REPORT OF THE
GEOTECHNICAL INVESTIGATION

MOCCASIN WALLOW ROAD IMPROVEMENTS
SEGMENT 3
MANATEE COUNTY, FLORIDA

Driggers Engineering Services Incorporated

DRIGGERS ENGINEERING SERVICES INCORPORATED
Geotechnical Engineering & Construction Materials Testing

May 18, 2023

Stantec
6900 Professional Parkway East
Sarasota, Florida 34240

Attn: Ms. Alexandra Johnson

RE: Results of the Subsurface Soil Investigation
Moccasin Wallow Road Improvements
Segment 3
Manatee County, Florida
Our File: DES 208603-S3

Dear Ms. Johnson:

Pursuant to your authorization, **DRIGGERS ENGINEERING SERVICES, INC.** has completed a series of exploratory borings for the subject project. Presented herein are the results of our field and laboratory testing together with our geotechnical recommendations.

FIELD INVESTIGATION PROGRAM

STANDARD PENETRATION TEST (SPT) BORINGS – A program of two (2) Standard Penetration Test (SPT) borings were performed to check subsurface soil and groundwater conditions at the two of the four accessible signal pole locations on the south side of Moccasin Wallow Road and Carter Road. The Standard Penetration Test (SPT) borings were advanced to nominal depths of 25 to 30 feet below present grade at the survey staked locations depicted on Plate I of the report attachments. Each boring location was survey staked by the project surveyor. Please note that the boring numbers correlate to the number scheme utilized by the project surveyor.

The Standard Penetration method of testing and sampling was used to provide soil samples for visual classification and to develop Standard Penetration resistance data reflective of the strength and bearing capability of the soils penetrated. The results of the borings are included in the report appendix. The boring logs present visual soil descriptions and estimated Unified Soil Classifications versus depth below existing grade, as well as penetration resistances and

groundwater information. Also attached is a brief description of this method of sampling and testing.

ROADWAY BORINGS- To investigate the subsurface soil and groundwater conditions within the planned roadway areas of the segment 3 Moccasin Wallow roadway improvements, a total of seventeen (17) classification or hand auger borings were performed. The roadway hand auger borings penetrated to depths of 5.5 to 6 feet below existing grade. Please note that a number of the hand auger borings (C1 – C6) were conducted within the existing roadway section to provide pavement section information in conjunction with subgrade soil and groundwater conditions.

The appended logs visually describe the soil strata from existing grades to the termination depth of the borings in accordance with the Unified Soil Classification system. The boring locations were located in the field by the project surveyor along with accompanying ground elevations.

INDICATED SUBSURFACE CONDITIONS

EXISTING PAVEMENT AND SUBGRADE SOIL CONDITIONS – The borings, performed within the existing roadway sections (C1 - C6), revealed an asphalt pavement ranging in thickness of 2-3/8 to 7-1/2 inches. Below the asphalt, the borings predominantly revealed a limestone base material varying in measurements of about 5 to 8 inches in thickness. A couple borings (C-5 and C-6) identified a fine sand with shell material just below the asphalt pavement.

The borings have identified fine sands with variable silt and clay fines with variable phosphatic sands content to a depth of 31.5 feet below grade. These sands were primarily classified as SP, SP-SM, SM and SC soils in the Unified Soil Classification System (USCS). Standard Penetration resistance data suggests the fine sands are generally very loose to medium dense in relative density.

It should be noted that boring RA-3 penetrated a very thin root zone at about 1 foot below grade while boring C-6 identified apparent fill soils with a mixture of fine sands, clay, gravel and asphalt millings to a depth of 5.5 feet below grade.

GROUNDWATER - Groundwater was typically encountered at a depth of 4.5 to 5.7 feet below existing grade. Borings were all recorded in April of 2023, during the drier time of the year.

Review of the Web Soil Survey of Manatee County suggests that EauGallie fine sands are the principal upland soil type in the project vicinity. Intersecting areas also include Floridana-Immokalee-Okeelanta Association, and Wabasso-Wabasso. The majority EauGallie fine sand

complex suggest a seasonal high at 6 to 18 inches while the intersecting complexes suggest seasonal high groundwater at 0 inches below historical grade. It should be noted that the existing roadway and adjacent right-of-way areas appear to have received a fill application to raise grades about 1 to 2 feet or more above historical grades.

Based upon results of our studies and the Web Soil Survey, we anticipate that groundwater levels could occur above the existing groundwater levels in response to the more frequent rainfall during typical peak wet season and/or a tropical weather event. A table of the normal estimated seasonal high groundwater determination has been included in the report attachments. Refinement in the normal seasonal groundwater estimation would require monitoring of groundwater levels during the upcoming rainy season. Groundwater levels can be monitored via shallow-depth piezometers constructed at selected locations.

SIGNAL POLES – We understand that four (4) traffic signal structures are proposed at the intersection of Carter Road and Moccasin Wallow Road. However, due to accessibility issues within the wetland to the north, we were only able to perform borings at the southern locations as survey staked in the field. It is our understanding that the signal pole structures will induce combined compression, overturning, sliding and torsional forces on the planned foundation element. At the time of this writing, the desired foundation type has been determined to be a deep foundation or drilled shaft.

It is our understanding that each signal pole may be supported by a single drilled shaft penetrating a sufficient depth to provide the necessary compression, overturning/lateral and torsional resistance. The required penetration of the drilled shaft will be established by the project structural engineer.

The design soil strength parameters are tabulated and included in Plate II of the report attachments. The soil parameters must be utilized in conjunction with appropriate factors of safety as well as design procedures applicable to drilled shaft foundation constructed in a wet-hole environment. This information should be utilized in developing the drilled shaft embedment and size requirements consistent with the design loading conditions and an appropriate factor of safety.

It is further recommended that a program of continued geotechnical inspection be implemented. Careful inspection should be planned to check for the proper installation and penetration depth based upon the project specifications, including concrete quality assurance testing.

PAVEMENT SUBGRADE CONDITIONS AND PREPARATION - Our geotechnical investigation program has generally identified the presence of near surface fine sands which are considered suitable for support of an anticipated flexible pavement structure provided proper subgrade preparation is incorporated. The near surface subgrade soils consisted principally of fine sands comprising the SP to SP-SM Unified Soil Classification. Exceptions did occur at boring RA-3 and C-6 that penetrated fine sands with heavy root concentrations and suspect potential unsuitable soils at C-6 that would warrant removal and replacement with compacted clean soils as described below. It would be prudent to conduct offset borings at these locations to help better evaluate the vertical and lateral extent of such soil that will require undercutting and replacement.

In addition to removal of buried unsuitable soils, further subgrade preparation must include careful stripping of surface vegetation, as well as any organic topsoil and root concentrations followed by proof-rolling of the subgrade with heavy vibratory compaction equipment. Backfill and fill soils used to develop proposed grades including areas where unsuitable soils were removed should consist of clean to slightly silty fine sands with a Unified Soil Classification of SP to SP-SM or superior.

