



US 301 (SR 35) PD&E Study

CR 470 E to State Road 44 in Sumter County, FL

Preliminary Geotechnical Soil Survey

FDOT Office

District Five

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1.0 Project Description

FDOT is conducting a Project Development and Environment (PD&E) study for an approximately 8.0 mile portion of US 301 between CR 470 East and SR 44 in Sumter County. Within these limits, US 301 (SR 35) travels through the cities of Coleman and Wildwood. While mostly a north-south route, US 301 travels in an east-west direction through the City of Coleman where it has the local road name Warm Springs Avenue. The Florida's Turnpike (SR 91) crosses US 301 with an interchange to the south of the northern project limit, and I-75 runs parallel to the study corridor on the west of US 301 through Sumter County.

The PD&E study will analyze design alternatives that widen US 301; improve the US 301 interchange at Florida's Turnpike; and consider a new corridor for US 301 south of the City of Coleman. The improvements will seek to provide additional capacity for future traffic growth. US 301 is projected to carry more than 14,000 vehicles per day by 2022 and increase to more than 24,000 per day by 2042. Based on existing 2014 conditions analysis, US 301 carried up to 9,600 vehicles per day on a 2-lane segment south of the Turnpike operating with a Level of Service of D.

Within the project limits, US 301 begins as a two-lane undivided roadway at CR 470 East with turn lanes at some intersections; makes a sharp 90° turn through the City of Coleman (Warm Springs Avenue/Commercial Street) and then curves to the north at CR 468. It then continues north as an undivided roadway until it reaches the Florida's Turnpike interchange where a median is added. North of the interchange the roadway is a four-lane divided, rural typical section facility. It has a short urban curb and gutter section approaching SR 44.

The purpose of this project is to increase the capacity of US 301 to respond to future travel demand from the intersection of CR 470 East, north through the City of Coleman, to SR 44 in the City of Wildwood. The project will also improve safety and provide multi-modal facilities for pedestrian and bicyclists, and evaluate improvements to the US 301 interchange with the Florida's Turnpike.

This study will evaluate all viable alternatives to widen US 301 on the existing project corridor as well as a potential realignment for US 301 from near CR 525 to CR 468 to minimize potential environmental impacts to the City of Coleman. Figure 1-1 shows the study corridor and potential realignment (truck route) area.

Figure 1-1 | Project Location Map



2.0 Scope of Services

The purpose of the geotechnical portion of the PD&E study is to obtain information on the existing subsurface conditions along the project alignment to assist in the preparation of the PD&E Report for the project. The following services were provided to achieve the preceding objective:

- Reviewed published soils information. This published information was obtained from the Web Soil Survey of Sumter County, Florida published by the United States Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS).
- Conducted a visual reconnaissance of the project site and located and coordinated utility clearance.
- Performed a geotechnical field study to evaluate the existing subsurface conditions along the roadway alignment consisting of borings, subsurface sampling and field-testing. We performed hand auger and Standard Penetration Test (SPT) borings advanced to depths ranging from approximately 2 to 12 feet below the existing ground surface along the roadway alignment and along the potential realignment alternative.
- Performed a geotechnical field study for the preferred pond site locations consisting of borings, subsurface sampling and field-testing. We performed SPT borings within or near the preliminary pond site locations to depths ranging from 20 to 35 feet below the existing ground surface.
- Performed a field permeability tests within or near the proposed pond site alternative 1B.
- Visually classified and stratified the recovered soil samples in the laboratory. Performed laboratory tests on selected representative samples to develop the soil legend for the project in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Soil Classification System.
- Prepared this Preliminary Soil Survey Study for the project.

3.0 Subsurface Conditions

3.1 Sumter County Soil Survey

Based on a review of the Sumter County Soil Survey published by USDA-NRCS, it appears that there are twenty-nine (29) soil-mapping units noted within the project limits. A detailed soil survey map is shown on the USDA Vicinity Map Sheet in the attachments. The general soil descriptions are presented in the sub-sections below, as described in the Web Soil Survey.

3.1.1 Candler sand, 0 to 5 percent slopes (Unit 4)

The Candler component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material

consists of eolian deposits and/or sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches.

3.1.2 Paisley fine sand, bouldery subsurface (Unit 9)

The Paisley component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of clayey marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, and November.

3.1.3 Millhopper sand, 0 to 5 percent slopes (Unit 11)

The Millhopper component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, and September.

3.1.4 Tavares fine sand, 0 to 5 percent slopes (Unit 13)

The Tavares component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November, and December.

3.1.5 Adamsville fine sand, bouldery subsurface (Unit 15)

The Adamsville, bouldery subsurface component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains, flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during June, July, August, September, October, and November.

3.1.6 Sumterville-Mabel-Tavares association, bouldery subsurface, 0 to 5 percent slopes (Unit 17)

The Sumterville, bouldery subsurface component makes up 55 percent of the map unit. Slopes are 0 to 5 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of sandy and clayey marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during June, July, August, and September.

The Mabel, bouldery subsurface component makes up 25 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy, loamy, and clayey marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, and September.

The Tavares, bouldery subsurface component makes up 15 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September.

3.1.7 EauGallie fine sand, bouldery subsurface (Unit 21)

The EauGallie, non-hydric component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September.

The EauGallie, hydric component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, and September.

3.1.8 Ona fine sand (Unit 23)

The Ona, non-hydric component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September.

The Ona, hydric component makes up 25 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, and September.

3.1.9 Vero fine sand, bouldery subsurface (Unit 26)

The Vero, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and

loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September.

The Vero, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September.

3.1.10 Sumterville fine sand, bouldery subsurface, 0 to 5 percent slopes (Unit 27)

The Sumterville, bouldery subsurface component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy and clayey marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during July, August, September, and October.

3.1.11 Nittaw muck, frequently flooded (Unit 29)

The Nittaw component makes up 80 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of clayey marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, and November.

3.1.12 Placid fine sand, depressional (Unit 30)

The Placid component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains, depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, November, and December.

3.1.13 Pompano fine sand (Unit 32)

The Pompano component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains, drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, and November.

3.1.14 Sparr fine sand, bouldery subsurface, 0 to 5 percent slopes (Unit 33)

The Sparr, bouldery subsurface component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, and September.

3.1.15 Tarrytown sandy clay loam, bouldery subsurface (Unit 34)

The Tarrytown, bouldery subsurface component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during July, August, and September.

3.1.16 Floridana mucky fine sand, depressional (Unit 36)

The Floridana, depressional component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, June, July, August, September, October, November, and December.

3.1.17 Millhopper sand, bouldery subsurface, 0 to 5 percent slopes (Unit 40)

The Millhopper, bouldery subsurface component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during July, August, September, and October.

3.1.18 Adamsville fine sand (Unit 42)

The Adamsville component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains, rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during June, July, August, September, October, and November.

3.1.19 Basinger fine sand, depressional (Unit 43)

The Basinger component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is

not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, June, July, August, September, October, November, and December.

3.1.20 Oldsmar fine sand, bouldery subsurface (Unit 44)

The Oldsmar, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, and August.

The Oldsmar, hydric component makes up 15 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during July, and August.

3.1.21 Ft. Green fine sand, bouldery subsurface (Unit 46)

The Ft. Green, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 3 percent. This component is on rises on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September.

The Ft. Green, hydric component makes up 15 percent of the map unit. Slopes are 0 to 3 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, and September.

3.1.22 Okeelanta muck, frequently flooded (Unit 47)

The Okeelanta component makes up 75 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on flood plains on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, June, July, August, September, October, November, and December.

3.1.23 Terra Ceia muck, frequently flooded (Unit 49)

The Terra Ceia component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on flood plains on marine terraces on coastal plains. The parent material consists of herbaceous

organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, June, July, August, September, October, November, and December.

3.1.24 Tavares fine sand, bouldery subsurface, 0 to 5 percent slopes (Unit 53)

The Tavares, bouldery subsurface component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, November, and December.

3.1.25 Montechoa fine sand, depressional (Unit 54)

The Montechoa component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, June, July, August, September, October, November, and December.

3.1.26 Vero fine sand, depressional (Unit 56)

The Vero component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, June, July, August, September, October, November, and December.

3.1.27 Candler sand, bouldery subsurface, 0 to 5 percent slopes (Unit 65)

The Candler, bouldery subsurface component makes up 80 percent of the map unit. Slopes are 0 to 5 percent. This component is on knolls on marine terraces on coastal plains, ridges on marine terraces on coastal plains. The parent material consists of eolian deposits and/or sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches.

3.1.28 Dump-Pits Complex (Unit 51) and Urban Land (Unit 62)

Soil and groundwater properties have not been provided within the USDA-NRCS Soil Survey. The dump-pits complex consists of land which soil material and limestone or shell has been removed and consists of dumps where excess and/or spoil material has been piled. Urban land is a miscellaneous area where the original soil has been modified for urban development.

3.2 General Soil Properties

Additional information regarding the soils and groundwater conditions for the above soil mapping units was obtained from the Sumter County Soil Survey published by USDA-NRCS and the Web Soil Survey and is presented in **Tables 3-1 and 3-2** as follows:

Table 3-1 | Sumter County USDA NRCS Soil Survey Hydrologic Information

Map No.	Soil Name	Hydrologic Soil Group	Depth to High Water Table (ft)	Typical Soil Types (Profile from Ground Surface to depth of approximately 80 inches)
4	Candler sand, 0 to 5 percent slopes	A	> 6	Sand
9	Paisley fine sand, bouldery subsurface	D	0.0 – 1.0	Sand to Sandy Clay Loam to Sandy Clay to Clay
11	Millhopper sand, 0 to 5 percent slopes	A	3.5 – 6.0	Sand to Sandy Loam to Sandy Clay Loam
13	Tavares fine sand, 0 to 5 percent slopes	A	3.5 – 6.0	Sand
15	Adamsville fine sand, bouldery subsurface	C	2.0 – 3.5	Sand
17	Sumterville-Mabel-Tavares association, bouldery subsurface, 0 to 5 percent slopes	C	1.5 – 3.0	Sand to Clay to Sandy Clay
		C	1.5 – 3.0	Sand to Sandy Clay Loam to Sandy Clay to Clay Loam
		A	3.5 – 6.0	Sand
21	EauGallie fine sand, bouldery subsurface	B/D	0.0 – 1.0	Sand to Sandy Loam to Sandy Clay Loam
23	Ona fine sand	B/D	0.0 – 1.0	Sand
26	Vero fine sand, bouldery subsurface	B/D	0.0 – 1.0	Sand to Loamy Sand to Sandy Clay Loam to Sandy Clay
27	Sumterville fine sand, bouldery subsurface, 0 to 5 percent slopes	C	1.5 – 3.0	Sand to Clay to Sandy Clay
29	Nittaw muck, frequently flooded	D	0.0 – 1.0	Muck to Mucky Sand to Sand to Clay to Sandy Clay to Sandy Loam

Table 3-1 (Continued) | Sumter County USDA NRCS Soil Survey Hydrologic Information

Map No.	Soil Name	Hydrologic Soil Group	Depth to High Water Table (ft)	Typical Soil Types (Profile from Ground Surface to depth of approximately 80 inches)
30	Placid fine sand, depressional	D	+2.0 – 1.0	Sand to Loamy Sand
32	Pompano fine sand	B/D	0.0 – 1.0	Sand
33	Sparr fine sand, bouldery subsurface, 0 to 5 percent slopes	C	1.5 – 3.5	Sand to Sandy Loam to Sandy Clay Loam to Sandy Clay
34	Tarrytown sandy clay loam, bouldery subsurface	C	1.5 – 2.5	Sandy Clay Loam to Sandy Loam to Clay Loam to Sand
36	Floridana mucky fine sand, depressional	D	+2.0 – 1.0	Mucky Sand to Sandy Loam to Sandy Clay Loam
40	Millhopper sand, bouldery subsurface, 0 to 5 percent slopes	A	3.5 – 6.0	Sand to Sandy Loam to Sandy Clay Loam
42	Adamsville fine sand	C	2.0 – 3.5	Sand
43	Basinger fine sand, depressional	D	+2.0 – 1.0	Sand
44	Oldsmar fine sand, bouldery subsurface	B/D	0.0 – 1.0	Sand to Loamy Sand to Sandy Loam to Sandy Clay Loam
46	Ft. Green fine sand, bouldery subsurface	D	0.0 – 1.0	Sand to Sandy Clay Loam to Sandy Loam to Sandy Clay
47	Okeelanta muck, frequently flooded	D	0.0 – 1.0	Muck to Sand to Loamy Sand
49	Terra Ceia muck, frequently flooded	D	0.0 – 1.0	Muck
53	Tavares fine sand, bouldery subsurface, 0 to 5 percent slopes	A	3.5 – 6.0	Sand
54	Monteocha fine sand, depressional	D	+2.0 – 0.0	Sand to Sandy Loam to Sandy Clay Loam
56	Vero fine sand, depressional	D	+1.0 – 1.0	Sand to Loamy Sand to Sandy Clay Loam to Sandy Loam
65	Candler sand, bouldery subsurface, 0 to 5 percent slopes	A	0.0 – 1.0	Sand
51/62	Dump-Pits Complex/ Urban Land	No Estimates Provided by USDA-NRCS		

Table 3-2 | Sumter County USDA NRCS Soil Survey Information

Map No.	Soil Name	Soil Classification			Permeability (in/hr)
		Depth (in)	USCS	AASHTO	
4	Candler sand, 0 to 5 percent slopes	0-8	SP, SP-SM	A-3	6.0-20.0
		8-50	SP, SP-SM	A-3	6.0-20.0
		50-80	SP-SM	A-3, A-2-4	6.0-20.0
9	Paisley fine sand, bouldery subsurface	0-16	SP-SM, SM	A-3, A-2-4	2.0-20.0
		16-25	SC	A-6, A-7	0.06-2.0
		25-80	CL, CH	A-7	0.06-2.0
11	Millhopper sand, 0 to 5 percent slopes	0-50	SP-SM, SM	A-3, A-2-4	6.0-20.0
		50-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-2.0
13	Tavares fine sand, 0 to 5 percent slopes	0-8	SP, SP-SM	A-3	>6.0
		8-80	SP, SP-SM	A-3	>6.0
15	Adamsville fine sand, bouldery subsurface	0-5	SP-SM	A-3, A-2-4	6.0-20.0
		5-80	SP, SP-SM	A-3, A-2-4	6.0-20.0
17	Sumterville-Mabel- Tavares association, bouldery subsurface, 0 to 5 percent slopes	0-7	SP-SM, SM	A-3, A-2-4	6.0-20.0
		7-25	SP-SM, SM	A-3, A-2-4	6.0-20.0
		25-80	CL, CH	A-7	0.06-0.2
		0-6	SP, SP-SM, SM	A-3, A-2-4	2.0-20.0
		6-14	SC, CL, CH	A-2, A-6, A-7	0.06-0.2
		14-52	CH, MH	A-7	0.06-0.2
		52-80	SC, CL, CH	A-6, A-7	0.06-0.2
		0-8	SP, SP-SM	A-3	>6.0
21	EauGallie fine sand, bouldery subsurface	0-8	SP	A-3	6.0-20.0
		8-25	SP	A-3	6.0-20.0
		25-36	SP-SM, SM	A-3, A-2-4	0.6-6.0
		36-57	SP, SP-SM	A-3, A-2-4	6.0-20.0
		57-80	SM, SM-SC, SC	A-2-4, A-2-6	0.2-0.6
23	Ona fine sand	0-9	SP, SP-SM	A-3	6.0-20.0
		9-20	SP-SM, SM	A-3, A-2-4	0.6-2.0
		20-80	SP, SP-SM	A-3	6.0-20.0
26	Vero fine sand, bouldery subsurface	0-4	SP-SM	A-3, A-2-4	6.0-20.0
		4-15	SP-SM	A-3, A-2-4	6.0-20.0
		15-21	SP-SM, SM	A-3, A-2-4	0.6-2.0
		21-60	SC, CL, CH	A-2-6, A-2-7, A-6, A-7	0.2-2.0
		60-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.2-2.0
27	Sumterville fine sand, bouldery subsurface, 0 to 5 percent slopes	0-9	SP-SM, SM	A-3, A-2-4	6.0-20.0
		9-29	SP-SM, SM	A-3, A-2-4	6.0-20.0
		29-80	CL, CH	A-7	0.06-0.2

Table 3-2 (Continued) | Sumter County USDA NRCS Soil Survey Information

Map No.	Soil Name	Soil Classification			Permeability (in/hr)
		Depth (in)	USCS	AASHTO	
29	Nittaw muck, frequently flooded	0-5	PT	A-8	6.0-20.0
		5-12	SP-SM, SM	A-3, A-2-4	6.0-20.0
		12-65	CL, CH	A-7	0.06-0.2
		65-80	SP, SP-SM, SM, SM-SC	A-3, A-2-4	6.0-20.0
30	Placid fine sand, depressional	0-80	SP, SP-SM, SM	A-3, A-2-4	6.0-20.0
32	Pompano fine sand	0-80	SP, SP-SM	A-3, A-2-4	6.0-20.0
33	Sparr fine sand, bouldery subsurface, 0 to 5 percent slopes	0-8	SP-SM	A-3, A-2-4	6.0-20.0
		8-46	SP-SM	A-3, A-2-4	6.0-20.0
		46-58	SM, SM-SC, SC	A-2-4	0.6-2.0
		58-80	SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-0.6
34	Tarrytown sandy clay loam, bouldery subsurface	0-7	SM	A-2-4	0.6-2.0
		7-14	SC, CL, CH	A-4, A-6, A-7	0.6-2.0
		14-50	SM-SC, SC, CL-ML, CL	A-4	0.06-0.2
		50-80	SP, SP-SM	A-3, A-2-4	6.0-20.0
36	Floridana mucky fine sand, depressional	0-12	SP-SM, SM	A-3, A-2-4	6.0-20.0
		12-25	SP, SP-SM	A-3	6.0-20.0
		25-80	SM-SC, SC	A-2-4, A-2-6	<0.2
40	Millhopper sand, bouldery subsurface, 0 to 5 percent slopes	0-7	SP-SM	A-3, A-2-4	6.0-20.0
		7-45	SP-SM	A-3, A-2-4	6.0-20.0
		45-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-2.0
42	Adamsville fine sand	0-8	SP-SM	A-3, A-2-4	6.0-20.0
		8-80	SP, SP-SM	A-3, A-2-4	6.0-20.0
43	Basinger fine sand, depressional	0-6	SP	A-3	6.0-20.0
		6-15	SP, SP-SM	A-3, A-2-4	6.0-20.0
		15-30	SP, SP-SM	A-3, A-2-4	6.0-20.0
		30-80	SP, SP-SM	A-3, A-2-4	6.0-20.0
44	Oldsmar fine sand, bouldery subsurface	0-31	SP, SP-SM	A-3	6.0-20.0
		31-48	SP-SM, SM	A-3, A-2-4	0.2-6.0
		48-80	SM-SC, SC	A-2, A-4, A-6, A-7	<0.2
46	Ft. Green fine sand, bouldery subsurface	0-28	SP-SM, SM	A-3, A-2-4	6.0-20.0
		28-38	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-0.6
		38-58	SC	A-2-6, A-4, A-6, A-7-6	0.06-0.6
		58-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-0.6

Table 3-2 (Continued) | Sumter County USDA NRCS Soil Survey Information

Map No.	Soil Name	Soil Classification			Permeability (in/hr)
		Depth (in)	USCS	AASHTO	
47	Okeelanta muck, frequently flooded	0-19	PT	A-8	6.0-20.0
		19-80	SP, SP-SM, SM	A-3, A-2-4	6.0-20.0
49	Terra Ceia muck, frequently flooded	0-80	PT	A-8	6.0-20.0
51	Dumps-Pits complex ⁽¹⁾	---	---	---	---
53	Tavares fine sand, bouldery subsurface, 0 to 5 percent slopes	0-7	SP, SP-SM	A-3	>6.0
		7-80	SP, SP-SM	A-3	>6.0
54	Monteocha fine sand, depressional	0-11	SP-SM, SM	A-3, A-2-4	6.0-20.0
		11-65	SP, SP-SM, SM	A-3, A-2-4	2.0-20.0
		65-80	SM, SM-SC, SC	A-2-4, A-2-6	0.2-2.0
56	Vero fine sand, depressional	0-17	SP-SM, SM	A-3, A-2-4	6.0-20.0
		17-33	SM	A-2-4	6.0-20.0
		33-60	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-0.6
		60-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0.06-0.6
62	Urban land ⁽¹⁾	---	---	---	---
65	Candler sand, bouldery subsurface, 0 to 5 percent slopes	0-3	SP, SP-SM	A-3	6.0-20.0
		3-65	SP, SP-SM	A-3	6.0-20.0
		65-80	SP-SM	A-3, A-2-4	6.0-20.0

⁽¹⁾ No Soil and groundwater properties were provided by the USDA. Soil unit consists of pits from which soil material and/or limestone or shell has been or is being removed and consists of dumps where these materials have been piled, and miscellaneous areas where natural soil has been modified for urban development.

