified in writing so that we may review the applicability of our recommendations.

4.2 Boring Logs & Figures

The soil and groundwater conditions shown in the boring logs and reported herein reflect the conditions at the specific boring locations at the time of our exploration only. Conditions will vary across the site and will also vary with time. Soil layer transitions depicted on the boring logs should be considered approximate and variations in depth should be anticipated. The boring locations indicated were not surveyed and should be considered approximate.

4.3 Reliance

This report has been prepared for the exclusive use of the client, the project owner, and the design team for the indicated project only. No other parties are entitled to rely upon this report. Contractors should not rely upon this report for preparation of their bids and should perform their own investigations to confirm any details that



may impact their bids. This report should not be relied upon to plan any other project at this site, or the same project at any other site.

4.4 Standard of Care

These geotechnical engineering services have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the location where the Work was performed. No other warranty, expressed or implied, is made including, without limitation, any warranty of fitness for a particular purpose other than those expressly stated herein.

4.5 Reproduction

No portion of this report should be reproduced or used unless the entire report is reproduced in full.

4.6 Out of Scope Considerations

The depths of the test borings performed herein were limited to the depths to which the anticipated foundation loads are likely to influence. Evaluation of potential hazards at deeper depths, such as karst (sinkhole) activity, is beyond the scope of this investigation.

The following items are considered out of scope considerations and have not been evaluated by Velocity: examination or testing of the soil samples recovered for chemical contamination or other environmental hazards; determination or evaluation of the seasonal high water table; and constructability review.

5.0 CLOSING & CERTIFICATION

We appreciate the opportunity to be of service to you on this project. Please do not hesitate to contact us if you have any questions or if we may further assist you.

Sincerely,

Velocity Engineering Services, LLC
FBPE CA# 30362

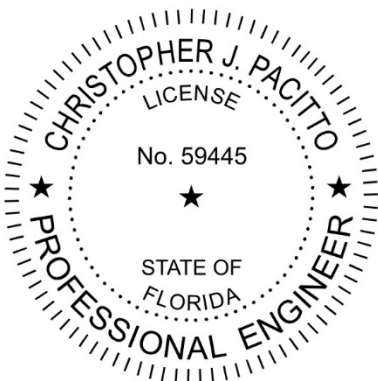
Christopher J. Pacitto, P.E.
President/Principal Engineer



