Imperial
Testing and Engineering, Inc.

Soil Profile
CR555 Multi Family Project
Bartow, FL
Imperial Project No. 21941

Prepared for:
The Parman Group, LLC
Attn: Jeffery Sizemore
4339 State Road 60 W
Mulberry, FL 33860

Prepared by:
Imperial Testing and Engineering, Inc.
3905 Kidron Road
Lakeland, Florida 33811

December 16, 2021

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3905 Kidron Road * Lakeland, FL 33811 * 863-647-2877 * Fax 863-647-1770

December 16, 2021

The Parman Group, LLC
Attn: Jeffery Sizemore
4339 State Road 60 W
Mulberry, FL 33860

Re: CR555 Multi Family Project, CR555, Bartow, FL
Soil Profile

Dear Mr. Sizemore:

As requested, Imperial Testing and Engineering, Inc. (Imperial) has performed five (5) soil borings at the above-mentioned site. The borings were installed in the proposed storm water pond for seasonal high-water table and groundwater elevation determination. The pond borings were designated as PB-1 through PB-5. The field work was completed on December 2, 2021. The general site location can be found on **Figure 1**. The test locations can be found on **Figure 2**. The following is the report of our findings.

The purpose of the soil borings was to determine the lithological profile at the tested locations. The borings would also identify the in-situ groundwater table and an estimation of the seasonal high-water table for design purposes. The pond borings PB-1 through PB-4 were installed to a depth of 15 feet. Pond boring PB-5 was installed to a depth of 8 feet due to vey loose soil conditions encountered below the depth of 8 feet below land surface. The borings were installed using hand auger techniques and with a drilling rig using Direct Push Technology (DPT). The borings were conducted in accordance with the standard method of *Soil Investigation and Sampling by Auger Borings*, as found in ASTM D1452 or Direct Push Soil Sampling as found in ASTM D6282. Visual Classifications of all soil samples were accomplished with the aid of the *Unified Soil Classification System*. The driller's field reports are attached in **Appendix A**.

Subsurface Conditions

According to the *Soil Survey of Polk County, Florida* (USDA-NRCS) there are two (2) available soil types for the property. The available soil types are soil number 66 (Fort Meade-Urban land complex, 0 to 5 percent slopes) and soil number 68 (Arents, 0 to 5 percent slopes). The site appears to be predominately made up of Arents soils which are commonly found in former mined areas. Arent soils contain sands to about 80 inches and are moderately well drained. The soil survey report can be found in **Appendix B.**

Stormwater pond borings PB-1 through PB-3 contained an upper sandy layer that transitioned to clayey sands and intermixed with sandy soils and clayey sands. The sandy soils are reported in the SP/SM and SM group. Boring PB-4 yielded sandy soils reported in the SP/SM group to about

130 inches before transitioning to intermixed clayey sands and sands to a depth of 137 inches. Sandy soils were reported in the formation below the clayey sands at PB-4. Sandy soils were reported to a depth of 83 inches at PB-5 before transitioning sandy soils intermixed with clayey sands to about 87 inches before transitioning to sandy soils reported in the SP/SM group to boring termination depth of 96 inches. No sample recovery was reported below 96 inches at PB-5 due to very loose soils conditions encountered. Imperial will recommend further exploration at the site to provide foundation recommendations to overcome the encountered very loose soils.

The encountered soil types are typical of reclaimed land soils that vary in soil type and contain some degree of clayey soils. Overburden type soils that contain clayey characteristics were reported throughout the site. Organics and unsuitable material were not encountered during the drilling campaign. The encountered soils in the SP/SM and SM group can be considered for use as backfill. Soils reported in the SC group should be considered semi-confining.

Groundwater Conditions

The in-situ water table was encountered at 140 inches at boring PB-1, 100 inches at PB-2, 98 inches at PB-3, 105 inches at PB-4, and 111 inches at boring PB-5. The resultant seasonal high-water tables were estimated between 48 inches and 83 inches below land surface. Perched conditions contributed by the encountered SC soils were reported at the site at PB-1 through PB-3.

The site contains soil types with a seasonal high-water table between 24 inches to greater than 80 inches as reported in the soil survey. The estimated seasonal high-water tables were generally reported higher than the available Arents soil type reported in the investigated areas. The encountered ground water table and estimated seasonal high-water table will likely be shallower at times due to the underlying overburden soils that contain clayey characteristics. The groundwater elevation can and will fluctuate with changes caused by naturally occurring conditions and may rise above the level recorded during our investigation. The soil survey report can be found in **Appendix B.**

We trust the information contained herein will fulfill your present requirements. However, should you need any additional information, or if we may be of any further assistance, please contact us. We sincerely appreciate this opportunity to be of service to you.