3.3 Groundwater Conditions

According to the USDA-NRSC Soil Survey, much of the project corridor consists of poorly to very poorly drained soils. The seasonal high groundwater table is at or near the ground surface throughout much of the corridor.

Along most of the project corridor, the Seasonal High Groundwater Table (SHGWT) levels in their natural condition are estimated to range between above the natural ground surface to within 3½ feet of the natural ground surface.

4.0 Preliminary Subsurface Exploration

4.1 Roadway Borings

To evaluate the subsurface conditions and groundwater table levels along the proposed project limits, hand auger and Standard Penetration Test (SPT) borings were advanced to depths ranging from approximately 2 to 12 feet below the existing ground surface along the project corridor. It should be noted that boring AB-19 was advanced to a depth of approximately 2.0 feet due to the presence of shallow limestone/caprock.

The hand auger borings were performed by manually twisting and advancing a bucket auger into the ground, typically in 4 to 6 inch increments. The SPT borings were performed using a drill rig with bentonite mud drilling procedures. The soil sampling for the SPT borings were performed in general accordance with the American Society for Testing and Materials (ASTM) test designation D-1586. SPT resistance N-values were generally taken continuously to a depth of 10 feet and on intervals of 5 feet thereafter. As each soil type was revealed, representative samples were placed in air-tight containers and returned to our office for confirmation of the field classification by a geotechnical engineer.

The location of the augers and the SPT borings performed along the roadway alignments were determined using the recorded GPS coordinates obtained by Tierra in conjunction with the design files provided by HDR. The locations of these borings should be considered approximate. The ground surface elevations at the boring locations are referenced to the NAVD 1988 datum. The station and offset along with the soil profile of each boring performed are shown on the **Roadway Soil Profiles Sheet** in the **Appendix**.

4.2 Pond Borings

To evaluate the subsurface conditions and groundwater table levels within the preliminary pond site areas, Standard Penetration Test (SPT) borings were advanced to depths ranging from 20 to 35 feet below the existing ground surface within or near the preferred pond site alternative locations.

The SPT borings were performed using a drill rig with bentonite mud drilling procedures. The soil sampling was performed in general accordance with the American Society for Testing and Materials (ASTM) test designation D-1586. SPT resistance N-values were generally taken continuously to a depth of 10 feet and on intervals of 5 feet thereafter. As each soil type was revealed, representative samples were placed in air-tight containers and returned to our office for confirmation of the field classification by a geotechnical engineer.

The location of the SPT borings performed within or near the preliminary pond site locations were determined using the recorded GPS coordinates obtained by Tierra in conjunction with the design files provided by HDR. The locations of these borings should be considered approximate. The ground surface elevations at the boring locations are referenced to the NAVD 1988 datum. The station and offset along with the soil profile of each boring performed are shown on the **Pond Soil Survey Sheets** in the **Appendix**.

4.3 Field Hydraulic Conductivity Test

One (1) field hydraulic conductivity test was performed at the location of the preliminary pond site alternative 1B. The test was performed at approximately 3 feet below the ground surface. The test was performed and the results evaluated in accordance with the methodology presented in the latest FDOT Soils and Foundation Handbook. A summary of the hydraulic conductivity test result is presented in **Table 5** of the **Appendix**.

It is important to note that the results provided are the measured hydraulic conductivity rates of the in-situ soil conditions encountered at the time of our field activities. No factors of safety have been applied to these rates. The project drainage engineer should apply an appropriate factor of safety for design purposes.

5.0 Laboratory Testing

5.1 General

Representative soil samples collected from the borings performed along the project alignments were classified and stratified in general accordance with the American Association of State Highway and Transportation Officials (AASHTO) Soil Classification System. Our classification was based on visual observations, using the results from the laboratory testing as confirmation. These tests included grain-size analyses, Atterberg Limits, organic content and natural moisture content determination. In addition, environmental corrosion tests were performed on selected soil samples to evaluate the corrosive nature of the subsurface soils encountered.

5.2 Test Designation

The following list summarizes the laboratory tests performed by Tierra and the respective test methods utilized.

- Grain-Size Analyses - The grain-size analyses were conducted in general accordance with the AASHTO test designation T-088 (ASTM test designation D-422).
- Atterberg Limits - The liquid limit and the plastic limit tests ("Atterberg Limits") were conducted in general accordance with the AASHTO test designations T-089 and T-090, respectively (ASTM test designation D-4318).
- Natural Moisture Content - The moisture content tests were conducted in general accordance with the AASHTO test designation T-265 (ASTM test designation D-2216).
- Organic Content - The organic content tests were conducted in general accordance with the AASHTO test designation T-267 (ASTM test designation D-2974).
- Environmental Corrosion - The environmental corrosion tests were conducted in general accordance with the FDOT test designations FM 5-550, FM 5-551, FM 5-552 and FM 5-553.

A summary of the laboratory test results for each soil stratum encountered along the project alignment is presented on the **Roadway Soil Survey** sheet in the **Appendix**. This sheet includes ranges of laboratory test results for different stratum soil samples collected from borings performed along the project alignments. A detailed summary of the laboratory test results performed for this report is presented in **Tables 3 and 4** of the **Appendix**.

6.0 Results of Subsurface Exploration

6.1 General Soil Conditions

Specific information of each boring performed is provided on the **Roadway Soil Profiles** and **Pond Soil Survey** sheets in the **Appendix**.

The soil types encountered during this exploration have been assigned a stratum number. The stratum number and soil types associated with this project to date are provided below.

Stratum Number	Typical Soil Description	AASHTO Classification
1	Brown to Gray SAND to SAND with Silt	A-3
2	Brown to Gray Silty SAND	A-2-4
3	Gray-Brown Clayey SAND	A-2-6/A-2-7
4	Gray-Brown to Gray Sandy SILT to Sandy CLAY (LL<50)	A-4/A-6/A-7-5/A-7-6
5	Light Gray SAND to Silty SAND with Limestone Fragments	A-3/A-2-4
6	Light Gray Sandy SILT to Sandy CLAY with Limestone Fragments	A-4/A-6 A-7-5/A-7-6
7	Limestone/Caprock	--
8	Dark gray Organic Silty SAND to MUCK	A-8
9	Gray-Brown to Gray Sandy SILT to Sandy CLAY (LL>50)	A-4/A-6/A-7-5/A-7-6

A geotechnical engineer bases soil stratification on a visual review of the recovered samples, laboratory testing and interpretation of the field boring logs. The boring stratification lines represent the approximate boundaries between soil types of significantly different engineering properties; however, the actual transition may be gradual. In some cases, small variations in properties within the same boring not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The boring profiles represent the conditions at the particular boring location and variations do occur among the borings.

The results of the borings performed for this project along with the boring location plans are presented in the **Appendix** of this report.

6.2 Groundwater

The groundwater table was recorded, if encountered, at each of the boring locations during our field exploration. The depths to the groundwater table along the project alignment were found to range from approximately 6 inches below the existing ground surface to depths of 9.5 feet below the existing ground surface at the locations of the borings where the groundwater was encountered. The groundwater table measured at each of the boring locations is presented on the **Roadway Soil Profiles** and **Pond Soil Survey** sheets in the **Appendix**. The groundwater table was not encountered within the boring depths of some of the hand auger borings. GNE (groundwater not encountered) is indicated on the soil profiles of these borings.

If the groundwater table was not apparent within the SPT borings prior to the commencement of mud-rotary drilling, Groundwater Not Apparent (GNA) is indicated on the boring profiles on the **Pond Soil Survey Sheets** in the **Appendix**. The introduction of drilling mud prevents an accurate measurement of the groundwater table.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e., existing water management canals, swales, drainage ponds, underdrains, and areas of covered soils, such as paved parking lots and sidewalks).

6.3 Seasonal High Groundwater Estimates

Seasonal high groundwater table levels were estimated at the boring locations along the project alignment and within or near the preliminary pond site locations. The estimated seasonal high groundwater table depths at the borings range from at or above the existing ground surface to depths of 9.0 feet below the existing ground surface. A summary of these estimates is presented in **Tables 1** and **2** in the **Appendix**.

In general, the seasonal high groundwater table levels estimated along the project alignments and within or near the proposed pond site alternative locations were based on soil stratigraphy, measured groundwater levels from the borings, the USDA Soil Survey information for Sumter County, Florida, and surrounding topography. In areas where subsurface soil conditions were disturbed, normal indications such as “stain lines” were not evident.

7.0 Preliminary Engineering Evaluations

7.1 General

Based upon the USDA-NRCS Soil Survey for Sumter County, sandy soils to depths of 80 inches below the natural ground surface are reported along the majority of the project corridor with areas of organic soil, plastic soil and shallow rock. In general, these soils are suitable for supporting proposed roadway embankments after proper subgrade preparation and removal of unsuitable materials.

Areas along the project corridor where clay, organics, shallow rock and/or groundwater conditions may impact the project are detailed below.

7.1.1 Shallow Groundwater

The Seasonal High Groundwater Table (SHGWT) for the soil units is reported to range from about 2 feet above the predevelopment natural grade to depths greater than 6 feet below the predevelopment natural grade within the project limits. The estimated SHGWT at the boring locations ranges between the existing ground surface to depths of 9 feet below grade.

Roadway base to groundwater clearance will need to be evaluated to ensure minimum separation between the base and the SHGWT is maintained or to determine if additional measures are required (ie, blackbase, underdrains, etc.). In areas where the existing SHGWT is above grade, the SHGWT will have to be established by the project biologist utilizing biological indicators.

7.1.2 Near Surface Clayey Soils

Near-surface, plastic/clayey soils (A-2-6, A-4, A-6, and A-7) were noted from ground surface to within approximately 6.5 feet of the natural ground surface throughout the project corridor. The following soil mapping units noted plastic/clayey soils (A-2-6, A-4, A-6, and A-7) between a depth range of approximately 0 to 80 inches below natural grade:

- Paisley Fine Sand, bouldery subsurface (Unit 9)
- Millhopper Sand, 0 to 5 percent slopes (Unit 11)
- Sumterville-Mabel-Tavares Association, bouldery subsurface, 0 to 5 percent slopes (Unit 17)
- EauGallie Fine Sand, bouldery subsurface (Unit 21)
- Vero Fine Sand, bouldery subsurface (Unit 26)
- Sumterville Fine Sand, bouldery subsurface, 0 to 5 percent slopes (Unit 27)
- Nittaw Muck, frequently flooded (Unit 29)
- Sparr Fine Sand, bouldery subsurface, 0 to 5 percent slopes (Unit 33)
- Tarrytown Sandy Clay Loam, bouldery subsurface (Unit 34)
- Floridana Mucky Fine Sand, depressional (Unit 36)
- Millhopper Sand, bouldery subsurface, 0 to 5 percent slopes (Unit 40)
- Oldsmar Fine Sand, bouldery subsurface (Unit 44)
- Ft. Green Fine Sand, bouldery subsurface (Unit 46)
- Montechoa Fine Sand, depressional (Unit 54)
- Vero Fine Sand, depressional (Unit 56)

Plastic soils have limitations related to base clearance and are also poorly drained. Separation between plastic clayey soils and the roadway pavement sections should be in accordance with FDOT Standard Indices 500 and 505. As the project progresses beyond the PD&E stage, additional geotechnical services should be performed to determine the impact these materials will have to the proposed design.

7.1.3 Organic Soils

Organic/muck (A-8) soils were noted along the project alignment. The following soil mapping units noted organic/muck (A-8) soils between the ground surface to within approximately 6.5 feet of the ground surface:

- Nittaw Muck, frequently flooded (Unit 29)
- Okeelanta Muck, frequently flooded (Unit 47)
- Terra Ceia Muck, frequently flooded (Unit 49)

Organic/muck (A-8) soil, if encountered during construction, should be removed in accordance with FDOT Standard Index 500 and replaced with backfill in accordance with Index 505. As the project progresses beyond the PD&E phase, delineation of the reported organic soils will be required to determine the impact of the organic soils on the proposed design. Additional geotechnical services should be performed to identify the vertical and horizontal limits of the encountered organic soils within the project limits.

7.1.4 Shallow Rock/Cap Rock

Near surface boundary subsurface soils were noted within the upper 6.5 feet of natural ground surface throughout the project corridor. The following soil mapping units noted boundary subsurface soils:

- Paisley Fine Sand, boundary subsurface (Unit 9)
- Adamsville Fine Sand, boundary subsurface (Unit 15)
- Sumterville-Mabel-Tavares Association, bouldery subsurface, 0 to 5 percent slopes (Unit 17)
- EauGallie Fine Sand, bouldery subsurface (Unit 21)
- Vero Fine Sand, bouldery subsurface (Unit 26)
- Sumterville Fine Sand, bouldery subsurface, 0 to 5 percent slopes (Unit 27)
- Sparr Fine Sand, boundary subsurface, 0 to 5 percent slopes (Unit 33)
- Tarrytown Sandy Clay Loam, boundary subsurface (Unit 34)
- Millhopper Sand, boundary subsurface, 0 to 5 percent slopes (Unit 40)
- Oldsmar Fine Sand, boundary subsurface (Unit 44)
- Ft. Green Fine Sand, boundary subsurface (Unit 46)
- Tavares Fine Sand, boundary subsurface, 0 to 5 percent slopes (Unit 53)
- Candler Sand, boundary subsurface, 0 to 5 percent slopes (Unit 65)

These soil types consist of surface and subsurface boulders occurring randomly throughout the soil profiles. Excavations for utilities, ponds and foundations may be difficult and the Contractor should be prepared for such materials. Near surface limestone is known to be located within the project area. The presence or near surface limestone also creates a higher than normal probability of sinkhole formation during pond excavations.

7.2 Roadway Construction

Site preparation should consist of normal clearing and grubbing followed by compaction of subgrade soils. Subgrade preparation should include the removal of plastic soils, top-soils and organic soils in accordance with FDOT Design Standard Index 500. Backfill embankment materials should consist of materials conforming to FDOT Design Standard Index 505. Clearing and grubbing and compaction should be accomplished in accordance with the latest FDOT Standard Specifications.

The overall site preparation and mechanical densification work for the construction of the proposed roadway improvements should be in accordance with the FDOT Standard Specifications and Standard Index requirements. In general, the existing subsurface soils appear capable of supporting the construction of the proposed roadway improvements subject to the above geotechnical considerations and after proper subgrade preparation.

8.0 Limitations

Our professional services have been performed, our findings obtained and our preliminary evaluations prepared in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. Tierra is not responsible for the conclusions, opinions or recommendations made by others based on this data.

The scope of the geotechnical portion of the PD&E study is to provide information on the existing subsurface conditions along the project alignment based on a review of the Sumter County Soil Survey published by the USDA-NRCS and limited subsurface exploration to assist in the preparation of the PD&E Report for the project. The preliminary evaluations submitted in this report are based upon the data obtained from the published information and the limited subsurface exploration. Should subsoil variations become evident during the course of this project, a re-evaluation will be necessary after we have had an opportunity to observe the characteristics of the condition encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed roadway construction.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of HDR, Inc. and the FDOT.

Tierra appreciates the opportunity to be of service to HDR, Inc. on this project. If you have any questions or comments regarding this report, please contact our office at your earliest convenience.

Respectfully Submitted,

TIERRA, INC.



Luis A. Almodovar, E.I.
Geotechnical Engineer Intern



Jeremy A. Sewell, P.E.
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Appendix

Tables

Table 1 | Summary of Seasonal High Groundwater Table Estimates for Roadway

Table 2 | Summary of Seasonal High Groundwater Table Estimates for Ponds

Table 3 | Summary of Laboratory Test Results for Soil Classification

Table 4 | Summary of Laboratory Test Results for Environmental Classification

Table 5 | Summary of Hydraulic Conductivity Test Results

Figures

FIGURE 2 | USDA Soil Survey Map

FIGURE 3 | USGS Quadrangle Map

FIGURE 4 | Roadway Soil Survey Sheet

FIGURE 5 | Roadway Soil Profiles Sheet

FIGURES 6 to 20 | Pond Soil Survey Sheets

Table 1
Summary of Seasonal High Groundwater Table Estimates for Roadway
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPN: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Boring Location ⁽¹⁾ C/L Construction SR 35		Boring Depth ⁽²⁾ (feet)	Ground Surface Elevation NAVD88 ⁽¹⁾ (feet)	Measured GWT		Date Groundwater Table Recorded	USDA Soil Survey		Estimated SHGWT	
	Station (feet)	Offset (feet)			Depth Below Ground Surface (feet)	Elevation NAVD88 (feet)		Soil Map Unit	SHGWT Depth ⁽³⁾ (feet)	Depth Below Ground Surface (feet)	Elevation NAVD88 (feet)
AB-1	103+08	38 RT	10.0	66.2	GNE ⁽⁴⁾	< 56.2	09/30/2017	27	1.5-3.0	9.0	57.2
AB-2	126+54	51 RT	10.0	62.3	6.8	55.5	10/02/2017	40	3.0-6.0	6.0	56.3
AB-3	151+58	16 LT	6.5	49.3	3.9	45.4	10/02/2017	9	0.0-1.0	3.0	46.3
AB-4	176+82	92 RT	10.0	59.9	7.8	52.1	10/02/2017	4	> 6.0	6.0	53.9
AB-5	201+21	10 LT	5.0	54.8	0.9	53.9	10/02/2017	43	+2.0-1.0	0.0	54.8
AB-15	221+40	1030 LT	5.0	60.0	4.1	55.9	10/03/2017	33	1.5-3.0	3.5	56.5
AB-16	222+19	504 LT	5.0	59.9	3.5	56.4	10/03/2017	33	1.5-3.0	3.0	56.9
AB-6	222+56	492 LT	5.5	59.0	2.3	56.7	10/03/2017	33	1.5-3.0	1.5	57.5
AB-17	223+97	102 LT	5.0	57.7	0.5	57.2	10/03/2017	9	0.0-1.0	0.0	57.7
AB-18	229+66	66 LT	5.0	56.8	2.3	54.5	10/03/2017	34	1.5-2.5	1.5	55.3
AB-19	234+81	2 RT	2.0	57.7	GNE ⁽⁴⁾	< 55.7	10/03/2017	9	0.0-1.0	1.5	56.2
AB-20	240+49	31 LT	5.0	57.1	3.5	53.6	10/06/2017	34	1.5-2.5	1.5	55.6
AB-21	245+74	12 LT	5.0	55.1	1.6	53.5	10/06/2017	34	1.5-2.5	0.0	55.1
AB-22	250+92	35 LT	5.0	56.2	2.4	53.8	10/06/2017	34	1.5-2.5	0.5	55.7
AB-23	257+58	5 LT	5.0	56.5	2.8	53.7	10/06/2017	34	1.5-2.5	1.5	55.0
AB-24	261+84	31 LT	10.0	57.3	3.5	53.8	11/07/2017	34	1.5-2.5	0.0	57.3
AB-25	267+30	4 RT	10.0	57.5	4.4	53.1	10/10/2017	34	1.5-2.5	0.5	57.0
AB-26	272+37	38 LT	10.0	57.3	2.5	54.8	10/10/2017	34	1.5-2.5	0.5	56.8
AB-27	276+38	75 RT	10.0	58.0	3.5	54.5	10/10/2017	34	1.5-2.5	1.5	56.5
AB-28	282+69	44 LT	10.0	57.6	1.3	56.3	11/07/2017	27	1.5-3.0	1.0	56.6
AB-29	287+90	41 LT	5.0	64.1	GNE ⁽⁴⁾	< 59.1	10/05/2017	33	1.5-3.0	2.5	61.6
AB-30	292+68	9 LT	5.0	64.8	GNE ⁽⁴⁾	< 59.8	10/05/2017	27	1.5-3.0	3.5	61.3
AB-31	297+62	15 LT	10.0	62.5	4.9	57.6	09/29/2017	27	1.5-3.0	1.5	61.0
AB-7	300+96	571 LT	5.0	61.8	1.5	60.3	10/03/2017	21	0.0-1.0	0.5	61.3
AB-32	302+99	29 LT	10.0	61.8	8.0	53.8	09/29/2017	27	1.5-3.0	2.0	59.8
AB-33	307+56	19 RT	6.5	65.2	GNE ⁽⁴⁾	< 58.7	10/03/2017	33	1.5-3.0	3.5	61.7
AB-34	310+09	406 RT	10.0	58.0	0.8	57.2	11/07/2017	27	1.5-3.0	0.0	58.0
AB-8	328+06	4 RT	10.0	64.0	GNE ⁽⁴⁾	< 54.0	11/07/2017	15	2.0-3.5	1.5	62.5
AB-9	352+82	15 RT	5.5	65.6	GNE ⁽⁴⁾	< 60.1	10/05/2017	27	1.5-3.0	1.5	64.1
AB-10	379+89	43 RT	10.0	58.5	0.6	57.9	11/07/2017	46	0.0-1.0	0.0	58.5
AB-11	404+18	12 RT	12.0	56.3	0.5	55.8	11/07/2017	47	0.0-1.0	0.0	56.3
AB-12	428+14	48 RT	5.0	58.1	2.0	56.1	09/30/2017	54	+2.0-0.0	1.0	57.1
AB-13	452+21	88 LT	7.0	55.5	2.0	53.5	10/03/2017	9	0.0-1.0	1.0	54.5
AB-14	478+66	45 LT	6.5	59.2	GNE ⁽⁴⁾	< 52.7	10/03/2017	62	⁽⁵⁾	3.0	56.2

⁽¹⁾ Boring locations (station and offset) and ground surface elevations were determined using the Microstation design files provided by HDR.

