Final Report of Geotechnical Engineering Investigation
For Retaining Wall Structures
WEKIVA PARKWAY (SR 429) – SECTION 7A
From 0.2 Miles West of Longwood-Markham Road
to 0.1 Miles East of Orange Boulevard
Seminole County, Florida
Financial Project ID 240200-2-52-01
GEC Project No. 3520G

June 23, 2017

AECOM
315 East Robinson Street, Suite 245
Orlando, Florida 32801

Attention: Mr. Steve Noppinger, P.E.
Project Manager

Subject: Final Report of Geotechnical Engineering Investigation for Retaining Wall Structures
WEKIVA PARKWAY (SR 429) – SECTION 7A
From 0.2 Miles West of Longwood-Markham Road
to 0.1 Miles East of Orange Boulevard
Seminole County, Florida
Financial Project ID 240200-2-52-01
GEC Project No. 3520G

Dear Mr. Noppinger:

Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to provide this Final Report of Geotechnical Engineering Investigation for Retaining Wall Structures for the above-referenced project. The purpose of this investigation was to evaluate soil and groundwater conditions along the proposed retaining wall structure alignments and provide geotechnical engineering recommendations to aid in design and construction of the proposed structures. This report presents the results of our field and laboratory investigations and includes our geotechnical recommendations for retaining wall design.

GEC appreciates the opportunity to work with AECOM and the Florida Department of Transportation (FDOT) District 5 on this project. Should there be any questions regarding the contents of this report, or if we may be of further assistance, please do not hesitate to contact us.

Very truly yours,

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, Florida 32814
Certificate of Authorization No. 5882

Craig G. Ballock, P.E.
Senior Geotechnical Engineer
Florida License No. 71571

Daniel C. Stanfill, P.E.
Senior Vice President
Florida License No. 42763

CC: Mr. Jeongsoo Ko, Ph.D., P.E. (Geotechnical Project Manager, FDOT District 5)

Table of Contents

APPENDIX

FIGURES

TABLES

APPENDIX 1

1.0 SITE AND PROJECT DESCRIPTION

The Wekiva Parkway (SR 429) Segment 7A project alignment… begins 0.2 miles west of Longwood-Markham Road (Station 954+00) and ends 0.1 miles east of Orange Boulevard (Station 1055+70)…

The Wekiva Parkway (SR 429) Segment 7A project alignment consists of an approximately 2-mile long portion of the Wekiva Parkway alignment that begins 0.2 miles west of Longwood-Markham Road (Station 954+00) and ends 0.1 miles east of Orange Boulevard (Station 1055+70) in Seminole County, Florida. The project alignment is depicted on excerpts of the U.S. Geological Survey (USGS) Sanford and Sanford SW, Florida Quadrangle Maps (**Figures 1A – 1B**) in the **Appendix**.

The project alignment of the proposed SR 429 generally follows the existing SR 46 alignment, which currently consists of a two-lane, undivided rural highway composed of two, 12-foot lanes and open swale drainage. The majority of the land use along the project alignment consists of rural residential dwellings with several plant nurseries located along the project alignment. The Wekiva River is located just to the west of the project alignment and several lakes, including Miranda Lake, Yankee Lake, Ross Lake, Sylvan Lake and Lake Markham, are located in the vicinity of the project alignment.

Based on our review of the project plans, we understand the following major project elements are proposed along the project alignment:

- An approximately 2-mile long portion of the Wekiva Parkway alignment that begins west of Longwood-Markham Road (Station 954+00) and ends east of Orange Boulevard (Station 1055+70). The proposed roadway typical section in this area includes a four-lane divided (expandable to six-lane divided) section. The proposed roadway profile depicts all but about 1,000 feet (Station 993+00 to 1003+00) of high fill embankment ranging in height from 10 to 38 feet above existing grade.
- Two service road alignments (north and south of SR 429) to provide access to local traffic.
- Twelve MSE wall alignments are proposed along the project alignment with wall heights ranging from approximately 5 to 37 feet above existing grade.
- Four gravity wall alignments are proposed along the project alignment with wall heights ranging from approximately 1.5 to 5 feet above existing grade.
- Six bridge sites including:
    - Wekiva Parkway over Longwood Markham Road (twin bridges)
    - Wekiva Parkway over Yankee Lake Road (twin bridges)

    - Wekiva Parkway over Lake Markham Road (twin bridges)
    - Wekiva Parkway over Glade View Drive (twin bridges)
    - Wekiva Parkway over Eastbound Frontage Road (twin bridges)
    - Wekiva Parkway over Orange Avenue & Orange Boulevard (twin bridges)
- Two toll facilities located on Ramp E and Ramp F, which include a toll gantry structure and associated support facilities.
- Seven cantilever sign structures and four truss sign structures.
- Four mast arm signal poles at the intersection of Orange Boulevard and SR 46.
- One, approximately 282-ft long, 9-ft by 2-ft box culvert structure.
- Seven CCTV pole structures associated with the project ITS.
- One, approximately 700-ft long, cast-in-place (CIP) cantilever retaining wall on the north side of the Westbound Frontage Road adjacent to Pond WR2.
- One, approximately 1,300-ft long, noise wall along the Westbound Frontage Road near the 12 Oaks RV Resort Property.

The retaining wall locations are shown on excerpts of the U.S. Geological Survey (USGS) Florida Quadrangle maps on **Figures 1A** and **1B** in the **Appendix**. A summary of the proposed retaining walls is presented **Table 6** in the **Appendix**.

This report describes our exploration procedures, exhibits the data obtained and presents our conclusions and recommendations regarding the geotechnical engineering aspects of the retaining wall structures improvements, including MSE retaining walls, CIP walls, noise walls, sheet pile walls and gravity walls. Geotechnical recommendations and the results of the geotechnical investigations for the bridge and miscellaneous structures proposed along the project alignment are submitted under separate cover.

2.0 REVIEW OF AVAILABLE DATA

To obtain general information on soil and groundwater conditions in the project area, GEC reviewed available data including USGS Quadrangle Maps, the Natural Resources Conservation Service (NRCS) Soil Survey of Seminole County and other published sources. A summary of this information is presented in the following report sections.

2.1 USGS Quadrangle Maps

Based on our review of the USGS Sanford and Sanford Southwest, Florida Quadrangle maps and the project plans, the existing ground surface elevations along the project alignment typically

range from approximate elevation +34 to +74 feet NAVD88. In addition, the quadrangle map indicates that portions of the project alignment were historically used for citrus groves and that the proposed alignment crosses in the vicinity of several topographically lower swamp features near the proposed Glade View Drive bridge site.

…several circular depression features and circular lakes, indicative of relic sinkholes… are… in the vicinity of the project alignment.

Also of note are several circular depression features and circular lakes, indicative of relic sinkholes, which are depicted on the quadrangle map in the vicinity of the project alignment. The Wekiva River is located just to the west of the project alignment and several lakes, including Miranda Lake, Yankee Lake, Ross Lake, Sylvan Lake and Lake Markham, are located in the vicinity of the project alignment.

The project alignment and proposed retaining wall locations are depicted on an excerpt of the U.S. Geological Survey (USGS) Sanford and Sanford Southwest, Florida Quadrangle Maps (**Figures 1A** and **1B**) in the **Appendix.**

Based on our review of the project cross-sections at our boring locations, the approximate existing ground surface elevations at our boring locations performed along the proposed retaining wall alignments are summarized in **Table 7** in the **Appendix**.

2.2 NRCS Soil Survey Review

The Natural Resources Conservation Service (NRCS) Soil Survey of Seminole County was reviewed to obtain near-surface soils information in the vicinity of the proposed retaining wall alignments. According to the NRCS map, the soils in the vicinity of the proposed retaining walls are summarized below. The NRCS Soil Survey map of the project area is shown on **Figures 2A** and **2B** in the **Appendix**.

Table 1
NRCS Soil Survey Classifications

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)
2	Adamsville fine sand	0 – 4 4 – 80	Fine sand Fine sand, sand	SP-SM SP, SP-SM	2.0 – 3.5
	Sparr fine sand	0 – 41 41 – 43 43 – 72 72 – 80	Fine sand, sand Sandy loam, sandy clay loam Sandy clay, sandy clay loam Sandy loam, sandy clay loam	SP-SM, SM SM, SC-SM, SM SC-SM, SC SM, SC-SM, SC	1.5 – 3.5
6	Astatula fine sand, 0 to 5 percent slopes	0 – 80	Fine sand, sand	SP, SP-SM	> 6.0
	Apopka fine sand, 0 to 5 percent slopes	0 – 64 64 – 80	Fine sand Sandy clay loam, sandy loam, sandy clay	SP, SP-SM SC-SM, SC	
10	Basinger soil, depressional	0 – 6 6 – 80	Mucky fine sand Fine sand, sand	SP, SP-SM SP, SP-SM	+2.0 – 0.0
	Hontoon soil, depressional	0 – 80	Muck	PT	
	Samsula soil, depressional	0 – 30 30 – 80	Muck Fine sand, loamy sand	PT SP, SP-SM, SM	
13	Eaugallie fine sand	0 – 18 18 – 30 30 – 45 45 – 64 64 – 80	Fine sand Fine sand, sand Fine sand, sand Sandy loam, sandy clay loam Sand, loamy sand	SP, SP-SM SP-SM, SM SP, SP-SM SM, SC-SM, SC SP-SM, SM	0.5 – 1.5
	Immokalee fine sand	0 – 42 42 – 62 62 – 80	Fine sand, sand Fine sand, sand Fine sand, sand	SP, SP-SM SP-SM, SM SP, SP-SM	
20	Myakka fine sand	0 – 28 28 – 45 45 – 80	Fine sand, sand Fine sand, sand, loamy fine sand Fine sand, sand	SP, SP-SM SP-SM, SM SP, SP-SM	0.5 – 1.5
	EauGallie fine sand	0 – 18 18 – 30 30 – 41 41 – 60 60 – 80	Fine sand Fine sand, sand Fine sand, sand Sandy clay loam, sandy loam Loamy sand, sand	SP, SP-SM SP-SM, SM SP, SP-SM SM, SC-SM, SC SP-SM, SM	
24	Paola sands, 0 to 5 percent slopes	0 – 80	Fine sand, sand	SP	> 6.0
	St. Lucie sands, 0 to 5 percent slopes	0 - 80	Fine sand, sand	SP	

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)
27	Pomello fine sand, 0 to 5 percent slopes	0 – 31 31 – 40 40 – 80	Fine sand Fine sand, sand Fine sand, sand	SP, SP-SM SP-SM, SM SP, SP-SM	2.0 – 3.5
31	Tavares fine sand, 0 to 5 percent slopes	0 – 80	Fine sand, sand	SP, SP-SM	3.5 – 6.0
	Millhopper fine sand, 0 to 5 percent slopes	0 – 45 45 – 54 54 – 80	Fine sand Sandy loam, loamy fine sand Sandy clay loam, sandy loam	SP-SM, SM SM SM, SC-SM, SC	
35	Wabasso fine sand	0 – 18 18 – 25 25 – 27 27 – 70 70 – 80	Fine sand, sand Loamy sand, fine sand, sand Fine sand, sand Sandy clay loam, sandy loam Loamy sand, fine sand, sand	SP, SP-SM SP-SM, SM SP, SP-SM SC-SM, SC SP-SM, SM	0.5 – 1.5

The NRCS soil types depicted by the NRCS at the proposed boring locations along the retaining wall alignments are summarized in **Table 7** in the **Appendix**. In general, the NRCS soil survey map depicts sandy soils with seasonal high groundwater levels ranging from 0.5 to greater than 6.0 feet below the natural ground surface. The soils classifying as SP, SP-SM and SM can be treated as Select (S) soil types and are generally appropriate for use as fill material to support structures, roadways and embankments. However, the clayey soils classifying as SC and SC-SM have limited suitability for use as fill material.

Along MSE wall alignments 6, 7 and 14 near the Lake Markham Road bridge site, the NRCS soil survey map depicts Basinger, Samsula and Hontoon soils, depressional (10).

Along MSE wall alignments 6, 7 and 14 near the Lake Markham Road bridge site, the NRCS soil survey map depicts Basinger, Samsula and Hontoon soils, depressional (10). This soil type contains high organic content soils that are generally classified as PT in the USCS and can have severe limitations for roadway construction. In addition, the NRCS predicts seasonal high groundwater levels for this soil type to range from 2 feet above the existing ground surface to at the existing ground surface.

Information contained in the NRCS Soil Survey is very general and may be outdated. It may not therefore be reflective of actual soil and groundwater conditions, particularly if recent development in the site vicinity has modified soil conditions or surface/subsurface drainage. The

soils and groundwater data collected as part of this study should be considered a more accurate representation of soil conditions along the project alignment.

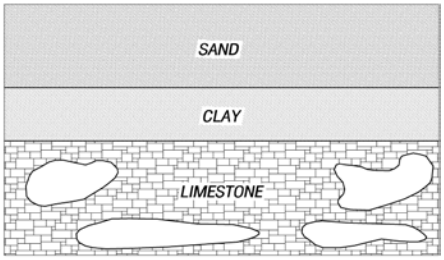
2.3 USGS Potentiometric Map Data

GEC reviewed the September 2008 USGS Map, "Potentiometric Surface of The Upper Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida," to evaluate the potentiometric surface elevation of the Floridan Aquifer at the proposed miscellaneous structure locations. **Table 7** in the **Appendix** summarizes the anticipated maximum elevation of the potentiometric surface along the proposed retaining wall alignments.

…artesian flow conditions are not anticipated at the proposed retaining wall sites.

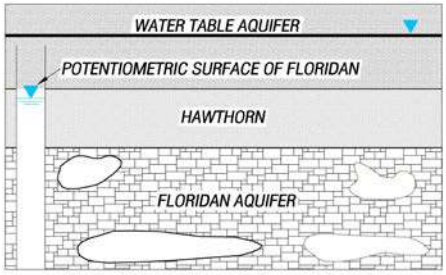
Since the existing ground surface elevations along proposed retaining wall alignments are above the predicted potentiometric surface, artesian flow conditions are not anticipated at the proposed retaining wall sites. Artesian conditions were not encountered at any of the boring locations.

3.0 REGIONAL GEOLOGY

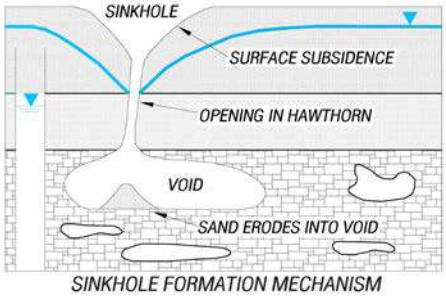


KARST GEOLOGY OF CENTRAL FLORIDA

Due to its prevalent geology, referred to as karst, Central Florida is prone to the formation of sinkholes, or large, circular depressions created by local subsidence of the ground surface. The nature and relationship of the three sedimentary layers typical of Central Florida geology cause sinkholes. The deepest, or basement, layer is a massive cavernous limestone formation known as the Floridan aquifer. The Floridan aquifer limestone is overlain by a silty or clayey sand, clay, phosphate, and limestone aquitard (or flow-retarding layer) ranging in thickness from nearly absent to greater than 100 feet and locally referred to as the Hawthorn formation. The Hawthorn formation is in turn overlain by a 40 to 70-foot thick surficial layer of sand, bearing the water table aquifer. The likelihood of sinkhole occurrence at a given site within the region is determined by the relationship among these three layers, specifically by the water (and soil)-transmitting capacity of the Hawthorn formation at that location.



CENTRAL FLORIDA AQUIFER SYSTEMS



SINKHOLE FORMATION MECHANISM

The water table aquifer is comprised of Recent and Pleistocene sands and is separated from the Eocene limestone of the Floridan aquifer by the Miocene sands, clays and limestone of the Hawthorn formation. Since the thickness and consistency of the Hawthorn layer is variable across Central Florida, the likelihood of groundwater flow from the upper to the lower aquifer (known as aquifer recharge) will also vary by geographical location. In areas where the Hawthorn formation is absent, water table groundwater (and associated sands) can flow downward to cavities within the limestone aquifer, like sand through an hourglass, recharging the Floridan aquifer, and sometimes causing the formation of surface sinkholes. This process of subsurface erosion associated with recharging the Floridan aquifer is known as raveling. Thus, in Central Florida, areas of effective groundwater recharge to the Floridan aquifer have a higher potential for the formation of surface sinkholes.

No method of geological, geotechnical, or geophysical exploration is known that can accurately predict the occurrence of sinkholes. It is common geotechnical practice in Central Florida to make a qualitative prediction of sinkhole risk on the basis of local geological conditions in the vicinity of a particular site.

…project alignment lies in a low to moderate recharge area between approximate stations 931+20 to 980+00 and a moderate to high recharge area between approximate stations 980+00 to 1114+56.

Based on our review of the U.S. Geological Survey Map entitled "Recharge and Discharge Areas of the Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida," 1984, the project alignment lies in a low to moderate recharge area between approximate stations 931+20 to 980+00 and a moderate to high recharge area between approximate stations 980+00 to 1114+56. We can conclude based solely on the available recharge data that the proposed miscellaneous structures are located in an area where the relative risk of sinkhole formation ranges from low to high compared to the overall risk across Central Florida.

4.0 SUBSURFACE EXPLORATION

GEC evaluated subsurface conditions along the proposed MSE retaining wall alignments by performing Standard Penetration Test (SPT) borings or Cone Penetration Test (CPT) soundings to a minimum depth of twice the proposed retaining wall height at the proposed boring location. In addition, a 100-foot SPT boring was performed approximately 100 feet behind each bridge end bent at bridge sites. Because proposed retaining wall alignments run parallel along the majority of the project alignment, borings were performed on approximate 300-foot intervals along the wall alignments and staggered on 150-foot intervals with parallel wall alignments.

Roadway auger borings, performed on 100-foot intervals by Antillian Engineering Associates, were utilized for evaluation of the majority of the gravity walls. However, where no roadway auger boring information was available, GEC performed SPT borings on approximate 150-foot intervals to a depth of 10 feet along the gravity wall alignments.

Along the proposed CIP cantilever retaining wall alignment, GEC performed SPT borings to a depth of 15 feet on approximate 150-foot intervals. In addition, along the proposed noise wall alignment, GEC performed SPT borings to a depth of 30 feet on approximate 200 to 300-foot intervals. Along the proposed sheet pile wall alignment, GEC performed SPT borings on approximate 100-ft intervals to depths ranging from 75 to 165 feet. The locations and depths of our borings are summarized in **Table 6** in the **Appendix.**

Boring and sounding locations were established in the field using project plans and a handheld, sub-meter accuracy, Global Positioning Satellite (GPS) unit (Trimble GeoXT 500 Series). Ground surface elevations at the boring locations were either surveyed in the field by AECOM or estimated from project cross-sections.

4.1 Standard Penetration Test Borings

SPT borings were drilled in general accordance with ASTM Procedure D-1586. The boreholes were advanced by the rotary wash method with bentonite-based mud used as the circulating fluid to stabilize the borehole. Casing was used as necessary to stabilize the borehole and prevent loose surficial sands from raveling into the lower more stable portions of the borehole. GEC's field crew obtained SPT samples continuously in the borings to a depth of 10 feet and at 5-foot depth intervals thereafter. However, some boring locations were hand augered to a depth of 6 feet to avoid damage to underground utilities. A GEC engineering technician monitored the drilling operation, and collected, examined and visually classified each sample. He then packaged

representative portions of each sample for transport to our laboratory for further examination and laboratory testing.

4.2 Cone Penetration Test Soundings

The Cone Penetration Test (CPT) soundings were performed in general accordance with ASTM Specification D 5578. The cone penetrometer is pushed into the soil by means of a hydraulic thrust system at a constant rate of 24 to 48 inches per minute. The penetrometer tip has a cone angle of 60 degrees, a base diameter of 1.4 inches and a total area of 1.55 square inches. A friction sleeve with the same diameter as the base of the cone is located directly above the cone tip. Hollow push rods are used to advance the cone penetrometer in 3.3-foot (1 meter) increments. Point stress and local side friction are continuously measured during each 3.3-foot (1 meter) push by transducers located in the cone tip and friction sleeve. An electric cable threaded through the push rods transmits the transducer signals to a computer for data processing and recording. The resulting point stress and local friction CPT data are presented graphically in the **Appendix**.

4.3 Groundwater Measurement

A GEC engineering technician measured the depth to the groundwater in the boreholes at the time of drilling and again after approximately 24 hours. Once the groundwater measurements were recorded, the boreholes were backfilled with soil cuttings to prevailing ground surface.

For SPT boring locations, which were grout-sealed upon completion, a GEC engineering technician performed a hand auger boring to a depth of 10 feet adjacent to the grouted borehole to obtain a stabilized groundwater depth. Once a 24-hour groundwater measurement was recorded, the hand auger boreholes were then backfilled with soil cuttings to prevailing ground surface. At some grouted SPT boring locations where groundwater was not encountered to a depth of 10 feet in adjacent hand auger borings a non-stabilized groundwater level measured at the time the borehole was drilled is indicated on the boring profiles.

4.4 Undisturbed Samples

Undisturbed samples of compressible soils were collected using a thin-walled “Shelby” tube sampler. The sampler was hydraulically pushed into the soil at the desired sample depth. After allowing the sampler to sit for a short period of time it was retrieved from the borehole where the soil at the top and bottom of the tube was sampled and classified. The 3-inch diameter tube was moisture sealed in the field immediately after sampling and returned to our laboratory for further

examination and testing. The sample depth is noted on the Report of SPT Borings sheet in the **Appendix**.

4.5 Field Vane Shear Tests

Vane shear tests were conducted at boring locations MB-1, WB-138, MB-8, WB-140 and MB-11 on the organic soil layers encountered along the proposed sheet pile wall alignment. This test is commonly used for measuring shear strength in soft clay and organic soil deposits.

The field vane test consists of advancing a four-bladed vane into soil to the desired test depth and applying a measured torque at a constant rate until the soil fails in shear along a cylindrical surface. The torque measured at failure is used to calculate the undrained shear strength of the soil. This test was performed in general accordance with ASTM D 2573.

Results of the field vane shear tests are presented adjacent to the respective boring profile in the **Appendix**. These results are shown in terms of S_u (undrained shear strength) and S_R (remolded shear strength).

5.0 LABORATORY TESTING

Selected soil and water samples retrieved from the boring locations were tested in accordance with Florida Standard Testing Methods (FM). Florida Standard Testing Methods are adaptations of recognized standard methods, e.g., ASTM and AASHTO, which have been modified to accommodate Florida's geological conditions. The GEC laboratory has been reviewed by the Construction Materials Engineering Council (CMEC). The laboratory testing program for this project is summarized in **Table 2**:

Table 2
Summary of Laboratory Testing Program

Type of Test	Number of Tests
Percent Fines (FM 1-T88)	543
Atterberg Limits (FM 1-T89/90)	117
Natural Moisture Content (FM 1-T265)	205
Organic Content (FM 1-T 267)	82
Unit Weight (ASTM D7263-09)	11
Specific Gravity (FM 1-T100)	11

Type of Test	Number of Tests
Consolidation Test (ASTM D-2435)	11
Corrosion Series (FM 5-550/551/552/553)	2

The results of our laboratory tests are shown adjacent to the soil profiles on the Report of SPT Borings sheets in the **Appendix**.

Corrosion series tests were performed on representative soil samples obtained at the CIP retaining wall site to evaluate the substructure environmental classification. In accordance with the FDOT Structure Design Guidelines and the results of our corrosion series test results, the substructure environmental classification for CIP retaining wall site is summarized in **Table 13** in the **Appendix**.

5.1 Consolidation Testing

A portion of the undisturbed samples obtained at the boring locations were sampled for one-dimensional consolidation testing in general accordance with ASTM-D2435. Undisturbed samples selected for testing are carefully trimmed and placed in the fixed ring consolidometer. A seating pressure of about 100 psf is applied and the sample is inundated in water. The sample submergence is maintained throughout the test.

The sample is then incrementally loaded and deflections are monitored. Each incremental load is maintained until internal pore pressures are dissipated as indicated by a flattening of the time-deflection curve. A rebound of the sample is provided at a selected load increment when the sample is unloaded and reloaded to obtain further details of the loading characteristics of the soil.

The data obtained during incremental loading is reduced and a semi-log plot of sample void ratio versus applied stress is created. A copy of this curve is included in the **Appendix** of this report. This curve is utilized to estimate the magnitude of settlement that will be induced by anticipated site loadings. The curve is also used to estimate the pre-consolidation pressure (P_C) and the over-consolidation ratio (OCR) of the soils tested. The results of our consolidation tests and associated laboratory soil classification tests are summarized in the following table.

Table 3
Summary of Consolidation Test Results

Wall Nos.	Boring No.	USCS Soil Type	Test Depth (feet)	N-Value (blows/ft)	e_O	Overburden Pressure (tsf)	P_c (tsf)	OCR	C_c	C_r
6	WB-49	CL	27 – 29	3	2.09	1.02	3.67	3.60	0.57	0.04
7 / 14	BR-24	PT	20.5 – 22.5	2	2.57	0.49	1.06	2.16	0.38	0.04
7 / 14	MB-10	PT	20 – 22	W/H	6.14	0.54	0.73	1.35	1.14	0.11
7	WB-56	PT	20 – 22	2	2.01	0.41	1.17	2.85	0.32	0.01
7	WB-56	PT	50 – 52	3	4.89	0.83	1.81	2.18	1.09	0.12
7	MB-14	PT	35 – 37	3	3.60	0.95	1.86	1.96	0.75	0.08
7	MB-14	PT	50 – 52	2	1.90	1.20	1.35	1.13	0.34	0.04
9	BR-30B	CH	38 – 40	4	1.80	1.60	2.09	1.31	0.37	0.06
10	WB-114	MH	45 – 47	5	2.22	1.39	3.96	2.85	0.61	0.12
10	BR-32	CH	43 – 45	7	2.60	1.35	3.85	2.85	0.89	0.11
11	WB-119	CH	40 – 42	3	2.63	1.30	2.49	1.92	0.67	0.17

The average OCR for the cohesive clay/silt soils (USCS soil types CL, CH, MH) is 2.82 and the average OCR for the organic soil types (USCS soil type PT) is 1.33.

6.0 DESCRIPTION OF SUBSURFACE CONDITIONS

The results of our borings and soundings are presented on Report of SPT Borings and CPT Soundings sheets in the **Appendix**. The boring logs describe the soil layers using the Unified Soil Classification System (USCS) symbol (e.g., SP-SM) and ASTM soil descriptions (e.g., sand with silt). We based our soil classifications and descriptions on visual examination and the limited laboratory testing shown adjacent to the boring profiles on the Report of SPT Borings and CPT Soundings sheets.

The boring logs indicate subsurface conditions only at the specific boring locations at the time of our field exploration. Subsurface conditions, including groundwater levels, at other locations of the project site may differ from conditions we encountered at the boring locations. Moreover, conditions at the boring locations can change over time. Groundwater levels fluctuate seasonally, and soil conditions can be altered by earthmoving operations.

The depths and thicknesses of the subsurface strata indicated on the boring logs were interpolated between samples obtained at different depths in the borings. The actual transition between soil layers may be different than indicated. *These stratification lines were used for our analytical purposes and actual earthwork quantities measured during construction should be expected to vary from quantities calculated based on the information in this report.*

6.1 MSE Retaining Walls – Subsurface Profiles

In general, the SPT borings and CPT soundings performed for the MSE retaining wall alignments typically encountered loose to medium dense fine sand to fine sand with silt to silty fine sand to clayey fine sand (SP, SP-SM, SM, SC) with occasional layers of soft to stiff fat to lean sandy clay to fat to lean clay (CL, CH) to a depth of 50 to 100 feet underlain by dense to very dense silty fine sand to clayey fine sand to sandy silt to silt (SM, SC, ML) with trace to abundant cemented sand, phosphates and shell to maximum boring termination depths. Notable exceptions to this generalized profile include the following:

- **Wall No. 5 (Boring WB-30 – Station 983+00)**: A layer of loose to very loose fine sand with silt to silty fine sand (SP-SM, SM) was encountered between elevations +35 to -25 feet NAVD88 (depth of 20 to 80 feet). In addition, a 100% loss of drilling fluid circulation occurred at an approximate elevation of +12 feet NAVD88. GEC performed additional SPT borings and CPT soundings around this boring location (WB-30A, WB-30B, WB-31A and WB-31B) to evaluate the horizontal extent of these soil conditions but the additional borings/soundings did not encounter the layer of loose/very loose sands to the extent encountered at boring location WB-30.
- **Wall Nos. 6 & 14 (Boring WB-53B – Station 1019+50)**: A layer of loose to very loose fine sand with silt to silty fine sand (SP-SM, SM) was encountered between elevations +16 to -40 feet NAVD88 (depth of 19 to 75 feet). GEC performed additional SPT borings around this boring location (WB-53D, WB-53E, WB-53F and WB-53G) to evaluate the horizontal extent of these soil conditions but the additional borings did not encounter the layer loose/very loose sands to the extent encountered at boring location WB-53B.
- **Wall Nos. 6, 7 & 14 (Station 1020+00 to 1027+50)**: Layers of surficial and buried organic soils were encountered intermittently throughout this station range of the project alignment. Deep, buried organic soils were encountered between stations 1024+75 and 1027+50 to depths of up to 87 feet below existing ground surface. A summary of the encountered organic soils in this project area is included in the following **Table 4**.
- **Wall Nos. 7, 8 & 9 (Station 1046+00 to 1075+00)**: A layer of loose to very loose fine sand with silt to silty fine sand to clayey fine sand (SP-SM, SM, SC) was typically encountered

between elevations +28 to 0 feet NAVD88 (depth of 20 to 48 feet).

- **Wall Nos. 9, 10 & 11 (Station 1079+50 to 1114+00)**: A 5 to 10-foot layer of soft to stiff fat clay with sand to fat clay (CH) was typically encountered between elevations +40 to +10 feet NAVD88.

Table 4
Summary of Encountered Organic Soils
Wall Nos. 6, 7 & 14 (Stations 1020+00 to 1027+50)

Boring No.	Station	Offset (ft)	Depth Range (feet)	Organic Content (%)	N-Value (blows/ft)
MB-1	1020+12	162 LT	0 – 2	---	---
			13 – 24	13	1 – 5
			33 – 44	8 – 40	2 – 24
WB-54	1020+54	33 LT	16.5 – 17.5	---	---
WB-55	1020+55	CL	---	---	---
MB-2	1020+81	59 LT	1.5 – 3	---	7
			22 – 24.5	6	12
			32 – 38	63	5
BR-19	1021+28	6 RT	---	---	---
MB-3	1021+32	152 LT	---	---	---
BR-22	1021+37	40 LT	24.5 – 27	44	1
MB-4	1022+30	25 LT	17 – 19.5	5	3
MB-5	1022+60	122 LT	1.5 – 2	---	---
			59 – 62	16	2 – 3
BR-20	1023+09	32 RT	---	---	---
BR-23	1023+19	46 LT	---	---	---
MB-6	1023+68	118 LT	20 – 23	7	W/H – 9
MB-7	1023+95	7 LT	---	---	---
BR-21	1024+76	20 RT	4 – 6	---	8
			16.5 – 24	24	1/18” – 1
MB-8	1024+83	150 LT	2 – 8	---	1 – 2
			19 – 29	6 – 8	W/H – 6
			58 – 64	16	10
BR-24	1024+86	30 LT	4 – 8	36	W/H – 1/18”
			18 – 25	28	2 – 3
			29 – 32	16	10
MB-10	1025+45	56 LT	3.5 – 6.5	50	2 – 3
			18 – 34	11 – 78	W/H – 2
			38 – 48.5	19 – 29	1 – 3
MB-9	1025+50	85 RT	3 – 4	---	---

Boring No.	Station	Offset (ft)	Depth Range (feet)	Organic Content (%)	N-Value (blows/ft)
WB-56	1025+80	10 RT	2 – 4	---	3
			18.5 – 38.5	25 – 39	W/H – 6
			43.5 – 63.5	34 – 80	2 – 5
MB-11	1026+04	149 LT	2 – 6	44	2 – 3
			13.5 – 28	17	W/H – 1
			35 – 36	11	2
MB-12	1026+50	25 RT	4 – 6	---	---
			13.5 – 14.5	---	---
			16 – 16.5	---	---
WB-57	1026+50	80 RT	18 – 24	16	1/18"
MB-13	1026+75	58 LT	13 – 19	8	1
MB-14	1027+36	63 RT	32 – 63.5	20 – 60	W/R – 3
			71 – 87	5 – 46	W/R – 1/18"
WB-58	1028+07	50 LT	---	---	---
MB-15	1028+40	65 RT	2 – 4	---	---

Generalized subsurface profiles encountered along each of the MSE wall alignments are summarized in **Table 9** in the **Appendix**. Please refer to the Report of SPT Borings and CPT Soundings for Structures sheets in the **Appendix** for the specific subsurface profiles at the individual boring locations.

6.2 Gravity Walls – Subsurface Profiles

In general, the auger and SPT borings performed in the vicinity of the proposed gravity wall alignments typically encountered fine sand to fine sand with silt to silty fine sand (SP, SP-SM, SM / A-3, A-2-4) to the maximum 20-foot boring termination depth.

Please refer to the project cross-sections or Antillian Engineering Associates Report of Roadway Soil Survey for specific subsurface profiles at the individual auger boring locations. Please refer to the Report of SPT Borings and CPT Soundings for Structures sheets in the **Appendix** for the specific SPT boring results.

6.3 Noise Wall – Subsurface Profile

In general, the SPT borings performed along the noise wall alignment encountered loose to medium dense fine sand to fine sand with silt to silty fine sand (SP, SP-SM, SM) to the boring

termination depth of 30 feet below the existing ground surface. However, a layer of very dense silty fine sand and fine sand (SM, SP) was encountered at boring locations WB-129 and WB-134 at depths of 30 and 25 feet below existing ground surface. In addition, a 6-foot layer of stiff fat clay (CH) was encountered at a depth of 22 feet below existing ground surface at boring location WB-133. Please refer to the Report of SPT Borings for Noise Walls sheets in the **Appendix** for the specific SPT boring results.

6.4 CIP Retaining Wall – Subsurface Profile

In general, the SPT borings performed along the CIP retaining wall alignment encountered very loose to loose fine sand to fine sand with silt (SP, SP-SM) to a depth of 10 feet underlain by medium dense fine sand with silt to silty fine sand (SP-SM, SM) to the boring termination depth of 15 feet below the existing ground surface. Please refer to the Report of SPT Borings and CPT Soundings for Structures sheets in the **Appendix** for the specific SPT boring results.

6.5 Sheet Pile Wall – Subsurface Profile

The borings and soundings performed between Stations 1018+00 to 1030+00 for the proposed sheet pile wall between the SR 429 right-of-way and the FGT easement encountered highly variable subsurface conditions. Highly compressible organic soils (muck/peat) were encountered at or just below the ground surface in the majority of the soil borings performed along the FGT easement. This surface organic soil layer is generally less than 5 feet thick and within 10 feet of the ground surface. In addition, the majority of the soil borings along the FGT easement encountered buried organic soil layers. The buried organic soil layers typically extended from approximate elevations +20 to +10 and from 0 to -10 feet NAVD88. However, at boring location WB-140 (Station 1025+25) the buried organic soils extended from approximate elevation -15 to -45.

The muck layers at the Lake Markham Road bridge site varied considerably in SPT N-value consistency (weight of rod (W/R) to 24), organic content (4% to 80%), and moisture content (30% to 651%). The consistency ranged from very soft to stiff, which also indicates some of the muck soils are over-consolidated, meaning they have experienced past stresses higher than their current overburden pressure. A summary of the generalized subsurface profiles encountered along the FGT easement are included in the Recommended Soil Parameters for Sheet Pile Wall Design Table (**Table 12**) in the **Appendix**.

6.6 Groundwater Levels

In general, encountered groundwater levels along the retaining wall alignments at the boring locations ranged from 1.1 to 27 feet below existing ground surface. **Table 7** in the **Appendix** provides a summary of encountered groundwater levels at retaining wall boring locations.

Groundwater levels can vary seasonally and with changes in subsurface conditions between boring locations. Alterations in surface and/or subsurface drainage brought about by site development can also affect groundwater levels. *Therefore, groundwater depths measured at different times or at different locations along the project alignment can be expected to vary from those measured by GEC during this investigation.*

For the purposes of this report, estimated seasonal high groundwater levels are defined as groundwater levels that are anticipated at the end of the wet season of a "normal rainfall" year under current site conditions. We define a "normal rainfall" year as a year in which rainfall quantity and distribution were at or near historical rainfall averages.

GEC estimated seasonal high groundwater levels for each boring location. **Table 7** in the **Appendix** provides a summary of estimated seasonal high groundwater levels at the retaining wall boring locations. The encountered and estimated seasonal high groundwater levels at the boring locations are presented on the Boring Results sheets in the **Appendix**.

7.0 ANALYSES AND RECOMMENDATIONS

Borings cannot be relied upon to accurately reflect the variations that usually exist between boring locations and these variations may not become evident until construction.

The analyses and recommendations contained in this report are based in part on the data obtained from a limited number of soil samples and groundwater measurements obtained from widely-spaced borings. The investigation methods used indicate subsurface conditions only at the specific boring locations, only at the time they were performed, and only to the depths penetrated. Borings cannot be relied upon to accurately reflect the variations that usually exist between boring locations and these variations may not become evident until construction.

7.1 Mechanically Stabilized Earth Walls – Special Construction

Based on the subsurface conditions encountered at the boring and sounding locations, Mechanically Stabilized Earth (MSE) walls appear suitable for use as retaining walls in areas of high fill along the majority of the project alignment. However, as summarized in **Table 4**, layers of surficial and buried organic soils were encountered intermittently between Stations 1020+00 to 1027+50 along the alignments of Wall Nos. 6, 7 and 14. Deep, buried organic soils were encountered between stations 1024+75 and 1027+50 to depths of up to 87 feet below the existing ground surface. These layers are soft and compressible and would cause significant post-construction settlement of the new roadway embankment and associated retaining walls if left untreated.

…GEC recommends a program of special embankment construction with surcharging… along the portions of wall alignments 6, 7 and 14 between Stations 1020+00 and 1027+50

Because of the depth of the organic soil layers, total demucking and traditional ground improvement techniques are not practical. Based on our discussions with the FDOT Geotechnical Department and evaluation of mitigation alternatives for the organic soil deposits at this site, GEC recommends a program of special embankment construction with surcharging to facilitate embankment, bridge foundation, wall, and box culvert construction in this area.

With the application of a surcharge program along the portions of wall alignments 6, 7 and 14 between Stations 1020+00 and 1027+50, the total long-term settlements after construction of the retaining walls can be significantly reduced such that the permanent MSE walls will meet the Settlement Criteria for MSE Wall Systems in the FDOT Structures Design Guidelines. This recommendation is contingent on the application of the roadway embankment surcharge in this area. GEC's analyses and recommendations regarding the surcharge program in this area are included under separate cover in our Report of Geotechnical Engineering Investigation for Muck Surcharge. GEC's analyses and recommendations for MSE wall alignments 6, 7 and 14 post-surcharge are included in the following Report Section.

7.2 Mechanically Stabilized Earth Walls

We understand MSE walls are the preferred retaining wall option for the proposed high fill areas along the project alignment. The fill to be placed behind the permanent MSE walls will be reinforced (i.e., mechanically stabilized) to achieve acceptable factors of safety for internal and external stability. GEC analyzed external stability safety factors for overturning, sliding, bearing capacity and slope stability based on control drawings and cross sections and the results of our borings. We understand

the wall manufacturer will be responsible for internal stability and, therefore, analysis of internal stability was not performed by GEC.

External stability for overturning, sliding and bearing capacity for the MSE walls was analyzed with the FDOT computer program MSE Wall LRFD External Stability Analysis (version 2.5.1). The program performs stability calculations in accordance with AASHTO LRFD Bridge Design Specifications.
The minimum Capacity-Demand Ratios (CDR) used in our analyses were obtained from the FDOT LRFD design procedures and are summarized as follows:

Overturning	CDR ≥ 1.0
Sliding	CDR ≥ 1.0
Bearing Capacity	CDR ≥ 1.0

Results of our external stability analyses for the proposed MSE walls, including minimum MSE wall strap lengths and factored bearing pressures, are included in the **Appendix** and are summarized in **Table 8** in the **Appendix**.

Soil strength parameters were based on the FDOT Structures Design Guidelines and the boring and sounding data obtained at the wall sites. Our recommended soil parameters for MSE wall design, which should be included in the plans for use by the MSE wall vendors and the contractor, are summarized in **Table 9** in the **Appendix**.

GEC also evaluated settlement for the permanent MSE walls using the computer program WINSAF-I, which utilizes the Boussinesq stress computation method. Due to the predominantly granular nature of the soil profiles at the MSE wall locations, we expect that the majority of settlements will occur during wall construction. Where compressible, clay soils were encountered, GEC performed consolidation testing of undisturbed samples of the clay layers. The results of the consolidation testing, summarized in **Table 3**, indicate the clay layers along the project alignment are generally over-consolidated with an average OCR of over 2, as noted earlier. In addition, the leveling pads for several of the MSE wall alignments along the SR 429 mainline are proposed above existing grade. Settlement that occurs during the placement of fill to raise grade prior to construction of the leveling pad is not included in the total settlement of the MSE retaining walls as this settlement will occur prior to construction of the wall. Estimated settlement values are summarized in **Table 10** in the **Appendix** and our settlement analyses are included in the **Appendix**.

Using the computer model PCSTABL6H, GEC analyzed the overall global stability of the critical MSE wall geometries using soil parameters developed from our borings and soundings. The calculated minimum factors of safety for overall stability for the walls exceeded the FDOT minimum

requirement of 1.5 for all wall alignments. The results of our global stability analyses are included in the **Appendix**.

7.3 Gravity Walls

We understand 4 gravity wall alignments are planned at various locations along the project alignment for grade separation between adjacent property owners and FDOT right-of-way. GEC utilized geometry from the gravity walls (critical sections) shown on roadway cross section sheets and subsurface data from the gravity wall SPT borings and roadway borings, performed by Antillian Engineering Associates, to analyze external stability safety factors for overturning, sliding, bearing capacity and slope stability of the proposed gravity walls. We understand the Wekiva Trail Driveway gravity meets the criteria and geometry of a Scheme 3 gravity wall and the remaining proposed gravity walls meet the criteria and geometry of Scheme 2 gravity walls in accordance with FDOT Index 6011 with a wall batter of 9:12 and a minimum embankment depth of 2 feet.

GEC modified the FDOT Gravity Wall worksheet (developed by Kathy Gray, P.E. with FDOT District 5) to incorporate the AASHTO LRFD (Load and Resistance Factor Design) Bridge Design Specifications and used it to analyze the proposed gravity walls for sliding, overturning and bearing capacity. GEC utilized the computer program PCSTABL6H for the global stability analysis of the gravity walls. Our analyses assumed only Strength I Limit State Load and Resistance Factors of the AASHTO LRFD Bridge Design Specifications.

The minimum Capacity to Demand Ratio (CDR) for sliding, overturning and bearing capacity and the minimum factor of safety for global stability required by FDOT are as follows:

Overturning	CDR ≥ 1.0
Sliding	CDR ≥ 1.0
Bearing Capacity	CDR ≥ 1.0
Global Stability	FS ≥ 1.5

The results of our stability analyses are summarized in the following table:

Table 5
Summary of Gravity Wall Stability Analysis Results

Roadway	Station Limits	Capacity to Demand Ratio (CDR)			Factor of Safety	Minimum Embedment Depth (ft)	Required Wall Batter
		Sliding	Overturning	Bearing Capacity	Global Stability		
Wekiva Trail Driveway	71+00 to 75+00	1.18	1.20	1.3	1.85	2	9:12
EB Frontage Road	2050+03 to 2052+53	1.26	1.12	1.90	3.83	2	9:12
EB Frontage Road	2110+57 to 2115+56	1.12	1.02	1.20	2.15	2	9:12
S. Orange Ave.	812+45 to 814+60	1.25	1.11	1.8	2.89	2	9:12

Based on the results of our analyses, it appears that the proposed gravity walls meet the minimum CDR stability requirements and minimum factor of safety for global stability utilizing the Scheme 2 gravity wall section in accordance with FDOT Index 6011. Gravity wall foundation soils should be prepared in accordance with Standard Specification 455. The results of our gravity wall stability analyses are included in the **Appendix**.

7.4 Noise Wall Foundations

The subsurface conditions encountered in the noise wall SPT borings typically consisted of loose to medium dense sands with varying silt content (SP, SP-SM, SM) from ground surface to the maximum depths explored of 30 feet. We understand that the proposed sound walls will be supported by auger cast piles at regular intervals along its alignment. Recommended soil parameters and soil type in accordance with FDOT Index 5200 for design of the proposed noise wall foundations are included in **Table 11** in the **Appendix**.

7.5 CIP Cantilever Retaining Wall

One, approximately 700-ft long, cast-in-place (CIP) cantilever retaining wall is proposed on the north side of the Westbound Frontage Road adjacent to Pond WR2. In general, the SPT borings performed along the CIP retaining wall alignment encountered very loose to loose fine sand to fine sand with silt (SP, SP-SM) to a depth of 10 feet underlain by medium dense fine sand with silt to silty fine sand (SP-SM, SM) to the boring termination depth of 15 feet below the existing ground surface. Based on the results of our soil borings we recommend the following soil parameters for design of the proposed CIP cantilever retaining wall:

- Backfill Soil Phi Angle: 32 degrees
- Unit Weight of Backfill: 115 pcf
- Nominal Bearing Capacity: 5,000 psf
- Design Groundwater Elevation: +45.3 NAVD88 (DHW EL of Pond WR2)

Using the computer model PCSTABL6H, GEC analyzed the overall global stability of the CIP cantilever retaining wall using soil parameters developed from our borings. The calculated minimum factors of safety for overall stability for the wall exceeded the FDOT minimum requirement of 1.5. The results of our global stability analyses are included in the **Appendix**. The CIP cantilever retaining wall dimensions summarized below were utilized in our global stability analyses.

- Toe (L_{toe}): 1.5 feet
- Total Footing (L_{foot}): 6.0 feet
- Stem Top (W): 1.0 foot
- Depth to Top of Footing (D_{soil}): 2.5 feet
- Footing Thickness (D): 16 inches

The cantilever wall should be designed according to the FDOT Design Standards Index 6010. We understand AECOM will perform external stability analyses for the proposed CIP wall.

7.6 Vertical Barrier Sheet Pile Wall

A surcharge program is proposed between Stations 1019+00 and 1028+86 of the SR 429 centerline to mitigate settlement of the roadway embankment and associated project elements due to the presence of deep, buried organic soils in this area of the project alignment. Approximately 46-inches of total settlement are estimated to occur during the surcharge program, as detailed in our Report of Geotechnical Engineering Investigation for Muck Surcharge submitted under separate cover. We understand FGT pipelines in this area are to be relocated along the northern right-of-way to a new 50-foot easement prior to the initiation of the surcharge program.

GEC submitted a Technical Memorandum, dated March 3, 2016, to provide geotechnical engineering recommendations for various design alternatives to mitigate vertical settlement and horizontal deflection of the FGT pipelines caused by the construction of SR 429 and the associated surcharge program. Based on the results of that evaluation a sheet pile vertical barrier was selected as the preferred alternative as it addresses both vertical settlement and horizontal deflection of the pipeline and can be installed after the FGT pipeline has been installed. The sheet pile wall will be installed within the SR 429 right-of-way along the proposed FGT easement to

create a vertical barrier between soils being surcharged within the SR 429 right-of-way and the soils within the FGT easement. The installation depth of the sheet pile would need to be sufficiently deep to dissipate stresses, induced from the SR 429 embankment, on deep compressible soil layers.

GEC conducted settlement analyses to calculate total settlement in the FGT easement with and without a vertical barrier in place between the FGT easement and the SR 429 right-of-way. Due to the variability in encountered organic soil depths along the FGT easement, GEC subdivided the proposed vertical barrier into 4 sections based on the encountered soil profiles at our boring locations. A summary of the generalized subsurface profiles encountered along the FGT easement are included in the Recommended Soil Parameters for Sheet Pile Wall Design Table in the **Appendix**. Settlement analyses were performed using soil consolidation parameters developed from consolidation test results and the computer program WINSAF-I. The following table summarizes the results of our settlement analyses:

Summary of Estimated Soil Settlement
Boring Location MB-1 (Station 1018+25 to 1021+50)
Sheet Pile Embedment Elevation: -25 feet NAVD88

Distance North of SR 429 Right-of-Way	Estimated Settlement Without Vertical Barrier (inches)	Estimated Settlement With Vertical Barrier (inches)
0	4.7	0.6
10	2.9	0.5
20	1.9	0.4
30	1.3	0.3
40	0.9	0.3
50	0.7	0.2

Summary of Estimated Soil Settlement
Boring Location WB-137 (Station 1021+50 to 1025+00)
Sheet Pile Embedment Elevation: -35 feet NAVD88

Distance North of SR 429 Right-of-Way	Estimated Settlement Without Vertical Barrier (inches)	Estimated Settlement With Vertical Barrier (inches)
0	4.8	1.0
10	3.1	0.9
20	2.2	0.7
30	1.6	0.6
40	1.2	0.5
50	0.9	0.4

Summary of Estimated Soil Settlement
Boring Location WB-140 (Station 1025+00 to 1026+00)
Sheet Pile Embedment Elevation: -45 feet NAVD88

Distance North of SR 429 Right-of-Way	Estimated Settlement Without Vertical Barrier (inches)	Estimated Settlement With Vertical Barrier (inches)
0	13.5	1.4
10	9.2	1.2
20	6.6	1.1
30	4.9	0.9
40	3.8	0.8
50	2.9	0.6

Summary of Estimated Soil Settlement
Boring Location MB-11 (Station 1026+00 to 1029+70)
Sheet Pile Embedment Elevation: -25 feet NAVD88

Distance North of SR 429 Right-of-Way	Estimated Settlement Without Vertical Barrier (inches)	Estimated Settlement With Vertical Barrier (inches)
0	4.2	0.4
10	2.4	0.3
20	1.5	0.3
30	1.0	0.2
40	0.7	0.2
50	0.5	0.1

With the installation of the sheet pile wall vertical barrier along the SR 429 northern right-of-way, the total settlement within the FGT easement is estimated to range from 0.1 to 1.4 inches, which is anticipated to be a tolerable level of settlement for the FGT pipeline. Maximum longitudinal differential settlement is estimated to be 0.15% (ft./100 ft.). In general, less settlement is anticipated the further from the SR 429 right-of-way, therefore, it is recommended the FGT pipelines be installed as far north within the FGT easement as possible to further reduced settlement of the pipeline. The results of our vertical settlement calculations are included in the **Appendix**.

AECOM performed sheet pile wall analyses to evaluate wall deflection based on worst case, critical soil profiles at boring locations WB-137 and WB-140, and at critical cross-sections where the minimum offsets occur between the proposed sheet pile vertical barrier and the SR 429 embankment. Minimum sheet pile embedment elevations were established based on the soil profiles to limit vertical settlement. Based on the results of AECOM's analyses, horizontal

deflection of the top of the sheet pile wall is estimated at a maximum of 3 inches. With the proposed FGT gas line to be installed at a minimum of 30 feet from the sheet pile wall and at a depth of approximately 4 feet, horizontal deflection of the FGT gas line due to the 3-inch maximum deflection of the top of the sheet pile wall will be 0.1 inches or less.

Because the FGT pipeline will be relocated prior to installation of the sheet pile vertical barrier the following recommendations are made to limit vibrations to the FGT pipelines:

- Sheet piles installation should be by hydraulic push to limit ground vibrations.
- Sheet piles should be abandoned in place to avoid additional disturbance to the FGT pipelines that would be caused by extraction of the sheet piles. In addition, by leaving the sheet piles in place they provide additional mitigation of vibrations caused by pile driving during construction of the Lake Markham Road Bridge.
- The FGT pipeline easement should be monitored for settlement, vibration and horizontal deflection. Additional details regarding monitoring requirements will be included in the Surcharge Plans.
- The recommended minimum sheet pile embedment elevations do not reach the confining layer in the area. Therefore, the sheet pile vertical barrier should not significantly impede groundwater flow in the area. However, it is recommended the sheet pile be cut-off two feet below ground surface after completion of construction of SR 429 to prevent artificial ponding of surficial groundwater flow in the area.

It should be noted the sheet pile vertical barrier is designed to mitigate settlement and deflection of the FGT pipeline due to construction of the SR 429 roadway embankment and surcharge. The sheet pile vertical barrier does not mitigate settlement of compressible, organic soil layers, which are present within the FGT easement, due to installation of the FGT gas line.

8.0 USE OF THIS REPORT

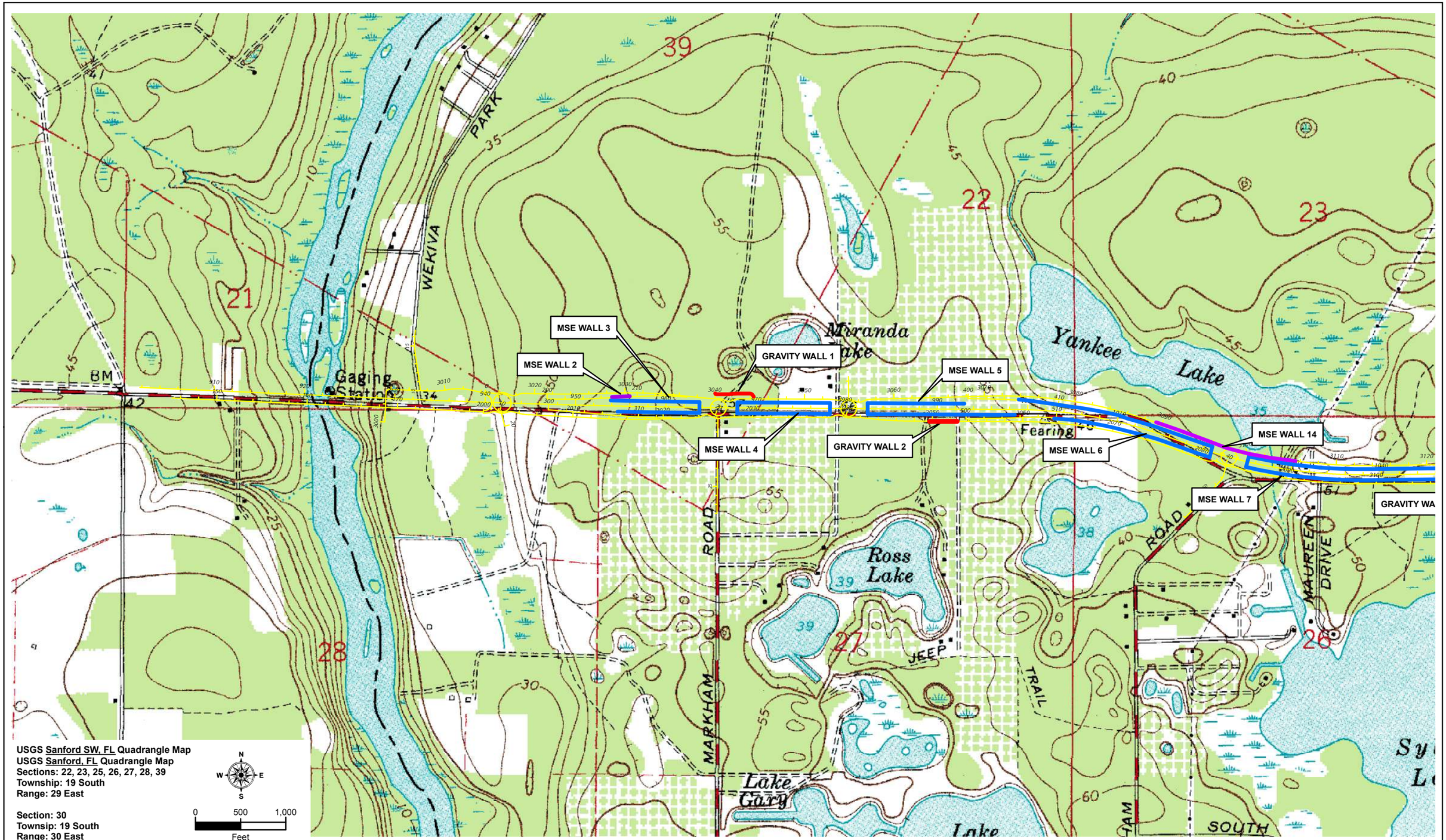
GEC has prepared this report for the exclusive use of our client, AECOM and the FDOT, and for specific application to this project. GEC will not be held responsible for any other party's interpretation or use of this report's subsurface data or engineering analysis without our written authorization.

The sole purpose of the borings performed by GEC at this site was to obtain indications of subsurface conditions as part of a geotechnical exploration program. GEC has not evaluated the soil from the miscellaneous structure borings for the potential presence of contaminated soil or groundwater, nor have we subjected any soil samples to analysis for contaminants. Our Level 1 CIA Report is submitted under separate cover.

GEC has strived to provide the services described in this report in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in Central Florida. No other representation is made or implied in this document.

APPENDIX

USGS QUADRANGLE AND NRCS SOIL SURVEY MAPS



USGS Sanford SW, FL Quadrangle Map
USGS Sanford, FL Quadrangle Map
Sections: 22, 23, 25, 26, 27, 28, 39
Township: 19 South
Range: 29 East

Section: 30
Townsip: 19 South
Range: 30 East

N W E S

0 500 1,000
Feet

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Geotechnical and Environmental Consultants, Inc.
919 Lake Baldwin Lane
Orlando, FL 32814
PH (407) 898-1818 FAX (407) 898-1837
Certificate of Authorization No. 00005882
DANIEL C. STANFILL P.E. NO. 42763

DRAWN BY	CHECKED BY	DESIGNED BY	CHECKED BY
SKR	CGB 71571	CGB 71571	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

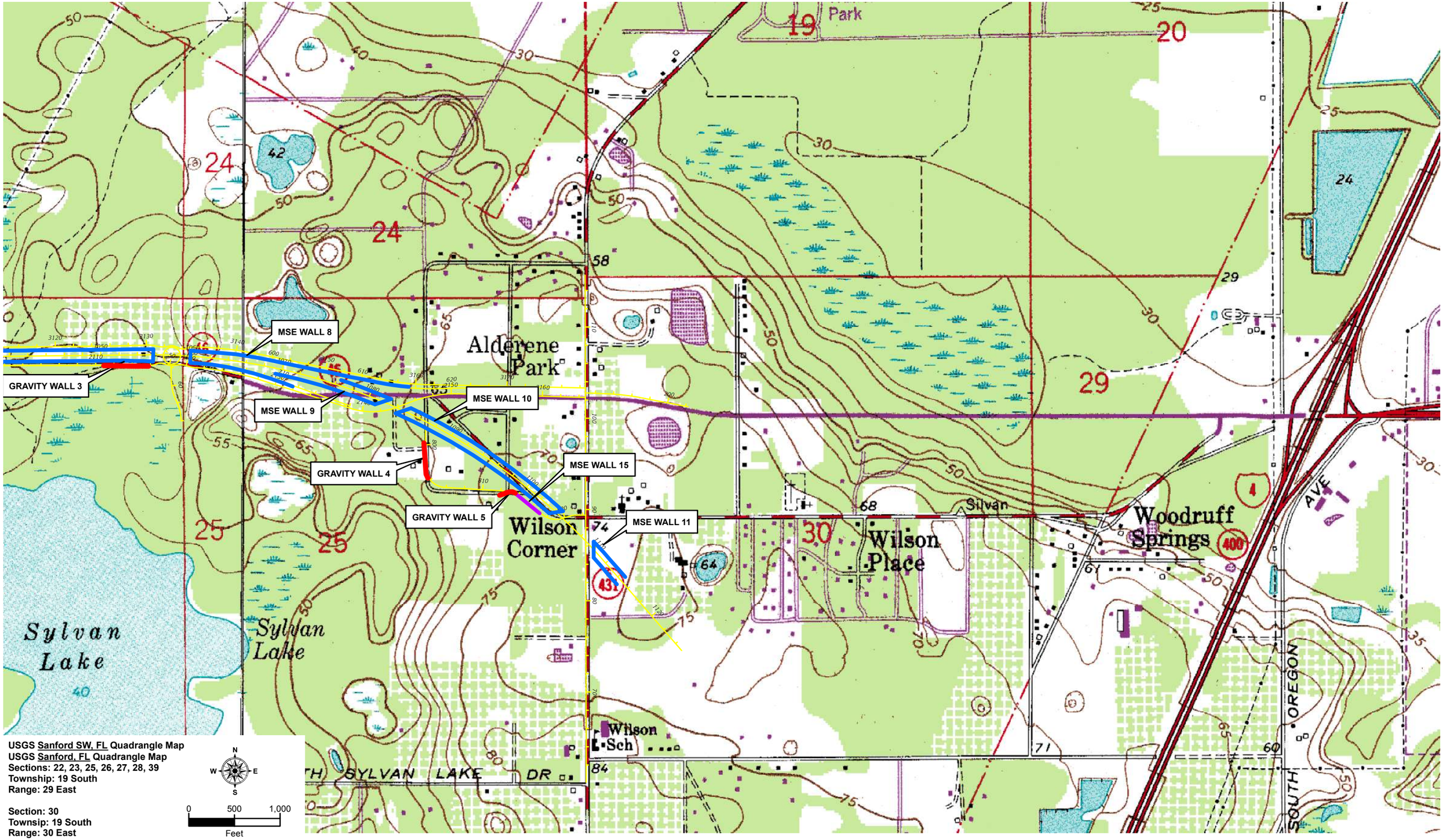
SHEET TITLE: *USGS QUADRANGLE MAP*

PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS*

REF. DWG. NO.

SHEET NO.

