Florida Testing & Engineering, Inc
Geotechnical Engineering * Construction Materials Testing
P.O. Box 275, Bunnell, Florida 32110-0275 * 386-734-4038/Fax 386-738-7933

April 26, 2023

Mr. Mark Blythe
Dawn Development
119 Pine Tree Street
Flagler Beach, Florida 32136

Re: Subsurface Investigation
Village Drive Multi-Family Complex
Proposed Two-Story Multi-Family Residences
Village Drive
Flagler Beach, FL
FTE No. 23-03092023

Dear Mr. Blythe:

Florida Testing & Engineering, Inc. has completed a subsurface investigation at the referenced project site located in Flagler Beach, Florida. This report describes the project site, discusses testing methods, presents investigation results, and provides geotechnical recommendations for foundation design.

Please feel free to request any further information or clarifications that may be needed. Thank you for choosing *Florida Testing & Engineering, Inc.* for performing this subsurface investigation. We would be pleased to assist you further in other phases of geotechnical engineering and construction materials testing as the project needs develop.

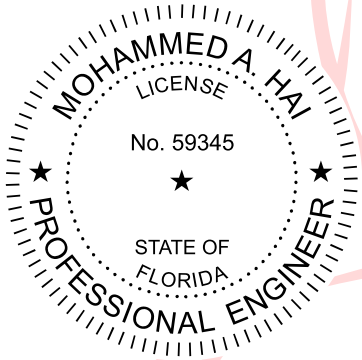
Sincerely,

FLORIDA TESTING & ENGINEERING, INC.
CA 29089

This item has been digitally signed and sealed by Mohammed A. Hai, PE, on the date noted in the digital signature.

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

Mohammed A. Hai, P.E.
Senior Geotechnical Engineer
FL Registration No. 59345



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Date: 2023.04.27 08:53:49 -04'00'

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EXECUTIVE SUMMARY[1]

Florida Testing & Engineering, Inc. has completed a geotechnical exploration of the proposed two-story multi-family residences located at Village Drive, Flagler Beach, Florida. The results of our findings are briefly summarized below. The text of this report should be reviewed for discussion of these items.

1. *Florida Testing & Engineering, Inc*. performed four (4) standard penetration test (SPT) borings to depths of 25 feet below ground surface (BGS) within the proposed building footprint at locations indicated in the Boring logs and Boring Location Plan (Appendix B & C). Generally, the subsurface soil profiles consist of fine sand up to the boring termination depths of 25 feet BGS. The subsurface soil layers' strength revealed standard penetration resistance values (N-values) ranging from 3 to 33 blows per foot.

2. Based on the presence of very loose to loose to medium dense fine sand found within the foundation's load-bearing zone of influence, anticipated design loads associated with the proposed two-story multi-family residences, and our experience on similar projects, it is our opinion that the soils at the site are generally suitable for shallow foundations to support the proposed structure, once heavy compaction has been completed.

3. Upon completing the recommended site preparation, it is our opinion that the proposed two-story multi-family residences can be supported on shallow foundations on existing suitable bearing soils or structural fill. A net allowable soil bearing pressure of up to 2,000 pounds per square foot may be utilized for footing designs when the top of the footing is at least 12-inch below the lowest adjacent grade for stem wall foundation and when the footings bear at least 18-inches to 24-inches below the finished grade for the monolithic foundation. Based on the log of borings, site soil improvement as noted in the report, and our experience with this type of soil, Florida Testing & Engineering, Inc. recommends a maximum wall load of 5 kips per linear foot for continuous footings and a maximum isolated column load of 50 kips may be used for design purpose. To reduce the possibility of localized shear failures, we recommend that isolated column footings should be at least 30 inches in width and continuous strip footings (non-monolithic foundation) should have a width of at least 18 inches, regardless of contact pressure. Footing design pressures given above are based on anticipated settlements to be less than 1-inch total and ½-inch differential if our recommendations are followed.

4. The on-site excavated fine sand should generally be suitable for reuse as engineered fill with proper moisture control. Density tests should be used to control subgrade and fill compaction. Density tests should be performed at the subgrade level, at each fill lift, and at the bottom of the footing elevations to ensure uniform compaction.

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1 This Executive Summary is not intended to be used or relied upon without reference to the entire report and cannot otherwise be properly understood and interpreted. It is provided solely for the convenience of the Client and not as a substitute for the report or review of the report.