⁽²⁾ Depth below existing grades at time of field services.

⁽³⁾ Seasonal high groundwater table depth reported in the Soil Survey of Sumter County, Florida published by the USDA/NRCS.

⁽⁴⁾ GNE: Groundwater not encountered within the depth of the soil boring.

⁽⁵⁾ Soil Type Urban Land. No estimates provided by the USDA NRCS.

Table 2
Summary of Seasonal High Groundwater Table Estimates for Ponds
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPN: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Boring Location ⁽¹⁾ C/L Construction SR 35		Boring Depth ⁽²⁾ (feet)	Ground Surface Elevation NAVD88 ⁽¹⁾ (feet)	Measured GWT		Date Groundwater Table Recorded	USDA Soil Survey		Estimated SHGWT	
	Station (feet)	Offset (feet)			Depth Below Ground Surface (feet)	Elevation NAVD88 (feet)		Soil Map Unit	SHGWT Depth ⁽³⁾ (feet)	Depth Below Ground Surface (feet)	Elevation NAVD88 (feet)
PB-1B	110+21	175 RT	20.0	65.3	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/17/2017	65	0.0-1.0	6.0 ⁽⁵⁾	59.3
PB-2A-2	146+56	148 LT	25.0	53.5	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/17/2017	9	0.0-1.0	2.0 ⁽⁵⁾	51.5
PB-2A-1	148+93	121 LT	20.0	49.6	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/02/2017	9/49	0.0-1.0	0.0 ⁽⁵⁾	49.6
PB-3B-1	153+54	372 RT	20.0	52.8	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/07/2017	17	1.5-6.0	4.0 ⁽⁵⁾	48.8
PB-3B-2	156+64	349 RT	20.0	54.4	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/07/2017	27	1.5-3.0	8.0 ⁽⁵⁾	46.4
PB-4B-1	190+98	473 RT	25.0	58.8	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/06/2017	42	2.0-3.5	6.0	52.8
PB-4B-2	193+12	140 RT	20.0	55.9	4.5	51.4	11/06/2017	42	2.0-3.5	3.0	52.9
FPC-1	200+95	173 LT	20.0	54.0	2.5	51.5	10/12/2017	43	+2.0-1.0	1.0	53.0
PB-19A-2	207+66	732 RT	20.0	59.7	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/06/2017	42	2.0-3.5	2.0 ⁽⁵⁾	57.7
PB-19A-1	211+85	517 RT	20.0	57.7	5.0	52.7	11/06/2017	42	2.0-3.5	3.5	54.2
PB-20C	240+72	164 LT	20.0	57.0	3.5	53.5	10/12/2017	34	1.5-2.5	0.0 ⁽⁵⁾	57.0
PB-21A-1	269+35	221 RT	20.0	56.3	3.0	53.3	10/12/2017	34	1.5-2.5	0.0 ⁽⁵⁾	56.3
PB-21A-2	272+04	183 RT	20.0	56.3	3.0	53.3	10/12/2017	34	1.5-2.5	0.0 ⁽⁵⁾	56.3
PB-22C-2	290+41	273 LT	20.0	62.5	GNA ⁽⁴⁾	GNA ⁽⁴⁾	10/13/2017	27/33	1.5-3.0	0.0 ⁽⁵⁾	62.5
PB-22C-1	293+12	154 LT	20.0	66.0	GNA ⁽⁴⁾	GNA ⁽⁴⁾	10/13/2017	27	1.5-3.0	4.0 ⁽⁵⁾	62.0
PB-23A-1	305+56	393 LT	20.0	64.0	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/16/2017	21/33	0.0-1.0/1.5-3.0	0.0 ⁽⁵⁾	64.0
PB-23A-2	305+68	188 LT	20.0	64.3	9.0	55.3	10/13/2017	33	1.5-3.0	2.0 ⁽⁵⁾	62.3
PB-23A-3	308+03	127 LT	20.0	63.3	9.5	53.8	10/13/2017	33	1.5-3.0	2.0 ⁽⁵⁾	61.3
PB-13C-1	325+08	174 RT	20.0	59.3	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/01/2017	51	⁽⁶⁾	0.0 ⁽⁵⁾	59.3
PB-13C-2	328+67	197 RT	20.0	61.4	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/01/2017	51	⁽⁶⁾	0.0 ⁽⁵⁾	61.4
PB-14C	377+12	656 RT	20.0	60.7	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/16/2017	46	0.0-1.0	6.0 ⁽⁵⁾	54.7
FPC-4	378+63	677 RT	20.0	61.4	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/16/2017	46	0.0-1.0	4.0 ⁽⁵⁾	57.4
PB-15B	398+31	177 LT	35.0	63.9	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/16/2017	46	0.0-1.0	2.0 ⁽⁵⁾	61.9
FPC-5-2	409+63	314 RT	20.0	61.8	7.0	54.8	11/02/2017	21/34	0.0-1.0/1.5-2.5	6.0	55.8
FPC-5-1	412+21	314 RT	20.0	61.4	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/02/2017	34	1.5-2.5	6.0 ⁽⁵⁾	55.4
FPC-6	422+28	217 RT	20.0	57.0	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/02/2017	34/54	1.5-2.5/+2.0-0.0	3.0	54.0
FPC-7	432+18	157 RT	20.0	57.8	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/02/2017	34	1.5-2.5	4.0	53.8
PB-16A	434+74	168 RT	20.0	58.0	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/02/2017	34	1.5-2.5	4.0	54.0
PB-17B-2	443+21	1252 RT	20.0	58.0	GNA ⁽⁴⁾	GNA ⁽⁴⁾	11/01/2017	21	0.0-1.0	2.0 ⁽⁵⁾	56.0
PB-17B-1	446+13	1009 RT	25.0	57.7	8.0	49.7	11/01/2017	26	0.0-1.0	2.0 ⁽⁵⁾	55.7

⁽¹⁾ Boring locations (station and offset) and ground surface elevations were determined using the Microstation design files provided by HDR.

⁽²⁾ Depth below existing grades at time of field services.

⁽³⁾ Seasonal high groundwater table depth reported in the Soil Survey of Sumter County, Florida published by the USDA/NRCS.

⁽⁴⁾ GNA: Groundwater not apparent due to introduction of drilling fluid.

⁽⁵⁾ Perched seasonal high groundwater table depth estimated based on soil stratigraphy.

⁽⁶⁾ Soil Type Dump-Pits Complex. No estimates provided by the USDA NRCS.

Table 3
Summary of Laboratory Test Results for Soil Classification
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPID: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Sample Depth (ft)	Stratum Number	AASHTO Symbol	Sieve Analysis					Atterberg Limits			Organic Content (%)	Natural Moisture Content (%)
				#10	#40	#60	#100	#200	Liquid Limit	Plastic Limit	Plasticity Index		
AB-1	3.5 - 7.5	1	A-3	100	92	57	25	9	-	-	-	-	-
AB-2	5.0 - 5.5	1	A-3	100	92	59	26	8	-	-	-	-	-
PB-4B-1	2.0 - 6.0	1	A-3	100	93	62	28	6	-	-	-	-	-
PB-4B-2	4.0 - 8.0	1	A-3	100	92	53	21	8	-	-	-	-	-
FPC-1	6.0 - 8.0	1	A-3	100	94	58	25	7	-	-	-	-	-
FPC-1	2.0 - 6.0	1	A-3	100	92	55	25	9	-	-	-	-	-
PB-19A-1	4.0 - 8.0	1	A-3	100	93	68	28	10	-	-	-	-	-
AB-16	1.5 - 2.0	1	A-3	100	93	61	28	9	-	-	-	-	-
PB-20C	6.0 - 8.0	1	A-3	100	94	67	28	6	-	-	-	-	-
AB-29	0.5 - 2.5	1	A-3	100	96	76	36	10	-	-	-	-	-
AB-30	1.0 - 3.5	1	A-3	100	96	77	36	10	-	-	-	-	-
AB-7	3.0 - 3.5	1	A-3	100	96	76	34	8	-	-	-	-	-
AB-33	3.0 - 3.5	1	A-3	100	96	78	37	9	-	-	-	-	-
AB-34	1.5 - 3.5	1	A-3	100	96	76	33	7	-	-	-	-	-
AB-11	1.0 - 3.0	1	A-3	100	96	75	32	8	-	-	-	-	-
PB-16A	2.0 - 6.0	1	A-3	100	95	75	35	10	-	-	-	-	-
AB-3	2.5 - 3.0	2	A-2-4	100	93	68	37	19	-	-	-	-	-
PB-3B-2	2.0 - 6.0	2	A-2-4	100	91	61	33	16	-	-	-	-	-
AB-4	6.5 - 7.0	2	A-2-4	100	94	67	37	20	-	-	-	-	-
AB-30	4.0 - 4.5	2	A-2-4	-	-	-	-	32	22	13	9	-	12
AB-31	6.0 - 6.5	2	A-2-4	100	97	81	43	21	-	-	-	-	-
AB-12	2.0 - 2.5	2	A-2-4	100	86	72	44	24	18	12	6	-	19
FPC-7	0.0 - 4.0	2	A-2-4	100	94	75	37	15	-	-	-	-	-

Table 3
Summary of Laboratory Test Results for Soil Classification
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPID: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Sample Depth (ft)	Stratum Number	AASHTO Symbol	Sieve Analysis					Atterberg Limits			Organic Content (%)	Natural Moisture Content (%)
				#10	#40	#60	#100	#200	Liquid Limit	Plastic Limit	Plasticity Index		
AB-17	2.0 - 3.0	3	A-2-6	100	95	71	47	34	33	18	15	-	21
AB-34	4.0 - 6.0	3	A-2-6	100	96	80	48	29	-	-	-	-	15
AB-10	4.0 - 6.0	3	A-2-6	100	96	80	48	32	33	16	17	-	21
AB-24	1.0 - 3.0	4	A-4	-	-	-	-	67	31	24	7	-	25
AB-26	6.0 - 8.0	4	A-4	100	98	86	62	44	-	-	-	-	-
AB-26	1.5 - 2.0	4	A-4	100	85	78	72	66	-	-	-	-	-
PB-21A-2	2.0 - 4.0	4	A-4	100	96	92	84	77	23	18	5	-	22
AB-2	8.0 - 8.5	4	A-6	100	95	73	54	41	31	15	16	-	-
PB-2A-1	4.0 - 6.0	4	A-6	100	90	72	57	47	33	11	22	-	19
AB-25	0.0 - 0.5	4	A-6	100	98	87	64	45	30	19	11	-	20
PB-22C-2	4.0 - 6.0	4	A-6	100	97	82	54	38	30	15	15	-	18
PB-22C-1	6.0 - 8.0	4	A-6	100	96	81	53	39	37	11	26	-	16
FPC-6	8.0 - 10.0	4	A-7-6	100	97	85	57	40	47	14	33	-	21
AB-28	6.0 - 8.0	5	A-2-4	100	97	81	38	16	-	-	-	-	-
PB-23A-2	4.0 - 6.0	6	A-7-6	100	98	87	66	55	49	21	28	-	27
PB-23A-3	6.0 - 8.0	6	A-7-6	100	98	86	61	48	42	13	29	-	25
AB-11	4.0 - 6.0	8	A-8	100	71	58	45	37	-	-	-	48	261
AB-11	6.0 - 7.0	8	A-8	100	79	64	47	35	-	-	-	32	196
AB-31	9.5 - 10.0	9	A-7-5	100	98	92	80	72	103	38	65	-	74
PB-19A-2	8.0 - 10.0	9	A-7-6	100	99	97	95	93	113	26	87	-	47
AB-21	1.0 - 1.5	9	A-7-6	-	-	-	-	62	52	24	28	-	33
AB-23	1.5 - 5.0	9	A-7-6	-	-	-	-	57	-	-	-	-	-
AB-24	0.5 - 1.0	9	A-7-6	-	-	-	-	69	53	27	26	-	35
AB-29	4.0 - 4.5	9	A-7-6	-	-	-	-	69	62	23	39	-	31

Table 3
Summary of Laboratory Test Results for Soil Classification
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPID: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Sample Depth (ft)	Stratum Number	AASHTO Symbol	Sieve Analysis					Atterberg Limits			Organic Content (%)	Natural Moisture Content (%)
				#10	#40	#60	#100	#200	Liquid Limit	Plastic Limit	Plasticity Index		
AB-32	2.5 - 3.0	9	A-7-6	100	98	85	57	38	86	16	70	-	15
AB-32	7.5 - 8.0	9	A-7-6	100	98	91	75	65	53	21	32	-	37
AB-33	6.0 - 6.5	9	A-7-6	100	98	92	80	74	72	27	45	-	38
AB-13	4.0 - 4.5	9	A-7-6	100	98	90	77	70	60	25	35	-	29

Table 4
Summary of Laboratory Test Results for Environmental Classification
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPID: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Sample Depth (ft)	Stratum No./ AASHTO Symbol	pH (FM 5-550)	Resistivity (ohm-cm) (FM 5-551)	Chlorides (ppm) (FM 5-552)	Sulfates (ppm) (FM 5-553)	Environmental Classification ⁽¹⁾ (Soil)	
							Steel	Concrete
AB-1	4.0 - 6.0	1/A-3	7.3	12,000	195	< 5	Slightly Aggressive	Slightly Aggressive
AB-2	3.0 - 5.0	1/A-3	7.6	14,000	30	< 5	Slightly Aggressive	Slightly Aggressive
PB-3B-2	2.0 - 6.0	2/A-2-4	5.7*	13,000	30	78	Extremely Aggressive	Moderately Aggressive
AB-4	2.0 - 4.0	1/A-3	6.3*	18,000	30	< 5	Moderately Aggressive	Slightly Aggressive
PB-4B-1	2.0 - 6.0	1/A-3	5.4*	54,000	30	9	Extremely Aggressive	Moderately Aggressive
PB-4B-2	4.0 - 8.0	1/A-3	5.4*	26,000	45	< 5	Extremely Aggressive	Moderately Aggressive
FPC-1	2.0 - 6.0	1/A-3	5.9*	20,000	45	< 5	Extremely Aggressive	Moderately Aggressive
AB-5	1.0 - 3.0	1/A-3	7.6	59,000	30	< 5	Slightly Aggressive	Slightly Aggressive
PB-19A-1	4.0 - 8.0	1/A-3	4.5*	30,000	15	< 5	Extremely Aggressive	Extremely Aggressive
AB-15	1.0 - 3.0	1/A-3	6.6*	14,000	60	< 5	Moderately Aggressive	Slightly Aggressive
AB-16	1.0 - 3.0	1/A-3	6.8*	15,000	15	< 5	Moderately Aggressive	Slightly Aggressive
AB-17	0.0 - 1.5	1/A-3	6.5*	11,000	15	< 5	Moderately Aggressive	Slightly Aggressive
AB-28	2.0 - 6.0	2/A-2-4	4.5*	17,000	45	45	Extremely Aggressive	Extremely Aggressive
AB-34	2.0 - 4.0	1/A-3	7.1	2,000*	45	< 5	Moderately Aggressive	Moderately Aggressive
AB-12	0.0 - 2.0	1/A-3	5.5*	24,000	30	< 5	Extremely Aggressive	Moderately Aggressive
FPC-7	0.0 - 4.0	2/A-2-4	6.7*	15,000	60	< 5	Moderately Aggressive	Slightly Aggressive
PB-16A	2.0 - 6.0	1/A-3	6.2*	34,000	15	< 5	Moderately Aggressive	Slightly Aggressive

⁽¹⁾ Classification based on Table 1.3.2-1 FDOT Structures Design Guidelines

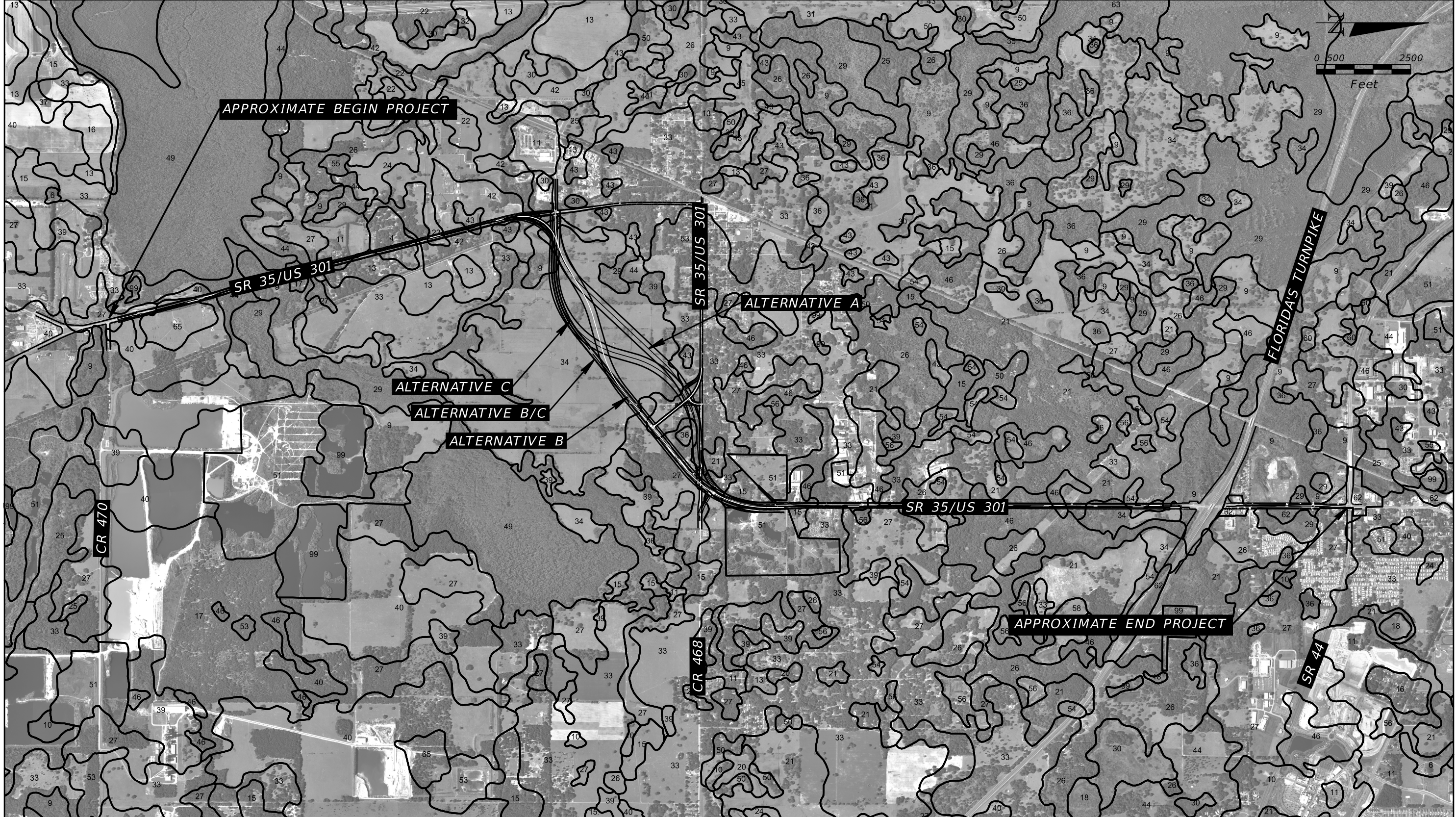
* Indicates governing factor(s) for environmental classification.