Respectfully submitted,

IMPERIAL TESTING and ENGINEERING, INC.

Rodney Carter
Quality Control Supervisor

Michael Stillinger, P.E. #47011
Vice President of Engineering

MICHAEL H. STILLINGER LICENSE No 47011 STATE OF FLORIDA PROFESSIONAL ENGINEER

Michael H. Stillinger

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Date: 2021.12.20 11:40:14 -05'00'

Cc: Client
File 21941

FIGURES

IMPERIAL TESTING and ENGINEERING, INC.
3905 KIDRON ROAD LAKELAND FL 33811

CR555 MULTI FAMILY PROJECT
CR555
BARTOW, FLORIDA

DATE OF DRAWING 12-7-2021
MICHAEL H STILLINGER P.E. # 47011

SITE LOCATION MAP
PROJ. NO. 21941 | FIGURE NO. 1

IMPERIAL TESTING and ENGINEERING, INC. 3905 KIDRON ROAD LAKELAND FL 33811	CR555 MULTI FAMILY PROJECT CR555 BARTOW, FLORIDA	DATE OF DRAWING 12-7-2021 MICHAEL H STILLINGER P.E. # 47011	SITE MAP WITH BORING LOCATIONS PROJ. NO. 21941 | FIGURE NO. 2

APPENDIX A

DRILLERS FIELD REPORTS

Imperial
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DRILLERS FIELD REPORT

CLIENT: The Parman Group, LLC **PROJECT NUMBER:** 21941 **HOLE NUMBER:** PB-1

PROJECT LOCATION: CR555, Bartow - CR555 Multi Family Project

DATE STARTED: December 2, 2021 **DATE COMPLETED:** December 2, 2021

HOLE LOCATION: Proposed pond; north end - see location map

DRILLER(S): R. Duncan, C. Hernandez **LAND SURFACE TYPE:** Grass

ESTIMATED SHWM: 48" **SLOPE OF LAND/ DEGREE:** Flat

SAMPLER DIAMETER AND TYPE: 3" Hand Auger/2" DPT

GROUNDWATER DEPTH- IMMEDIATE: ~11.7' **AFTER 24 HRS:** N/A

BORING TERMINATION DEPTH: 15' **ELEVATION DIFFERENCE (+/-):**

Sample Type	Sample Depth Interval (inches)	Sample Recovery (inches)	SCP Readings (Dial Gauge)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
HA	0-7				Gray slightly silty fine sand with finger roots	N	<2%	SP/SM	D
HA	7-11				Gray and dark brown mottled slightly silty fine sand with finger roots	N	<2%	SP/SM	M
HA	11-30				Light brown slightly silty fine sand with phosphatic pebbles	N	---	SP/SM	M/W
HA	30-40				Tan slightly silty fine sand with cemented sands	N	---	SP/SM	W/S
HA	40-48				Dark brownish gray slightly silty fine sand	N	---	SP/SM	S
HA	48-60				Brown and gray mottled slightly silty fine sand with clayey sand lenses and slight iron staining	N/M	---	SP/SM/ SC	S
DPT	60-120				Gray clayey sand	M	---	SC	S
DPT	120-125				Tan silty cemented sands	N	---	SM	S
DPT	125-132				Gray silty fine sand	N	---	SM	S
DPT	132-156				Light brown slightly silty fine sand	N	---	SP/SM	S
DPT	156-170				Grayish green clayey sand with silty fine sand lenses	L/M	---	SC/SM	S
DPT	170-180				Light brown slightly silty fine sand	N	---	SP/SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DPT** = Direct Push Technology; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: The Parman Group, LLC **PROJECT NUMBER:** 21941 **HOLE NUMBER:** PB-2

