PRELIMINARY GEOTECHNICAL EXPLORATION SERVICES REPORT

CONDUCTED FOR:

Coquina at Maple Ridge Reserve - Phase 1
Milano Street Extension
Ave Maria, Collier County, Florida

PREPARED FOR:

Mr. Daniel C. Hartley, P.E.
Project Manager
Peninsula Engineering
2600 Golden Gate Parkway
Naples, Florida 34105

4 August 2017
YPC Project No. 17GY159

YPC Consulting Group, PL
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Florida Certificate of Authorization No. 28233

Mr. Daniel C. Hartley, P.E.
Project Manager
Peninsula Engineering
2600 Golden Gate Parkway
Naples, Florida 34105

4 August 2017

Subject: ***Preliminary Geotechnical Exploration Services Report***
Coquina at Maple Ridge Reserve - Phase 1
Milano Street Extension
Ave Maria, Collier County, Florida

YPC Project No. 17GY159

Dear Mr. Hartley:

YPC Consulting Group, P.L. is pleased to submit the *Preliminary Geotechnical Exploration Services Report* for the project referenced above.

It has been a pleasure to work for you on this project. Please contact us should you have any questions or if you require additional information.

Copies to: 1, Mr. Daniel C. Hartley, P.E.
via email: DHartley@barroncollier.com
1, Mr. John C. English, P.E. LEED-AP
via email: JEnglish@barroncollier.com

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Terms of Reference

YPC Consulting Group, P.L. (YPC) was retained by the Client to provide preliminary geotechnical exploration services for the Coquina at Maple Ridge Reserve - Phase 1 project located off Milano Street Extension in Ave Maria, Collier County, Florida (hereafter referred to as the "project site"). Please refer to **Figure 1** for a Project Site Location and Vicinity Map. These services were performed in general accordance with the YPC Proposal No. 17278YFM dated 2 June 2017, and subsequent written authorization by the Client.

1.2 Project Description

The preliminary geotechnical scope of services for the proposed project includes advancing test borings to determine the depths to the rock strata and the general subsurface soil conditions at selected locations within the project site. A total of nineteen (19), 20-ft to 40-ft deep Standard Penetration Test (SPT) borings were advanced in the planned lake areas and selected areas throughout the project site. The number, depths, and the locations of the test borings were selected by the Client. It is understood that the information compiled from the field exploration program by YPC will be utilized by the Client for general planning purposes for the possible residential development at the project site.

1.3 Purpose and Scope of Work

The purpose of the preliminary geotechnical exploration services completed by YPC for the project was to describe, in general terms, soil and groundwater conditions encountered at the project site. To achieve this purpose, the scope of services has included the elements listed below.

- exploring subsurface soil and groundwater conditions by advancing six (6) SPT borings to depths of approximately 20-ft below the existing ground surface (egs) at the selected locations;

- exploring subsurface soil and groundwater conditions by advancing twelve (12) SPT borings to depths of approximately 30-ft below the egs at the selected locations;

- exploring subsurface soil and groundwater conditions by advancing one (1) SPT boring to a depth of approximately 40-ft below the egs at the selected location;

- recording groundwater levels in the test borings;

- grouting the borings in general accordance with regulatory requirements;
- evaluating generalized boring data as well as groundwater conditions;
- performing visual inspection of all soil samples and laboratory tests on selected samples for soil classification purposes;
- providing observations and comments for use by the Client in planning for the project; and,
- compiling the field exploration data, laboratory test data, and observations and comments in this report of findings.

2.0 FIELD EXPLORATION AND LABORATORY TESTING PROGRAMS

2.1 Field Exploration Program

The field exploration program, consisting of the elements described in Section 1.3 above, was performed in general accordance with relevant portions of applicable testing procedures during the period from 16 June through 29 July 2017.

The test borings were advanced by a drilling subcontractor, under the supervision of an YPC engineer, using a wet-rotary procedure. Representative soil samples were obtained using split-barrel sampling procedures. In this procedure, a 2-in. outer-diameter, split-barrel sampler is driven into the soil by a 140-lb hammer with a free-fall of 30-in. The number of blows required to drive the sampler through a 12-in. interval is termed the Standard Penetration Resistance, or "N", value, and is indicated for each sample on the boring logs. The "N" value is an indication of the relative density of granular soils in-situ.