TABLE 5
SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPN: 430132-1-22-01
Tierra Project No.: 5511-15-004

Pond No.	Boring No./Test Location	Boring/Test Location		Ground Surface Elevation (feet, NAVD 88)	Test Elevation (feet, NAVD 88)	Measured Groundwater Elevation (feet)	Estimated SHGW Elevation (feet, NAVD 88)	Vertical Hydraulic Conductivity (feet/day)	Horizontal Hydraulic Conductivity (feet/day)	Confining Layer Elevation (feet, NAVD 88)	Effective Porosity (%)
		Station	Offset								
Pond 1B	PB-1B	110+21	175 RT	65.3	62.3	< 62.3	59.3	9	9	51.8	25

Notes:

1. These values are the measured *insitu* field rates; no reduction or safety factors have been applied to the values. We recommend the pond designer apply the appropriate safety factors to these *insitu* values.



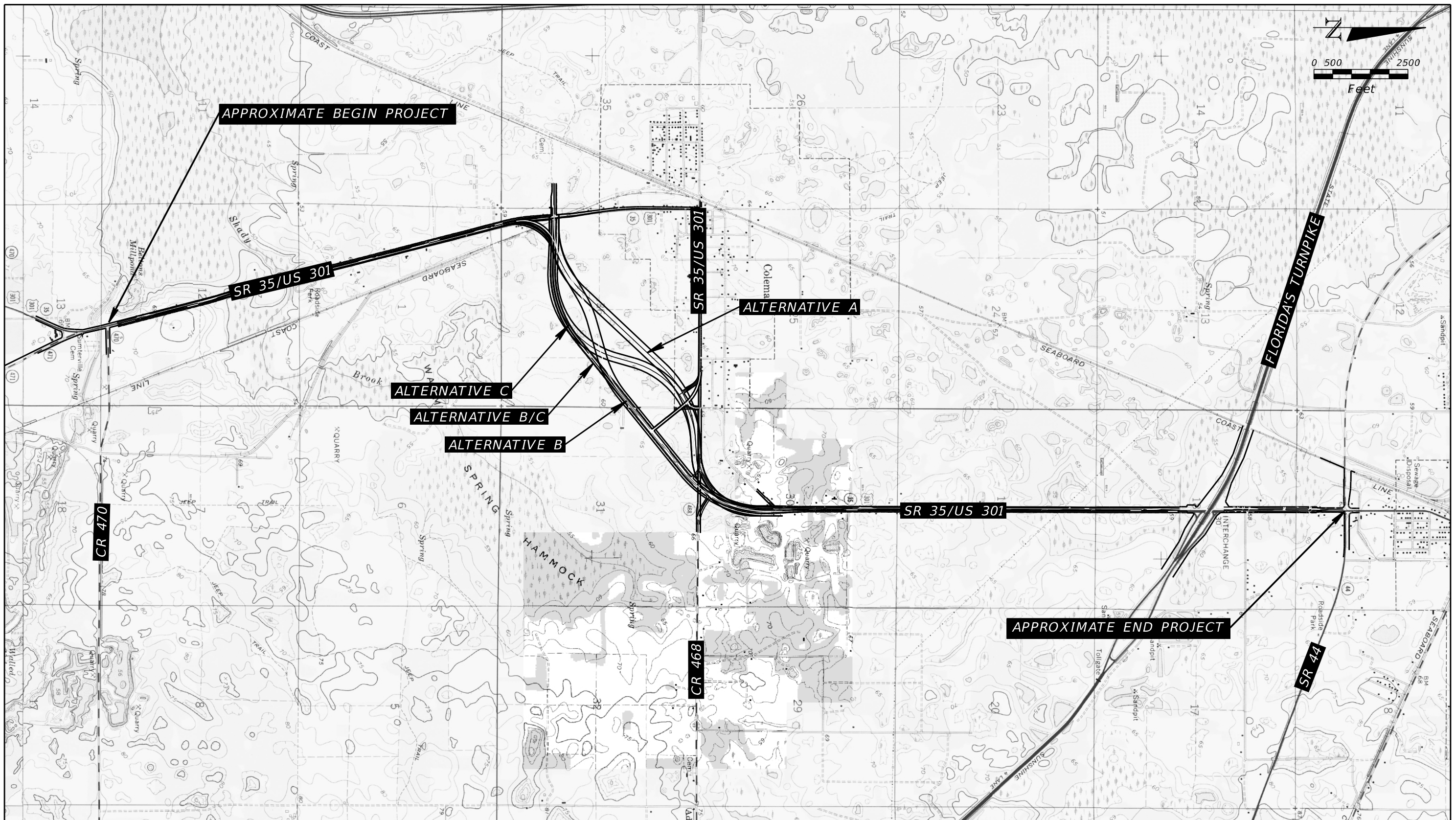
REFERENCE: USDA SOIL SURVEY OF SUMTER COUNTY, FLORIDA

SOURCE: FDOT SURVEY AND MAPPING DATED 2014

TOWNSHIP: 19S 20S
 RANGE: 22E, 23E 22E
 SECTION: 25, 30, 31, 36 1

FIGURE 2

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			USDA SOIL SURVEY MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				SR 35	SUMTER	430132-1-22-01			



REFERENCE: USGS QUADRANGLE MAP OF "WILDWOOD, FLORIDA"

TOWNSHIP: 19S 20S
 RANGE: 22E, 23E 22E
 SECTION: 25, 30, 31, 36 1

FIGURE 3

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				SR 35	SUMTER	430132-1-22-01	USGS QUADRANGLE MAP	

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

DATE OF SURVEY: SEPTEMBER 2017 TO NOVEMBER 2017
SURVEY MADE BY: TIERRA, INC.
SUBMITTED BY: JEREMY A. SEWELL, P.E.

DISTRICT: 5
ROAD NO.: 35
COUNTY: SUMTER

FINANCIAL PROJECT ID : 430132-1-22-01
PROJECT NAME: SR 35/US 301 PD&E STUDY

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS

SURVEY BEGINS STA. : 100+00 SURVEY ENDS STA. : 480+25 REFERENCE: CENTERLINE CONSTRUCTION SR 35

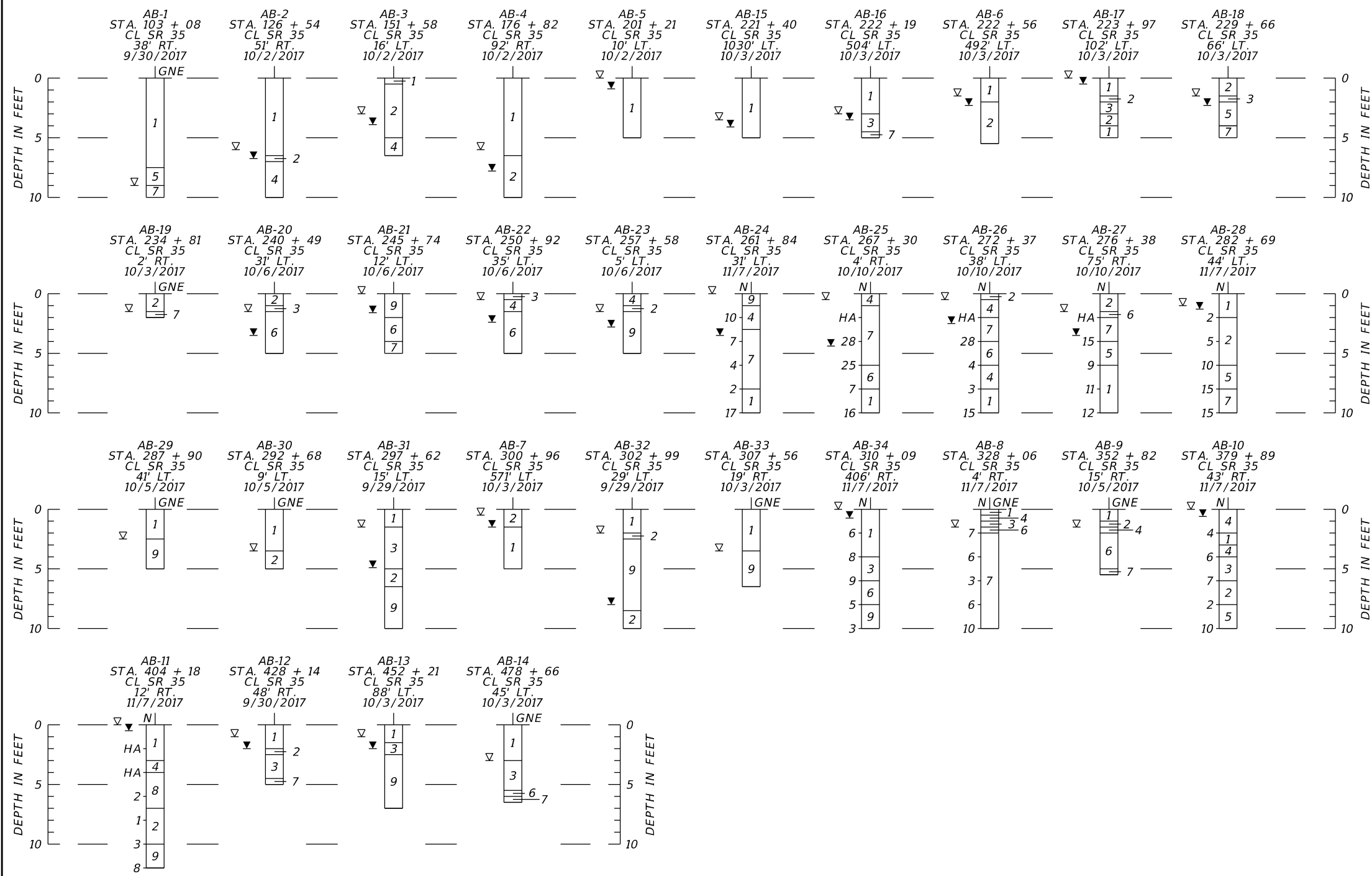
STRATUM NO.	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS					ATTERBERG LIMITS				DESCRIPTION	CORROSION TEST RESULTS					
	NO. OF TESTS	% ORGANIC	NO. OF TESTS	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX		AASHTO GROUP	NO. OF TESTS	RESISTIVITY ohm-cm	CHLORIDE ppm	SULFATES ppm	pH
1	--	--	--	--	16	100	92-96	53-78	21-37	6-10	--	--	--	A-3	BROWN TO GRAY SAND TO SAND WITH SILT	14	2,000-59,000	15-195	<5-9	4.5-7.6
2	--	--	2	12-19	7	100	86-97	61-81	33-44	15-32	2	18-22	6-9	A-2-4	BROWN TO GRAY SILTY SAND	3	13,000-17,000	30-60	<5-7.8	4.5-6.7
3	--	--	3	15-21	3	100	95-96	71-80	47-48	29-34	2	33	15-17	A-2-6/A-2-7	GRAY-BROWN CLAYEY SAND	--	--	--	--	--
4	--	--	6	16-25	10	100	85-98	72-92	53-84	38-77	8	30-47	7-33	A-4/A-6/ A-7-5/A-7-6	GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (LL<50)	--	--	--	--	--
5	--	--	--	--	1	100	97	81	38	16	--	--	--	A-3/A-2-4	LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS	--	--	--	--	--
6	--	--	2	25-27	2	100	98	86-87	61-66	48-55	2	42-49	28-29	A-4/A-6/ A-7-5/A-7-6	LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	LIMESTONE/CAPROCK	--	--	--	--	--
8	2	32-48	2	196-261	2	100	71-79	58-64	45-47	35-37	--	--	--	A-8	DARK GRAY ORGANIC SILTY SAND TO MUCK	--	--	--	--	--
9	--	--	9	15-74	10	100	98-99	85-97	57-95	38-93	9	52-113	26-87	A-4/A-6/ A-7-5/A-7-6	GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)	--	--	--	--	--

NOTES:

- STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH BORING LOCATION ONLY. ANY SUBSOIL CONNECTING LINES SHOWN ARE FOR ESTIMATING EARTHWORK ONLY AND DO NOT INDICATE ACTUAL STRATUM LIMITS. SUBSURFACE VARIATIONS BETWEEN BORINGS SHOULD BE ANTICIPATED AS INDICATED IN SECTION 2-4. FOR FURTHER DETAILS SEE SECTION 120-3.
- GROUNDWATER LEVEL AS SHOWN AS ▽ WHERE ENCOUNTERED. GROUNDWATER NOT ENCOUNTERED SHOWN AS "GNE". ESTIMATED SEASONAL HIGH GROUNDWATER TABLE SHOWN AS ▽.
- SOIL ANALYSIS INCLUDES DATA FROM ROADWAY AND POND AREAS.
- THE SYMBOL "-" REPRESENTS AN UNMEASURED PARAMETER.
- STRATA 1, 2 AND 5 SHALL BE TREATED AS SELECT (S) IN ACCORDANCE WITH INDEX 505.
- STRATA 3, 4, AND 6 SHALL BE TREATED AS PLASTIC (P) IN ACCORDANCE WITH INDEX 505.
- STRATUM 9 SHALL BE TREATED AS HIGH PLASTIC (H) IN ACCORDANCE WITH INDEX 505.
- STRATUM 2 MAY RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT.
- STRATUM 7 IS THE NATURAL LIMESTONE FORMATION. SPECIAL TOOLS AND EQUIPMENT MAY BE REQUIRED TO EXCAVATE AND/OR DEWATER THIS MATERIAL.
- STRATUM 8 IS ORGANIC MATERIAL AND SHALL BE REMOVED IN ACCORDANCE WITH INDEX 500

FIGURE 4

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

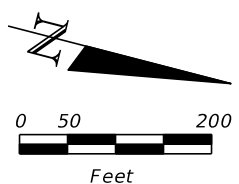
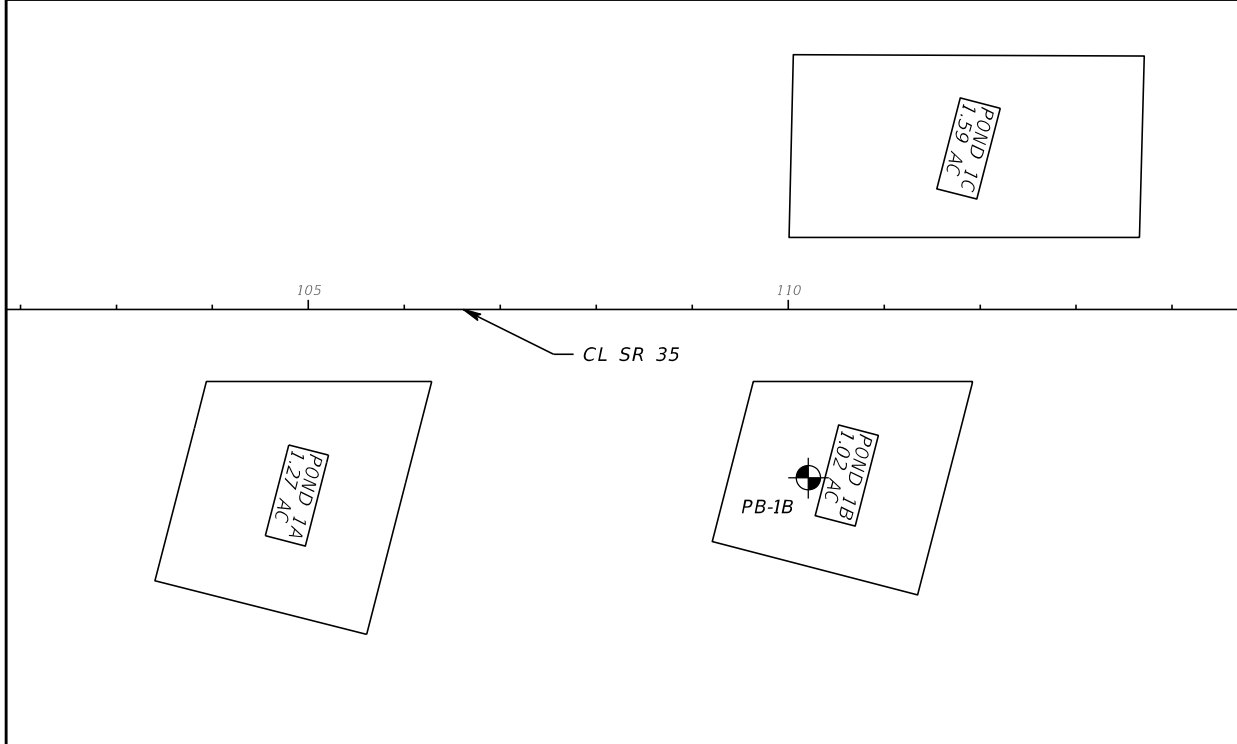


- ### LEGEND
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- ▼ GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ▽ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNE GROUNDWATER NOT ENCOUNTERED
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

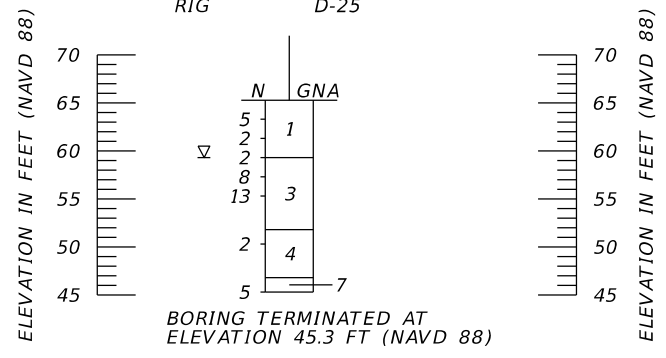
FIGURE 5

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY SOIL PROFILES	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 35	SUMTER	430132-1-22-01		