PROJECT LOCATION: CR555, Bartow - CR555 Multi Family Project

DATE STARTED: December 2, 2021 **DATE COMPLETED:** December 2, 2021

HOLE LOCATION: Proposed pond; north of center - see location map

DRILLER(S): R. Duncan, C. Hernandez **LAND SURFACE TYPE:** Grass

ESTIMATED SHWM: 49" **SLOPE OF LAND/ DEGREE:** Flat

SAMPLER DIAMETER AND TYPE: 3" Hand Auger/2" DPT

GROUNDWATER DEPTH- IMMEDIATE: ~8.4' **AFTER 24 HRS:** N/A

BORING TERMINATION DEPTH: 15' **ELEVATION DIFFERENCE (+/-):**

Sample Type	Sample Depth Interval (inches)	Sample Recovery (inches)	SCP Readings (Dial Gauge)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
HA	0-12				Gray slightly silty fine sand with finger roots	N	<2%	SP/SM	D
HA	12-13				Gray slightly silty fine sand to light gray slightly silty fine sand	N	---	SP/SM	M
HA	13-26				Light brown slightly silty fine sand with phosphatic pebbles	N	---	SP/SM	M
HA	26-30				Tan clayey sand	M	---	SC	W/S
HA	30-34				Gray clayey sand	M/H	---	SC	S
HA	34-40				Gray slightly silty fine sand with light gray clayey sand lenses	N/M	---	SP/SM/ SC	S
HA	40-45				Brown and dark brown mottled slightly silty fine sand with cemented sands	N	---	SP/SM	S
HA	45-49				Gray and light gray mottled clayey sand	M	---	SC	S
HA	49-56				Brown, dark brown and light brown mottled slightly silty fine sand	N	---	SP/SM	S
HA	56-60				Light brown slightly silty fine sand	N	---	SP/SM	S
DPT	60-70				Light brown slightly silty fine sand	N	---	SP/SM	S
DPT	70-90				Very light brown slightly silty fine sand	N	---	SP/SM	S
DPT	90-150				Tan and gray mottled silty fine sand with cemented sands	N	---	SM	S
DPT	150-160				Dark brown silty fine sand	N	---	SM	S
DPT	160-180				Brown slightly silty fine sand	N	---	SP/SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DPT** = Direct Push Technology; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: The Parman Group, LLC **PROJECT NUMBER:** 21941 **HOLE NUMBER:** PB-3

PROJECT LOCATION: CR555, Bartow - CR555 Multi Family Project

DATE STARTED: December 2, 2021 **DATE COMPLETED:** December 2, 2021

HOLE LOCATION: Proposed pond; approximate center - see location map

DRILLER(S): R. Duncan, C. Hernandez **LAND SURFACE TYPE:** Grass

ESTIMATED SHWM: 55" **SLOPE OF LAND/ DEGREE:** 15'

SAMPLER DIAMETER AND TYPE: 3" Hand Auger/2" DPT

GROUNDWATER DEPTH- IMMEDIATE: ~8.2' **AFTER 24 HRS:** N/A

BORING TERMINATION DEPTH: 15' **ELEVATION DIFFERENCE (+/-):**

Sample Type	Sample Depth Interval (inches)	Sample Recovery (inches)	SCP Readings (Dial Gauge)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
HA	0-10				Gray slightly silty fine sand with finger roots	N	<2%	SP/SM	D
HA	10-13				Gray and brown mottled slightly silty fine sand with finger roots	N	<2%	SP/SM	D
HA	13-36				Light brown slightly silty fine sand with phosphatic pebbles	N	---	SP/SM	D/M
HA	36-41				Tan and brown mottled slightly silty fine sand with cemented sands	M	---	SP/SM	M/W
HA	41-55				Light brown and tan mottled slightly silty fine sand with cemented sands	M/H	---	SP/SM	W/S
HA	55-60				Light brown and brown mottled slightly silty fine sand with cemented sands	N/M	---	SP/SM	S
HA	60-64				Tan clayey sand	N	---	SC	S
HA	64-68				Light brown and brown mottled slightly silty fine sand	M	---	SP/SM	S
HA	68-75				Tan, light brown and light gray mottled clayey sand	N	---	SC	S
HA	75-120				Brown and light brown mottled slightly silty fine sand	N	---	SP/SM	S
DPT	120-130				Light brown slightly silty fine sand	N	---	SP/SM	S
DPT	130-140				Brown and light brown mottled slightly silty fine sand	N	---	SP/SM	S
DPT	140-180				Tan slightly silty fine sand	N	---	SP/SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DPT** = Direct Push Technology; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: The Parman Group, LLC **PROJECT NUMBER:** 21941 **HOLE NUMBER:** PB-4

PROJECT LOCATION: CR555, Bartow - CR555 Multi Family Project

DATE STARTED: December 2, 2021 **DATE COMPLETED:** December 2, 2021

HOLE LOCATION: Proposed pond; south of center - see location map

DRILLER(S): R. Duncan, C. Hernandez **LAND SURFACE TYPE:** Grass

ESTIMATED SHWM: 77" **SLOPE OF LAND/ DEGREE:** Flat

SAMPLER DIAMETER AND TYPE: 3" Hand Auger/2" DPT

GROUNDWATER DEPTH- IMMEDIATE: N/A **AFTER 24 HRS:** ~8.8'