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1.0 SITE AND PROJECT DESCRIPTION

The project site is located at Village Drive, Flagler Beach, Florida (Appendix A). A site plan provided by the client was used to determine the general boundaries of the project site. Based on the client's provided information and site plan, a two-story multi-family residences will be constructed at the project site. Ground floor slabs are expected to have live loads of less than 200 psf. FTE Engineering staff determined SPT boring locations based on the site plan. The GPS locations of borings are as follows:

B-1 - 29.28 Degrees 34.33 Minutes North, 81.08 Degrees 25.30 Minutes West
B-2 - 29.38 Degrees 34.30 Minutes North, 81.08 Degrees 25.60 Minutes West
B-3 - 29.28 Degrees 33.97 Minutes North, 81.08 Degrees 25.58 Minutes West
B-4 - 29.28 Degrees 33.96 Minutes North, 81.08 Degrees 25.78 Minutes West

We recommend that FTE, Inc. be consulted during construction to conduct Geotechnical Evaluations as described elsewhere in this report. The purpose is to verify the similarity of the actual subsurface conditions versus conditions anticipated by the designers.

2.0 SCOPE

The scope of our services included the following items:

1. A visual reconnaissance of the site from a geotechnical standpoint;
2. Conducting four (4) standard penetration test (SPT) borings to depths of 25 feet below ground surface (BGS) within the proposed building footprint to assess subsurface soil conditions;
3. Classification of the soil samples obtained during our fieldwork program;
4. Analyzing the existing soil conditions with respect to the proposed construction;

5. Preparing this report to document the results of the fieldwork program, general information regarding soil types, and provide geotechnical soil parameters necessary for foundation design and evaluation of recovered soils or groundwater.

3.0 PURPOSE

The primary purpose of the geotechnical exploration was to determine the general type and condition of the subsurface materials at the project site and provide geotechnical soil parameters necessary for foundation design and evaluation of recovered soils or groundwater.

4.0 FIELD EXPLORATION METHODS

5.1 Standard Penetration Test Boring

Florida Testing & Engineering, Inc. performed the standard penetration test (SPT) borings on April 12, 2023, using a Standard Penetration Test drill rig to advance SPT borings. The Standard Penetration Test (SPT) boring permits soil classification of samples retained during the test and allows the standard penetration resistance to be determined at selected depth intervals. These data permit the estimation of soil properties such as continuity, strength, compressibility, and permeability. Drilling and standard penetration tests are performed in general conformance with ASTM D-1586. Conventional rotary drilling procedures were utilized along with a bentonite drilling fluid to stabilize the borehole.

In performing the SPT test, borings are advanced to the desired test depth by rotary drilling methods, whereupon the drill bit is withdrawn and the penetration test performed using a standard 1.4-inch I.D., 2.0-inch O.D., split-barrel sampler. Spacing between each test interval varies by no more than 2.0 feet in the top 10 feet of each boring and by not more than 5.0 feet at depths greater than 10 feet. A 140-pound hammer falling 30 inches drives

the sampler. Because of disturbance effects, the number of blows required to drive the sampler the first six inches is not considered in the standard penetration test value. The SPT value is based on the second and third 6-inch increments, and this resistance is designated the "penetration resistance." Penetration resistance is an index of the soil strength and density that is used in engineering design.

After each penetration test, the driller classifies the split-barrel sample according to color, texture, material type, and moisture content. A portion of each sample is collected in a sealed container and transported to the laboratory, where it is further examined to verify field conditions. The samples are temporarily stored in the laboratory for future reference.

5.0 SUBSURFACE CONDITIONS

Florida Testing & Engineering, Inc. performed four (4) standard penetration test (SPT) borings to depths of 25 feet below ground surface (BGS) within the proposed building footprint at locations indicated in the Boring logs and Boring Location Plan (Appendix B & C). Generally, the subsurface soil profiles consist of fine sand up to the boring termination depths of 25 feet BGS. The subsurface soil layers' strength revealed standard penetration resistance values (N-values) ranging from 3 to 33 blows per foot.

The groundwater table was recorded to depths ranging from 4.5 to 5.6 feet BGS at the time of drilling. Fluctuation in groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff, or re-direction of water flow as a result of natural or anthropogenic activities and other site-specific factors. For a more precise description of the conditions encountered within the soil test borings, we refer you to the boring log sheets included in Appendix C in this report.