J:\D107\3520E Wekiva 7A\5-3-17\3520GquadRT1.mxd 5/3/2017



USGS Sanford SW, FL Quadrangle Map
USGS Sanford, FL Quadrangle Map
Sections: 22, 23, 25, 26, 27, 28, 39
Township: 19 South
Range: 29 East

Section: 30
Townsip: 19 South
Range: 30 East

N W E S

0 500 1,000
Feet

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Geotechnical and Environmental Consultants, Inc.
919 Lake Baldwin Lane
Orlando, FL 32814
PH (407) 898-1818 FAX (407) 898-1837
Certificate of Authorization No. 00005882
DANIEL C. STANFILL P.E. NO. 42763

DRAWN BY	SKR
CHECKED BY	CGB 71571
DESIGNED BY	CGB 71571
CHECKED BY	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

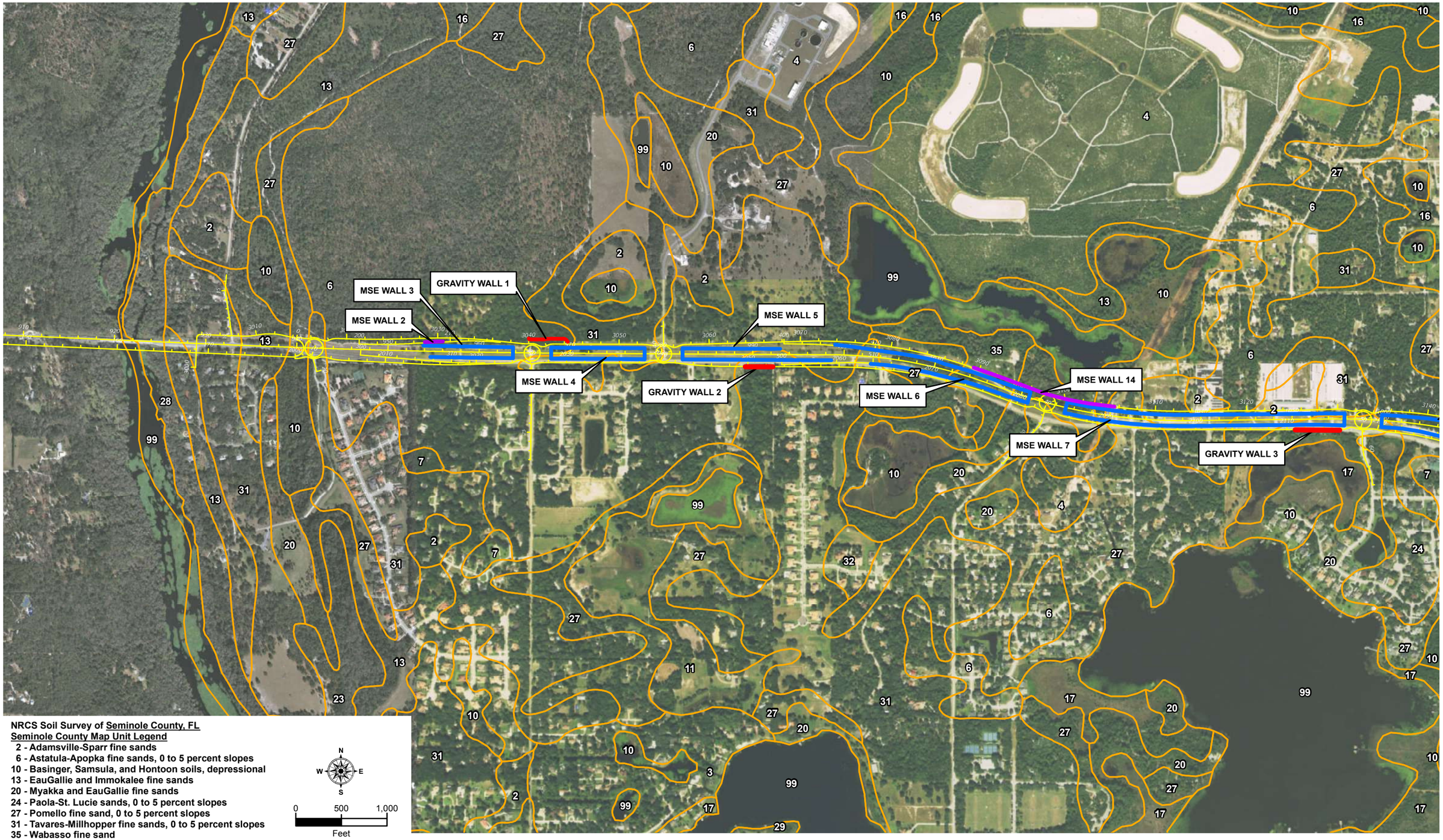
SHEET TITLE: *USGS QUADRANGLE MAP*

REF. DWG. NO.:

PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS*

SHEET NO.:

J:\D107\3520E Wekiva 7A\5-3-17\3520GquadRT2.mxd 5/3/2017



NRCS Soil Survey of Seminole County, FL
Seminole County Map Unit Legend

- 2 - Adamsville-Sparr fine sands
- 6 - Astatula-Apopka fine sands, 0 to 5 percent slopes
- 10 - Basinger, Samsula, and Hontoon soils, depressional
- 13 - EauGallie and Immokalee fine sands
- 20 - Myakka and EauGallie fine sands
- 24 - Paola-St. Lucie sands, 0 to 5 percent slopes
- 27 - Pomello fine sand, 0 to 5 percent slopes
- 31 - Tavares-Millhopper fine sands, 0 to 5 percent slopes
- 35 - Wabasso fine sand

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Geotechnical and Environmental Consultants, Inc.
919 Lake Baldwin Lane
Orlando, FL 32814
PH (407) 898-1818 FAX (407) 898-1837
Certificate of Authorization No. 00005882
DANIEL C. STANFILL P.E. NO. 42763

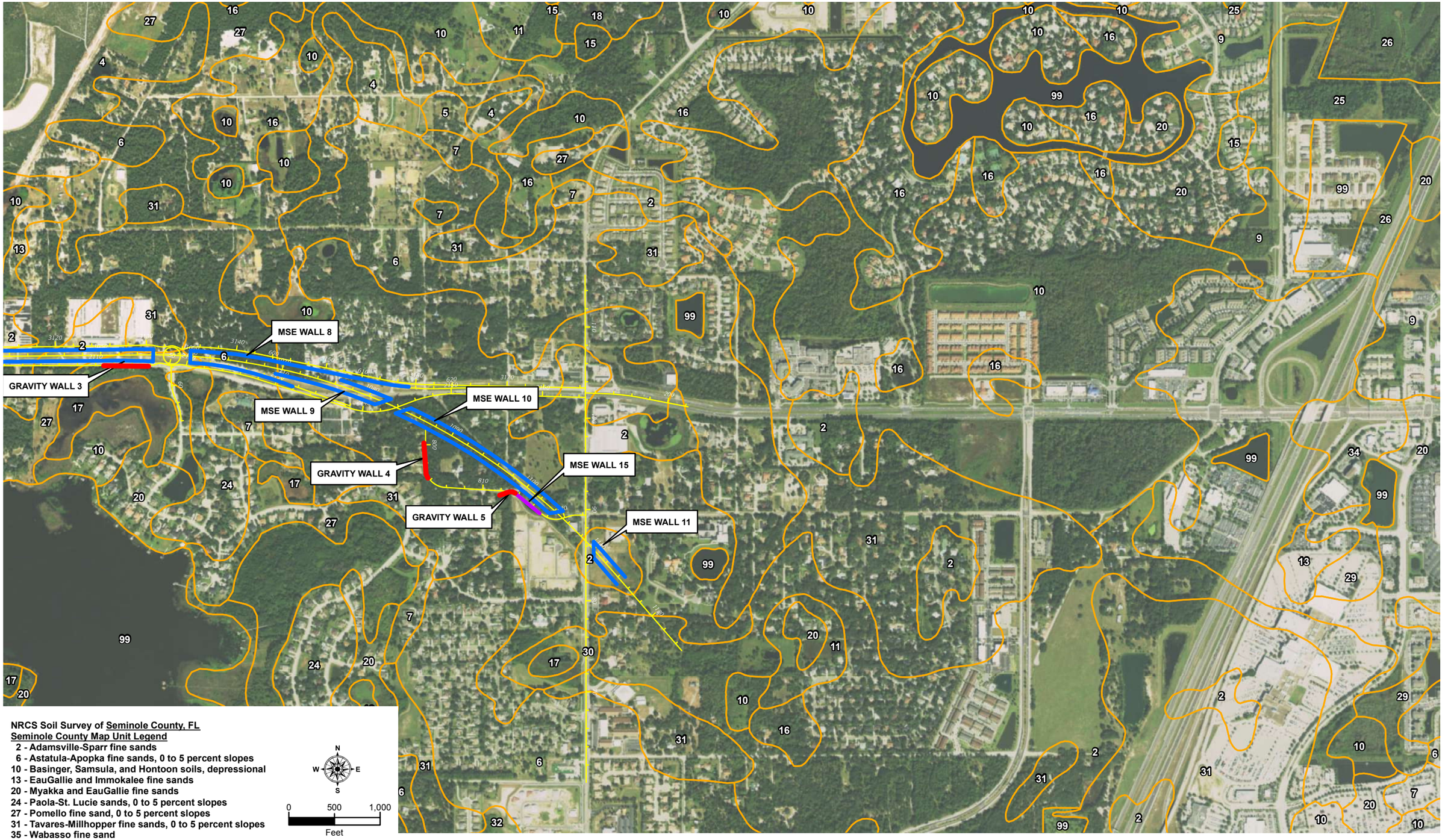
DRAWN BY	CHECKED BY	DESIGNED BY	CHECKED BY
SKR	CGB 71571	CGB 71571	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *NRCS SOIL SURVEY MAP*
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS*
REF. DWG. NO.
SHEET NO.

J:\D107\3520E Wekiva 7A\5-3-17\3520GnrcsRT1.mxd 5/3/2017



NRCS Soil Survey of Seminole County, FL
Seminole County Map Unit Legend

- 2 - Adamsville-Sparr fine sands
- 6 - Astatula-Apopka fine sands, 0 to 5 percent slopes
- 10 - Basinger, Samsula, and Hontoon soils, depressional
- 13 - EauGallie and Immokalee fine sands
- 20 - Myakka and EauGallie fine sands
- 24 - Paola-St. Lucie sands, 0 to 5 percent slopes
- 27 - Pomello fine sand, 0 to 5 percent slopes
- 31 - Tavares-Millhopper fine sands, 0 to 5 percent slopes
- 35 - Wabasso fine sand

N W E S

0 500 1,000
Feet

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Geotechnical and Environmental Consultants, Inc.
919 Lake Baldwin Lane
Orlando, FL 32814
PH (407) 898-1818 FAX (407) 898-1837
Certificate of Authorization No. 00005882
DANIEL C. STANFILL P.E. NO. 42763

DRAWN BY	SKR
CHECKED BY	CGB 71571
DESIGNED BY	CGB 71571
CHECKED BY	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *NRCS SOIL SURVEY MAP*

PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS*

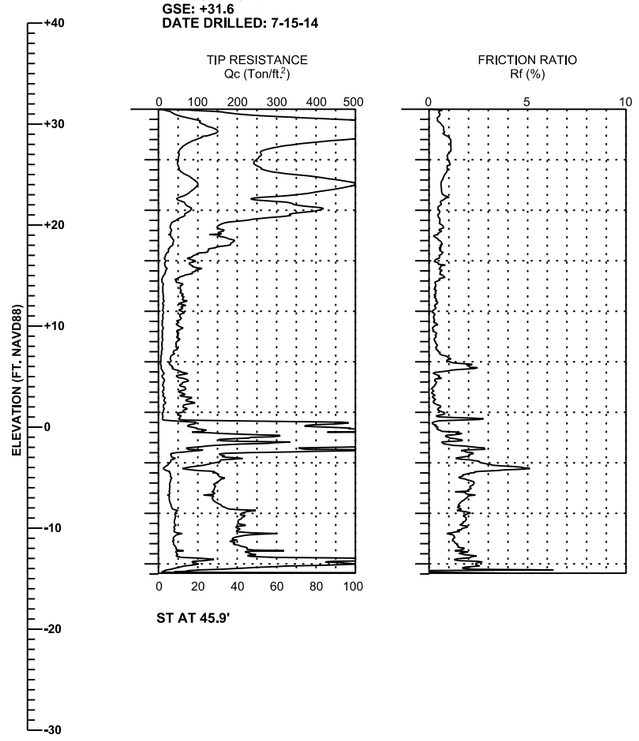
REF. DWG. NO.:

SHEET NO.:

J:\D107\3520E Wekiva 7A\5-3-17\3520GnrcsRT2.mxd 5/3/2017

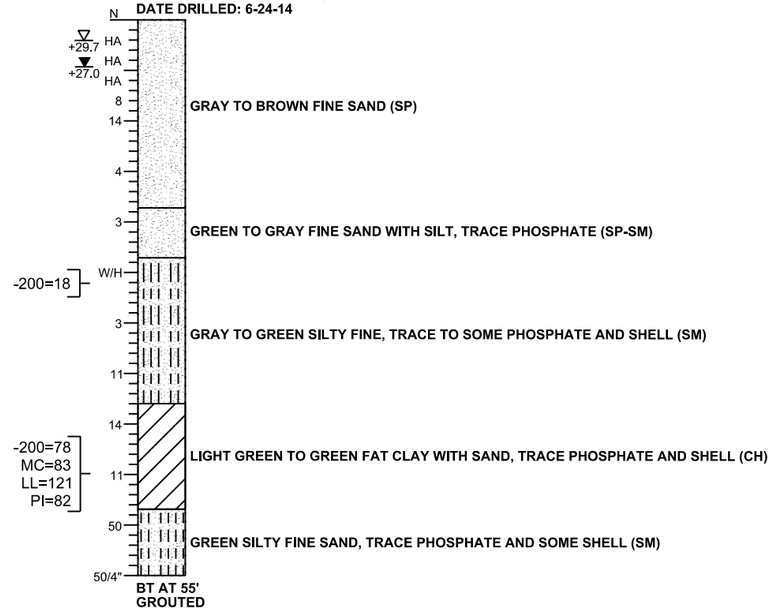
REPORT OF SPT BORINGS
AND CPT SOUNDINGS FOR STRUCTURES
(MSE, GRAVITY & CIP WALLS)

WB-1
STA. 931+20, 55' LEFT
LAT: N28.81526
LONG: W81.41644
GSE: +31.6
DATE DRILLED: 7-15-14



ST AT 45.9'

WB-2
STA. 932+60, 100' RIGHT
LAT: N28.81481
LONG: W81.41602
GSE: +31.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-24-14



GRAY TO BROWN FINE SAND (SP)

GREEN TO GRAY FINE SAND WITH SILT, TRACE PHOSPHATE (SP-SM)

GRAY TO GREEN SILTY FINE, TRACE TO SOME PHOSPHATE AND SHELL (SM)

LIGHT GREEN TO GREEN FAT CLAY WITH SAND, TRACE PHOSPHATE AND SHELL (CH)

GREEN SILTY FINE SAND, TRACE PHOSPHATE AND SOME SHELL (SM)

BT AT 55'
GROUTED

LEGEND

GSE	**GROUND SURFACE ELEVATION (FT. NAVD88)**
N	**STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT**
HA	**HAND AUGERED FOR UTILITY CLEARANCE**
50/4"	**NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION**
W/H	**WEIGHT OF HAMMER**
+29.7 ▽	**ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)**
+27.0 ▼	**ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED**
BT	**BORING TERMINATED AT DEPTH INDICATED**
ST	**SOUNDING TERMINATED AT DEPTH INDICATED**
-200=	**PERCENT PASSING NO. 200 U.S. STANDARD SIEVE**
MC=	**PERCENT NATURAL MOISTURE CONTENT**
LL=	**LIQUID LIMIT**
PI=	**PLASTICITY INDEX**

SAND **CLAY** **SAND AND SILT**

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

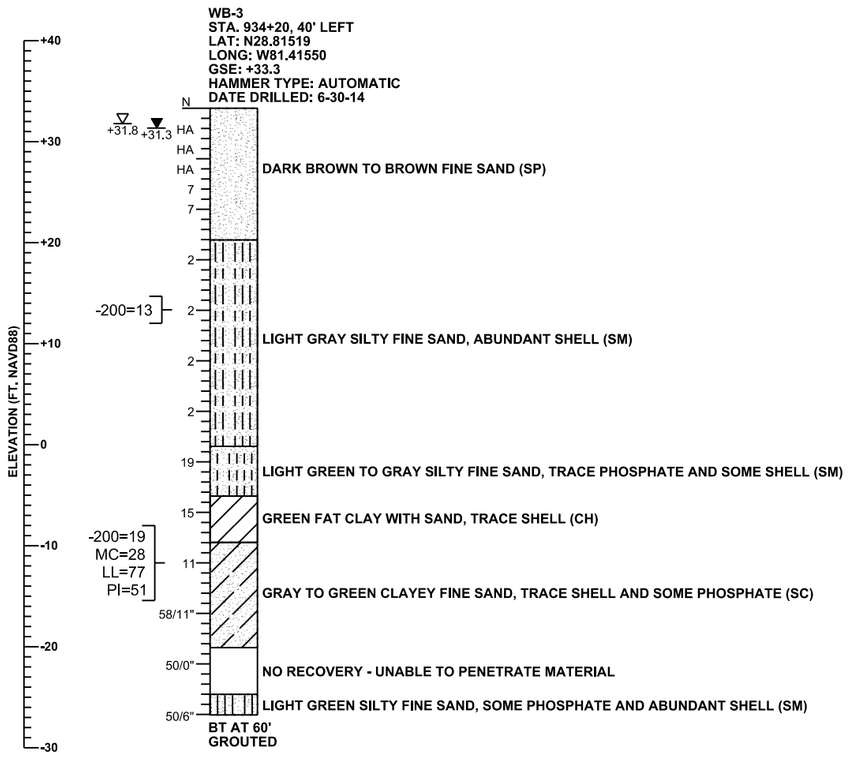
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

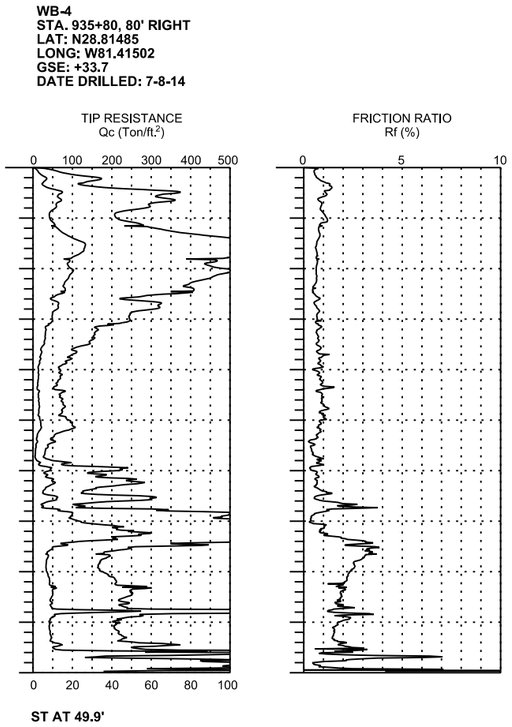
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES*
REF. DWG. NO.
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS*
SHEET NO. *BW-97*

scott 5/14/2015 6:33:55 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





ST AT 49.9'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/6"	NUMBER OF BLOWS FOR 6 INCHES OF PENETRATION
▽ +31.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — CLAY

SAND AND SILT — SAND AND CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

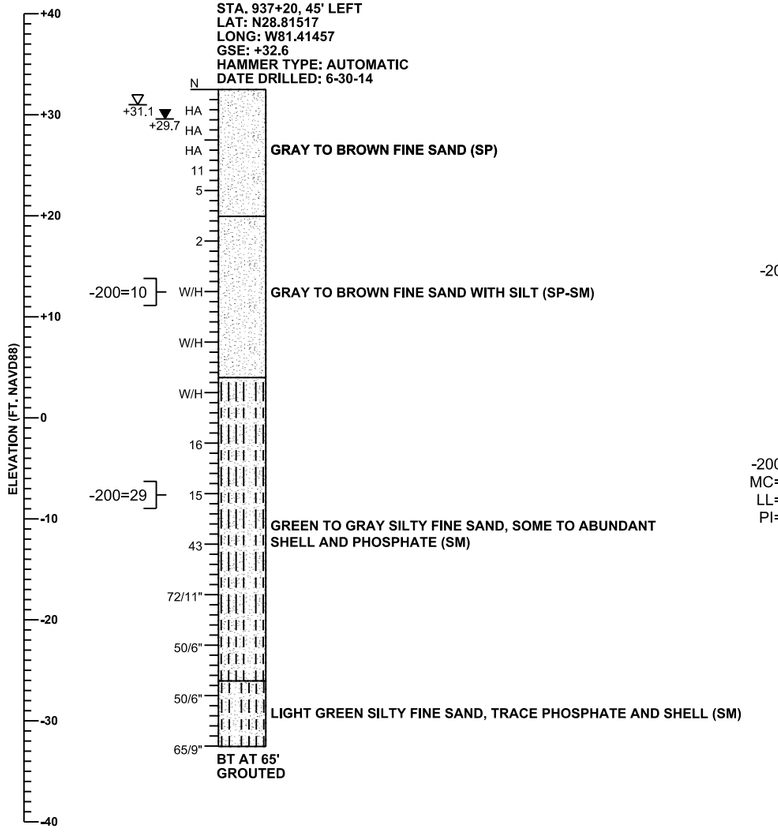
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

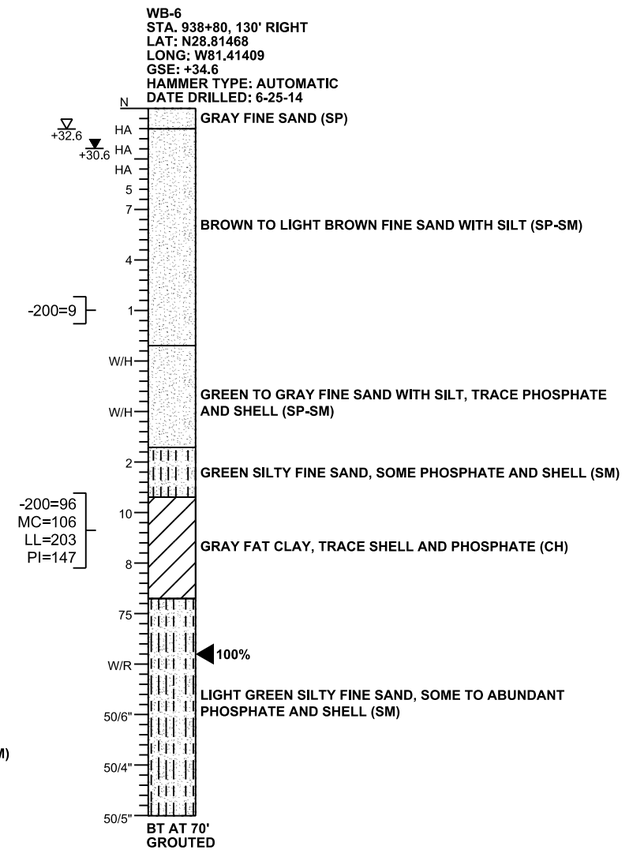
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-98

scott 5/14/2015 6:34:25 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/6"	NUMBER OF BLOWS FOR 6 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
+32.6 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+30.6 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND CLAY SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-5
SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-6
SECTION: 28
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

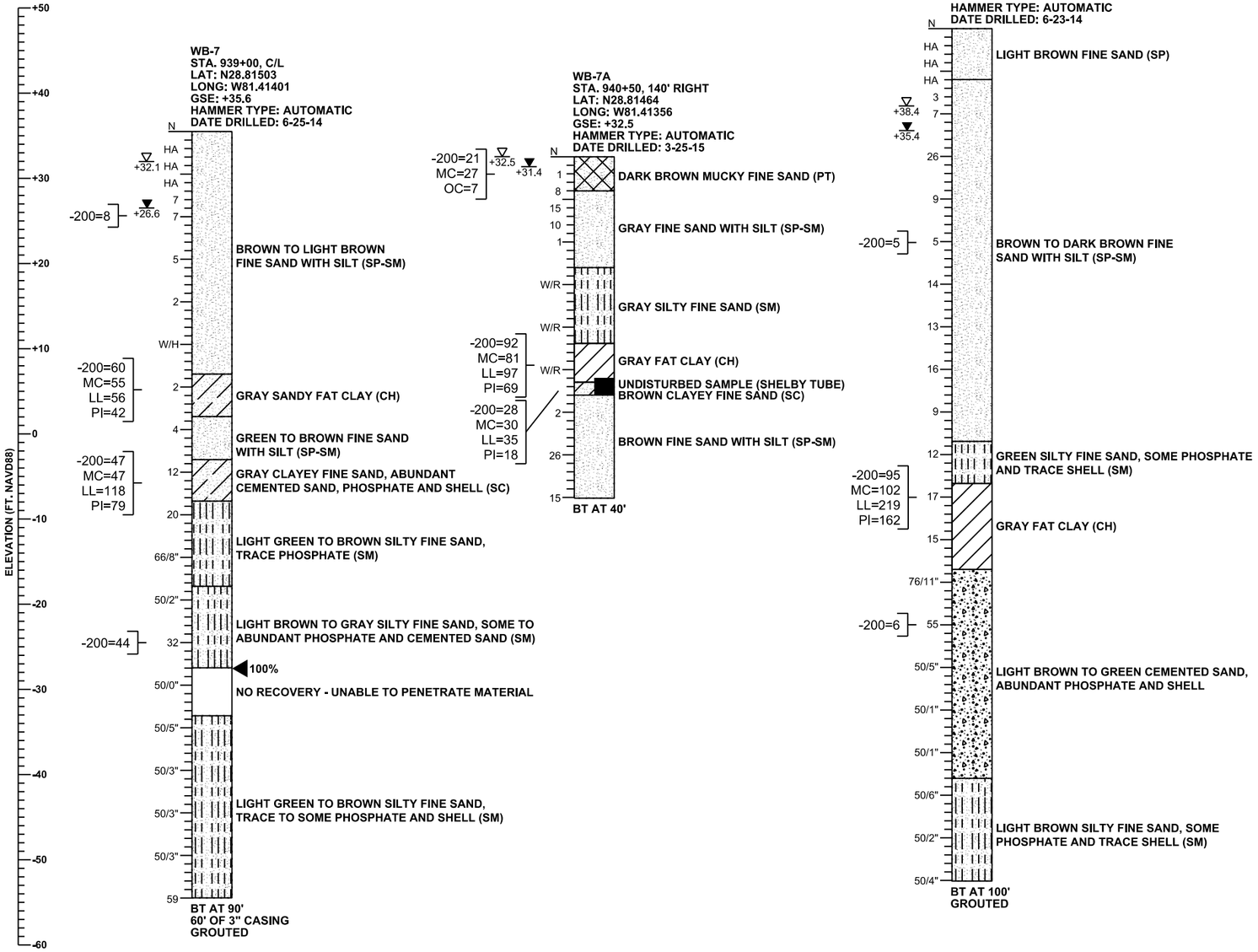
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-99



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
+32.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+26.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | CLAY | SAND AND MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-7
SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-7A
SECTION: 28
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-8
SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

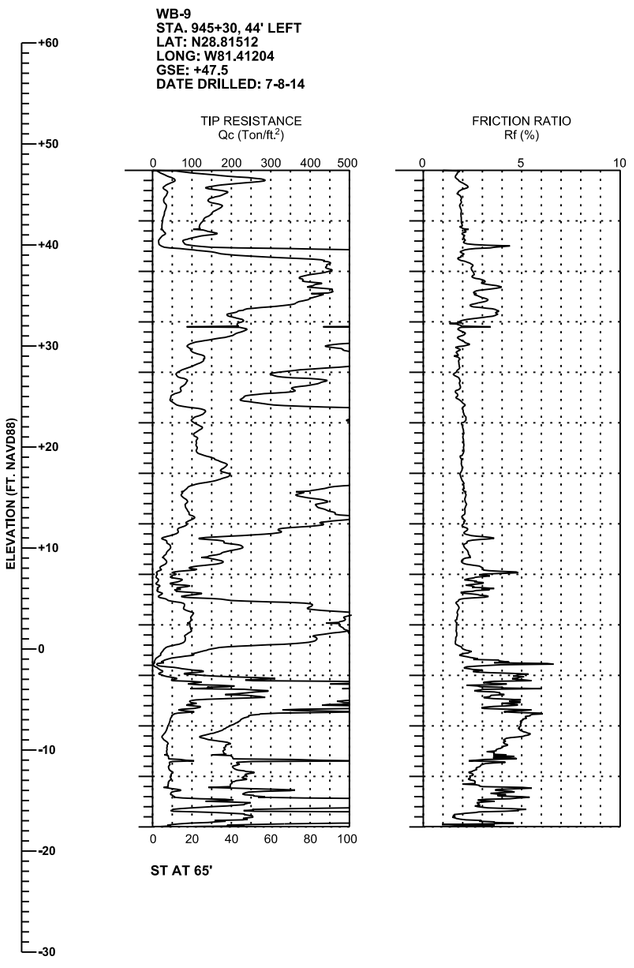
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

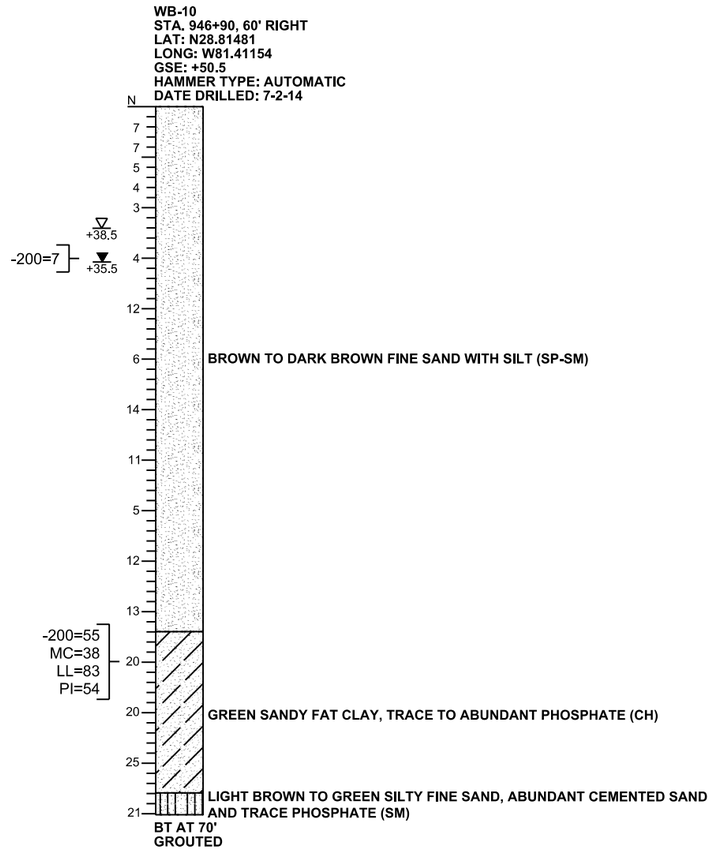
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-100

scott 5/14/2015 6:35:06 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +38.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +35.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

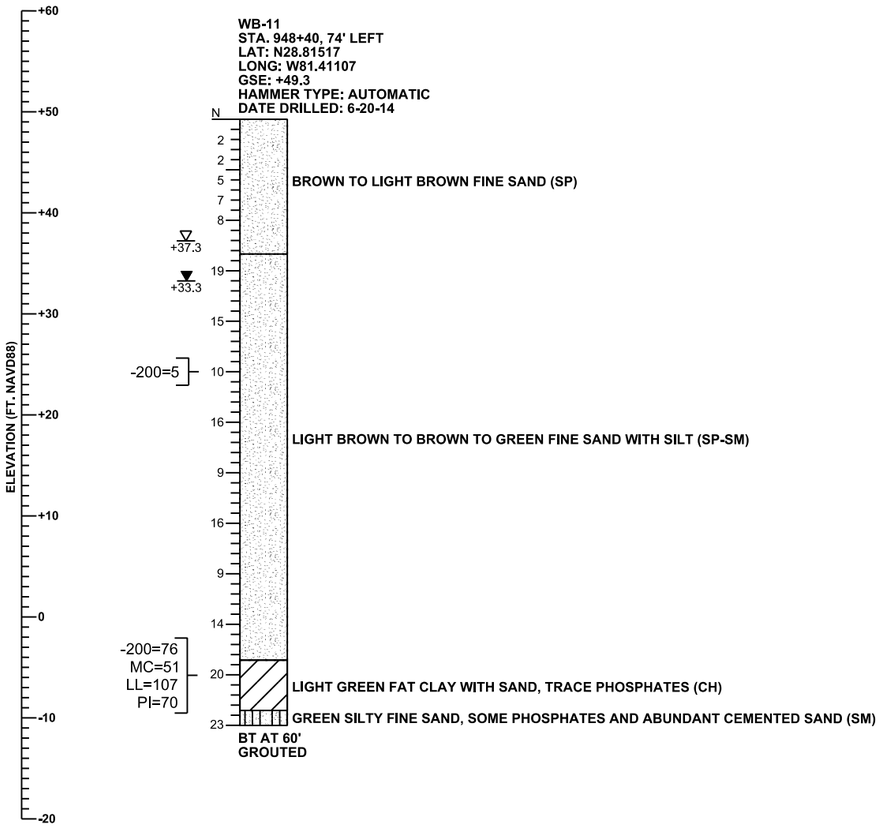
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-101



WB-11
STA. 948+40, 74' LEFT
LAT: N28.81517
LONG: W81.41107
GSE: +49.3
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-20-14

BROWN TO LIGHT BROWN FINE SAND (SP)

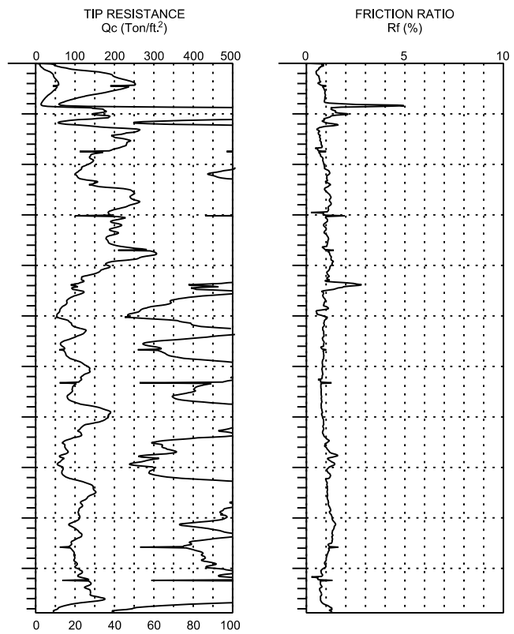
LIGHT BROWN TO BROWN TO GREEN FINE SAND WITH SILT (SP-SM)

LIGHT GREEN FAT CLAY WITH SAND, TRACE PHOSPHATES (CH)

GREEN SILTY FINE SAND, SOME PHOSPHATES AND ABUNDANT CEMENTED SAND (SM)

BT AT 60'
GROUTED

WB-12
STA. 950+00, 50' RIGHT
LAT: N28.81481
LONG: W81.41058
GSE: +53.7
DATE DRILLED: 7-8-14



ST AT 54.4'

LEGEND

- **GSE** GROUND SURFACE ELEVATION (FT. NAVD88)
- **N** STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
- **▽ +37.3** ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
- **▼ +33.3** ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
- **BT** BORING TERMINATED AT DEPTH INDICATED
- **ST** SOUNDING TERMINATED AT DEPTH INDICATED
- **-200=** PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
- **MC=** PERCENT NATURAL MOISTURE CONTENT
- **LL=** LIQUID LIMIT
- **PI=** PLASTICITY INDEX

SAND CLAY

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

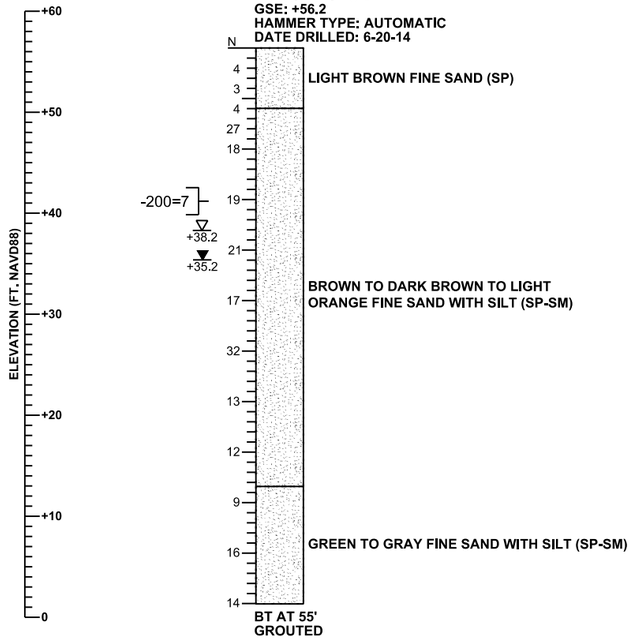
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

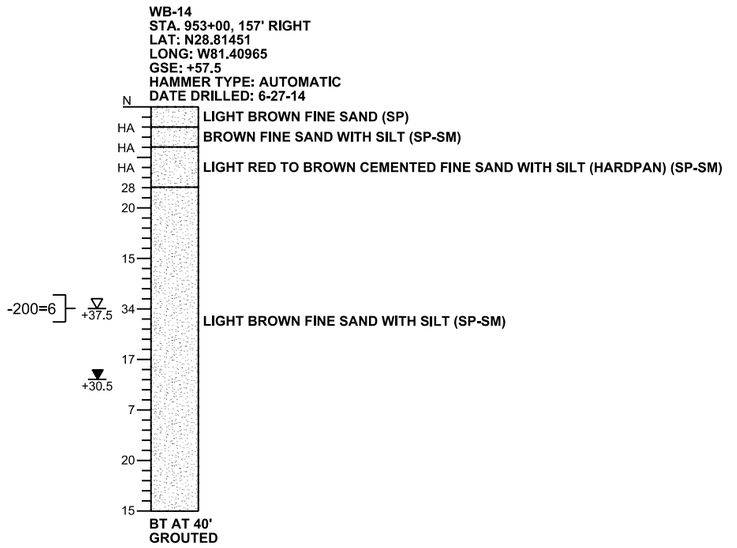
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-102

scott 5/14/2015 6:35:46 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +38.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +35.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

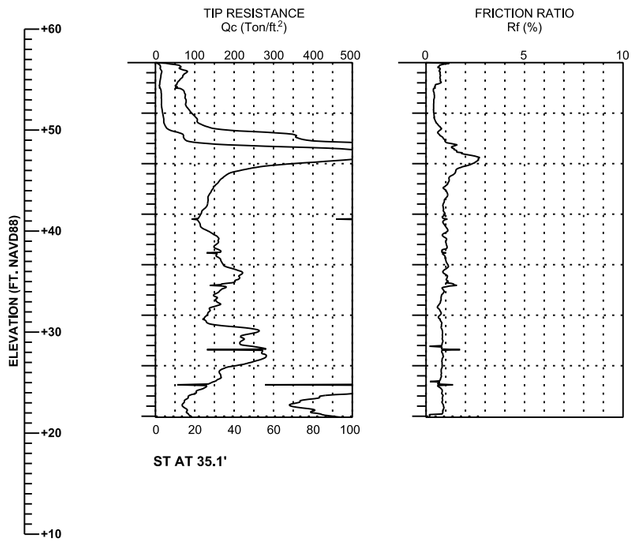
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-103

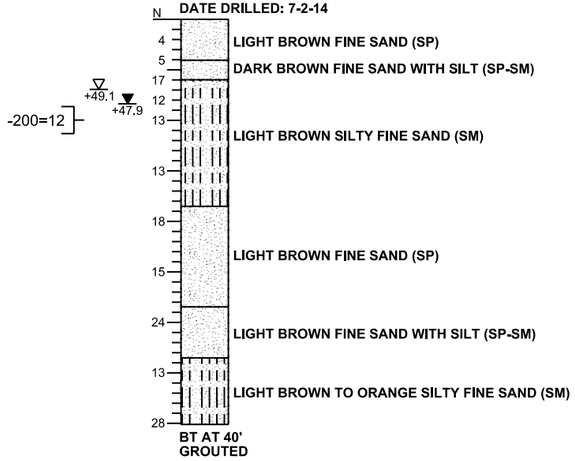
scott 5/14/2015 9:13:23 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-15
STA. 954+40, 100' LEFT
LAT: N28.81520
LONG: W81.40932
GSE: +56.9
DATE DRILLED: 7-8-14



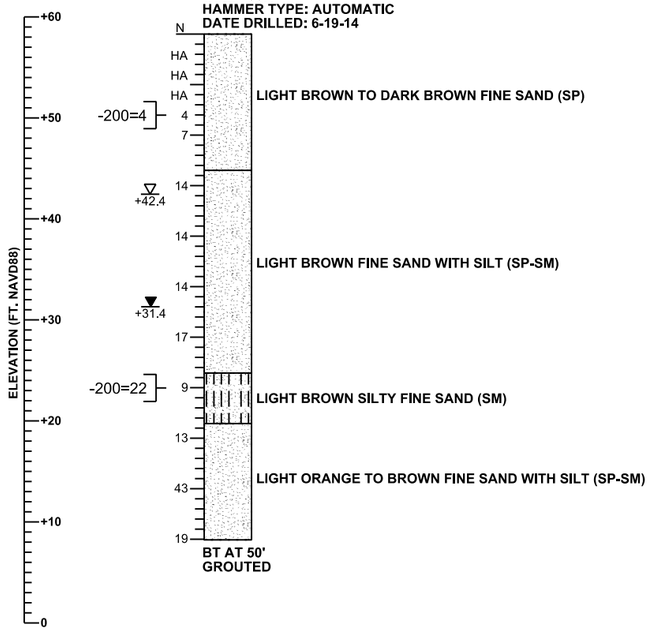
ST AT 35.1'

WB-16
STA. 956+00, 65' RIGHT
LAT: N28.81475
LONG: W81.40874
GSE: +56.1
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 7-2-14



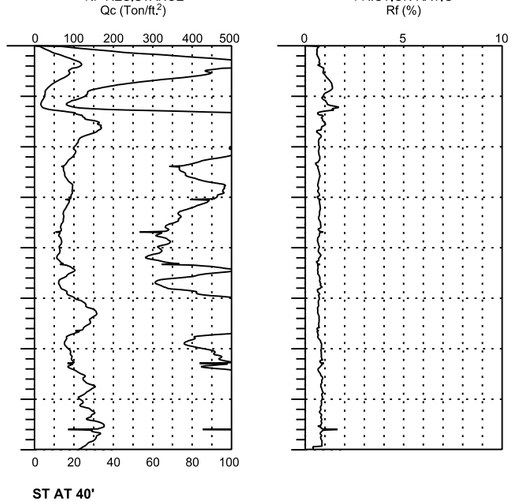
BT AT 40'
GROUTED

WB-17
STA. 957+40, 60' LEFT
LAT: N28.81508
LONG: W81.40823
GSE: +58.4
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-19-14



BT AT 50'
GROUTED

WB-18
STA. 959+00, 155' RIGHT
LAT: N28.81448
LONG: W81.40777
GSE: +57.4
DATE DRILLED: 7-14-14



ST AT 40'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +49.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +47.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

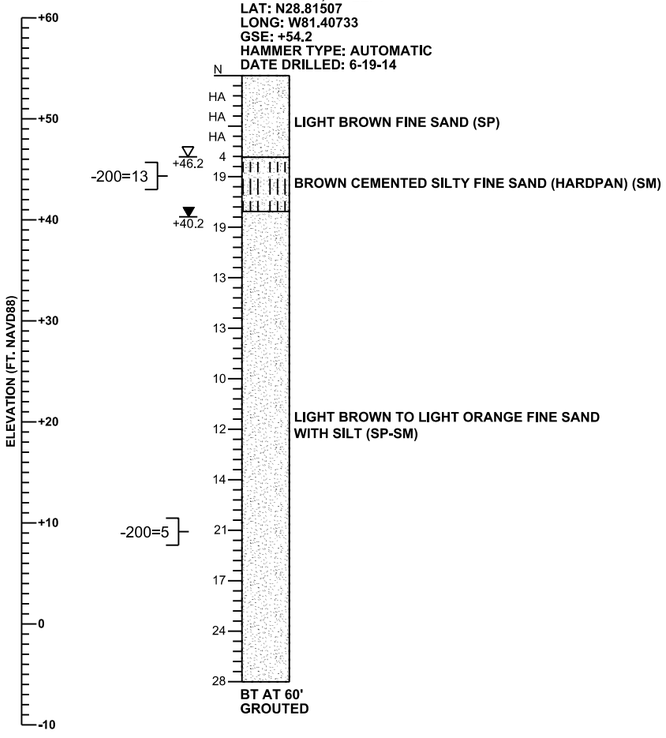
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

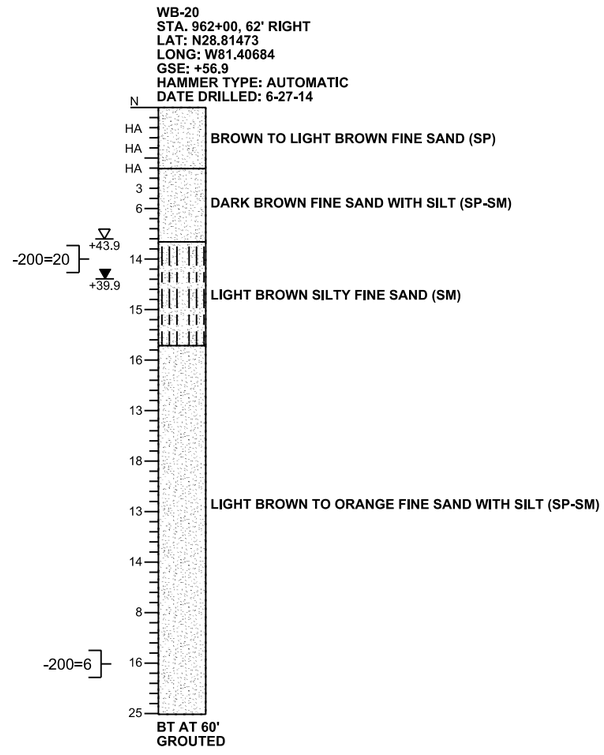
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-105

Scott 4/17/2017 1:00:40 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +46.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +40.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

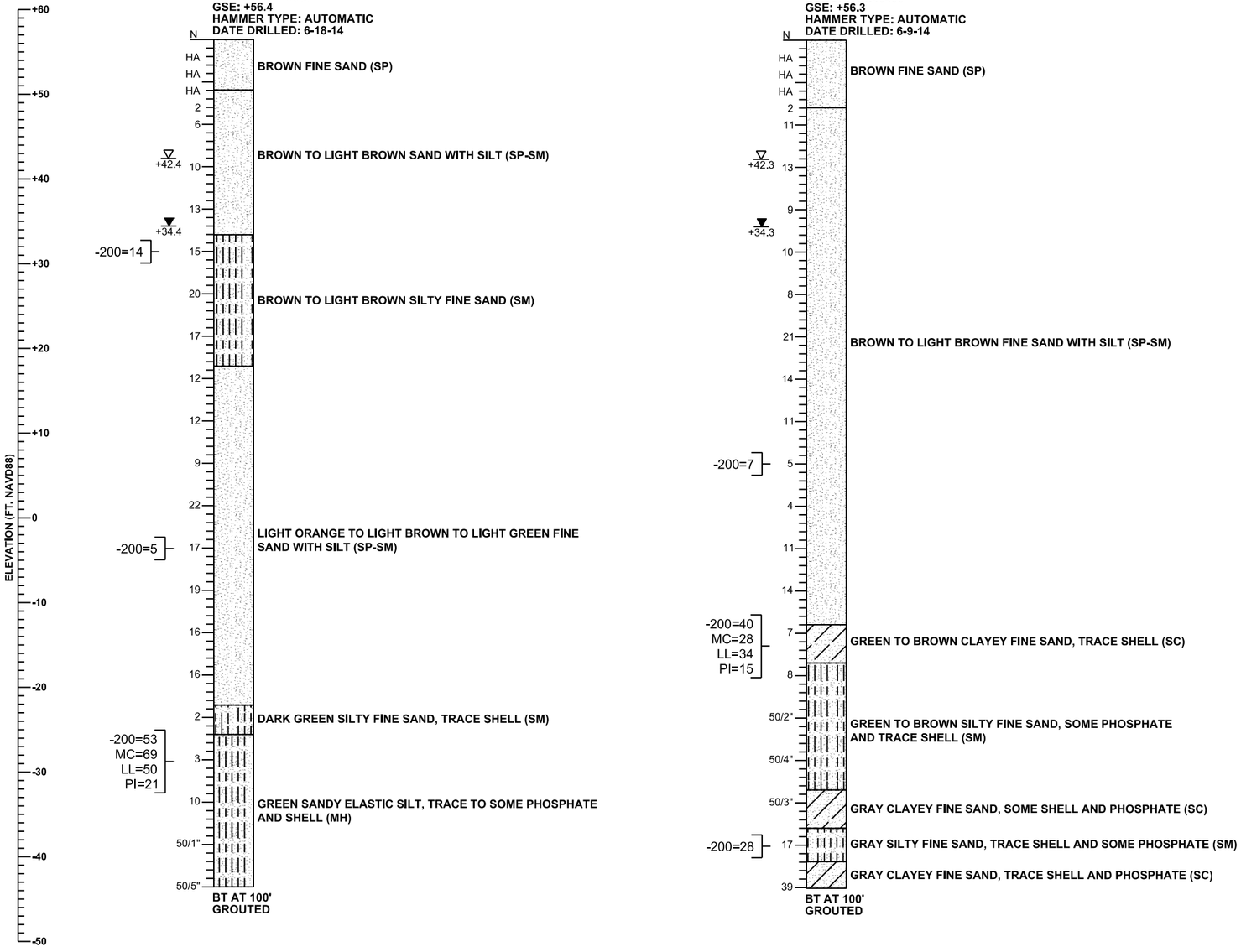
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-106

Scott 4/17/2017 1:01:02 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +42.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +34.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

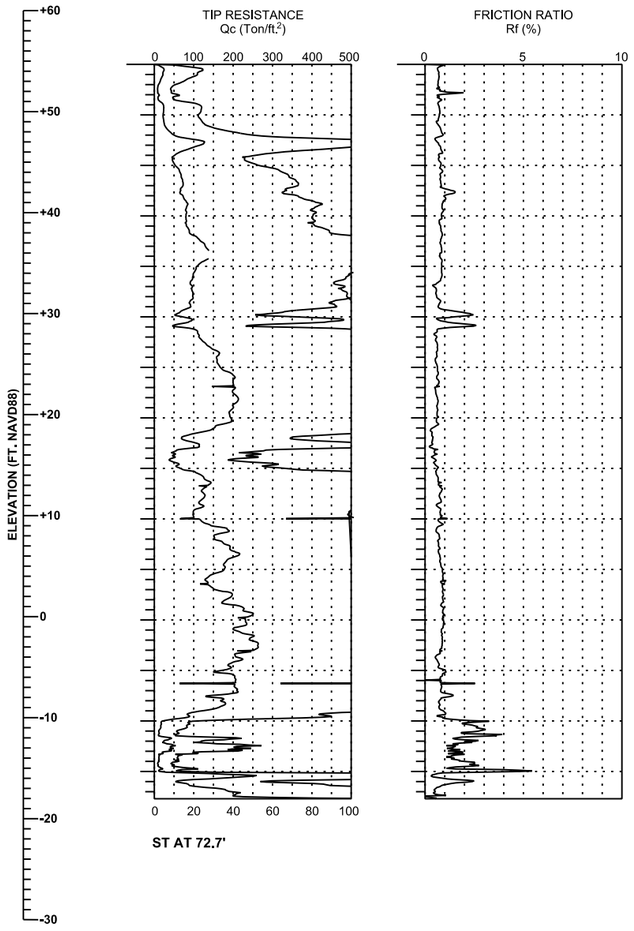
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-107

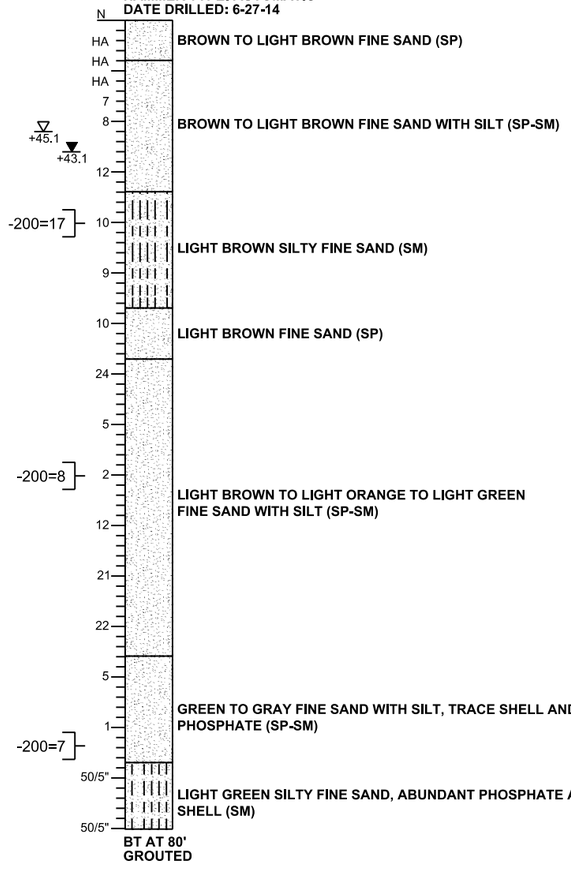
Scott 4/17/2017 1:01:26 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-23
STA. 969+00, 65' LEFT
LAT: N28.81506
LONG: W81.40464
GSE: +54.8
DATE DRILLED: 7-9-14



ST AT 72.7'

WB-24
STA. 970+50, 60' RIGHT
LAT: N28.81472
LONG: W81.40417
GSE: +56.1
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-27-14



BROWN TO LIGHT BROWN FINE SAND (SP)

BROWN TO LIGHT BROWN FINE SAND WITH SILT (SP-SM)

LIGHT BROWN SILTY FINE SAND (SM)

LIGHT BROWN FINE SAND (SP)

LIGHT BROWN TO LIGHT ORANGE TO LIGHT GREEN FINE SAND WITH SILT (SP-SM)

GREEN TO GRAY FINE SAND WITH SILT, TRACE SHELL AND ABUNDANT PHOSPHATE (SP-SM)

LIGHT GREEN SILTY FINE SAND, ABUNDANT PHOSPHATE AND TRACE SHELL (SM)

BT AT 80'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +45.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +43.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-23
SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-24
SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

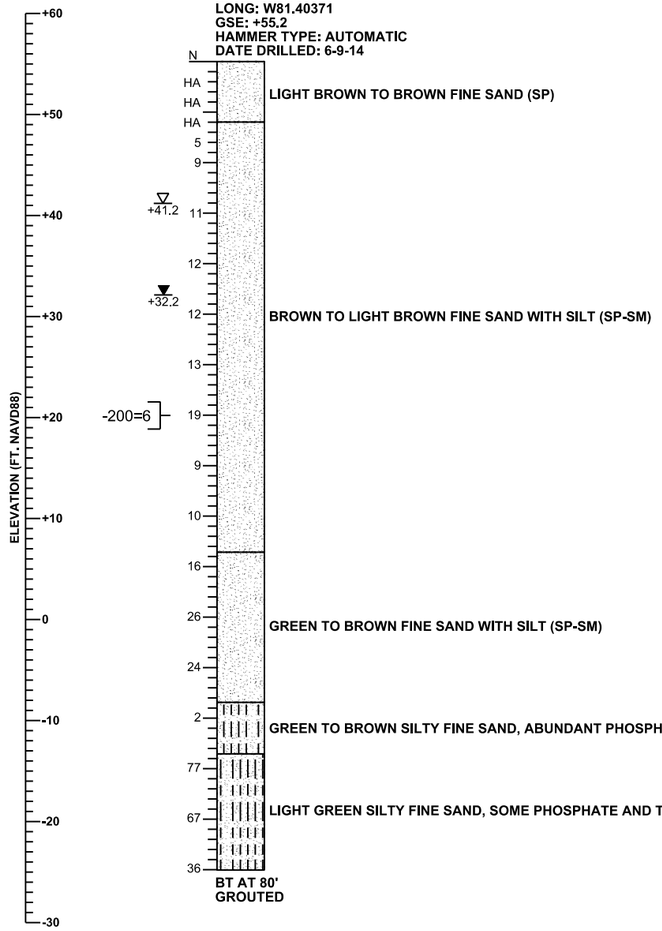
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

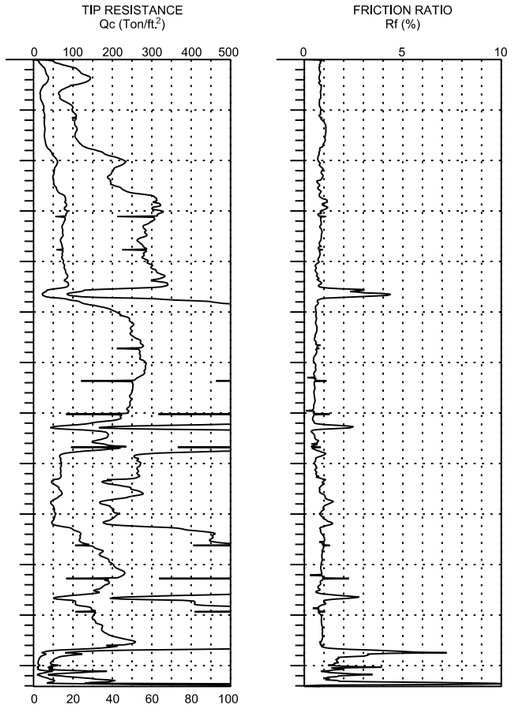
SHEET NO. BW-108

Scott 4/17/2017 1:01:47 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-25
STA. 972+00, 27' LEFT
LAT: N28.81505
LONG: W81.40371
GSE: +55.2
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-9-14



WB-26
STA. 973+50, 62' RIGHT
LAT: N28.81471
LONG: W81.40324
GSE: +55.4
DATE DRILLED: 7-9-14



ST AT 62.1'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +41.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +32.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

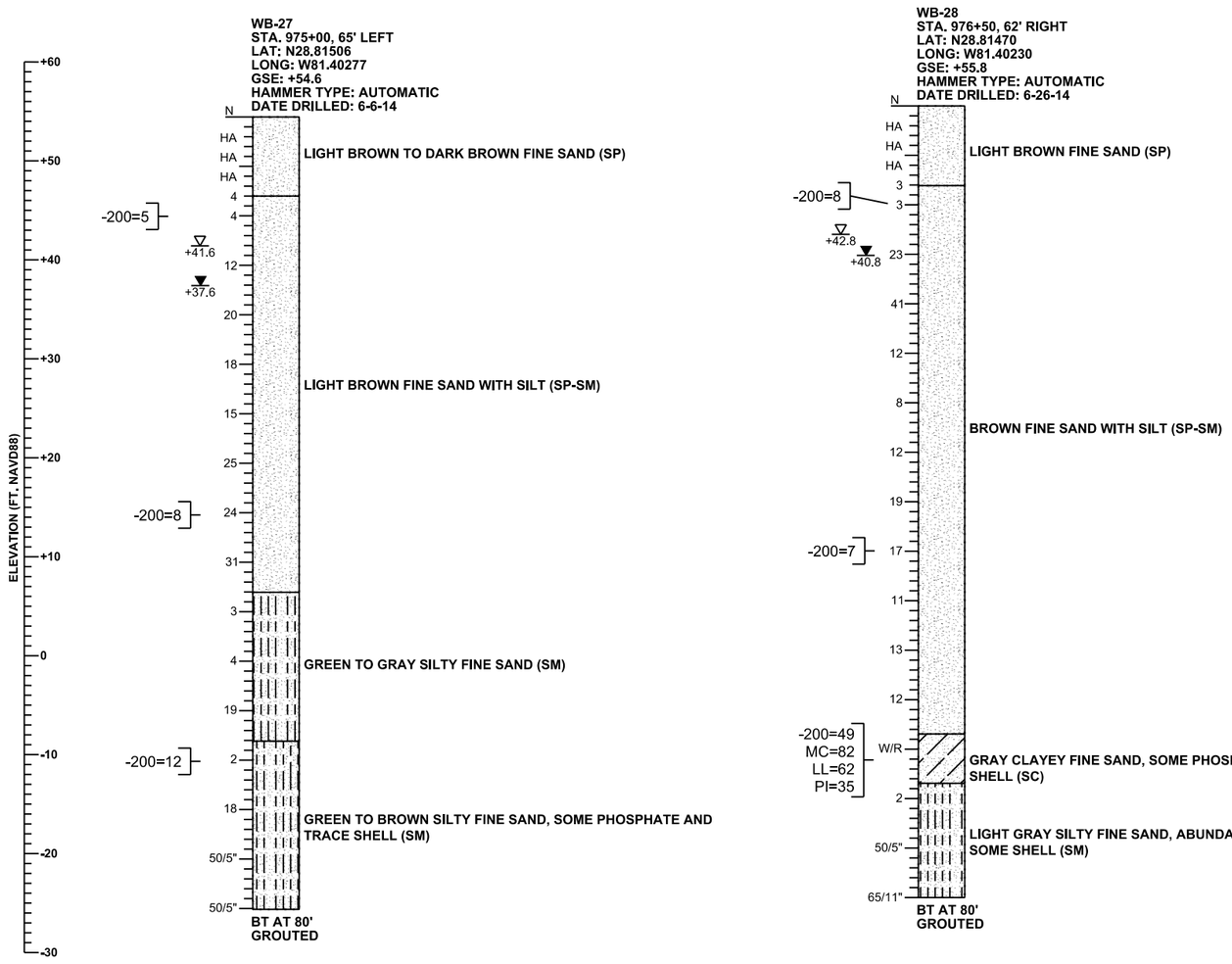
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-109

Scott 4/17/2017 1:02:11 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
▽ +41.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +37.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