BORING TERMINATION DEPTH: 15' **ELEVATION DIFFERENCE (+/-):**

Sample Type	Sample Depth Interval (inches)	Sample Recovery (inches)	SCP Readings (Dial Gauge)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
HA	0-10				Gray slightly silty fine sand with finger roots	N	<2%	SP/SM	D
HA	10-22				Light brown slightly silty fine sand with phosphatic pebbles	N	---	SP/SM	D/M
HA	22-36				Light brown and light gray mottled slightly silty fine sand with phosphatice pebbles	N	---	SP/SM	M/W
HA	36-42				Light brown slightly silty fine sand with cemented sands	N	---	SP/SM	S
HA	42-60				Brown and light brown mottled slightly silty fine sand with cemented sands	N	---	SP/SM	S
DPT	60-130				Brown and light brown mottled slightly silty fine sand	N	---	SP/SM	S
DPT	130-137				Very light brown silty fine sand with clayey sand lenses	N/M	---	SM/'SC	S
DPT	137-150				Brown slightly silty fine sand	N	---	SP/SM	S
DPT	150-180				Tan slightly silty fine sand	N	---	SP/SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DPT** = Direct Push Technology; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: The Parman Group, LLC **PROJECT NUMBER:** 21941 **HOLE NUMBER:** PB-5

PROJECT LOCATION: CR555, Bartow - CR555 Multi Family Project

DATE STARTED: December 2, 2021 **DATE COMPLETED:** December 2, 2021

HOLE LOCATION: Proposed pond; south end - see location map

DRILLER(S): R. Duncan, C. Hernandez **LAND SURFACE TYPE:** Grass

ESTIMATED SHWM: 83" **SLOPE OF LAND/ DEGREE:** Flat

SAMPLER DIAMETER AND TYPE: 3" Hand Auger/2" DPT

GROUNDWATER DEPTH- IMMEDIATE: ~9.5' **AFTER 24 HRS:** ~9.3'

BORING TERMINATION DEPTH: 8' **ELEVATION DIFFERENCE (+/-):**

Sample Type	Sample Depth Interval (inches)	Sample Recovery (inches)	SCP Readings (Dial Gauge)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
HA	0-5				Dark brown slightly silty fine sand with finger roots	N	<5%	SP/SM	D
HA	5-11				Brown slightly silty fine sand with finger roots	N	<5%	SP/SM	D
HA	11-39				Light brown slightly silty fine sand with finger roots	N	<5%	SP/SM	M
HA	39-60				Light brown slightly silty fine sand with phosphatic pebbles	N	---	SP/SM	M/W
DPT	60-68				Gray slightly silty fine sand	N	---	SP/SM	M
DPT	68-77				Light brown slightly silty fine sand with phosphatic pebbles	N	---	SP/SM	M
DPT	77-85				Light brown slightly silty fine sand with phosphatic pebbles with slight iron staining	N	---	SP/SM	M
DPT	83-87				Tan, light brown and brown mottled slightly silty fine sand with clayey sand lenses and iron staining	N/M	---	SP/SM/ SC	M
DPT	87-94				Light brown slightly silty fine sand with phosphatic pebbles and heavy iron staining	N	---	SP/SM	M
DPT	94-96				Light brown slightly silty fine sand with phosphatic pebbles and slight iron staining	N	---	SP/SM	M

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DPT** = Direct Push Technology; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

APPENDIX B

NRCS SOIL SURVEY DATA

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Polk County, Florida

November 11, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:3,330 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Polk County, Florida
Survey Area Data: Version 19, Aug 27, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 25, 2020—Jan 19, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
66	Fort Meade-Urban land complex, 0 to 5 percent slopes	0.5	1.1%
68	Arents, 0 to 5 percent slopes	48.2	98.9%
Totals for Area of Interest		**48.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Polk County, Florida

66—Fort Meade-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jtwf
Elevation: 100 to 250 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Fort meade and similar soils: 55 percent
Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fort Meade

Setting

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

Typical profile

A - 0 to 25 inches: sand
C - 25 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G154XB999FL)
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: No

Description of Urban Land

Setting

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

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G154XB999FL)
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: Unranked

68—Arents, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jtwh
Elevation: 50 to 360 feet
Mean annual precipitation: 46 to 54 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

C - 0 to 80 inches: sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: About 24 to 48 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G154XB999FL)
Other vegetative classification: Forage suitability group not assigned (G154XB999FL)
Hydric soil rating: No

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