6.0 DISCUSSION AND EVALUATION

The following recommendations are based on our understanding of the proposed construction, the data obtained in our soil test borings, visual soil classification, a site reconnaissance, and our experience with subsurface conditions similar to those encountered at the project site.

We recommend that *Florida Testing & Engineering, Inc.* be consulted during construction to conduct Geotechnical Evaluations as described elsewhere in this report. The purpose is to verify the similarity of the actual subsurface conditions versus conditions anticipated by the designers.

6.1 General

Based on the presence of very loose to loose to medium dense fine sand found within the foundation's load-bearing zone of influence, anticipated design loads associated with the proposed two-story multi-family residences, and our experience on similar projects, it is our opinion that the soils at the site are generally suitable for shallow foundations to support the proposed structure, once heavy compaction has been completed.

6.2 Site Preparation –Shallow Foundation

Based on the existing very loose to loose to medium dense fine sand layers found in the subsurface soil profile, the following geotechnical site preparation is recommended. This approach to improving and maintaining the site soils has been successful in projects with similar soil conditions. The site inspection by an experienced geotechnical engineer or his representative from this office will be recommended to perform field density.

1. Initial site preparation should consist of performing clearing, grubbing, and removal of topsoil in order to remove trees, vegetation, and associated root systems to a depth of their vertical reach. This should be done within and to a minimum distance of 5 feet beyond the perimeter of the proposed building footprint if the area permits. The stripped topsoil should be stockpiled on-site for later usage in landscape (non-structural) areas only.

2. Upon completion of the clearing, grubbing, and removal of topsoil, as noted above, perform compaction with a vibratory roller. We recommend a moderate-weight vibratory drum roller having a total operating static weight (including fuel and water) of at least 5 tons and a drum diameter of 2.5 to 3 feet. Regardless of the degree of compaction achieved, a minimum of **8** perpendicular overlapping passes should be made in the building area with the compaction equipment in order to increase the density and improve the uniformity of the underlying loose sandy soils. Upon completion of the compaction, density tests shall be performed to confirm minimum compaction compliance of **98** percent of modified proctor maximum density (ASTM D-1557). The roller coverages should be divided evenly into two perpendicular directions, where possible. Additional passes may be necessary if compliance compaction is not achieved.

3. Place fill material in uniform lifts of 12 inches to reach the finished grade. The fill material should be inorganic (classified as SP, SW, GP, GW, SP-SM, SW-SM, GP-GM, GW-GM), containing not more than 5 percent (by weight) organic materials. Fill materials with silt-sized soil fines in excess of 12% should not be used. Place fill in maximum 12-inch lifts and compact each lift to a minimum density of **98** percent of the Modified Proctor maximum dry density (ASTM D-1557) with a vibratory roller, as mentioned in item #2.

4. Perform compliance tests within the fill at a frequency of not less than one test per 2,500 square feet per lift or at a minimum of 4 tests per lift, whichever is greater.

5. Upon completion of the building footing excavation and prior to placement of reinforcing steel and concrete, we recommend compaction of the bottom of the footings with the vibratory compactor over each footing. The bottom of the footings shall be examined by the engineer or his representative to determine if the soil is vertically free of all organic and/or deleterious material and if the compaction and soil pressures are achieved or if additional compaction is required. Perform compliance tests within the footings, as noted in section **6.4**.

6. The contractor shall take into account the final contours and grades as established by the plan when executing his backfilling and compaction operations.

Using vibratory compaction equipment at this site may disturb adjacent structures. Care shall be taken during the excavation and compaction operations to ensure any adjacent structures and utilities are not adversely affected. We recommend that you monitor nearby structures before and during compaction operations.

6.3 Geotechnical Foundation Recommendations

Upon completing the recommended site preparation, it is our opinion that the proposed two-story multi-family residences can be supported on shallow foundations on existing suitable bearing soils or structural fill. A net allowable soil bearing pressure of up to 2,000 pounds per square foot may be utilized for footing designs when the top of the footing is at least 12-inch below the lowest adjacent grade for stem wall foundation and when the footings bear at least 18-inches to 24-inches below the finished grade for the monolithic foundation.

Based on the log of borings, site soil improvement as noted in the report, and our experience with this type of soil, *Florida Testing & Engineering, Inc.* recommends a maximum wall load of 5 kips per linear foot for continuous footings and a maximum isolated column load of 50 kips may be used for design purpose. To reduce the possibility of localized shear failures, we recommend that isolated column footings should be at least 30 inches in width and continuous strip footings (non-monolithic foundation) should have a width of at least 18 inches, regardless of contact pressure.