Shane Kelley, E.I.
Project Engineer



Carlos Santillan, E.I.
Staff Engineer



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



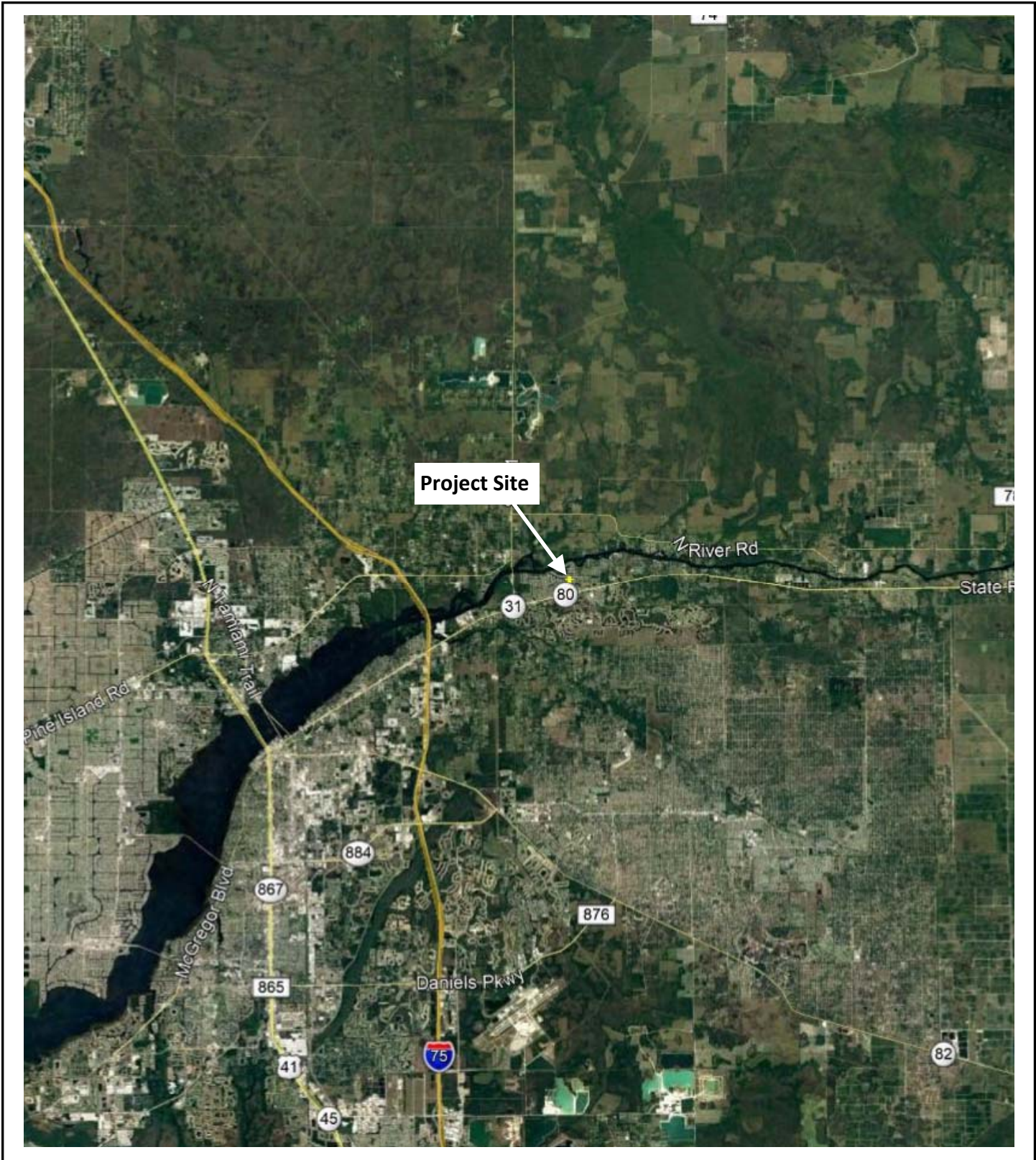


FIGURE 1 — PROJECT LOCATION PLAN



13498 Caribbean Boulevard
Fort Myers, Lee County, Florida
Velocity Project Number: 17-358

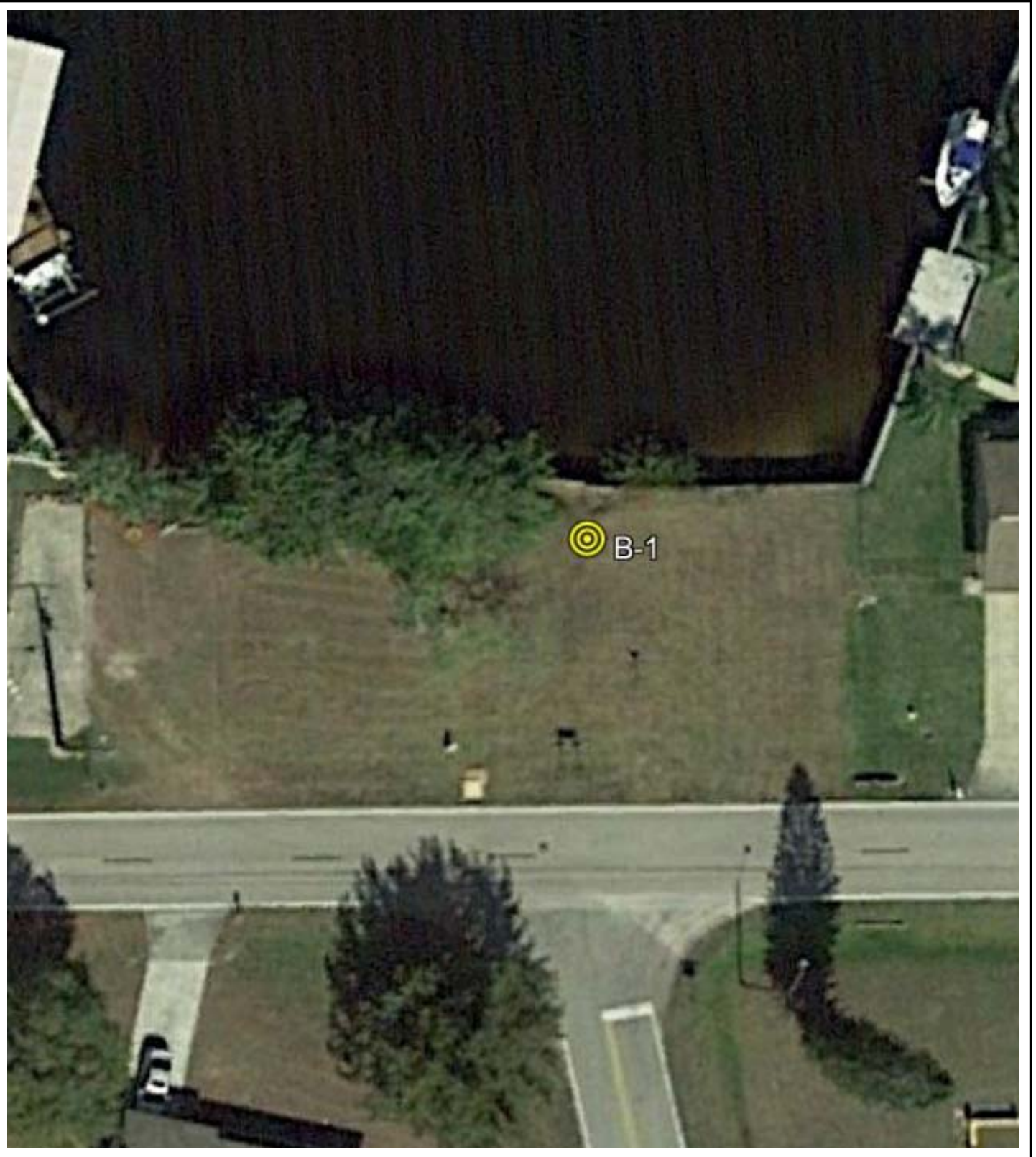


FIGURE 2 — BORING LOCATION PLAN

13498 Caribbean Boulevard
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KEY TO BORING LOGS

Major Division		Group Symbols	Typical Names
COARSE-GRAINED SOILS (50% of the material retained on No. 200 sieve)	Gravels (>50% retained on No. 4 sieve)	Clean Gravel	GW Well-graded gravels, gravel-sand mixtures, little or no fines
			GP Poorly-graded gravels, gravel-sand mixtures, little or no fines
		Gravel w/Fines	GM Silty gravels, gravel-sand-silt mixtures
			GC Clayey gravels, gravel-sand-silt mixtures
	Sands (<50% passes No. 4 sieve)	Clean Sands	SW Well-graded sands, gravelly sands, little or no fines
			SP Poorly-graded sands, gravelly sands, little or no fines
		Sand w/ Fines	SM Silty sands, sand-silt mixtures
			SC Clayey sands, sand clay mixtures
FINE-GRAINED SOILS (>50% of the material passes No. 200 sieve)	Silts and Clays (Liquid limit < 60)	ML Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
		OL Organic silts and organic silty clays of low plasticity	
	Silts and Clays (Liquid limit > 60)	MH Inorganic silts micaceous or distomaceous fine sandy or silty soils, organic silts	
		CH Inorganic clays of high plasticity, fat clays	
		OH Organic clays of medium to high plasticity, organic silts	
		PT Peat and other highly organic soils	
Highly Organic Soils			
Limestones	LS Limestone layer		
	WLS Weathered and/or deteriorated limestone		

DENSITY of SANDS, GRAVELS, and WEATHERED LIMESTONE

<u>N Value</u>	<u>Density</u>
0-4	Very Loose
5-10	Loose
11-30	Medium Dense
31-50	Dense