BORING LOCATION PLAN

BOR # PB-1B
 STA. 110+21
 REF. CL SR 35
 OFF. 175 RT
 ELEV. 65.3
 DATE 11/17/2017
 DRILLER R.SHUEY
 HAMMER AUTOMATIC
 RIG D-25



BORING TERMINATED AT
 ELEVATION 45.3 FT (NAVD 88)

LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

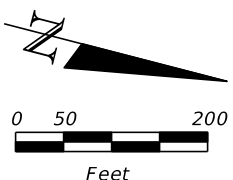
	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 6

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

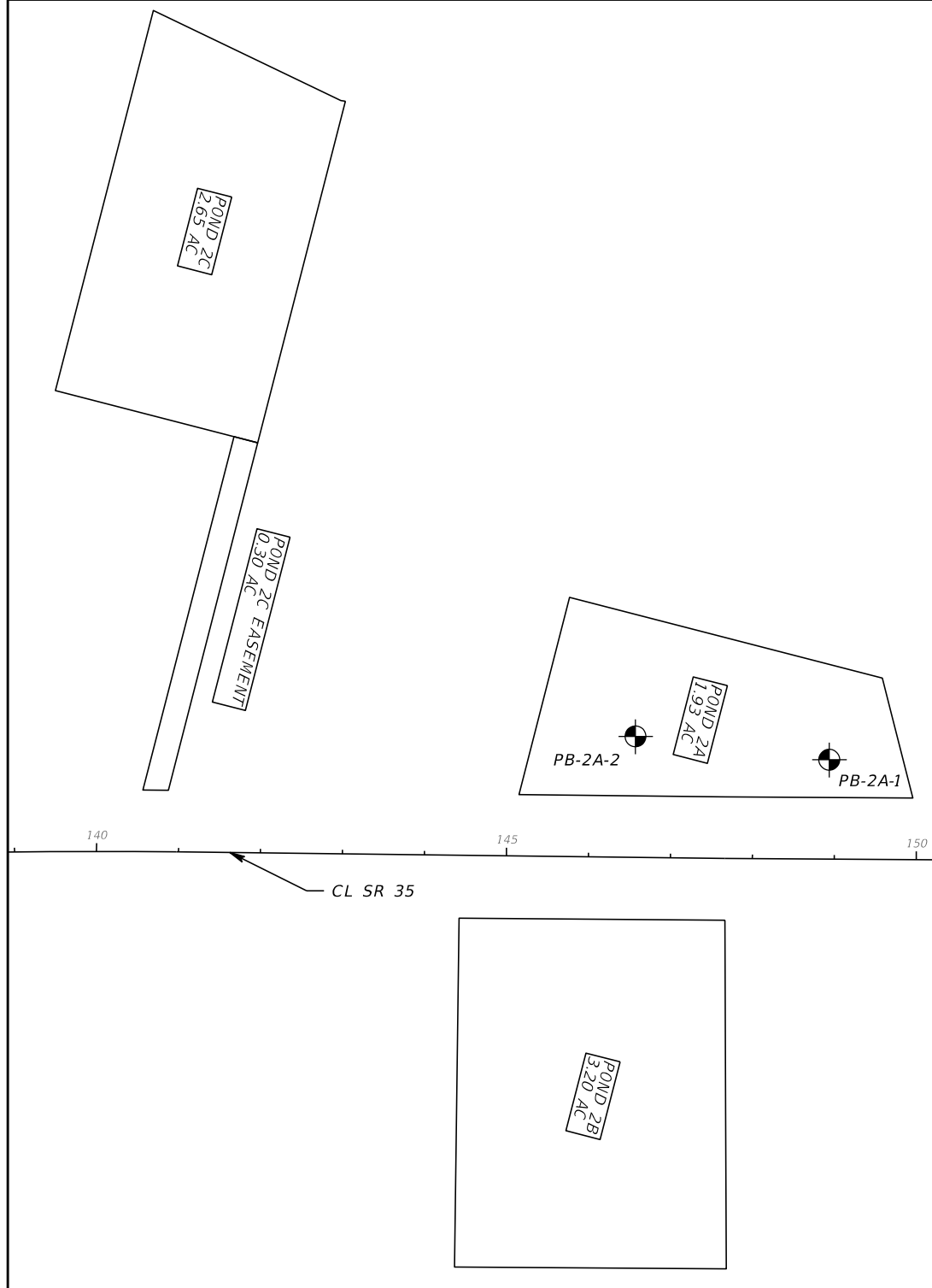
POND SOIL SURVEY (1)

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



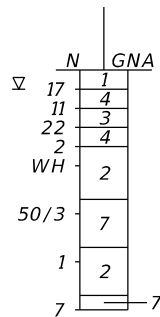
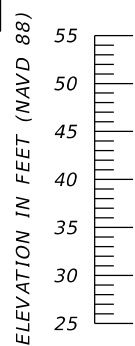
LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

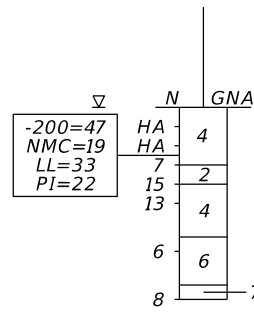
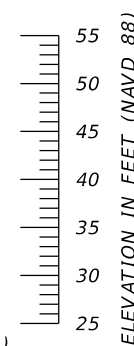


BOR # PB-2A-2
 STA. 146+56
 REF. CL SR 35
 OFF. 148 LT
 ELEV. 53.5
 DATE 11/17/2017
 DRILLER R.SHUEY
 HAMMER AUTOMATIC
 RIG D-25

BOR # PB-2A-1
 STA. 148+93
 REF. CL SR 35
 OFF. 121 LT
 ELEV. 49.6
 DATE 11/2/2017
 DRILLER J. SHAW
 HAMMER AUTOMATIC
 RIG D-25



BORING TERMINATED AT ELEVATION 28.5 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 29.6 FT (NAVD 88)

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 7

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

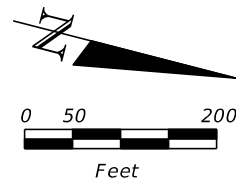
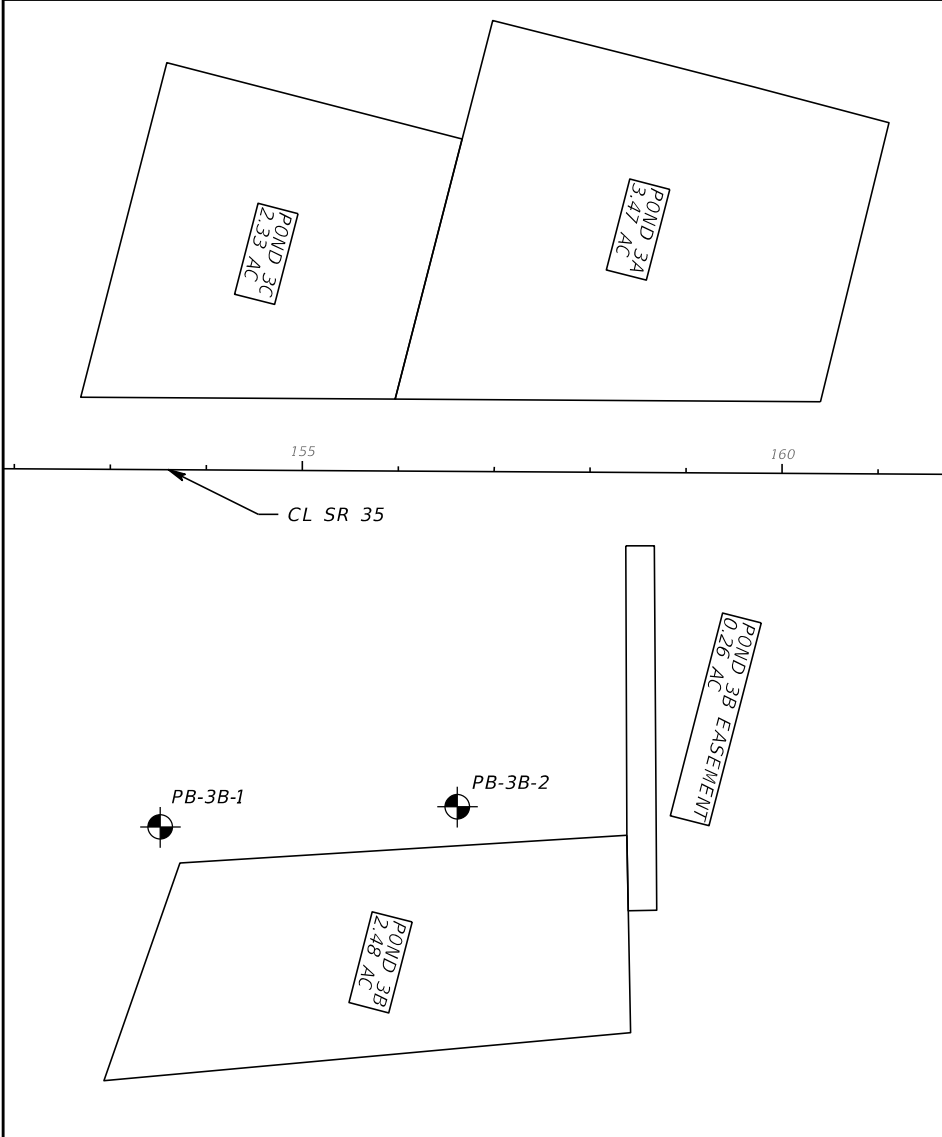
JEREMY A. SEWELL, P.E.
 P.E. LICENSE NUMBER 62951
 TIERRA, INC.
 591 SUSAN B. BRITT COURT
 WINTER GARDEN, FLORIDA 34787
 CERTIFICATE OF AUTHORIZATION NO. 6486

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 35	SUMTER	430132-1-22-01

POND SOIL SURVEY (2)

SHEET NO.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

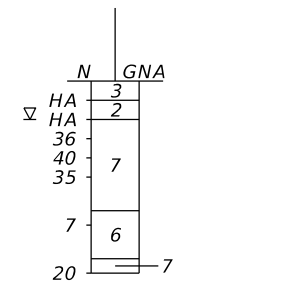
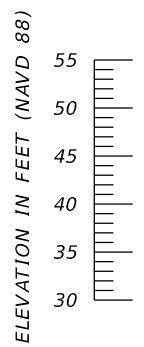


BORING LOCATION PLAN

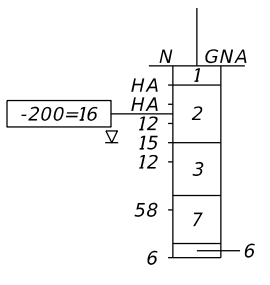
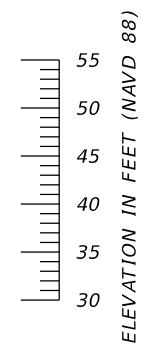
- LEGEND**
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BOR # PB-3B-1
 STA. 153+54
 REF. CL SR 35
 OFF. 372 RT
 ELEV. 52.8
 DATE 11/7/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC RIG D-50

BOR # PB-3B-2
 STA. 156+64
 REF. CL SR 35
 OFF. 349 RT
 ELEV. 54.4
 DATE 11/7/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC RIG D-50



BORING TERMINATED AT ELEVATION 32.8 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 34.4 FT (NAVD 88)

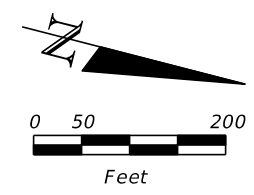
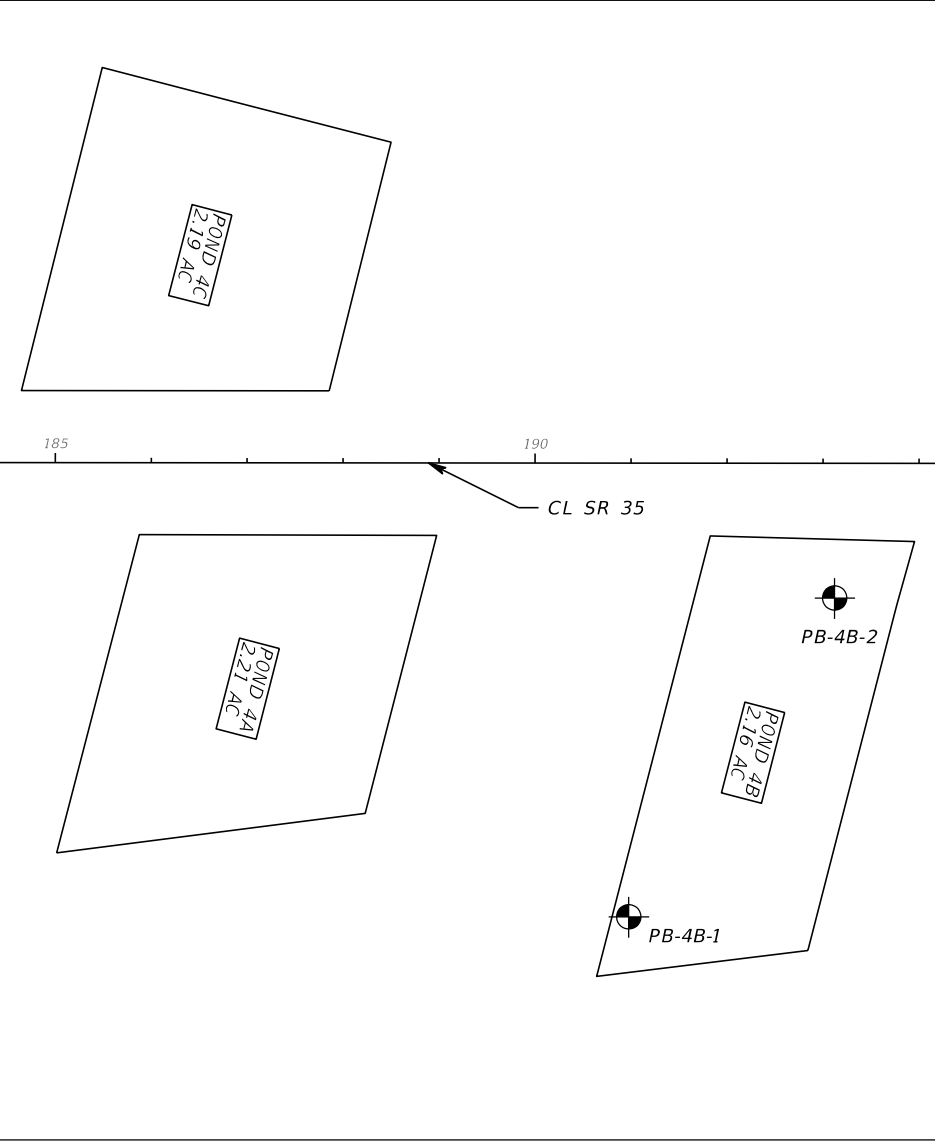
	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 8

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

POND SOIL SURVEY (3)

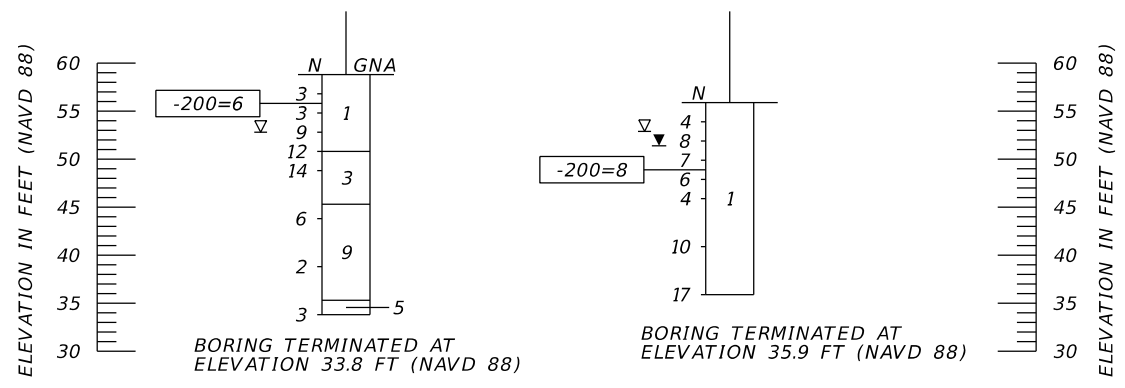
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



BORING LOCATION PLAN

- LEGEND**
- BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 - BROWN TO GRAY SILTY SAND (A-2-4)
 - GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 - GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 - LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 - LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 - LIMESTONE/CAPROCK
 - DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 - GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
- NMC NATURAL MOISTURE CONTENT (%)
- LL LIQUID LIMIT
- PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- ⊕ APPROXIMATE SPT BORING LOCATION
- ▽ GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ▽ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- ←100 LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BOR #	PB-4B-1	BOR #	PB-4B-2
STA.	190+98	STA.	193+12
REF.	CL SR 35	REF.	CL SR 35
OFF.	473 RT	OFF.	140 RT
ELEV.	58.8	ELEV.	55.9
DATE	11/6/2017	DATE	11/6/2017
DRILLER	J. SMITH	DRILLER	J. SMITH
HAMMER	AUTOMATIC	HAMMER	AUTOMATIC
RIG	D-50	RIG	D-50

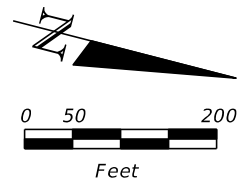
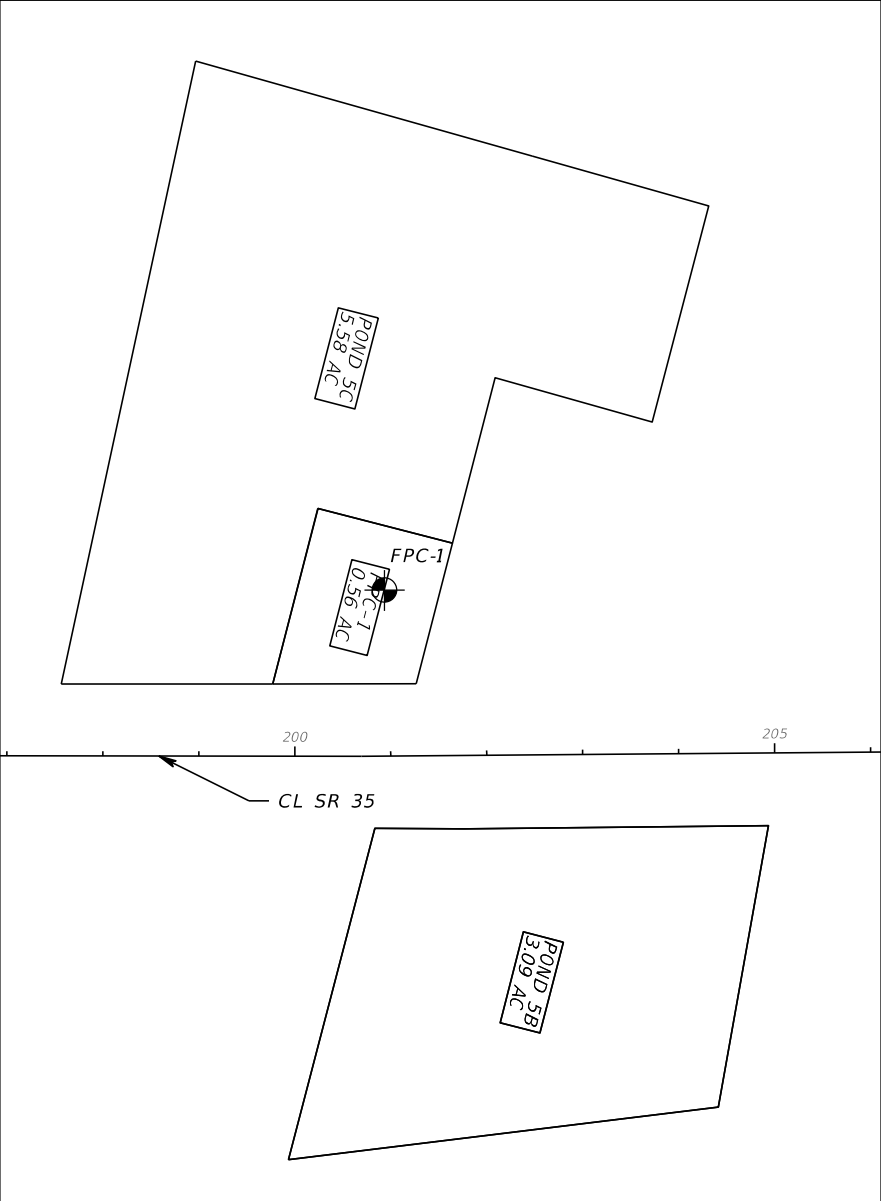