The amount of movement that a foundation will experience is a function of the footing size and imposed sustained pressure intensity, as well as the in-situ stress conditions of the soils within the zone influenced by the footing. Typically, settlements of a footing bearing on granular materials are predicted from empirical procedures based upon the standard penetration resistance (N-value) as a measure of the in-situ soil's relative density. Footing design pressures given above are based on anticipated settlements to be less than 1-inch total and ½-inch differential if our recommendations are followed.

6.4 Compliance Testing

Density tests should be used to control subgrade and fill compaction. Density tests should be performed at the subgrade level, at each fill lift, and at the bottom of the footing elevations to ensure uniform compaction.

A minimum testing frequency of one density test per 2,500 square feet of each lift or 4 tests per lift, whichever is greater, should be used. Additional testing should be performed in the excavated footing areas to confirm that excavation operations have not loosened the subgrade. A minimum of one density test per 50 linear foot of the load-bearing wall and on each column pad should be performed.

6.5 Floor Slabs

Following proper site preparation, as previously described, it is our opinion that a conventional slab-on-grade may be utilized for the proposed structure. However, it is the discretion of the structural engineer of record whether to use reinforcement (wire mesh or fiber mesh) within the slab-on-grade to reduce concrete shrinkage cracks. We recommend that the floor subgrade in the proposed building pad areas be compacted, and soil density be measured by a geotechnical engineer or his representative prior to floor slab concreting.

We suggest that a vapor barrier be placed immediately beneath the floor slab according to project specifications to reduce moisture migration through the concrete slab. Based on experience with similar soil types, an estimated sub-grade modulus of 120 lb/in^3 may be used to design the slab.

6.6 Lateral Earth Pressures

We recommend the following equivalent fluid pressures that can be used for different earth pressure conditions.

Lateral Earth Pressures

Earth Pressure Condition	Earth Pressure Coefficient	Recommended Equivalent Fluid Pressure
Active	$K_A = 0.33$	33 psf/foot
At-Rest	$K_O = 0.50$	50 psf/foot
Passive	$K_P = 3.00$	300 psf/foot

The recommended equivalent fluid pressures are based on an assumed soil density of 100 pcf, an internal friction angle of 30 degrees, and cohesion of zero. An allowable bearing pressure of up to 2,000 psf and a coefficient of friction of 0.35 for sliding may be used for design purposes.

6.7 Structural Fill Placement

The on-site excavated fine sand should generally be suitable for reuse as engineered fill with proper moisture control. Fill placed in confined areas that cannot be reached by the large roller should be compacted by lightweight vibratory equipment that can operate in confined areas. The fill loose lift thickness should be reduced to 6 inches. Each lift should be thoroughly compacted with the compaction equipment until densities equivalent to at least **98** percent of the Modified Proctor maximum dry density (ASTM D-1557) are uniformly obtained.

7.0 LIMITATIONS

This report is for the exclusive use of ***Dawn Development*** and the other designers of the project and may only be applied to this specific project. Our conclusions and recommendations have been prepared using generally accepted standards of Geotechnical Engineering practice. No other warranty is expressed or implied. Our firm is not responsible for the conclusions, opinions, or recommendations of others.

Our conclusions and recommendations are based upon preliminary information furnished to us, data obtained from the testing program, and our past experience. They do not reflect variations in subsurface conditions that may exist intermediate of our borings and in unexplored areas of the site. Should such variations become apparent during the construction period, it will be necessary to re-evaluate our conclusions and recommendations based upon “on-site” observations of the conditions.

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Appendix A - Site Location Map