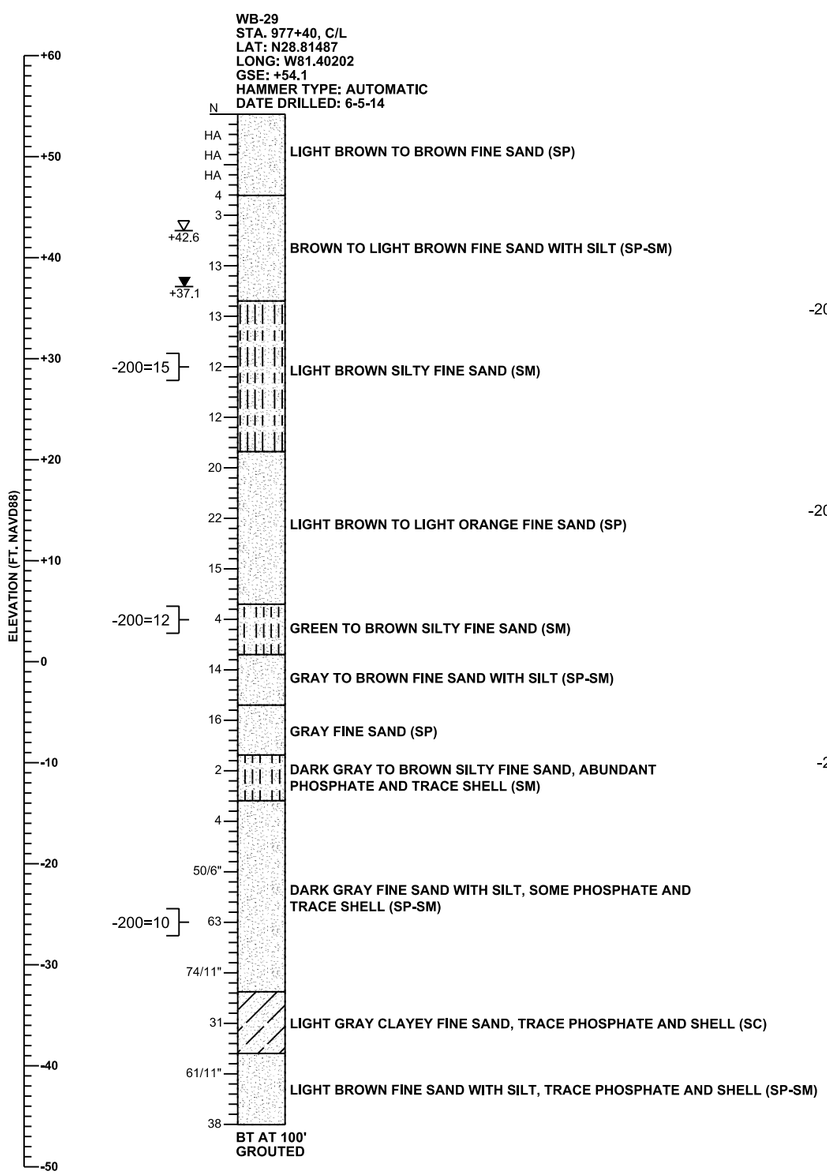
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

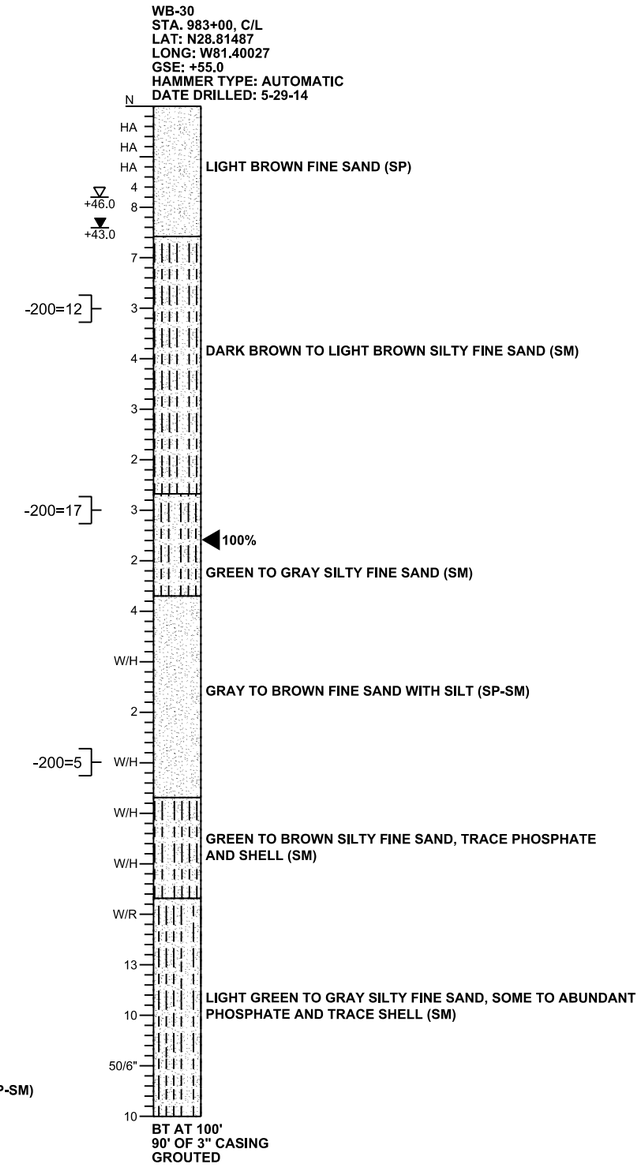
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-110

Scott 4/17/2017 1:02:36 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/6"	NUMBER OF BLOWS FOR 6 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
▽ +42.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +37.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

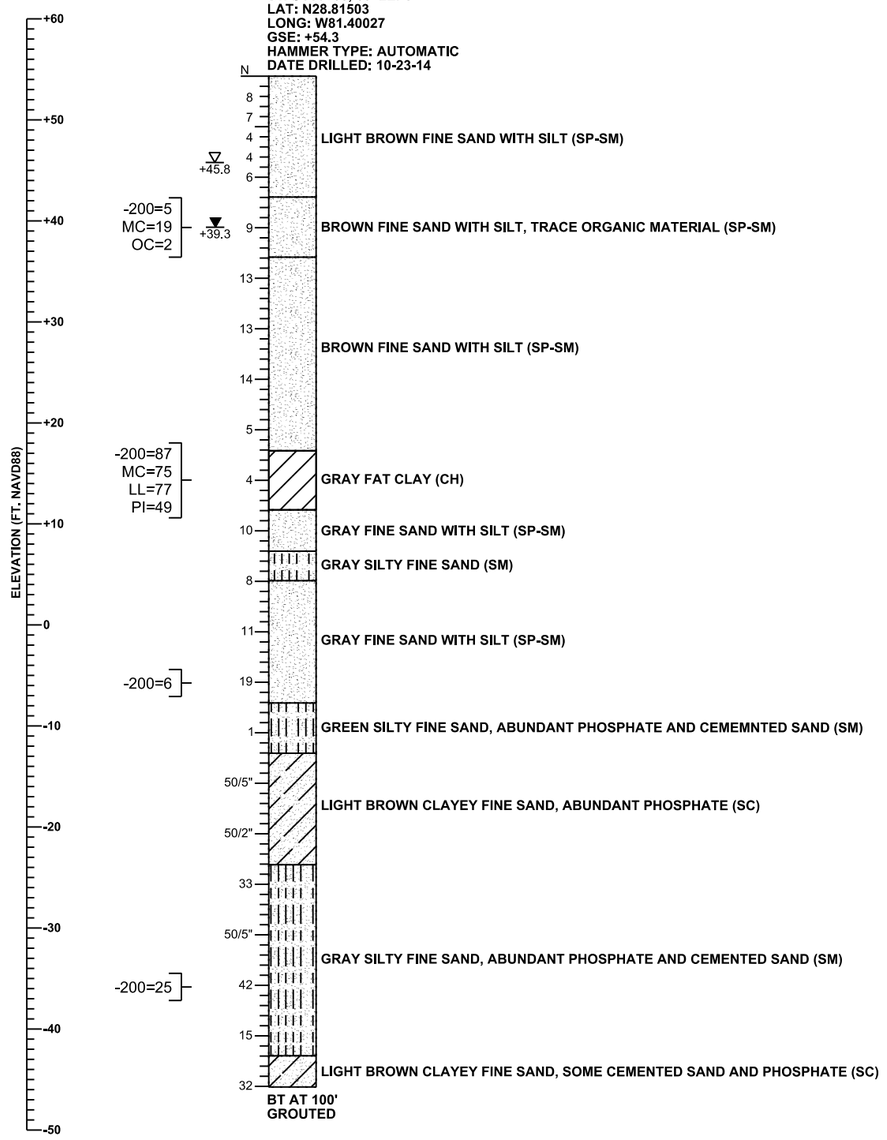
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-111

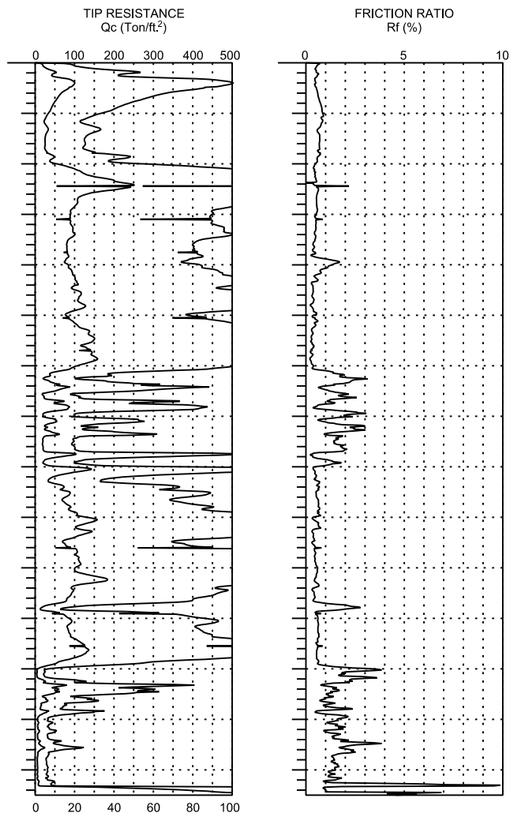
Scott 4/17/2017 1:02:57 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-30A
STA. 983+00, 60' LEFT
LAT: N28.81503
LONG: W81.40027
GSE: +54.3
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-23-14



BT AT 100'
GROUTED

WB-30B
STA. 983+00, 60' RIGHT
LAT: N28.81471
LONG: W81.40027
GSE: +55.5
DATE DRILLED: 10-2-14



ST AT 72.5'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +45.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND — SAND AND CLAY
SAND AND SILT — CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

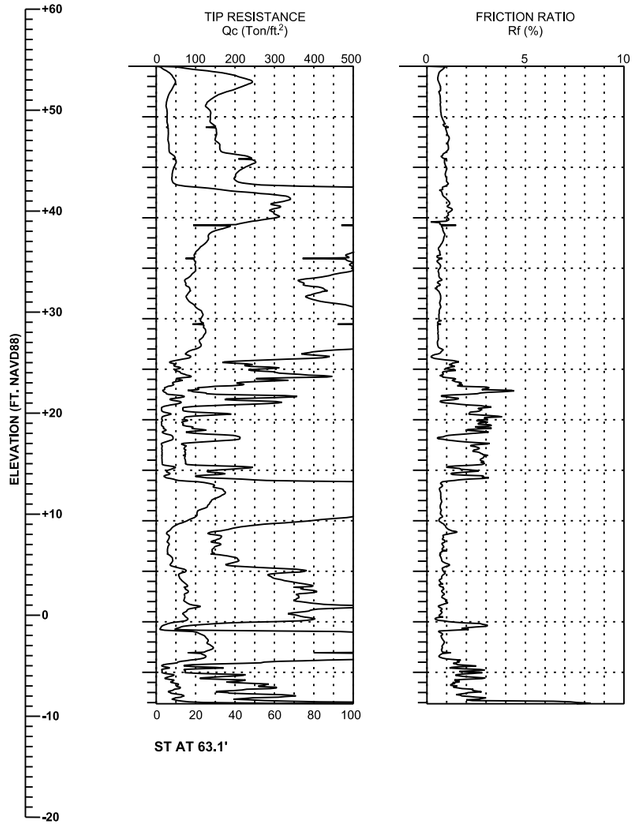
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
REF. DWG. NO.
SHEET NO. BW-112

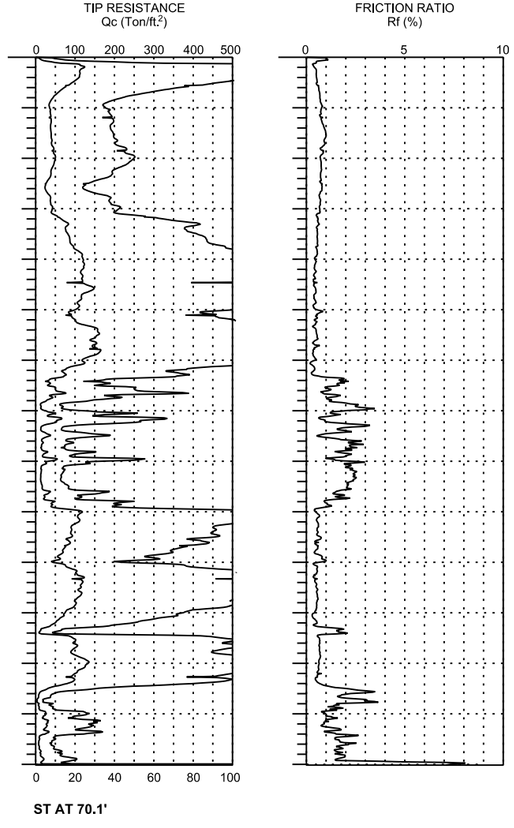
Scott 4/17/2017 1:03:18 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-31
STA. 984+00, 65' LEFT
LAT: N28.81505
LONG: W81.39996
GSE: +54.2
DATE DRILLED: 7-9-14



ST AT 63.1'

WB-31A
STA. 984+00, C/L
LAT: N28.81487
LONG: W81.39996
GSE: +55.2
DATE DRILLED: 10-3-14



ST AT 70.1'

LEGEND

ST SOUNDING TERMINATED AT DEPTH INDICATED

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

PRELIMINARY: NOT FOR CONSTRUCTION

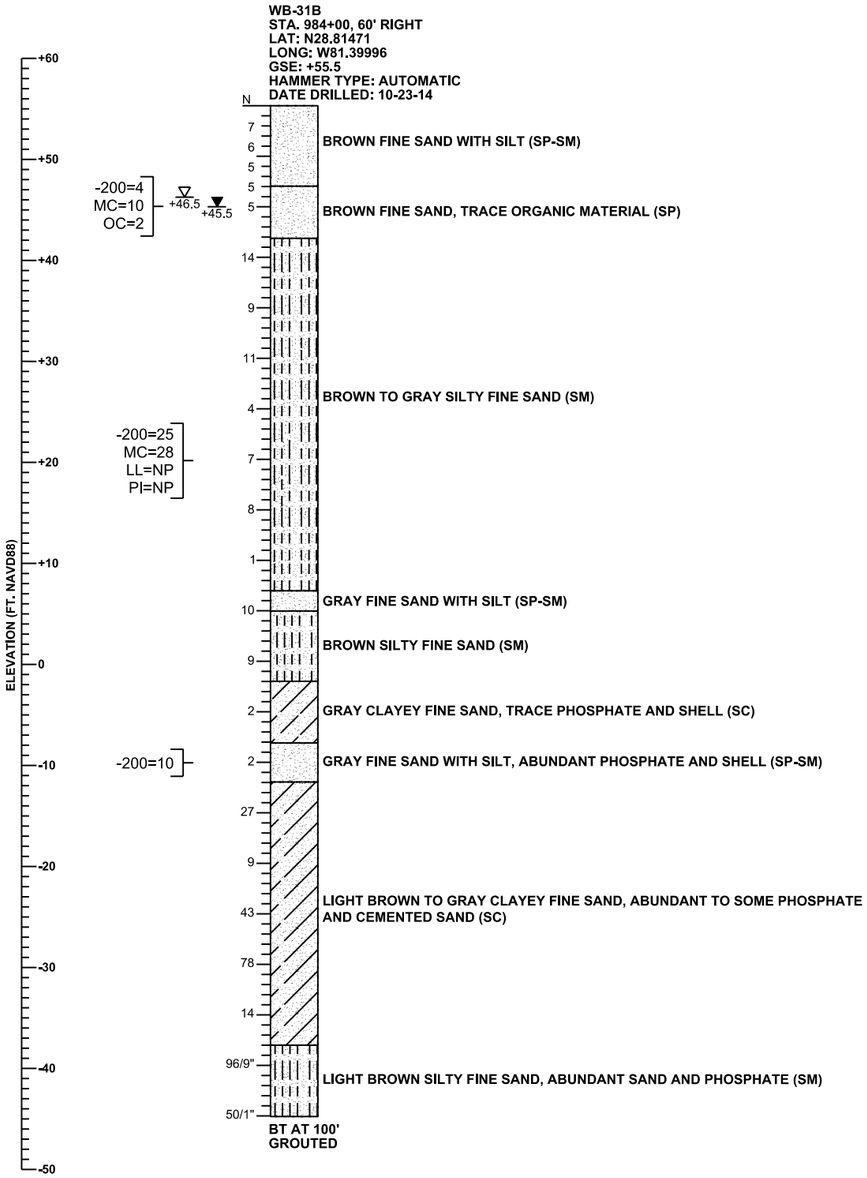
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

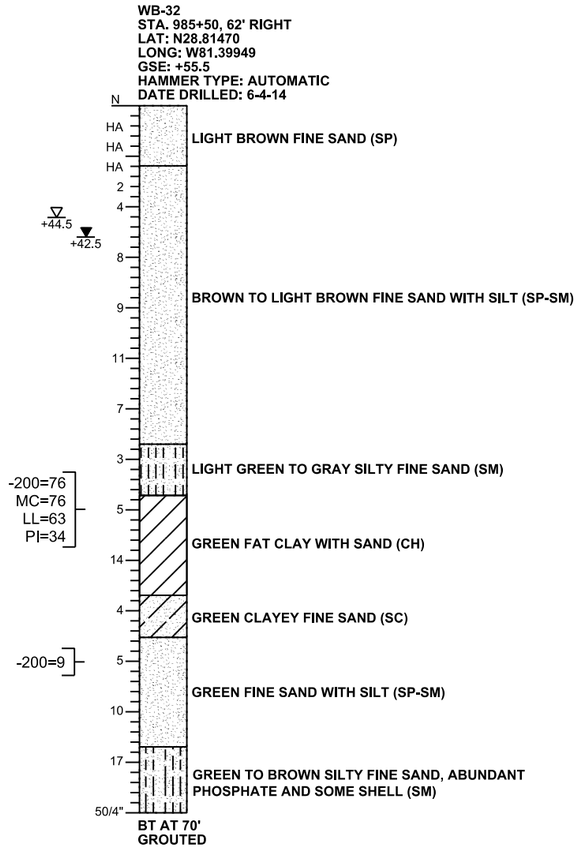
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY: CGB 71571			
DESIGNED BY: CGB 71571	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CHECKED BY: DCS 42763	SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO.: BW-113

Scott 4/17/2017 1:03:44 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/4"	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
▽ +44.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +42.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND — SAND AND CLAY

SAND AND SILT — CLAY

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

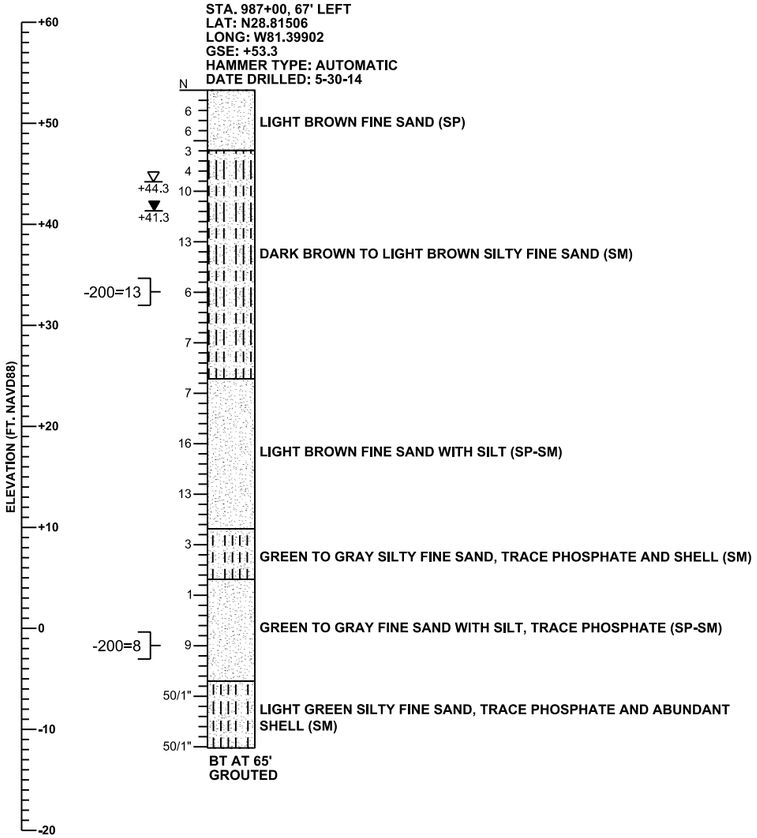
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

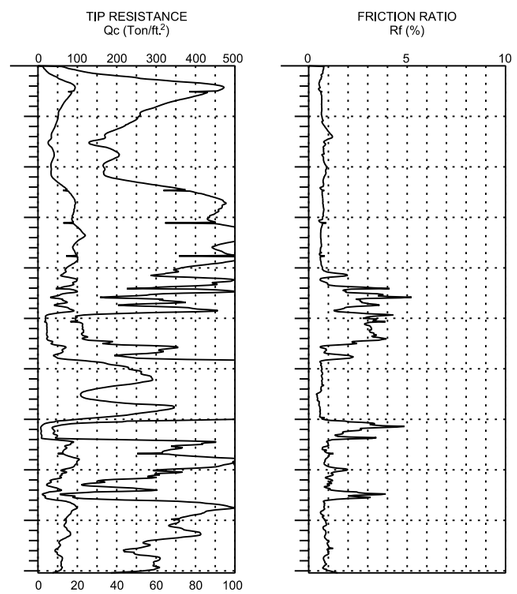
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-114

Scott 4/17/2017 1:04:09 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +44.3	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

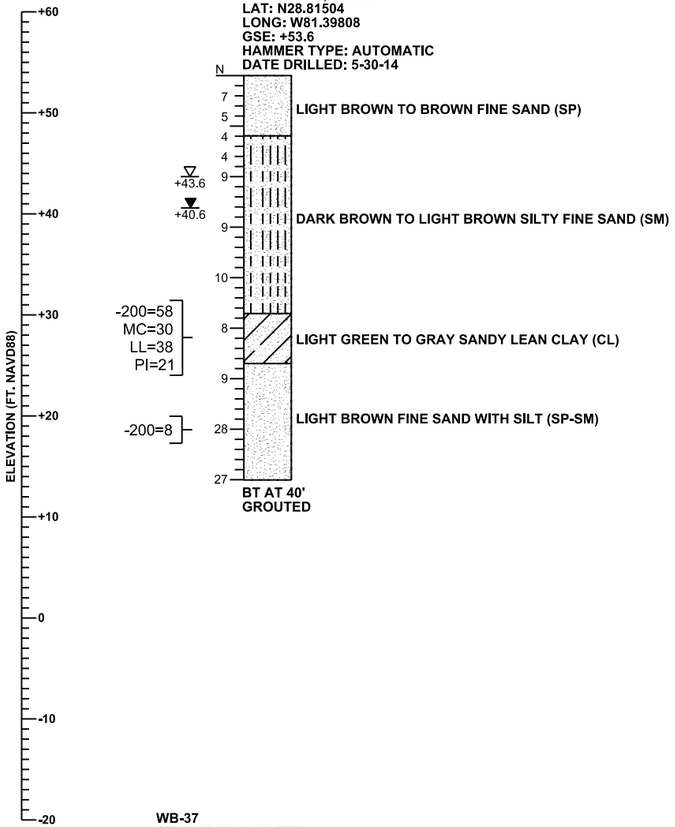
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

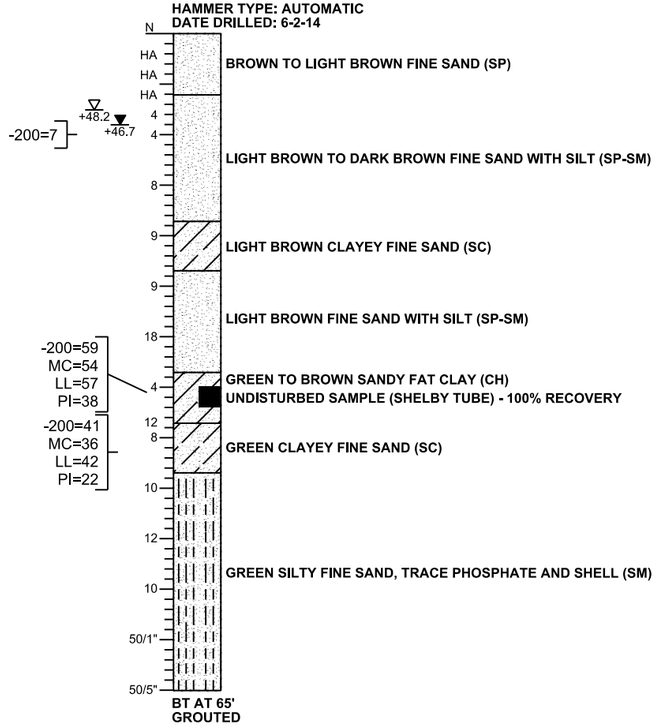
SHEET NO. BW-115

Scott 4/17/2017 1:04:32 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn



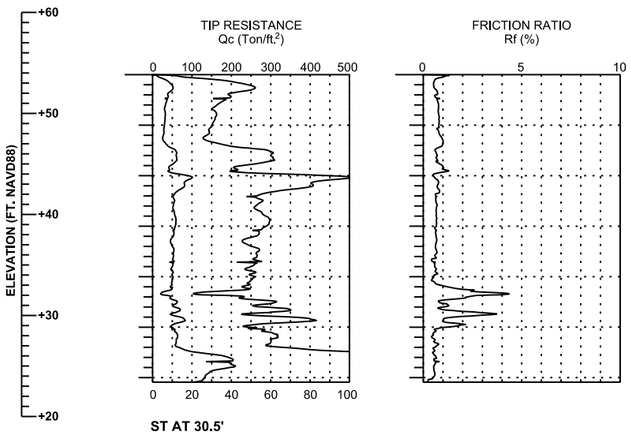
WB-35
STA. 990+00, 62' LEFT
LAT: N28.81504
LONG: W81.39808
GSE: +53.6
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-30-14

BT AT 40'
GROUTED



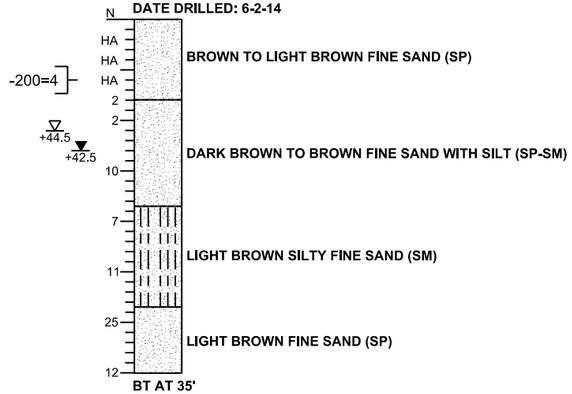
WB-36
STA. 991+50, 62' RIGHT
LAT: N28.81470
LONG: W81.39762
GSE: +55.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-2-14

BT AT 65'
GROUTED



WB-37
STA. 993+00, 62' LEFT
LAT: N28.81503
LONG: W81.39714
GSE: +53.9
DATE DRILLED: 7-10-14

ST AT 30.5'



WB-38
STA. 994+50, 62' RIGHT
LAT: N28.81470
LONG: W81.39669
GSE: +55.5
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-2-14

BT AT 35'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +43.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +40.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND
SAND AND CLAY
SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

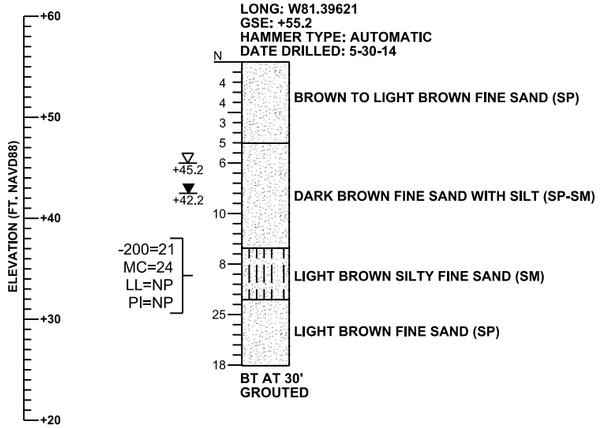
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

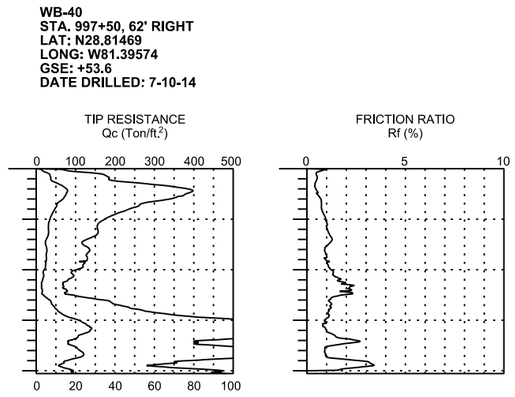
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

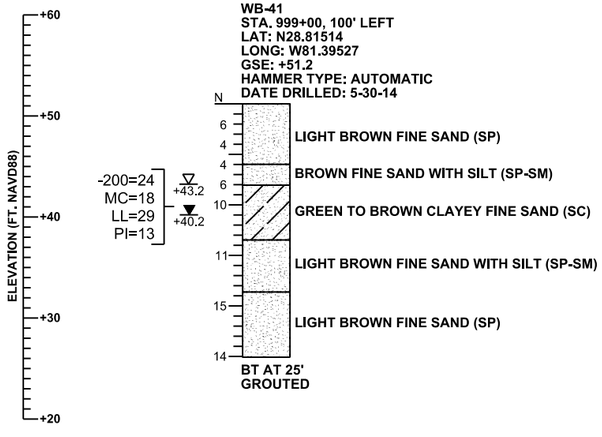
REF. DWG. NO.

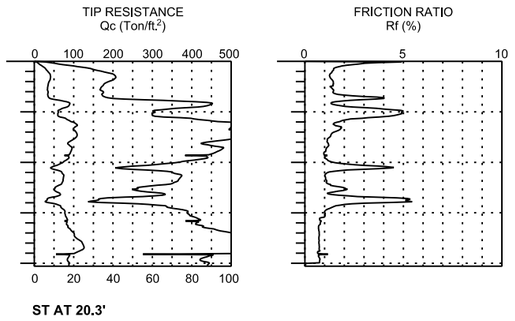
SHEET NO. BW-116

Scott 4/17/2017 1:04:58 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn









LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +45.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +42.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

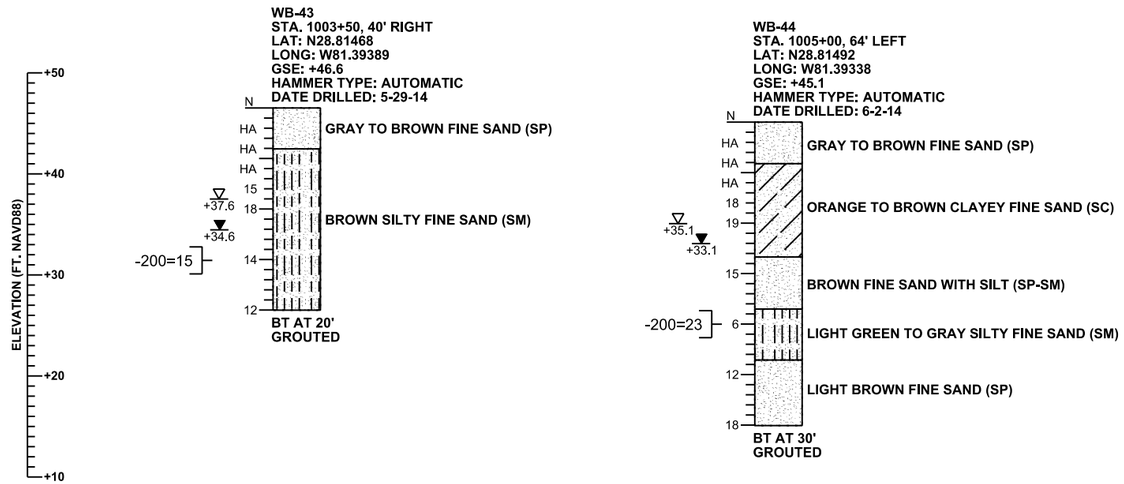
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

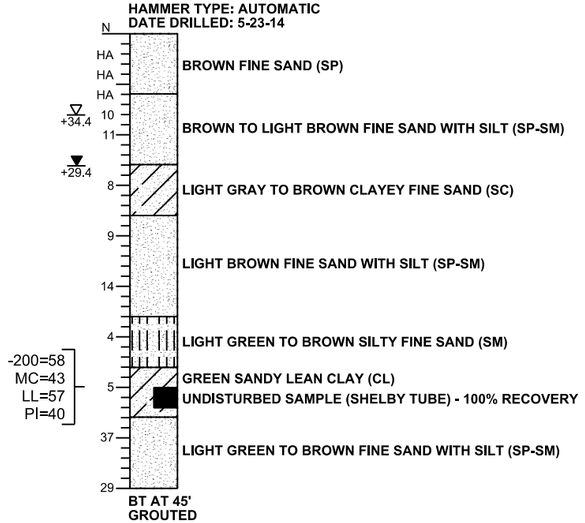
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-117

Scott 4/17/2017 1:05:20 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +37.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +34.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-43, WB-44	WB-45	WB-46
SECTION: 22	SECTION: 26	SECTION: 23
TOWNSHIP: 19 SOUTH	TOWNSHIP: 19 SOUTH	TOWNSHIP: 19 SOUTH
RANGE: 29 EAST	RANGE: 29 EAST	RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

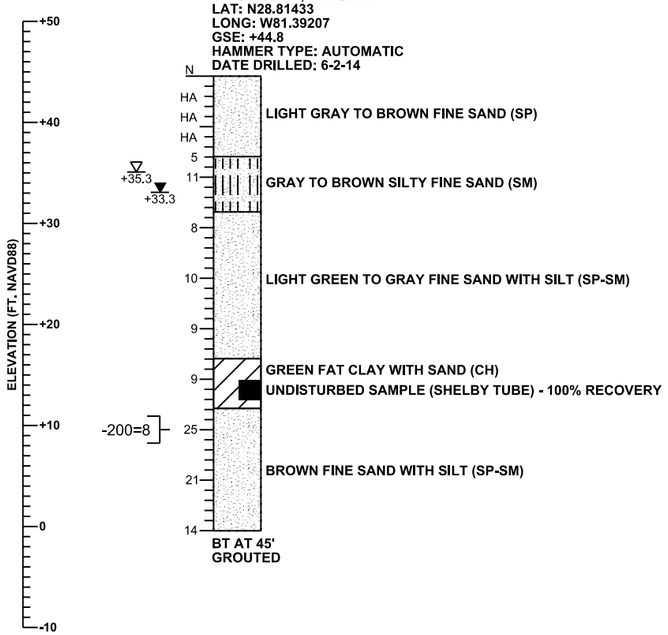
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

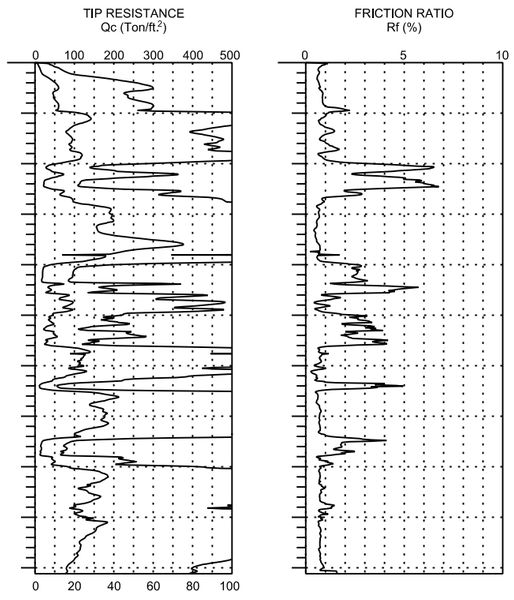
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-118

Scott 4/17/2017 1:05:47 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-47
STA. 1009+50, 74' RIGHT
LAT: N28.81433
LONG: W81.39207
GSE: +44.8
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 6-2-14



WB-48
STA. 1011+00, 62' LEFT
LAT: N28.81460
LONG: W81.39152
GSE: +42.5
DATE DRILLED: 7-14-14



ST AT 50.6'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
+35.3	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+33.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND CLAY

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

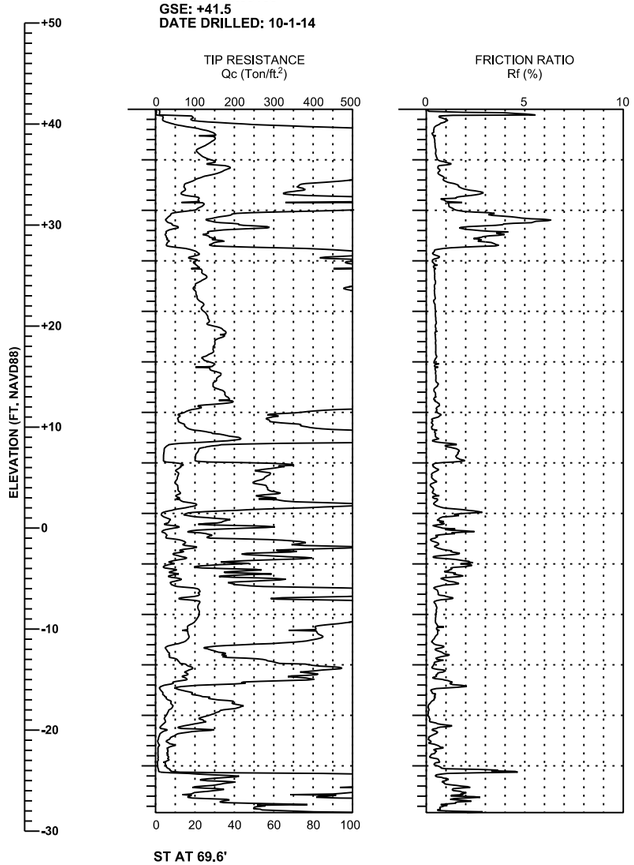
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-119

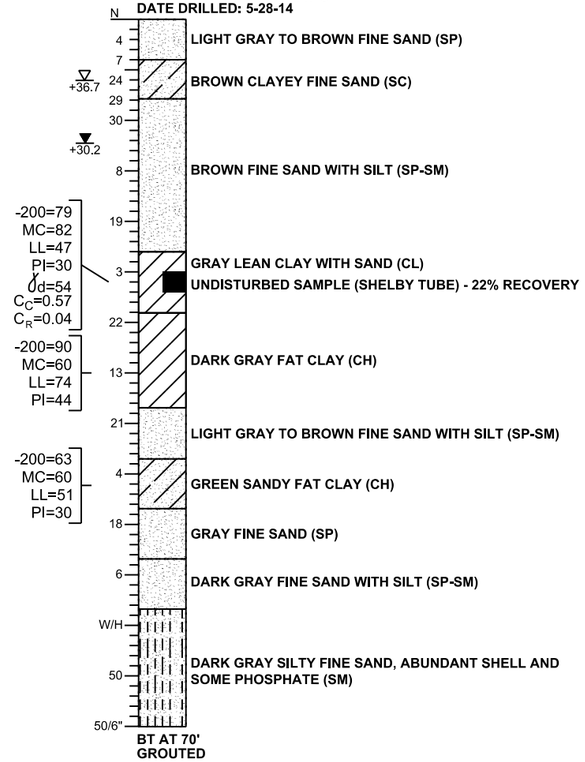
Scott 4/17/2017 1:06:10 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-49A
STA. 1012+50, 70' LEFT
LAT: N28.81451
LONG: W81.39105
GSE: +41.5
DATE DRILLED: 10-1-14



ST AT 69.6'

WB-49
STA. 1012+50, 64' RIGHT
LAT: N28.81416
LONG: W81.39117
GSE: +42.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-28-14



BT AT 70' GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
▽ +36.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND — SAND AND CLAY
SAND AND SILT — CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

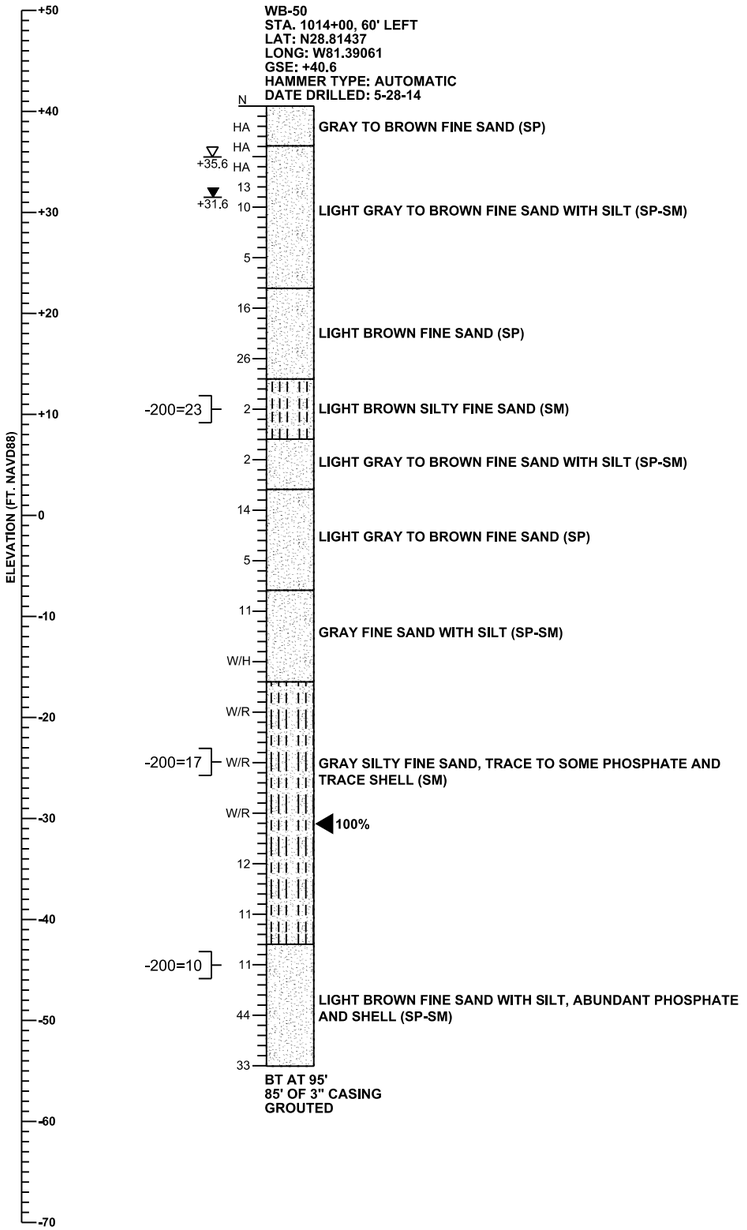
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-120

Scott 4/17/2017 1:06:28 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
+36.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+35.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY

SAND AND SILT — LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

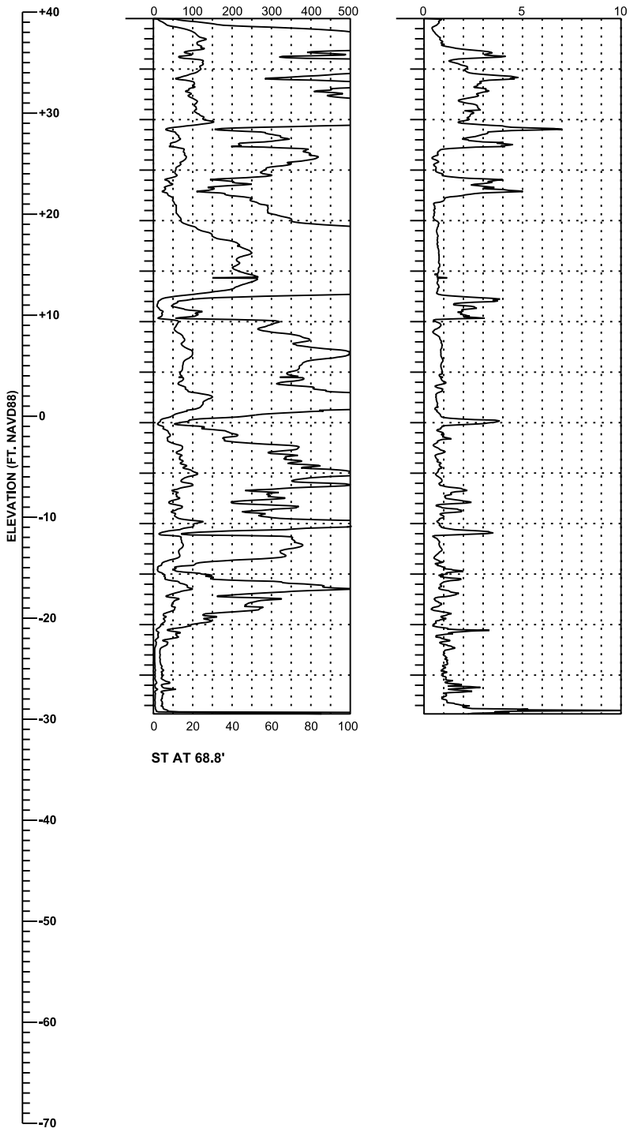
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-121

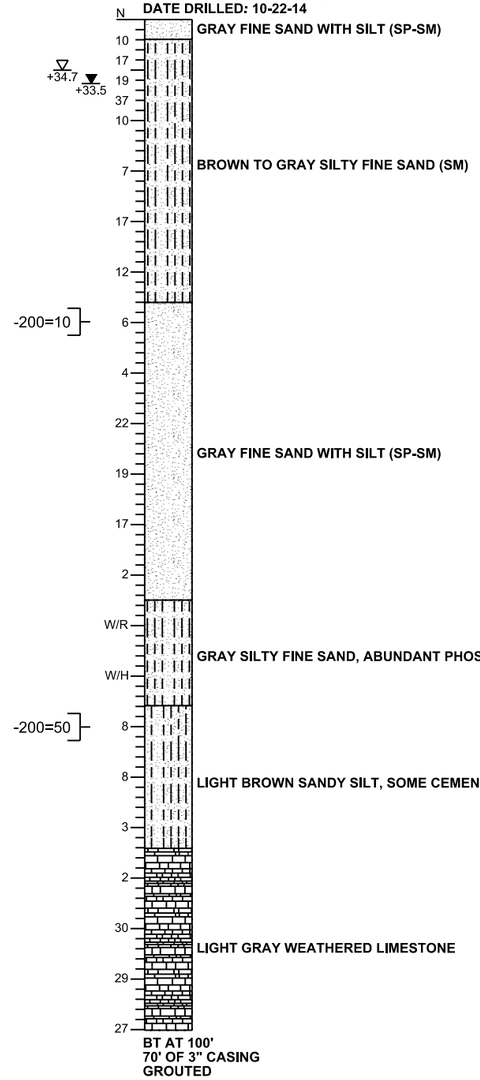
Scott 4/17/2017 1:06:49 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

WB-51
STA. 1015+50, 60' RIGHT
LAT: N28.81392
LONG: W81.39029
GSE: +39.5
DATE DRILLED: 7-15-14



ST AT 68.8'

WB-51A
STA. 1015+50, 55' LEFT
LAT: N28.81420
LONG: W81.39012
GSE: +39.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-22-14



GRAY FINE SAND WITH SILT (SP-SM)

BROWN TO GRAY SILTY FINE SAND (SM)

GRAY FINE SAND WITH SILT (SP-SM)

GRAY SILTY FINE SAND, ABUNDANT PHOSPHATE AND CEMENTED SAND (SM)

LIGHT BROWN SANDY SILT, SOME CEMENTED SAND AND TRACE PHOSPHATE (ML)

LIGHT GRAY WEATHERED LIMESTONE

BT AT 100'
70' OF 3" CASING GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
+34.7 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+33.5 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — LIMESTONE

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

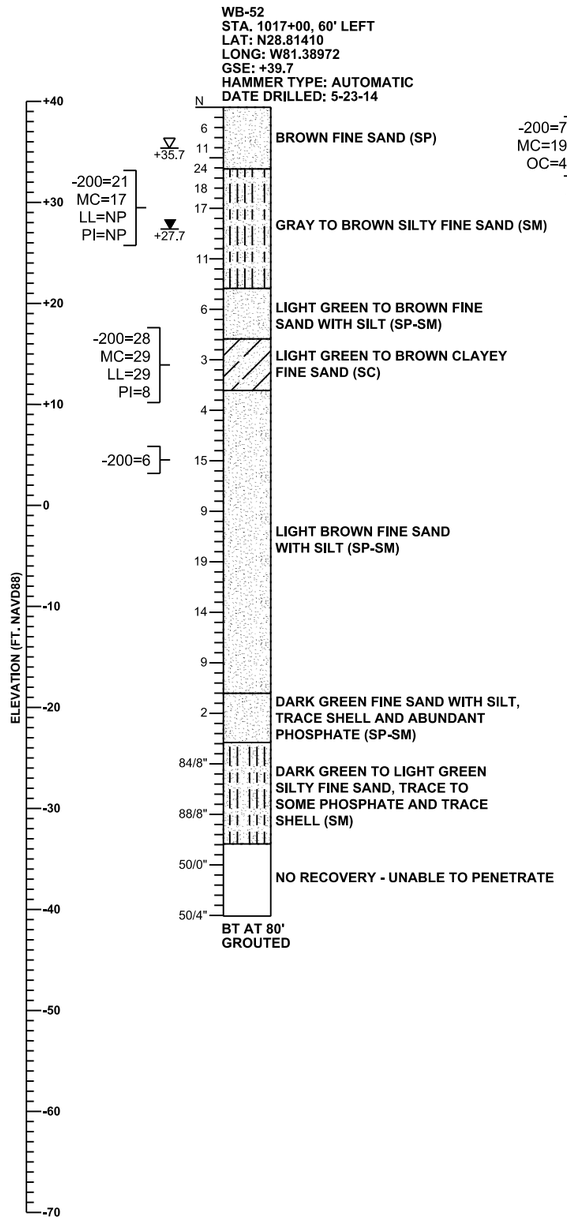
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.:

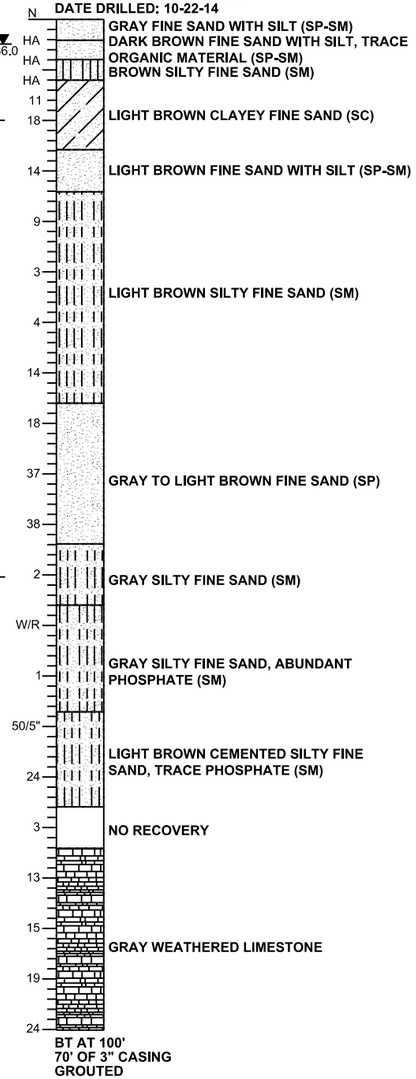
SHEET NO.: BW-122

Scott 4/17/2017 1:07:26 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

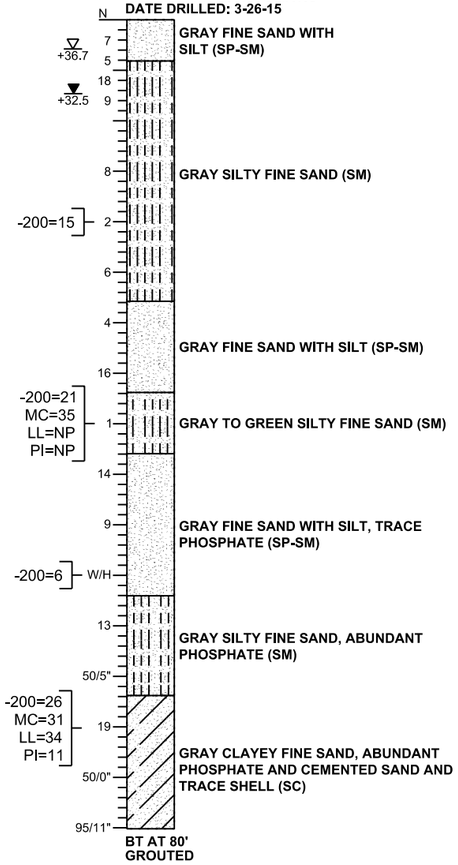


WB-52
STA. 1017+00, 60' LEFT
LAT: N28.81410
LONG: W81.38972
GSE: +39.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-23-14

WB-52A
STA. 1017+00, 65' RIGHT
LAT: N28.81378
LONG: W81.38987
GSE: +38.4
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-22-14



WB-52B
STA. 1018+00, 123' LEFT
LAT: N28.81417
LONG: W81.38936
GSE: +39.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 3-26-15



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
+36.4 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+36.0 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND — SAND AND CLAY
SAND AND SILT — LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

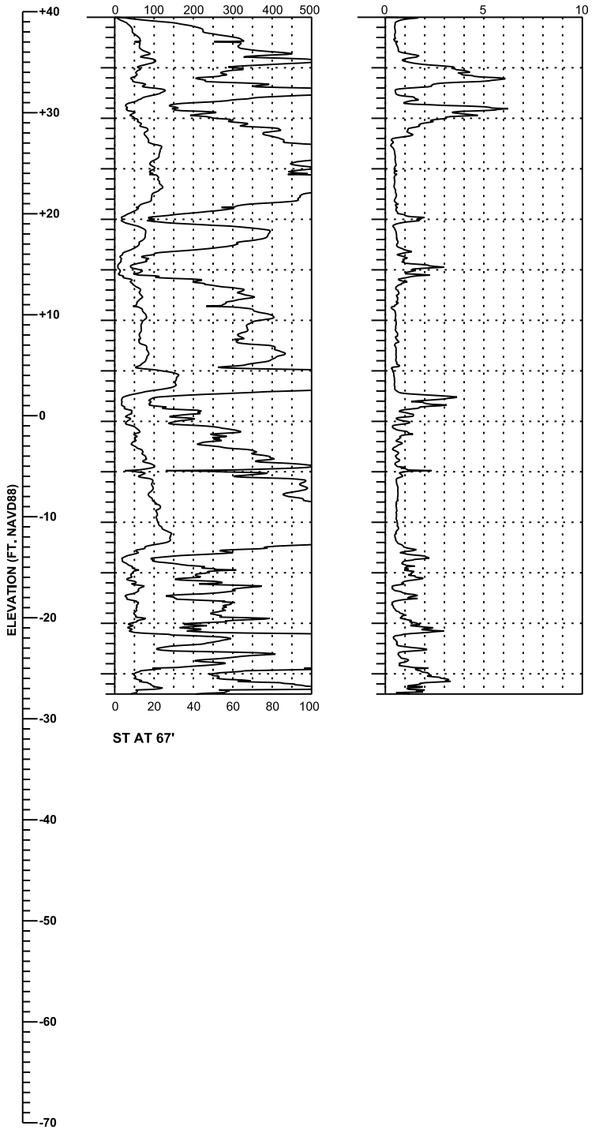
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

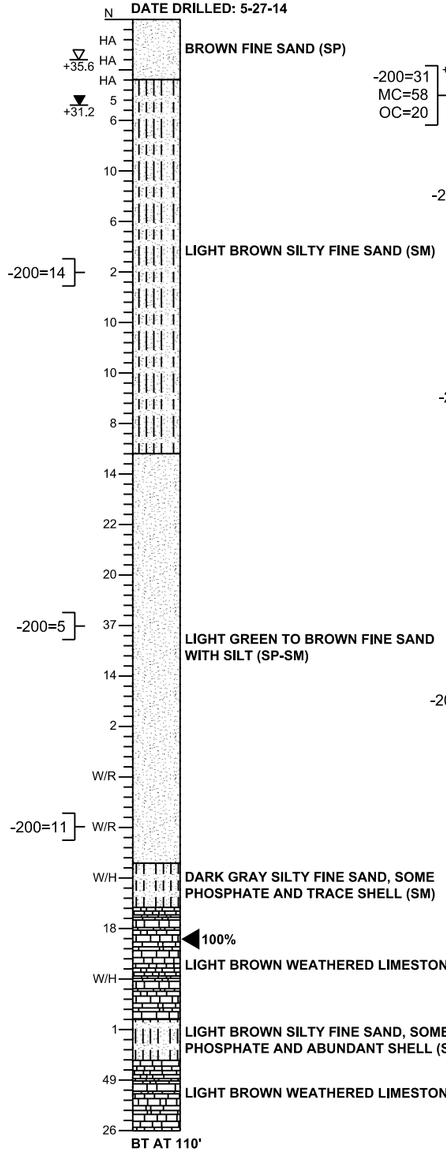
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-123

Scott 4/17/2017 1:07:52 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

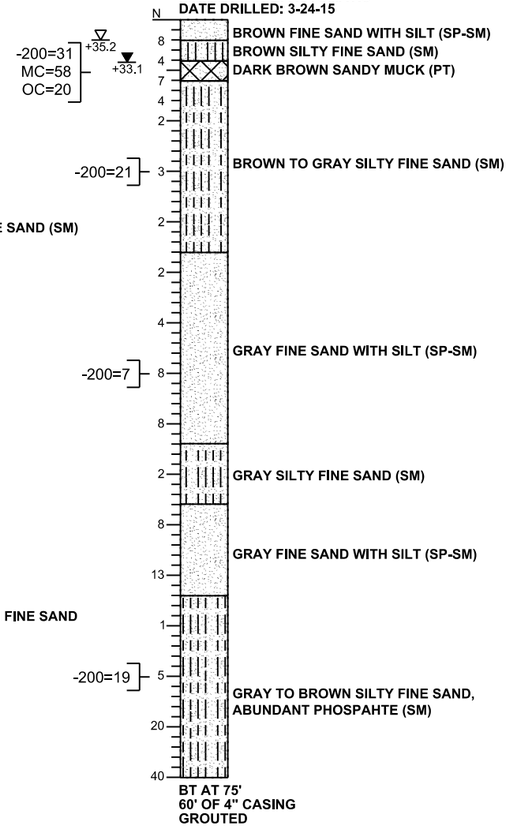


WB-53A
STA. 1018+50, 60' LEFT
LAT: N28.81396
LONG: W81.38928
GSE: +39.4
DATE DRILLED: 10-6-14

WB-53
STA. 1018+50, 70' RIGHT
LAT: N28.81362
LONG: W81.38942
GSE: +39.6
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-27-14



WB-53E
STA. 1019+25, 60' LEFT
LAT: N28.81389
LONG: W81.38906
GSE: +37.2
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 3-24-15



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
▽ +35.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND
SAND AND MUCK
SAND AND SILT
LIMESTONE

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

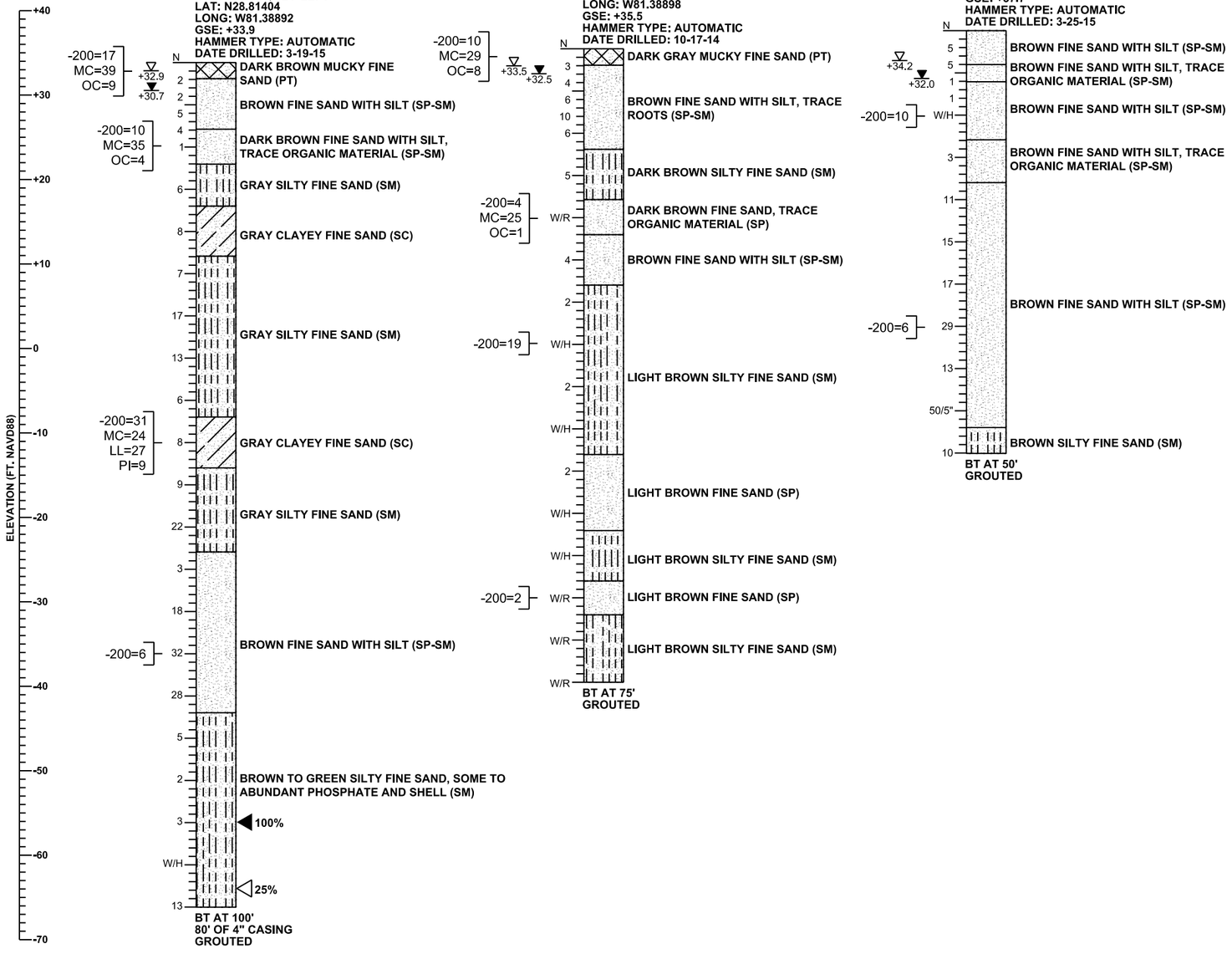
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-124