All backfill soils and roadway embankment fill soils should be compacted to not less than 98% of the Modified Proctor maximum dry density per AASHTO T-180. Moisture contents should be controlled to within ±2% of optimum moisture.

Specific pavement thickness design is typically based upon detailed information relative to expected traffic and vehicular wheel loads. The design civil consultant will need to design thickness of the pavement structure to accommodate specific area traffic frequency and design axle loads, where applicable. It is our understanding that a pavement section has been specified to include 12" stabilized subgrade (subgrade shell marl blended with sandy subgrade with minimum LBR of 60), 10" road base (FDOT Group 9) and 3" of first lift asphalt followed by a second lift of 1.5" FC-12.5.

Limerock Bearing Ratio (LBR) testing was not conducted. However, our experience suggests that the near surface, relatively clean fine sands and similar fine sands which may be excavated from the pond areas may have LBR values on the order of 15 to 20. In order to improve the bearing characteristics of the fine sand deposits to an LBR of 60, a stabilizing admixture such as limerock, crushed concrete, shell or even clayey fine sand would be required. Evaluation of

the bearing characteristics of the subgrade soils should be performed during construction, particularly where road embankments would be elevated above existing grades. The upper 12 inches of the subgrade immediately below the pavement structure should be uniformly compacted so as to achieve a uniform density of no less than 98% of the Modified Proctor (AASHTO T-180) maximum dry density.

Pavement grades should be designed to maintain the bottom of the base course at least a foot above the normal seasonal high groundwater table. According to paving and grading plans that were provided for our use, grades will be maintained above the minimum elevation of 1 foot above the estimated seasonal high groundwater table. In the event that grades cannot be maintained at this minimum criteria, an appropriate more "water friendly" base course of cement treated base or crushed concrete and underdrains should be considered. Of course, a positive outflow will be required for the design of underdrains to ensure that they will perform correctly.

We have assumed that grading will allow for shaping of the ground surface away from the roadway sections to adjacent swales or collection areas and not allow for water to drain "pond" next to the pavement section.

DRIGGERS ENGINEERING SERVICES, INC. appreciates the opportunity to assist you on this project. If you have any questions concerning our findings, please contact the undersigned at your convenience.

Respectfully submitted,
DRIGGERS ENGINEERING SERVICES, INC.

Jeffry A. Driggers, P.E.
Vice President
FL Registration No. 70598

JAD-REP\208603-S3
Copies submitted: Email:

APPENDIX

PLATE I – BORING LOCATION PLAN

PLATE II – DESIGN SOIL STRENGTH PARAMETERS

PLATE III – ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER ELEVATIONS

STANDARD PENETRATION TEST BORING LOGS

HAND AUGER BORING LOGS

SUMMARY OF LABORATORY TESTING RESULTS

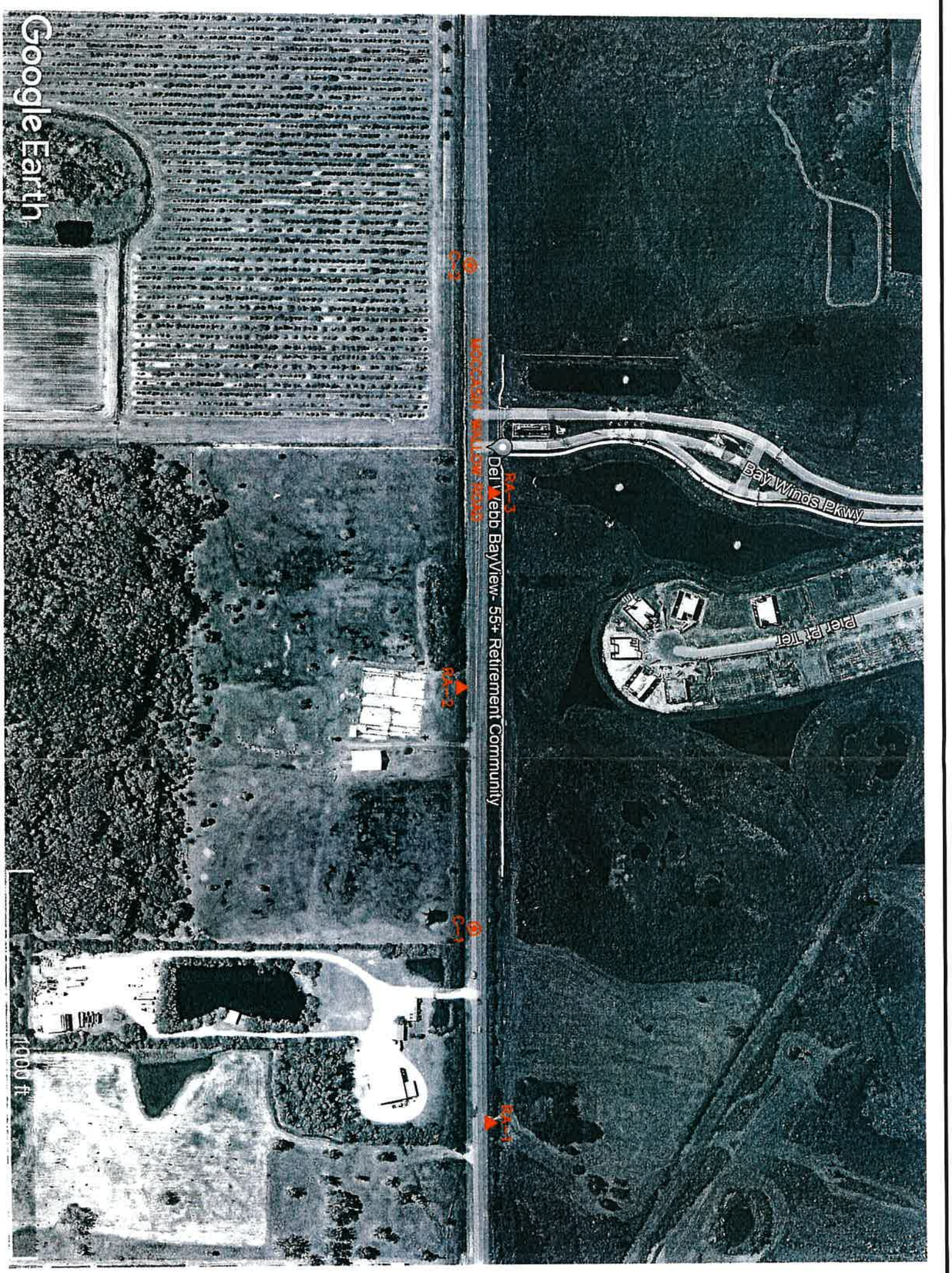
METHOD OF TESTING

PLATE I - BORING LOCATION PLAN

LEGEND:

▶ HAND AUGER BORING LOCATION

⊙ ASPHALT CORE/HAND AUGER BORING LOCATION



0 150 300 600

SCALE IN FEET

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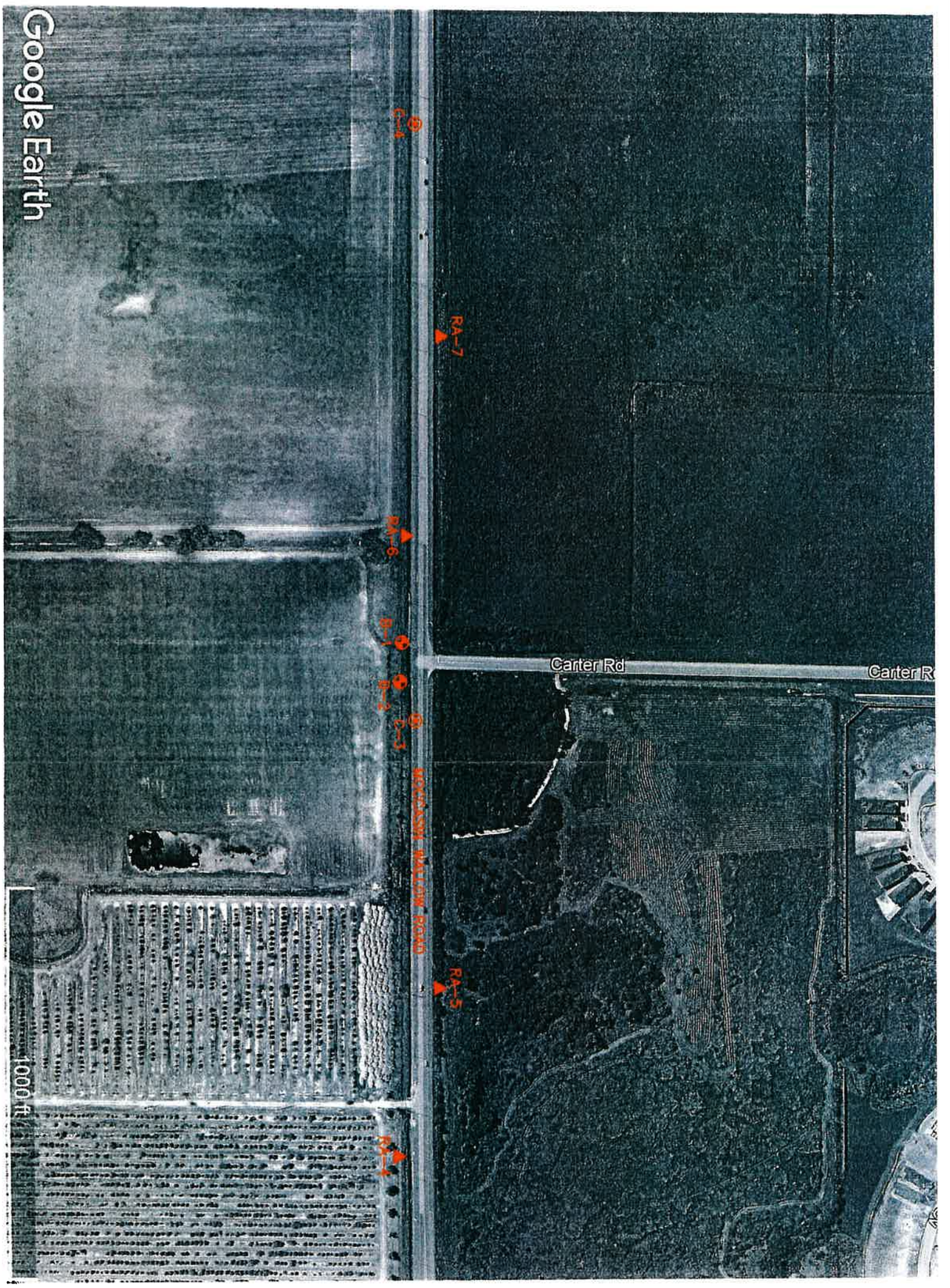
CAD / ENGINEER	SHEET TITLE	PROJECT NO.
R.D.B. / J.A.D.	BORING LOCATION PLAN	DES 208603
PREPARED BY	PROJECT NAME	SHEET NO.
DRIGGERS ENGINEERING SERVICES, INCORPORATED	MOCCASIN WALLOW ROAD – SEGMENT 3 MANATEE COUNTY, FLORIDA	PLATE 1-A

LEGEND:

- HAND AUGER BORING LOCATION
- ASPHALT CORE/HAND AUGER BORING LOCATION
- STANDARD PENETRATION TEST BORING/ HAND CONE SOUNDING LOCATION



SCALE IN FEET
0
150
300
600

CAD FILE NAME: A:\PLATE1\208603-SEG3-P1B-CAD-IMPORT-PDF\208603-SEG3-P1B-LOCATION-PLAN.DWG DRAWN BY: R.D.B. DATE: 4/20/23

CAD / ENGINEER	SHEET TITLE	PROJECT NO.
R.D.B. / J.A.D.	BORING LOCATION PLAN	DES 208603
PREPARED BY	PROJECT NAME	SHEET NO.
DRIGGERS ENGINEERING SERVICES, INCORPORATED	MOCCASIN WALLOW ROAD – SEGMENT 3 MANATEE COUNTY, FLORIDA	PLATE 1-B

LEGEND:

▶ HAND AUGER BORING LOCATION

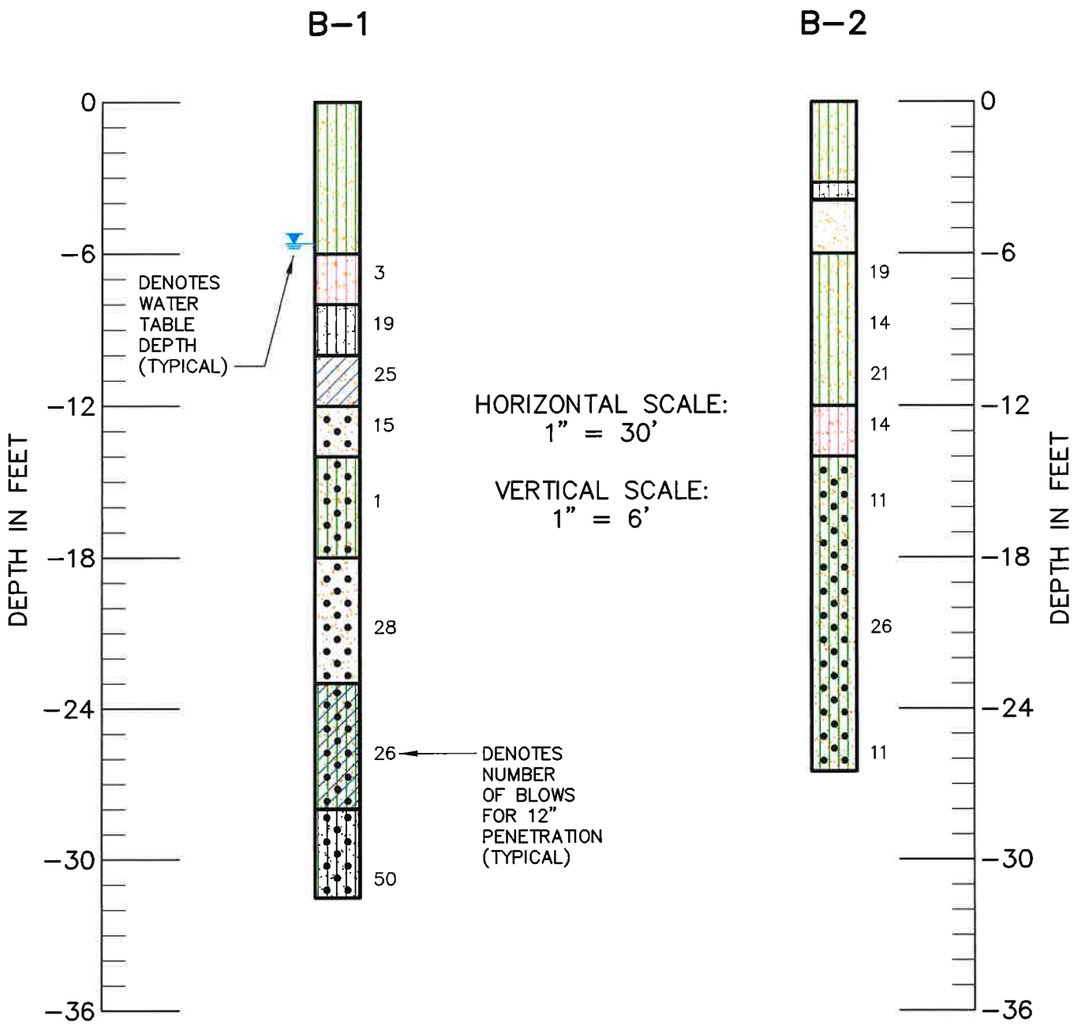
⊙ ASPHALT CORE/HAND AUGER BORING LOCATION

SCALE IN FEET: 0, 150, 300, 600

CAD FILE NAME: A:\PLATE1\208603-SEG3-P1C-CAD-IMPORT-PDF\208603-SEG3-P1C-LOCATION-PLAN.DWG DRAWN BY: R.D.B. DATE: 4/20/23

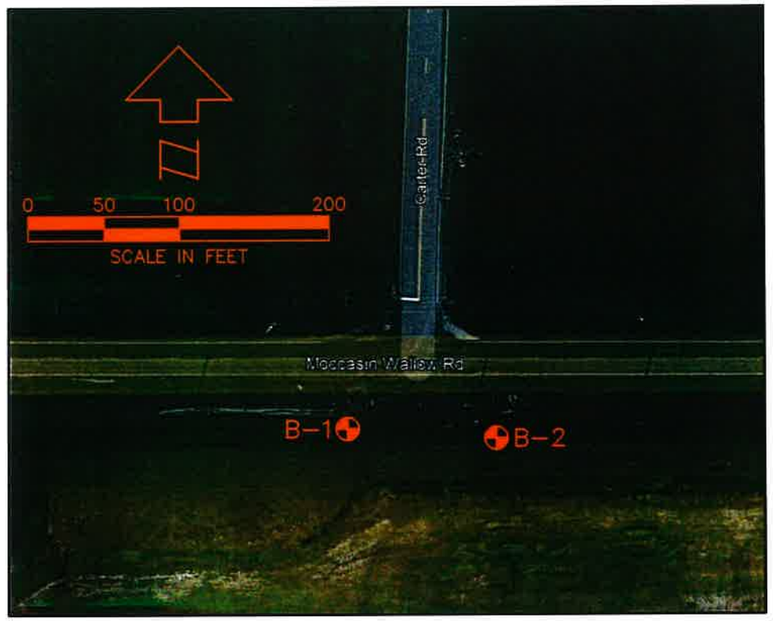
CAD / ENGINEER	SHEET TITLE	PROJECT NO.
R.D.B. / J.A.D.	BORING LOCATION PLAN	DES 208603
PREPARED BY	PROJECT NAME	SHEET NO.
DRIGGERS ENGINEERING SERVICES, INCORPORATED	MOCCASIN WALLOW ROAD – SEGMENT 3 MANATEE COUNTY, FLORIDA	PLATE I-C

PLATE II – DESIGN SOIL STRENGTH PARAMETERS



GRANULAR MATERIALS – RELATIVE DENSITY	SPT – BLOWS PER FOOT
VERY LOOSE	LESS THAN 4
LOOSE	4–10
MEDIUM DENSE	10–30
DENSE	30–50
VERY DENSE	GREATER THAN 50

SILTS AND CLAYS – CONSISTENCY	SPT – BLOWS PER FOOT
VERY SOFT	LESS THAN 2
SOFT	2–4
FIRM	4–8
STIFF	8–15
VERY STIFF	15–30
HARD	GREATER THAN 30



LEGEND:

STANDARD PENETRATION TEST BORING LOCATION

LEGEND OF SOIL BORING PROFILE SYMBOLS:

- FINE SAND (SP) (A-3)
- SLIGHTLY SILTY FINE SAND (SP-SM) (A-3)
- SILTY FINE SAND (SM) (A-2-4)
- SILTY, CLAYEY FINE SAND (SM-SC) (A-2-6)
- CLAYEY FINE SAND (SC) (A-2-6)
- PHOSPHATIC

CAD FILE NAME: A:\PROFILE\208603-MOCCASIN-CARTER-P&P-5-23.DWG

DESIGN SOIL STRENGTH PARAMETERS FOR BORING B-1

DEPTH INTERVAL (feet)	FRICTION ANGLE	UNCONFINED COMPRESSIVE STRENGTH (tsf)	MOIST UNIT WEIGHT (pcf)	BUOYANT UNIT WEIGHT (pcf)	SATURATED UNIT WEIGHT (pcf)
0–8	28°	--	110	60	120
8–14	32°	--	--	60	120
14–18	28°	--	--	60	120
18–28	32°	--	--	60	120
28–31.5	35°	--	--	60	120

DESIGN SOIL STRENGTH PARAMETERS FOR BORING B-2

DEPTH INTERVAL (feet)	FRICTION ANGLE	UNCONFINED COMPRESSIVE STRENGTH (tsf)	MOIST UNIT WEIGHT (pcf)	BUOYANT UNIT WEIGHT (pcf)	SATURATED UNIT WEIGHT (pcf)
0–6	30°	--	110	60	120
6–27.5	32°	--	--	60	120

DATE	NAME	REVISION	APPROVED BY:

PREPARED BY
DRIGGERS ENGINEERING SERVICES, INCORPORATED

JEFFRY A. DRIGGERS, P.E.
FL LICENSE NO. 70598

	NAME	DATE
DESIGNED BY:	RDB	5/10/23
DRAWN BY:	RDB	5/10/23
CHECKED BY:	JAD	5/10/23
SUPERVISED BY:	FJD	

REPORT OF CORE BORINGS

Traffic Signal Structures
Moccasin Wallow Road & Carter Road
Manatee County, Florida