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Site Location Map

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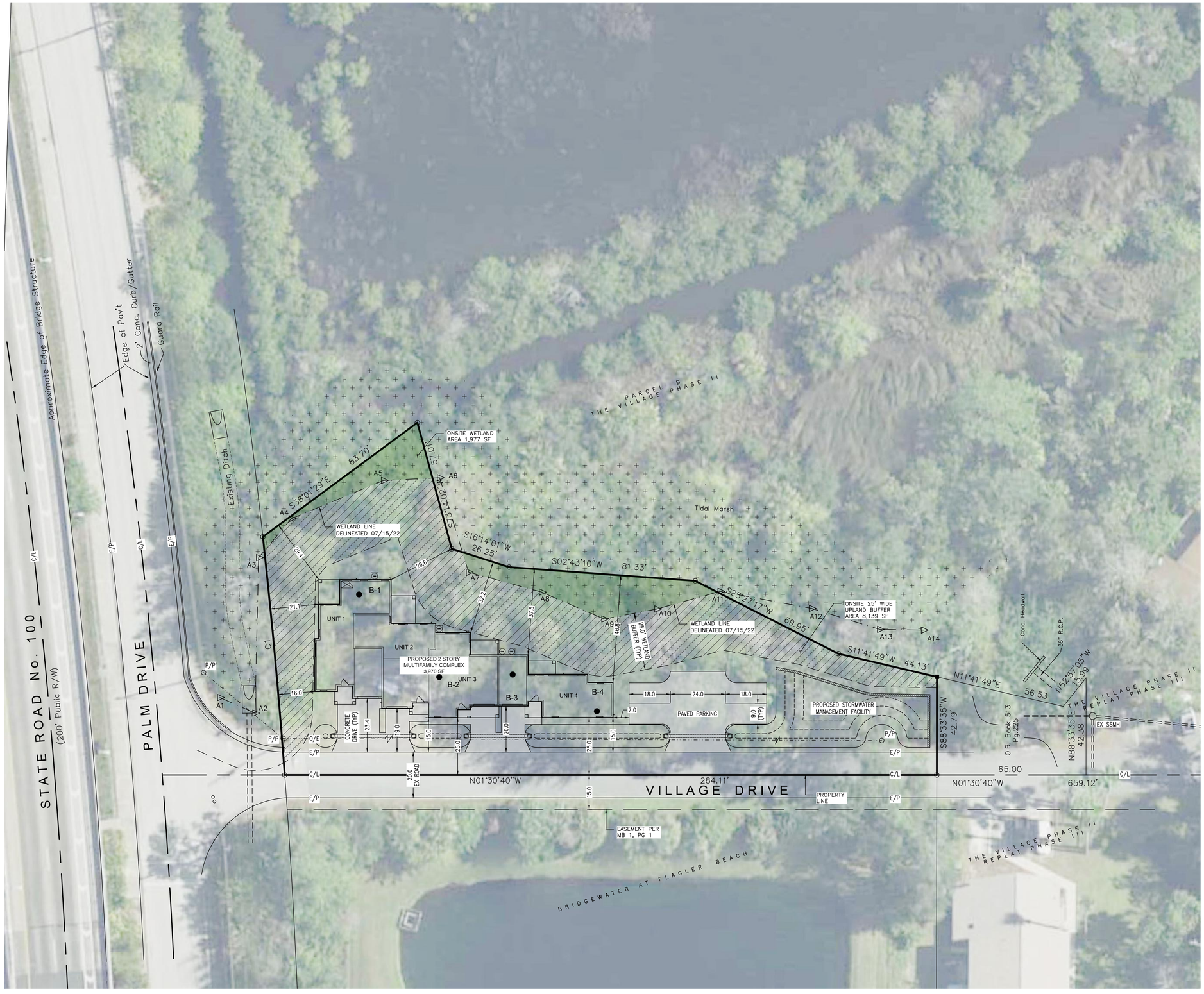
Appendix B - Boring Location Plan

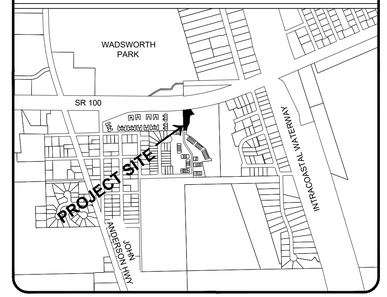


NORTH

20' 10' 0' 20' 40'

SCALE: 1" = 20'

LOCATION MAP (N.T.S.)