Scott 4/17/2017 1:42:13 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring16.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +33.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +32.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND MUCK | SAND AND SILT | SAND AND CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

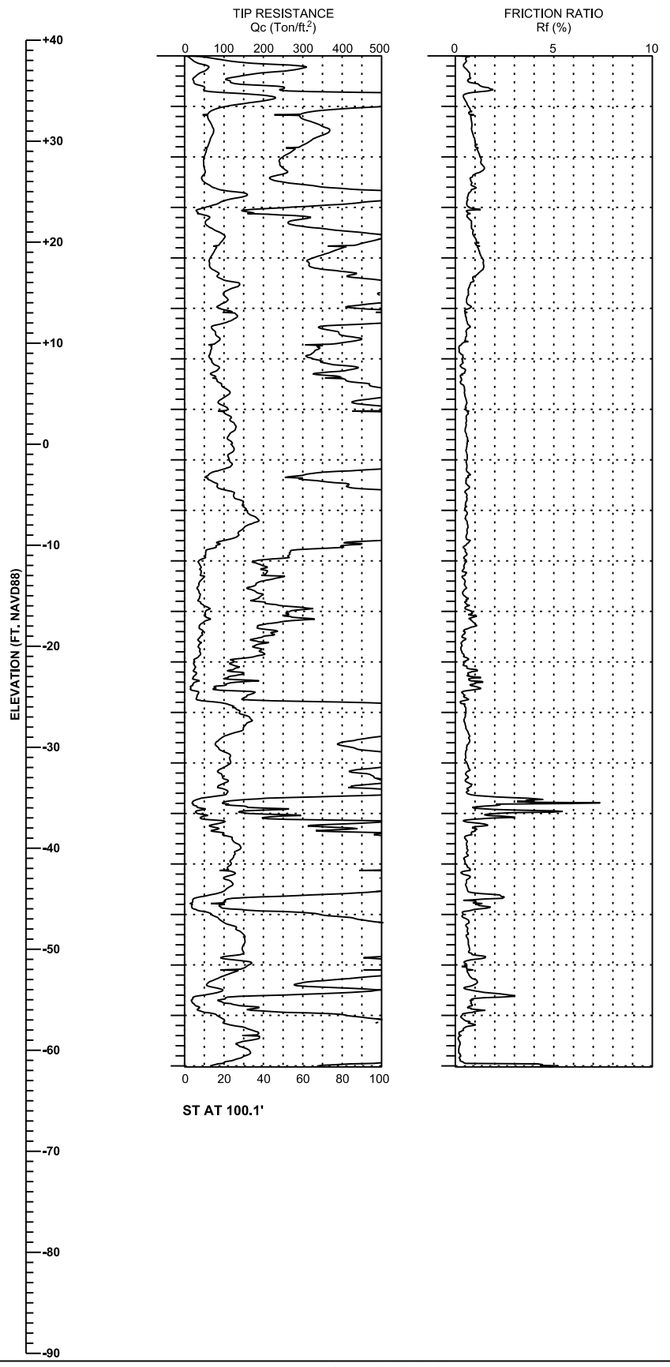
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-125

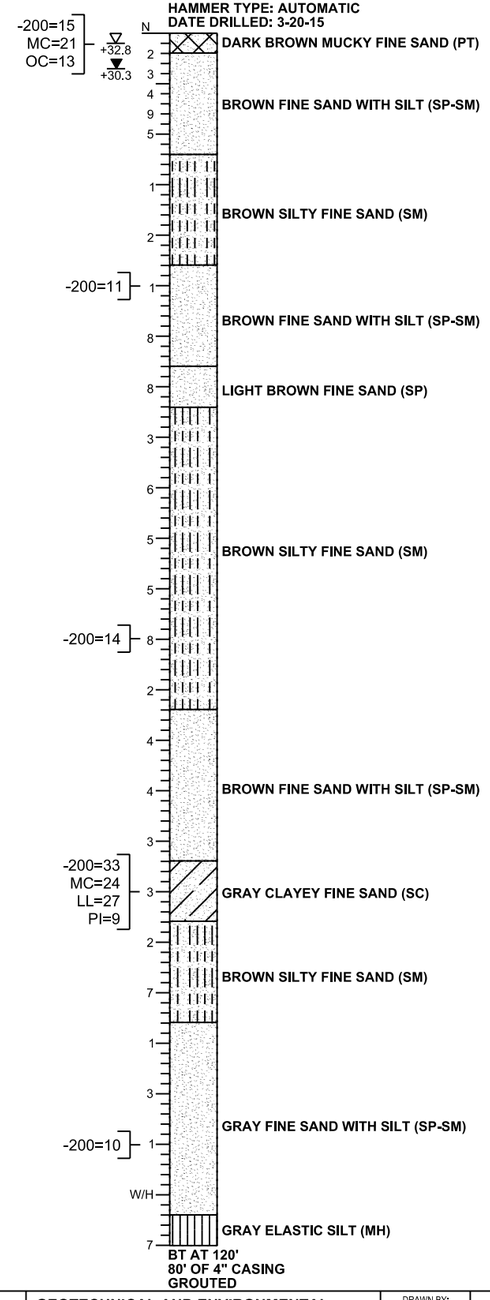
Scott 4/17/2017 1:42:43 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring16.dgn

WB-53C
STA. 1019+50, 60' RIGHT
LAT: N28.81355
LONG: W81.38910
GSE: +38.7
DATE DRILLED: 10-3-14



ST AT 100.1'

WB-53F
STA. 1019+75, 60' LEFT
LAT: N28.81385
LONG: W81.38891
GSE: +33.8
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 3-20-15



BT AT 120'
80' OF 4" CASING
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
+32.8 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+30.3 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND MUCK | SILT | SAND AND SILT | SAND AND CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

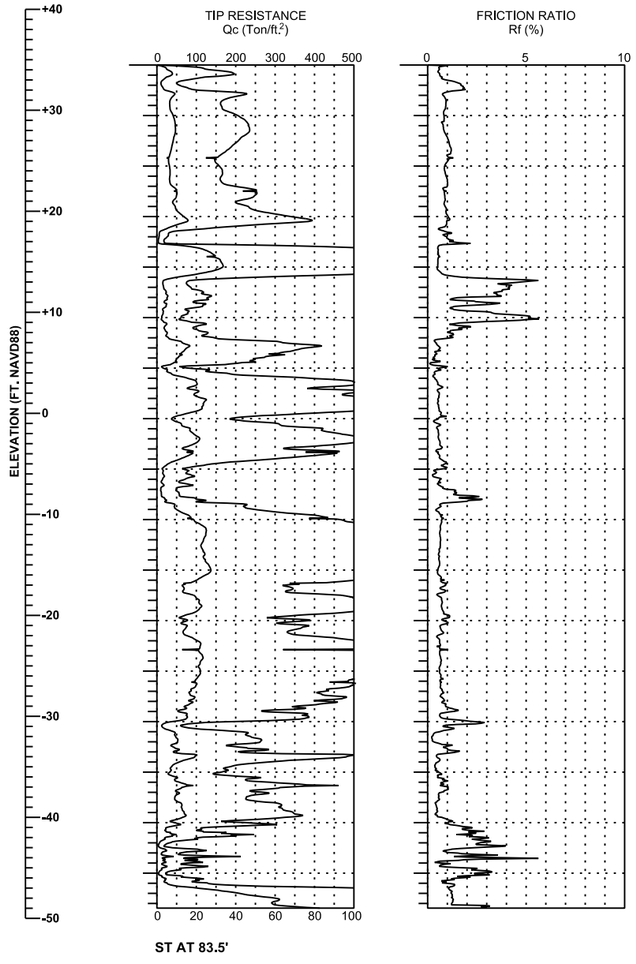
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-126

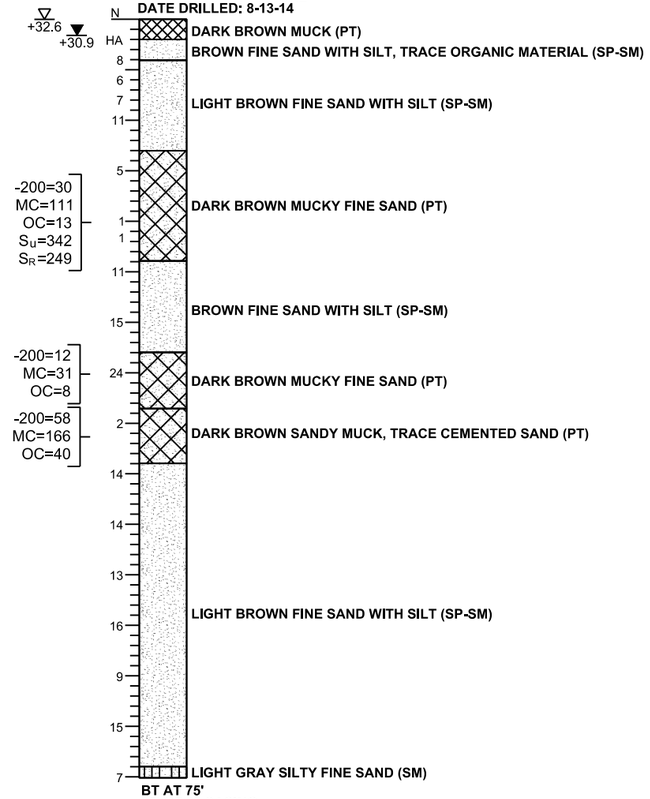
Scott 4/17/2017 1:43:16 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring16.dgn

WB-54
STA. 1020+55, 34' LEFT
LAT: N28.81378
LONG: W81.38882
GSE: +34.3
DATE DRILLED: 7-11-14



ST AT 83.5'

MB-1
STA. 1020+12, 162' LEFT
LAT: N28.81409
LONG: W81.38870
GSE: +32.6
HAMMER TYPE: MANUAL
DATE DRILLED: 8-13-14



BT AT 75'
10' OF 4" CASING
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +32.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND — SAND AND MUCK
SAND AND SILT — MUCK

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

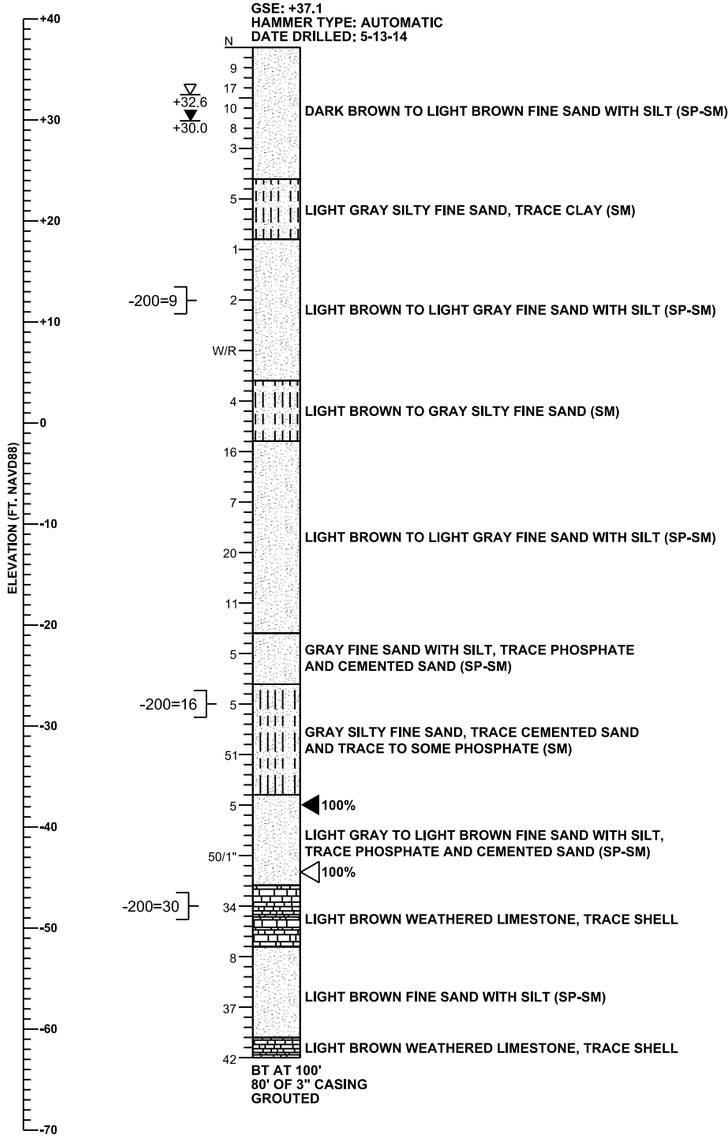
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

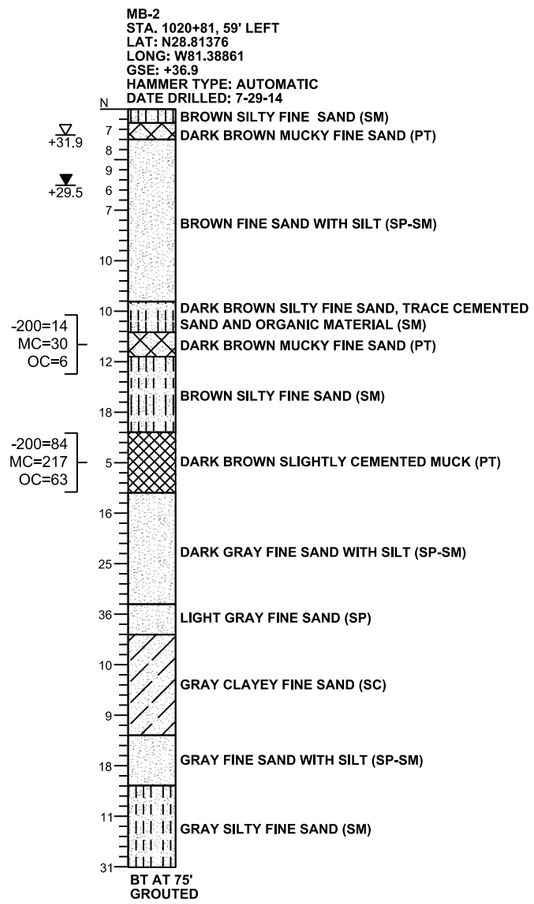
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-127

Scott 4/17/2017 1:43:51 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring16.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
+31.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+29.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND CLAY | SAND AND MUCK
SAND AND SILT | LIMESTONE | MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

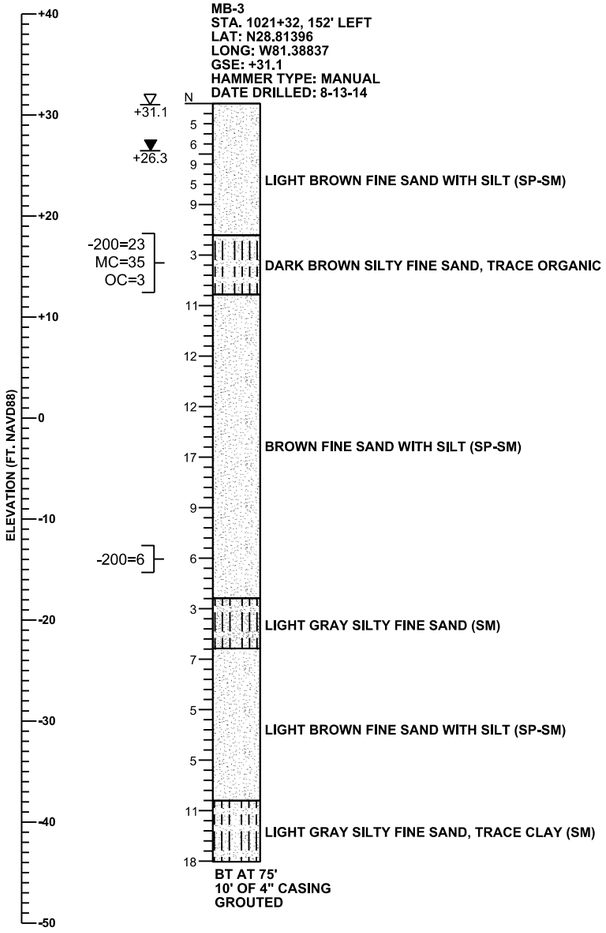
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

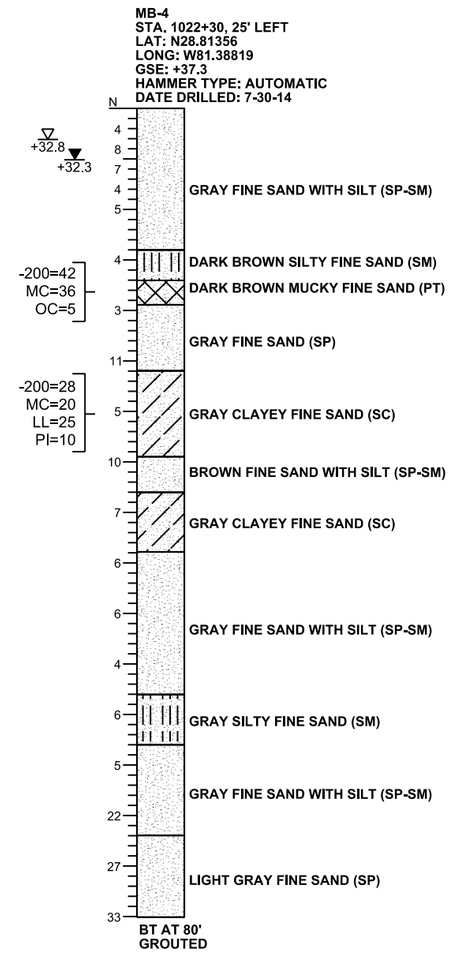
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-128

Scott 4/17/2017 1:44:19 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring16.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +32.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +32.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND CLAY | SAND AND SILT | SAND AND MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

$USER$

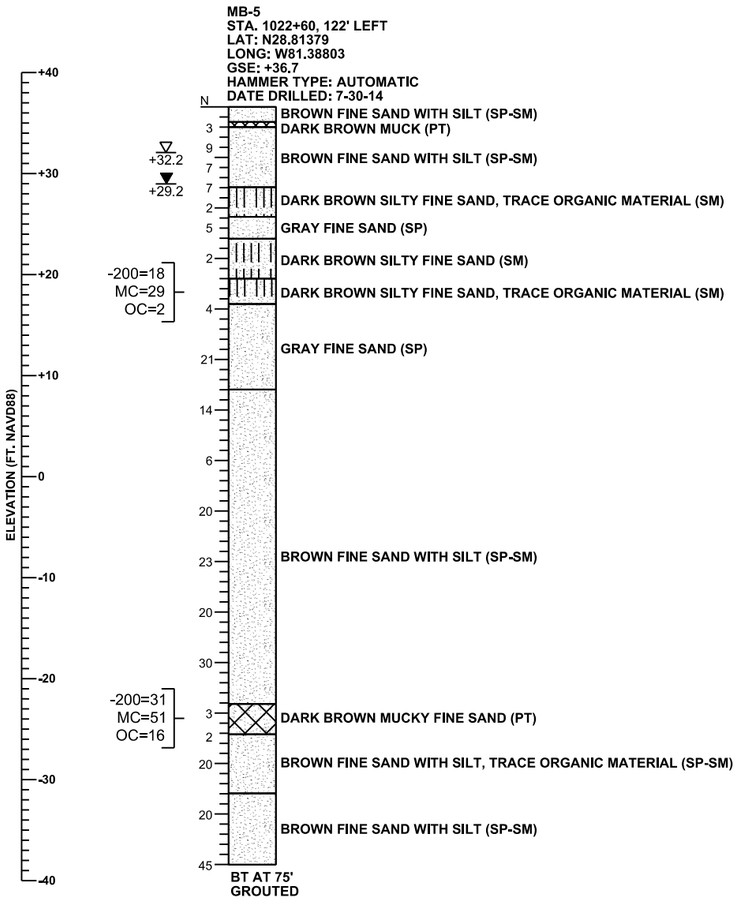
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

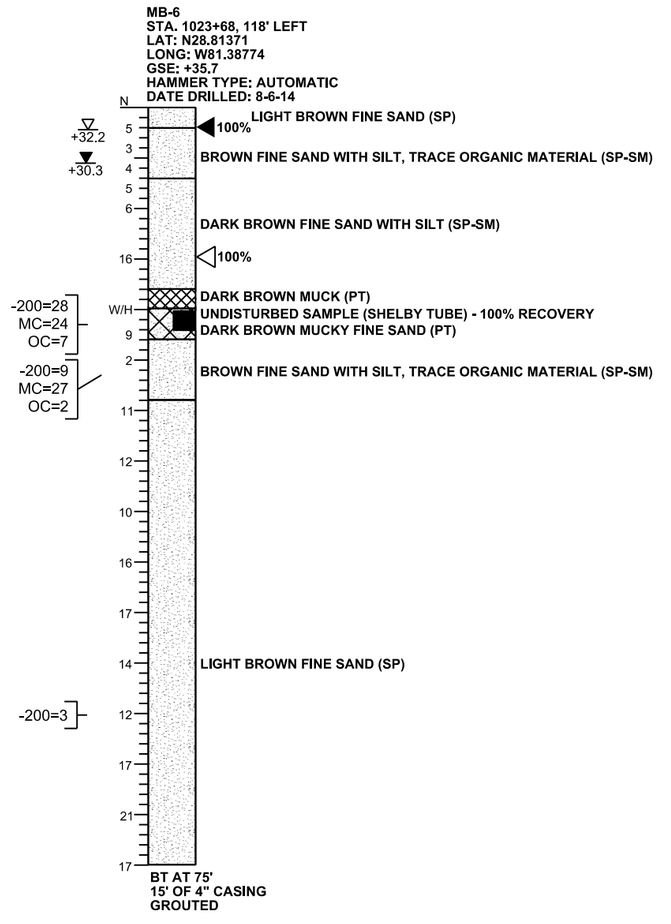
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

$DATE$ $TIME$ $FILE$

REF. DWG. NO.

SHEET NO. BW-129





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
+32.2 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+29.2 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND — SAND AND MUCK
SAND AND SILT — MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

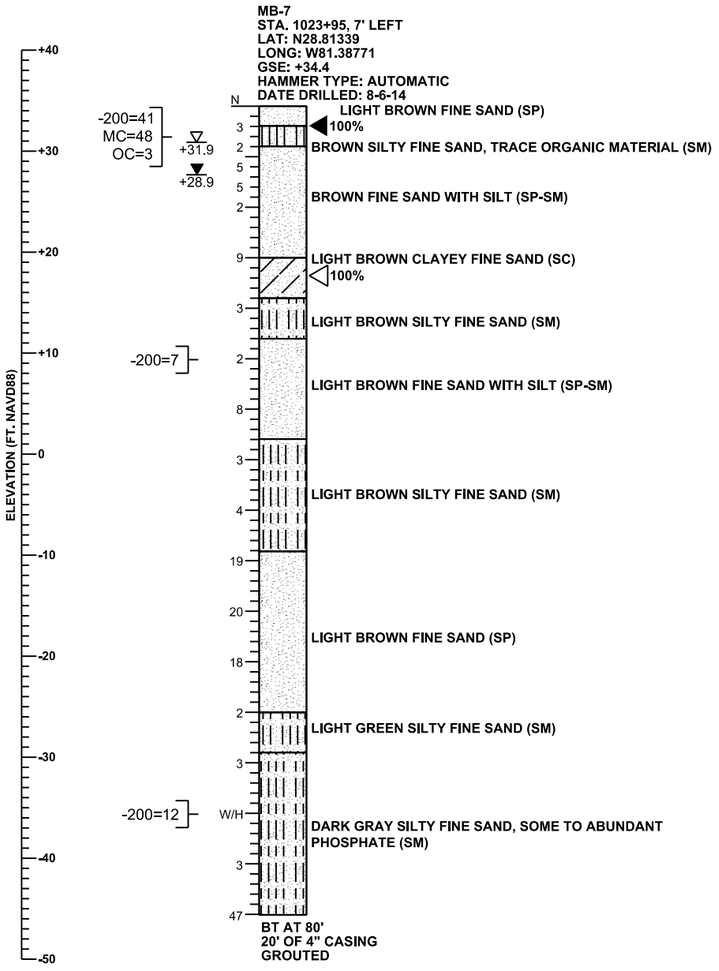
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-130

$USER$ $DATE$ $TIME$ $FILE$



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +31.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +28.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
γ_d=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND — SAND AND MUCK

SAND AND SILT — MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

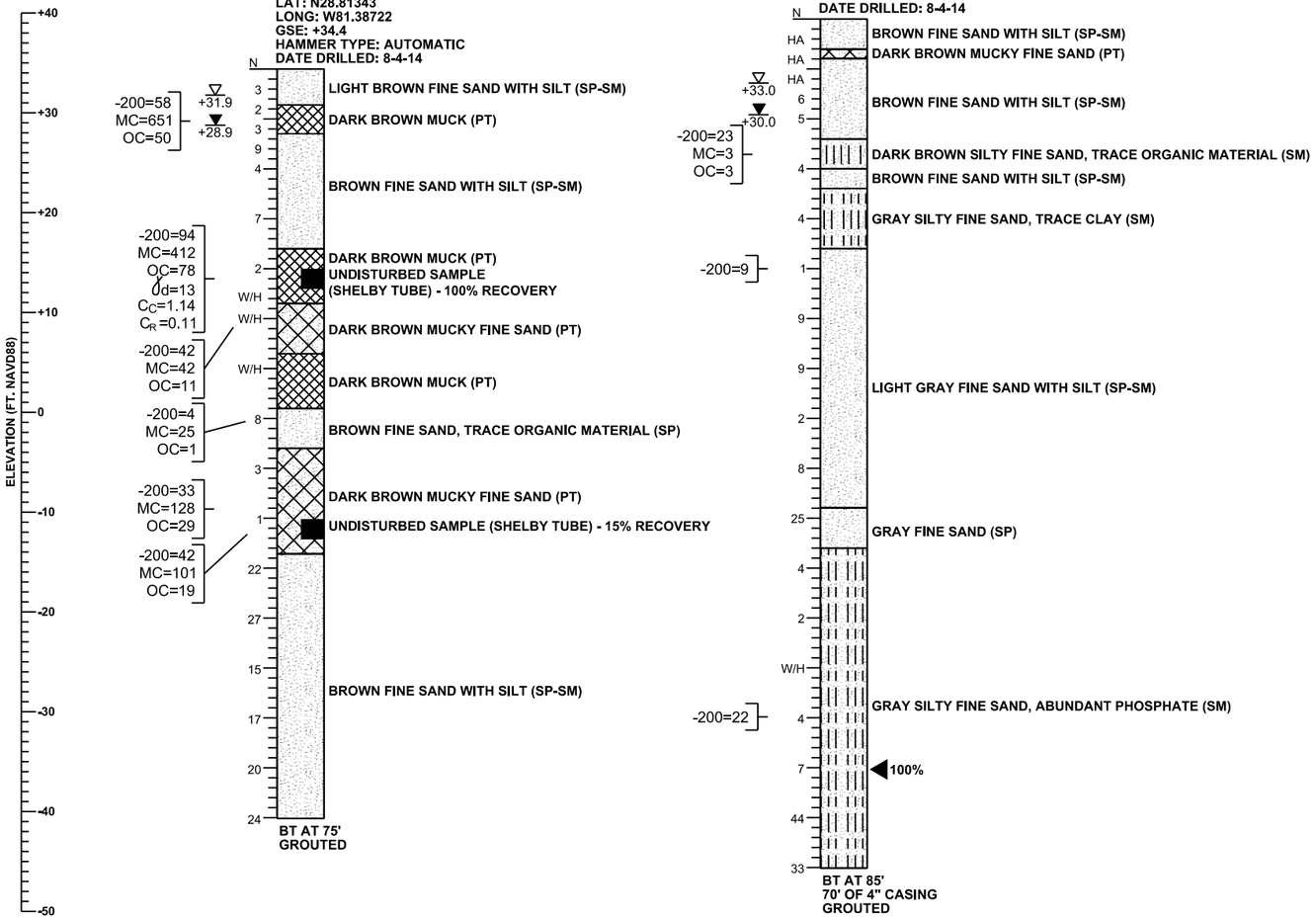
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-131

$USER$ $DATE$ $TIME$ $FILE$



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
+33.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+30.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND — SAND AND MUCK

SAND AND SILT — MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

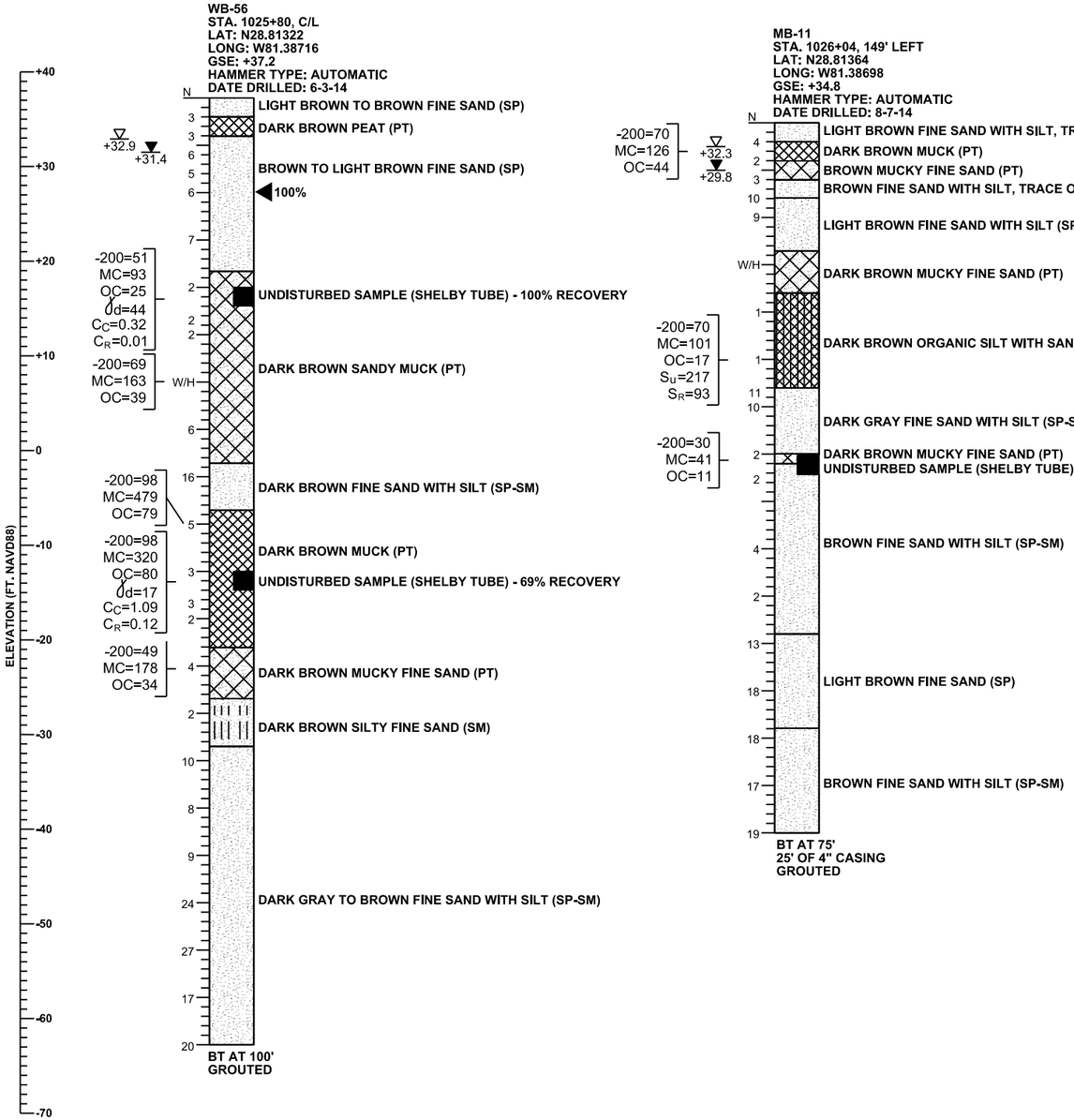
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-132

$USER$ $DATE$ $TIME$ $FILE$



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +32.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND | SAND AND MUCK | ORGANIC SILT

SAND AND SILT | MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

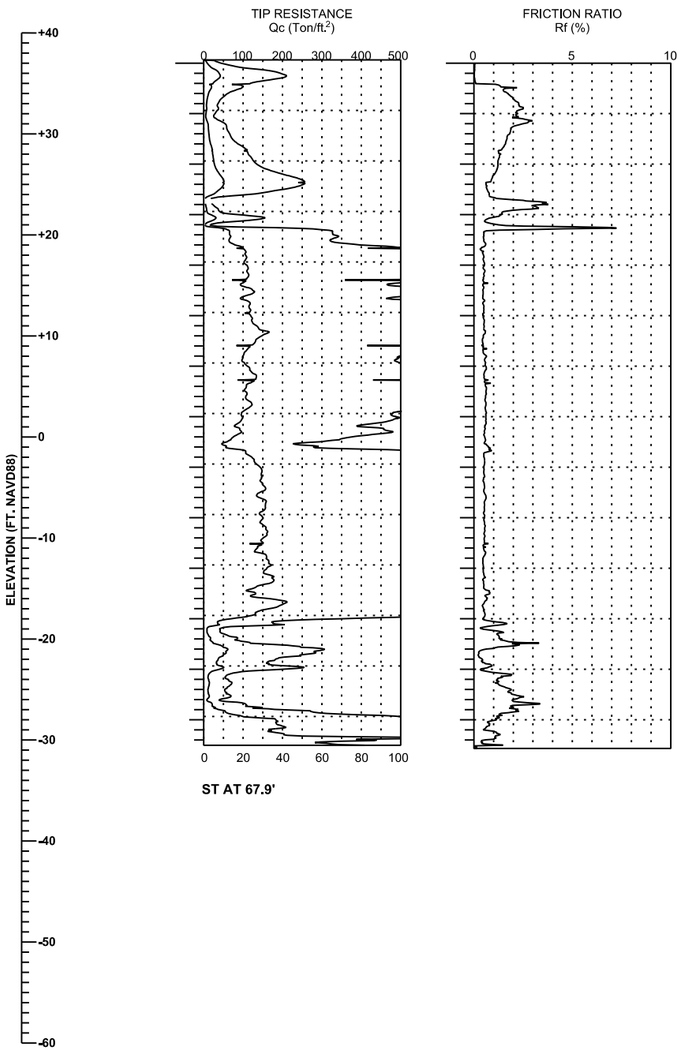
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-133

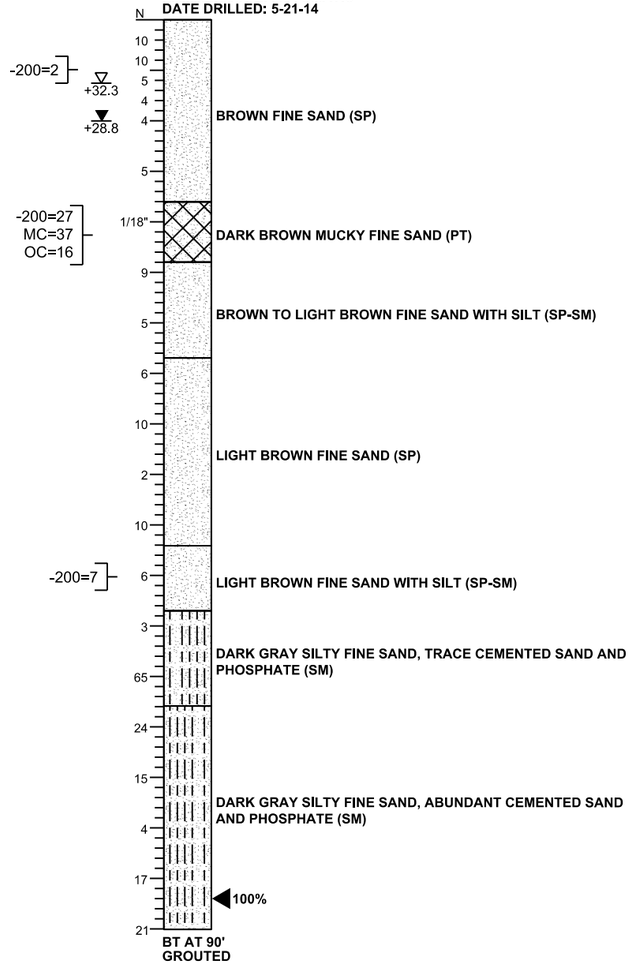
$USER$ $DATE$ $TIME$ $FILE$

MB-12
STA. 1026+50, 25' RIGHT
LAT: N28.81314
LONG: W81.38695
GSE: +37.0
DATE DRILLED: 10-3-14



ST AT 67.9'

WB-57
STA. 1026+50, 80' RIGHT
LAT: N28.81300
LONG: W81.38699
GSE: +38.8
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-21-14



BT AT 90'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +32.3	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +28.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND
SAND AND MUCK
SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

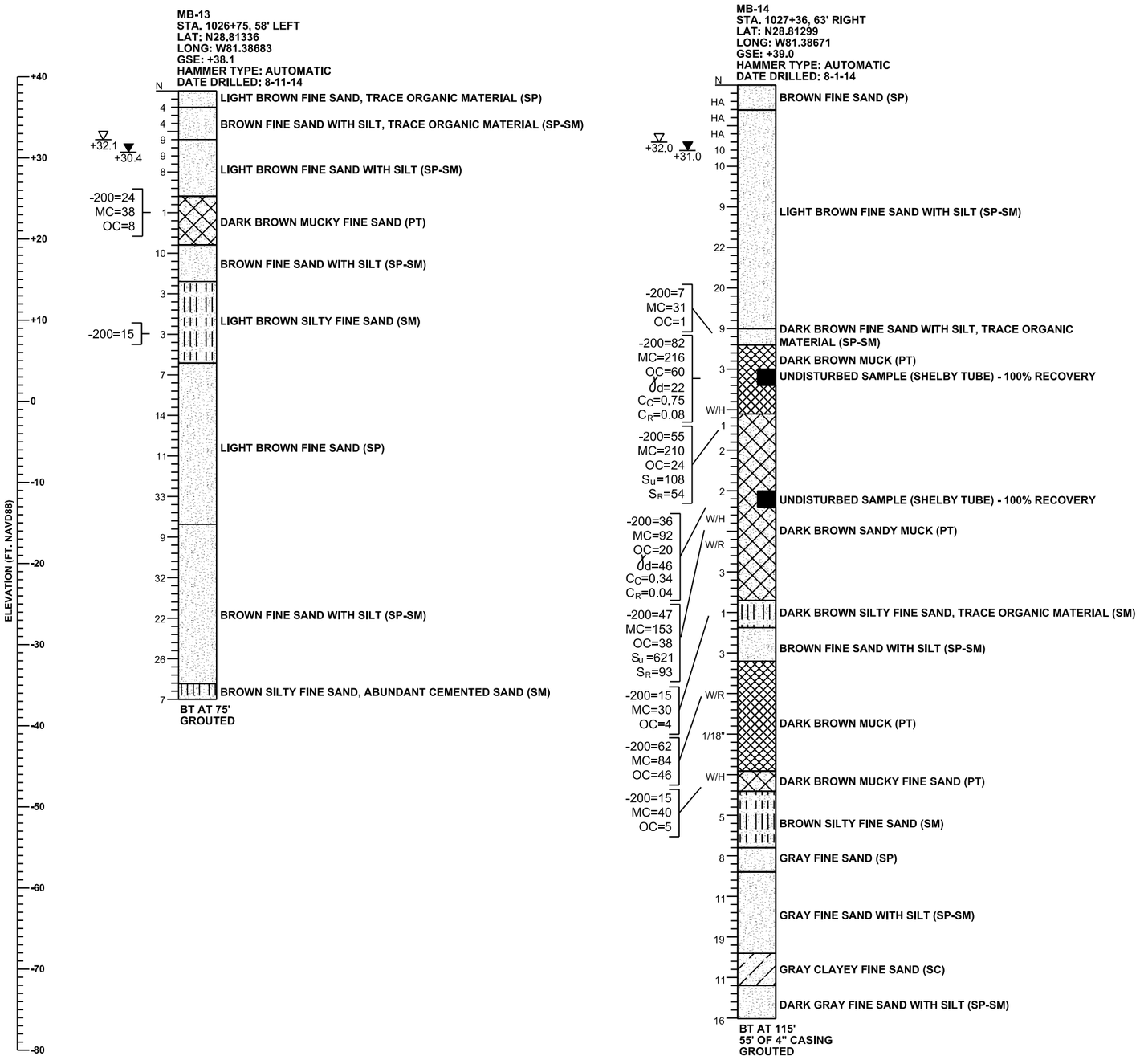
SHEET TITLE:
REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME:
WEKIVA PARKWAY (SR 429) SECTION 7A
RETAINING WALLS

REF. DWG. NO.

SHEET NO.
BW-134

$USER$ $DATE$ $TIME$ $FILE$



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
1/18"	NUMBER OF BLOWS FOR 18 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
+32.1 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+30.4 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX
S_U=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND | SAND AND CLAY | MUCK | SAND AND SILT | SAND AND MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

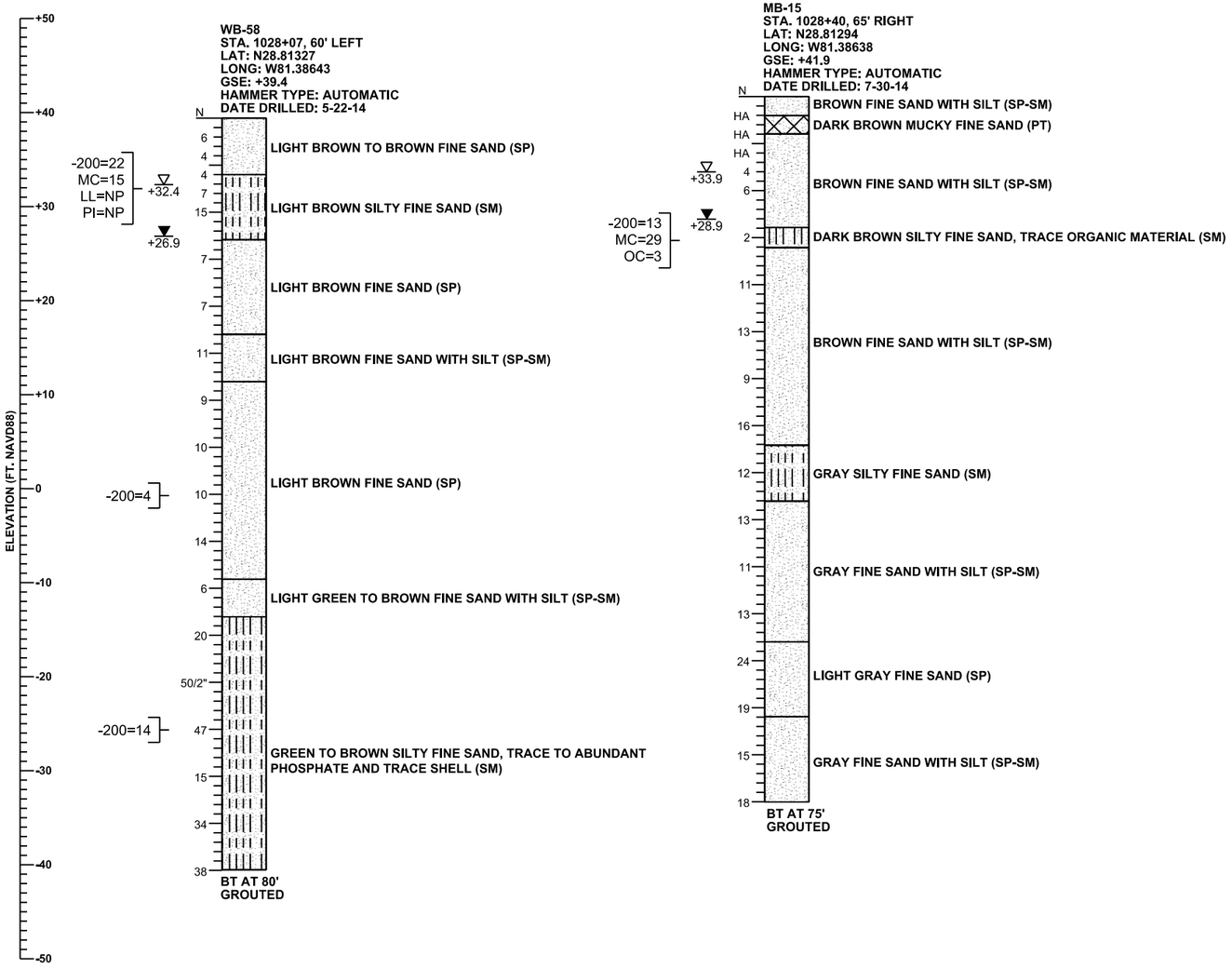
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-135

$USERS $DATES $TIMES $FILES



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +32.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +26.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND

SAND AND MUCK

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

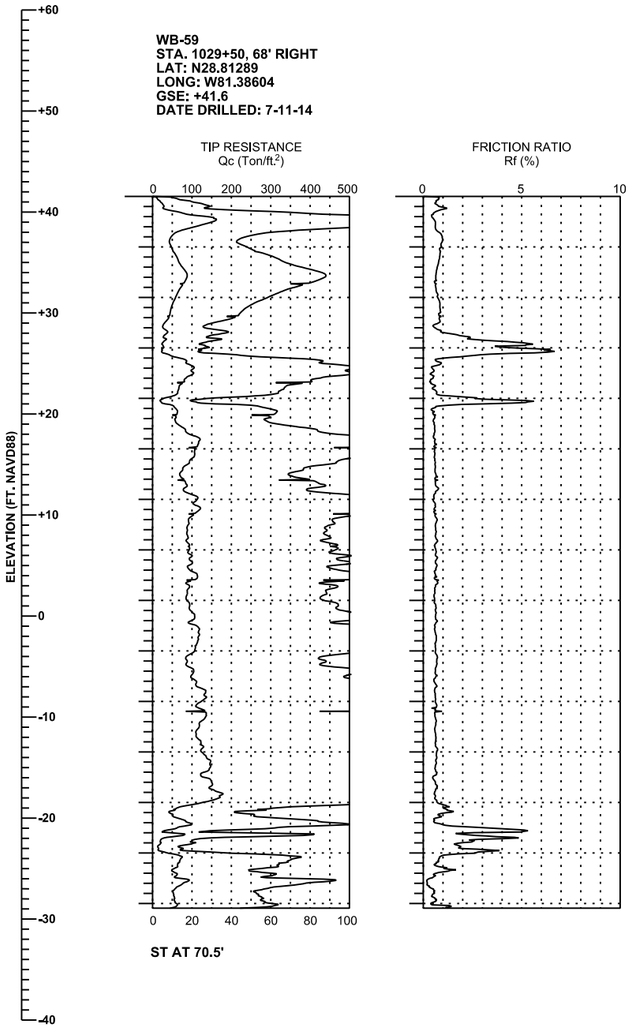
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

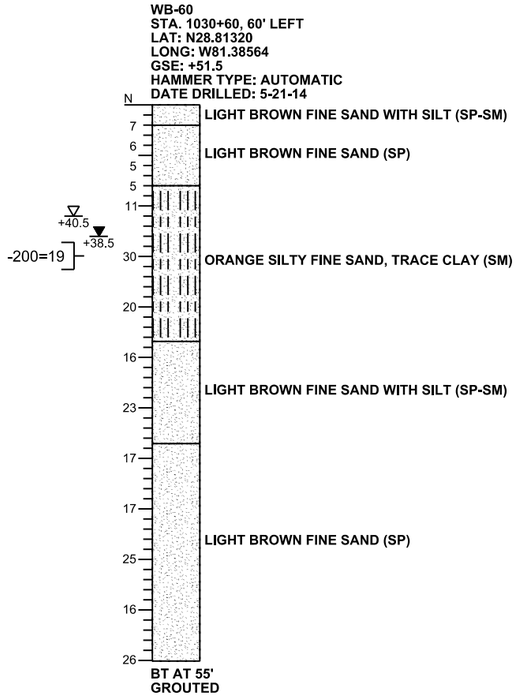
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-136

$USER$ $DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
+40.5 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+38.5 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

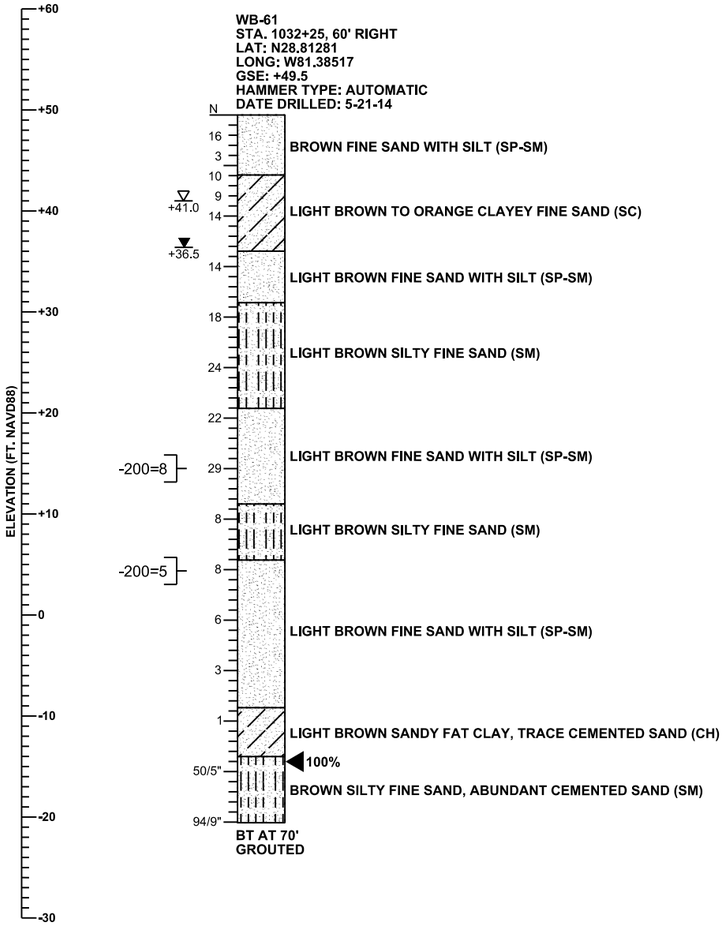
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

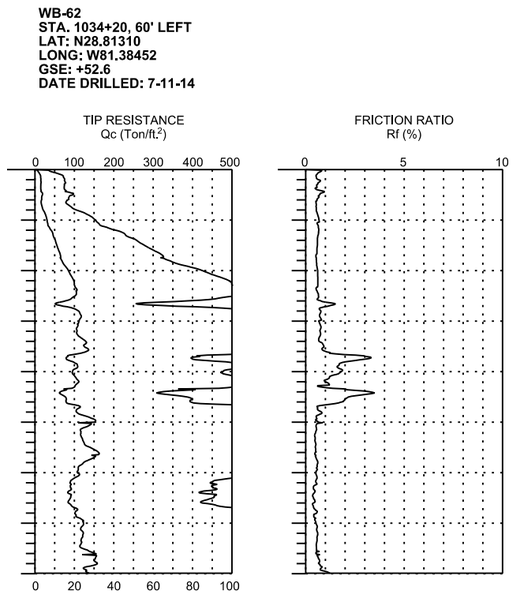
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-137

$USER$ $DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +41.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +36.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

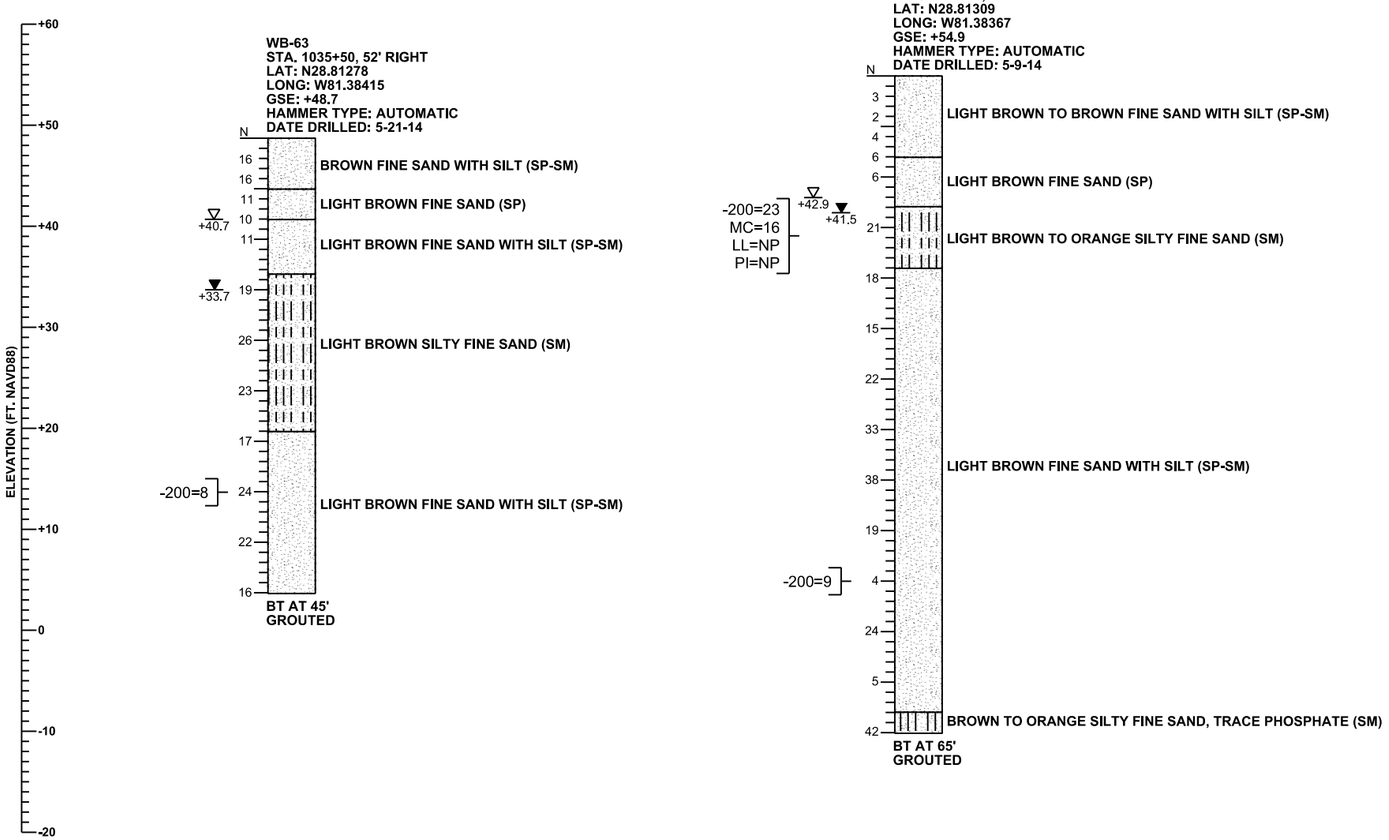
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-138

$USER$ $DATE$ $TIME$ $FILE$



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +40.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +33.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

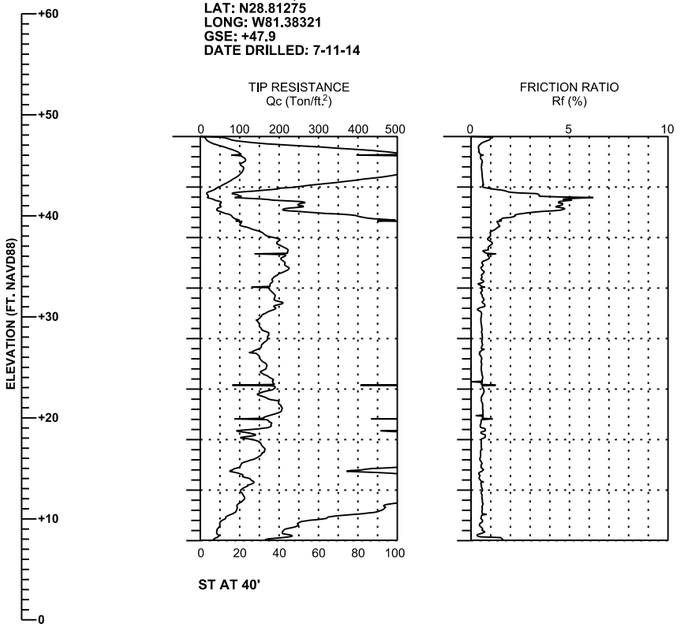
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-139

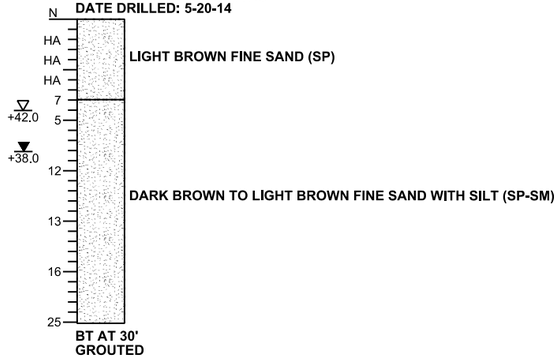
$USER$ $DATE$ $TIME$ $FILE$

WB-65
STA. 1038+50, 60' RIGHT
LAT: N28.81275
LONG: W81.38321
GSE: +47.9
DATE DRILLED: 7-11-14



ST AT 40'

WB-66
STA. 1040+00, 40' LEFT
LAT: N28.81303
LONG: W81.38274
GSE: +51.0
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-20-14



BT AT 30'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +42.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +38.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
	SAND

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

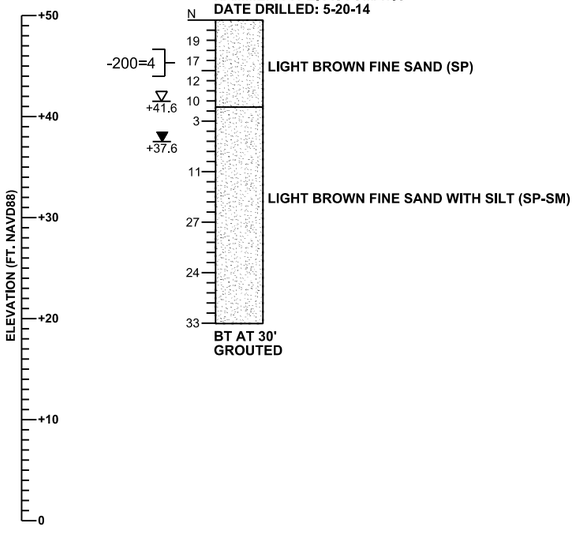
SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

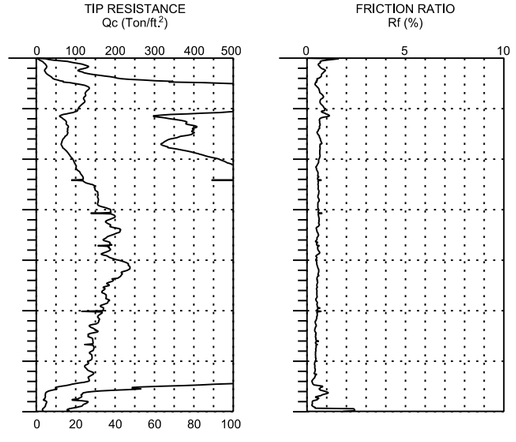
NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

WB-67
STA. 1041+44, 60' RIGHT
LAT: N28.81276
LONG: W81.38229
GSE: +49.6
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-20-14



BT AT 30'
GROUTED

WB-68
STA. 1043+00, 60' LEFT
LAT: N28.81310
LONG: W81.38181
GSE: +45.4
DATE DRILLED: 7-14-14



ST AT 35'

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY: CGB 71571	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY: CGB 71571	SR 429	SEMINOLE	240200-2-52-01
CHECKED BY: DCS 42763			

$USER$

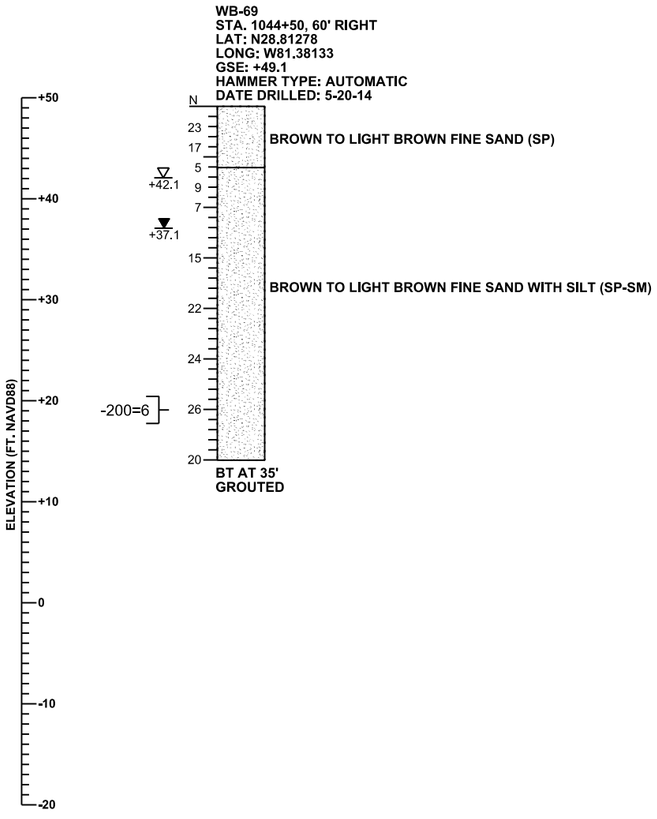
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