Soil samples obtained during the field exploration program were sealed immediately in the field and brought to YPC's laboratory for further examination and testing. Test boring locations were selected by the Client and staked in the field by the project surveyor. The test borings were advanced at the approximate locations illustrated in the Project Layout and Test Location Plan presented in **Figure 2**.

2.2 Laboratory Testing and Inspection Program

Laboratory inspection of soil samples is generally performed to assist in the classification of soils based on their mechanical and physical behavior. It is noted that the indicated boundaries between soil types are approximate, and that actual transition between soil types may be gradual. Tests were performed on selected samples retrieved for this project to determine moisture contents and partial particle size distributions including percent passing

a #200 U. S. standard sieve (i.e., percent silt and/or clay particles). All soil samples were visually inspected by a geotechnical engineer and classified in general accordance with the Unified Soil Classification System (USCS), modified as necessary to describe typical southwest Florida conditions. Laboratory test results are indicated on the individual boring log profiles presented in **Figures 3A through 3D**.

3.0 SITE, GROUNDWATER, AND SOIL CONDITIONS

3.1 Site Features

The project site is located off Milano Street Extension in Ave Maria, Collier County, Florida. The project site is full of heavy vegetative growth and located in an undeveloped urban low-lying area which is constantly flooded during the rainy season. Pathways were mowed down through the heavy brush and a dike partially removed in order to access the boring locations.

3.2 Groundwater Conditions

At the time of the field exploration program, groundwater levels were recorded at the egs to approximately 1.5-ft below the egs in the test borings. It is noted that any groundwater table will be subject to fluctuation due to seasonal climatic changes, construction and development activities, rainfall variations, surface-water runoff, the extent of artificial drainage, tidal influences, and other site-specific factors. Since groundwater level variations are anticipated, design drawings and specification should incorporate such possibilities and provide for dewatering, as required, during construction.

3.3 Subsurface Soils

General subsurface soil conditions at the boring locations are described below (please refer to **Figure 2** for the Project Layout and Test Location Plan and **Figures 3A through 3D** for boring log profiles).

20-ft borings:

- Subsurface soils encountered in borings SB-1, SB-2, SB-3, and SB-10 generally consist of **poorly-graded sand (SP)** and/or **poorly-graded sand with silt (SP-SM)**, and **weathered/fractured limestone (WLS)** from the egs to the boring termination depths 20-ft below the egs.

- Subsurface soils encountered in borings SB-8 and SB-11 generally consist of **poorly-graded sand (SP)**, **silty sand (SM)**, and **weathered/fractured limestone (WLS)** from the egs to the boring termination depths 20-ft below the egs.

30-ft borings:

- Subsurface soils encountered in borings SB-4, SB-6, SB-7, SB-9, SB-15, and SB-16 generally consist of **poorly-graded sand (SP)** and/or **poorly-graded sand with silt (SP-SM)**, and **weathered/fractured limestone (WLS)** from the egs to the boring termination depths 30-ft below the egs.

- Subsurface soils encountered in borings SB-5, SB-18, and SB-19 generally consist of **poorly-graded sand (SP)** and/or **poorly-graded sand with silt (SP-SM)**, **silty sand (SM)**, and **weathered/fractured limestone (WLS)** from the egs to the boring termination depths 30-ft below the egs.

- Subsurface soils encountered in borings SB-13, SB-14, and SB-17 generally consist of **poorly-graded sand (SP)** from the egs to the boring termination depths 30-ft below the egs.

40-ft boring:

- Subsurface soils encountered in boring SB-12 generally consist of **poorly-graded sand (SP)**, **weathered/fractured limestone (WLS)**, **sandy silt (ML)**, and **silty sand (SM)** from the egs to the boring termination depth 40-ft below the egs.

4.0 OBSERVATIONS AND COMMENTS

Based on current conditions and data obtained during the field exploration and visual inspection of soil samples for this project, observations and comments are presented below:

- Subsurface soils generally consist of poorly-graded sand (SP), poorly-graded sand with silt (SP-SM), silty sand (SM), sandy silt (ML), and weathered/fractured limestone (WLS) to the boring termination depths 20-ft to 40-ft below the egs.