DESI PROJ. NO.: DES 208603

SHEET NO.: PLATE II

PLATE III – ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER ELEVATIONS

MOCCASIN WALLOW ROAD - SEGMENT 3
MANATEE COUNTY, FLORIDA
DES 208603

Boring No.	Approx Ground Surface Elevation (NAVD) (ft.)	Existing Groundwater Depth (ft.)	Approx. Existing Groundwater Elevation (NAVD) (ft.)	Estimated Normal Seasonal High Groundwater Elevation (NAVD) (ft.)
B-1	N/A	5.6	N/A	N/A
B-2	N/A	N/A	N/A	N/A
RA-1	+25.3+/-	N/A	N/A	24.5
RA-2	+25.3+/-	N/A	N/A	24.5
RA-3	+25.0+/-	N/A	N/A	24.0
RA-4	+22.1+/-	N/A	N/A	+ 22.0 +/-
RA-5	+23.9+/-	5.7	+18.2	23.5
RA-6	+25.8+/-	5.4	+20.4	24.5
RA-7	+26.0+/-	5.3	+20.7	25.0
RA-8	+26.1+/-	4.5	+21.6	25.0
RA-9	+28.5+/-	5.8	+22.7	26.0
RA-10	+28.1+/-	5.5	+22.6	26.0
RA-11	+26.7+/-	N/A	N/A	25.5
C-1	+26.1+/-	5.7	+20.4	25.0
C-2	+26.3+/-	N/A	N/A	25.0
C-3	+25.4+/-	N/A	N/A	24.5
C-4	+27.3+/-	N/A	N/A	26.0
C-5	+27.9+/-	N/A	N/A	26.0
C-6	+29.1+/-	N/A	N/A	26.0

PLATE III

STANDARD PENETRATION TEST BORING LOGS

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 208603 **BORING NO.** B-1

Project Moccasin Wallow Road - Segment 3, Manatee County, Florida

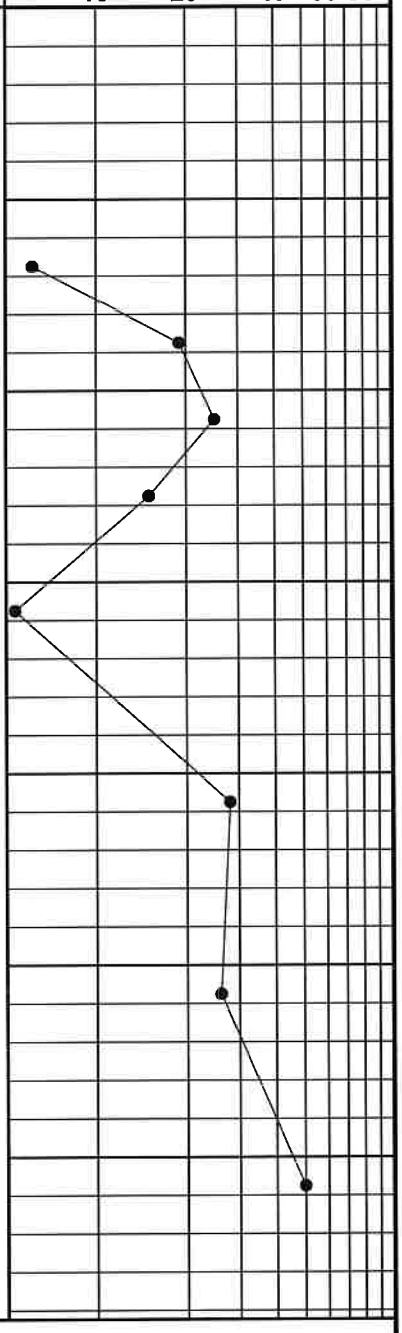
Location See Plate I-B **Foreman** N.P.

Completion Depth 31.5' **Date** 4/11/23 **Depth To Water** 5.6' **Time** _____ **Date** 4/11/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION (SURF. EL: N/A)	BLOWS ON SAMPLER PER 6" OR PEN. STR.
0			Grayish-brown silty Fine SAND (SM) (A-2-4)	
5			Very loose grayish-brown slightly silty Fine SAND (SP-SM) (A-3)	3/1/2
			Medium dense grayish-brown silty Fine SAND (SM) (A-2-4)	5/9/10
10			Medium dense light grayish-brown clayey Fine SAND (SC) (A-2-6)	13/13/12
			Medium dense gray phosphatic Fine SAND (SP) (A-3)	12/8/7
15			Very loose light grayish-brown phosphatic, silty Fine SAND (SM) (A-2-4)	2/0/1
			Medium dense grayish-brown phosphatic Fine SAND (SP) (A-3)	
20				5/10/18
			Medium dense light brown phosphatic, silty, clayey Fine SAND (SM-SC) (A-2-6)	
25				8/9/17
			Dense grayish-brown phosphatic, silty Fine SAND (SM) (A-2-4)	
30				22/26/24

STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP

10 20 40 60 80



Remarks _____

Casing Length _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 208603 **BORING NO.** B-2

Project Moccasin Wallow Road - Segment 3, Manatee County, Florida

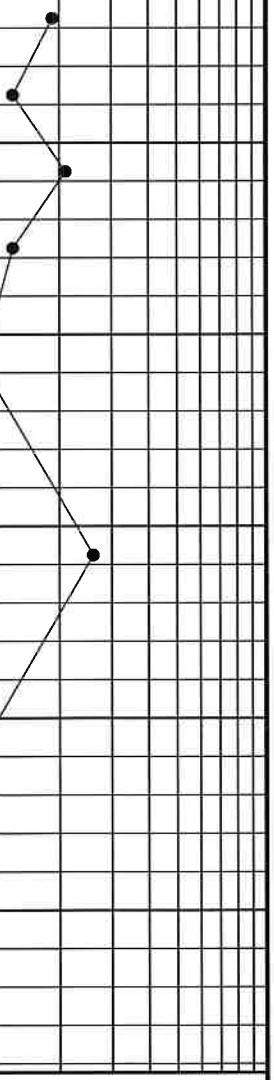
Location See Plate I-B **Foreman** R.K.