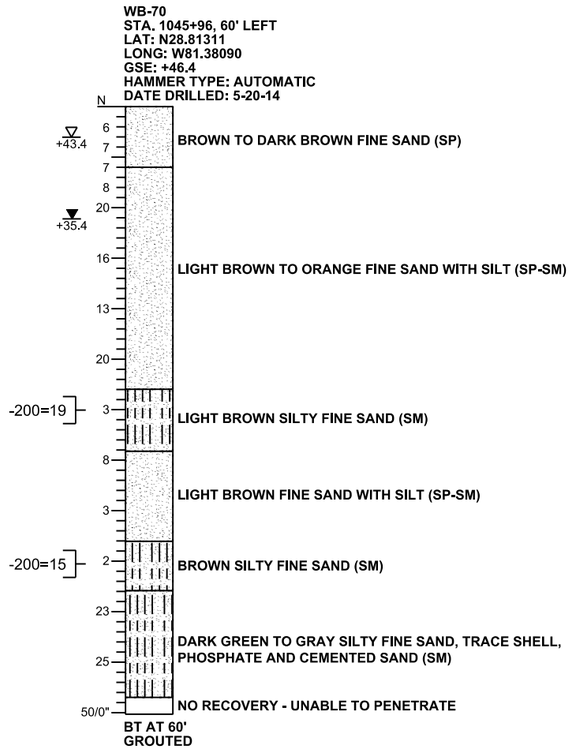
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-140

$DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +42.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +37.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

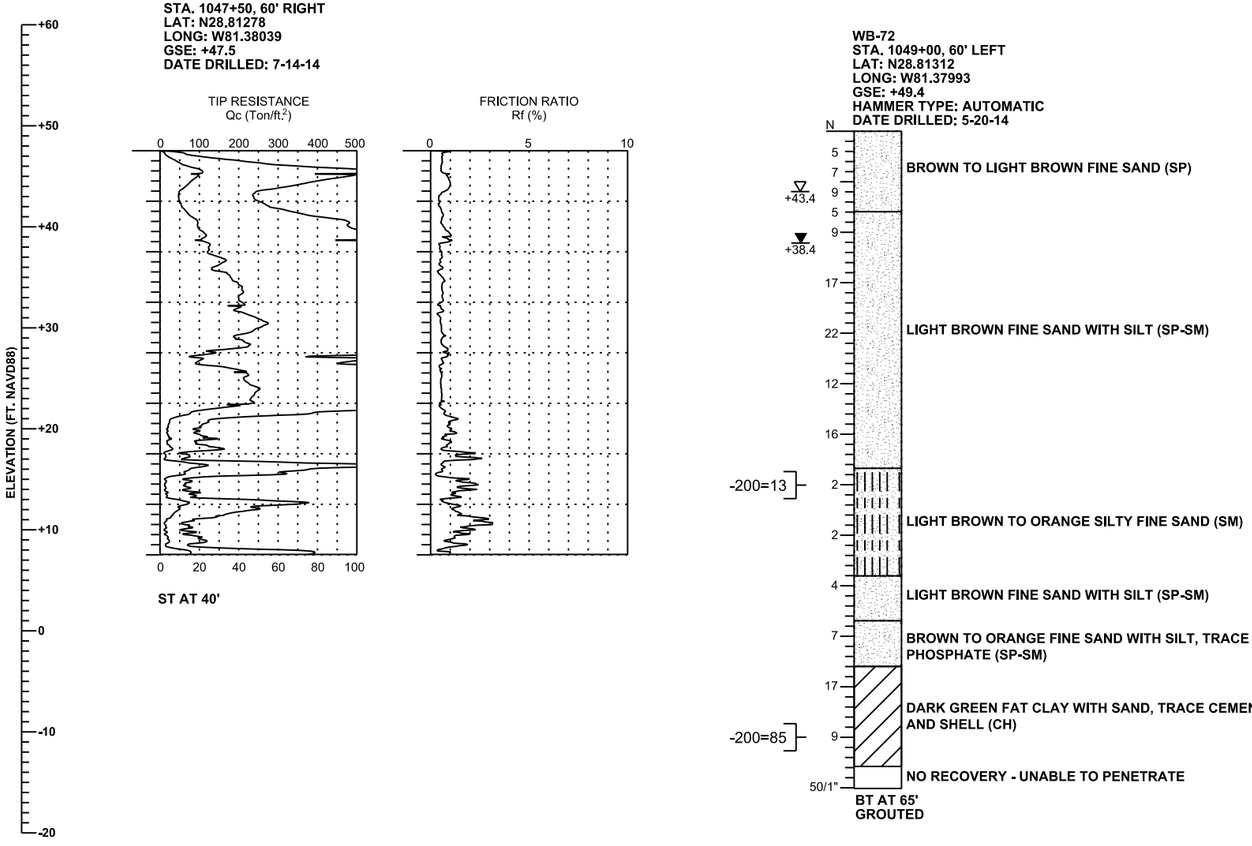
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

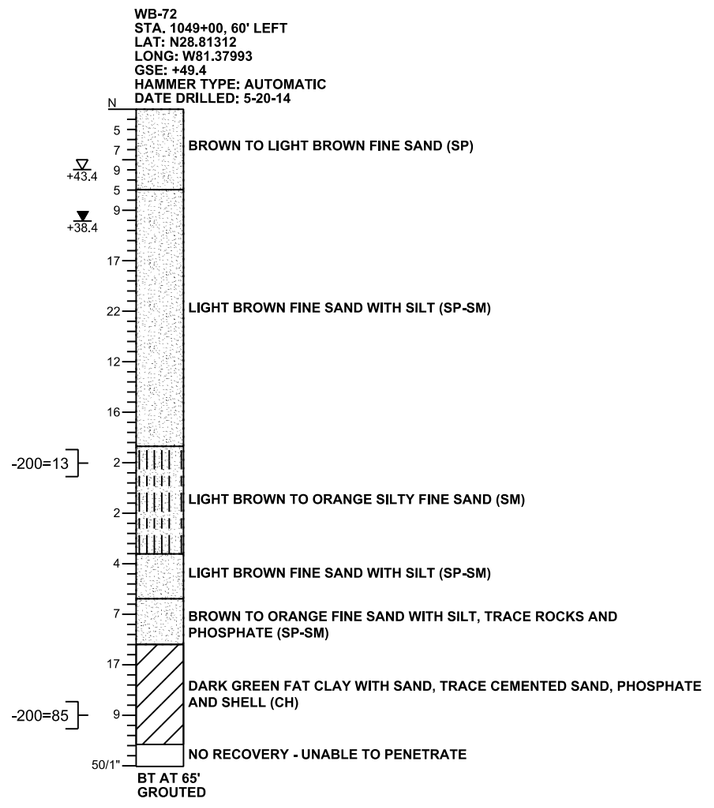
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-141

$USER$ $DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +43.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +38.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND
CLAY
SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

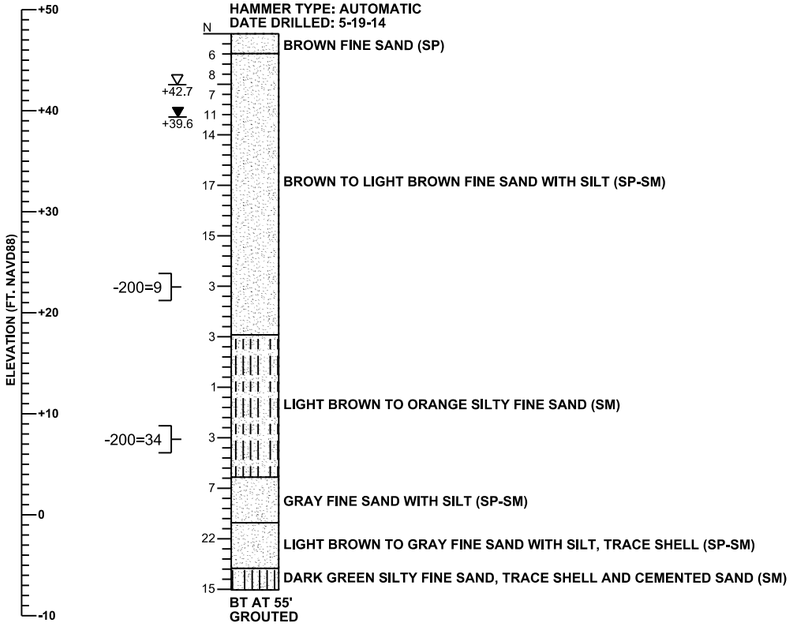
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

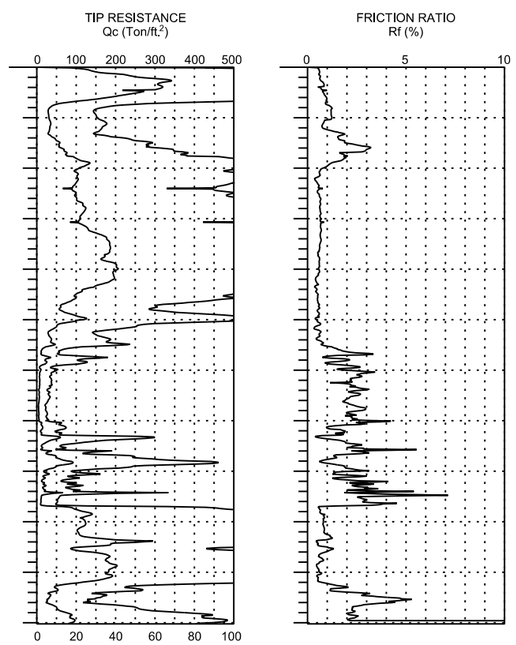
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-142

$USER$ $DATE$ $TIME$ $FILE$

WB-73
STA. 1050+48, 65' RIGHT
LAT: N28.81281
LONG: W81.37946
GSE: +47.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-19-14



WB-74
STA. 1052+00, 60' LEFT
LAT: N28.81313
LONG: W81.37900
GSE: +49.4
DATE DRILLED: 7-14-14



ST AT 55.1'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +42.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

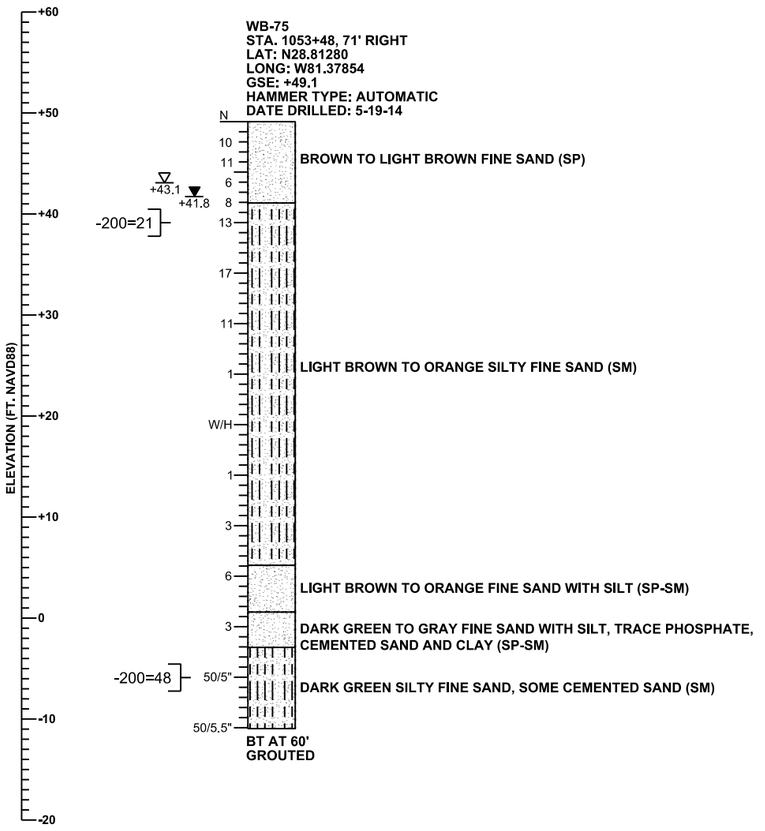
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

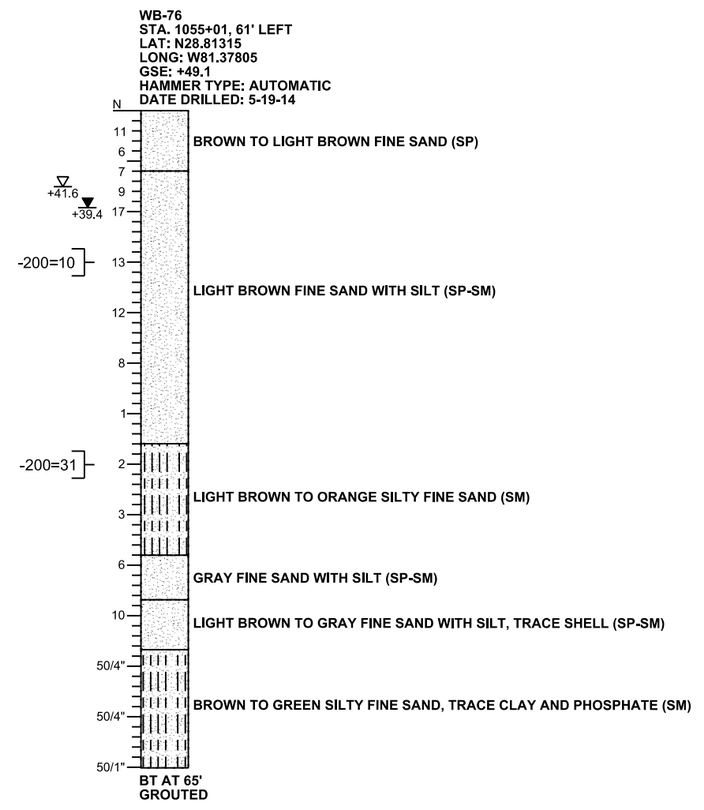
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-143

$USER$ $DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
▽ +43.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

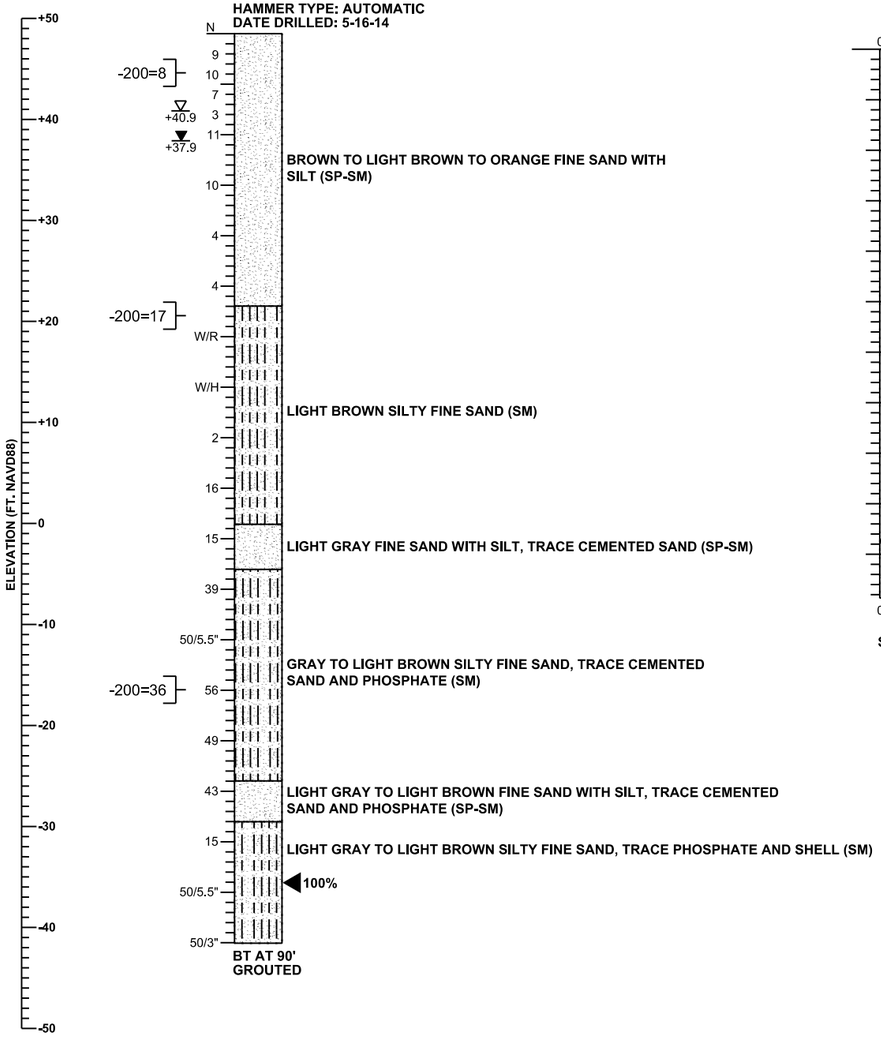
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

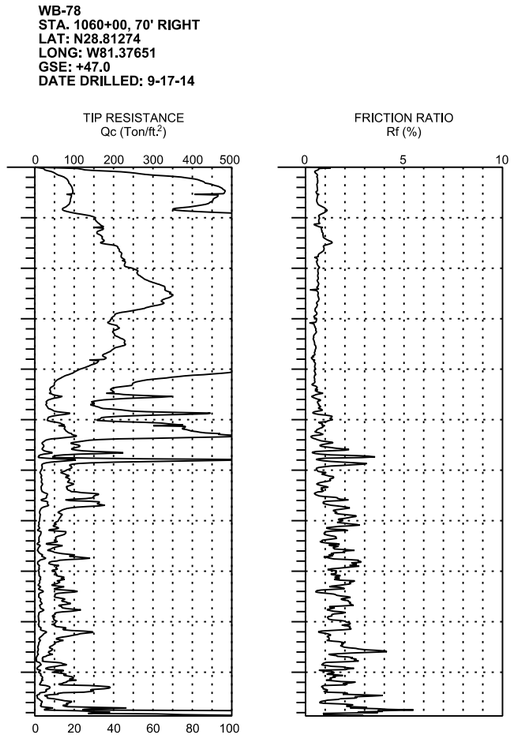
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-144

$USER$ $DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
▽ +40.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +37.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-77
SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-78
SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

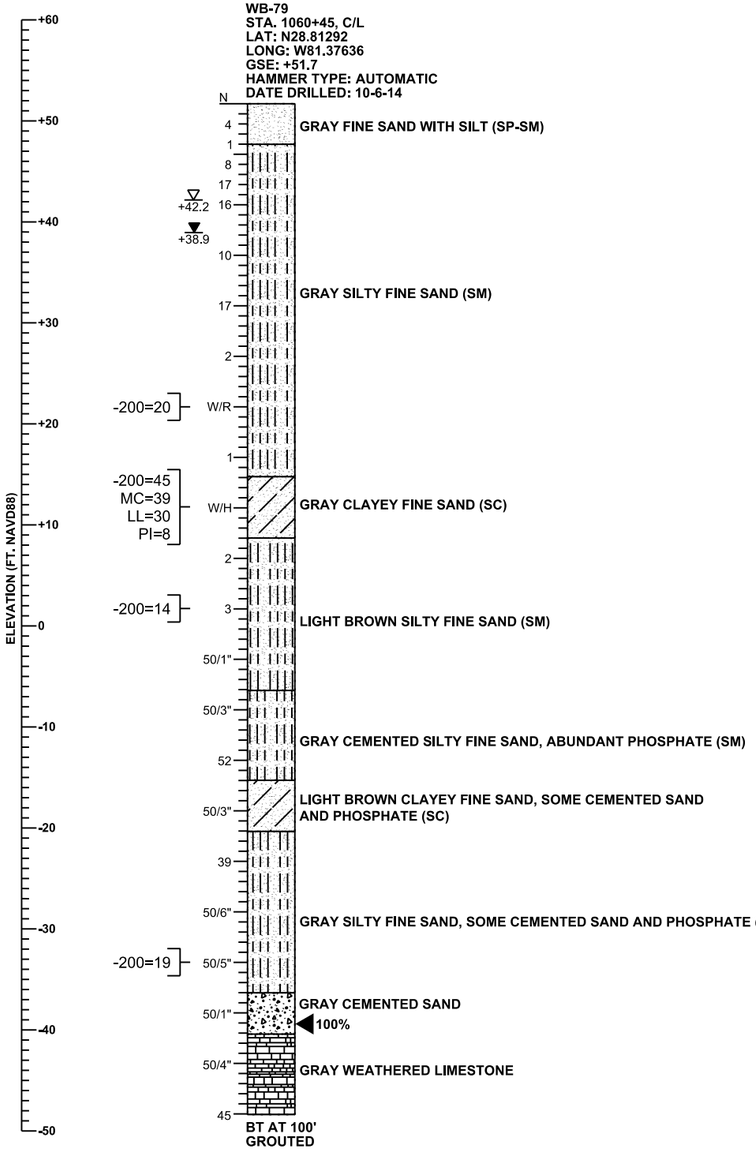
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

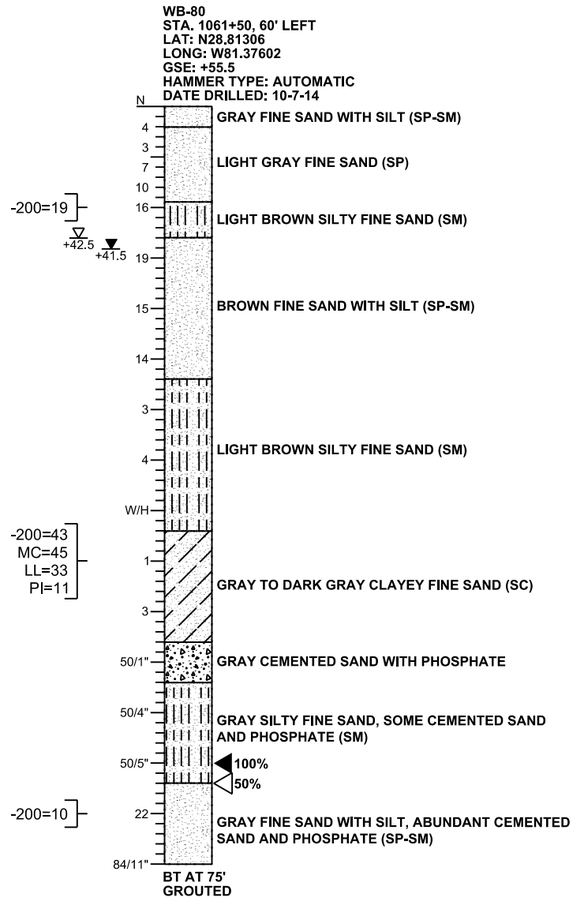
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-145

$USER$ $DATE$ $TIME$ $FILE$





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +42.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +38.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

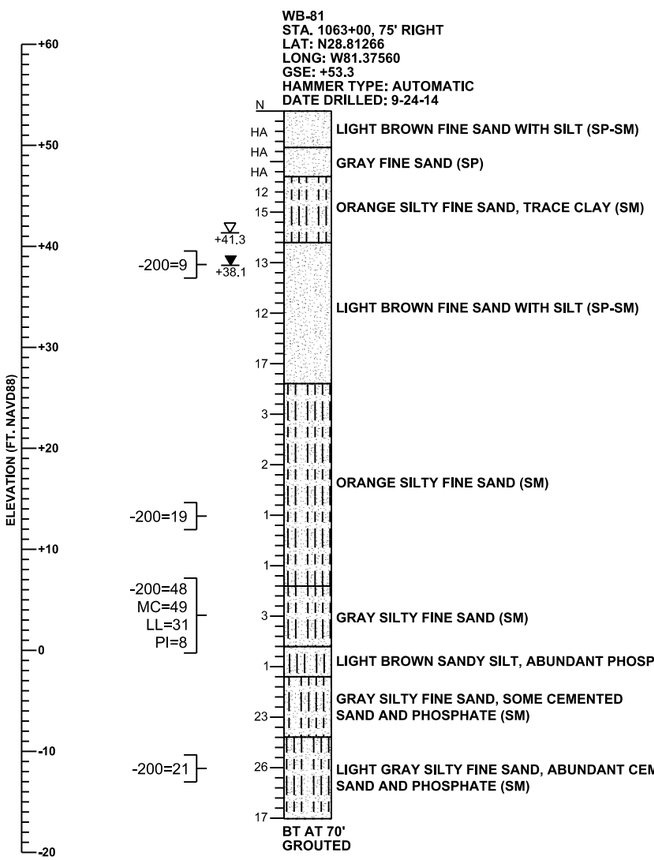
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
REF. DWG. NO.
SHEET NO. BW-146

$USER$ $DATE$ $TIME$ $FILE$



WB-81
STA. 1063+00, 75' RIGHT
LAT: N28.81266
LONG: W81.37560
GSE: +53.3
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 9-24-14

	N	
	HA	LIGHT BROWN FINE SAND WITH SILT (SP-SM)
	HA	
	HA	GRAY FINE SAND (SP)
	12	
	15	ORANGE SILTY FINE SAND, TRACE CLAY (SM)
▽ +41.3		
-200=9 ▼ +38.1	13	
	12	LIGHT BROWN FINE SAND WITH SILT (SP-SM)
	17	
	3	
	2	ORANGE SILTY FINE SAND (SM)
-200=19	1	
	1	
-200=48 MC=49 LL=31 PI=8	3	GRAY SILTY FINE SAND (SM)
	1	LIGHT BROWN SANDY SILT, ABUNDANT PHOSPHATE (ML)
	23	GRAY SILTY FINE SAND, SOME CEMENTED SAND AND PHOSPHATE (SM)
-200=21	26	LIGHT GRAY SILTY FINE SAND, ABUNDANT CEMENTED SAND AND PHOSPHATE (SM)
	17	

BT AT 70'
GROUTED

WB-82
STA. 1064+50, 70' LEFT
LAT: N28.81300
LONG: W81.37507
GSE: +53.9
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 9-25-14

	N	
-200=3	4	GRAY FINE SAND (SP)
	5	
	7	
	24	
	31	LIGHT BROWN SILTY FINE SAND (SM)
▽ +41.4		
▼ +38.4	17	
	19	
	50/4"	LIGHT BROWN FINE SAND (SP)
	3	
	2	LIGHT BROWN TO ORANGE SILTY FINE SAND (SM)
	1	
	W/R	
	1	GRAY SANDY FAT CLAY (CH)
		UNDISTURBED SAMPLE (SHELBY TUBE) - 0% RECOVERY
	W/H	
	1	GRAY CLAYEY FINE SAND (SC)
-200=16	1	
	50/3"	GRAY SILTY FINE SAND, ABUNDANT CEMENTED SAND AND PHOSPHATE (SM)
	63	LIGHT BROWN CLAYEY FINE SAND, ABUNDANT CEMENTED SAND AND PHOSPHATE (SC)

BT AT 70'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +41.3	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +38.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SAND AND CLAY
SAND AND SILT | CLAY

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

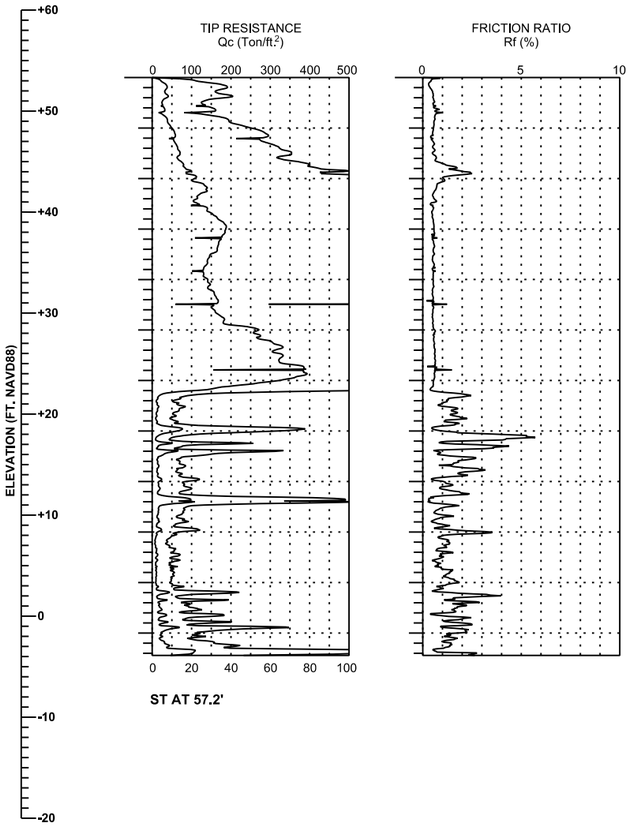
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-147

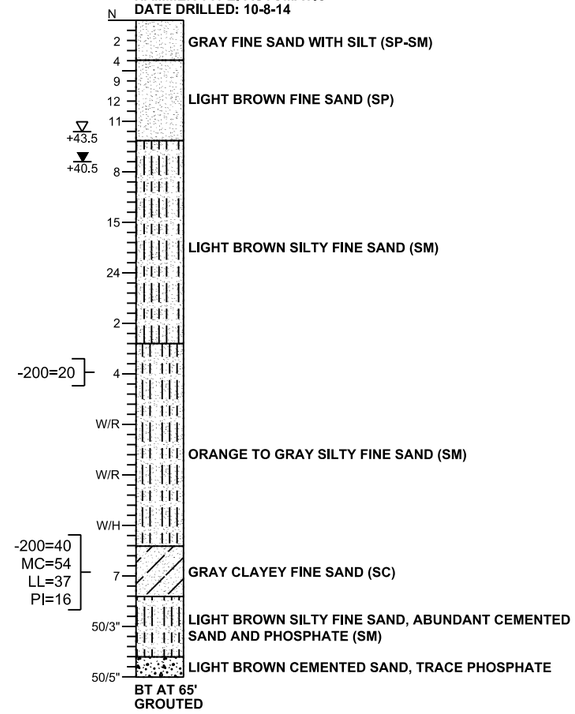
$USER$ $DATE$ $TIME$ $FILE$

WB-83
STA. 1066+00, 95' RIGHT
LAT: N28.81249
LONG: W81.37468
GSE: +53.2
DATE DRILLED: 9-22-14



ST AT 57.2'

WB-84
STA. 1067+50, 70' ELFT
LAT: N28.81287
LONG: W81.37413
GSE: +54.5
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-8-14



GRAY FINE SAND WITH SILT (SP-SM)

LIGHT BROWN FINE SAND (SP)

LIGHT BROWN SILTY FINE SAND (SM)

ORANGE TO GRAY SILTY FINE SAND (SM)

GRAY CLAYEY FINE SAND (SC)

LIGHT BROWN SILTY FINE SAND, ABUNDANT CEMENTED SAND AND PHOSPHATE (SM)

LIGHT BROWN CEMENTED SAND, TRACE PHOSPHATE

BT AT 65'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +43.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +40.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY
SAND AND SILT — CEMENTED SAND

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

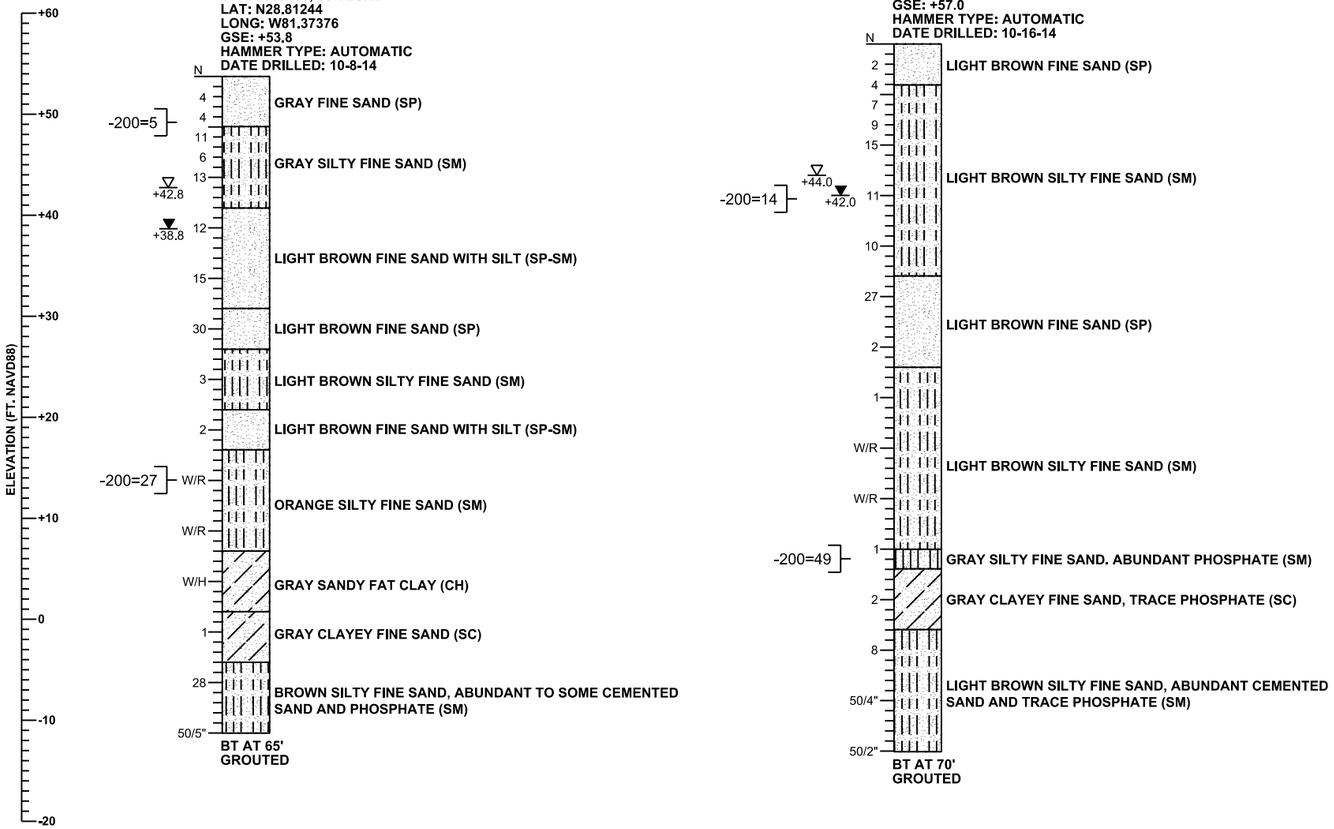
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-148

$USER$ $DATE$ $TIME$ $FILE$



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
+42.8 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+38.8 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

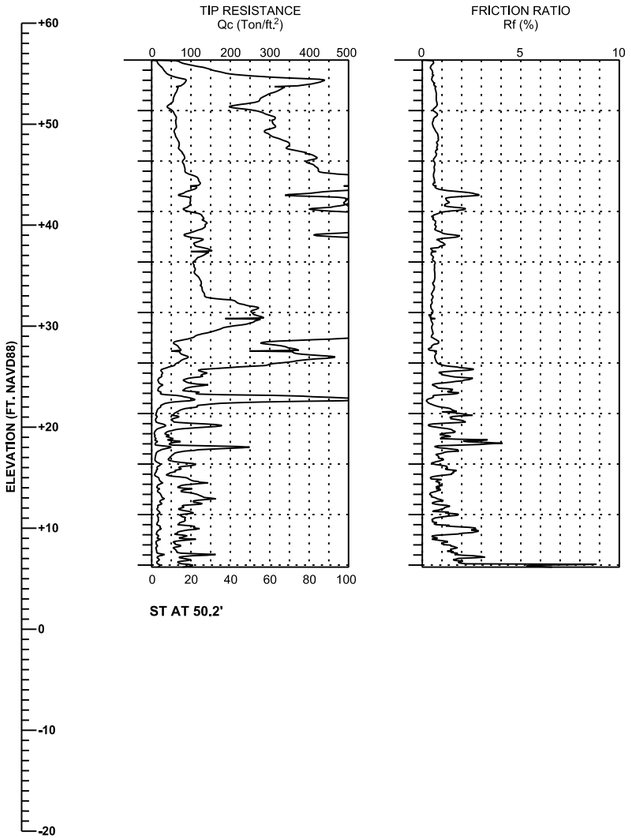
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-149

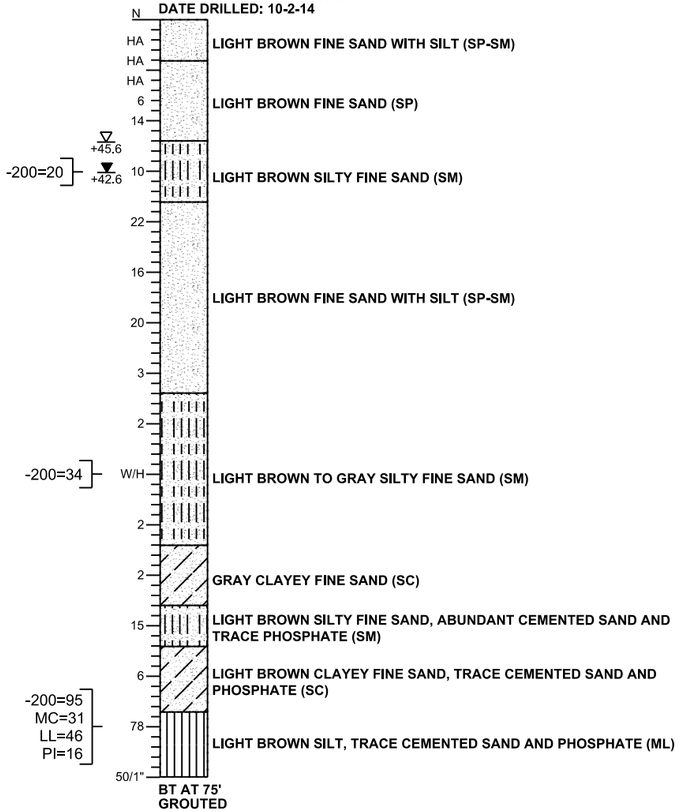
$USER$ $DATE$ $TIME$ $FILE$

WB-89
STA. 1072+00, 60' RIGHT
LAT: N28.81226
LONG: W81.37285
GSE: +56.3
DATE DRILLED: 9-24-14



ST AT 50.2'

WB-90
STA. 1073+50, 85' LEFT
LAT: N28.81254
LONG: W81.37228
GSE: +57.6
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-2-14



LIGHT BROWN FINE SAND WITH SILT (SP-SM)

LIGHT BROWN FINE SAND (SP)

LIGHT BROWN SILTY FINE SAND (SM)

LIGHT BROWN FINE SAND WITH SILT (SP-SM)

LIGHT BROWN TO GRAY SILTY FINE SAND (SM)

GRAY CLAYEY FINE SAND (SC)

LIGHT BROWN SILTY FINE SAND, ABUNDANT CEMENTED SAND AND TRACE PHOSPHATE (SM)

LIGHT BROWN CLAYEY FINE SAND, TRACE CEMENTED SAND AND PHOSPHATE (SC)

LIGHT BROWN SILT, TRACE CEMENTED SAND AND PHOSPHATE (ML)

BT AT 75'
GROUTED

LEGEND

GSE	**GROUND SURFACE ELEVATION (FT. NAVD88)**
N	**STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT**
HA	**HAND AUGERED FOR UTILITY CLEARANCE**
50/5"	**NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION**
W/H	**WEIGHT OF HAMMER**
▽ +45.6	**ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)**
▼ +42.6	**ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED**
BT	**BORING TERMINATED AT DEPTH INDICATED**
ST	**SOUNDING TERMINATED AT DEPTH INDICATED**
-200=	**PERCENT PASSING NO. 200 U.S. STANDARD SIEVE**
MC=	**PERCENT NATURAL MOISTURE CONTENT**
LL=	**LIQUID LIMIT**
PI=	**PLASTICITY INDEX**

SAND **SAND AND CLAY**
SAND AND SILT **SILT**

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

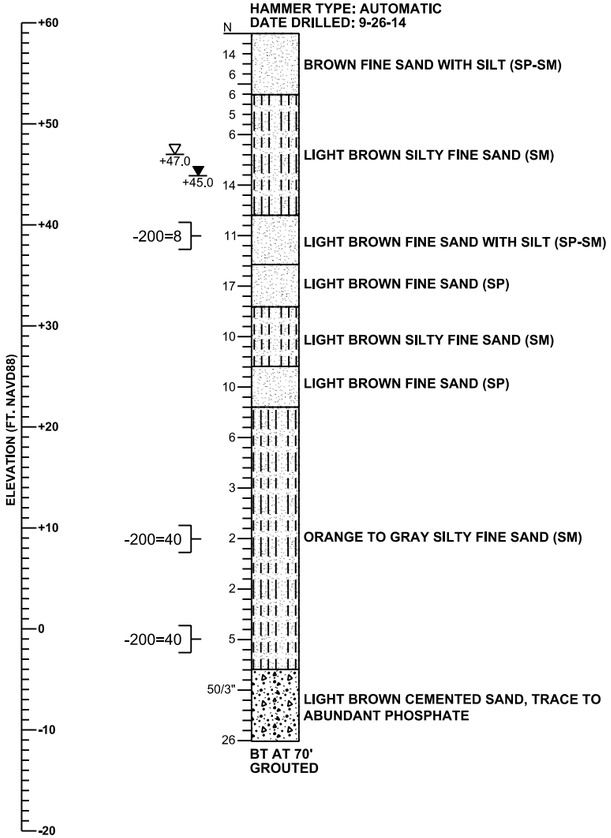
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

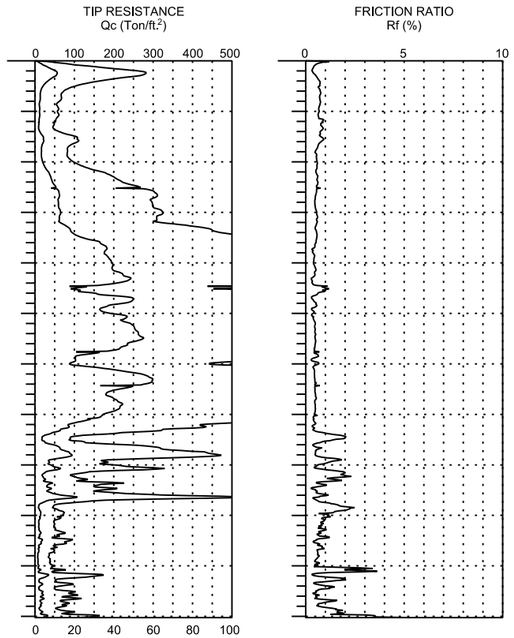
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-150

$USER$ $DATE$ $TIME$ $FILE$

WB-92
STA. 1075+00, 60' RIGHT
LAT: N28.812036
LONG: W81.37196
GSE: +59.0
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 9-26-14



WB-94
STA. 1077+00, 40' LEFT
LAT: N28.81213
LONG: W81.37127
GSE: +60.0
DATE DRILLED: 9-24-14



ST AT 55.1'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +47.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +45.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND
CEMENTED SAND
SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

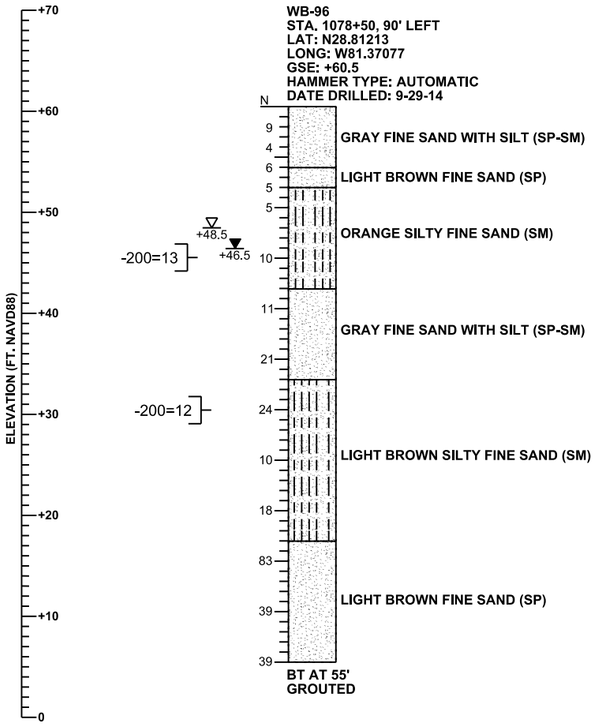
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

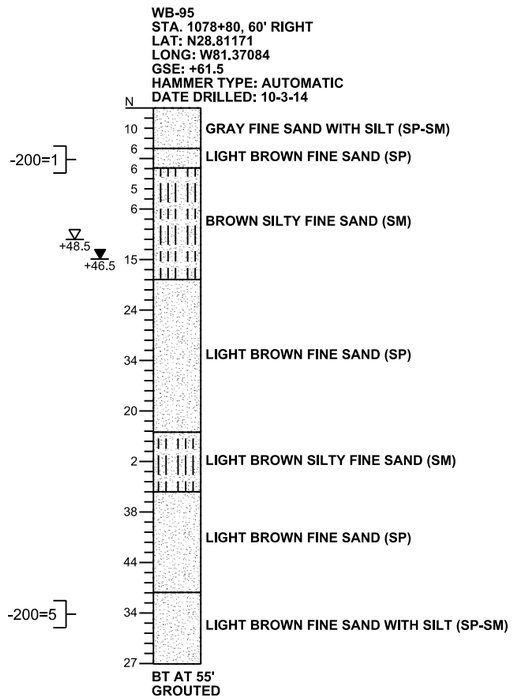
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-151

Scott 4/17/2017 2:16:20 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
+48.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+46.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

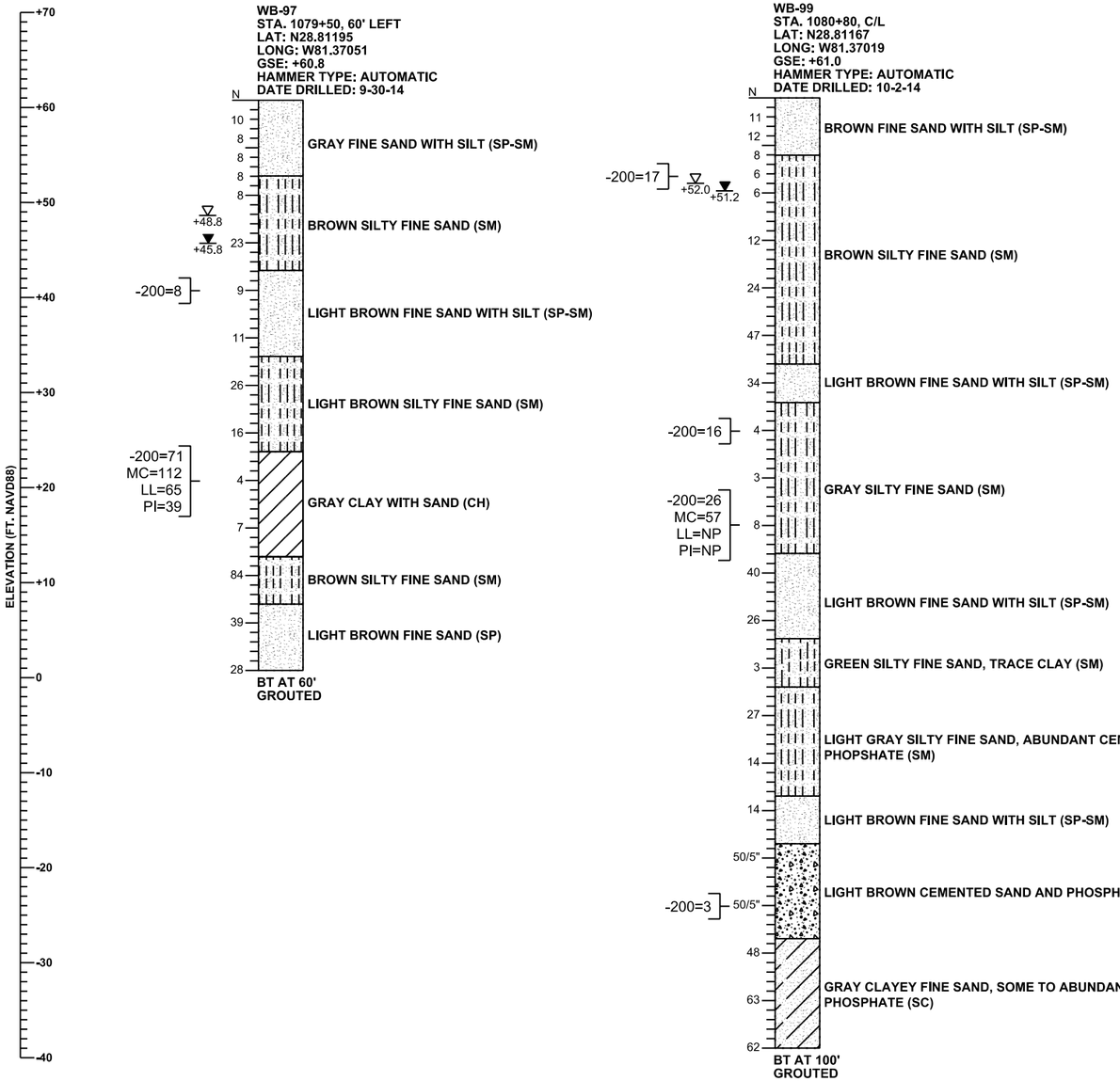
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-152

Scott 4/17/2017 2:17:02 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +48.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +45.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | CLAY

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

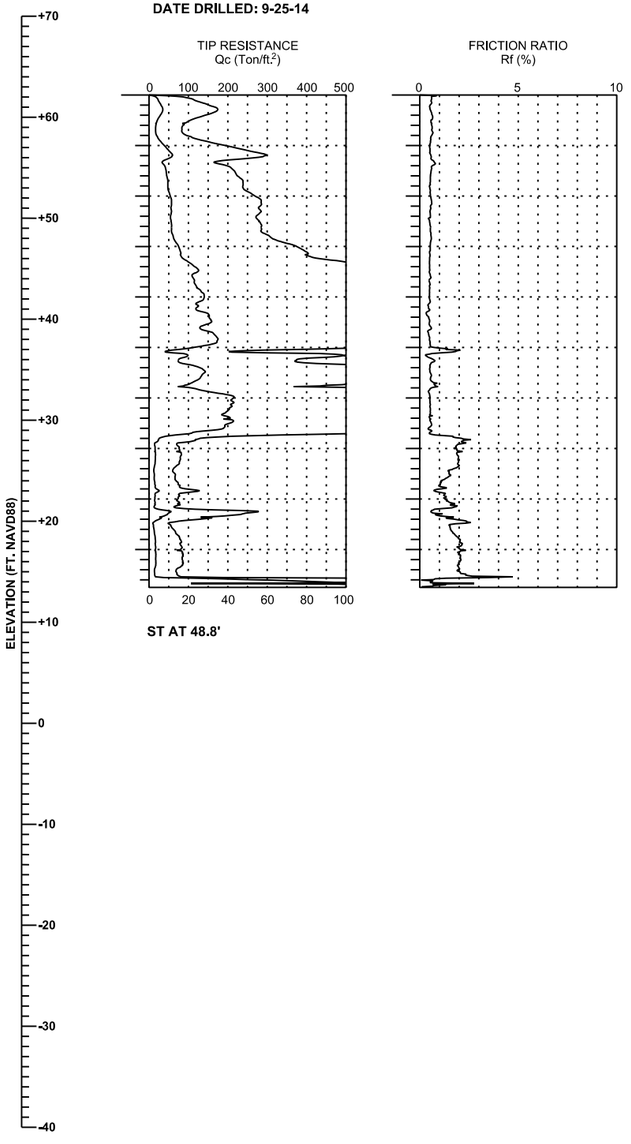
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-153

Scott 4/17/2017 2:17:27 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn

WB-98
STA. 1081+00, 60' RIGHT
LAT: N28.81149
LONG: W81.37021
GSE: +62.2
DATE DRILLED: 9-25-14



ST AT 48.8'

WB-101
STA. 1084+80, C/L
LAT: N28.811227
LONG: W81.36905
GSE: +68.8
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-10-14

N		
2		BROWN FINE SAND WITH SILT (SP-SM)
1		
3		LIGHT BROWN FINE SAND (SP)
7	▽ +59.8	LIGHT BROWN CLAYEY FINE SAND (SC)
7		
13	▼ +53.8	LIGHT BROWN FINE SAND WITH SILT (SP-SM)
27	-200=7	
18		LIGHT BROWN SILTY FINE SAND (SM)
18		LIGHT BROWN FINE SAND WITH SILT (SP-SM)
27		LIGHT BROWN FINE SAND (SP)
3	-200=70 MC=67 LL=56 PI=36	GRAY FAT CLAY WITH SAND (CH)
4		
8		
50/3"		GRAY FINE SAND WITH SILT, TRACE PHOSPHATE (SP-SM)
45		
5		LIGHT GRAY SILTY FINE SAND, ABUNDANT CEMENTED SAND AND PHOSPHATE (SM)
16	◀ 100%	
21	-200=6	LIGHT BROWN FINE SAND WITH SILT (SP-SM)
14		BROWN SANDY FAT CLAY, ABUNDANT CEMENTED SAND AND PHOSPHATE (CH)
50/1"		LIGHT BROWN CEMENTED SAND AND PHOSPHATE
50/1"		
50/1"		GRAY CLAYEY FINE SAND, SOME TO ABUNDANT CEMENTED SAND AND PHOSPHATE (SC)
50/2"		

BT AT 100'
70' OF 3" CASING GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +59.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +53.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

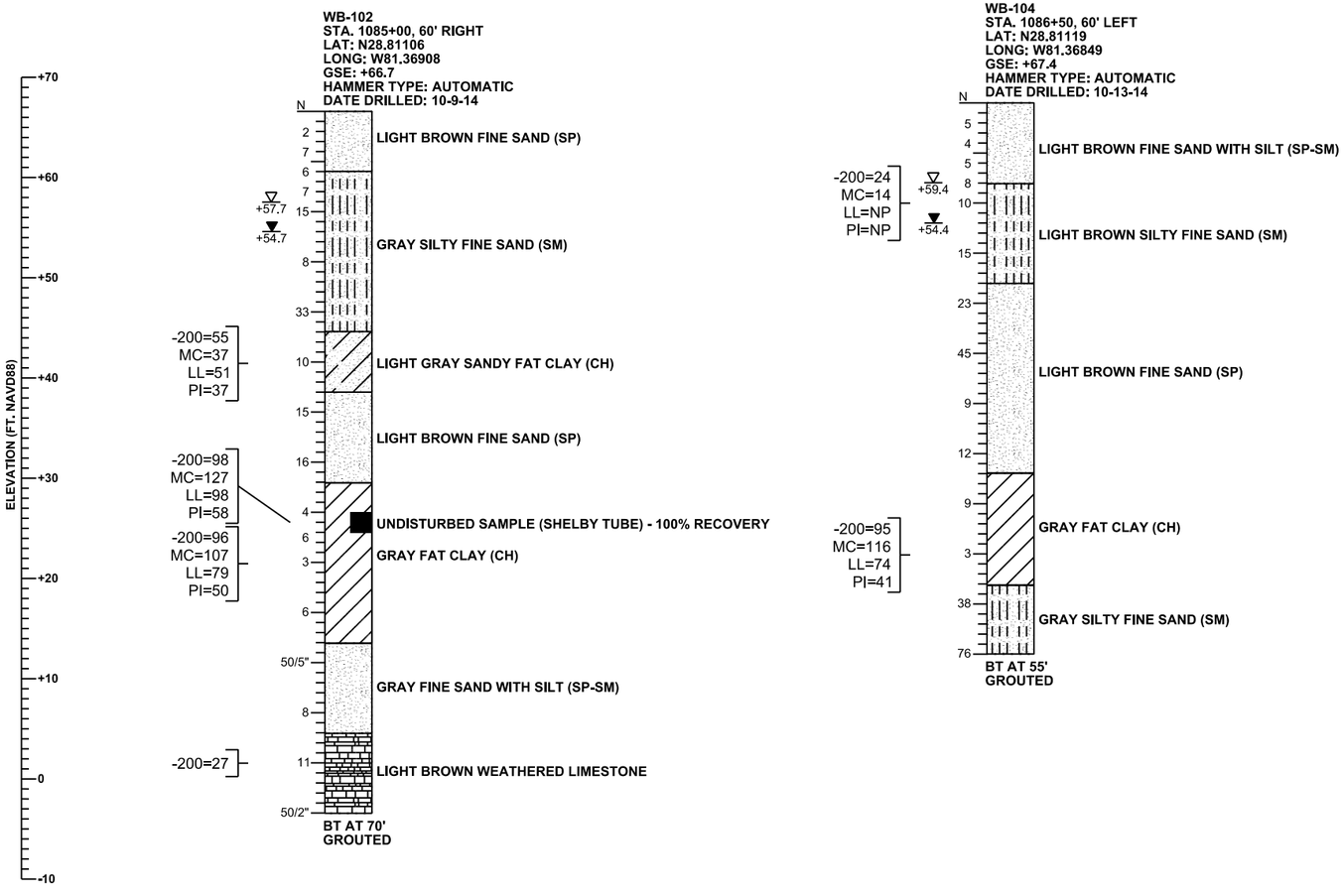
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-154

Scott 4/17/2017 2:17:53 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +57.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +54.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND | SAND AND CLAY | LIMESTONE
SAND AND SILT | CLAY

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

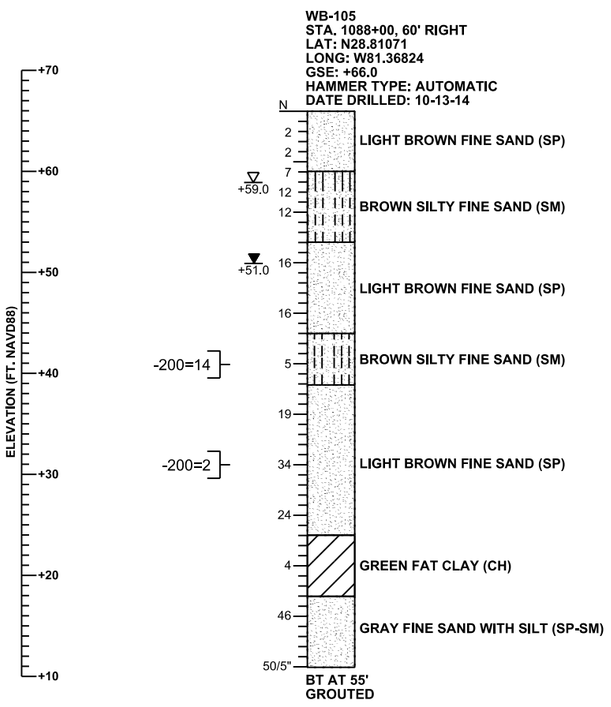
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

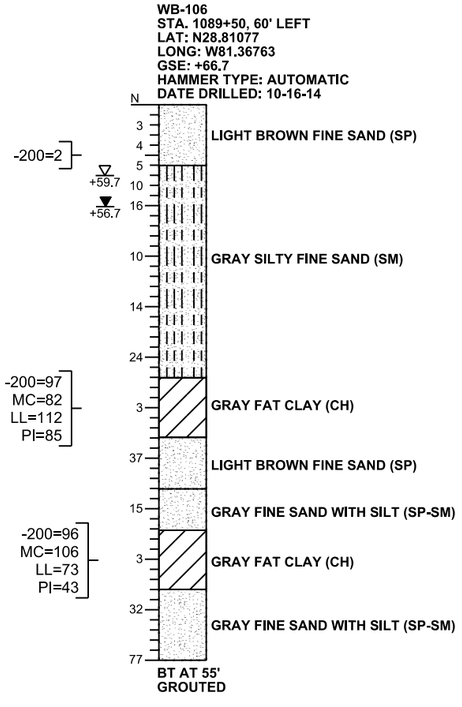
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-155

Scott 4/17/2017 2:18:16 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +59.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +51.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND CLAY

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

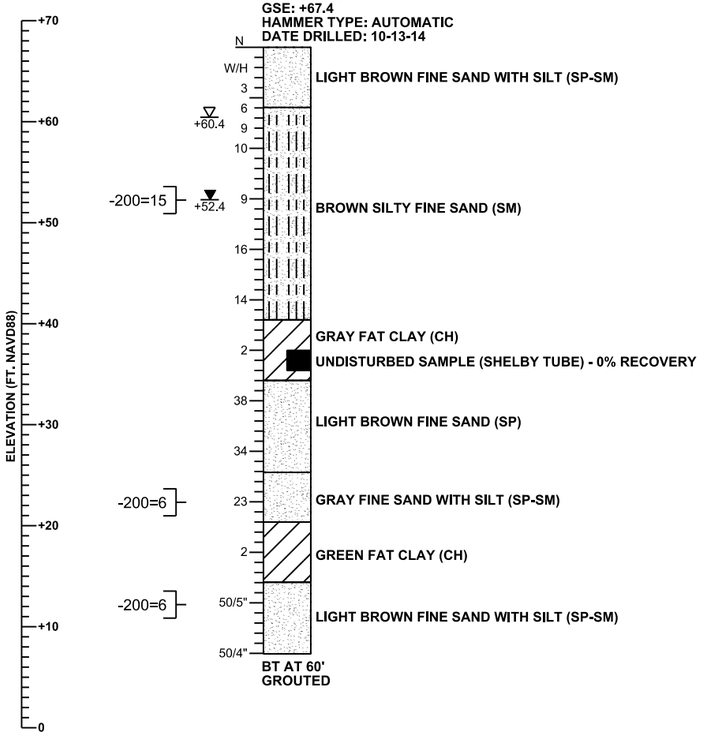
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

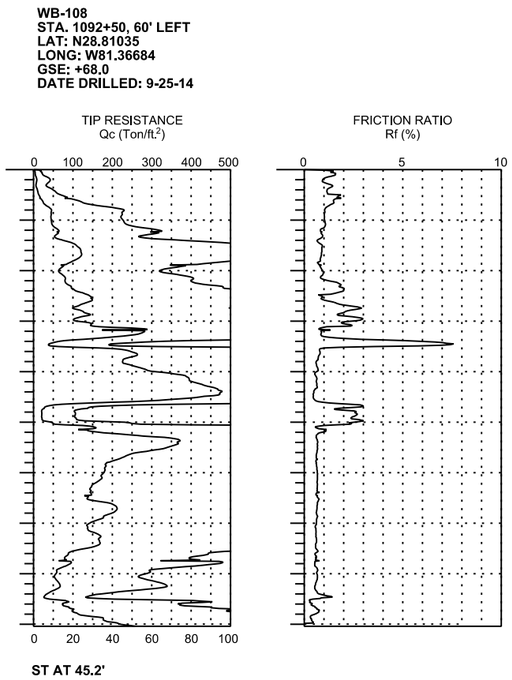
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-156

Scott 4/17/2017 2:18:41 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
▽ +60.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +52.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND CLAY

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

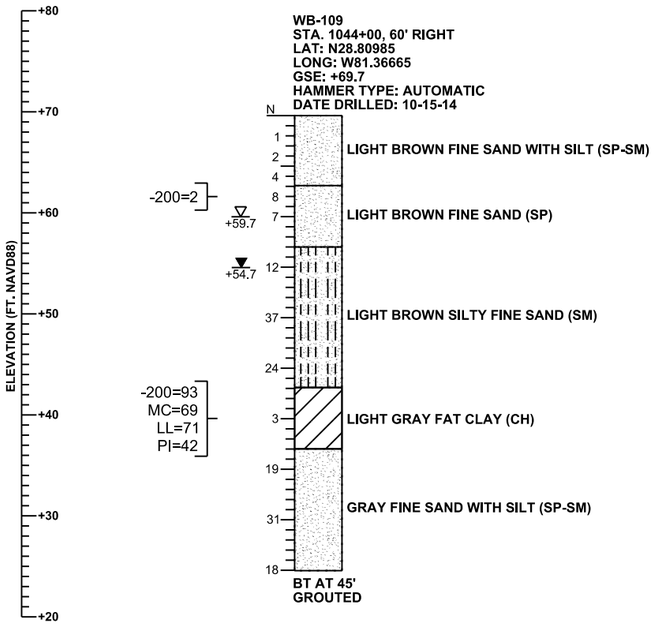
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

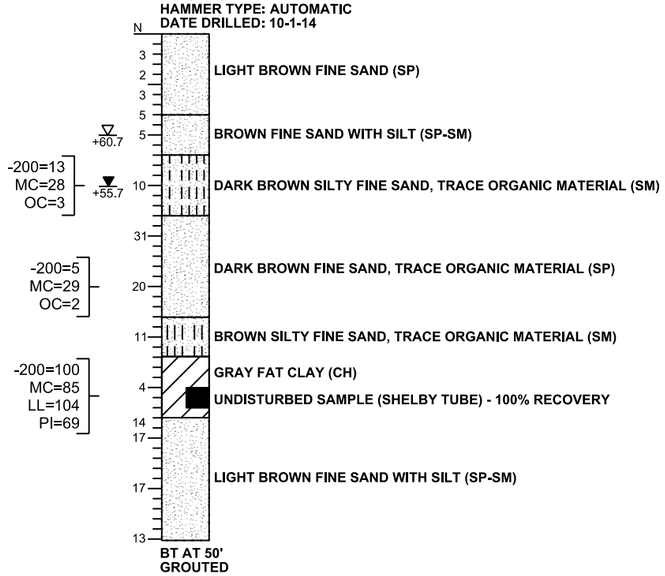
REF. DWG. NO.