- Poorly-graded sand (SP) and Poorly-graded sand with silt (SP-SM) can generally be used as embankment fill or fill beneath structures. Silty sand (SM) with more than 12% fines should be mixed with clean sands to reduce the overall fines contents to less than 12%, or their use should be restricted to landscape areas and maintenance berm. Fine-grained soil, sandy silt (ML) should not be used as structural fill material, but can generally be used in green areas and landscape berms.

- Excavation of sandy soils and weathered and/or fractured limestone can generally be achieved with normal, heavy duty earthwork equipment.

Although hard limestone was not encountered in any of the test borings, the presence of hard limestone at other locations cannot be ruled out.

5.0 LIMITATIONS

This preliminary geotechnical services report has been prepared for the exclusive use of the Client. No other warranty is expressed nor implied. It is noted that the information presented in this report address only soils and deposits that would normally be influenced by the proposed construction. The scope of services does not include an evaluation of deep soil or rock conditions where limestone cavities may exist due to sinkhole activity. Deep borings/ soundings, geophysical exploration, and/or resistivity surveys would be required in order to evaluate the structural condition and stability of deep soil and rock formations, and is beyond the scope of services for this project.

This report has been prepared to aid in the evaluation of the property and to assist the owner and/or engineer in planning and design of this project. The scope of services is limited to the specific project and locations described herein, and the description of the project as described herein represents YPC's understanding of significant project aspects related to soil characteristics. In the event that any changes in the design or location of the structures as outlined in the report are planned, YPC must be informed so that the changes can be reviewed and the conclusions of this report modified or approved in writing. **Any conclusions or recommendations made by others based on the data contained herein are not the responsibility of YPC, unless we are advised of the same in writing and given the opportunity to review those conclusions and recommendations.**

The analyses and recommendations submitted in this report are based upon the data obtained from field exploration program at locations indicated in the Project Layout and Test Location Plan presented in **Figure 2,** as well as any other information discussed in this report. In the performance of a subsurface exploration, specific information is obtained at specific locations at specific times. However, it is known that site and subsurface conditions can change over time. Additionally, variations in soil and rock exist on most sites between test locations. The nature and extent of such variations may not become evident until after the start of construction. If variations appear, it will be necessary to re-evaluate the recommendations of this report after performing on-site observations during the construction period and/or performing supplemental tests.

It is the responsibility of the Client to see that the recommendations in this report are brought to the attention of all concerned parties. Because of the possibility of unanticipated subsurface conditions occurring, it is recommended that a "changed condition" clause be provided in contracts with the general contractor and with subcontractors involved in foundations or earthwork construction. Furthermore, it is necessary that YPC be retained to review the site preparations and foundation phases of construction. Otherwise, no

responsibility for construction compliance with the design concepts, plans, specifications, and recommendations presented herein can be assumed.

The reproduction of any portion of this report in plans or other engineering documents supplied to parties other than the Client or assigned parties must bear the language indicating that the information contained in the report is for general information only, and that neither the Client nor YPC are liable to such parties.

6.0 ACKNOWLEDGMENT

YPC appreciates the opportunity to work with you on this project. Please contact us should you have any questions concerning this report or if you require additional information.

Sincerely,

YPC Consulting Group, P.L.
Florida Certificate of Authorization No. 28233

This document has been electronically signed & sealed using a digital signature by:

Yen-Po Chiu

Digitally signed by Yen-Po Chiu
Date: 2017.08.06 16:50:33 -04'00'

Yen-Po Chiu, P.E.
Senior Project Manager
Florida Registration No. 62391

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

WGS84
LAT: 26.328963° N
LONG: 81.448290° W
17GY159.dwg (08-04-2017)

TITLE	SOURCE	FIGURE NO.
Project Site Location and Vicinity Map	Google Earth	1

Consulting Group, PL

DATE	4th August 2017
DRAWN BY	JIDS-JBC
CHECKED BY	YPC
SCALE	nts
PROJECT NO.	17GY159

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Milano Street Extension
Ave Maria, Collier County, Florida
for:
Mr. Daniel C. Hartley, P.E.
Peninsula Engineering
Naples, Florida

0 400'

LEGEND

SB-1 Standard Penetration Boring(s) Location and Identification.

