GEOTECHNICAL ENGINEERING SERVICES REPORT

Velocity Project Number: 18-225

Project:

Surfside Corner
2320 Southwest 21st Avenue
Cape Coral, Lee County, Florida
Strap #: 28-44-23-C4-05916.0000

Client:

Mr. Adam Tucker
Zimmer Development Company
111 Princess Street
Wilmington, NC 28401

Date: September 11, 2018

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Wilmington, NC 28401
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September 11, 2018

Subject: Geotechnical Engineering Services Report
Surfside Corner
2320 Southwest 21st Avenue
Cape Coral, Lee County, Florida
Strap #: 28-44-23-C4-05916.0000
Velocity Project Number: 18-225

Dear Mr. Tucker:

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 the new construction of 13, 4-story condominium buildings and one amenity building at the subject site. The client requested a geotechnical exploration program to evaluate subsurface soil conditions relative to the foundation support of the proposed building structures.

Velocity was provided with an Environmental Survey, 5 pages, dated June 2018, by W. Dexter Bender & Associates, Inc., and a Concept Plan, 1 page, dated June 11, 2018, by Ensite, Inc. No other 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 foundation support and construction of the proposed building structures. 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 borings based on measured or estimated distances from existing structures and/or GPS coordinates.

- ✓ Performing thirteen (13) Standard Penetration Test (SPT) borings to depths of thirty (30) feet below the ground surface (BGS) within the proposed 4-story building footprints (B-1 through B-13).
- ✓ Performing one (1) SPT borings to depths of 20 feet BGS within the amenity building footprint (B-14).
- ✓ Grouting the test borings in accordance with regulatory requirements.
- ✓ Visually classifying the soil samples recovered from the test borings.
- ✓ Performing engineering analyses and preparing a Geotechnical Report for the project.

2.0 METHODOLOGY & FINDINGS

2.1 Site Features

The project site is currently vacant (grassy) and is generally level. The site is bordered by SW 23rd Street followed by single family homes to the north and east, Veterans Memorial Parkway to the south, and wooded land and SW 23rd Lane to the west. The approximate site location is depicted in Figure 1, Project Location Plan.

2.2 Field Exploration Program

The test borings were 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 locations are 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.

During the visual inspection of the soil samples, Velocity identified the presence of phosphate in samples ranging from 8 to 30 feet below the ground surface in all the borings. Radium-226, the source of radon gas, is often found in phosphate. Therefore, Velocity recommends that consideration be given to performing laboratory testing to determine if Radium-226 is present in the soils at the site.

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 very dense sand (SP), sand with silt (SP-SM), silty sand (SM) and weathered limestone (WLS), and hard limestone (LS) from the existing ground surface to the boring termination depths of approximately 20 to 30 feet BGS. Detailed records of each boring are attached to this report.

During the subsurface exploration program, hard limestone was encountered at shallow depths ranging from 0 to 4 feet BGS within borings B-1, B-2, B-3, B-5, B-7, B-9 and B-14. The presence of a hard limestone layer can make the excavations of foundations and the installation of utilities difficult. Velocity recommends performing test pits to further explore the impact the hard limestone will have on the proposed construction.

2.5 Groundwater

At the time of our field exploration program, the ground water depth was measured at approximately 2.9 to 4.0 feet below the existing ground surface in borings B-4, B-6, B-8, B-10, B-11 and B-13. In the remaining borings, mud rotary drilling began at depths of approximately 0 to 4 feet BGS prior to the water table being encountered.

Fluctuation in groundwater depths should be anticipated due to seasonal changes, local rainfall, surface water runoff, 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 & RECOMMENDATIONS

3.1 Building Foundations

The evaluation of foundation options is generally governed by 2 primary considerations, bearing capacity and settlement. Bearing capacity is the soil's ability to support the foundation load without experiencing a plunging failure. The selected foundation must be able to provide adequate bearing capacity within an acceptable range of settlement.

Based upon the project description and subsurface conditions detailed herein, Velocity considers the subsurface soil conditions suitable for the support of the proposed structures on a shallow foundation system so long structural loads do not exceed 12.5 kips per linear foot for walls and 202.5 kips for columns. Recommendations for a shallow foundation system are presented in Section 3.2 of this report. These recommendations are contingent upon site preparation being performed in accordance with the specifications presented in Section 3.4 of this report.