SHEET NO. BW-157

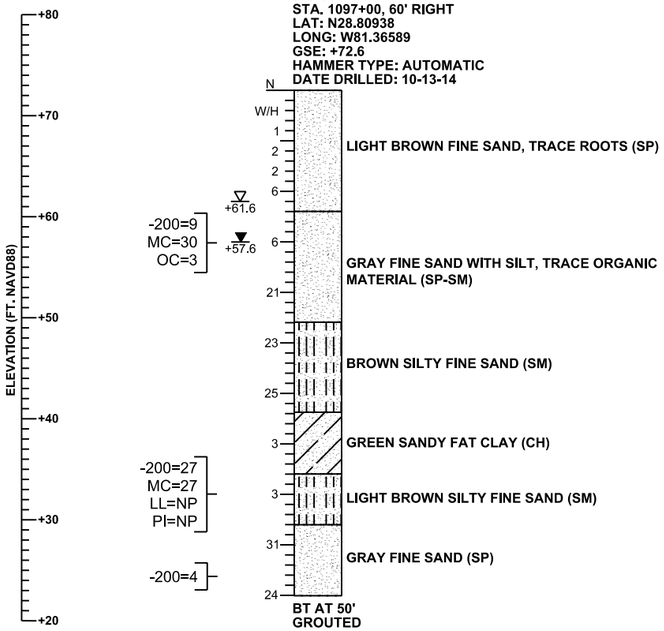
Scott 4/17/2017 2:19:04 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn



WB-109
STA. 1044+00, 60' RIGHT
LAT: N28.80985
LONG: W81.36665
GSE: +69.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-15-14

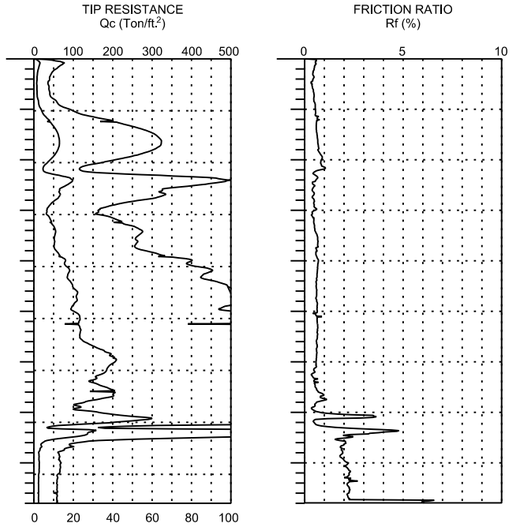


WB-110
STA. 1095+50, 60' LEFT
LAT: N28.80990
LONG: W81.36605
GSE: +70.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-1-14



WB-111
STA. 1097+00, 60' RIGHT
LAT: N28.80938
LONG: W81.36589
GSE: +72.6
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-13-14

WB-112
STA. 1099+50, 60' LEFT
LAT: N28.80940
LONG: W81.36529
GSE: +72.0
DATE DRILLED: 9-25-14



ST AT 44'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
▽ +59.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +54.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND
SAND AND CLAY
SAND AND SILT
CLAY

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

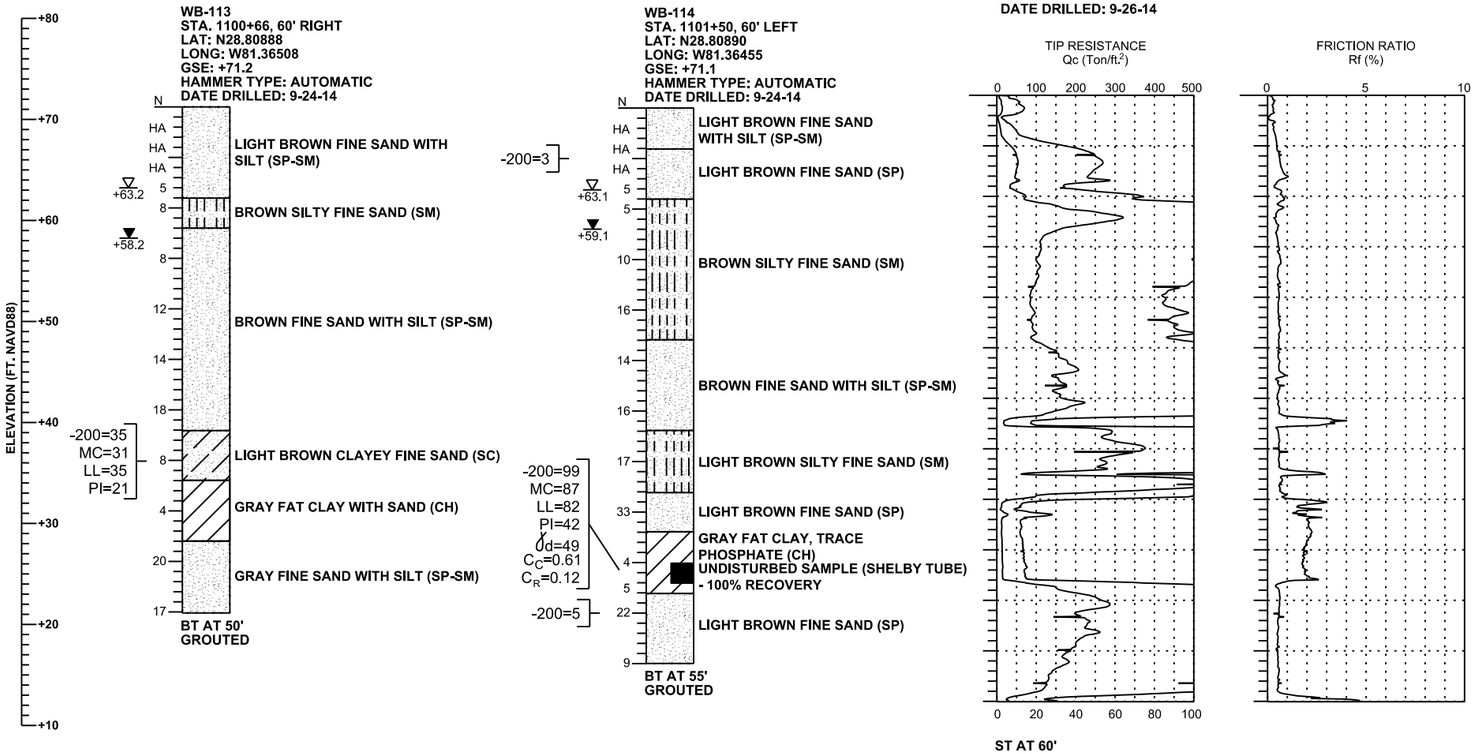
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-158

Scott 4/17/2017 2:19:27 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +63.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +59.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND — CLAY

SAND AND SILT — SAND AND CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

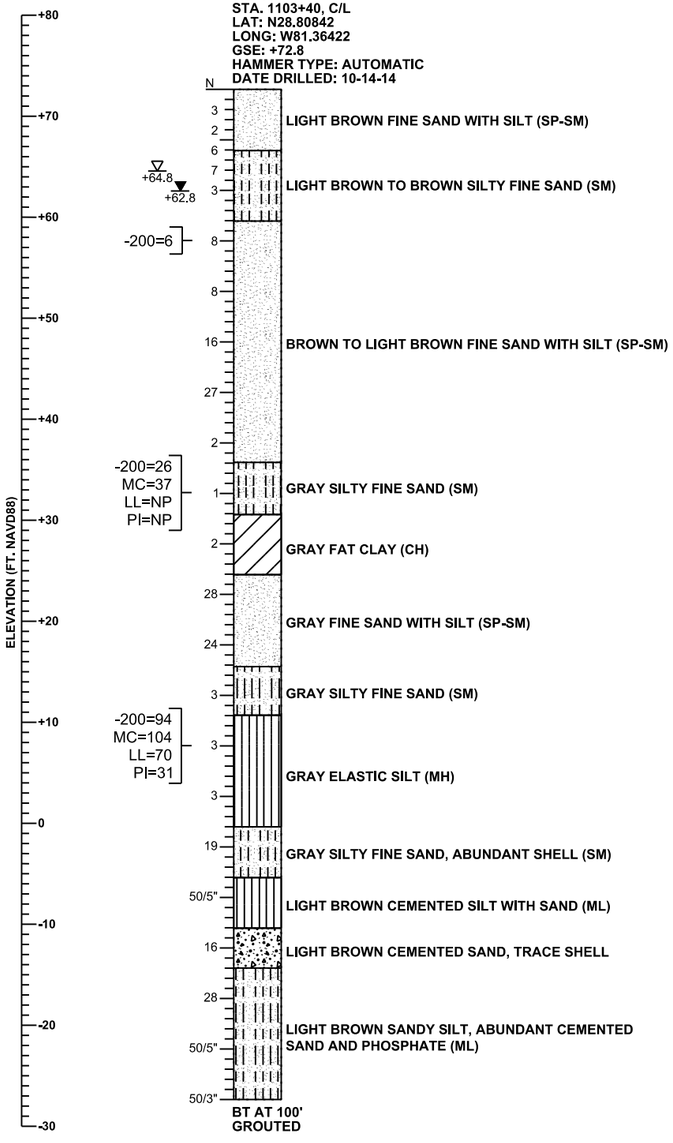
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

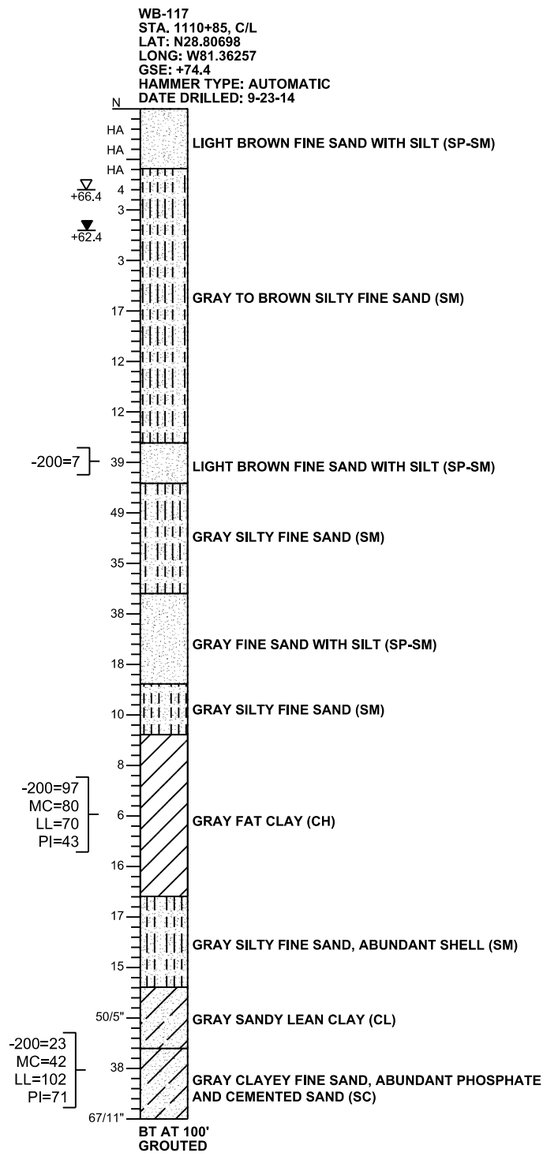
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-159

Scott 4/17/2017 2:19:54 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
+64.8 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+62.8 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND | SAND AND CLAY | SILT
SAND AND SILT | CLAY | CEMENTED SAND

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-116
SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-117
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 30 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

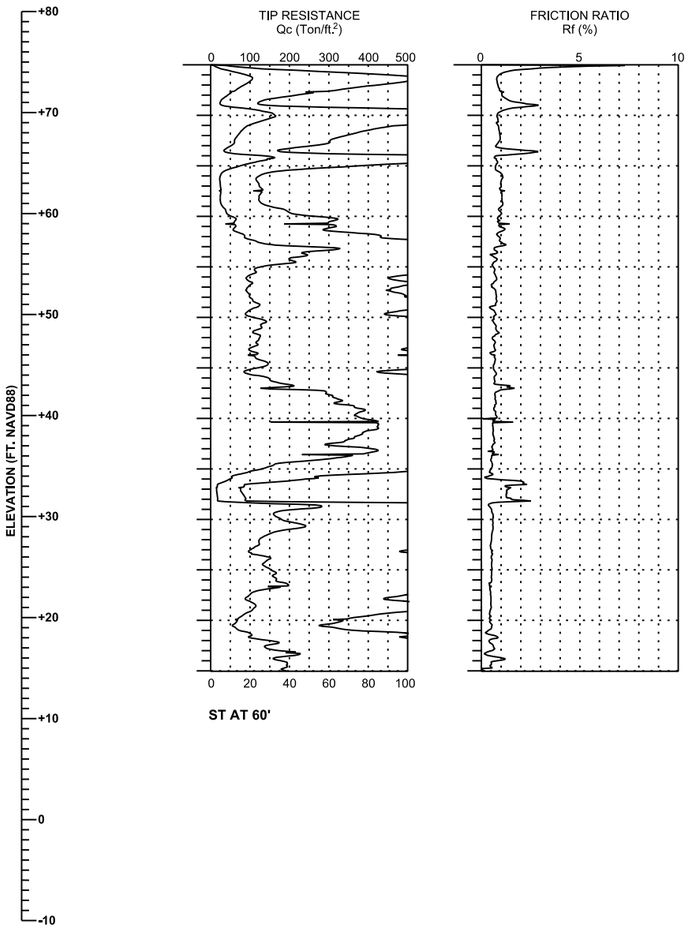
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-160

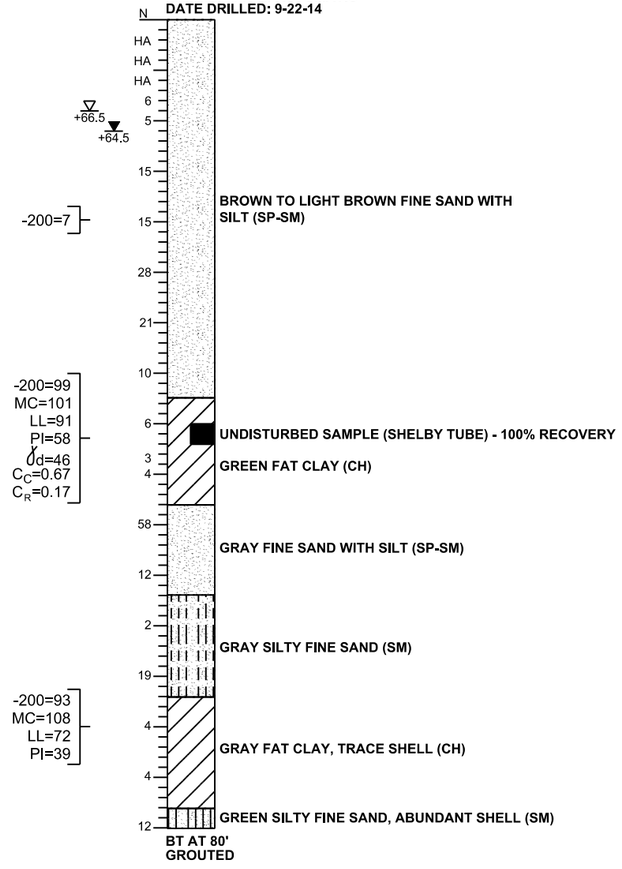
Scott 4/17/2017 2:20:21 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn

WB-118
STA. 1111+00, 60' LEFT
LAT: N28.80706
LONG: W81.36239
GSE: +74.7
DATE DRILLED: 9-26-14



ST AT 60'

WB-119
STA. 1112+50, 60' RIGHT
LAT: N28.80658
LONG: W81.36241
GSE: +75.5
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 9-22-14



BROWN TO LIGHT BROWN FINE SAND WITH SILT (SP-SM)

UNDISTURBED SAMPLE (SHELBY TUBE) - 100% RECOVERY

GREEN FAT CLAY (CH)

GRAY FINE SAND WITH SILT (SP-SM)

GRAY SILTY FINE SAND (SM)

GRAY FAT CLAY, TRACE SHELL (CH)

GREEN SILTY FINE SAND, ABUNDANT SHELL (SM)

BT AT 80'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +66.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +64.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND CLAY

SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-118
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-119
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 30 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

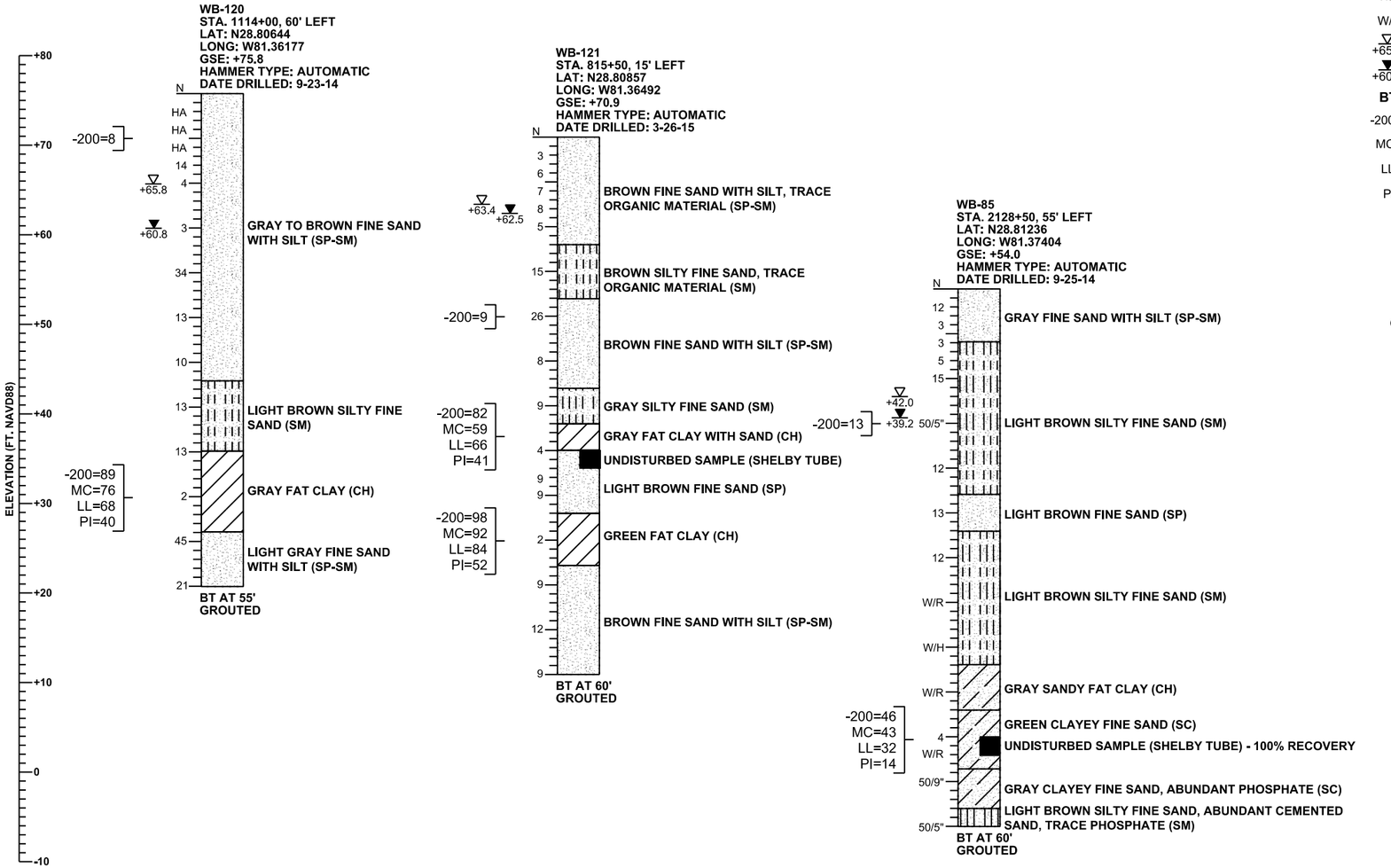
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-161

Scott 4/17/2017 2:20:59 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +65.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +60.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — CLAY — SAND AND SILT — SAND AND CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATION WB-120 REFERENCES THE SR 429 CENTERLINE AND BORING LOCATION WB-85 REFERENCES THE EB FRONTAGE ROAD CENTERLINE. BORING LOCATION WB-121 REFERENCES THE ORANGE AVENUE CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-120
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 30 EAST

WB-85 / WB-121
SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

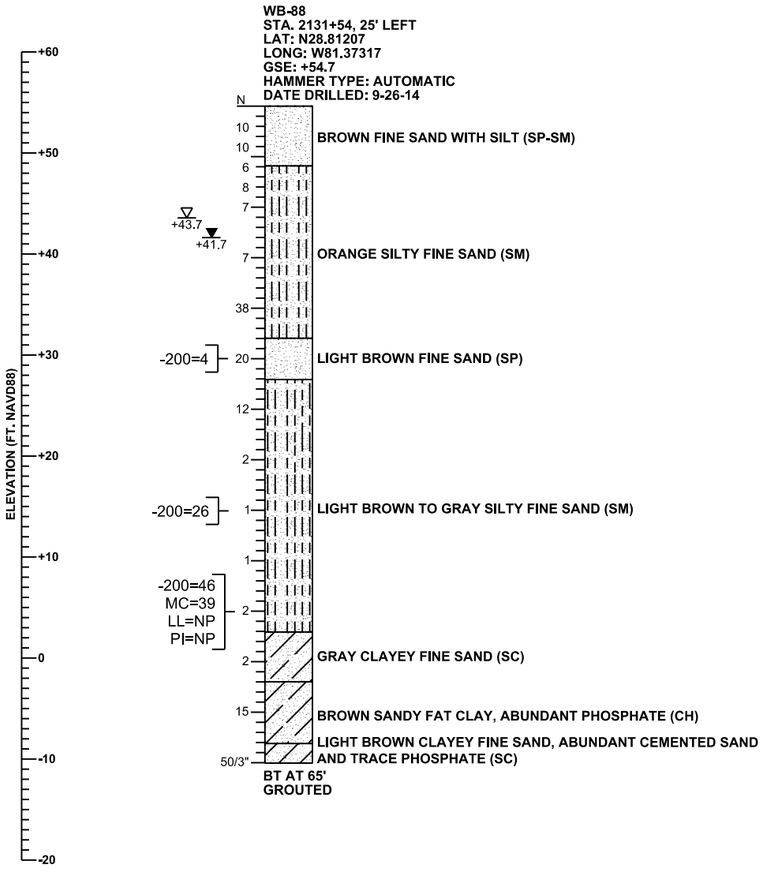
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

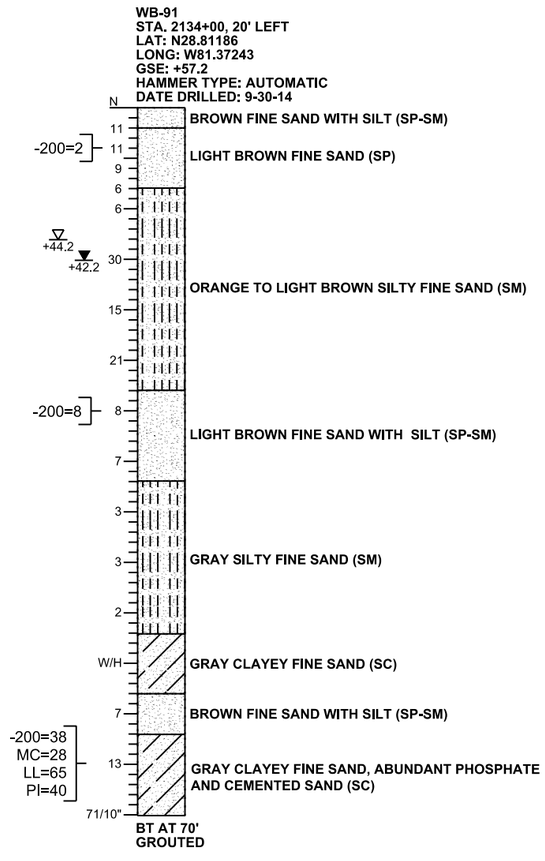
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-162

Scott 4/17/2017 2:21:24 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
▽ +43.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND

SAND AND CLAY

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE EB FRONTAGE ROAD CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

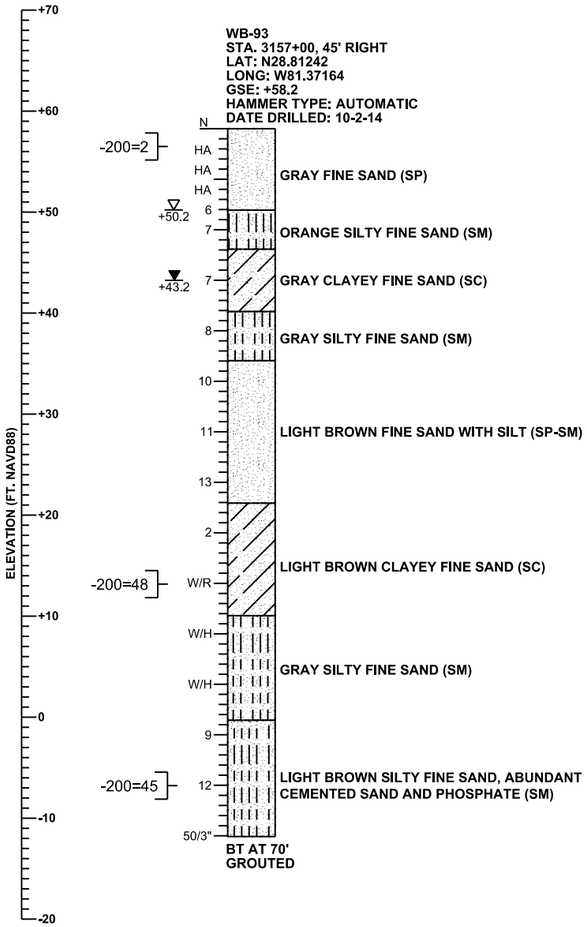
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

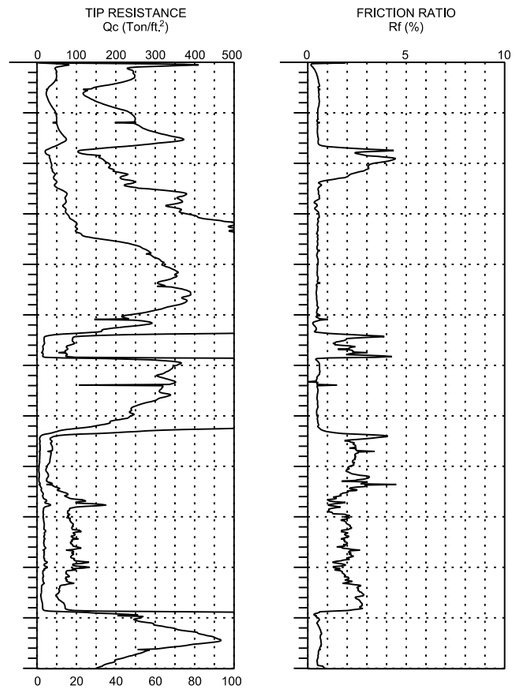
REF. DWG. NO.

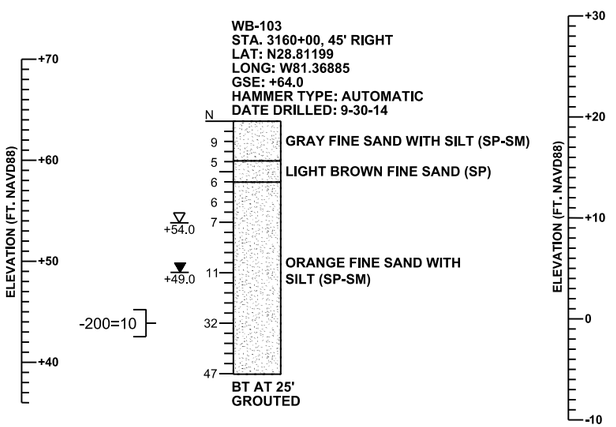
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

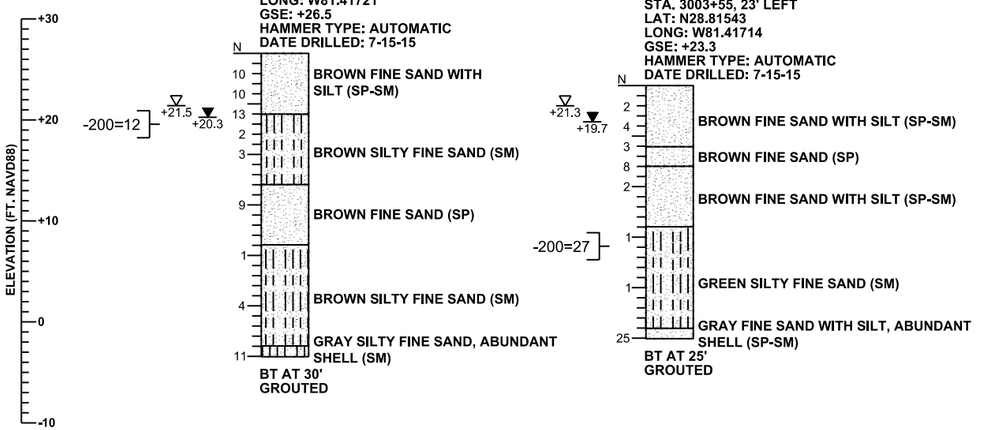
SHEET NO. BW-163

Scott 5/3/2017 2:02:49 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn









LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +50.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +43.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS WB-93, WB-100, WB-103, WB-122 AND WB-123 REFERENCE THE WB FRONTAGE ROAD CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-93, WB-100 AND WB-113
SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-122 AND WB-123
SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 20 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

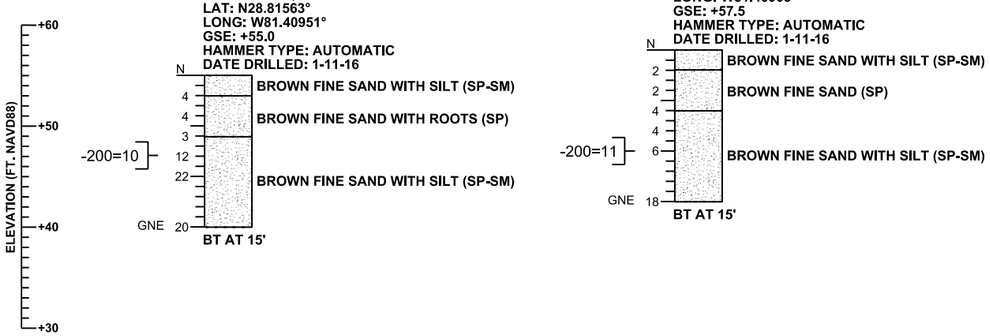
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

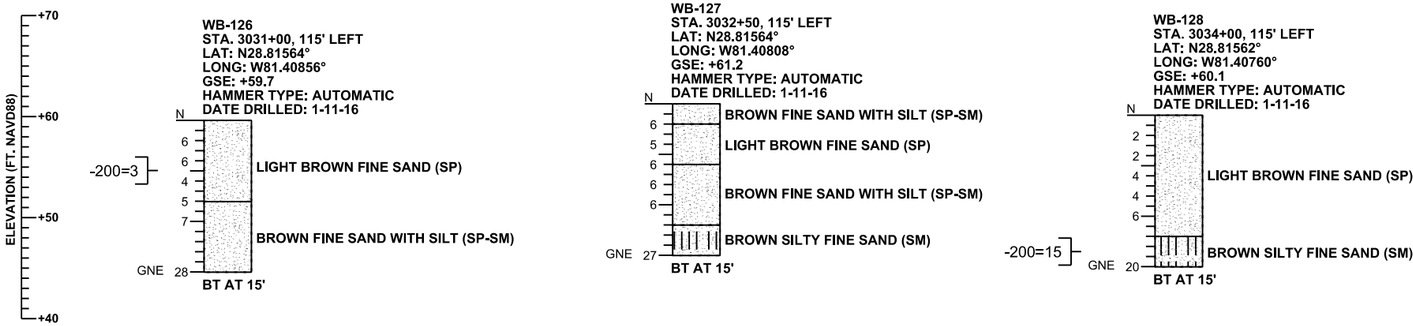
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
REF. DWG. NO.
SHEET NO. BW-164

Scott 4/17/2017 2:22:17 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn

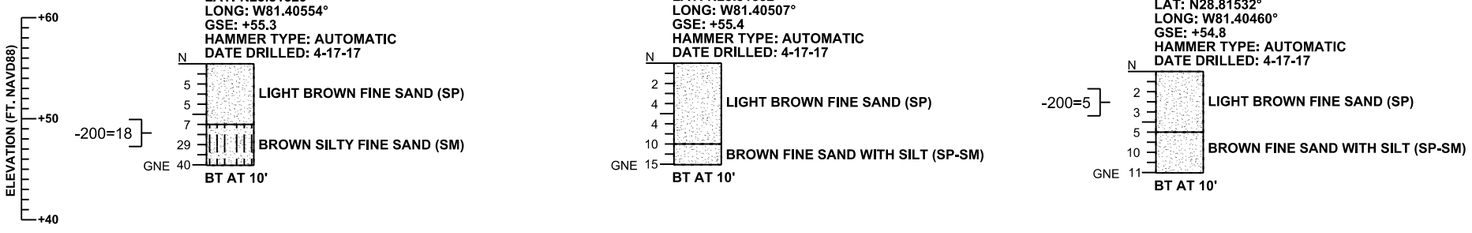
POND WR2 CIP WALL



POND WR2 CIP WALL



WEKIVA TRAIL DRIVEWAY GRAVITY WALL



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
GNE	GROUNDWATER NOT ENCOUNTERED DURING DRILLING OF BORING
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. POND WR2 CIP WALL BORING LOCATIONS REFERENCE THE WB FRONTAGE ROAD CENTERLINE. WEKIVA TRAIL DRIVEWAY GRAVITY WALL BORING LOCATIONS REFERENCE THE WEKIVA TRAIL DRIVEWAY CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

ENVIRONMENTAL CLASSIFICATION: (POND WR2 CIP WALL)
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=6.0)
CONCRETE: MODERATELY AGGRESSIVE (pH=6.0)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

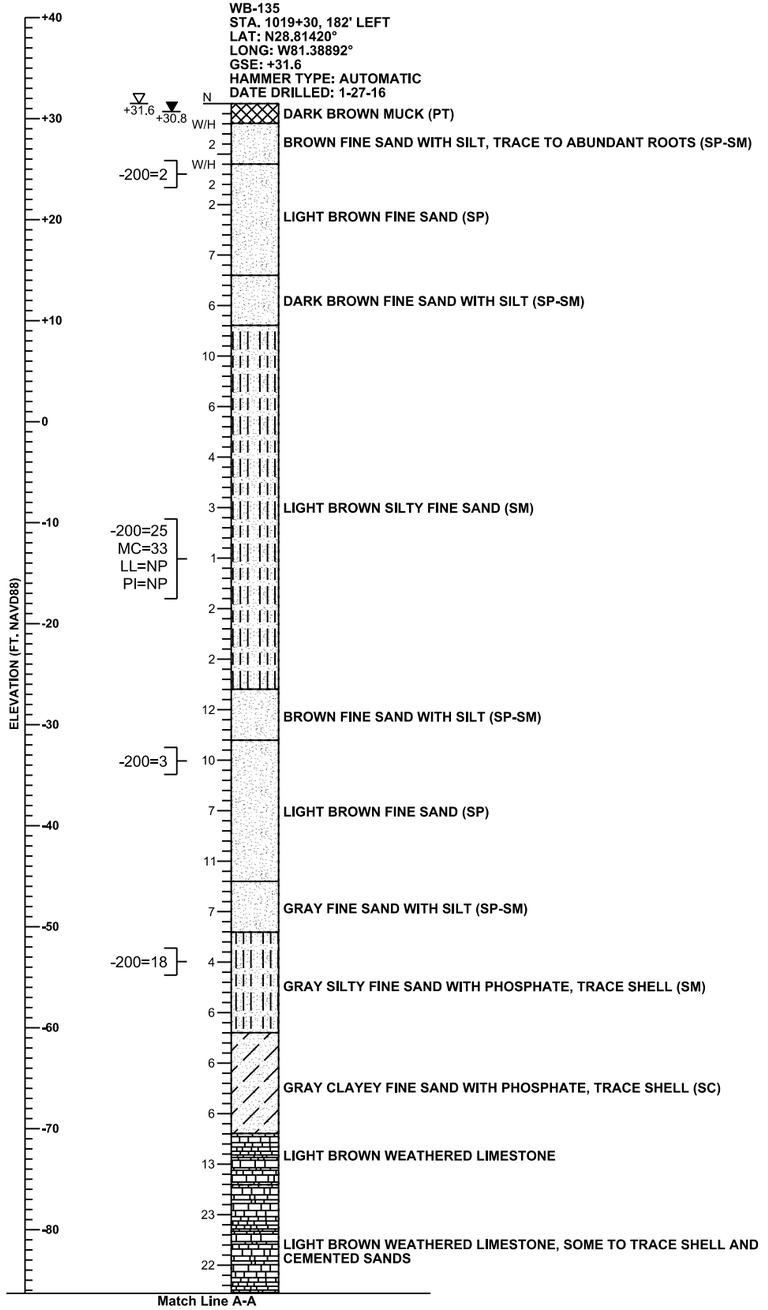
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

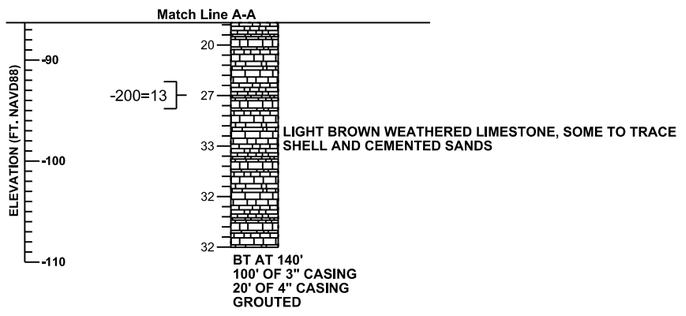
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-165

Scott 5/3/2017 9:17:21 AM J:\D109\3520G Wekiva Parkway Section 7A\2-15-16\b1boring01.dgn

REPORT OF SPT BORINGS
FOR SHEET PILE WALL





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +31.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND | SAND AND CLAY | MUCK
SAND AND SILT | LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

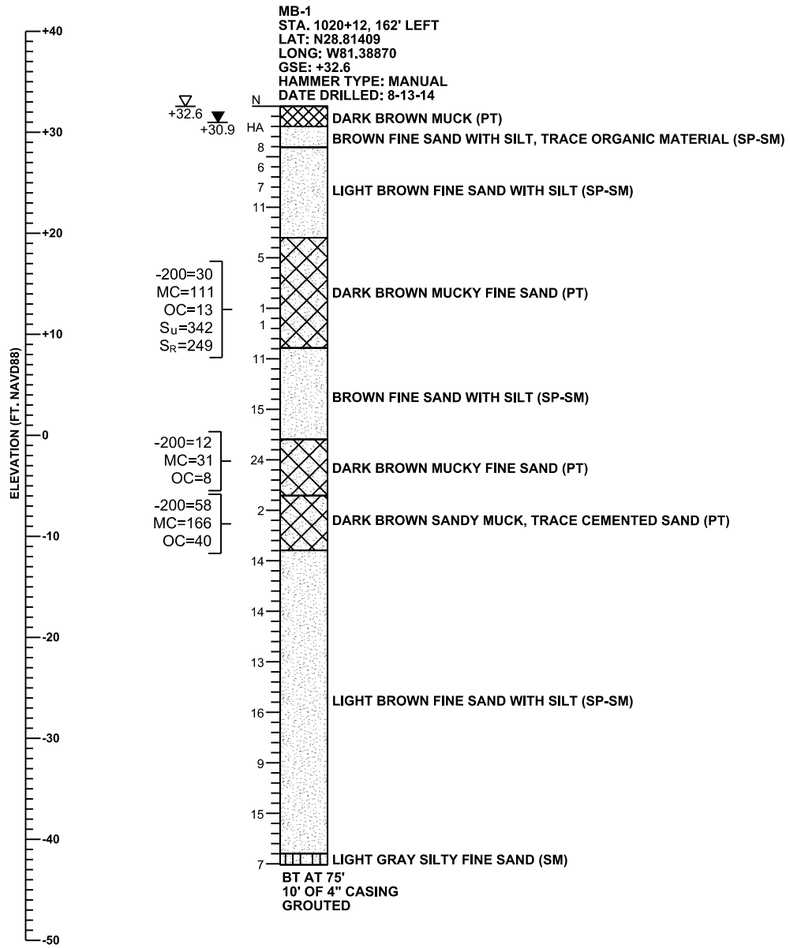
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-166

Scott 4/17/2017 2:32:41 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring03.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
+32.6 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+30.9 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND — SAND AND MUCK

SAND AND SILT — MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

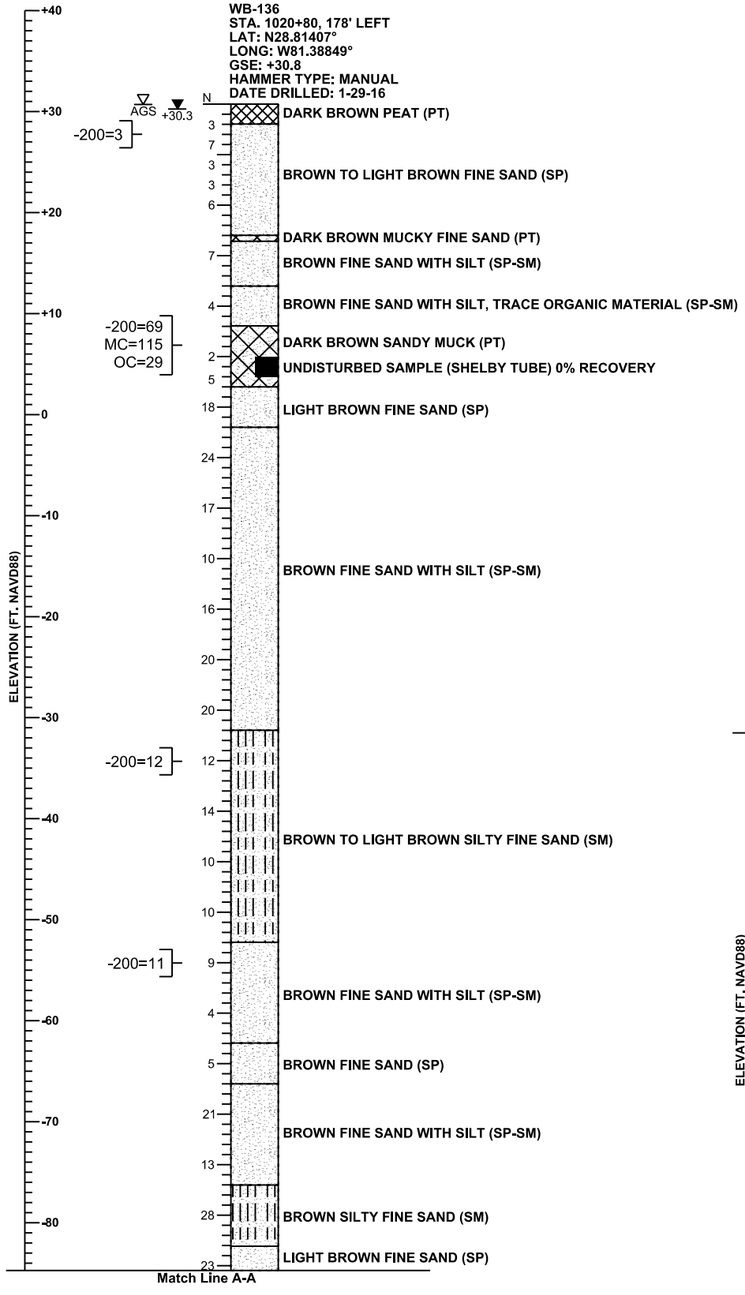
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-167

Scott 4/17/2017 2:38:06 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring19.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
AGS	ESTIMATED SEASONAL HIGH GROUNDWATER LEVEL ABOVE THE GROUND SURFACE
+30.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND | SAND AND CLAY | SAND AND MUCK
SAND AND SILT | PEAT | SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: MANUAL

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	VERY LOOSE
	4-10	LOOSE
	10-30	MEDIUM DENSE
	30-50	DENSE
	OVER 50	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	VERY SOFT
	2-4	SOFT
	4-8	FIRM
	8-15	STIFF
	15-30	VERY STIFF
	OVER 30	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

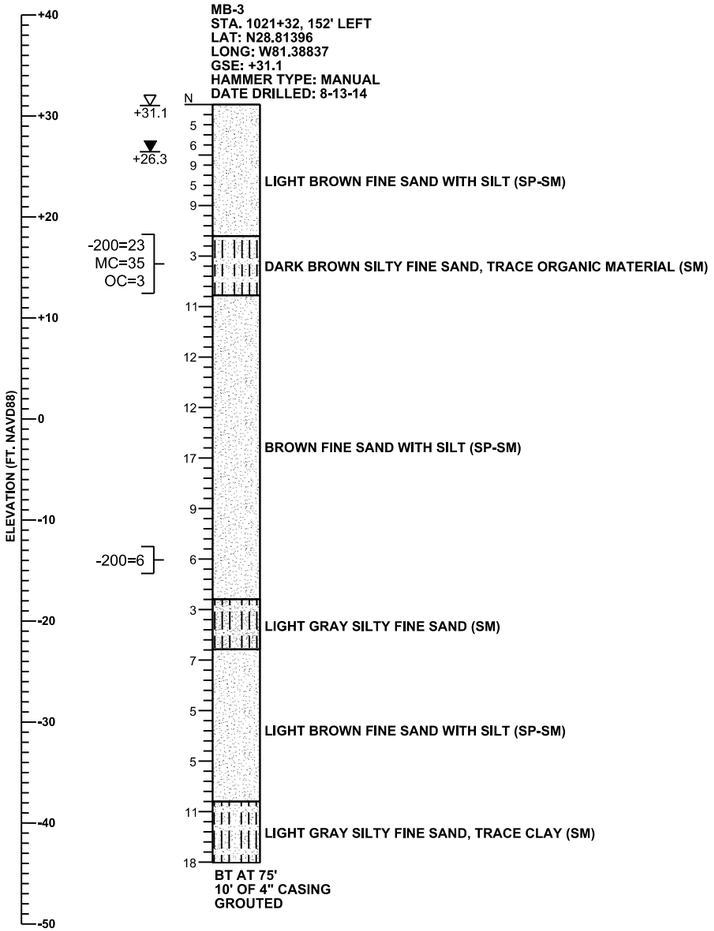
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-168

Scott 4/17/2017 2:40:37 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring03.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +31.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +26.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

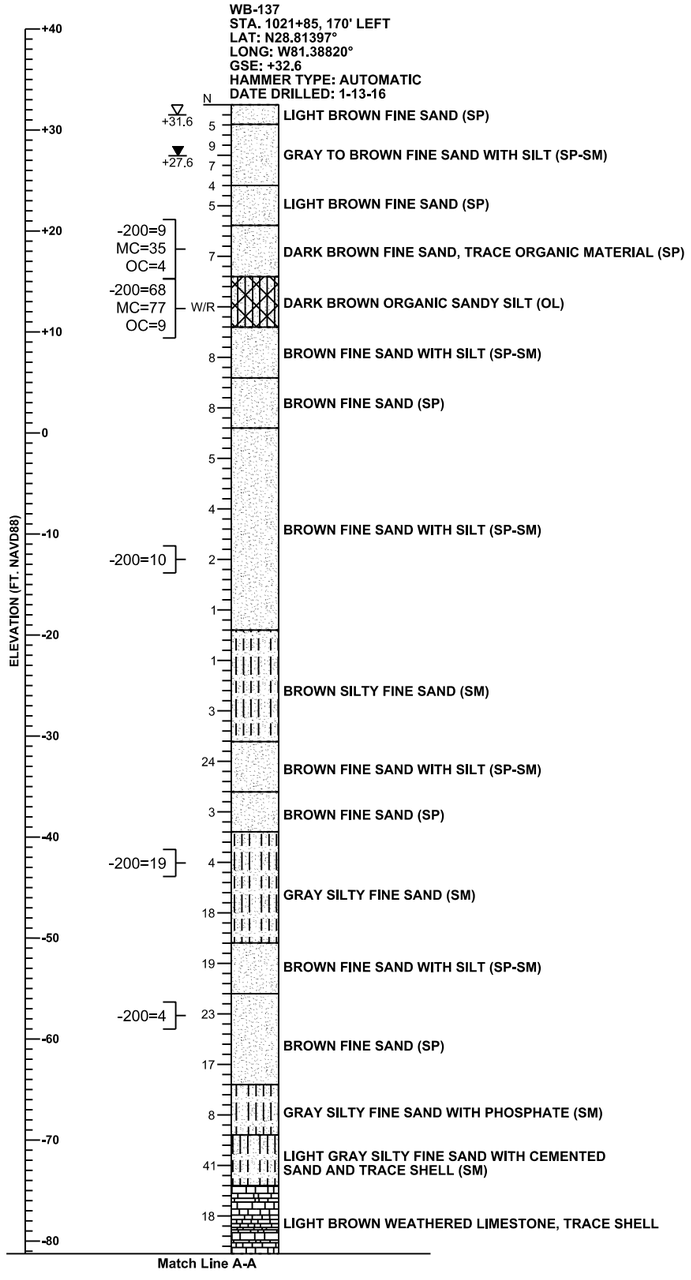
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

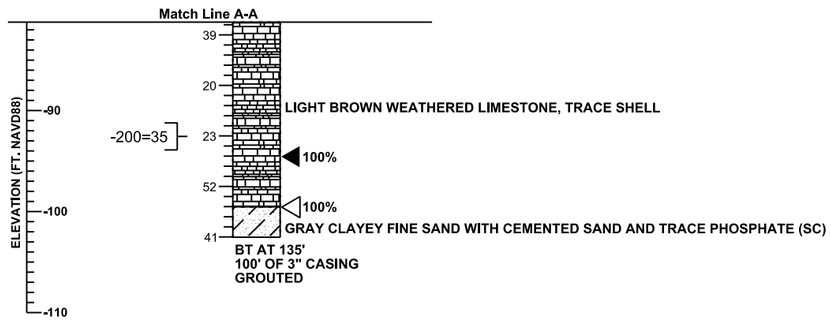
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-169

Scott 4/17/2017 2:43:13 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring19.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
▽ +31.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +27.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND CLAY | ORGANIC SANDY SILT

SAND AND SILT | LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

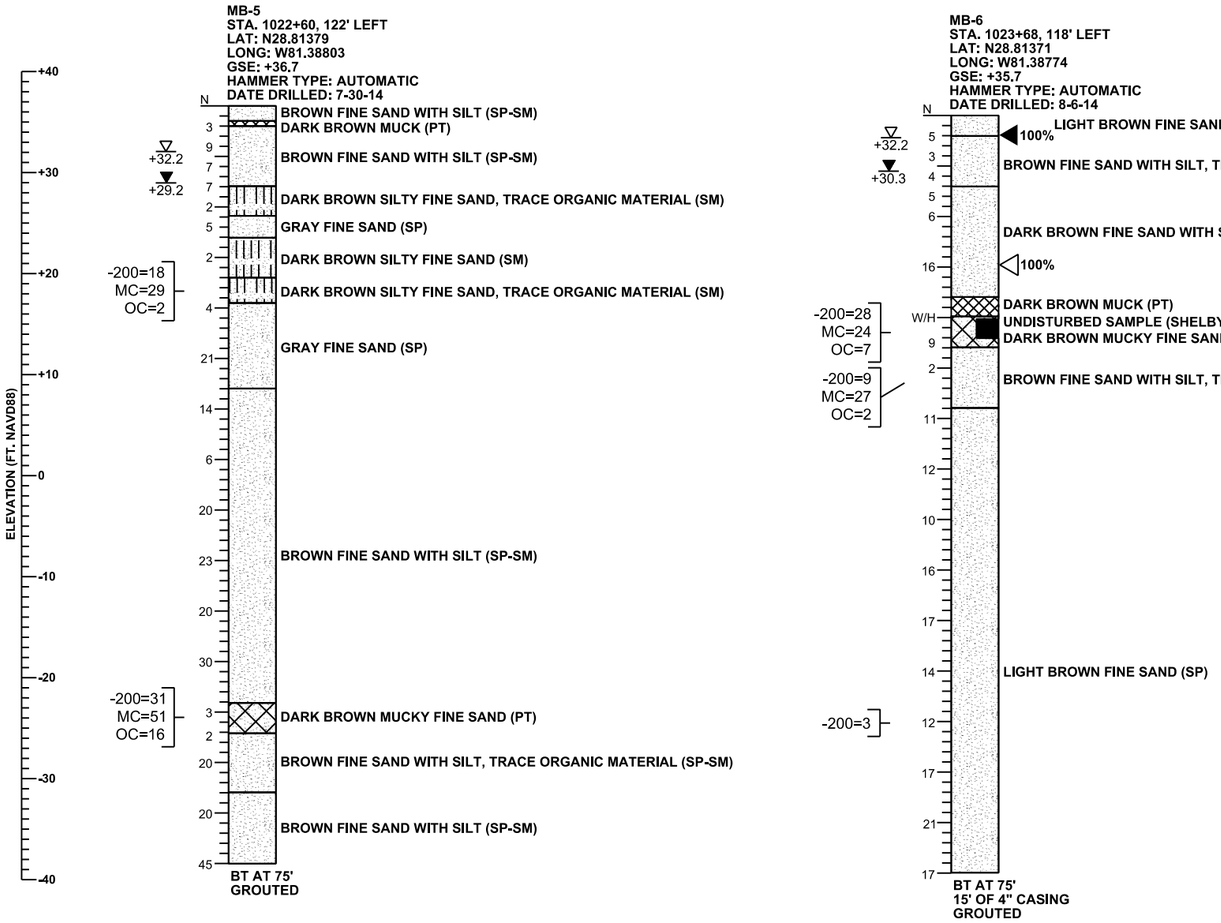
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

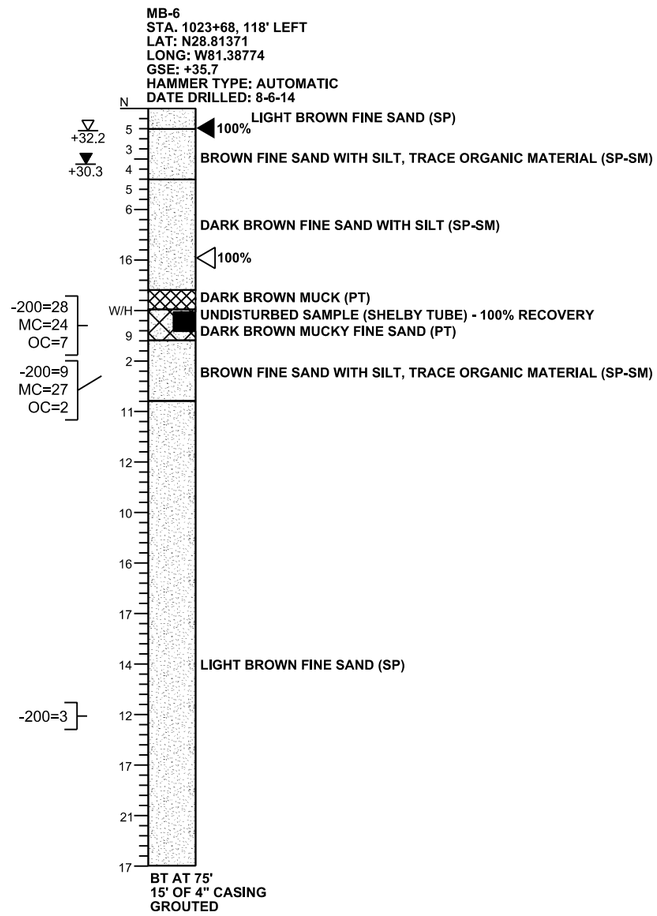
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-170

Scott 4/17/2017 2:46:51 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring04.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +32.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +29.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND — SAND AND MUCK

SAND AND SILT — MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

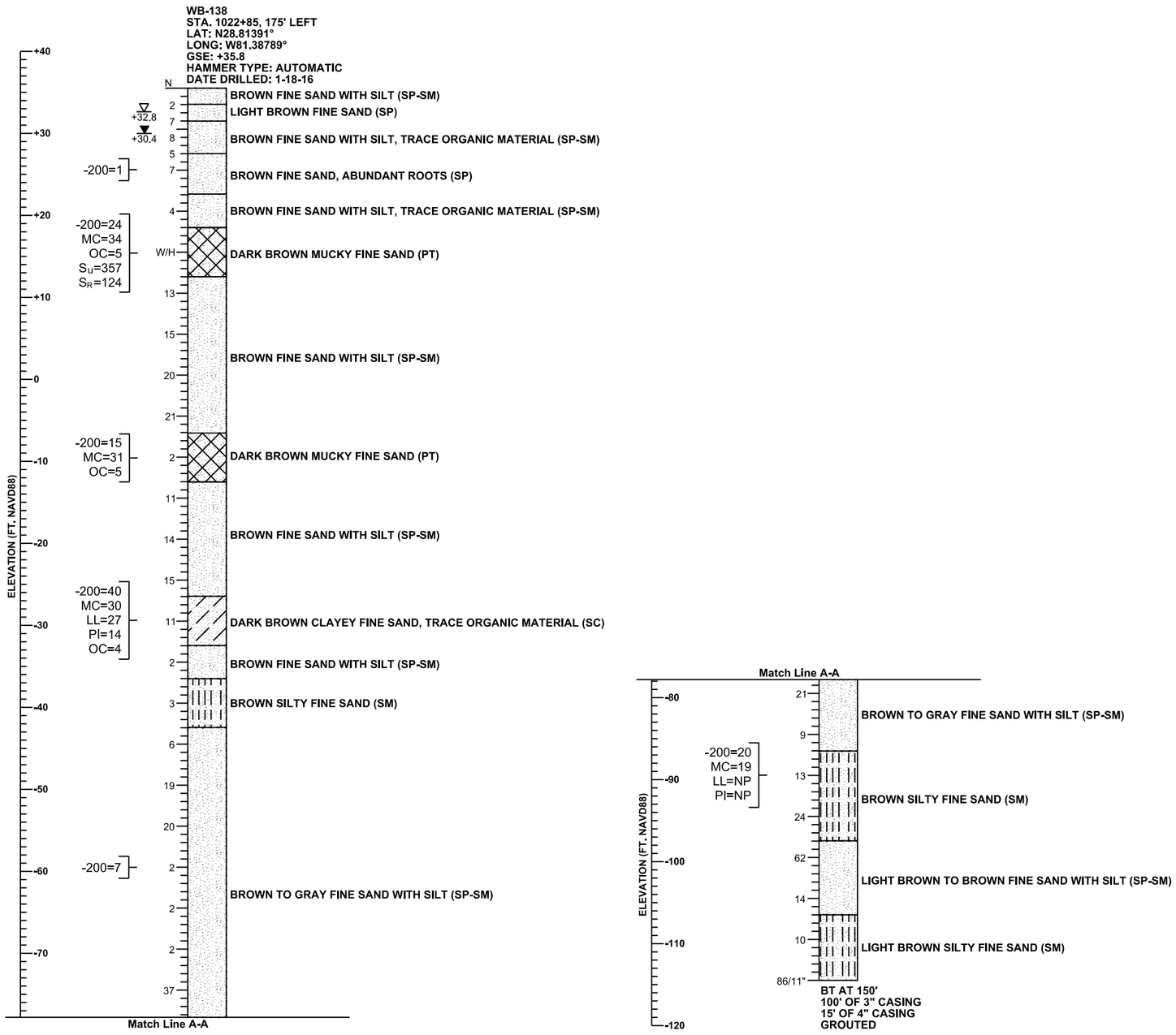
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-171