	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 9

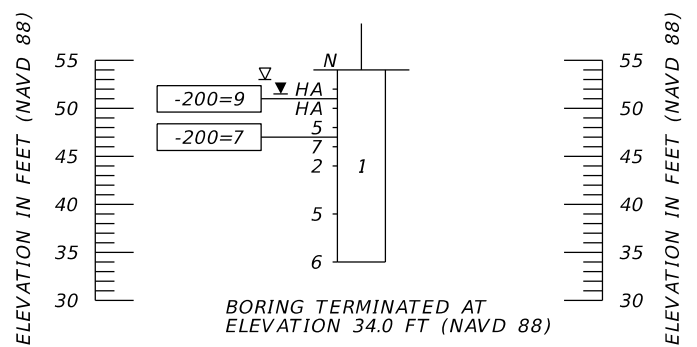
<table border="1"> <thead> <tr> <th colspan="2">REVISIONS</th> </tr> <tr> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>				REVISIONS		DATE	DESCRIPTION			JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	SHEET NO.
REVISIONS												
DATE	DESCRIPTION											
<table border="1"> <thead> <tr> <th>ROAD NO.</th> <th>COUNTY</th> <th>FINANCIAL PROJECT ID</th> </tr> </thead> <tbody> <tr> <td>SR 35</td> <td>SUMTER</td> <td>430132-1-22-01</td> </tr> </tbody> </table>		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	SR 35	SUMTER	430132-1-22-01	POND SOIL SURVEY (4)				
ROAD NO.	COUNTY	FINANCIAL PROJECT ID										
SR 35	SUMTER	430132-1-22-01										

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BORING LOCATION PLAN

BOR # FPC-1
 STA. 200+95
 REF. CL SR 35
 OFF. 173 LT
 ELEV. 54.0
 DATE 10/12/2017
 DRILLER J. SHAW
 HAMMER AUTOMATIC
 RIG D-25



LEGEND

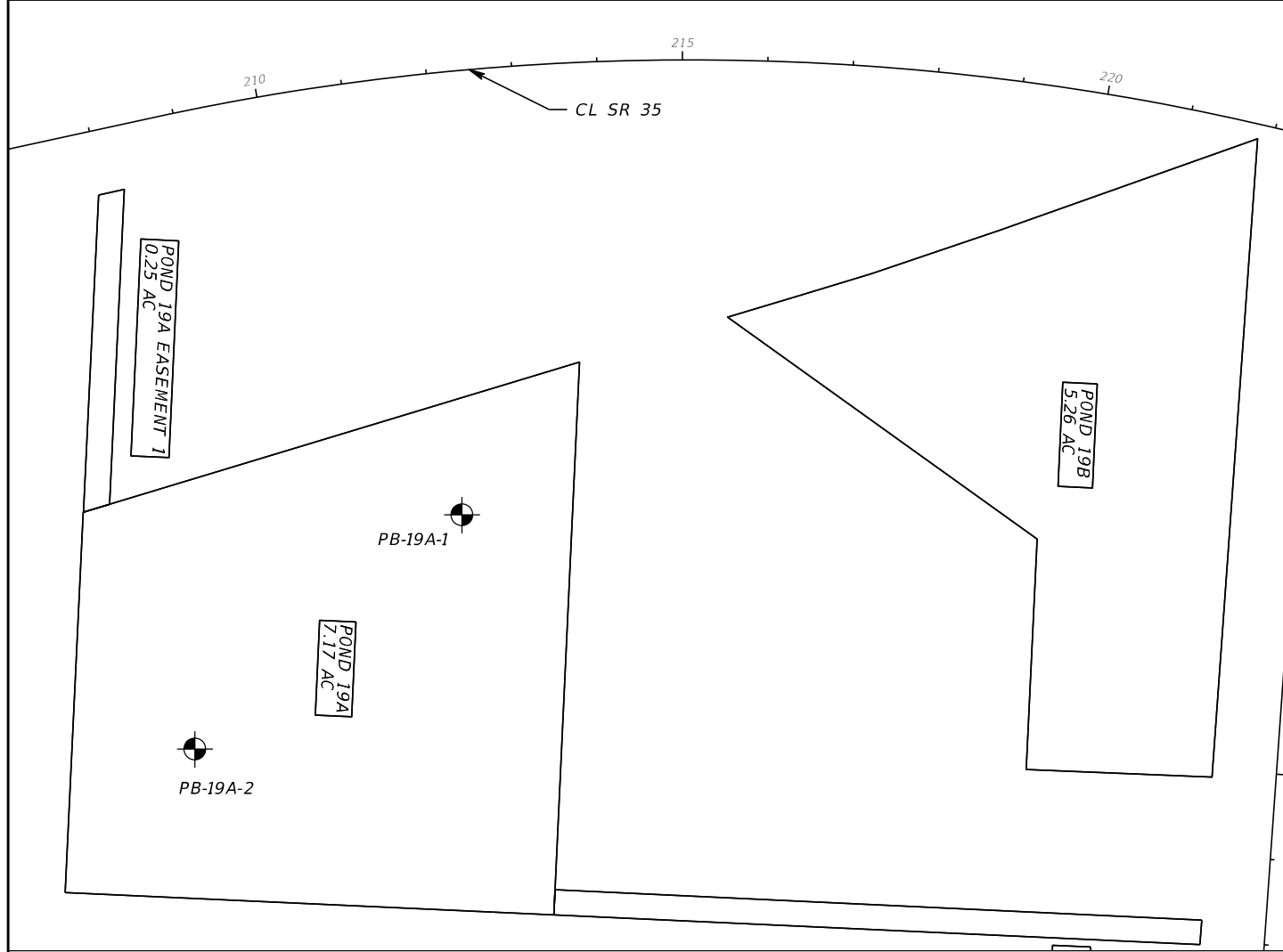
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
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- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- ⊕ APPROXIMATE SPT BORING LOCATION
- ▽ GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ▽ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- ←100 LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 10

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. POND SOIL SURVEY (5)
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

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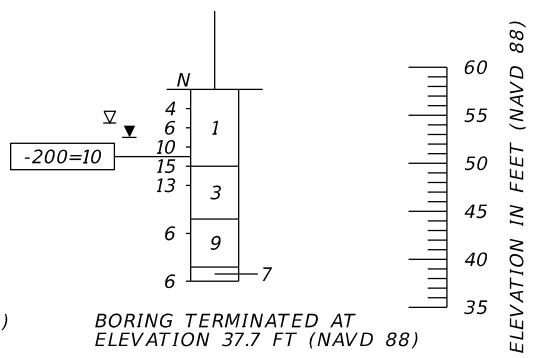
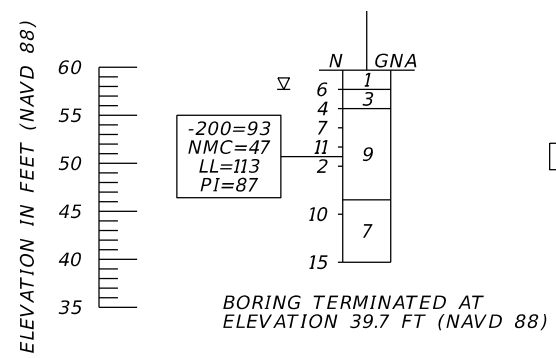
LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
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- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
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- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- ⊙ APPROXIMATE SPT BORING LOCATION
- ▽ GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ∇ ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- ←100 LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BORING LOCATION PLAN

BOR # PB-19A-2
 STA. 207+66
 REF. CL SR 35
 OFF. 732 RT
 ELEV. 59.7
 DATE 11/6/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC
 RIG D-50

BOR # PB-19A-1
 STA. 211+85
 REF. CL SR 35
 OFF. 517 RT
 ELEV. 57.7
 DATE 11/6/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC
 RIG D-50



	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
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VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

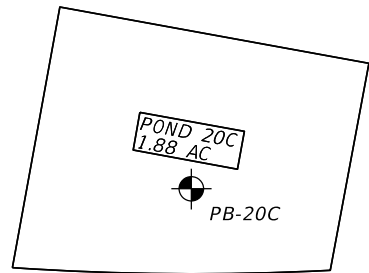
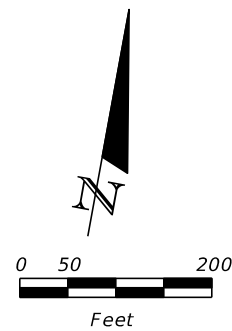
FIGURE 11

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

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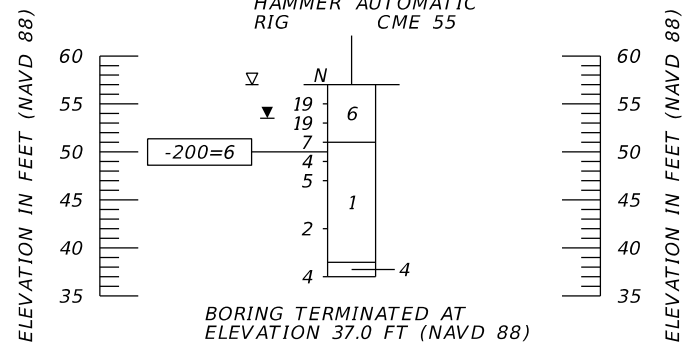
LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
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 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
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- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35



BORING LOCATION PLAN

BOR # PB-20C
 STA. 240+72
 REF. CL SR 35
 OFF. 164 LT
 ELEV. 57.0
 DATE 10/12/2017
 DRILLER D. STAKELIN
 HAMMER AUTOMATIC
 RIG CME 55



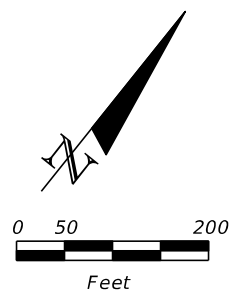
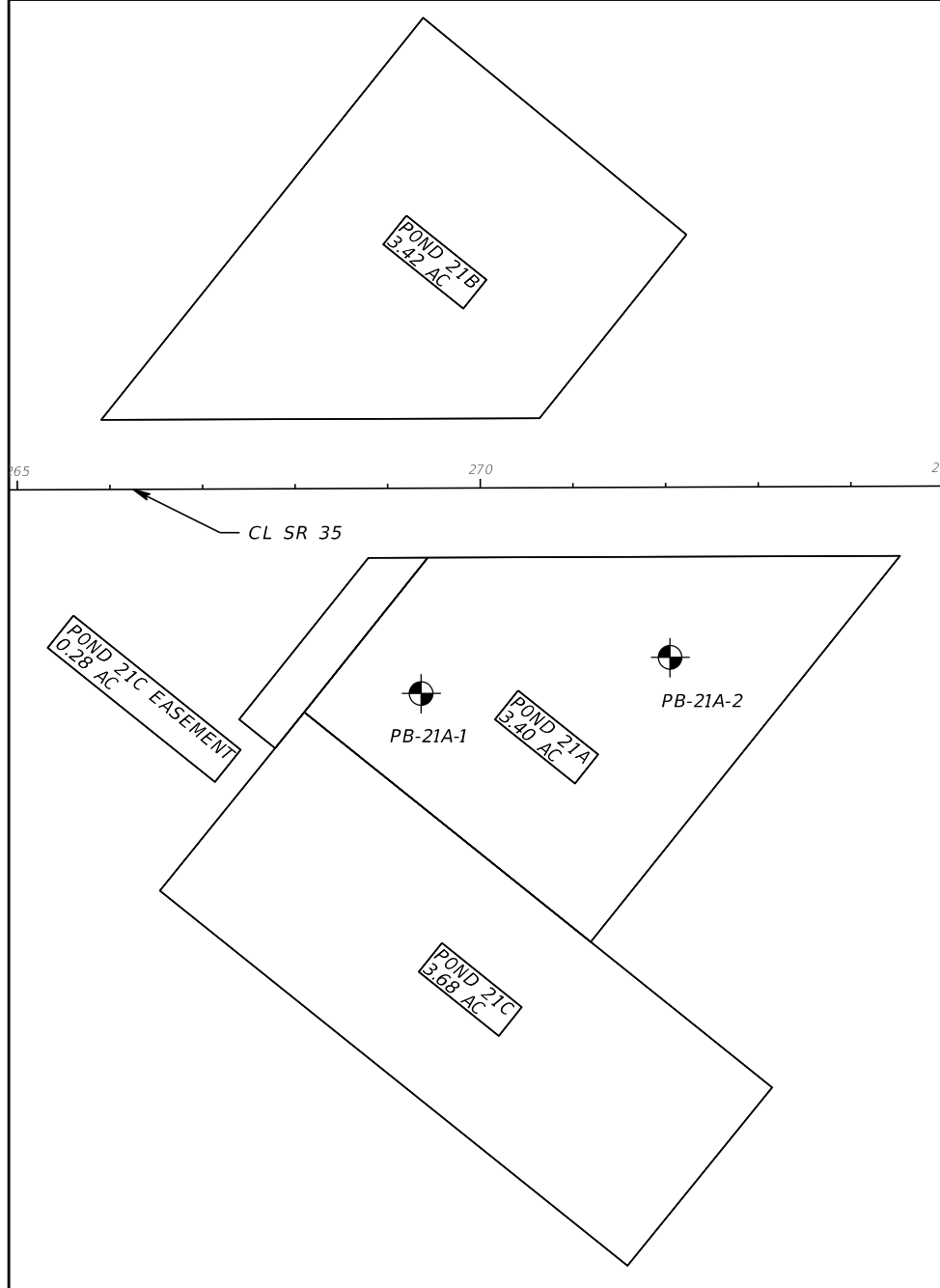
	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 12

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

POND SOIL SURVEY (7)

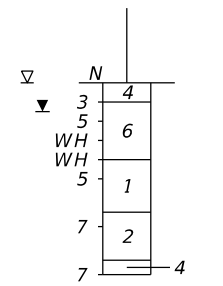
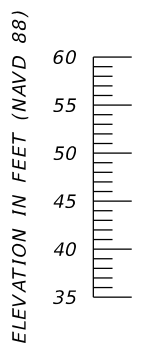
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BORING LOCATION PLAN

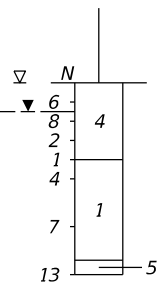
BOR # PB-21A-1
 STA. 269+35
 REF. CL SR 35
 OFF. 221 RT
 ELEV. 56.3
 DATE D. STAKELIN
 DRILLER 10/12/2017
 HAMMER AUTOMATIC
 RIG CME 55

BOR # PB-21A-2
 STA. 272+04
 REF. CL SR 35
 OFF. 183 RT
 ELEV. 56.3
 DATE 10/12/2017
 DRILLER D. STAKELIN
 HAMMER AUTOMATIC
 RIG D-25

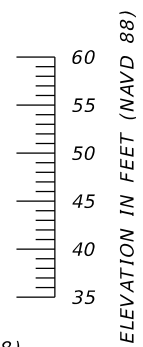


BORING TERMINATED AT ELEVATION 36.3 FT (NAVD 88)

-200=77
 NMC=22
 LL=23
 PI=5



BORING TERMINATED AT ELEVATION 36.3 FT (NAVD 88)



LEGEND

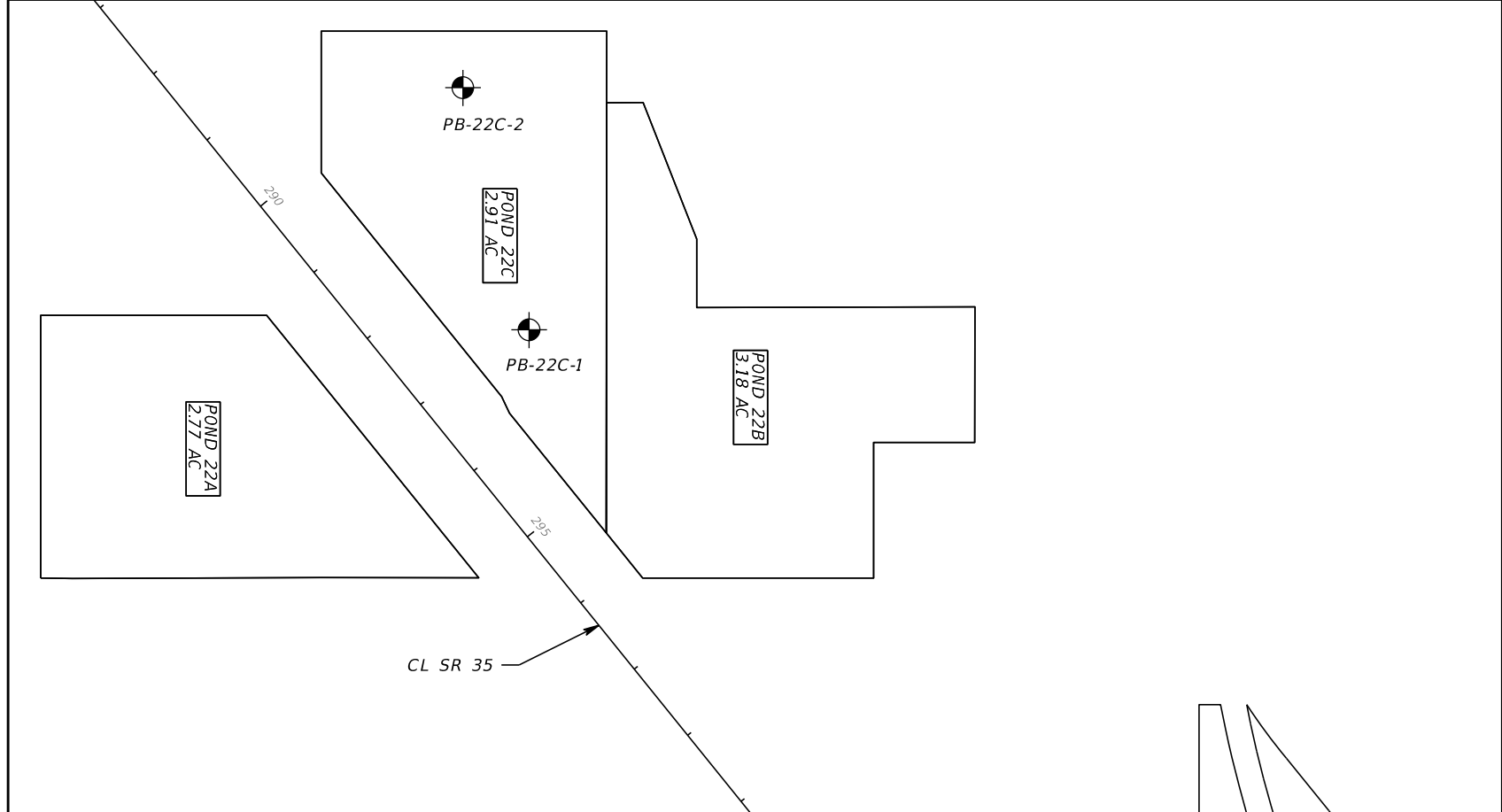
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
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 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
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- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- ⊕ APPROXIMATE SPT BORING LOCATION
- ▽ GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
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- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- ←100 LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
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LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
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SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