Completion Depth 26.5' **Date** 4/14/23 **Depth To Water** ** **Time** **Date** 4/14/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.
			SURF. EL: N/A	
0			Grayish-brown silty Fine SAND (SM) (A-2-4)	
			Dark grayish-brown slightly silty Fine SAND (SP-SM) (A-3)	
5			Grayish-brown Fine SAND (SP) (A-3)	
			Brown Fine SAND (SP) (A-3)	
			Medium dense grayish-brown to light grayish-brown silty Fine SAND (SM) (A-2-4)	9/9/10
				5/6/8
10				7/10/11
			Medium dense gray slightly silty Fine SAND (SP-SM) (A-3)	5/6/8
15			Medium dense gray to light brown phosphatic, silty Fine SAND (SM) (A-2-4)	5/5/6
20				14/16/10
25				4/5/6
30				

STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (AUTOMATIC HAMMER)

10 20 40 60 80



Remarks ** Water Table not encountered within depth of 10.0'

Casing Length

HAND AUGER BORING LOGS

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.6'	**DATE:** 4/11/23
TECHNICIAN: N.P./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** B-1	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	HAND CONE TIP RESISTANCE (TSF) 0 10 20 30 40 50 60 70
	Grayish-brown silty Fine SAND (SM) (A-2-4)	0		
		2		
		4		
		6		
	Surface Elevation: N/A	8		
		10		
		12		
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603	**CLIENT:** Stantec Consulting Services, Inc. **WATER TABLE:** See "Note" — **DATE:** 4/14/23
TECHNICIAN: R.K./G.F.	**DATE:** 4/14/23 — **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B	**TEST NUMBER:** B-2

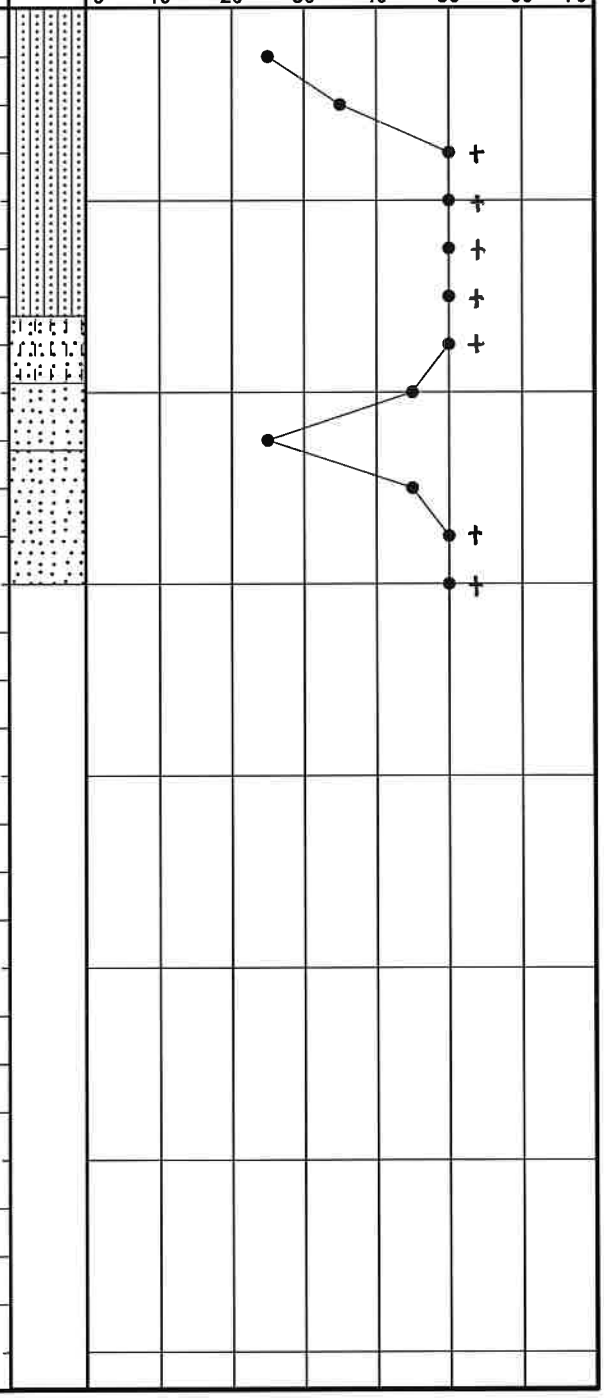
ELEV. (FT)	DESCRIPTION	DEPTH (FT)
	Grayish-brown silty Fine SAND (SM) (A-2-4)	0
	Dark grayish-brown slightly silty Fine SAND (SP-SM) (A-3)	4
	Grayish-brown Fine SAND (SP) (A-3)	
	Brown Fine SAND (SP) (A-3)	6

Surface Elevation: N/A

Note: Water Table not encountered within depth of 6.0'.

LEGEND:

●+ Denotes Penetration Resistance in excess of 50 TSF



DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: N/A	**DATE:** 4/10/23
TECHNICIAN: G.F.		**DATE:** 4/10/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-A		**TEST NUMBER:** RA-1	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	Gray Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +25.3+/-'
25	Gray Fine SAND with rock fragments (SP) (A-3)			
	Grayish-brown Fine SAND (SP) (A-3)	1		
24				
	Grayish-brown Fine SAND with trace of shell fragments (SP) (A-3)	2		
23				
	Light brown Fine SAND (SP) (A-3)	3		
22				
		4		
21				
		5		
20	Brown silty, clayey Fine SAND (SM-SC) (A-2-6)			
	Brown silty Fine SAND with cemented fragments (SM) (A-2-4)	6		
19				
		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: N/A	**DATE:** 4/10/23
TECHNICIAN: G.F.		**DATE:** 4/10/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-A		**TEST NUMBER:** RA-2	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
25	Gray Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +25.3+/-'
24	Dark gray Fine SAND with finely divided organic material (SP) (A-3)	1		
		2		
23	Light gray Fine SAND (SP) (A-3)	3		
22	Dark brown Fine SAND with finely divided organic material (SP) (A-3)			
	Brown clayey Fine SAND (SC) (A-2-6)	4		
21	Grayish-brown and orange clayey Fine SAND (SC) (A-2-6)	5		
20				
		6		
19		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603	**CLIENT:** Stantec Consulting Services, Inc. **WATER TABLE:** N/A **DATE:** 4/10/23
TECHNICIAN: G.F.	**DATE:** 4/10/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-A	**TEST NUMBER:** RA-3