PROJECT DATA SUMMARY

PARCEL ID:	11-12-31-5916-00000-00A0	
ADDRESS:	_____ VILLAGE DRIVE	
OWNERSHIP AREA:	25,832 SF (0.593 AC)	100%
ONSITE WETLAND AREA:	1,977 SF (0.454 AC)	8%
WETLAND BUFFER AREA:	8,139 SF (0.187 AC)	32%
UPLAND PORTION:	15,716 SF (0.361 AC)	61%
PROJECT AREA:	12,552 SF (0.288 AC)	49%
ZONING:	GC (GENERAL COMMERCIAL)	
FLUM:	COMMERCIAL	
PROPOSED USE:	MULTIFAMILY	
DENSITY:	ONE UNIT PER 3,000 SF 12,552/3,000= 4 UNITS ALLOWABLE 4 UNITS PROPOSED	

SETBACKS	ALLOWABLE	PROPOSED
FRONT	25.0'	25.0'
SIDE (10% LOT WIDTH)	28.4'	25.0' (PER LARRY TORINO)
REAR	10.0'	30.8'

PROPOSED MULTI-FAMILY COMPLEX DATA

4- PROPOSED UNITS
PROPOSED 1 CAR GARAGE PER UNIT
2 PARKING SPACES PER UNIT (9 TOTAL PARKING)
BUILDING FOOTPRINT AREA = 3,970 SF

STORMWATER MANAGEMENT
ONSITE RETENTION

UTILITIES
SEWER: CONNECT TO EXISTING SEWER STUB OUT SOUTH OF PROJECT SITE
WATER: CONNECT TO EXISTING WATER MAIN LOCATED WITHIN VILLAGE DRIVE

CONCEPTUAL PLAN NOTES:
1. CONCEPTUAL PLAN PREPARED BASED ON BEST AVAILABLE DATA, AND MAY PRE-DATE LAND SURVEY DATA COLLECTION, TOGETHER WITH ANY OTHER SITE ASSESSMENTS THAT MAY CAUSE SITE DESIGNS TO VARY AS SHOWN HEREON.
2. THE CONCEPTUAL SITE PLAN HAS BEEN PREPARED TO INTRODUCE THE PROJECT INTENT TO APPLICABLE LOCAL JURISDICTIONS.
3. BUILDING DIMENSIONS SHOWN HEREON ARE EXTERIOR WALL DIMENSIONS.

SWA STEPHENSON, WILCOX & ASSOCIATES, INC. (CA#27726 / LB#7672)
CIVIL ENGINEERS • LAND SURVEYORS • CONSULTANTS • PLANNERS
2729 E. MOODY BLVD., STE. 400, P.O. BOX 186 BUNNELL, FL 32110
PHONE: (386) 437-2363 FAX: (386) 437-0030 EMAIL: INFO.SWA@GMAIL.COM

FOR
DAWN DEVELOPMENT
119 PINE TREE STREET
FLAGLER BEACH, FL 32136
PHONE: 386.295.2384

REVISIONS
REV SITE PLAN 07/18/22
REV SITE PLAN 08/24/22

CONCEPTUAL SITE PLAN

VILLAGE DRIVE
MULTI-FAMILY COMPLEX

DRAWN BY: JAP
DATE DRAWN: JULY 2022
CHECKED BY: DAW
DATE CHECKED: JULY 2022
SCALE: 1"=20'

Not valid without the signature and the original raised seal.
DAN A. WILCOX, P.E., PSM
P.E. No. 67883 • PSM No. 6749
STATE OF FLORIDA

SHEET NO.
CP-02

Florida Testing & Engineering, Inc
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Appendix C - Logs of SPT Borings (4) & Key to Log of Boring

Project: **Dawn Development - Village Drive - Multi Family Complex** Project Location: **Village Drive - Flagler Beach** Project Number: **23-03092023**	Log of Boring B-1 **Sheet 1 of 1**