17GY159.dwg (08-04-2017)

NO.	REVISIONS	DATE	BY		NAME	DATE
				DESIGNED		
				DRAWN	JIDS	08/17
				CHECKED	YPC	08/17
				APPROVED	YPC	08/17

YPC Consulting Group, PL

SEAL

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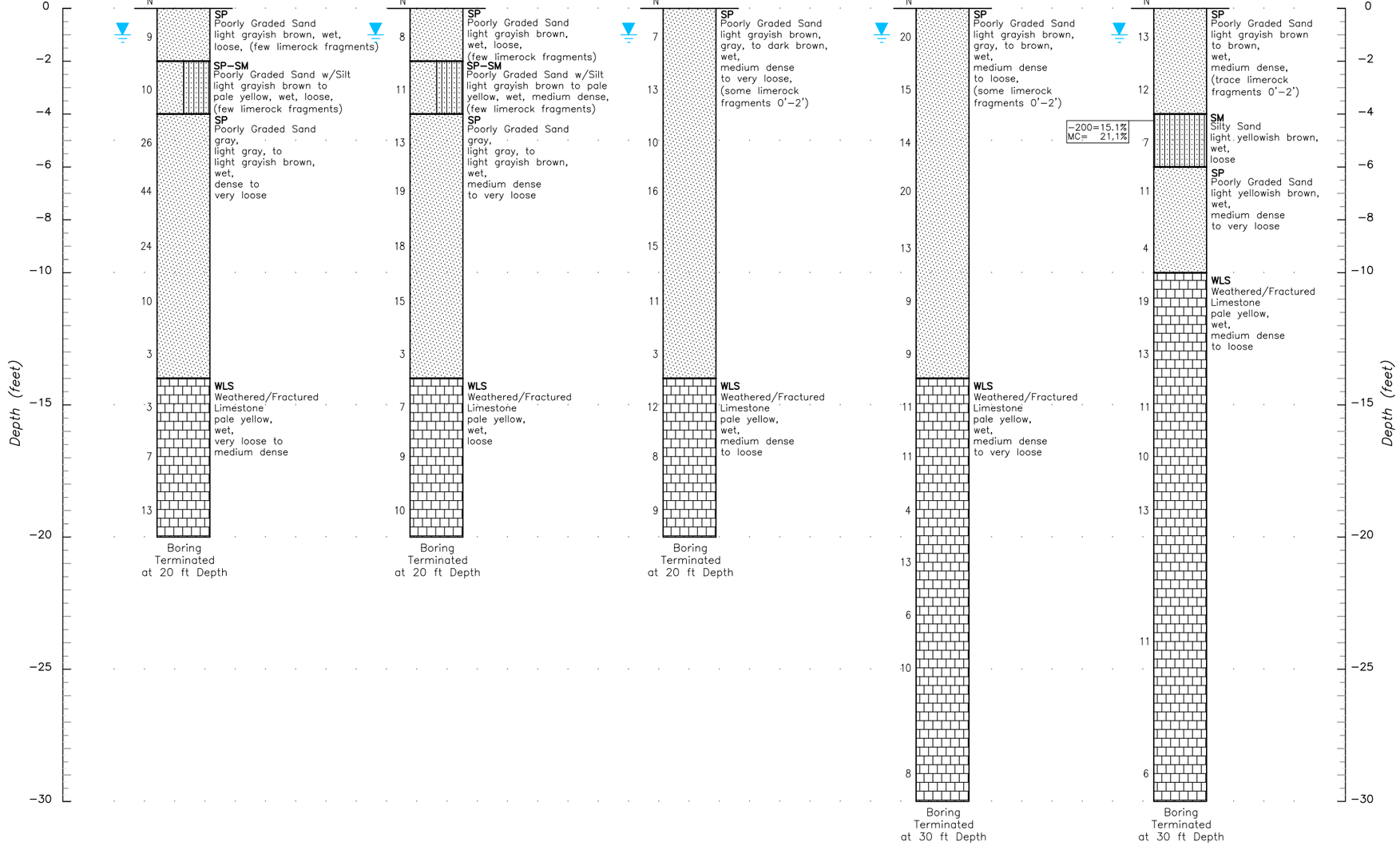
CLIENT
Mr. Daniel C. Hartley, P.E.
Peninsula Engineering
Naples, Florida