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
25	Gray Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +25.0+/-'
24	Brown Fine SAND with trace of clayey Fine SAND pockets (SP) (A-3)	1		
	Dark gray organic Fine SAND with abundant roots (SP-SM/Pt) (A-8)			
23	Gray Fine SAND (SP) (A-3)	2		
22	Dark brown Fine SAND (SP) (A-3)	3		
21	Brown Fine SAND (SP) (A-3)	4		
20	Grayish-brown silty, slightly clayey Fine SAND (SM) (A-2-4)	5		
19	Light brown silty, slightly clayey Fine SAND (SM) (A-2-4)	6		
18		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: N/A	**DATE:** 4/10/23
TECHNICIAN: G.F.		**DATE:** 4/10/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** RA-4	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
22	Gray Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +22.1+/-'
21	Grayish-brown Fine SAND (SP) (A-3)	1		
20	Dark brown silty Fine SAND with finely divided organic material (SM) (A-2-4)	2		
19	Brown Fine SAND (SP) (A-3)	3		
18		4		
17	Grayish-brown silty, slightly clayey Fine SAND (SM) (A-2-4)	5		
16	Dark grayish-brown Fine SAND with trace of roots (SP) (A-3)	6		
15		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.7'	**DATE:** 4/12/23
TECHNICIAN: K.A.		**DATE:** 4/12/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** RA-5	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	Gray Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +23.9+/-'
23	Brown slightly silty Fine SAND with clayey Fine SAND pockets and trace of rock fragments (SP-SM/SC (A-3/A-2-6)	1		
22	Brown Fine SAND (SP) (A-3)	2		
21	Light brown Fine SAND (SP) (A-3)	3		
20		4		
19		5		
18		6		
17		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.4'	**DATE:** 4/12/23
TECHNICIAN: K.A.		**DATE:** 4/12/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** RA-6	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	Gray Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +25.8+/-'
25	Light grayish-brown Fine SAND (SP) (A-3)	1		
24		2		
23	Light brown Fine SAND (SP) (A-3)	3		
22		4		
21	Light grayish-brown Fine SAND (SP) (A-3)	5		
20		6		
19		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.3'	**DATE:** 4/10/23
TECHNICIAN: G.F.		**DATE:** 4/10/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** RA-7	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
26	Gray Fine SAND (SP) (A-3)	0		Surface Elevation: +26.0+/-'
25	Brown Fine SAND (SP) (A-3)	1		
24	Light brown Fine SAND (SP) (A-3)	2		
23		3		
22	Orangish-brown silty Fine SAND (SM) (A-2-4)	4		
21	Light brown slightly silty Fine SAND (SP-SM) (A-3)	5		
20	Light brown Fine SAND (SP) (A-3)	6		
19		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 4.5'	**DATE:** 4/12/23
TECHNICIAN: K.A.		**DATE:** 4/12/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C		**TEST NUMBER:** RA-8	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
26	Brown Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +26.1+/-'
25	Grayish-brown Fine SAND with light gray clayey Fine SAND (SP/SC) (A-3/A-2-6)	1		
24	Brown slightly silty Fine SAND (SP-SM) (A-3)	2		
23	Light brown silty Fine SAND (SM) (A-2-4)	3		
22	Dark gray Fine SAND (SP) (A-3)	4		
21	Dark grayish-brown Fine SAND (SP) (A-3)	5		
20		6		
19		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.8'	**DATE:** 4/12/23
TECHNICIAN: K.A.		**DATE:** 4/12/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C		**TEST NUMBER:** RA-9	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	Brown Fine SAND with trace of roots (SP) (A-3)	0		Surface Elevation: +28.5+/-'
28	Grayish-brown Fine SAND with trace of rock fragments (SP) (A-3)	1		
27		2		
26	Grayish-brown Fine SAND with trace of clayey Fine SAND pockets (SP) (A-3)	3		
25		4		
24	Gray Fine SAND (SP) (A-3)			
	Grayish-brown slightly silty Fine SAND (SP-SM) (A-3)	5		
23				
		6		
22				
		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.5'	**DATE:** 4/12/23
TECHNICIAN: K.A.		**DATE:** 4/12/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C		**TEST NUMBER:** RA-10	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
28	Grayish-brown Fine SAND with roots (SP) (A-3)	0		Surface Elevation: +28.1+/-'
27	Grayish-brown Fine SAND with rock fragments (SP) (A-3)	1		
26	Gray Fine SAND (SP) (A-3) Grayish-brown Fine SAND (SP) (A-3)	2		
25	Dark gray Fine SAND (SP) (A-3)	3		
24	Gray Fine SAND (SP) (A-3)	4		
23	Dark brown slightly silty Fine SAND (SP-SM) (A-3) Dark brown Fine SAND (SP) (A-3)	5		
22	Light brown Fine SAND (SP) (A-3)	6		
21		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: See "Note"	**DATE:** 4/12/23
TECHNICIAN: K.A.		**DATE:** 4/12/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C		**TEST NUMBER:** RA-11	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	Dark grayish-brown Fine SAND with roots and rock fragments (SP) (A-3)	0		Surface Elevation: +26.7+/-'
26	Grayish-brown slightly silty Fine SAND with rock fragments (SP-SM) (A-3)	1		
25	Gray Fine SAND (SP) (A-3)	2		
	Light brown Fine SAND (SP) (A-3)			
24	Grayish-brown Fine SAND (SP) (A-3)	3		
23		4		
22		5		
21	Light grayish-brown Fine SAND (SP) (A-3)	6		Note: Water Table not encountered within depth of 6.0'.
20		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

ASPHALT CORE/HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: 5.7'	**DATE:** 4/11/23
TECHNICIAN: S.F./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-A		**TEST NUMBER:** C-1	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
26	7-1/2" Asphalt Pavement	0		Surface Elevation: +26.1+/-'
	7-1/2" Cream Colored Limerock Base	1		
25	Light brown slightly silty Fine SAND with shell (SP-SM) (A-3)			
	Dark gray Fine SAND with trace of roots (SP) (A-3)	2		
24	Gray Fine SAND (SP) (A-3)			
23		3		
	Dark grayish-brown slightly organic, clayey Fine SAND (SC) (A-2-6)	4		
22	Orangish-brown silty, slightly clayey Fine SAND (SM) (A-2-4)			
	Orangish-brown weakly cemented, slightly silty Fine SAND with trace of shell (SP-SM) (A-3)	5		
21	Tan silty, slightly clayey Fine SAND with shell fragments (SM) (A-2-4)			
	Light gray silty Fine SAND with shell (SM) (A-2-4)	6		
20				
		7		
19				

DRIGGERS ENGINEERING SERVICES INCORPORATED

ASPHALT CORE/HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: See "Note"	**DATE:** 4/11/23
TECHNICIAN: S.F./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-A		**TEST NUMBER:** C-2	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	6" Asphalt Pavement	0		Surface Elevation: +26.3+/-'
26				
	6" Cream Colored Limerock Base			
		1		
	Brown Fine SAND with shell and pockets of CLAY (SP/SC) (A-3/A-7-6)			
25				
	Dark gray Fine SAND (SP) (A-3)			
	Gray Fine SAND (SP) (A-3)	2		
24				
	Brown Fine SAND (SP) (A-3)	3		
	Light brown Fine SAND (SP) (A-3)			
23	Tan Fine SAND (SP) (A-3)			
		4		
22				
		5		
	Light orangish-brown silty Fine SAND (SM) (A-2-4)			
21				
		6		Note: Water Table not encountered within depth of 6.0'.
20				
		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

ASPHALT CORE/HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: See "Note"	**DATE:** 4/11/23
TECHNICIAN: S.F./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** C-3	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	6-1/8" Asphalt Pavement	0		Surface Elevation: +25.4+/-'
25				
	5-7/8" Cream Colored Limerock Base			
		1		
	Brown and light brown Fine SAND with shell and trace of clayey Fine SAND pockets (SP) (A-3)			
24				
	Dark grayish-brown slightly silty Fine SAND with trace of CLAY pockets (SP-SM) (A-3)			
		2		
	Light brown Fine SAND (SP) (A-3)			
23				
	Dark grayish-brown slightly silty Fine SAND (SP-SM) (A-3)			
		3		
22	Dark gray slightly organic, slightly silty Fine SAND (SP-SM) (A-3)			
		4		
	Dark gray and brown slightly silty Fine SAND (SP-SM) (A-3)			
21				
		5		
	Grayish-brown Fine SAND (SP) (A-3)			
20	Light brown Fine SAND (SP) (A-3)			
		6		Note: Water Table not encountered within depth of 6.0'.
19				
		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