50+	Very Dense

CONSISTENCY of SILTS & CLAYS

<u>N Value</u>	<u>Density</u>
0-2	Very Soft
3-4	Soft
5-8	Firm
9-15	Stiff
16-30	Very Stiff
30+	Hard

HARDNESS OF LIMESTONE

<u>N Value</u>	<u>Density</u>
50-99	Soft
100+	Hard

PROPORTIONS

<u>Content</u>	<u>Description</u>
0-10%	With a Trace
10-25%	With Some
25-50%	With
*Recovery is 100% unless noted otherwise	

ABBREVIATIONS

WT	Water table at time of boring
HA	Boring advanced using Hand Auger
~	Approximated N value due to refusal
Moisture	Moisture Content per ASTM D2216
-200	% passing #200 sieve per ASTM D1140
Organics	Organic Content per ASTM D2974
LL, PL, PI	Atterberg Limits per ASTM D4318



BORING LOG NUMBER: B-1

PROJECT: 13498 Caribbean Boulevard
 PROJECT No.: 17-358 DATE: 4/26/18 GROUNDWATER: 5.5 ft
 NOTES:

DEPTH (FEET)	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
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0		5 3 3 4	6		SAND WITH SILT (SP-SM) Loose	Brown to tan with some shell X = 105 pcf, $\phi = 28^\circ$
		2 2 3 5	5		SAND (SP) Loose	Tan to brown X = 105 pcf, $\phi = 28^\circ$
5	WT	3 5 5 3	10		SAND WITH SILT (SP-SM) Loose	Tan X = 105 pcf, $\phi = 29^\circ$
		3 3 3 3	6		SAND WITH SILT (SP-SM) Loose	Grey X = 105 pcf, $\phi = 28^\circ$
		2 1 1 1	2		WEATHERED LIMESTONE (WLS) Very Loose	Grey Light tan X = 100 pcf, $\phi = 28^\circ$
10						
		0 0 1	1		WEATHERED LIMESTONE (WLS) Very Loose	The drill string advanced from 14 to 15 feet under the weight of the hammer Light tan with some silt X = 100 pcf, $\phi = 27^\circ$
15						
		1 1 1	2		WEATHERED LIMESTONE (WLS) Very Loose	Light grey with a trace of phosphate X = 100 pcf, $\phi = 28^\circ$
20						
		1 1 2	3		SILTY SAND (SM) Very Loose	Grey with some shell and a trace of phosphate X = 100 pcf, $\phi = 27^\circ$
25						
		1 1 2	3		SILTY SAND (SM) Very Loose	Green with some shell X = 100 pcf, $\phi = 27^\circ$ Boring terminated at 30.5 feet
30						