SHEET TITLE
Project Layout and Test Location Plan

Figure No. 2

SOURCE
Base Plan Acquired from: Peninsula Engineering

PROJECT NO. 17GY159



LEGEND

SP	SAND	ML	SILT	MH	ELASTIC SILT
SM	SILTY SAND	CL	LEAN CLAY	CH	FAT CLAY
SC	CLAYEY SAND	SH	SHELL	PT	MUCK/PEAT
LS	HARD LIMESTONE	--	SHELLY-GRAVEL	--	CONCRETE
WLS	WEATHERED OR SOFT LIMESTONE	--	SHELLY-SAND	AS	ASPHALT
SP-SC		--	SHELLY-CLAY	LB	LIMEROCK BASE
SP-SM		--	SOIL/CEMENT	--	DEBRIS
WD	WOOD	OL	ORGANIC SILTS	OH	ORGANIC CLAY
GM	SILTY-GRAVEL	GC	GRAVELLY-CLAY	GP	GRAVEL

SOIL PROPERTIES

GRANULAR SOILS (COHESIONLESS)

DESCRIPTIVE TERM FOR RELATIVE DENSITY	SPT N-VALUE (blows per ft)
very loose	0 - 4
loose	5 - 10
medium dense	11 - 30
dense	31 - 50
very dense	over 50

FINE GRAINED SOILS (COHESIVE)

DESCRIPTIVE TERM FOR CONSISTENCY	SPT N-VALUE (blows per ft)
very soft	0 - 2
soft	3 - 4
firm	5 - 8
stiff	9 - 15
very stiff	16 - 30
hard	31-50
very hard	over 50

MOISTURE DESCRIPTION

dry - absence of moisture, dusty, dry to the touch
moist - damp, but no visible water
wet - visible free water, usually soil is below water table

GNE	GROUND WATER NOT ENCOUNTERED
GNM	GROUND WATER NOT MEASURED
LL	LIQUID LIMIT
PL	PLASTIC LIMIT
PI	PLASTICITY INDEX
-200	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE (%)
MC	NATURAL MOISTURE CONTENT (%)
WR	WEIGHT OF ROD
WOH	WEIGHT OF HAMMER
N	STANDARD PENETRATION RESISTANCE IN BLOWS PER 1ft (2ft SPOON - ASTM D-1586)
>100	REFUSAL CRITERIA
PH	POST HOLE DIGGER
OC	ORGANIC CONTENT
TOD	TIME OF DRILLING
GSE	GROUND SURFACE ELEVATION
	CASING USED
SP	USCS SOIL CLASSIFICATION
	LOSS OF CIRCULATION
N/R	NO RECOVERY

GWT or GROUND WATER TABLE LEVEL (OBSERVED)

SHWL or SEASONAL HIGH WATER LEVEL (ESTIMATED)

TYPE OF RIG: AD-2 (Manual Hammer)

NOTES:

1. THE BORINGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING, NO WARRANTY AS TO THE SUBSURFACE CONDITIONS, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE THE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING. DO NOT ASSUME THIS DATA IS A GUARANTEE OF THE DEPTH, EXTENT, OR CHARACTER OF THE MATERIAL PRESENT.
2. REFER TO PROJECT LAYOUT AND TEST LOCATION PLAN FOR TEST LOCATIONS.