ASPHALT CORE/HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: See "Note"	**DATE:** 4/11/23
TECHNICIAN: S.F./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B		**TEST NUMBER:** C-4	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
27	6-7/8" Asphalt Pavement	0		Surface Elevation: +27.3+/-'
	5-1/8" Cream Colored Limerock Base	1		
26	Brown slightly silty Fine SAND with shell (SP-SM) (A-3)			
	Gray Fine SAND (SP) (A-3)	2		
25				
		3		
24	Brown Fine SAND (SP) (A-3)			
		4		
23	Light brown Fine SAND (SP) (A-3)			
		5		
22				
	Light grayish-brown silty, slightly clayey Fine SAND (SM) (A-2-4)	6		Note: Water Table not encountered within depth of 6.0'.
21				
		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

ASPHALT CORE/HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: See "Note"	**DATE:** 4/11/23
TECHNICIAN: S.F./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C		**TEST NUMBER:** C-5	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
	2-3/8" Asphalt Pavement	0		Surface Elevation: +27.9+/-'
	Tan slightly silty Fine SAND with shell (SP-SM) (A-3)			
27	Brown Fine SAND with shell fragments (SP) (A-3)	1		
26		2		
	Dark grayish-brown Fine SAND with trace of shell fragments (SP) (A-3)			
25		3		
24		4		
	Tan Fine SAND (SP) (A-3)			
23		5		
	Light grayish-brown and orange silty, slightly clayey Fine SAND (SM) (A-2-4)			
22		6		Note: Water Table not encountered within depth of 6.0'.
21		7		

DRIGGERS ENGINEERING SERVICES INCORPORATED

ASPHALT CORE/HAND AUGER BORING LOG

PROJECT: Moccasin Wallow Road - Segment 3 Manatee County, Florida Project No.: DES 208603		**CLIENT:** Stantec Consulting Services, Inc.	
		WATER TABLE: See "Note"	**DATE:** 4/11/23
TECHNICIAN: S.F./G.F.		**DATE:** 4/11/23	**COMPLETION DEPTH:** 5.5' *
LOCATION: See Plate I-C		**TEST NUMBER:** C-6	

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	REMARKS
29	2-7/8" Asphalt Pavement	0		Surface Elevation: +29.1+/-'
	Light brown slightly silty Fine SAND with shell (SP-SM) (A-3)			
28	Brown slightly silty Fine SAND with shell (SP-SM) (A-3)	1		
27		2		
	Brown Fine SAND with trace of shell and pockets of clayey Fine SAND (SP/SC) (A-3/A-2-6)			
26		3		
25	Grayish-brown silty Fine SAND with trace of shell and trace of clayey Fine SAND pockets (SM) (A-2-4)	4		
	Grayish-brown clayey Fine SAND (SC) (A-2-6)			
24		5		
	Brown Fine SAND with trace of Asphalt Millings (SP) (A-3)			
23		6		* Could not penetrate below depth 5.5' due to Asphalt Millings. Note: Water Table not encountered within depth of 5.5'.
22		7		

SUMMARY OF LABORATORY TESTING RESULTS

SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	DEPTH (ft)	DESCRIPTION	W %	Y_d (pcf)	G_s	ATTERBERG LIMITS			P.P. (tsf)	U.C.	CON.	G.S.	ORG. (%)	pH	Cl. (ppm)	SO_4 (ppm)	RES. (ohm-cm)
						LL	PL	PI									
RA-2	0.3-2.2	Dark gray Fine SAND with finely divided organic material											1.7				
RA-2	3.0-3.4	Dark brown Fine SAND with finely divided organic material											1.7				
RA-4	1.7-2.8	Dark brown silty Fine SAND with finely divided organic material											2.5				
C-1	3.2-4.0	Dark grayish-brown slightly organic, clayey Fine SAND										** 28.0	4.4				
C-3	3.2-4.0	Dark gray slightly organic, slightly silty Fine SAND											4.8				

W % = Water Content
Y_d (pcf) = Dry Density
G_S = Specific Gravity
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
P.P. (tsf) = Pocket Penetrometer
U.C. = Unconfined Compression
Con. = Consolidation Test
G.S. (+1) = Grainsize Analysis (Hydrometer)
ORG. (%) = Organic Content
Cl. (ppm) = Total Chloride
SO_4 (ppm) = Total Sulfate
RES. (ohm-cm) = Lab Resistivity
* = See Test Curves
** = Percent Passing No. 200 Sieve

CLIENT: Stantec Consulting Services, Inc.

PROJECT: Moccasin Wallow Road – Segment 3, Manatee County, Florida

FILE: DES 208603

METHOD OF TESTING

STANDARD PENETRATION TEST
AND
SOIL CLASSIFICATION

STANDARD PENETRATION TEST (ASTM D-1586)

In the Standard Penetration Test borings, a rotary drilling rig is used to advance the borehole to the desired test depth. A viscous drilling fluid is circulated through the drill rods and bit to stabilize the borehole and to assist in removal of soil and rock cuttings up and out of the borehole.

Upon reaching the desired test depth, the 2-inch O.D. split-barrel sampler or "split-spoon", as it is sometimes called, is attached to an N-size drill rod and lowered to the bottom of the borehole. A 140-pound hammer, attached to the drill string at the ground surface, is then used to drive the sampler into the formation. The hammer is successively raised and dropped for a distance of 30 inches using a rope and "cathead" assembly. The number of blows is recorded for each 6-inch interval of penetration or until virtual refusal is achieved. In the above manner, the samples are ideally advanced a total of 18 inches. The sum of the blows required to effect the final 12 inches of penetration is called the blow count, penetration resistance or "N" value of the particular material at the sample depth.

After penetration, the rods and sampler are retracted to the ground surface where the core sample is removed, sealed in a glass jar and transported to the laboratory for verification of field classification and storage.

SOIL SYMBOLS AND CLASSIFICATION

Soil and rock samples secured in the field sampling operation were visually classified as to texture, color and consistency. The Unified Soil Classification was assigned to each soil stratum per ASTM D-2487. Soil classifications are presented descriptively and symbolically for ease of interpretation. The stratum identification lines represent the approximate boundary between soil types. In many cases, this transition may be gradual.

Consistency of the soil as to relative density or undrained shear strength, unless otherwise noted, is based upon Standard Penetration resistance values of "N" values and industry-accepted standards. "N" values, or blow counts, are presented in both tabular and graphical form on each respective boring log at each sample interval. The graphical plot of blow count versus depth is for illustration purposes only and does not warrant continuity in soil consistency or linear variation between sample intervals.

The borings represent subsurface conditions at respective boring locations and sample intervals only. Variations in subsurface conditions may occur between boring locations. Groundwater depths shown represent water depths at the dates and time shown only. The absence of water table information does not necessarily imply that groundwater was not encountered.