3.2 Shallow Foundation Systems

An allowable soil bearing pressure of 2,500 psf may be used for shallow spread footing foundation design. Isolated column footings should have a minimum dimension of 24 inches and should bear at a depth of at least 24 inches below the lowest adjacent grade. Continuous wall footings should have a minimum width of 18 inches and should bear at a depth of at least 18 inches below the lowest adjacent grade. Settlement is projected to be less than 1 inch total and 1/2 inch differential.

3.3 Ground Floor Slab(s)

Ground floor slabs may be designed as traditionally reinforced concrete slabs-on-grade using a modulus of subgrade reaction ("K") of 150 pci. The ground floor slabs-on-grade should be structurally separated from all foundations, walls, and columns unless a monolithic "thickened edge" slab foundation is utilized. If a monolithic "thickened edge" slab is utilized, it should be properly reinforced to resist the bending moments that will occur due to the loading differences between the thickened foundation elements and the remainder of the slab.

A moisture vapor barrier should be placed beneath the ground floor slab-on-grade to minimize vapor intrusion in accordance with the Florida Building Code. Care should be taken to ensure that all seams, penetrations, and punctures in the barrier are properly sealed prior to the slab being poured.

3.4 Site Preparation

The building pad should be stripped and cleared of all organic material, roots, topsoil, and any other deleterious materials to a distance of at least 5 feet beyond the building limits. The stripped surface should be proof rolled and tested for compaction prior to any structural fill being placed. Structural fill may then be placed in lifts of not more than 12 inches and each lift should be compacted and tested prior to placement of the next lift.

Velocity recommends the following compaction requirements for this project. The specified compaction percentages are based upon the maximum dry density as determined by a "modified proctor test" in accordance with ASTM D1557 "*Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))*".

- ✓ Proof Roll.....95%
- ✓ Structural Fill.....95%
- ✓ Bottom of Footings.....95%

All density testing should be performed in accordance with ASTM D6938 "*Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)*". Tests should be performed to a depth of 12 inches below the surface being tested, or the thickness of the soil layer if thinner than 12 inches, unless specified otherwise. Any areas not in compliance with the compaction requirements should be reworked and retested prior to placement of the next lift of fill. The following testing frequencies are recommended:

- ✓ Building Pad Proof Roll & Fill ..... 1 test per 2,500 sq.ft. (minimum 4) per lift
- ✓ Isolated Column Footings ..... 1 test per footing
- ✓ Continuous Wall Footings ..... 1 test per each 50 lineal feet
- ✓ Paved Areas..... 1 test per 5,000 sq.ft. (minimum 4) per lift

All structural fill material placed should be well graded and conform to the following requirements:

- ✓ Fines Content per ASTM D1140..... 12% maximum
- ✓ Organic Content per ASTM D2974..... 5% maximum

- ✓ Plasticity per ASTM D4318..... Non Plastic
- ✓ Maximum Particle Size..... 2 inches

Using vibratory compaction equipment at the site may disturb nearby structures. We recommend that vibration levels reaching any nearby structures be monitored during any operations utilizing vibratory equipment.

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.

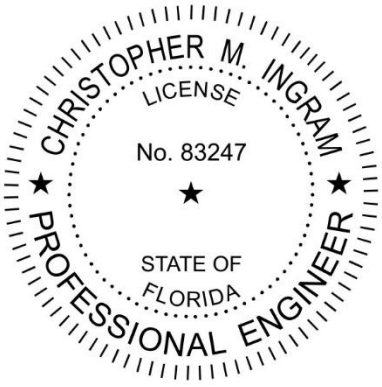
5.0 CLOSING & CERTIFICATION

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 M. Ingram, P.E.
Project Manager



Digitally signed by Christopher Ingram
Date: 2018.09.11 10:46:31 -04'00'