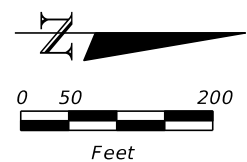
FIGURE 13

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. POND SOIL SURVEY (8)
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



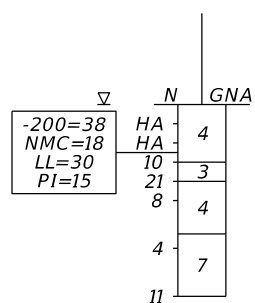
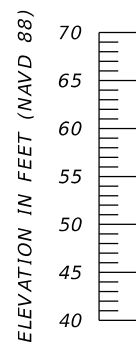
BORING LOCATION PLAN



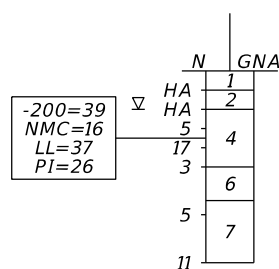
- LEGEND**
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BOR # PB-22C-2
 STA. 290+41
 REF. CL SR 35
 OFF. 273 LT
 ELEV. 62.5
 DATE 10/13/2017
 DRILLER J. SHAW
 HAMMER AUTOMATIC
 RIG D-25

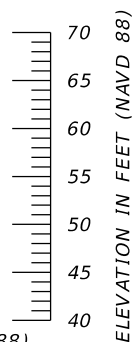
BOR # PB-22C-1
 STA. 293+12
 REF. CL SR 35
 OFF. 154 LT
 ELEV. 66.0
 DATE 10/13/2017
 DRILLER J. SHAW
 HAMMER AUTOMATIC
 RIG D-25



BORING TERMINATED AT ELEVATION 42.5 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 46.0 FT (NAVD 88)

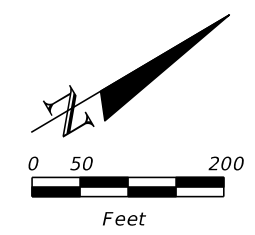
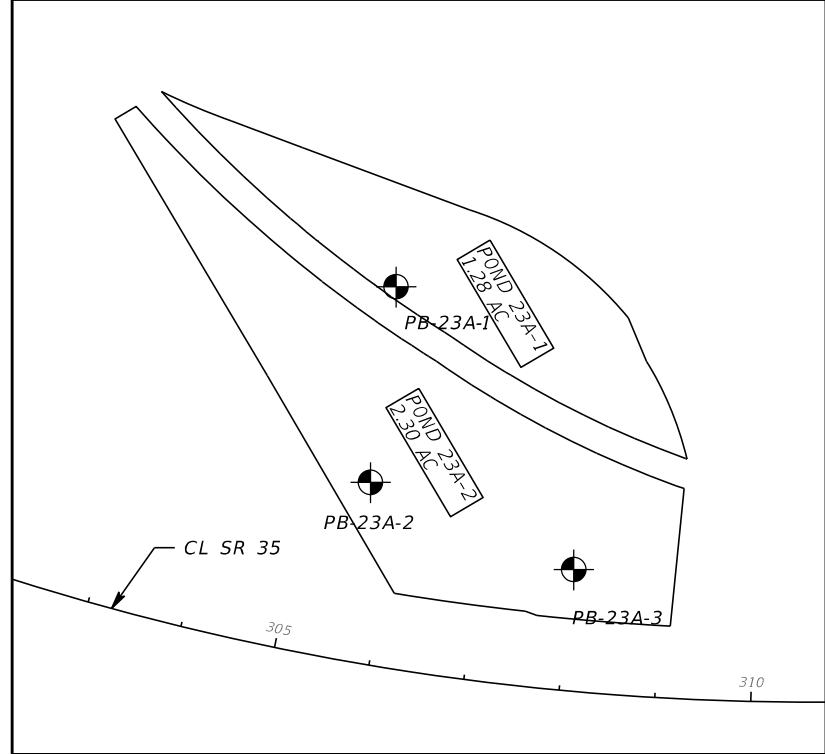


	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 14

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. POND SOIL SURVEY (9)
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

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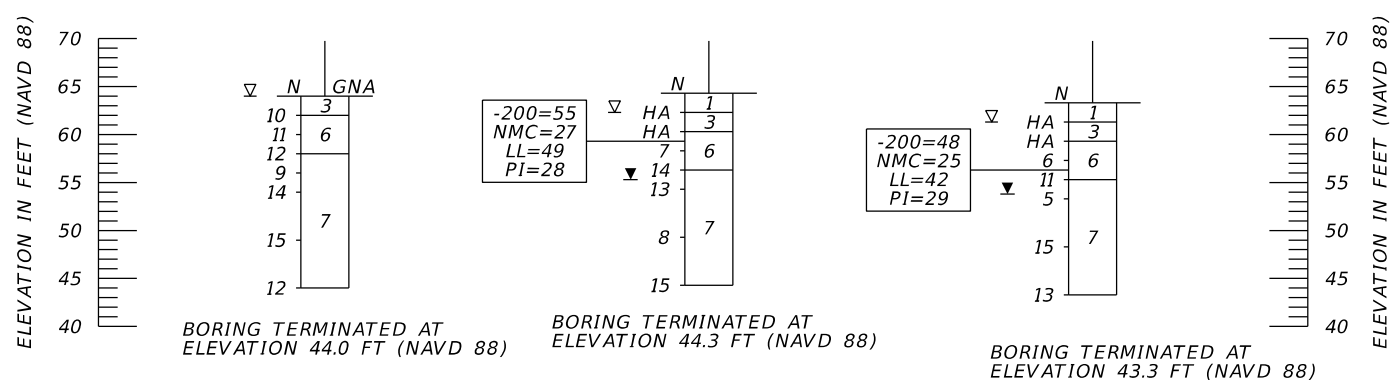
BORING LOCATION PLAN

- LEGEND**
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
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- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BOR # PB-23A-1
 STA. 305+56
 REF. CL SR 35
 OFF. 393 LT
 ELEV. 64.0
 DATE 11/16/2017
 DRILLER R.SHUEY
 HAMMER AUTOMATIC
 RIG D-25

BOR # PB-23A-2
 STA. 305+68
 REF. CL SR 35
 OFF. 188 LT
 ELEV. 64.3
 DATE 10/13/2017
 DRILLER J. SHAW
 HAMMER AUTOMATIC
 RIG D-25

BOR # PB-23A-3
 STA. 308+03
 REF. CL SR 35
 OFF. 127 LT
 ELEV. 63.3
 DATE 10/13/2017
 DRILLER J. SHAW
 HAMMER AUTOMATIC
 RIG D-25

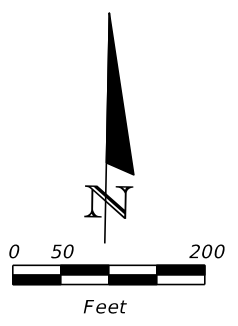
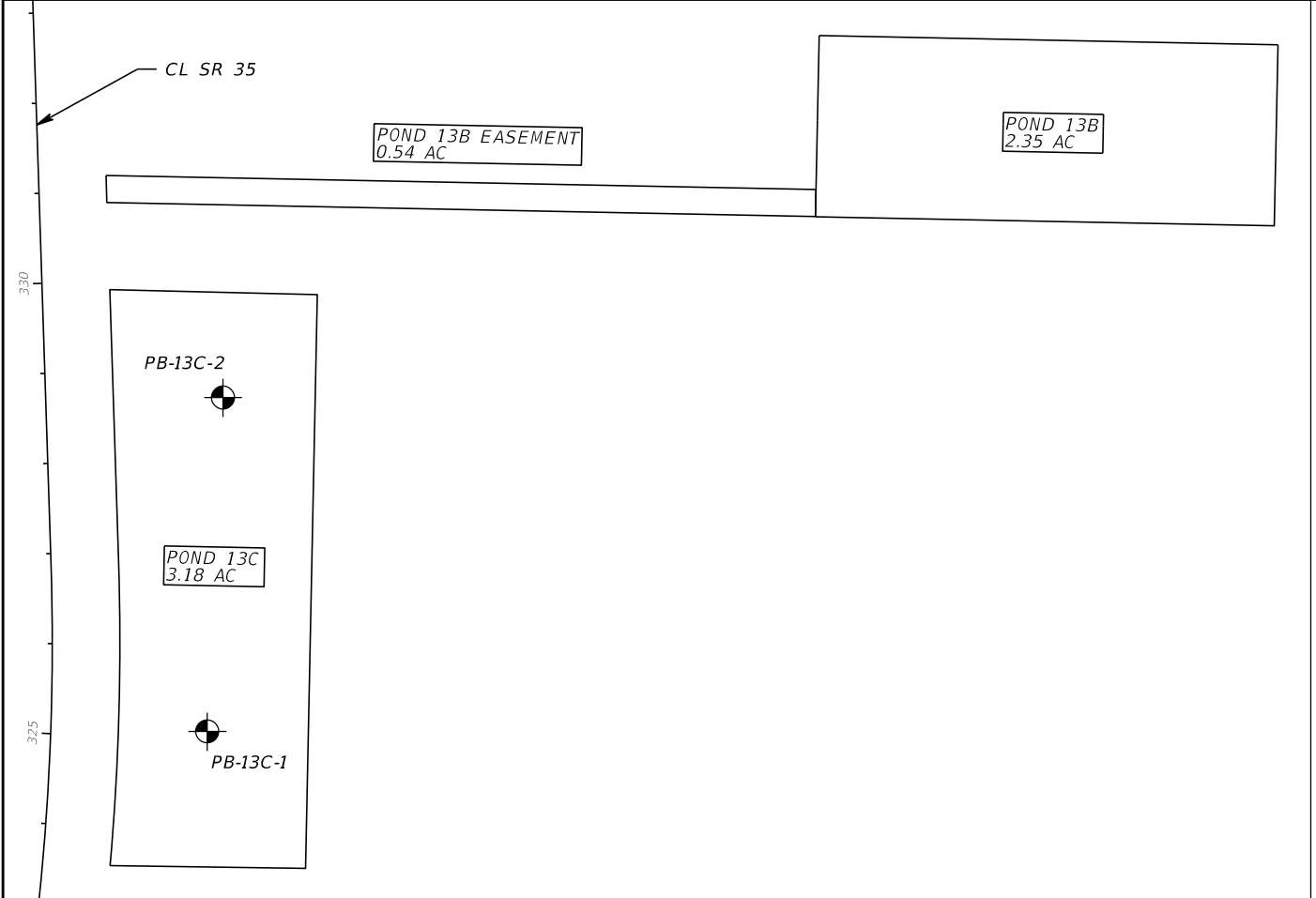


	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 15

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. POND SOIL SURVEY (10)
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

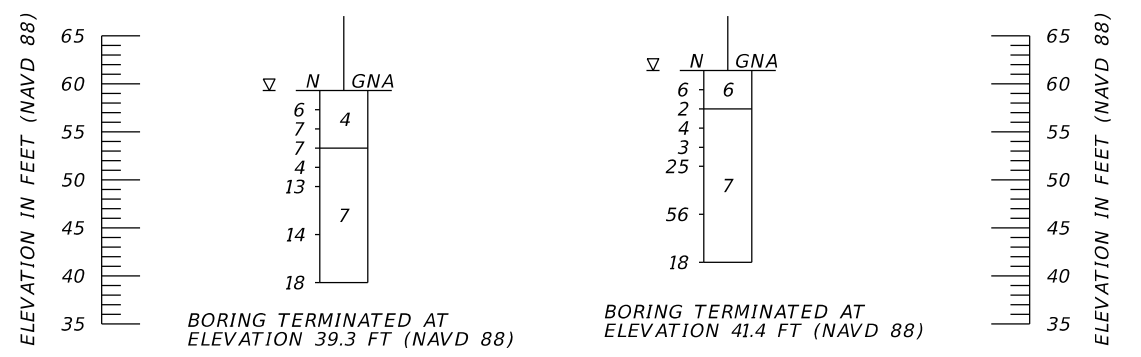


LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
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- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BORING LOCATION PLAN

BOR #	PB-13C-1	BOR #	PB-13C-2
STA.	325+08	STA.	328+67
REF.	CL SR 35	REF.	CL SR 35
OFF.	174 RT	OFF.	197 RT
ELEV.	59.3	ELEV.	61.4
DATE	11/1/2017	DATE	11/1/2017
DRILLER	J. SMITH	DRILLER	J. SMITH
HAMMER	AUTOMATIC	HAMMER	AUTOMATIC
RIG	D-50	RIG	D-50



	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
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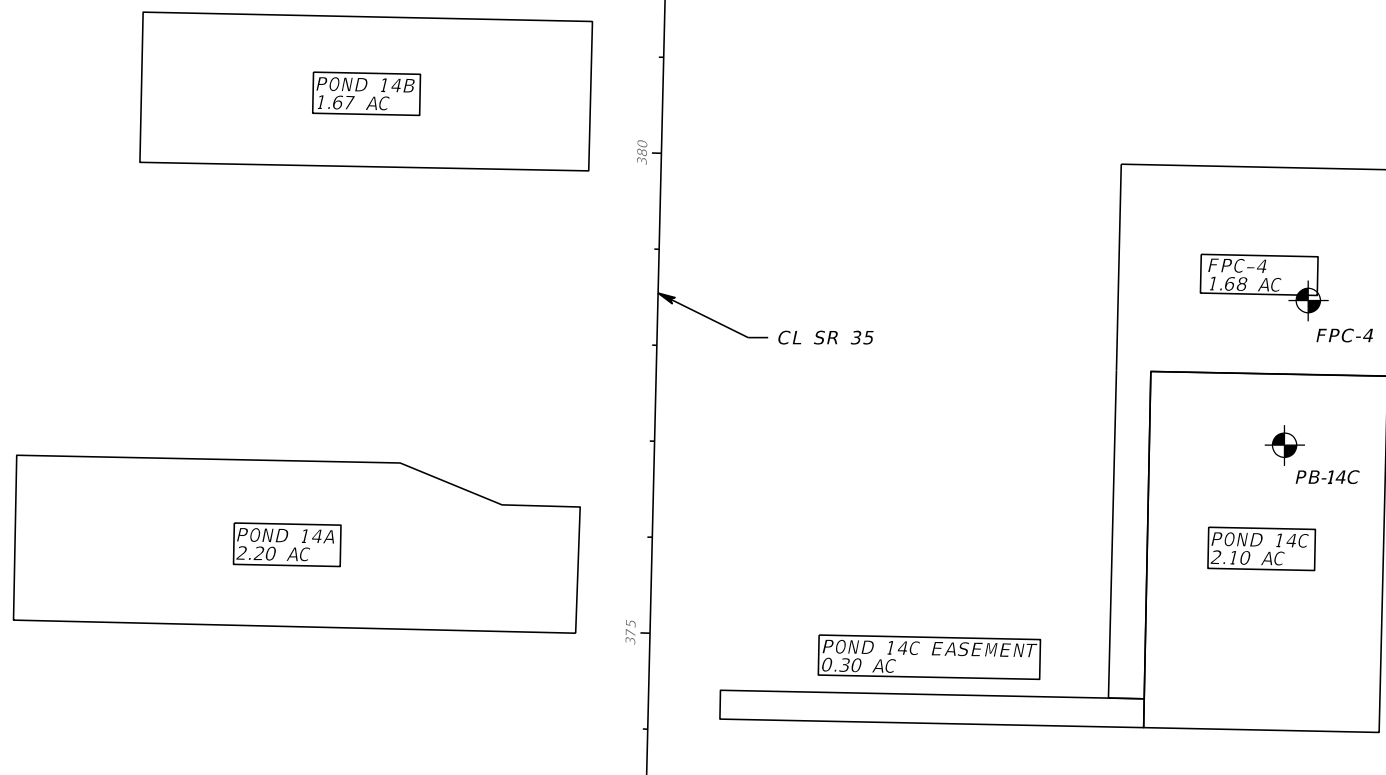
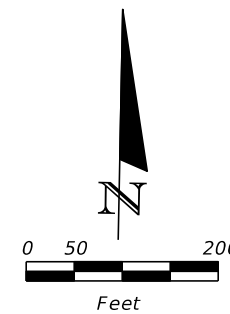
FIGURE 16

<table border="1"> <thead> <tr> <th colspan="2">REVISIONS</th> </tr> <tr> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>				REVISIONS		DATE	DESCRIPTION			JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	SHEET NO.
REVISIONS												
DATE	DESCRIPTION											
		<table border="1"> <thead> <tr> <th>ROAD NO.</th> <th>COUNTY</th> <th>FINANCIAL PROJECT ID</th> </tr> </thead> <tbody> <tr> <td>SR 35</td> <td>SUMTER</td> <td>430132-1-22-01</td> </tr> </tbody> </table>	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	SR 35	SUMTER	430132-1-22-01				
ROAD NO.	COUNTY	FINANCIAL PROJECT ID										
SR 35	SUMTER	430132-1-22-01										
		POND SOIL SURVEY (11)										

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LEGEND

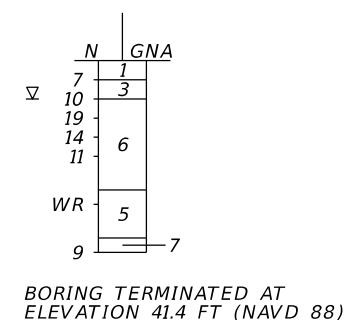
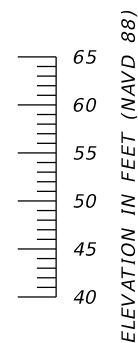
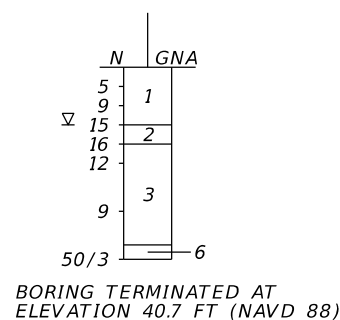
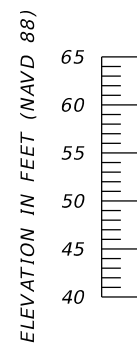
1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
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- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
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- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35



BORING LOCATION PLAN

BOR # PB-14C
 STA. 377+12
 REF. CL SR 35
 OFF. 656 RT
 ELEV. 60.7
 DATE 11/16/2017
 DRILLER R.SHUEY
 HAMMER AUTOMATIC
 RIG D-25

BOR # FPC-4
 STA. 378+63
 REF. CL SR 35
 OFF. 677 RT
 ELEV. 61.4
 DATE 11/16/2017
 DRILLER R.SHUEY
 HAMMER AUTOMATIC
 RIG D-25