Scott 4/17/2017 2:54:37 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring19.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +32.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC
OC=	PERCENT ORGANIC CONTENT
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND — SAND AND CLAY

SAND AND SILT — SAND AND MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

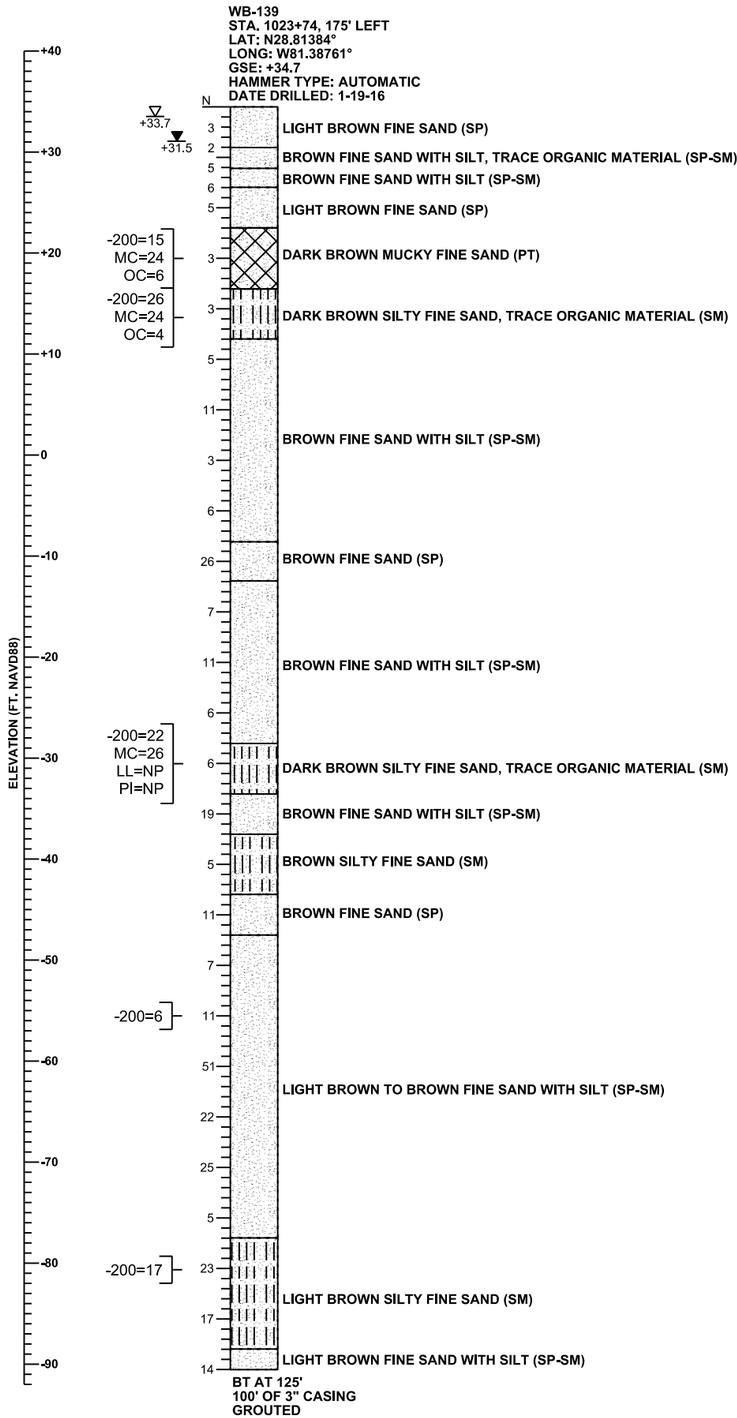
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-172

Scott 4/17/2017 2:56:16 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring04.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
+33.7 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+31.5 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND

SAND AND MUCK

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

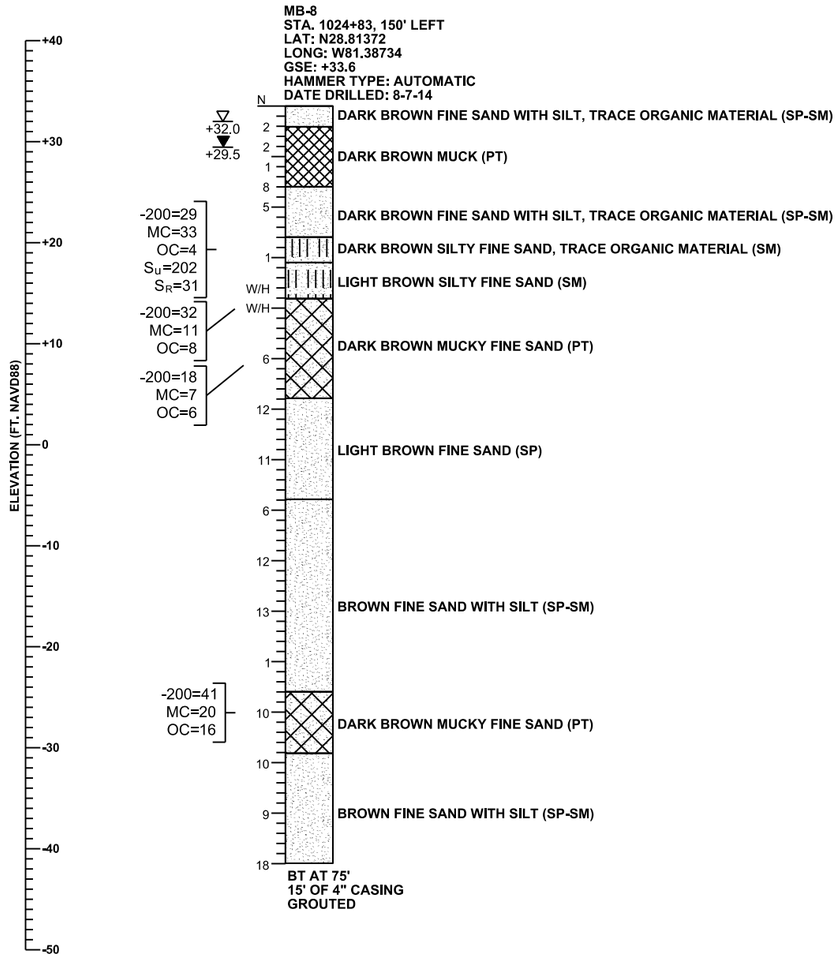
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-173

Scott 4/17/2017 2:57:22 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring04.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +32.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +29.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND — SAND AND MUCK

SAND AND SILT — MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

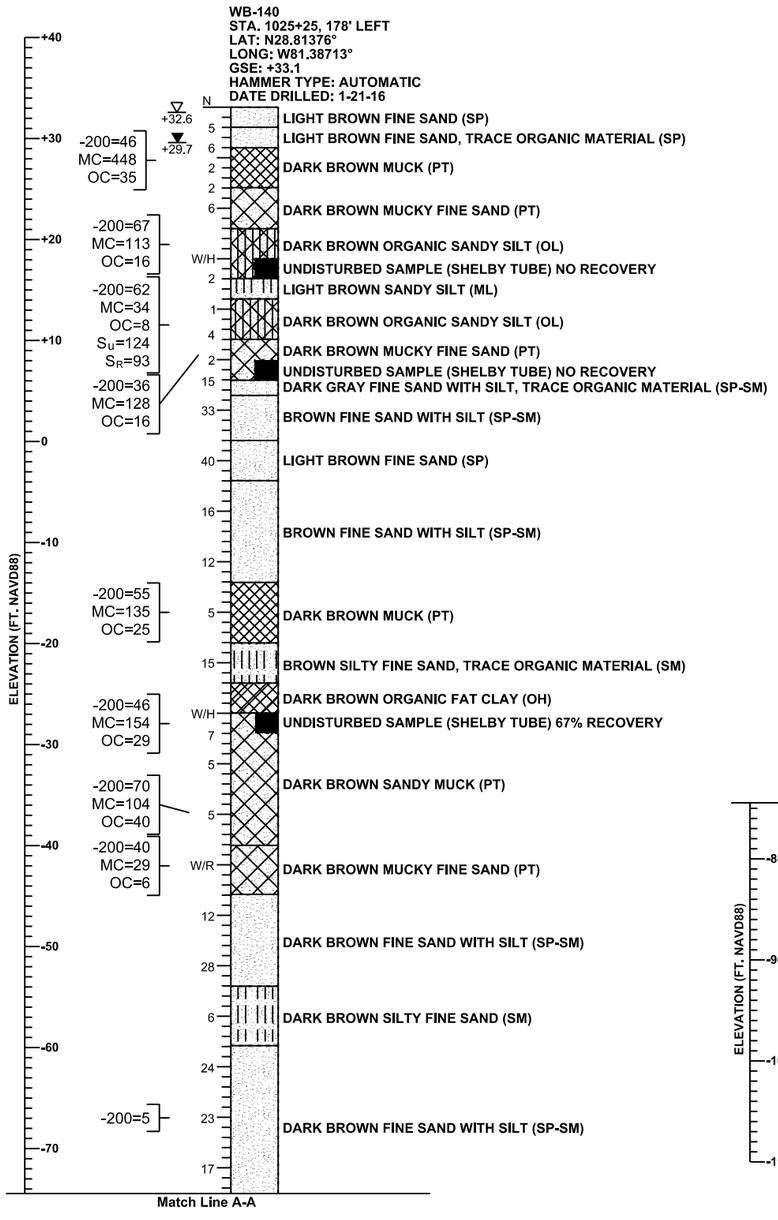
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

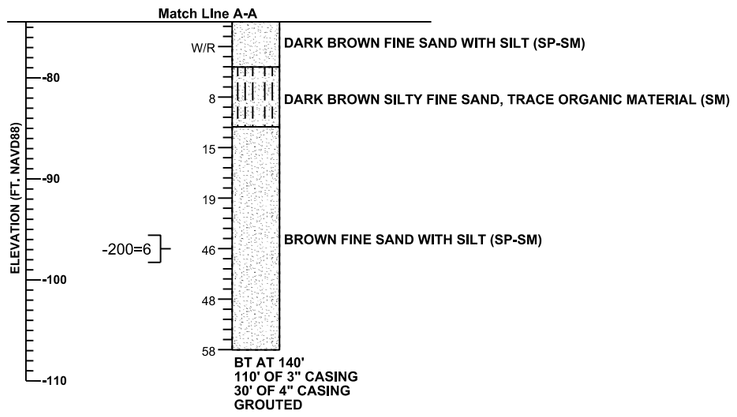
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-174

Scott 4/17/2017 2:59:03 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring19.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
▽ +32.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +29.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND | SAND AND MUCK | MUCK
SAND AND SILT | ORGANIC CLAY | ORGANIC SANDY SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

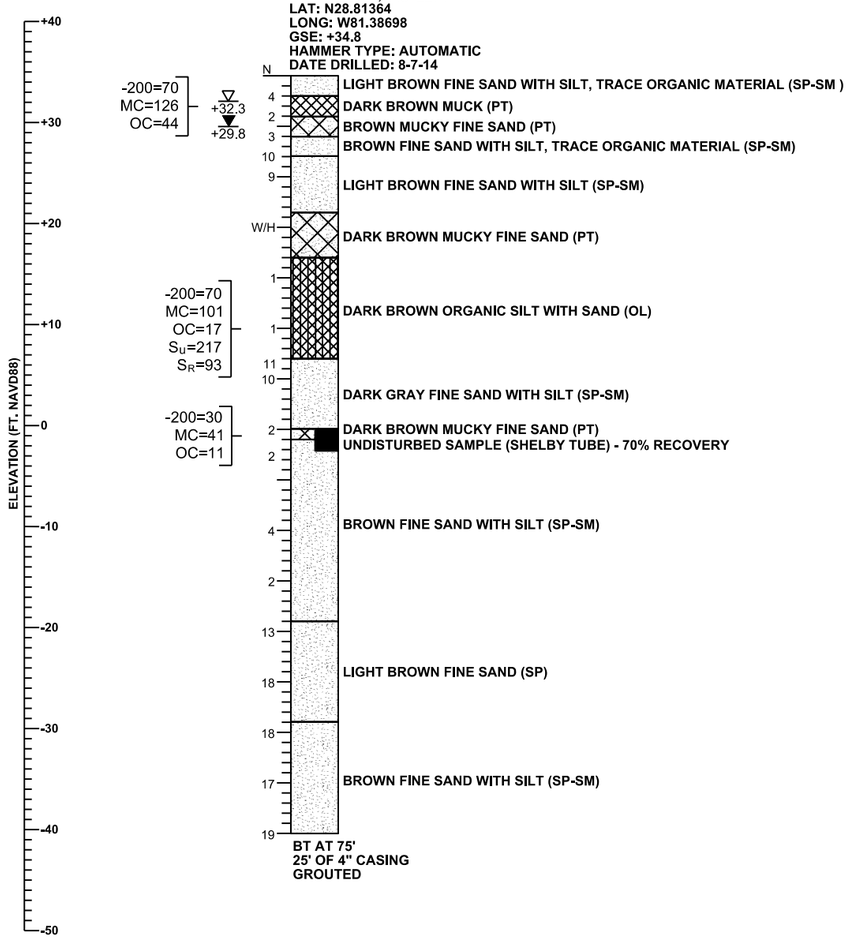
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-175

Scott 4/17/2017 3:00:25 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring04.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
+32.3	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+29.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
S_u=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND — SAND AND MUCK

MUCK — ORGANIC SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

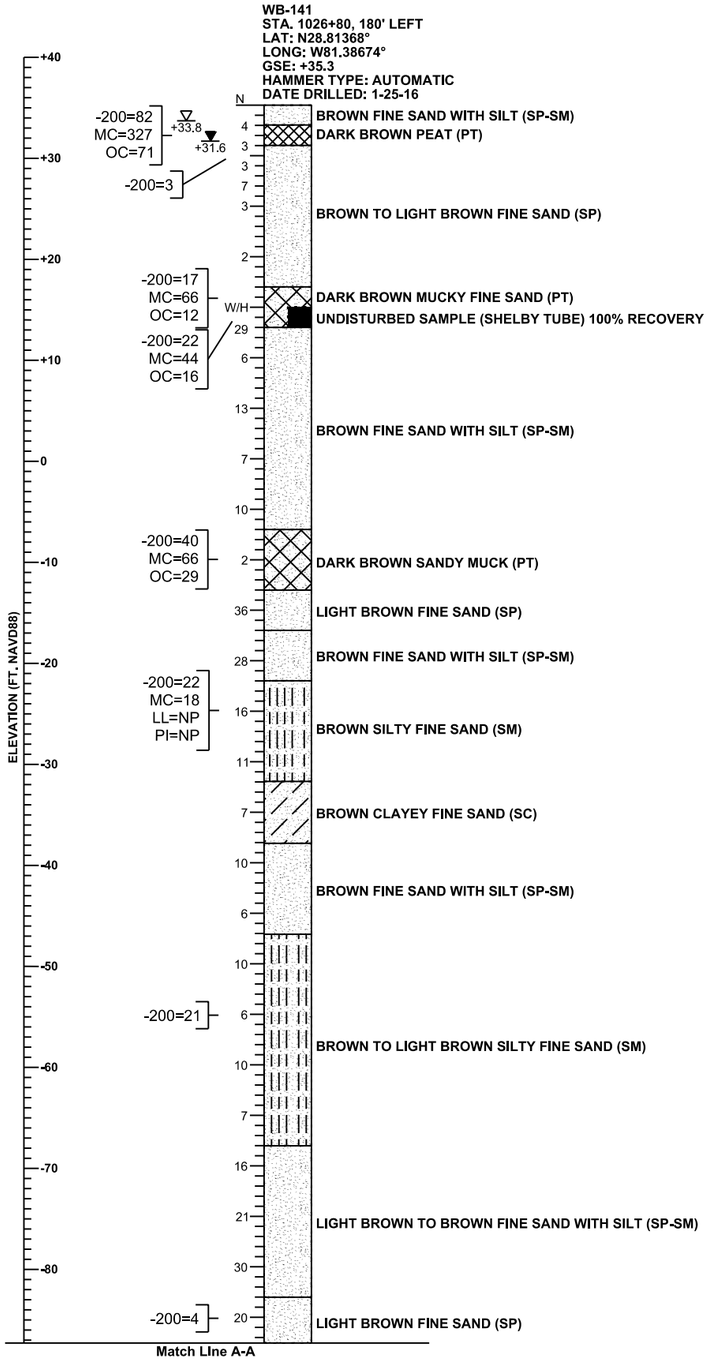
SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL

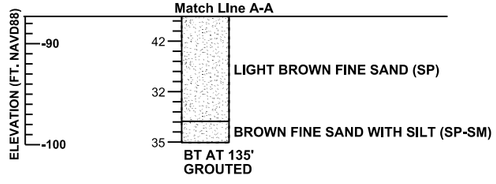
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

REF. DWG. NO.

SHEET NO. BW-176

Scott 4/17/2017 3:03:27 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring19.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +33.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND CLAY | SAND AND MUCK

SAND AND SILT | PEAT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

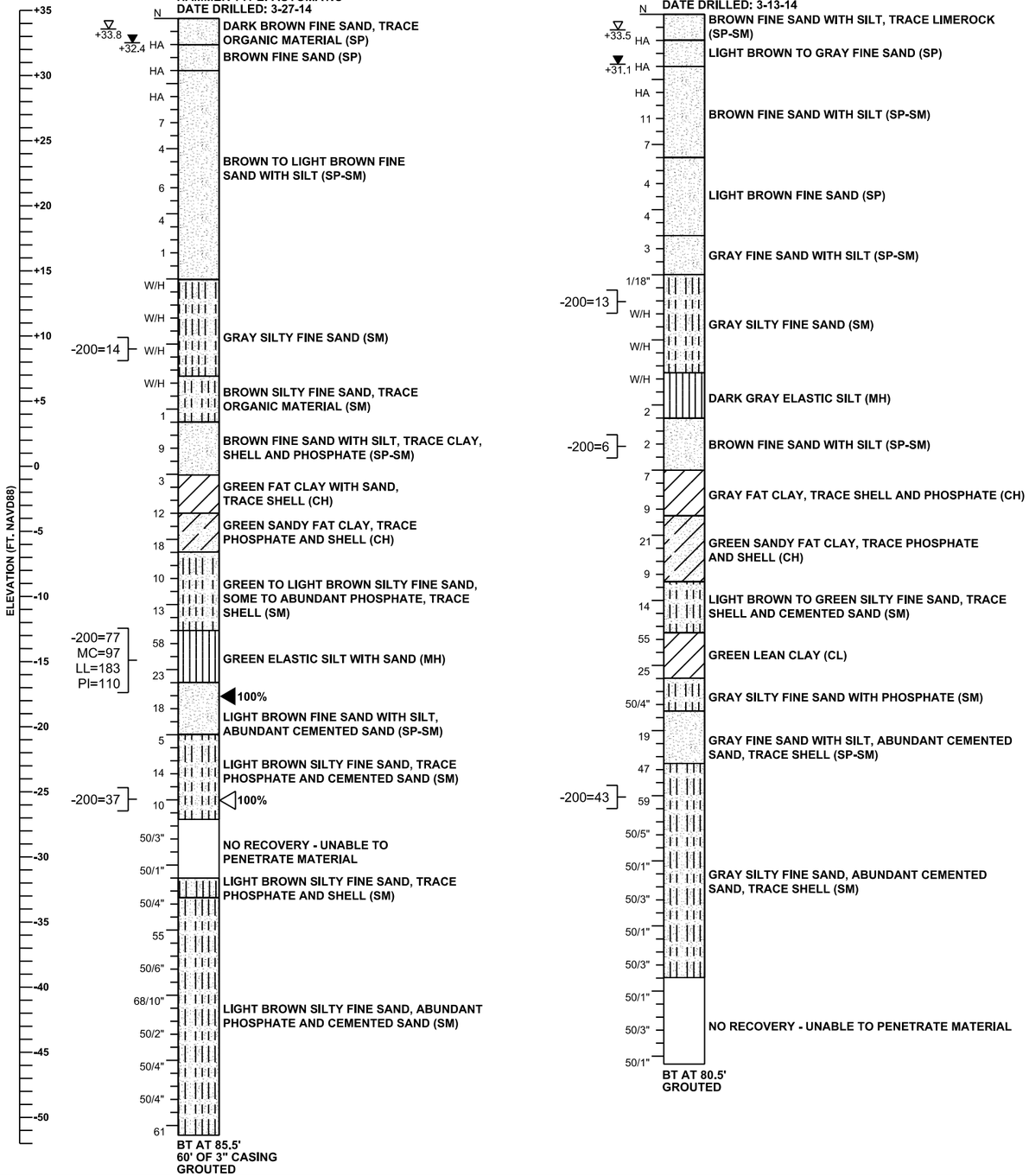
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR SHEET PILE WALL
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO. BW-177

Scott 4/17/2017 3:05:14 PM J:\D109\3520G Wekiva Parkway Section 7A\5-6-16\b1boring04.dgn

REPORT OF SPT BORINGS
FOR STUCTURES
(BRIDGES)



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +33.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SILT | SAND AND CLAY | SAND AND SILT | CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.8)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770097 & 770098

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

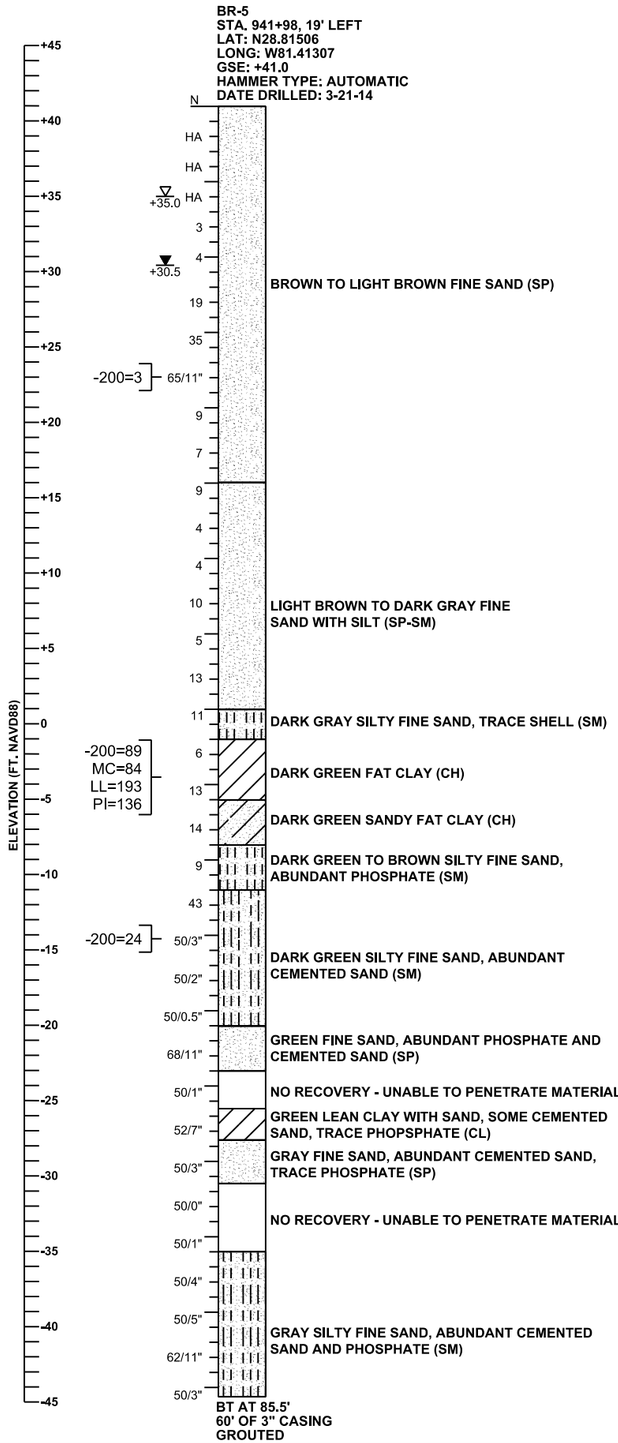
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT OSPREY HAMMOCK TRAIL
SHEET NO. B1-4

scott 5/13/2015 2:05:07 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



BR-5
STA. 941+98, 19' LEFT
LAT: N28.81506
LONG: W81.41307
GSE: +41.0
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 3-21-14

	N	
	HA	
	HA	
+35.0	HA	
	3	
+30.5	4	BROWN TO LIGHT BROWN FINE SAND (SP)
	19	
	35	
-200=3	65/11"	
	9	
	7	
	9	
	4	
	4	LIGHT BROWN TO DARK GRAY FINE SAND WITH SILT (SP-SM)
	10	
	5	
	13	
	11	DARK GRAY SILTY FINE SAND, TRACE SHELL (SM)
-200=89 MC=84 LL=193 PI=136	6	
	13	DARK GREEN FAT CLAY (CH)
	14	DARK GREEN SANDY FAT CLAY (CH)
	9	DARK GREEN TO BROWN SILTY FINE SAND, ABUNDANT PHOSPHATE (SM)
	43	
-200=24	50/3"	
	50/2"	DARK GREEN SILTY FINE SAND, ABUNDANT CEMENTED SAND (SM)
	50/0.5"	
	68/11"	GREEN FINE SAND, ABUNDANT PHOSPHATE AND CEMENTED SAND (SP)
	50/1"	NO RECOVERY - UNABLE TO PENETRATE MATERIAL
	52/7"	GREEN LEAN CLAY WITH SAND, SOME CEMENTED SAND, TRACE PHOPSPHATE (CL)
	50/3"	GRAY FINE SAND, ABUNDANT CEMENTED SAND, TRACE PHOSPHATE (SP)
	50/0"	NO RECOVERY - UNABLE TO PENETRATE MATERIAL
	50/1"	
	50/4"	
	50/5"	GRAY SILTY FINE SAND, ABUNDANT CEMENTED SAND AND PHOSPHATE (SM)
	62/11"	
	50/3"	

BT AT 85.5'
60' OF 3" CASING
GROUTED

BR-2
STA. 941+89, 19' RIGHT
LAT: N28.81495
LONG: W81.41311
GSE: +39.0
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 3-17-14

	N	
	HA	LIGHT BROWN FINE SAND, TRACE LIMEROCK (SP)
+35.0	HA	
+33.2	HA	LIGHT BROWN FINE SAND (SP)
	5	
	5	
	4	DARK BROWN TO BROWN FINE SAND WITH SILT (SP-SM)
	7	
	7	
	10	
	7	LIGHT BROWN FINE SAND (SP)
	6	
	5	
-200=13	2	DARK GRAY SILTY FINE SAND (SM)
	8	
	7	GRAY FINE SAND (SP)
	8	GRAY TO GREEN FINE SAND WITH SILT, TRACE PHOSPHATE (SP-SM)
	3	
-200=80 MC=84 LL=204 PI=135	12	DARK GREEN FAT CLAY WITH SAND, TRACE PHOSPHATE (CH)
	12	
	11	DARK GREEN TO BROWN SILTY FINE SAND, TRACE SHELL (SM)
	10	
	18	GREEN SANDY SILT, TRACE PHOSPHATE (ML)
	68/7"	GREEN FAT CLAY WITH SAND, TRACE CEMENTED SAND (CH)
	50/0"	NO RECOVERY - UNABLE TO PENETRATE MATERIAL
-200=14	44	LIGHT BROWN SILTY FINE SAND, ABUNDANT CEMENTED SAND, TRACE SHELL (SM)
	50/3"	
	95	GRAY SILTY FINE SAND, ABUNDANT CEMENTED SAND, LIMESTONE AND TRACE SHELL (SM)
	50/0"	
	50/2"	NO RECOVERY - UNABLE TO PENETRATE
	50/0"	
	50/1"	
	50/5"	LIGHT BROWN SILTY FINE SAND, ABUNDANT PHOSPHATE AND CEMENTED SAND (SM)
	50/3"	

BT AT 80.5'
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
+35.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+33.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY
SAND AND SILT — CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.8)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770097 & 770098

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

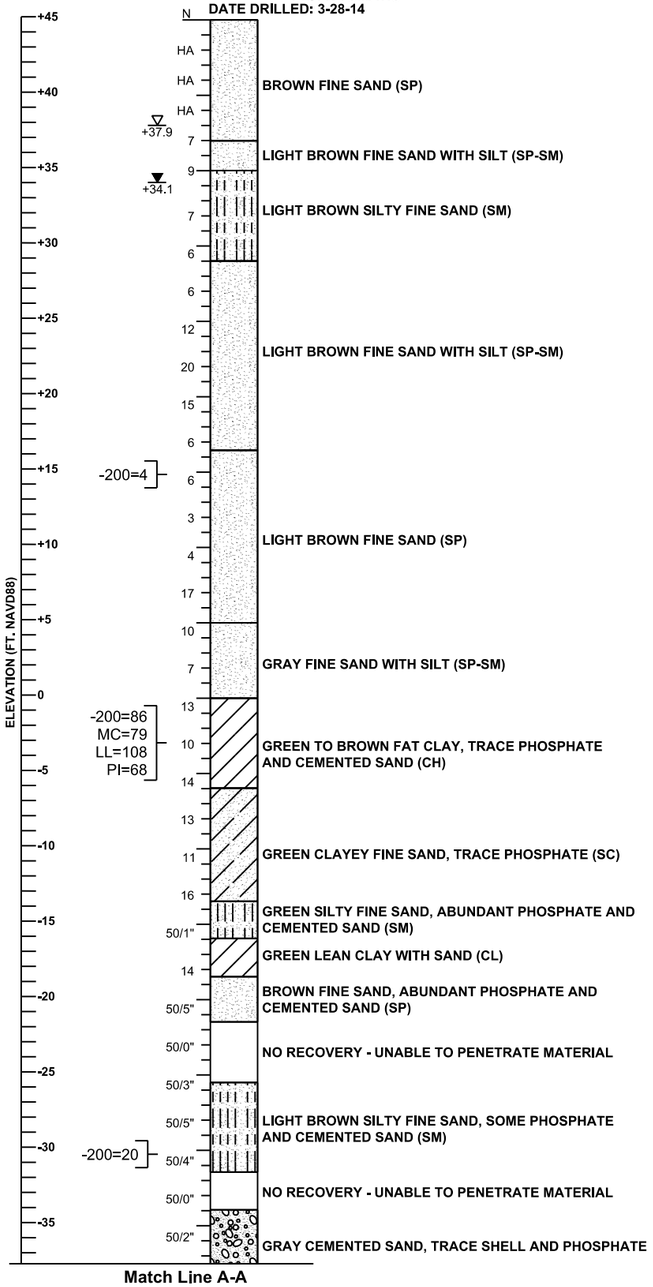
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

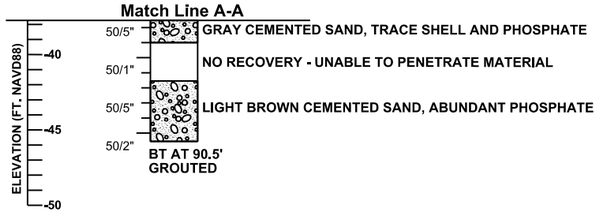
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT OSPREY HAMMOCK TRAIL
SHEET NO.: B1-5

scott 5/13/2015 2:06:56 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn

BR-6
STA. 943+70, 16' LEFT
LAT: N28.81504
LONG: W81.41254
GSE: +44.9
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 3-28-14



Match Line A-A



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +37.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +34.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND
SAND AND SILT
CLAY
CEMENTED SAND
SAND AND CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.8)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770097 & 770098

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

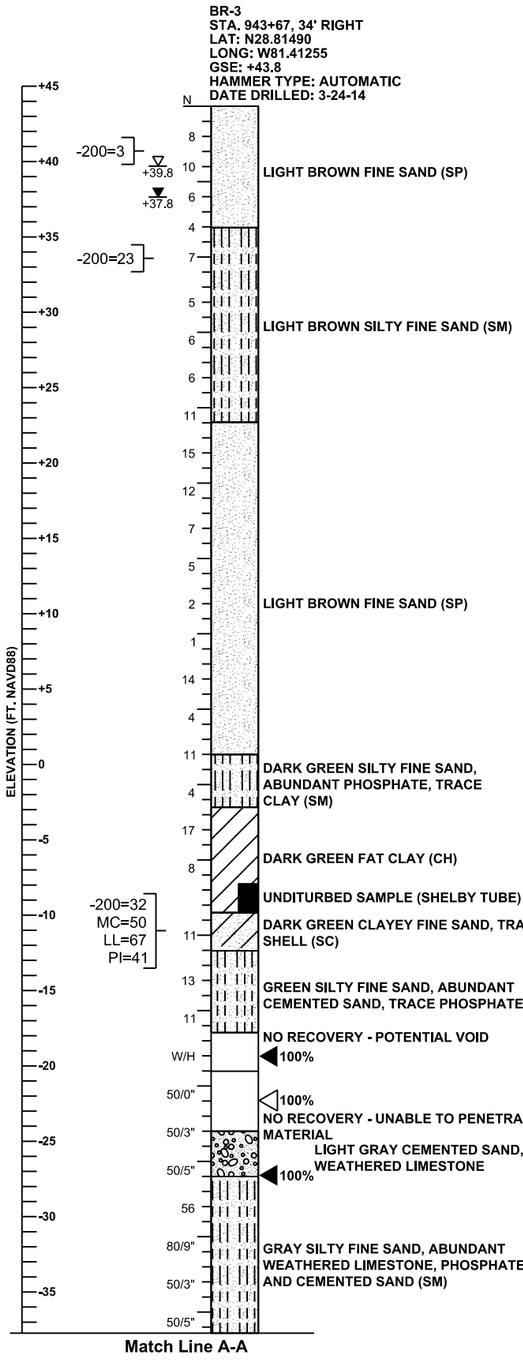
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

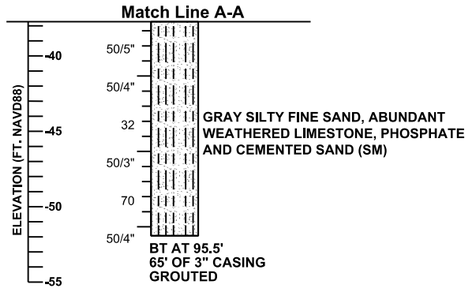
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPT BORINGS FOR STRUCTURES*
REF. DWG. NO.:
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A AT OSPREY HAMMOCK TRAIL*
SHEET NO.: *B1-6*

scott 5/13/2015 2:09:04 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
$\overline{+39.8}$	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
$\underline{+37.8}$	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND

SAND AND SILT

CLAY

CEMENTED SAND

SAND AND CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.8)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 21
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770097 & 770098

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

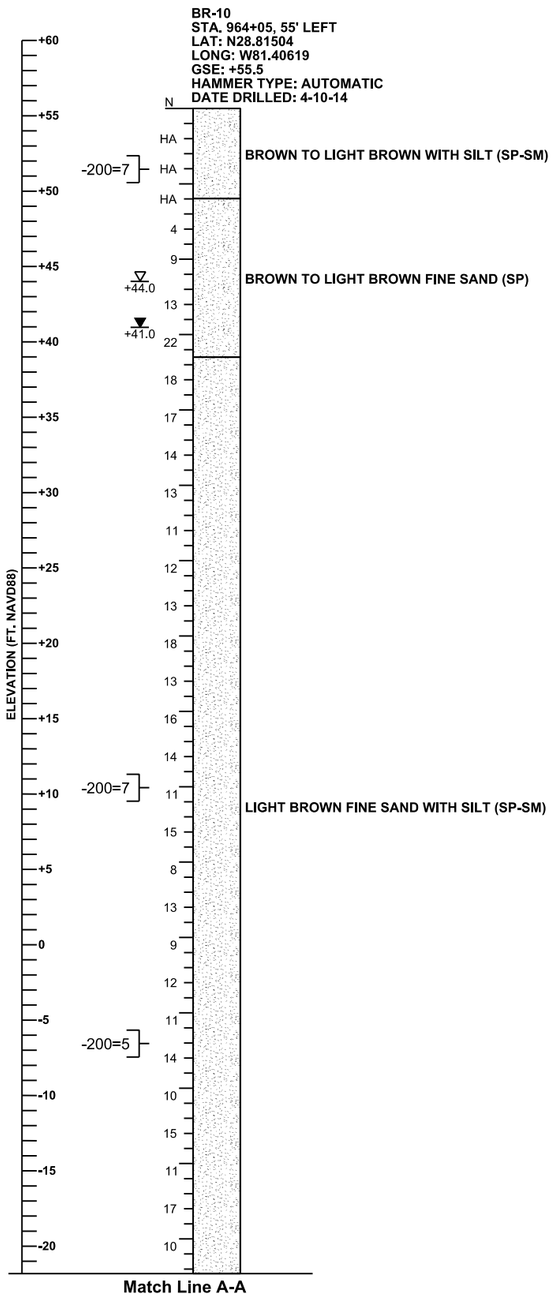
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

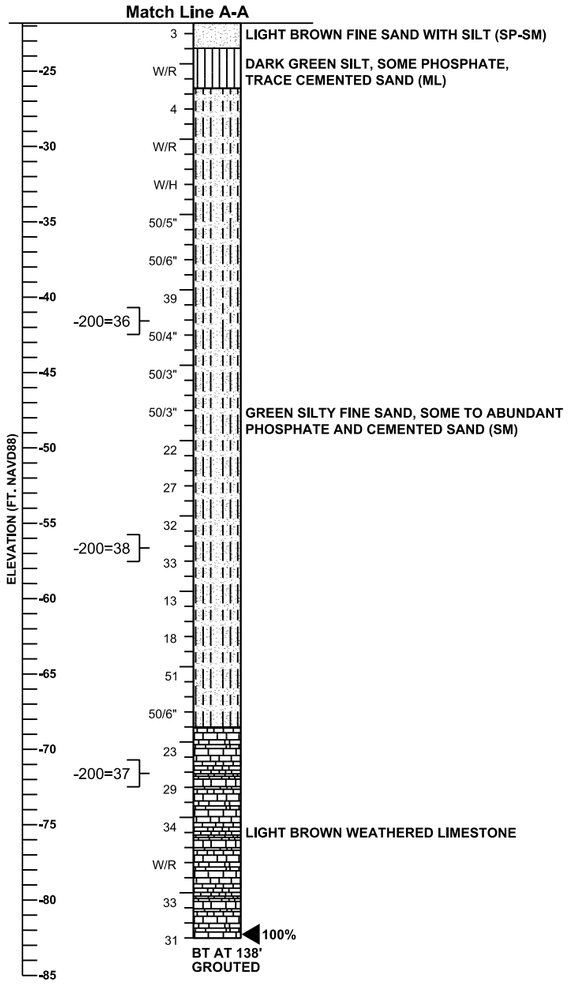
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT OSPREY HAMMOCK TRAIL

SHEET NO. B1-7

scott 5/13/2015 2:10:46 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +44.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — SILT

SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.7)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.7)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770099 & 770100

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

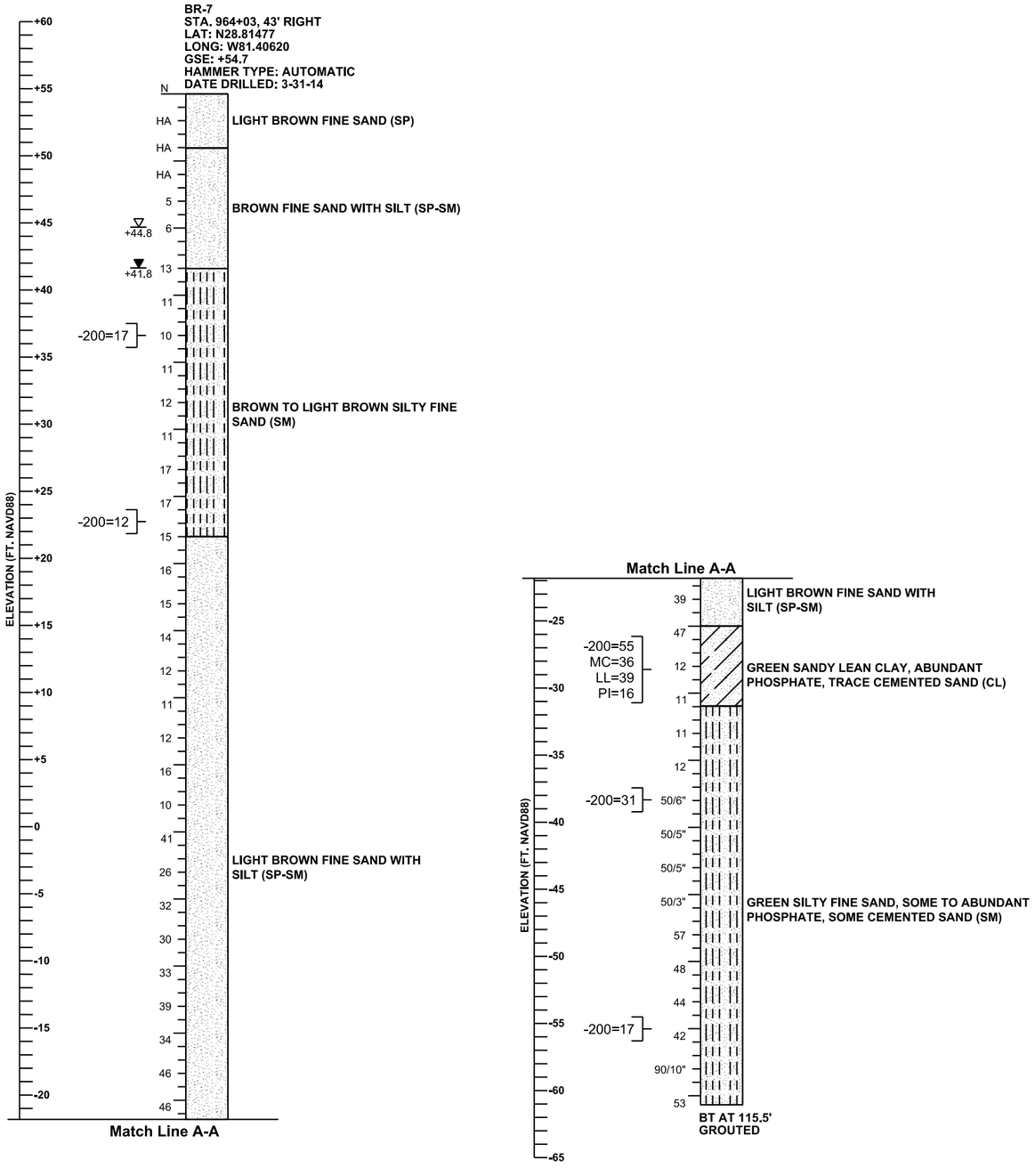
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LONGWOOD-MARKHAM ROAD (CR 46A)
SHEET NO.: B2-4

scott 5/14/2015 9:24:11 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +44.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND
SAND AND CLAY
SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.7)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.7)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770099 & 770100

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

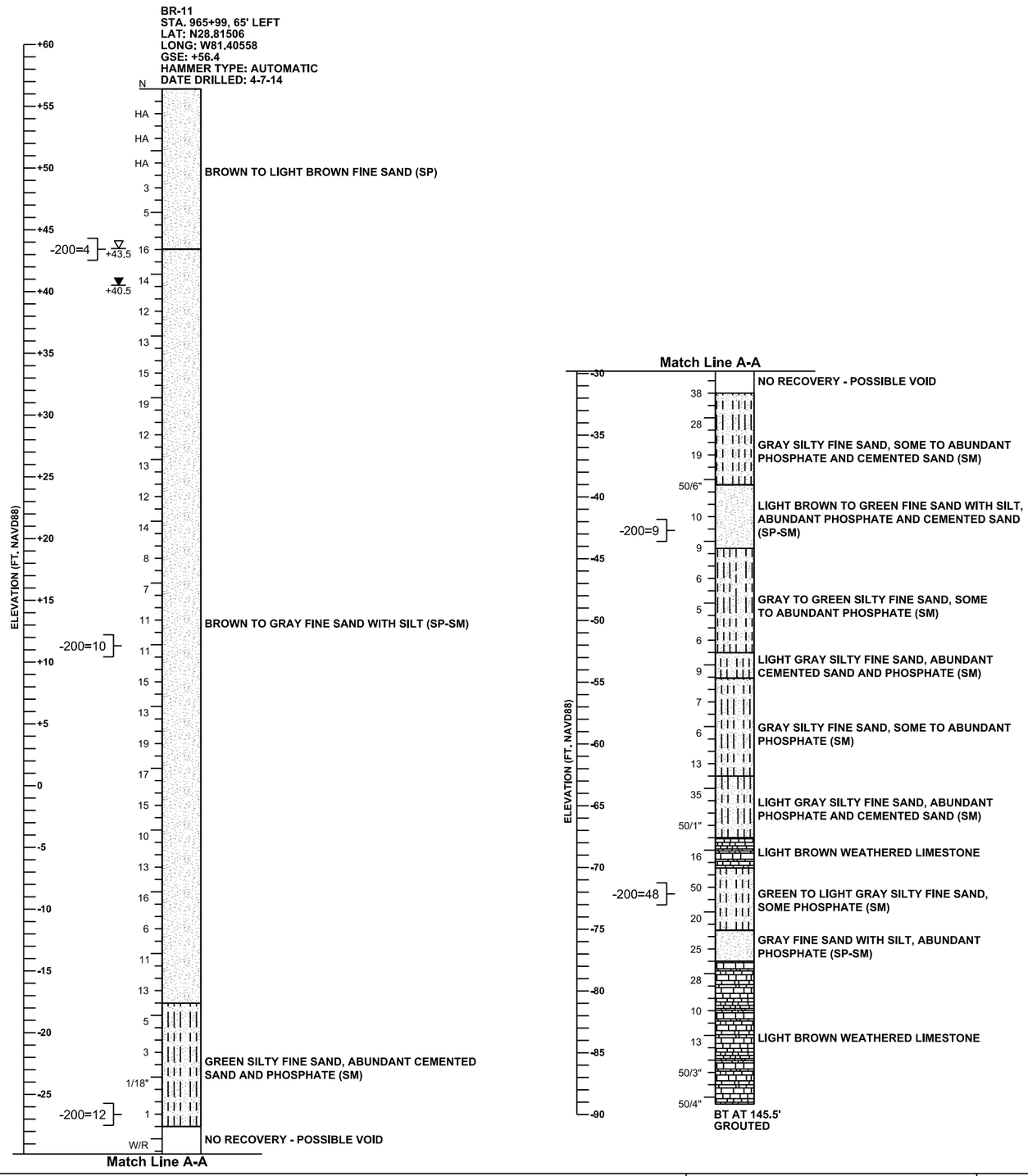
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LONGWOOD-MARKHAM ROAD (CR 46A)
SHEET NO. B2-5

scott 5/12/2015 2:03:25 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +33.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +40.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — LIMESTONE — SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.7)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.7)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770099 & 770100

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

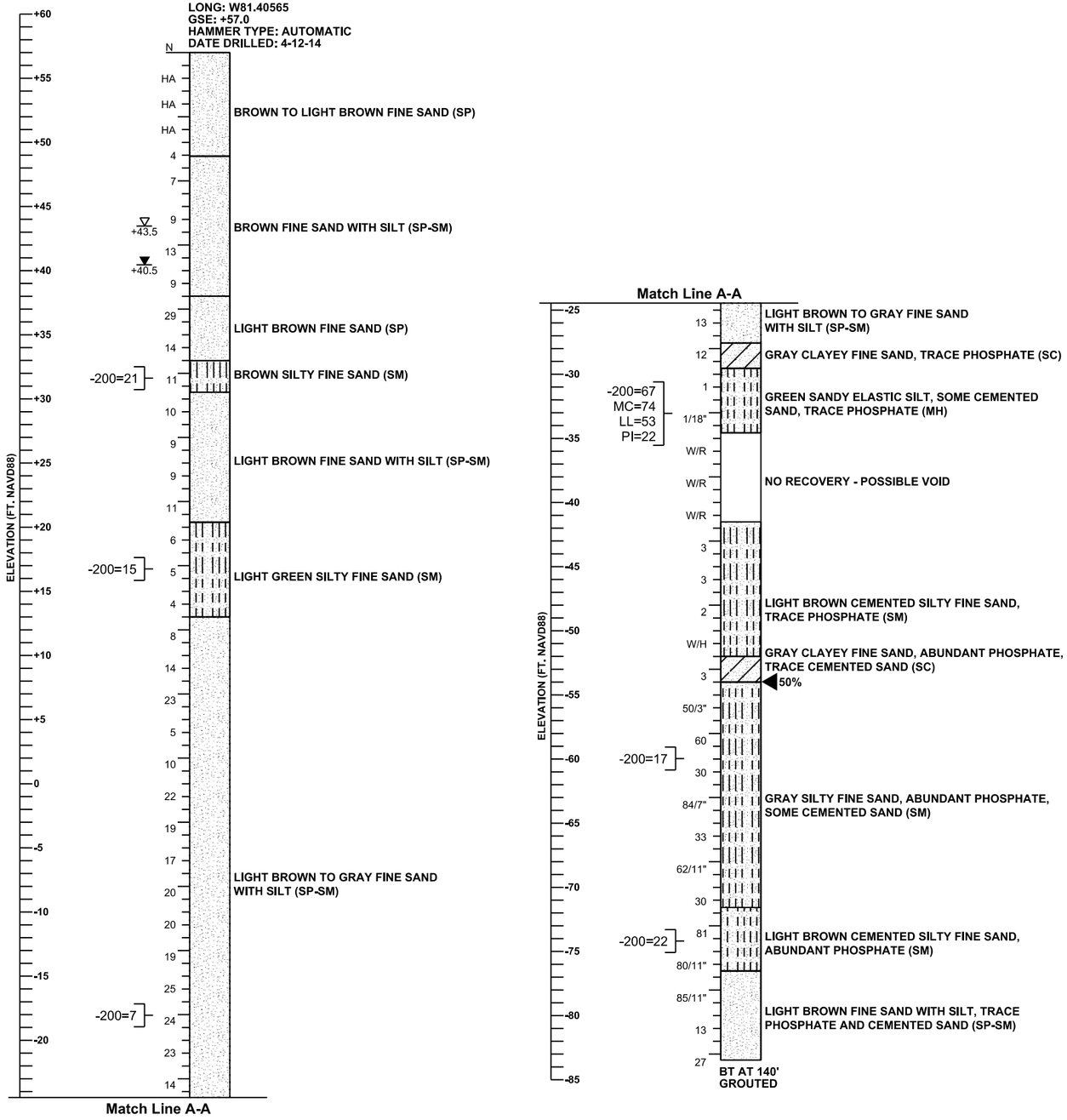
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LONGWOOD-MARKHAM ROAD (CR 46A)
SHEET NO. B2-6

scott 5/12/2015 2:04:28 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +43.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +40.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.7)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.7)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770099 & 770100

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

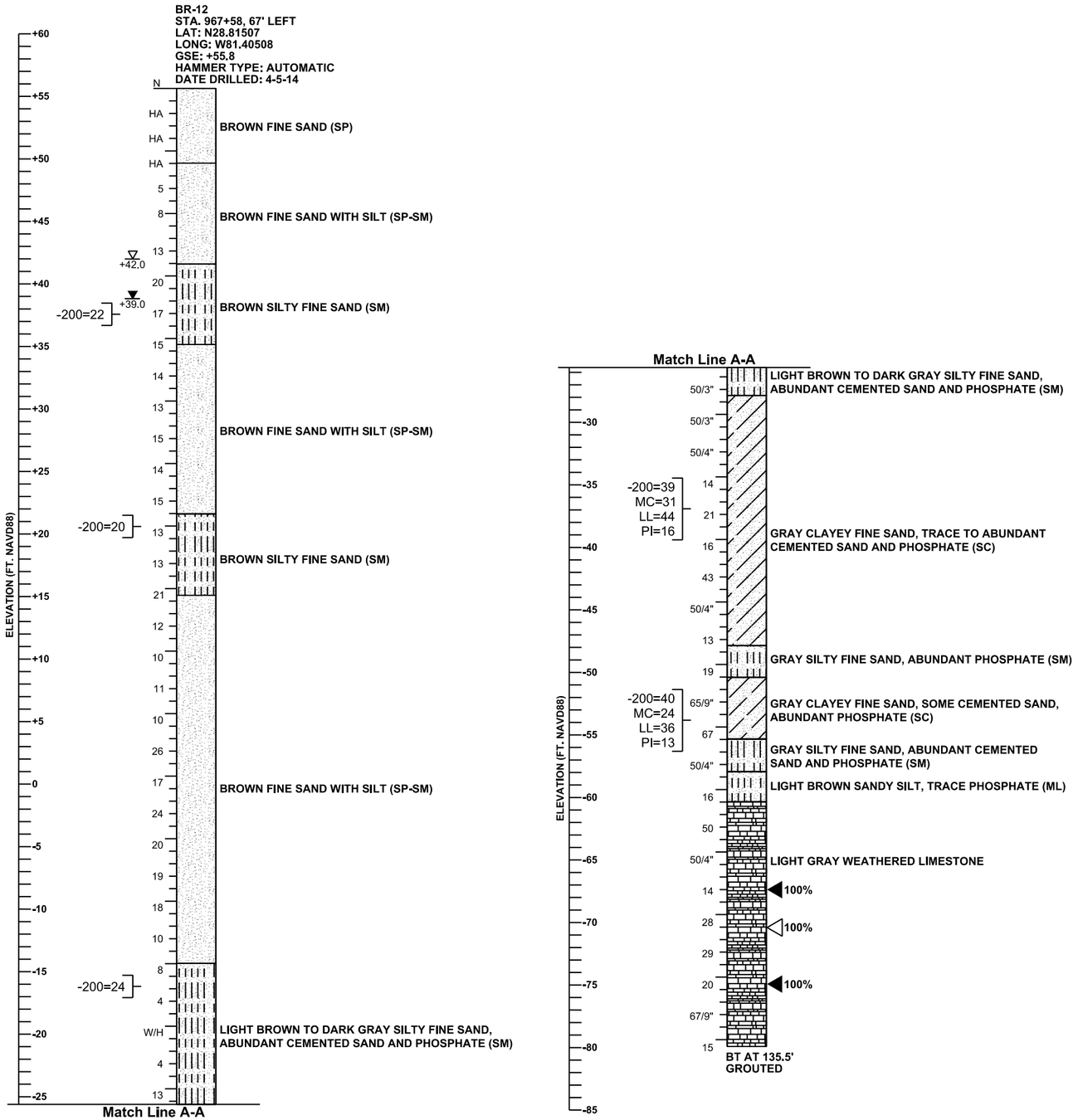
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LONGWOOD-MARKHAM ROAD (CR 46A)
SHEET NO. B2-7

scott 5/12/2015 2:03:56 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +42.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY
SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.7)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.7)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770099 & 770100

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

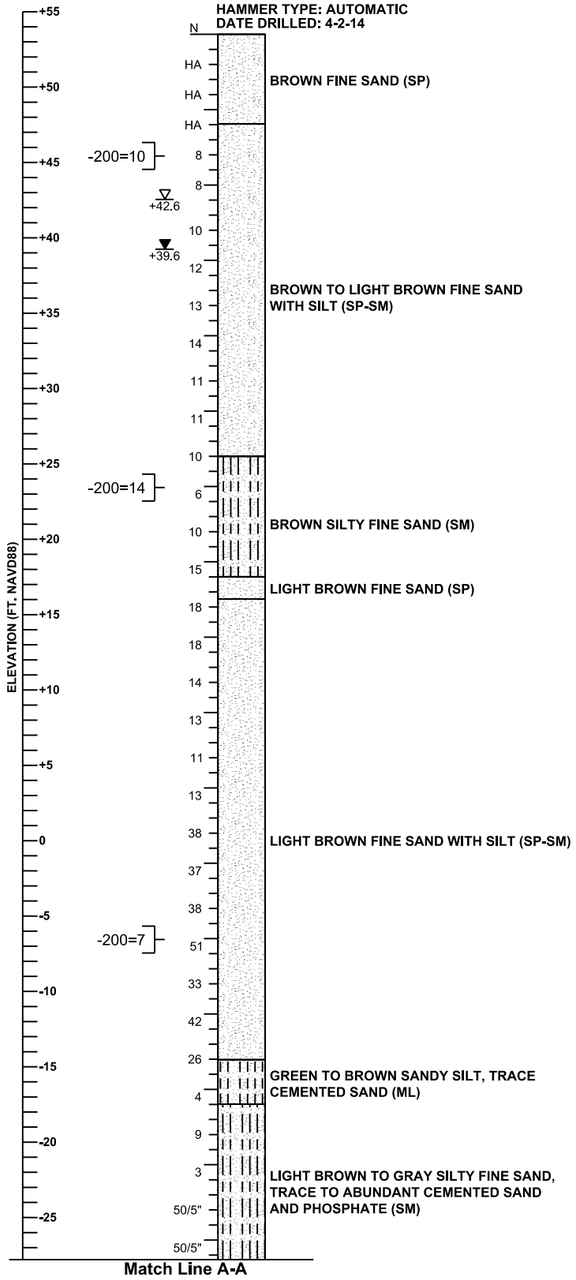
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

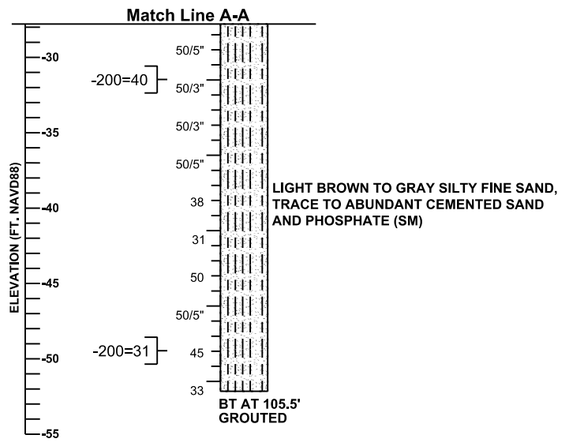
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPR BORINGS FOR STRUCTURES*
REF. DWG. NO.
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A AT LONGWOOD-MARKHAM ROAD (CR 46A)*
SHEET NO. *B2-8*

scott 5/12/2015 2:08:30 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +42.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.7)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.7)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770099 & 770100

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

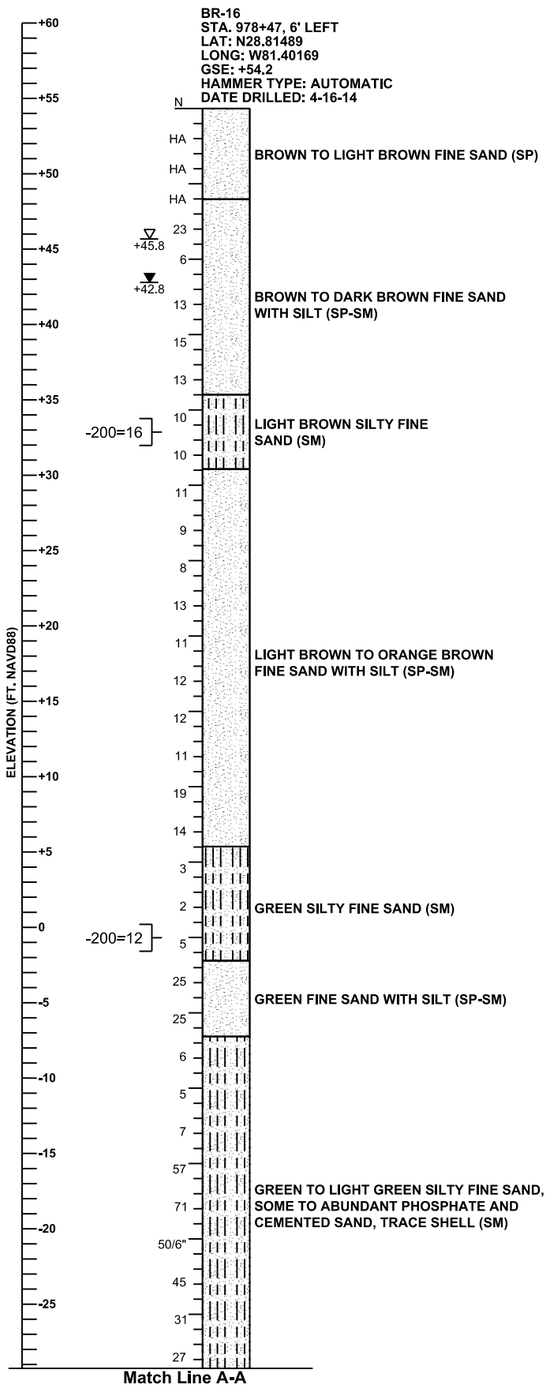
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

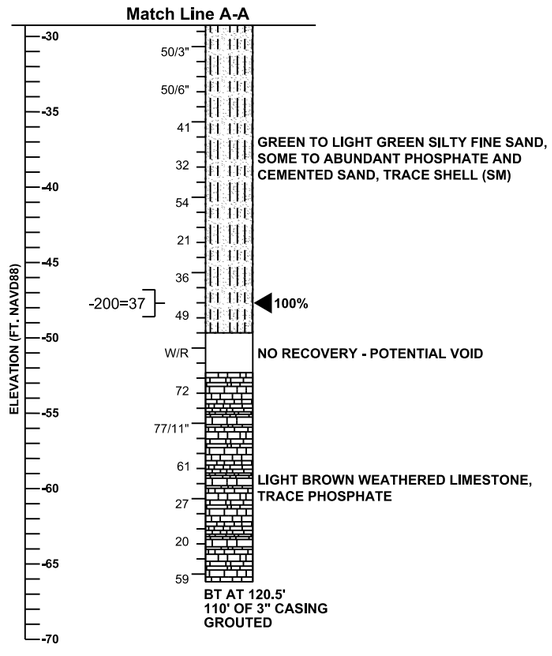
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LONGWOOD-MARKHAM ROAD (CR 46A)

SHEET NO. B2-9

scott 5/12/2015 2:05:06 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +45.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +42.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — LIMESTONE — SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.6)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.6)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770101 & 770102