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

Felipe Compean, E.I.
Project Engineer

Velocity ENGINEERING SERVICES

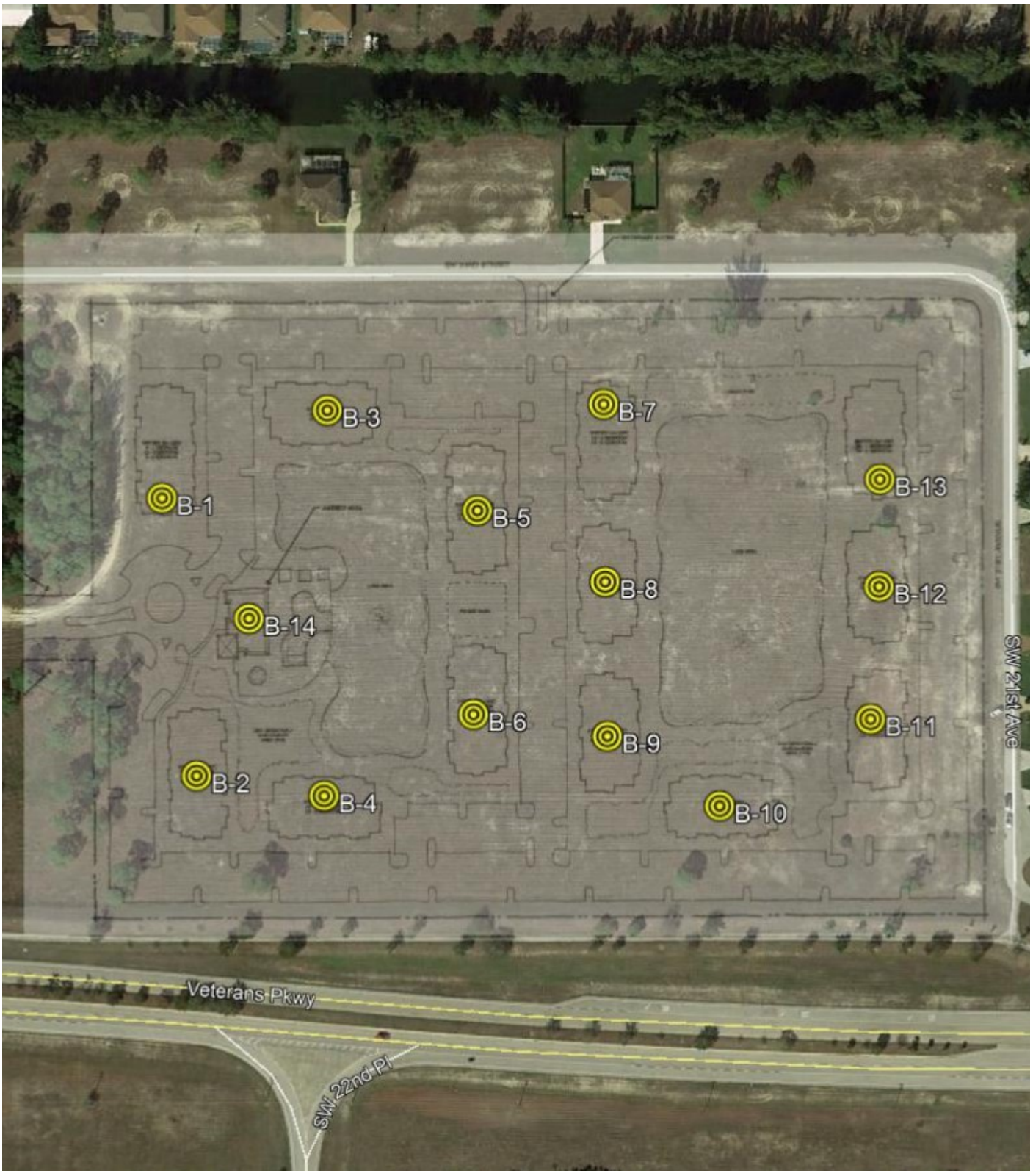
FIGURE 1 — PROJECT LOCATION PLAN

Surfside Corner

2320 Southwest 21 Avenue

Cape Coral Lee County, Florida

Velocity Project Number: 18-185



Velocity ENGINEERING SERVICES

FIGURE 2 — BORING LOCATION PLAN

Surfside Corner

2320 Southwest 21 Avenue

Cape Coral Lee County, Florida

Velocity Project Number: 18-185

KEY TO BORING LOGS

Major Division			Group Symbols	Typical Names
COARSE-GRAINED SOILS (50% of the material reatined on No. 200 sieve)	Gravels (>50% reatained 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
Highly Organic Soils			PT	Peat and other highly organic soils
Limestones			LS	Limestone layer
			WLS	Weathered and/or deteriorated limestone