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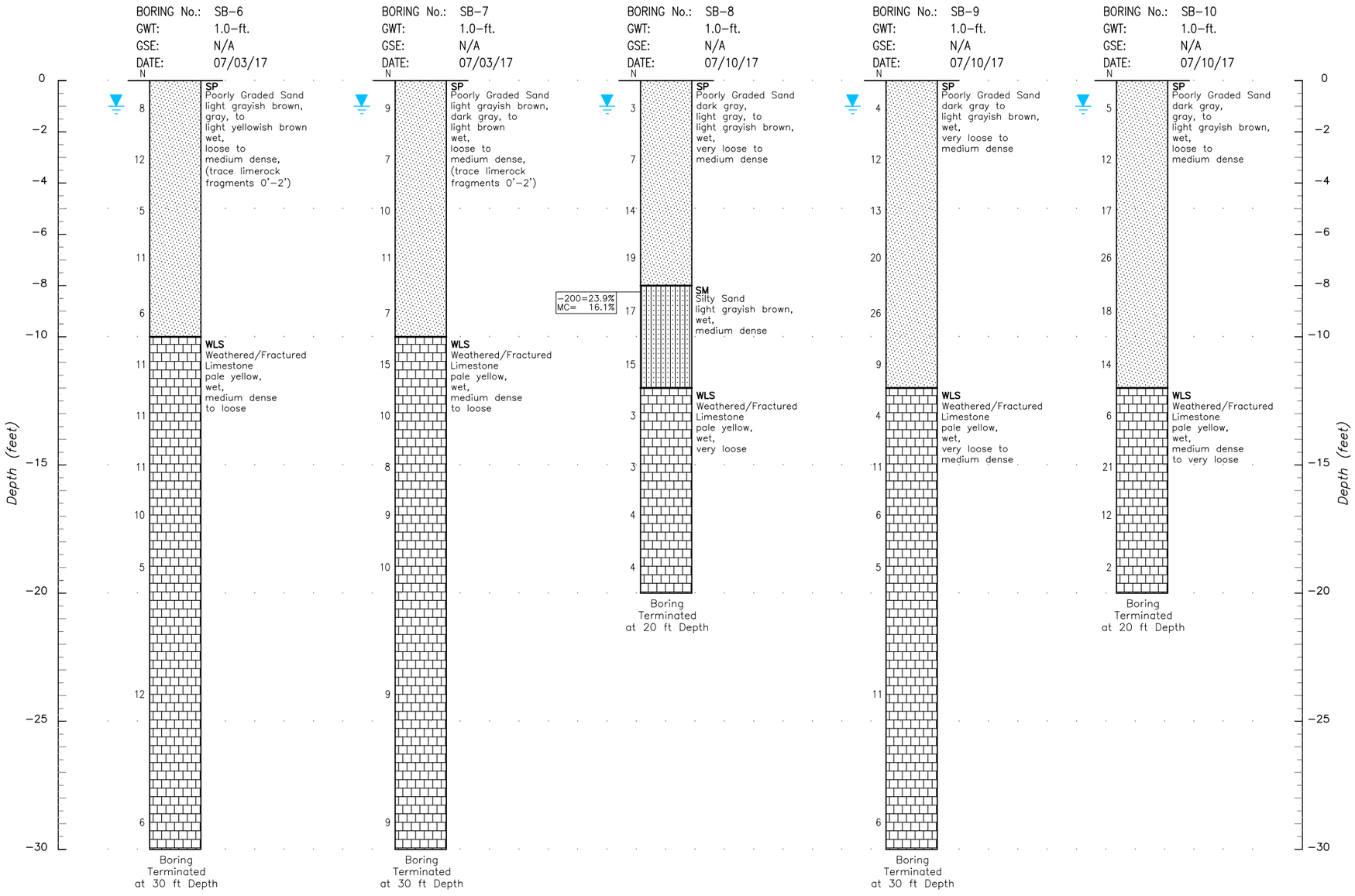
SHEET TITLE
Boring Log Profiles

Figure No.
3A

SOURCE
Standard Penetration Test Boring Logs

PROJECT NO.
17GY159



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SHEET TITLE
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Figure No.
3B