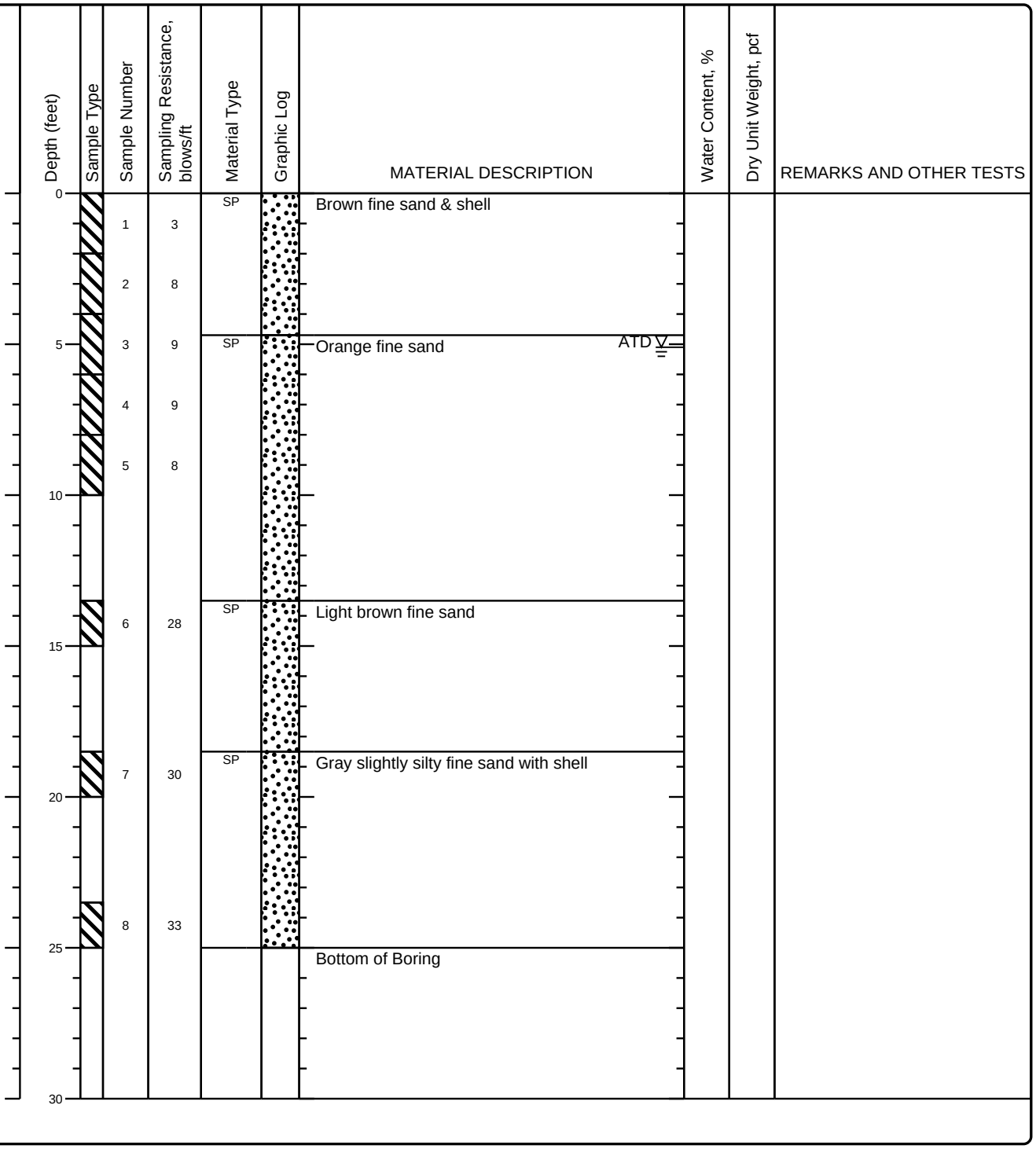
Date(s) Drilled **April 12, 2023**	Logged By **RW**	Checked By **JT**
Drilling Method **Rig**	Drill Bit Size/Type **1.5" / 2.0" / Split Spoon**	Total Depth of Borehole **25 feet bgs**
Drill Rig Type **Mud**	Drilling Contractor	Approximate Surface Elevation
Groundwater Level and Date Measured **4.5 Feet**	Sampling Method(s) **SPT**	Hammer Data **30" / 140 lb**
Borehole Backfill **Cuttings**	Location **Approximate Northeast Section of Proposed Building**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0				SP		Brown fine sand			
			1	17						
					SP		Brown fine sand with limerick			
			2	19	SP		Brown fine sand			
							ATD ▽			
	5		3	13	SP		Dark brown fine sand			
			4	12	SP		Brown fine sand			
			5	9						
	10									
			6	25	SP		Gray fine sand			
	15									
			7	26	SP		Gray fine sand with shell			
	20									
			8	21	SP		Gray fine sand			
	25						Bottom of Boring			
	30									

/var/folders/nj/ndstc2d51kzg9hrnphl5b43m0000gn/T/borings_temp/tmpfile.bgs[(master 2 lab).tpl]

Project: **Dawn Development - Village Drive - Multi Family Complex** Project Location: **Village Drive - Flagler Beach** Project Number: **23-03092023**	Log of Boring B-2 **Sheet 1 of 1**