DENSITY of SANDS, GRAVELS, and WEATHERED LIMESTONE

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

CONSISTENCY of SILTS & CLAYS

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

HARDNESS OF LIMESTONE

N Value	Density
50-99	Soft
100+	Hard

PROPORTIONS

Content	Description
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: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/21/18 **GROUNDWATER:** N/A

NOTES: Initiated mud rotary drilling at 1' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		2 50/4"	55+		**SAND (SP)**	Tan with a trace of rock
					LIMESTONE (LS) **Hard**	Tan
		16 15 13 12	28		**SAND (SP)**	Light tan with a trace of rock
5		4 6 8 8	14		**Medium Dense**	Light tan with traces of shell and rock
		6 6 5 7	11		**SAND WITH SILT (SP-SM)** **Medium Dense**	Light tan with a trace of rock
		5 4 4 7	8			Light tan with a trace of shell
10						
		6 8 10	18		**SAND (SP)**	Grey with traces of shell and phosphate
15						
		16 22 26	48			Grey with traces of shell and phosphate
20					**Loose to Dense**	
		4 5 6	11			Dark grey with some shell
25						
		1 2 14	16		**SILTY SAND (SM)** **Medium Dense**	Dark grey with traces of shell and rock
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-2

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** N/A ft

NOTES: Initiated mud rotary drilling at 1' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0	X	4 5 50/1"	55+		SAND (SP)	Tan
					LIMESTONE (LS) Hard	Tan
	X	25 24 26 29	50		SAND (SP) Loose to Dense	Light tan with some rock
5	X	11 15 10 12	25			Light grey with traces of shell and rock
	X	8 8 6 5	14			Light grey with traces of shell and rock
	X	6 5 3 3	8			Light grey with traces of shell and phosphate
10						
	X	15 17 19	36			Grey with traces of shell and phosphate
15						
	X	14 8 9	17			Grey with traces of shell and phosphate
20						
	X	7 6 8	14		WEATHERED LIMESTONE (WLS) Medium Dense	Grey
25						
	X	38 12 11	23			Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-3

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/21/18 **GROUNDWATER:** N/A

NOTES: Initiated mud rotary drilling at 2' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		4 7 7 50/1"	14		**SAND (SP)** **Medium Dense**	Tan
		50/1"	50+		**LIMESTONE (LS)** **Hard**	Tan
5		16 19 11 7	30		**SAND (SP)**	Light tan with traces of shell and rock
		4 4 5 6	9		**Loose to Medium Dense**	Light tan with traces of shell and rock
		3 3 3 3	6		**SAND WITH SILT (SP-SM)** **Loose**	Light tan with a trace of shell
10						
		8 6 4	10		**SAND (SP)**	Dark grey with traces of shell and phosphate
15						
		6 6 11	17			Dark grey with traces of shell and phosphate
20					**Very Loose to Medium Dense**	
		4 2 1	3			Grey with some shell
25						
		5 9 14	23		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-4

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** 2.9 ft

NOTES:

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		3 5 4 3	9		**SAND (SP)** **Loose**	Tan
					SAND WITH SILT (SP-SM) **Loose**	Tan
WT		4 7 18 15	25		**SAND (SP)**	Grey with some rock and a trace of shell
5		10 8 9 16	17			Light grey
		9 17 16 16	33			Light tan
		8 9 8 9	17			Light grey
10						
		7 9 16	25		**Medium Dense**	Grey with traces of shell and phosphate
15						
		11 11 15	26			Grey with traces of shell and phosphate
20						
		7 5 6	11		**WEATHERED LIMESTONE (WLS)**	Grey
25					**Medium Dense**	
		3 22 7	29			Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-5

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/21/18 **GROUNDWATER:** N/A ft