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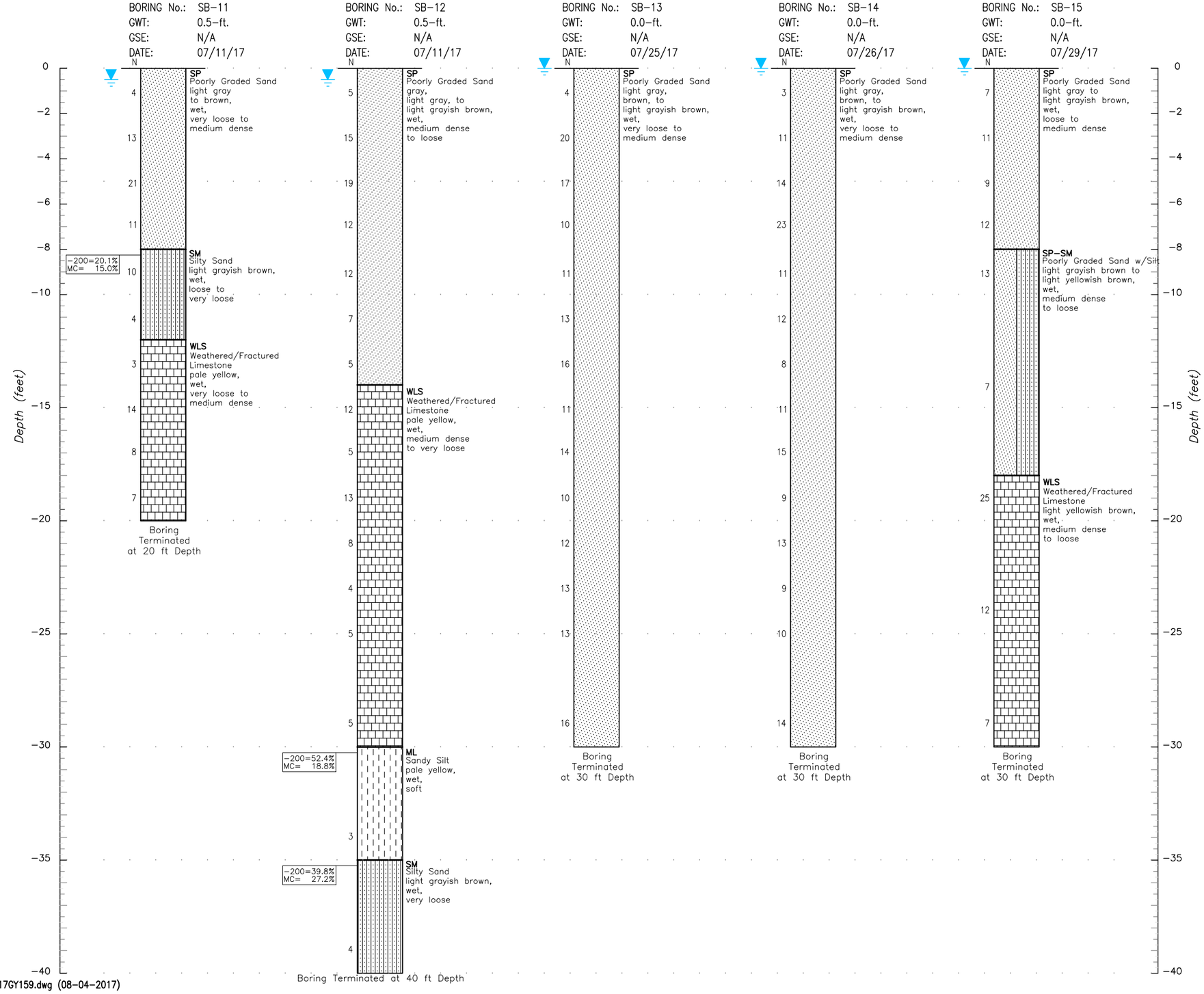
Standard Penetration Test Boring Logs

PROJECT NO.
17GY159



LEGEND

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SHEET TITLE
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Figure No.
3C