Date(s) Drilled **April 12, 2023**	Logged By **RW**	Checked By **JT**
Drilling Method **Rig**	Drill Bit Size/Type **1.5" / 2.0" / Split Spoon**	Total Depth of Borehole **25 feet bgs**
Drill Rig Type **Mud**	Drilling Contractor	Approximate Surface Elevation
Groundwater Level and Date Measured **5.1 Feet**	Sampling Method(s) **SPT**	Hammer Data **30" / 140 lb**
Borehole Backfill **Cuttings**	Location **Approximate North Half, Center Section of Proposed Building**	



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Project: **Dawn Development - Village Drive - Multi Family Complex** Project Location: **Village Drive - Flagler Beach** Project Number: **23-03092023**	Log of Boring B-3 **Sheet 1 of 1**

Date(s) Drilled **April 12, 2023**	Logged By **RW**	Checked By **JT**
Drilling Method **Rig**	Drill Bit Size/Type **1.5" / 2.0" / Split Spoon**	Total Depth of Borehole **25 feet bgs**
Drill Rig Type **Mud**	Drilling Contractor	Approximate Surface Elevation
Groundwater Level and Date Measured **5.6 Feet**	Sampling Method(s) **SPT**	Hammer Data **30" / 140 lb**
Borehole Backfill **Cuttings**	Location **Approximate Southeast Section of Proposed Building**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0		1	5	SP		Gray / brown fine sand			
			2	6						
	5		3	6	SP		Dark brown fine sand ATD ▽			
			4	9	SP		Brown fine sand			
			5	7	SP		Brown fine sand with trace of roots			
	10									
			6	5	SP		Brown fine sand with trace of wood			
	15									
			7	22	SP		Gray fine silty fine sand & shell			
	20									
			8	28						
	25						Bottom of Boring			
	30									

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Project: **Dawn Development - Village Drive - Multi Family Complex** Project Location: **Village Drive - Flagler Beach** Project Number: **23-03092023**	Log of Boring B-4 **Sheet 1 of 1**

Date(s) Drilled **April 12, 2023**	Logged By **RW**	Checked By **JT**
Drilling Method **Rig**	Drill Bit Size/Type **1.5" / 2.0" / Split Spoon**	Total Depth of Borehole **25 feet bgs**
Drill Rig Type **Mud**	Drilling Contractor	Approximate Surface Elevation
Groundwater Level and Date Measured **4.5 Feet**	Sampling Method(s) **SPT**	Hammer Data **30" / 140 lb**
Borehole Backfill **Cuttings**	Location **Approximate Southwest Section of Proposed Building**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0		1	6	SP		Brown fine sand with shell			
			2	26	SP		Brown fine sand			
	5		3	22			ATD ▽			
			4	8	SP		Brown fine sand			
			5	11	SP		Gray brown fine sand			
	10									
			6	24	SP		Gray fine sand with shell			
	15									
			7	19						
	20									
			8	16						
	25						Bottom of Boring			
	30									

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Project: **Dawn Development - Village Drive - Multi Family Complex**
Project Location: **Village Drive - Flagler Beach**
Project Number: **23-03092023**

Key to Log of Boring

Sheet 1 of 1

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11

COLUMN DESCRIPTIONS

1. Elevation (feet): Elevation (MSL, feet).
2. Depth (feet): Depth in feet below the ground surface.
3. Sample Type: Type of soil sample collected at the depth interval shown.
4. Sample Number: Sample identification number.
5. Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
6. Material Type: Type of material encountered.
7. Graphic Log: Graphic depiction of the subsurface material encountered.
8. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9. Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
10. Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
11. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Auger sampler
- CME Sampler
- Pitcher Sample
- Bulk Sample
- Grab Sample
- 2-inch-OD unlined split spoon (SPT)
- 3-inch-OD California w/ brass rings
- 2.5-inch-OD Modified California w/ brass liners
- Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting, AW)
- Minor change in material properties within a stratum
- Inferred/gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Figure B-1

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KEY TO BORING LOGS

Major Division			Group Symbols	Typical Names
COARSE-GRAINED SOILS % of the material reatined on No. 200 sieve	Gravels % 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 % 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 % of the material passes No. 200 sieve	Silts and Clays (< 60) Liquid limit		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 (> 60) Liquid limit		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

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

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Appendix D - Photographs of Fieldwork

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Photograph of Fieldwork

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Photograph of Fieldwork

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Photograph of Fieldwork