NOTES: Initiated mud rotary drilling at 0' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		50/1"	50+		**LIMESTONE (LS)** **Hard**	Tan
		29 39 27 29	66		**SAND (SP)** **Loose to Very Dense**	Light tan with some rock and a trace of shell
5		19 16 11 14	27			Light tan with traces of shell and rock
		7 5 3 4	8			Light tan with traces of shell and rock
		2 8 2 4	10		**SAND WITH SILT (SP-SM)** **Loose**	Light tan with traces of shell and rock
10						
		10 14 17	31		**SAND (SP)** **Medium Dense to Dense**	Dark grey with traces of shell and phosphate
15						
		6 14 16	30			Dark grey with traces of shell and phosphate
20						
		10 9 9	18		**WEATHERED LIMESTONE (WLS)** **Loose to Medium Dense**	Grey
25						
		8 5 5	10			Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-6

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** 3.5 ft

NOTES:

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		5 7 8 9	15		SAND (SP) Loose to Medium Dense	Tan
		6 9 9 7	18			Tan with some rock
WT		8 17 22 15	39			Grey with some rock
5		8 14 16 16	30			Light grey
		6 5 5 3	10			Light grey with a trace of shell
10						
		5 9 15	24			Grey with traces of shell and phosphate
15						
		16 13 16	29			Grey with traces of shell and phosphate
20						
		4 5 7	12		SAND WITH SILT (SP-SM) Medium Dense	Dark grey
25						
		13 5 7	12		WEATHERED LIMESTONE (WLS) Medium Dense	Grey Boring terminated at 30' BGS
30						

BORING LOG NUMBER: B-7

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/21/18 **GROUNDWATER:** N/A

NOTES: Initiated mud rotary drilling at 2' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		6 5 6	11		**SAND (SP)** **Medium Dense**	Tan
		50/4"				
		50/5"	50+		**LIMESTONE (LS)** **Hard**	Tan Tan
5		20 18 14 9	32			Tan with a trace of rock
		7 4 6 17	10			Light grey with a trace of rock
		8 8 8 7	16			Light grey with some rock
10					**SAND (SP)**	
		4 2 1	3			Dark grey with traces of shell
15						
		12 14 13	27		**Very Loose to Dense**	Grey with traces of shell, rock, and phosphate
20						
		6 4 4	8			Grey with traces of shell and phosphate
25						
		7 8 10	18		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-8

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/21/18 **GROUNDWATER:** 4.0 ft

NOTES: Initiated rotary drilling at 4'

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0						
		2 3 4 6	7			Tan
		13 14 23 48	37			Tan with some rock
WT		17 33 15 16	48		**SAND (SP)**	Tan with some rock
5		7 6 5 5	11			Light tan with a trace of rock
		6 5 8 10	13		**Loose to Dense**	Light tan with traces of shell and rock
10						
		3 1 1	2		**SAND WITH SILT (SP-SM)** **Very Loose**	Grey with a trace of shell
15						
		4 16 12	28			Grey with traces of shell and phosphate
20					**SAND (SP)**	
		3 2 8	10		**Loose to Medium Dense**	Grey with a trace of shell
25						
		1 8 11	19		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-9

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** N/A ft

NOTES: Initiated mud rotary drilling at 2.5' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		2 4 6 9	10		**SAND (SP)** **Loose**	Tan
		37 50/1"	50+		**LIMESTONE (LS)** **Hard**	Tan with a trace of rock Tan
5		26 16 12 13	28			Light grey with some rock
		9 7 8 14	15			Light grey with a trace of rock
		8 7 10 11	17			Light grey with traces of shell and phosphate
10					**SAND (SP)**	
		3 3 3	6			Grey with some shell and phosphate
15					**Loose to Medium Dense**	
		11 14 17	31			Grey with traces of shell and phosphate
20						
		6 4 3	7		**SILTY SAND (SM)** **Loose**	Dark grey with a trace of shell
25						
		12 7 4	11		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey with a trace of phosphate Boring terminated at 30' BGS
30						

BORING LOG NUMBER: B-10

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** 3.2 ft

NOTES:

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		4 9 10 19	19		**SAND (SP)** **Medium Dense to Dense**	Tan Light tan with some rock Light grey with rock
WT		25 23 23 24	46			
5		16 13 7 4	20			
		5 6 3 9	9		**WEATHERED LIMESTONE (WLS)** **Loose**	Light grey
		9 6 7 7	13		**SAND (SP)**	Light grey with a trace of shell
10						
		5 4 3	7			Dark grey with traces of shell and phosphate
15					**Loose to Medium Dense**	
		9 3 11	14			Dark grey with traces of shell and phosphate
20						
		6 2 4	6		**SAND WITH SILT (SP-SM)** **Loose**	Dark grey with a trace of rock
25						
		5 4 10	14		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey Boring terminated at 30' BGS
30						

BORING LOG NUMBER: B-11

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** 3.5 ft

NOTES:

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		2 6 8 8	14		**SAND (SP)**	Grey
		10 22 29 20	51		**Mediun Dense to Very Dense**	Tan with rock and a trace of shell
WT		11 6 9 10	15		**SAND WITH SILT (SP-SM)** **Medium Dense**	Light grey with some rock
5		4 7 12 11	19		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Light grey
		9 11 12 10	23		**SAND (SP)** **Medium Dense**	Light grey with a trace of shell
10						
		2 2 2	4		**SILTY SAND (SM)** **Very Loose**	Dark grey with traces of shell and rock
15						
		11 10 8	18		**SAND (SP)**	Grey with shell
20					**Medium Dense**	
		10 5 8	13			Grey with traces of shell and phosphate
25						
		4 3 3	6		**WEATHERED LIMESTONE (WLS)** **Loose**	Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-12

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** N/A

NOTES: Initiated mud rotary drilling at 2' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0	X	4 7 15 33	22		**SAND (SP)** **Medium Dense**	Tan with a trace of rock
	X	17 19 23 16	42		**WEATHERED LIMESTONE (WLS)**	Tan with some rock
5	X	8 13 6 4	19			Tan
	X	10 10 6 4	16		**Medium Dense to Dense**	Tan
	X	9 17 17 18	34		**SAND (SP)** **Dense**	Grey with traces of shell and rock
10						
	X	6 4 2	6		**SAND WITH SILT (SP-SM)** **Loose**	Grey with a trace of shell
15						
	X	9 11 9	20		**SAND (SP)**	Grey with traces of shell and phosphate
20						
	X	8 6 5	11		**Medium Dense**	Grey with traces of shell, rock, and phosphate
25						
	X	8 9 5	14		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey Boring terminated at 30' BGS
30						

BORING LOG NUMBER: B-13

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/21/18 **GROUNDWATER:** 3.8 ft

NOTES:

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0		3 3 6 8	9		**SAND (SP)** **Loose to Medium Dense**	Grey
		8 6 6 10	12			Tan
WT		13 12 11 14	23			Grey with some rock
5		4 5 7 10	12			Light grey with traces of shell and rock
		8 10 11 20	21			Light grey with traces of rock
10						
		4 2 2	4		**SILTY SAND (SM)** **Very Loose**	Greywith traces of shell and phosphate
15						
		10 11 11	22		**SAND WITH SILT (SP-SM)**	No recovery
20						
		3 4 3	7		**Loose to Medium Dense**	Dark grey with traces of shell and phosphate
25						
		12 10 10	20		**WEATHERED LIMESTONE (WLS)** **Medium Dense**	Grey
30						Boring terminated at 30' BGS

BORING LOG NUMBER: B-14

PROJECT: Surfside Corner

PROJECT No.: 18-225 **DATE:** 8/22/18 **GROUNDWATER:** N/A ft

NOTES: Initiated mud rotary drilling at 2' BGS prior to encountering water table

DEPTH (FEET) & Water Table	SAMPLE	BLOWS / 6"	"N" VALUE BLOWS / FT.	SYMBOL	SOIL DESCRIPTION	NOTES
0	X	3 4 7 50/1"	11		**SAND (SP)** **Medium Dense**	Tan
					LIMESTONE (LS)	
	X	32 25 23 25	48			Light tan with some rock
5	X	7 8 6 5	14			Light grey with a trace of rock
	X	4 3 2 4	5		**SAND (SP)**	Light grey with a trace of shell
	X	7 6 6 5	12			Grey with traces of shell and phosphate
10					**Loose to Very Dense**	
	X	18 13 17	30			Grey with traces of shell and phosphate
15						
	X	14 18 21	39			Grey with traces of shell and phosphate
20						Boring terminated at 20' BGS
25						
30						