SOURCE
Standard Penetration Test Boring Logs

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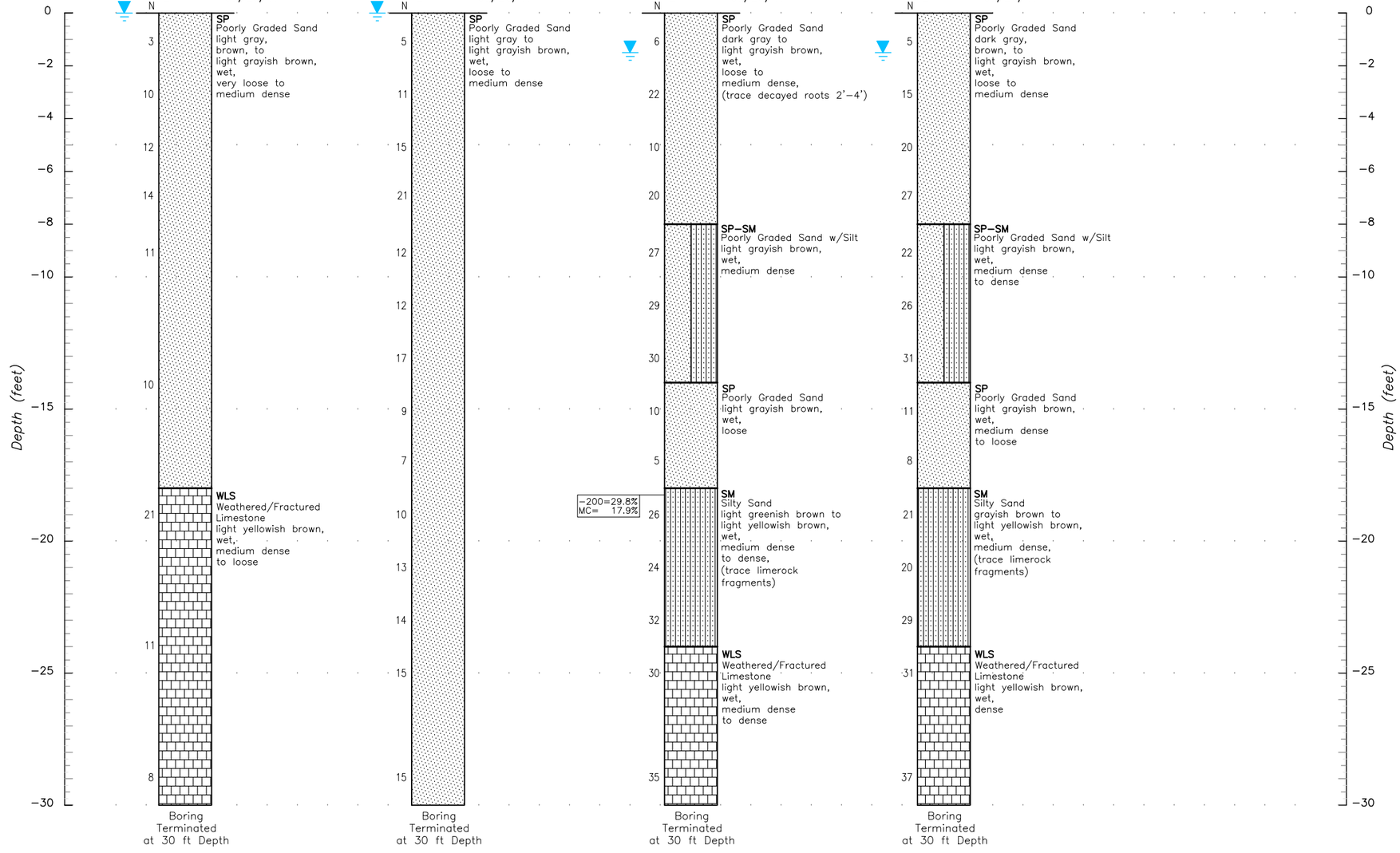

LEGEND

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PH	POST HOLE DIGGER
OC	ORGANIC CONTENT
TOD	TIME OF DRILLING
GSE	GROUND SURFACE ELEVATION
	CASING USED
SP	USCS SOIL CLASSIFICATION
	LOSS OF CIRCULATION
N/R	NO RECOVERY

GWT or GROUND WATER TABLE LEVEL (OBSERVED)

SHWL or SEASONAL HIGH WATER LEVEL (ESTIMATED)

TYPE OF RIG: AD-2 (Manual Hammer)

NOTES:

1. THE BORINGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING, NO WARRANTY AS TO THE SUBSURFACE CONDITIONS, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE THE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING. DO NOT ASSUME THIS DATA IS A GUARANTEE OF THE DEPTH, EXTENT, OR CHARACTER OF THE MATERIAL PRESENT.
2. REFER TO PROJECT LAYOUT AND TEST LOCATION PLAN FOR TEST LOCATIONS.

17GY159.dwg (08-04-2017)

NO.	REVISIONS	DATE	BY

	NAME	
DESIGNED		
DRAWN	JIDS	08/17
CHECKED	YPC	08/17
APPROVED	YPC	08/17

YPC Consulting Group, PL

SEAL

PROJECT NAME
Preliminary Geotechnical Exploration Services Report
Coquina at Maple Ridge Reserve - Phase 1
Milano Street Extension
Ave Maria, Collier County, Florida

CLIENT
Mr. Daniel C. Hartley, P.E.
Peninsula Engineering
Naples, Florida

SHEET TITLE
Boring Log Profiles

Figure No.
3D

SOURCE
Standard Penetration Test Boring Logs

PROJECT NO.
17GY159