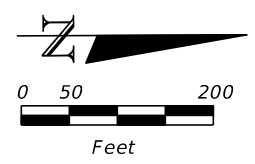
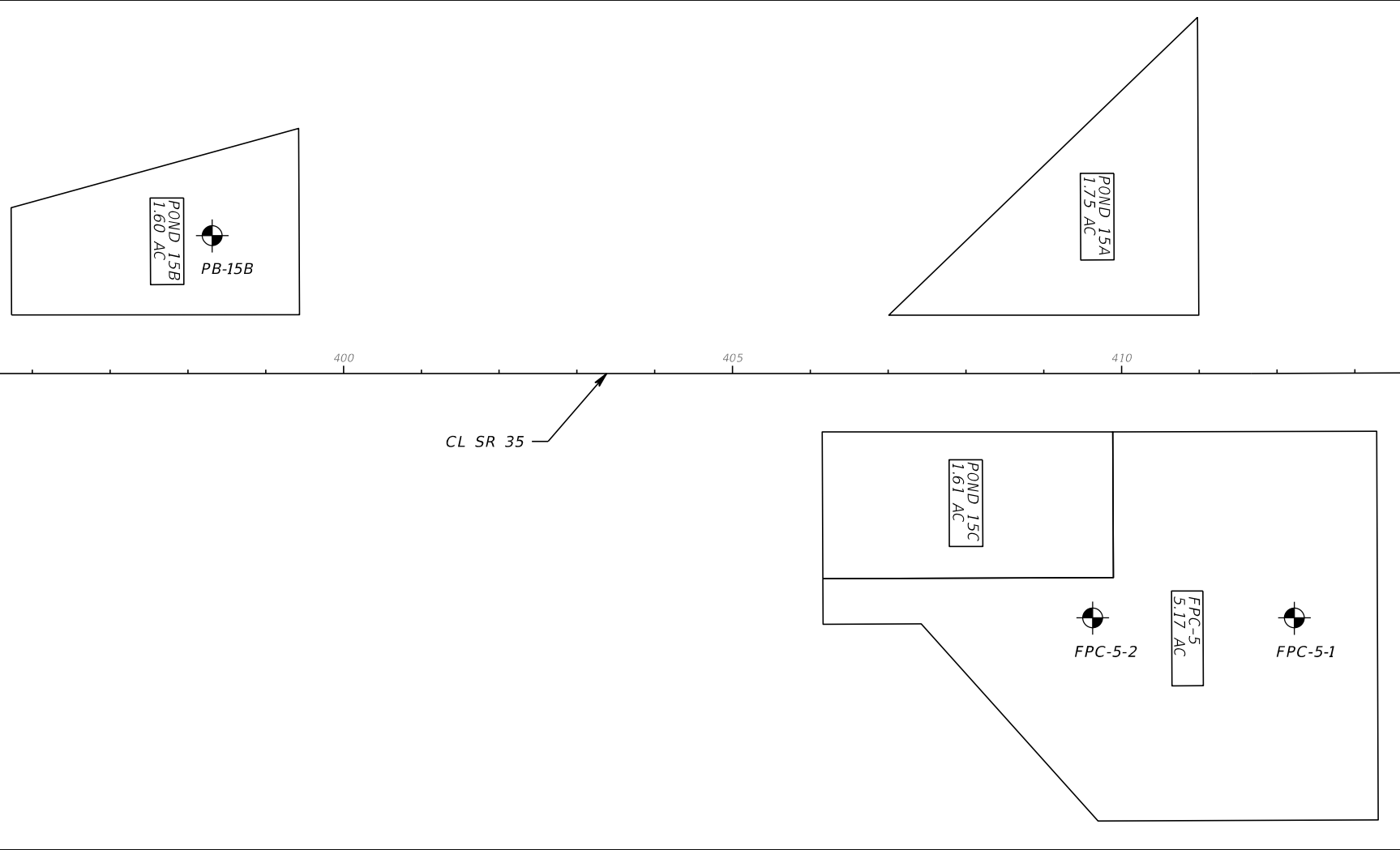


	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
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VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 17

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

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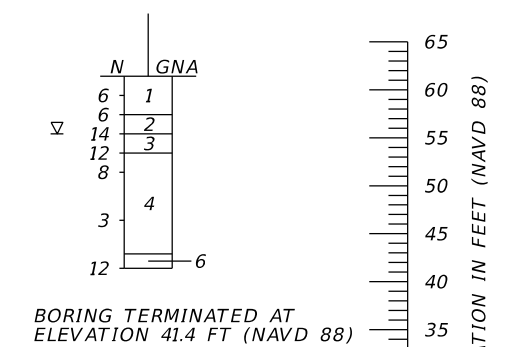
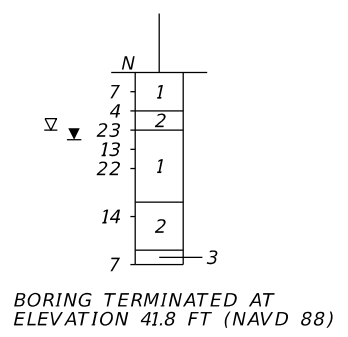
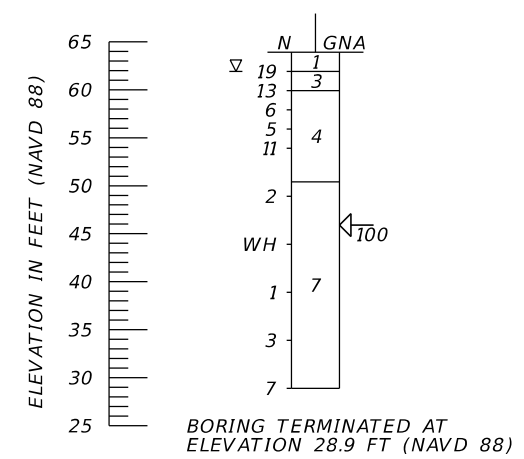
- ### LEGEND
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 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
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- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BORING LOCATION PLAN

BOR # PB-15B
 STA. 398+31
 REF. CL SR 35
 OFF. 177 LT
 ELEV. 63.9
 DATE 11/16/2017
 DRILLER R.SHUEY
 HAMMER AUTOMATIC
 RIG D-25

BOR # FPC-5-2
 STA. 409+63
 REF. CL SR 35
 OFF. 314 RT
 ELEV. 61.8
 DATE 11/2/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC
 RIG D-50

BOR # FPC-5-1
 STA. 412+21
 REF. CL SR 35
 OFF. 314 RT
 ELEV. 61.4
 DATE 11/2/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC
 RIG D-50

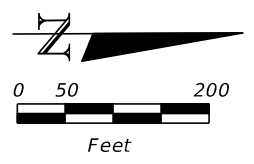


	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 18

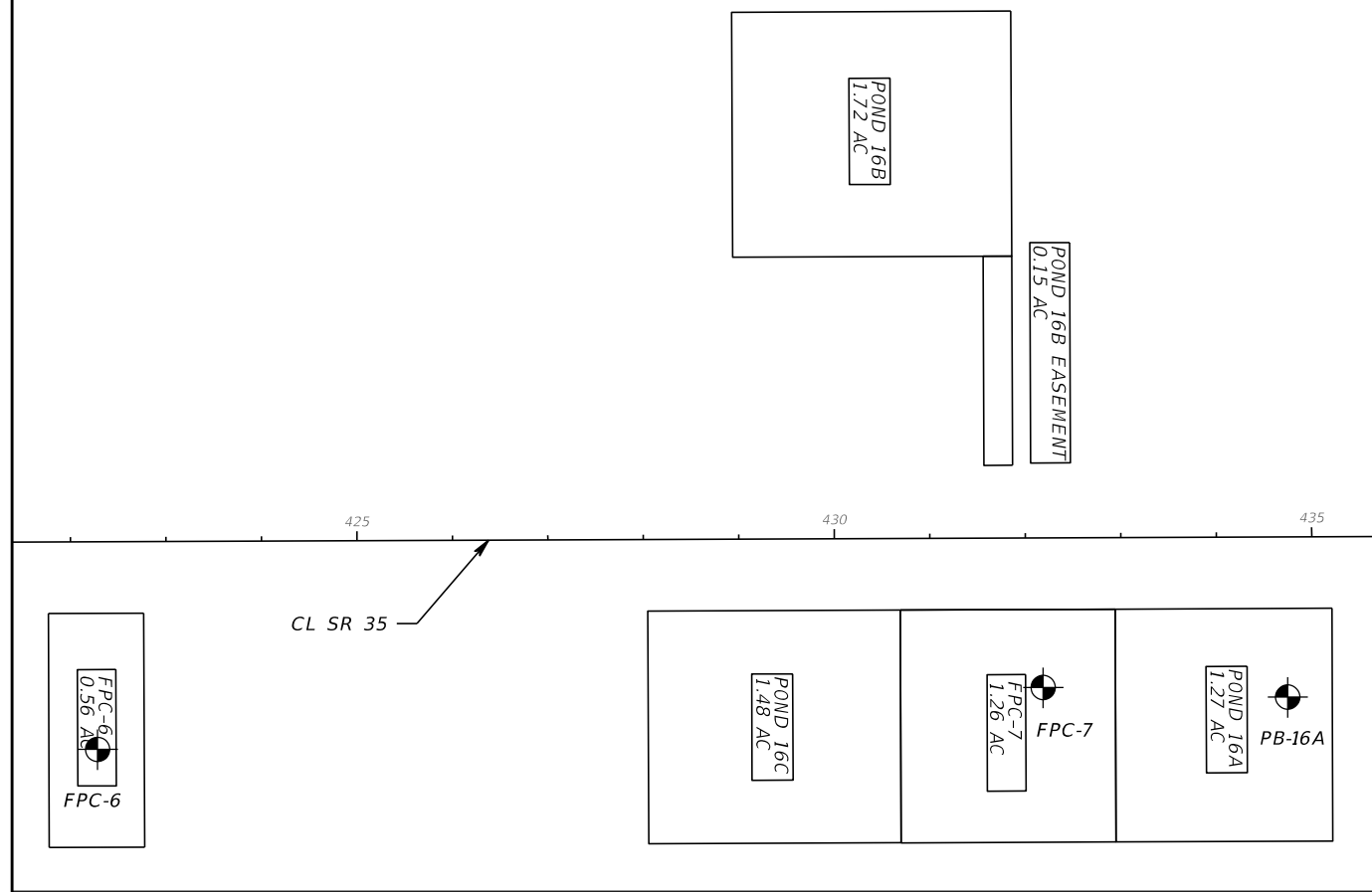
REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POND SOIL SURVEY (13)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 35	SUMTER	430132-1-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
 7. LIMESTONE/CAPROCK
 8. DARK GRAY ORGANIC SILTY SAND TO MUCK (A-8)
 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
- N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

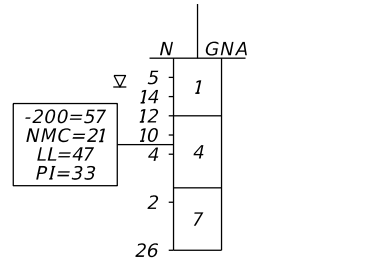
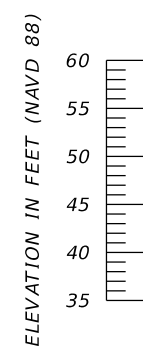


BORING LOCATION PLAN

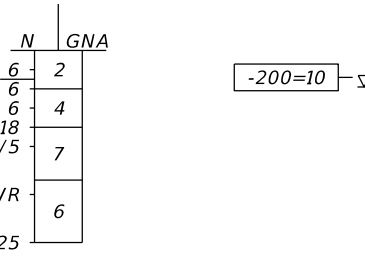
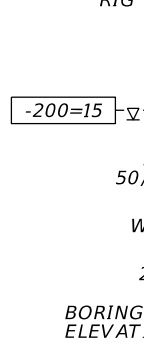
BOR # FPC-6
 STA. 422+28
 REF. CL SR 35
 OFF. 217 RT
 ELEV. 57.0
 DATE 11/2/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC RIG D-50

BOR # FPC-7
 STA. 432+18
 REF. CL SR 35
 OFF. 157 RT
 ELEV. 57.8
 DATE 11/2/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC RIG D-50

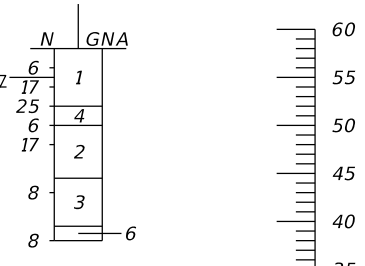
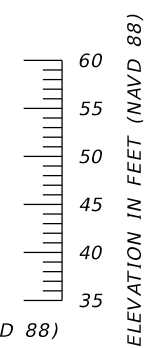
BOR # PB-16A
 STA. 434+74
 REF. CL SR 35
 OFF. 168 RT
 ELEV. 58.0
 DATE 11/2/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC RIG D-50



BORING TERMINATED AT ELEVATION 37.0 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 37.8 FT (NAVD 88)



BORING TERMINATED AT ELEVATION 38.0 FT (NAVD 88)

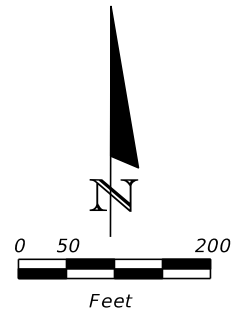
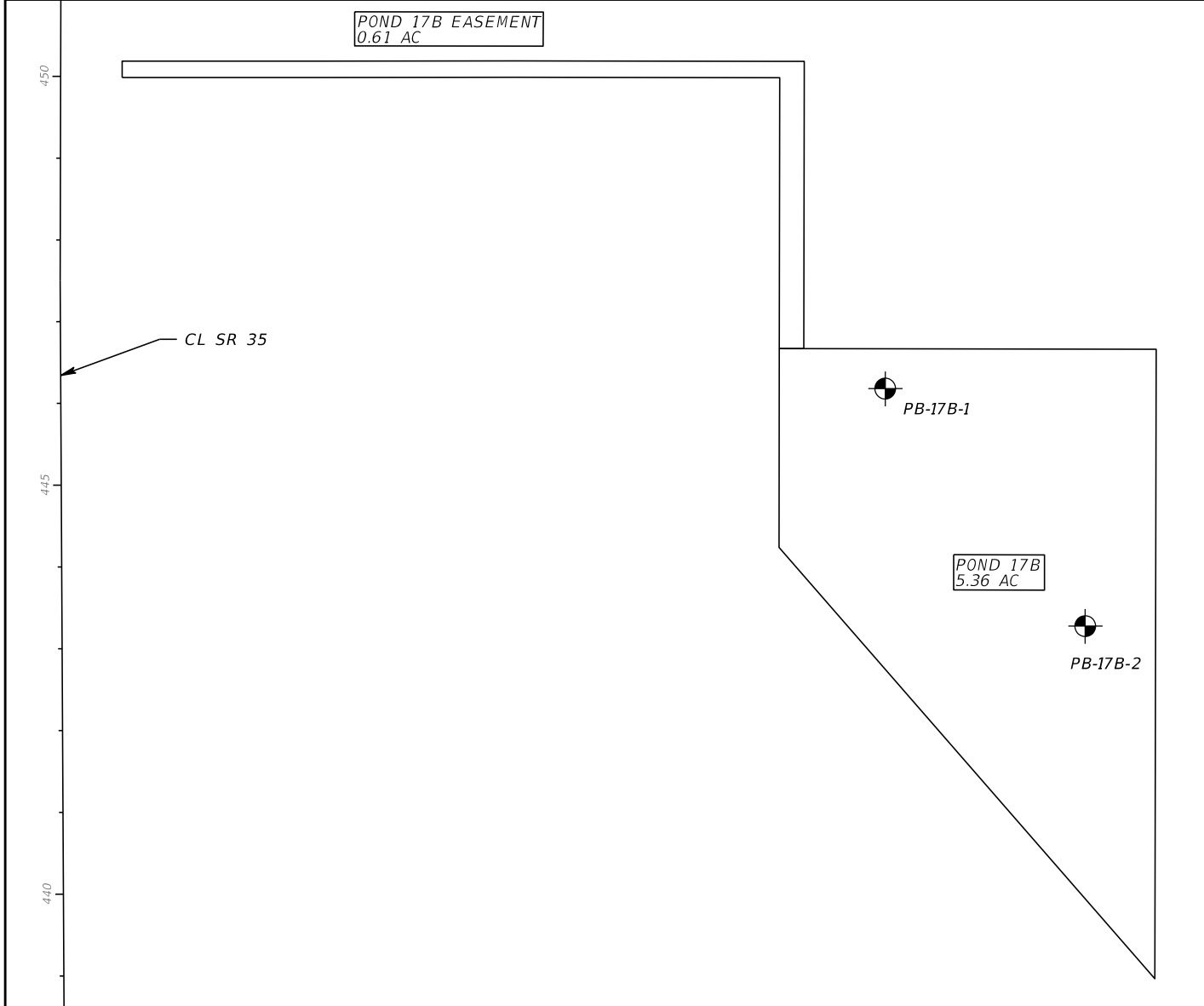
	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 19

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

POND SOIL SURVEY (14)

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



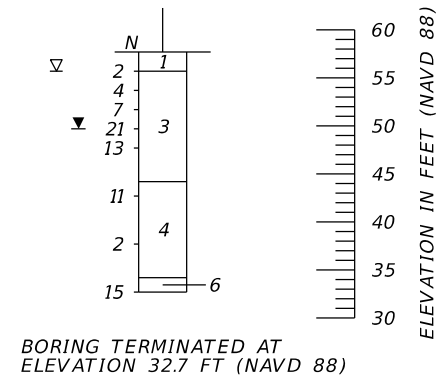
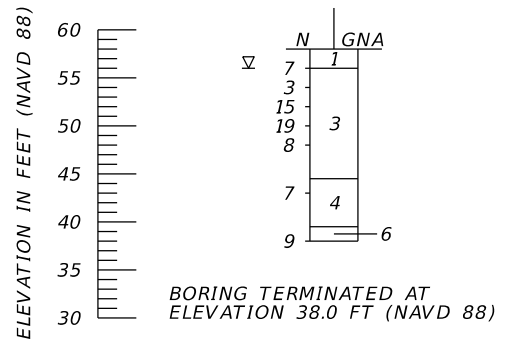
LEGEND

1. BROWN TO GRAY SAND TO SAND WITH SILT (A-3)
 2. BROWN TO GRAY SILTY SAND (A-2-4)
 3. GRAY-BROWN CLAYEY SAND (A-2-6/A-2-7)
 4. GRAY-BROWN TO GRAY SANDY SILT TO SANDY CLAY (A-4/A-6/A-7-5/A-7-6) (LL<50)
 5. LIGHT GRAY SAND TO SILTY SAND WITH LIMESTONE FRAGMENTS (A-3/A-2-4)
 6. LIGHT GRAY SANDY SILT TO SANDY CLAY WITH LIMESTONE FRAGMENTS (A-4/A-6/A-7-5/A-7-6)
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 9. GRAY-BROWN TO GRAY-SANDY SILT TO SANDY CLAY (LL>50)
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- 50/4 NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
- HA HAND AUGERED TO VERIFY UTILITY CLEARANCE
- WH SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
- WR SPLIT-SPOON SAMPLER ADVANCED UNDER WEIGHT OF ROD
- 200 PERCENT PASSING #200 SIEVE
 NMC NATURAL MOISTURE CONTENT (%)
 LL LIQUID LIMIT
 PI PLASTICITY INDEX
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988
- APPROXIMATE SPT BORING LOCATION
- GROUNDWATER LEVEL ENCOUNTERED DURING FIELD EXPLORATIONS
- ESTIMATED SEASONAL HIGH GROUNDWATER TABLE
- GNA GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
- LOSS OF CIRCULATION OF DRILLING FLUID (%)
- CL SR 35 CENTERLINE CONSTRUCTION SR 35

BORING LOCATION PLAN

BOR # PB-17B-2
 STA. 443+21
 REF. CL SR 35
 OFF. 1252 RT
 ELEV. 58.0
 DATE 11/1/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC
 RIG D-50

BOR # PB-17B-1
 STA. 446+13
 REF. CL SR 35
 OFF. 1009 RT
 ELEV. 57.7
 DATE 11/1/2017
 DRILLER J. SMITH
 HAMMER AUTOMATIC
 RIG D-50



	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
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FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

FIGURE 20

REVISIONS				JEREMY A. SEWELL, P.E. P.E. LICENSE NUMBER 62951 TIERRA, INC. 591 SUSAN B. BRITT COURT WINTER GARDEN, FLORIDA 34787 CERTIFICATE OF AUTHORIZATION NO. 6486	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. POND SOIL SURVEY (15)
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 35	SUMTER	430132-1-22-01	

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