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

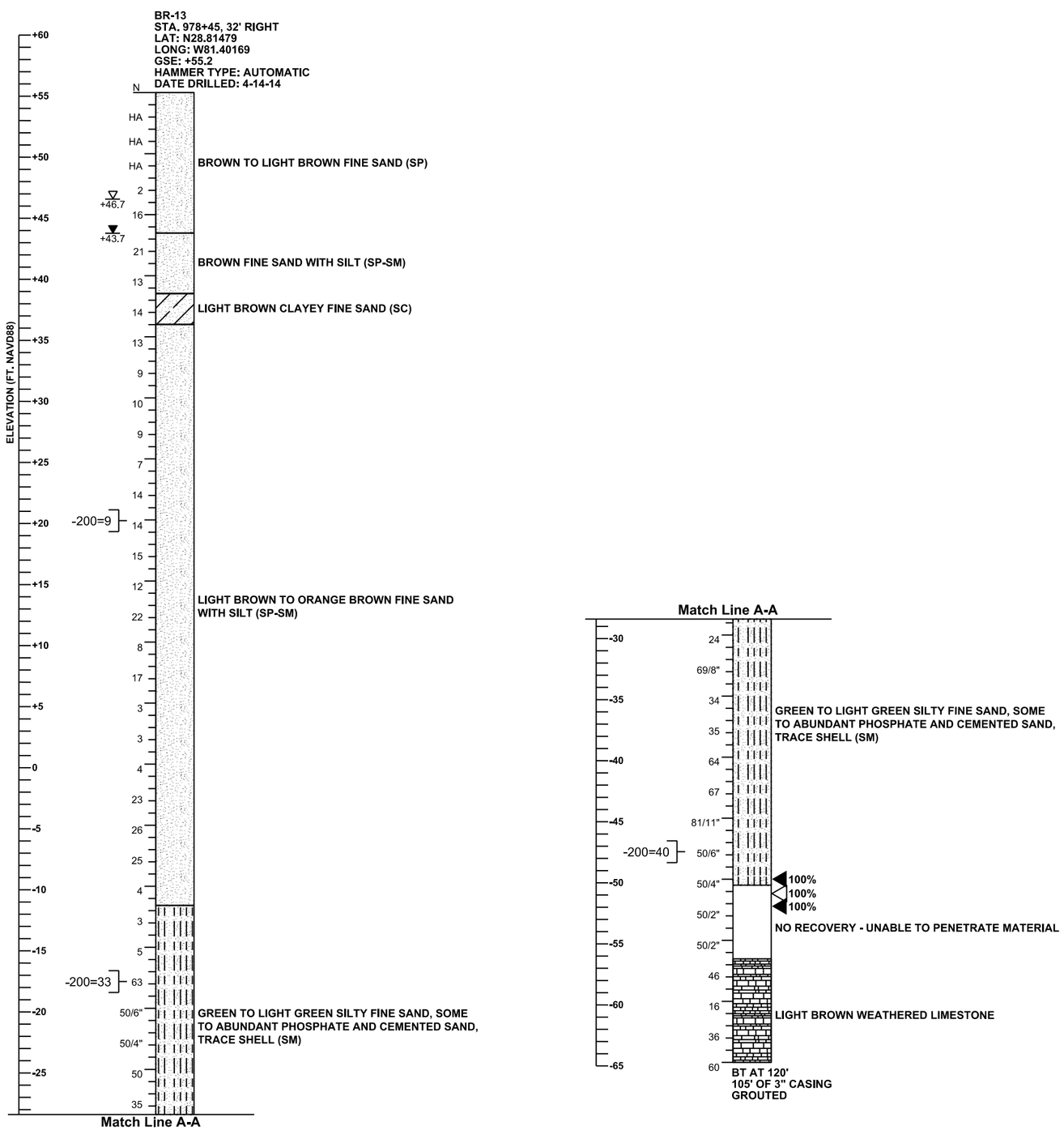
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT YANKEE LAKE ROAD
SHEET NO.: B3-4

scott 5/12/2015 2:26:23 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/4"	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
▽ +46.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +43.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — SAND AND CLAY
SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.6)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.6)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770101 & 770102

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

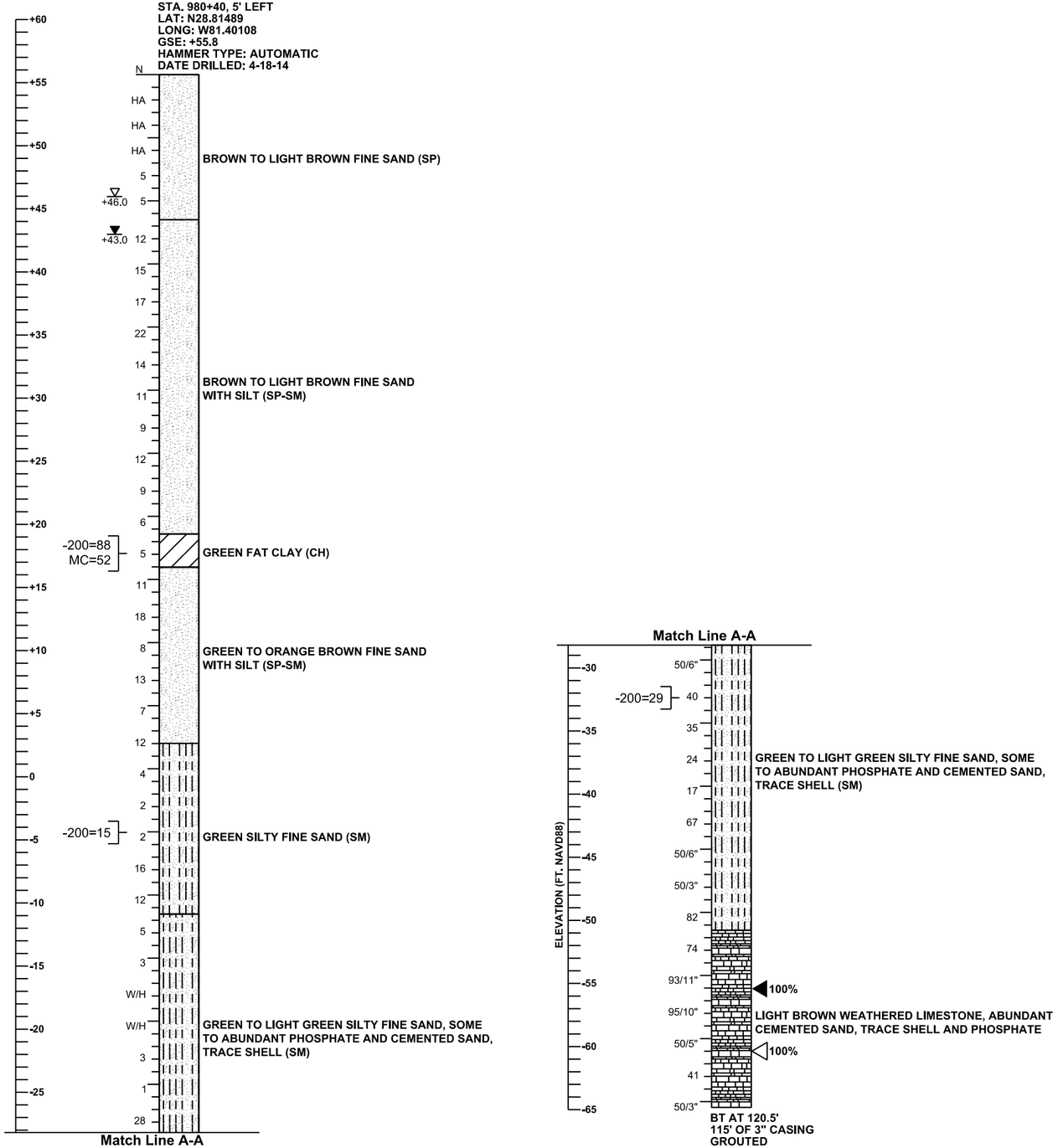
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT YANKEE LAKE ROAD
SHEET NO. B3-5

scott 5/12/2015 2:26:02 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +46.0	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +43.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT

SAND — LIMESTONE
SAND AND SILT — CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.6)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.6)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770101 & 770102

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

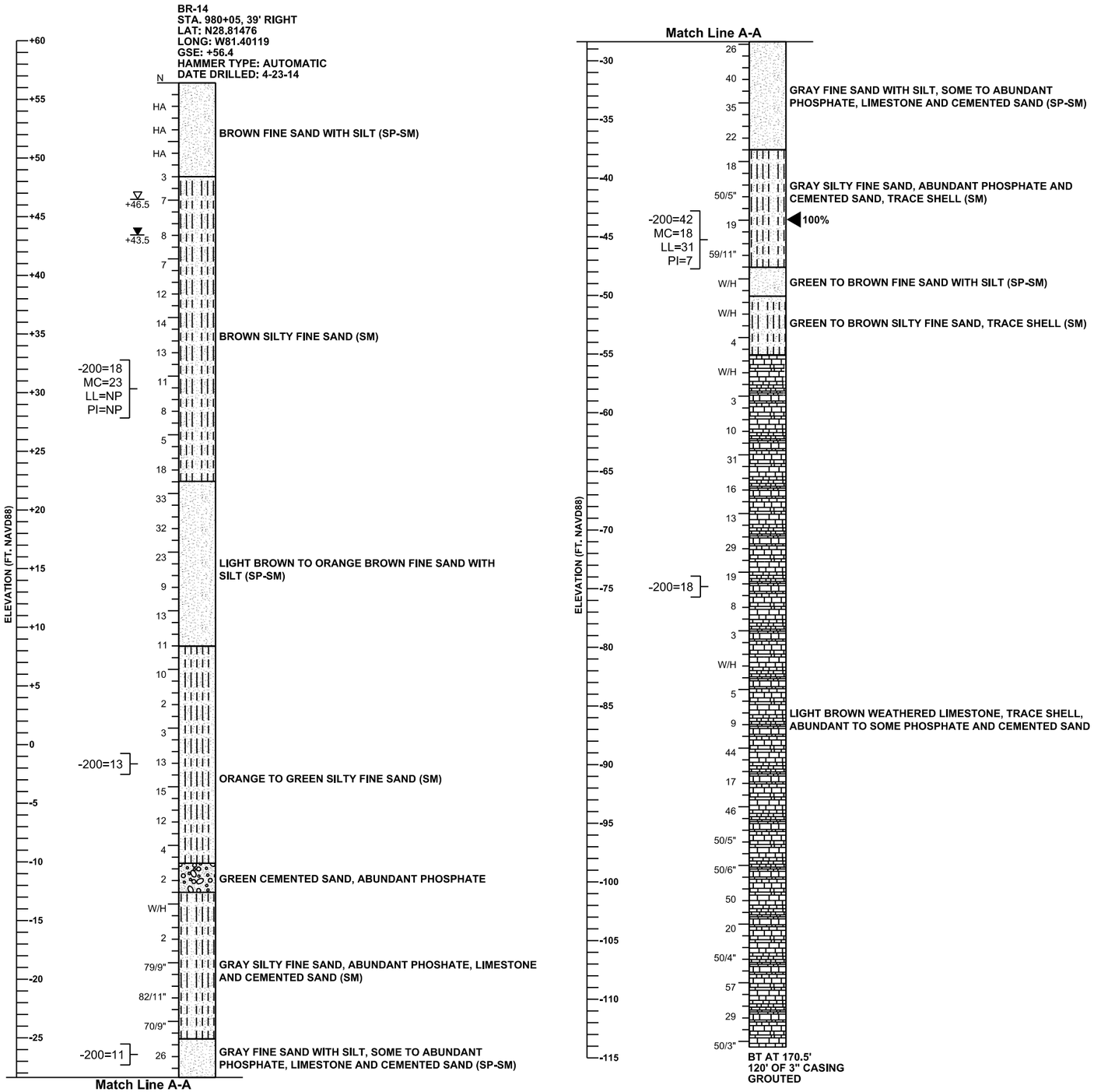
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT YANKEE LAKE ROAD
SHEET NO.: B3-6

scott 5/12/2015 2:27:45 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +46.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND — CEMENTED SAND

SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.6)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.6)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770101 & 770102

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

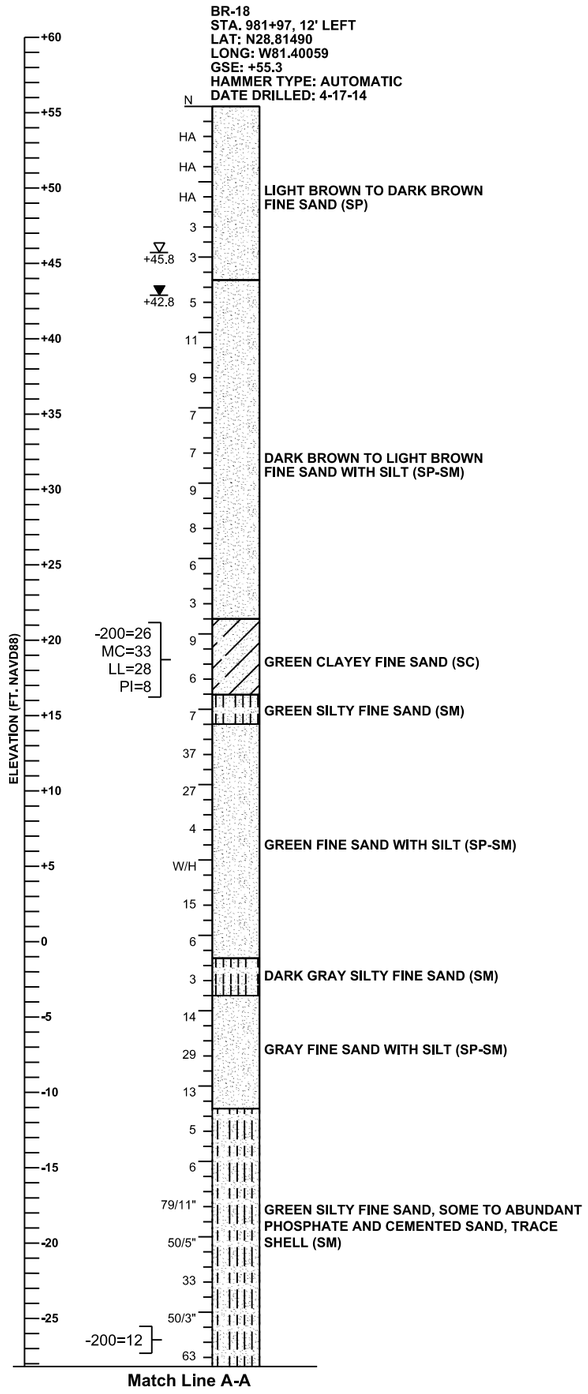
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

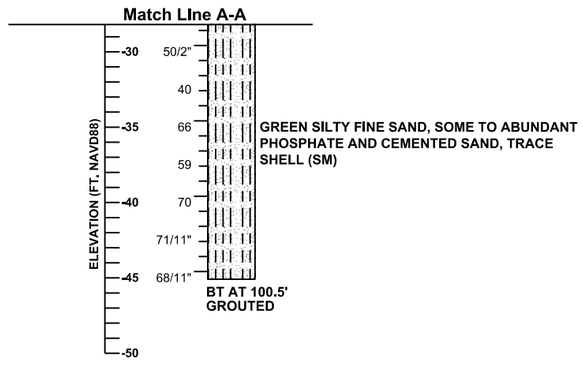
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT YANKEE LAKE ROAD
SHEET NO. B3-7

scott 5/12/2015 2:27:20 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +45.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +42.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.6)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.6)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770101 & 770102

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

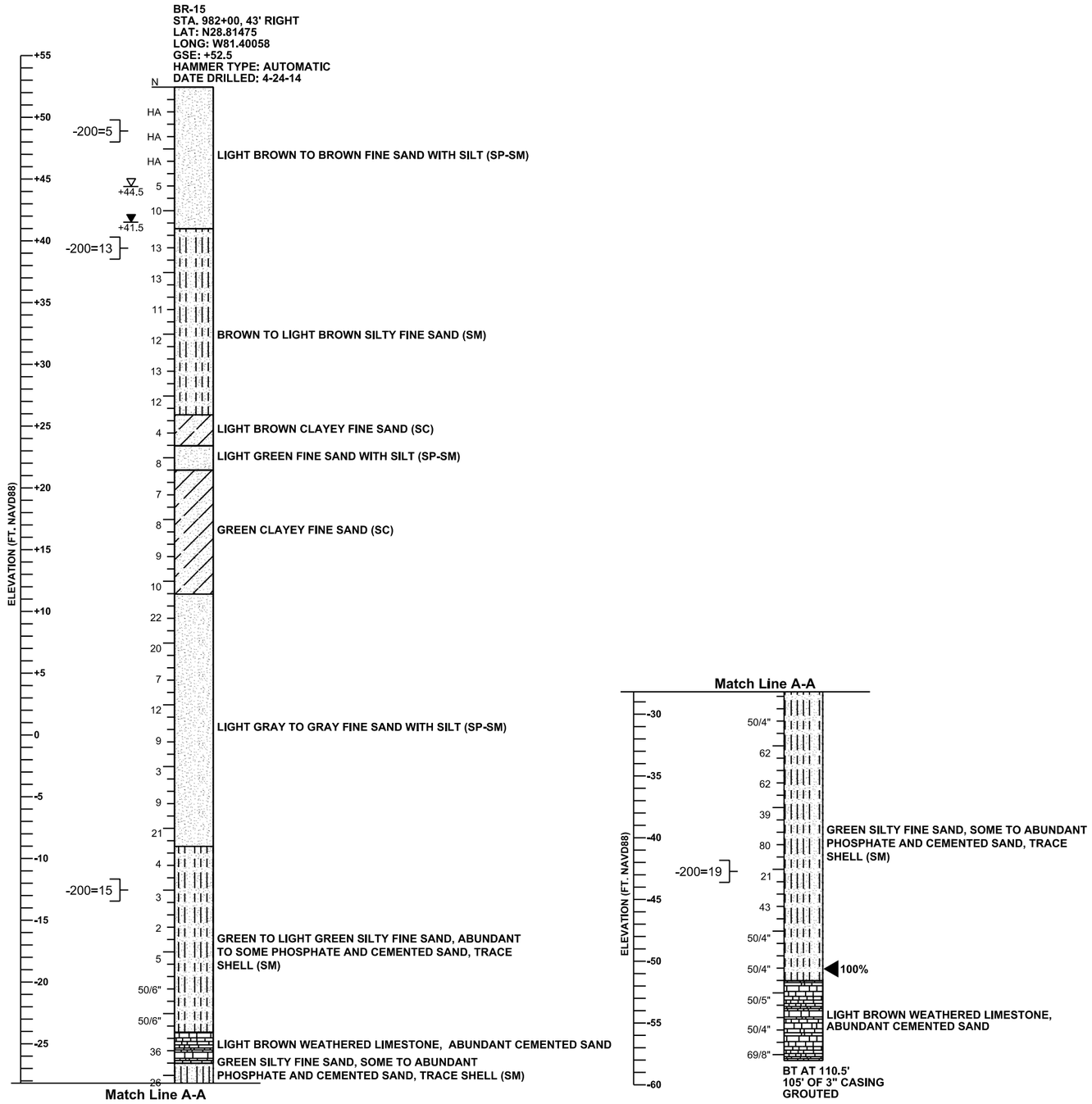
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT YANKEE LAKE ROAD
SHEET NO.: B3-8

scott 5/12/2015 2:28:37 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +44.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — SAND AND CLAY

SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +19 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +19 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.6)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.6)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770101 & 770102

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

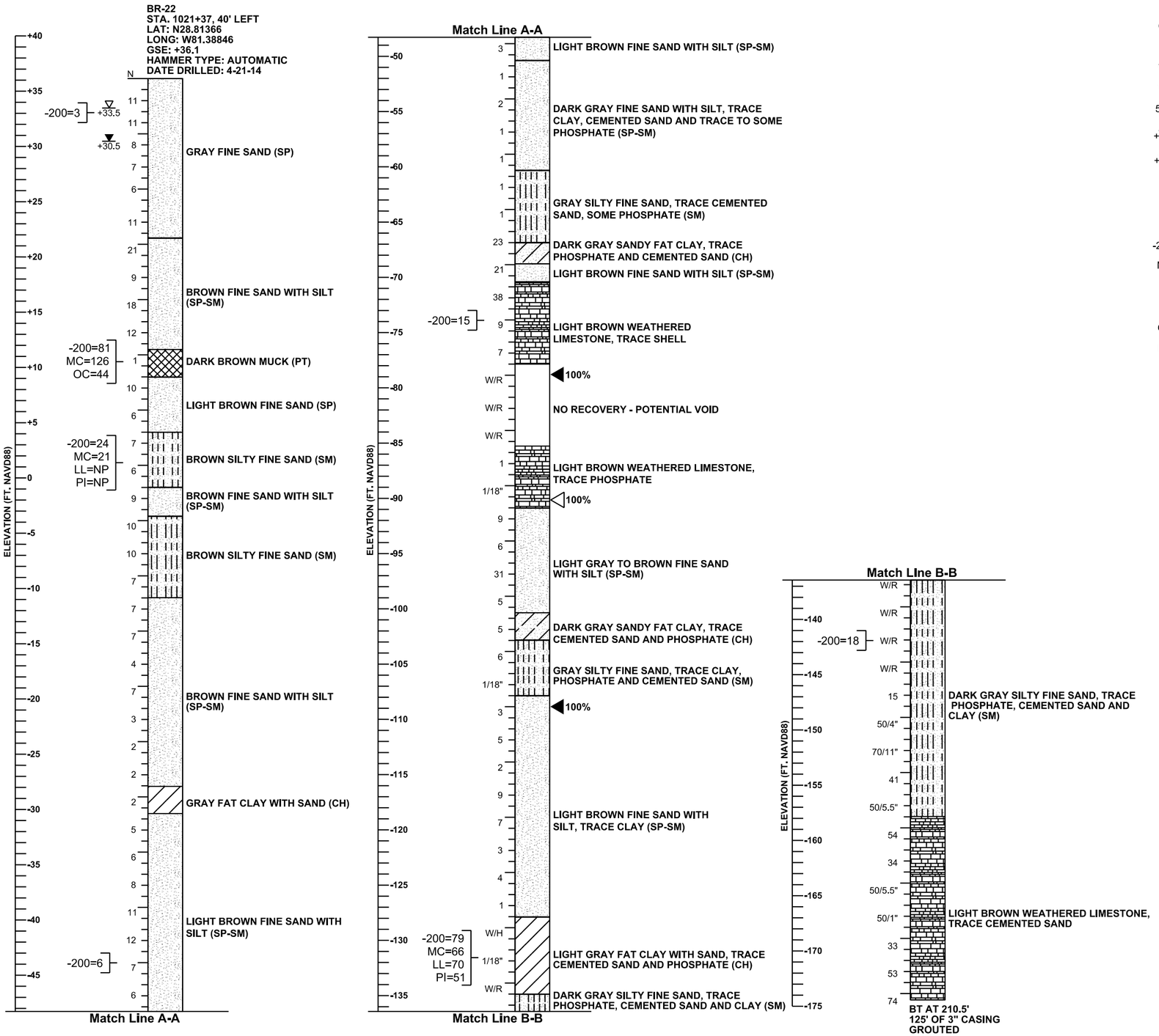
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT YANKEE LAKE ROAD

SHEET NO. B3-9

scott 5/12/2015 2:29:03 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +33.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND · SAND AND CLAY · MUCK · SAND AND SILT · CLAY · LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +21 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +21 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.8)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770103 & 770104

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT PF SPT BORINGS FOR STRUCTURES

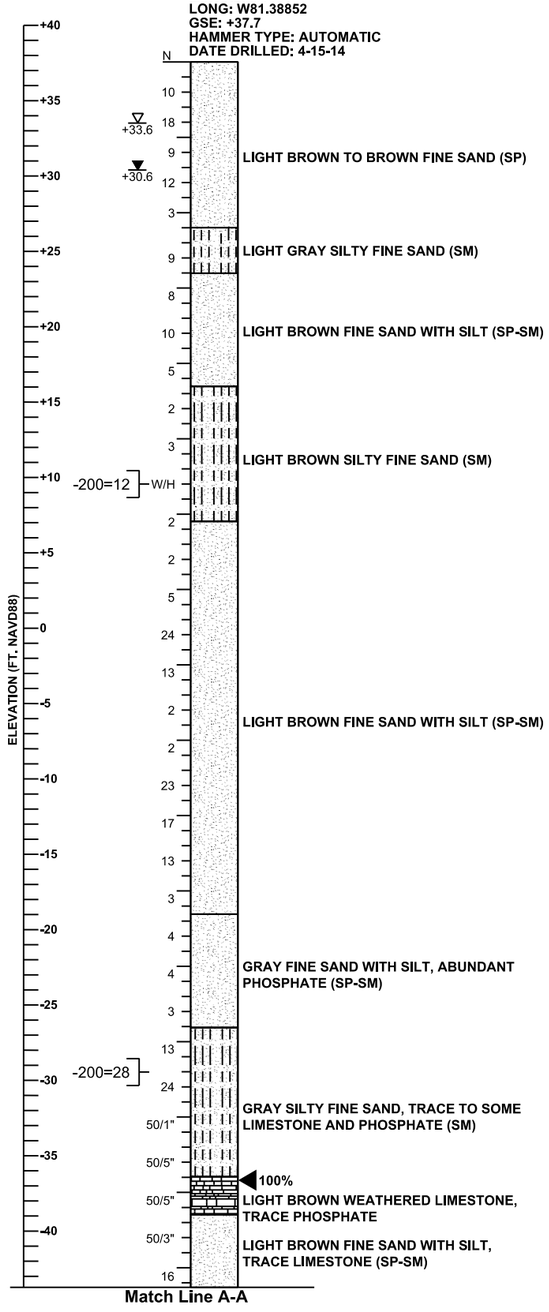
REF. DWG. NO.:

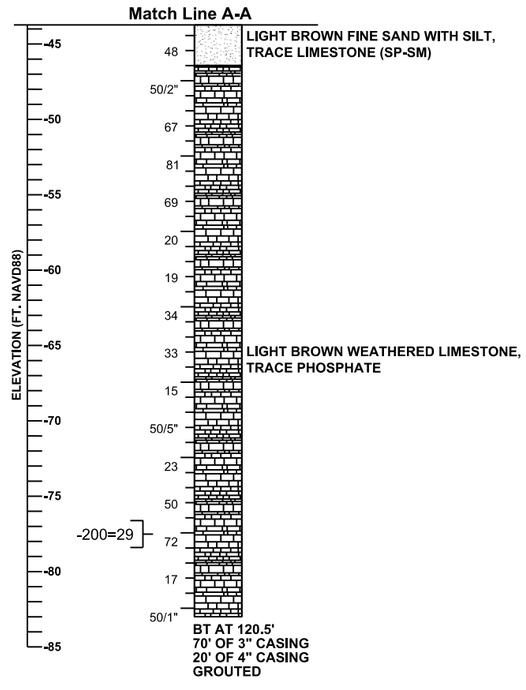
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LAKE MARKHAM ROAD

SHEET NO.: B4-4

scott 5/12/2015 1:49:28 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn

BR-19
STA. 1021+28, 6' RIGHT
LAT: N28.81354
LONG: W81.38852
GSE: +37.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 4-15-14





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +33.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND
LIMESTONE
SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +21 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +21 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.8)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770103 & 770104

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

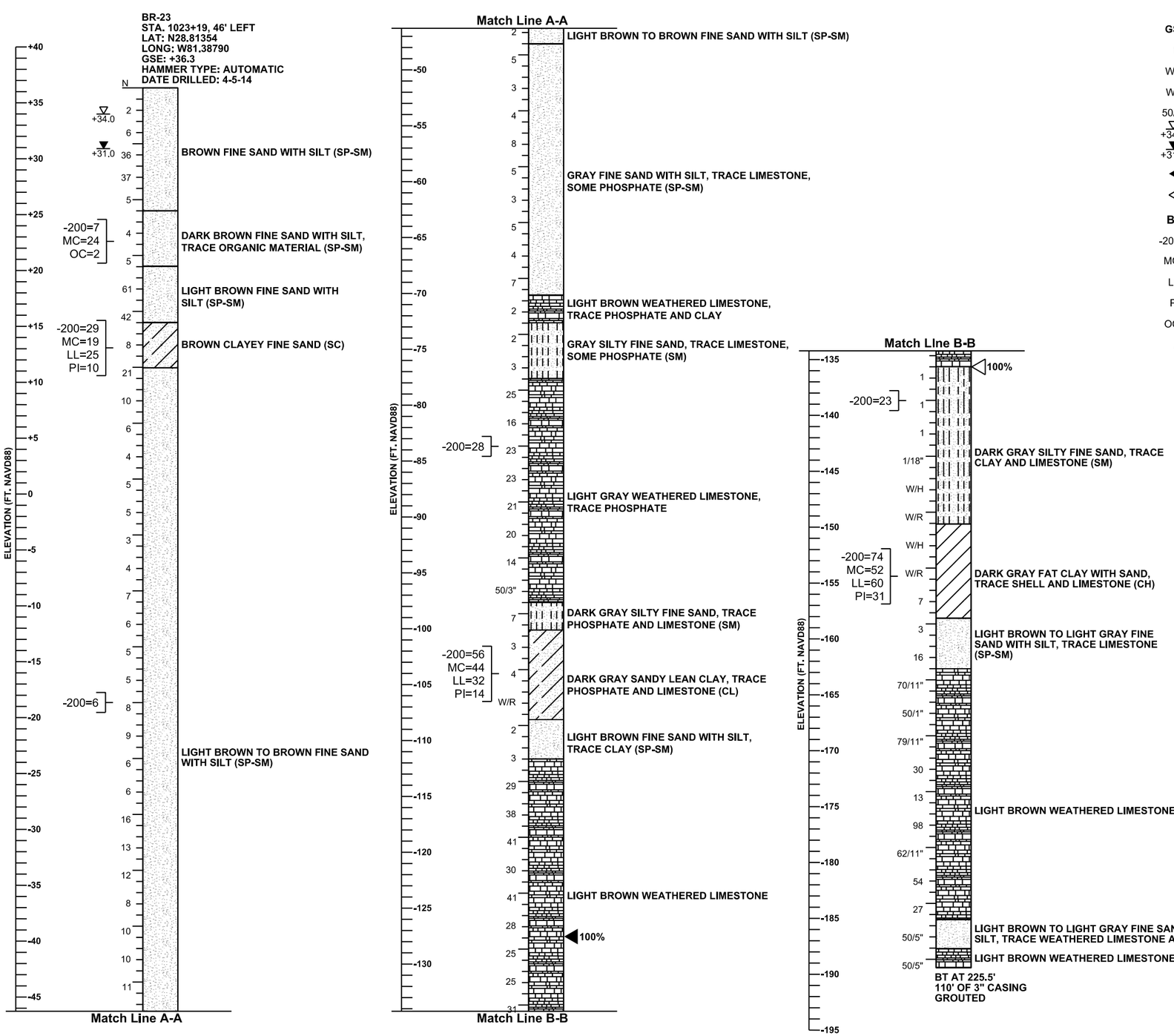
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPT BORINGS FOR STRUCTURES*
REF. DWG. NO.
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A AT LAKE MARKHAM ROAD*
SHEET NO. *B4-5*

scott 5/12/2015 1:49:06 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
+34.0 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+31.0 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND
SAND AND SILT
CLAY
SAND AND CLAY
LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +21 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +21 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.8)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770103 & 770104

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

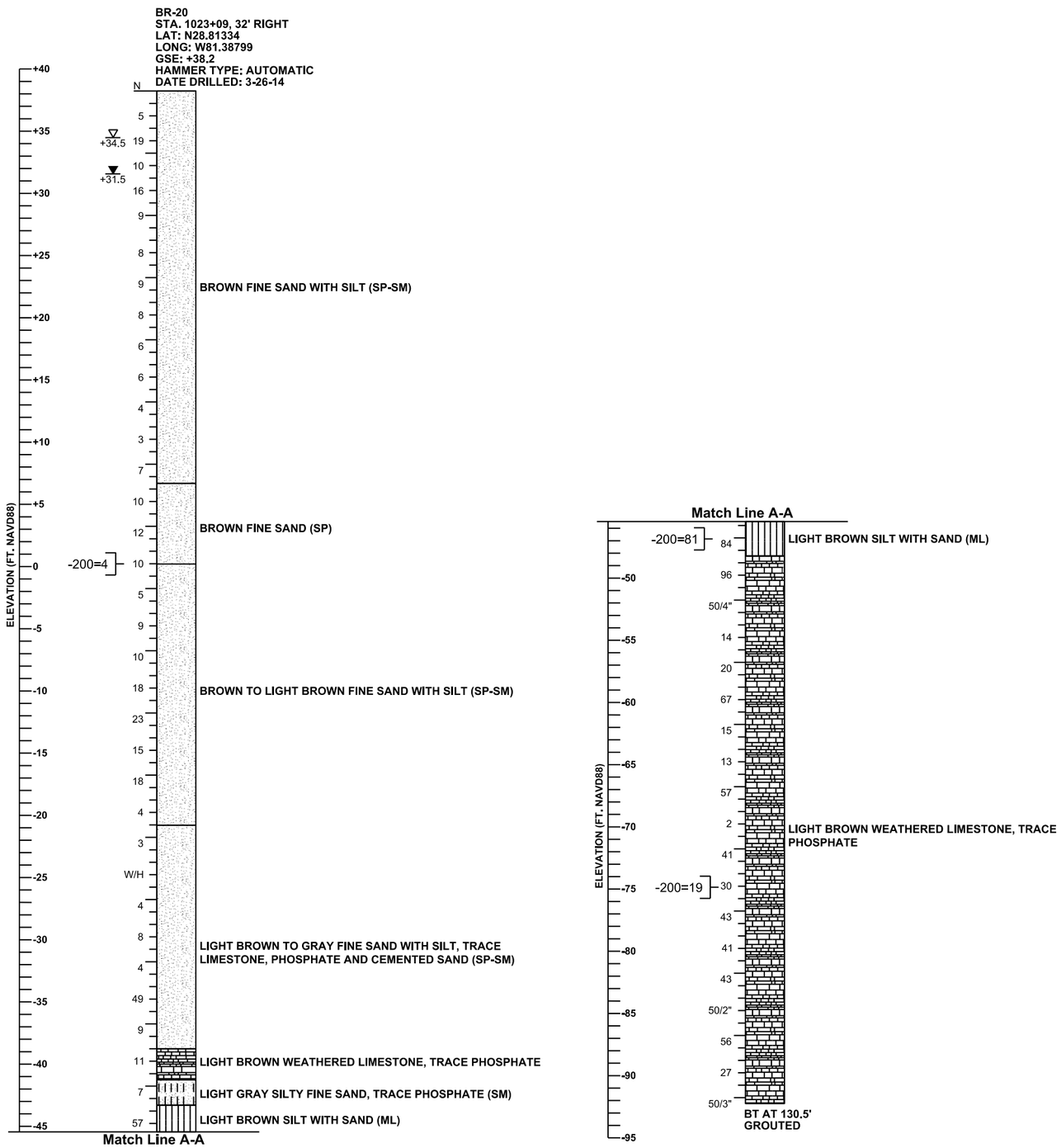
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LAKE MARKHAM ROAD
SHEET NO.: B4-6

scott 5/12/2015 1:50:31 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
50/4"	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
▽ +34.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — SILT — SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +21 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +21 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.8)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770103 & 770104

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

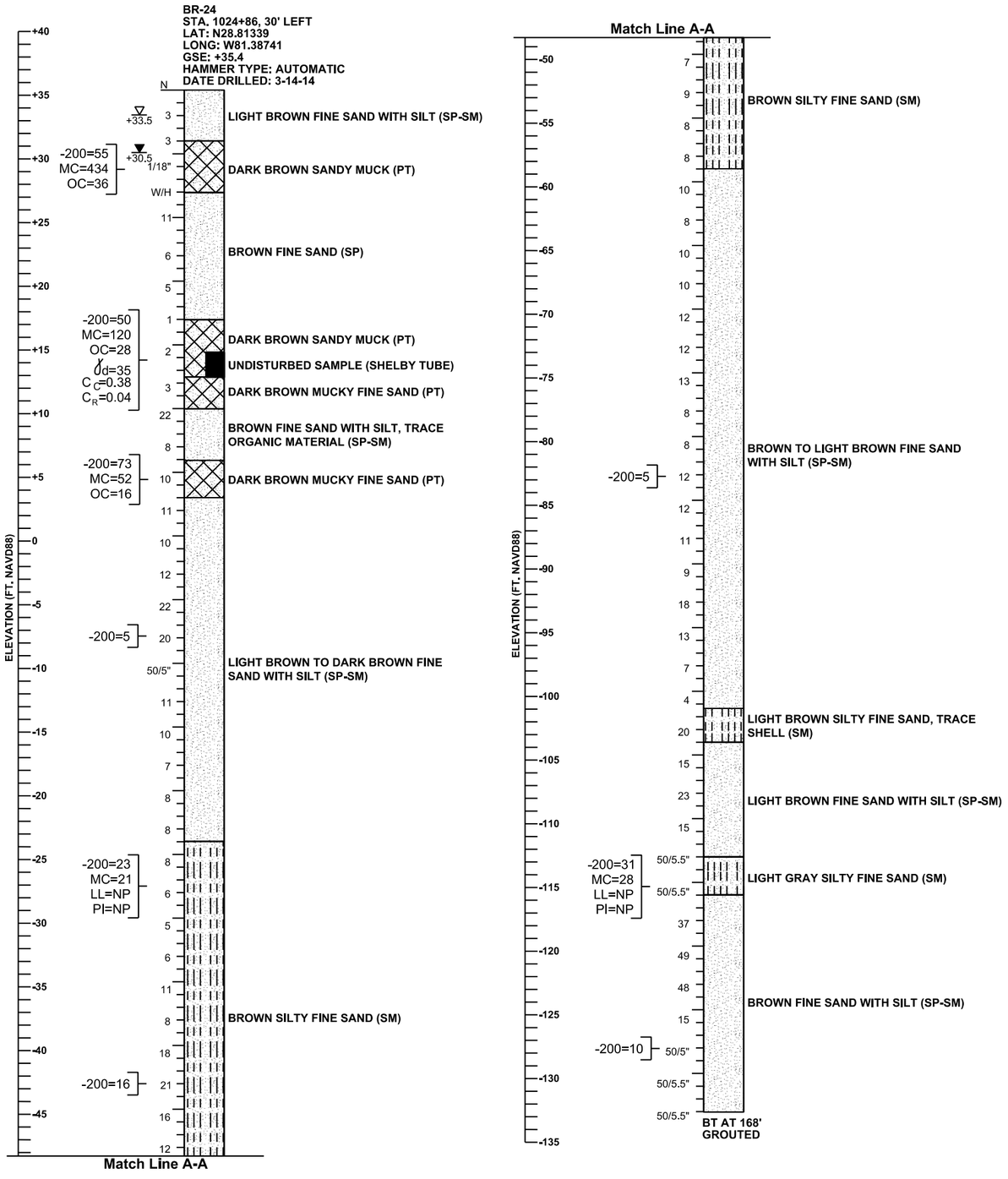
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LAKE MARKHAM ROAD
SHEET NO. B4-7

scott 5/12/2015 1:49:55 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +33.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX
NP=	NON-PLASTIC

SAND — SAND AND MUCK — SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +21 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +21 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.8)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770103 & 770104

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

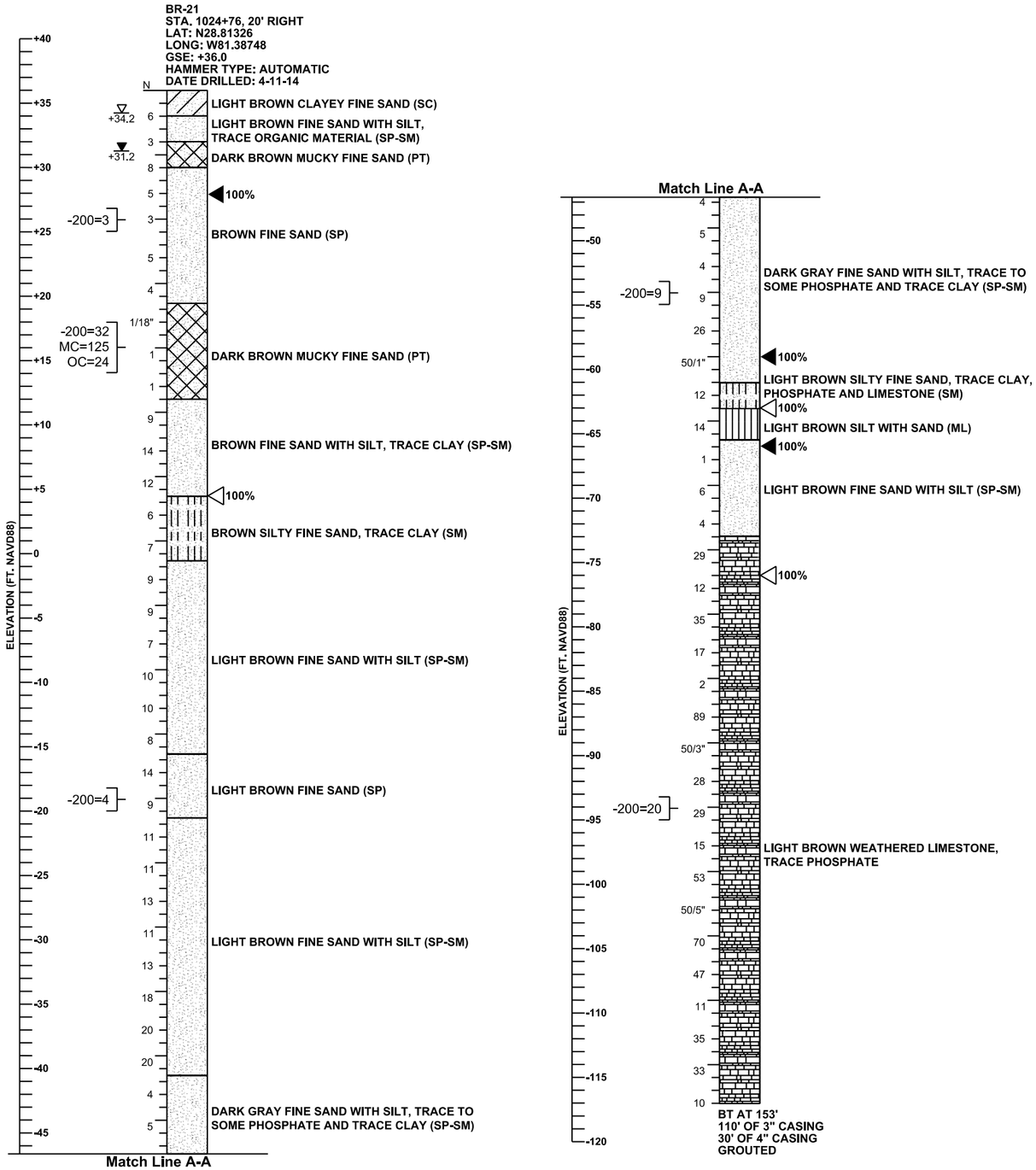
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LAKE MARKHAM ROAD
SHEET NO. B4-8



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +34.2	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.2	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND | SAND AND CLAY | LIMESTONE
SAND AND SILT | SILT | SAND AND MUCK

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +21 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +21 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.8)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.8)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770103 & 770104

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

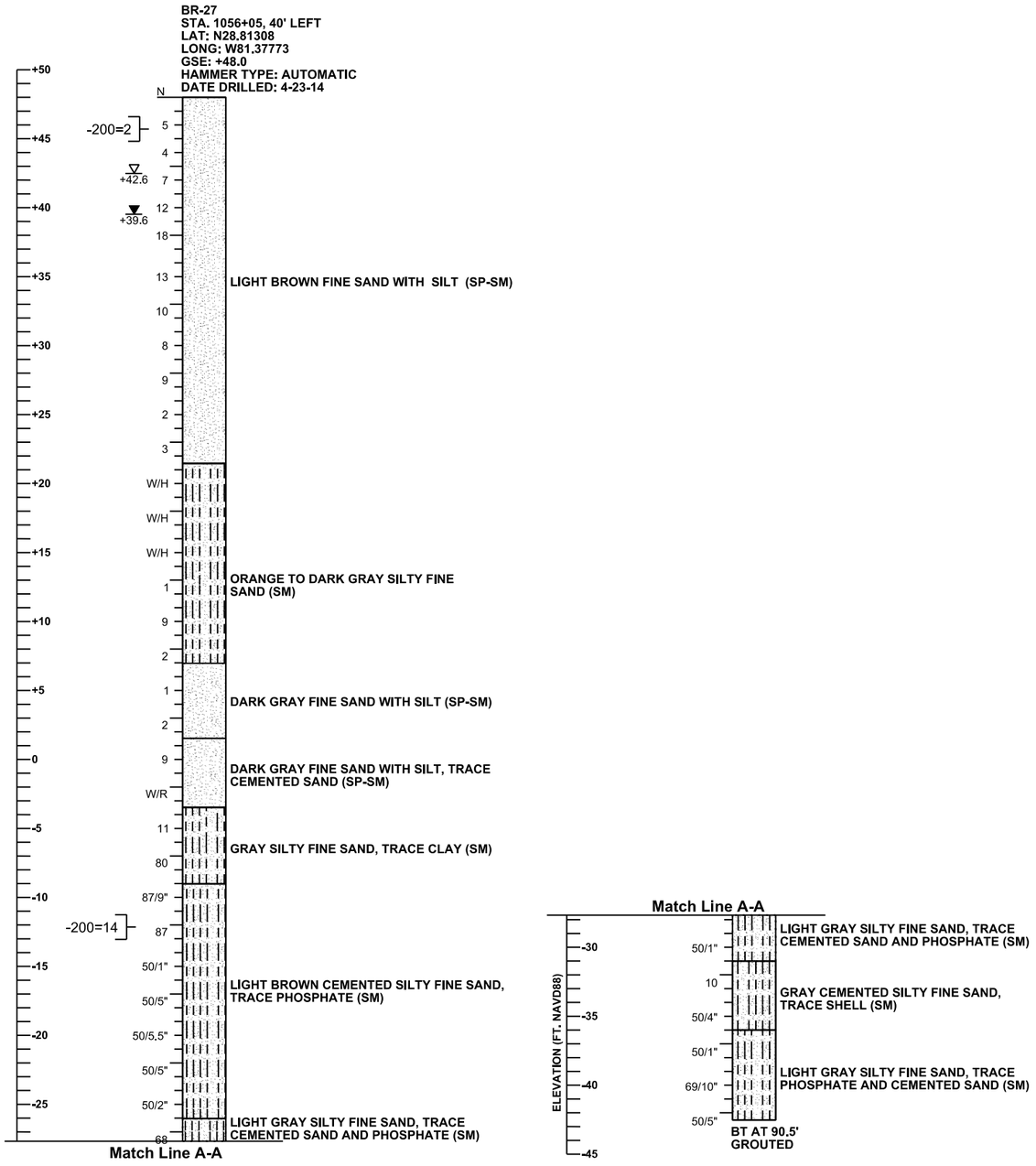
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT LAKE MARKHAM ROAD
SHEET NO. B4-9

scott 5/12/2015 1:50:55 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +42.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +22 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +22 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.3)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.3)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770105 & 770106

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

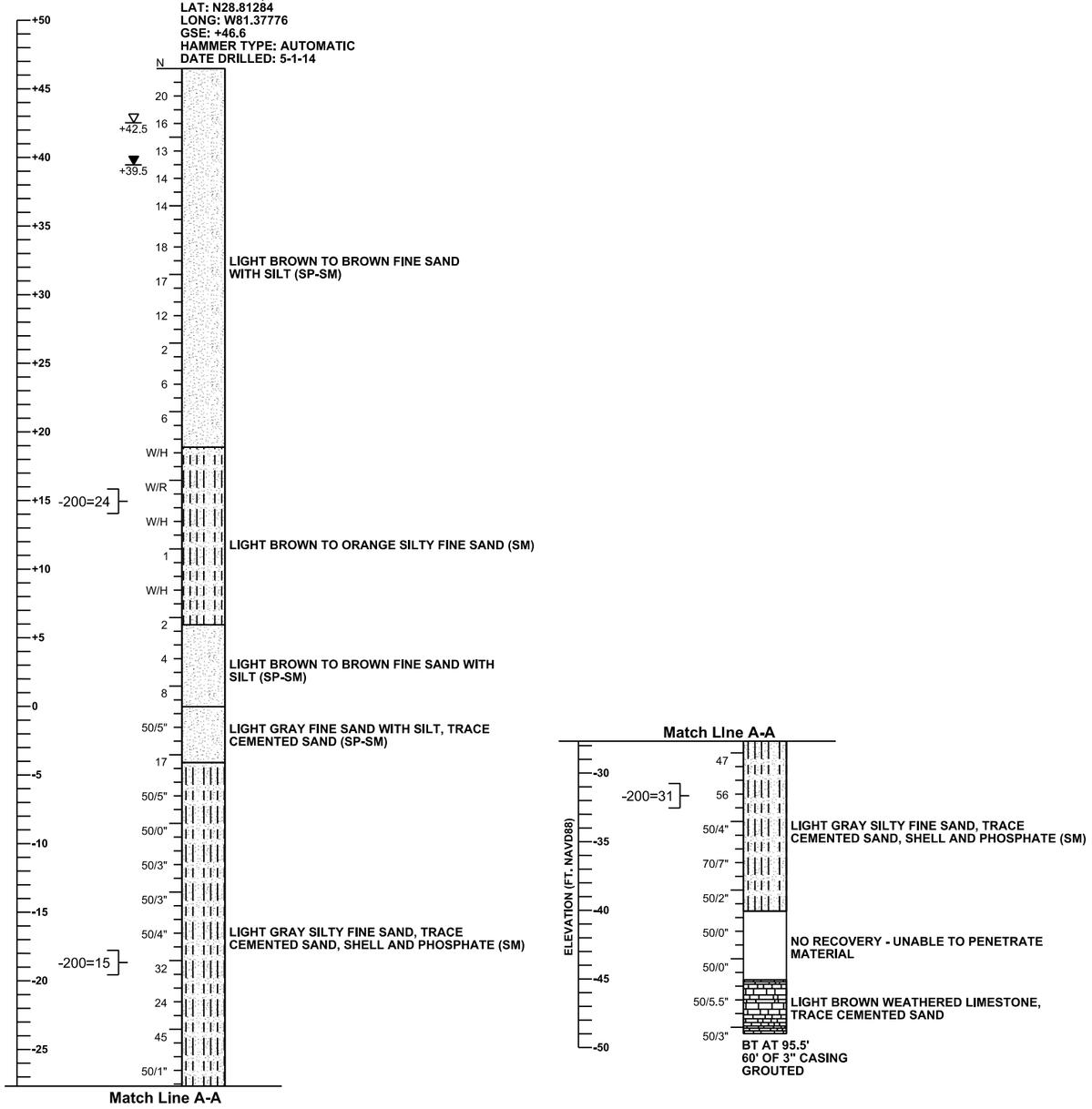
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT GLADE VIEW DRIVE

SHEET NO. B5-4

scott 5/12/2015 1:42:40 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn

BR-25
STA. 1055+96, 49' RIGHT
LAT: N28.81284
LONG: W81.37776
GSE: +46.6
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-1-14



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +42.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — LIMESTONE — SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +22 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +22 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.3)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.3)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770105 & 770106

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

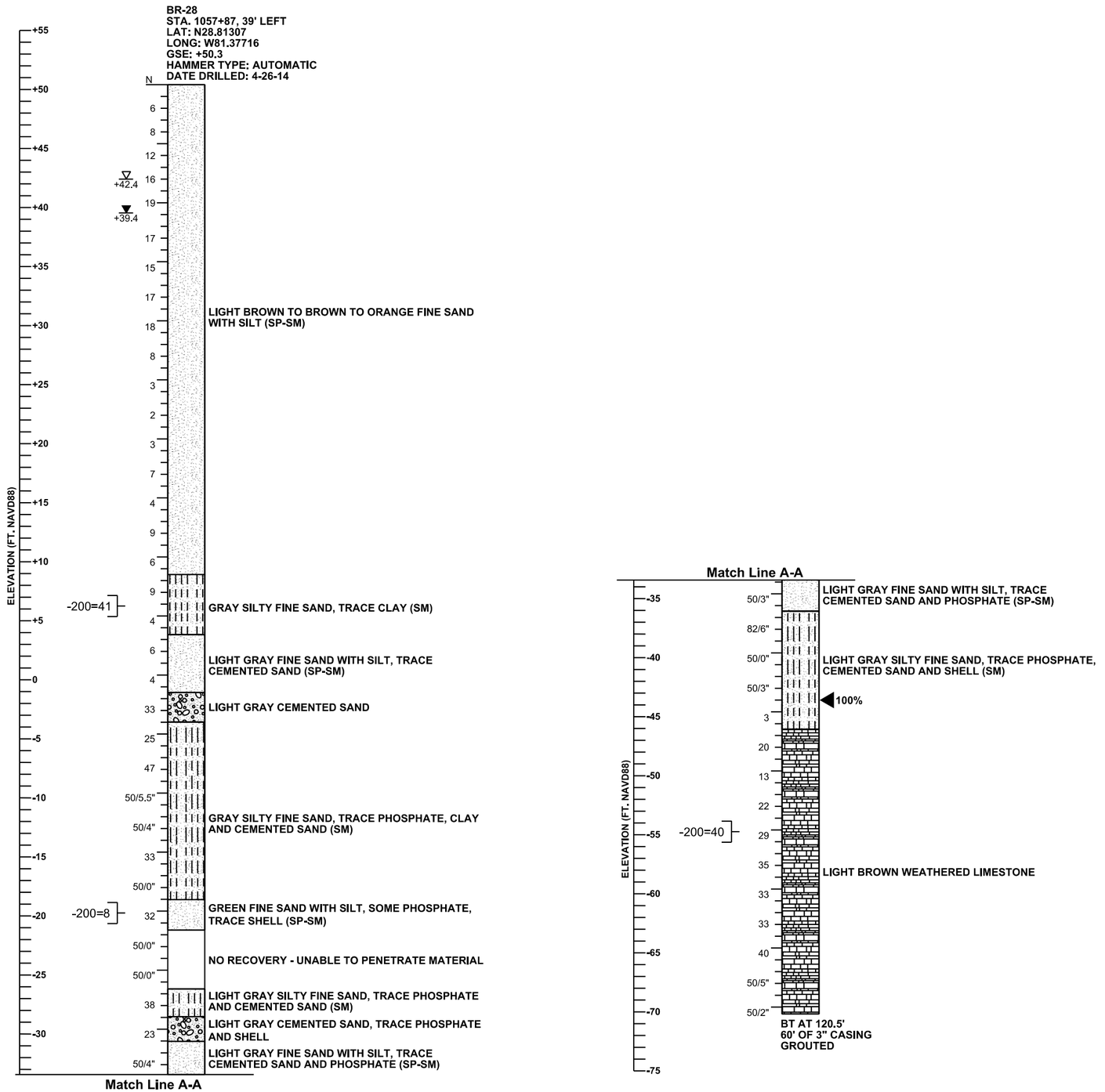
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT GLADE VIEW DRIVE
SHEET NO.: B5-5

scott 5/12/2015 1:43:05 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +42.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +39.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — CEMENTED SAND
SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +22 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +22 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.3)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.3)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770105 & 770106

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

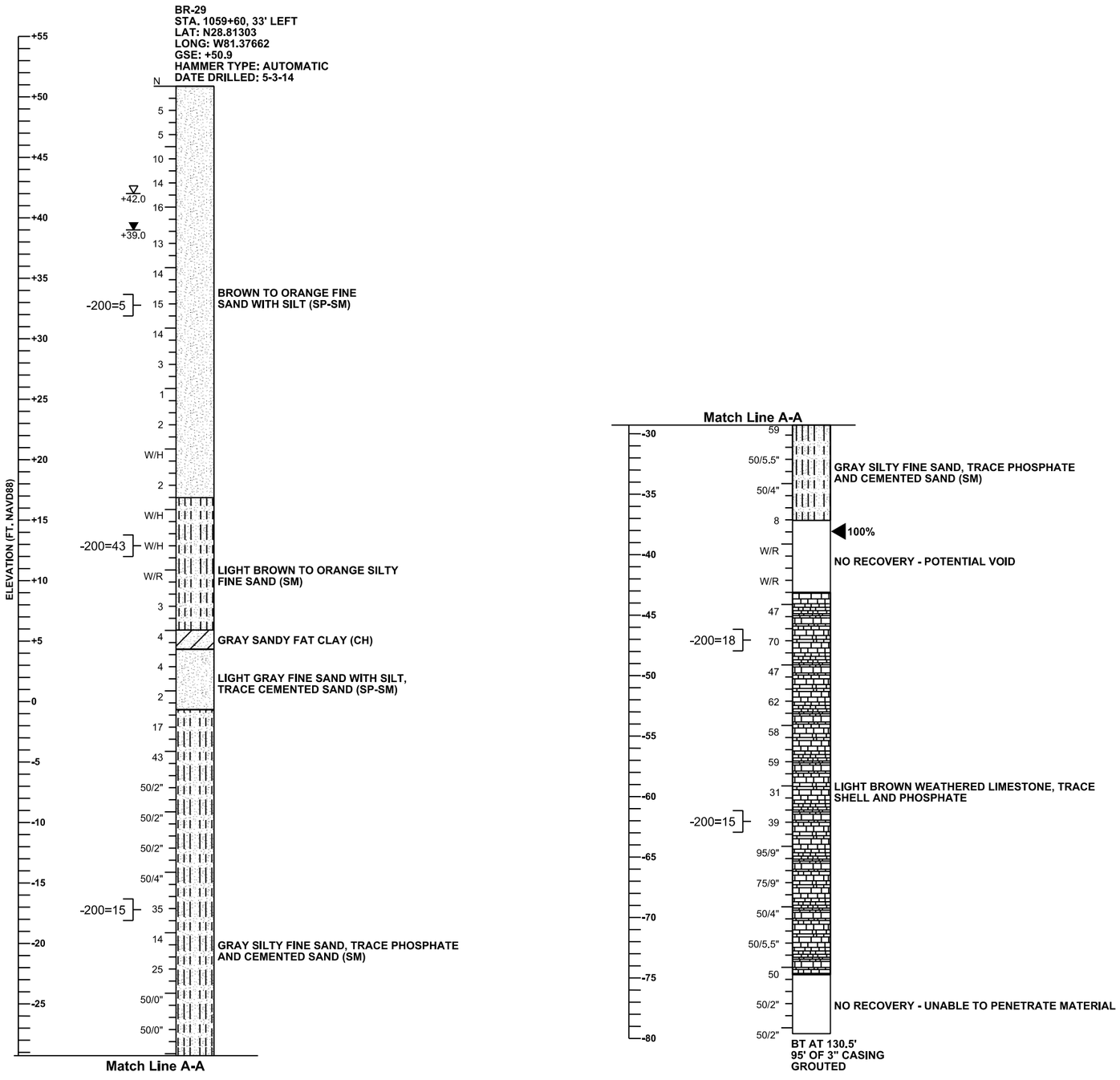
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT GLADE VIEW DRIVE
SHEET NO.: B5-6

scott 5/12/2015 1:43:27 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +43.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.0	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND — SAND AND CLAY

SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +22 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +22 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.3)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.3)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770105 & 770106

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

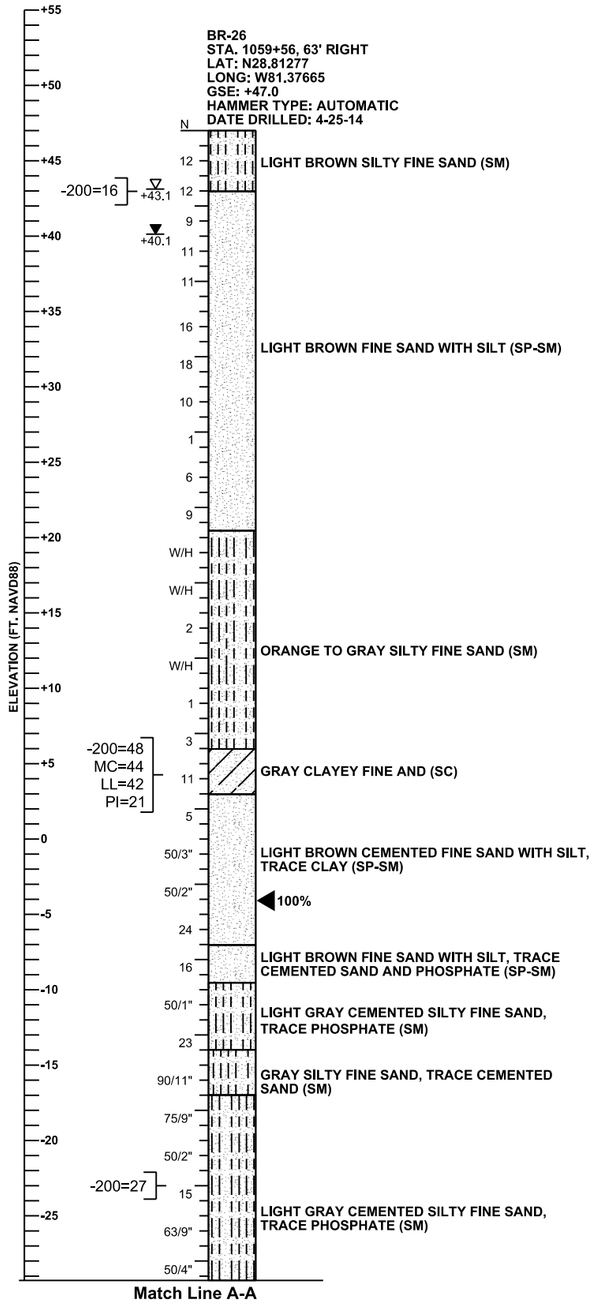
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

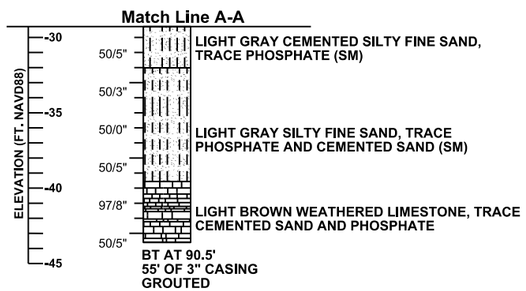
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT GLADE VIEW DRIVE
SHEET NO.: B5-7

scott 5/12/2015 1:44:12 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +43.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +40.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY

SAND AND SILT — LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +22 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +22 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.3)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.3)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770105 & 770106

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

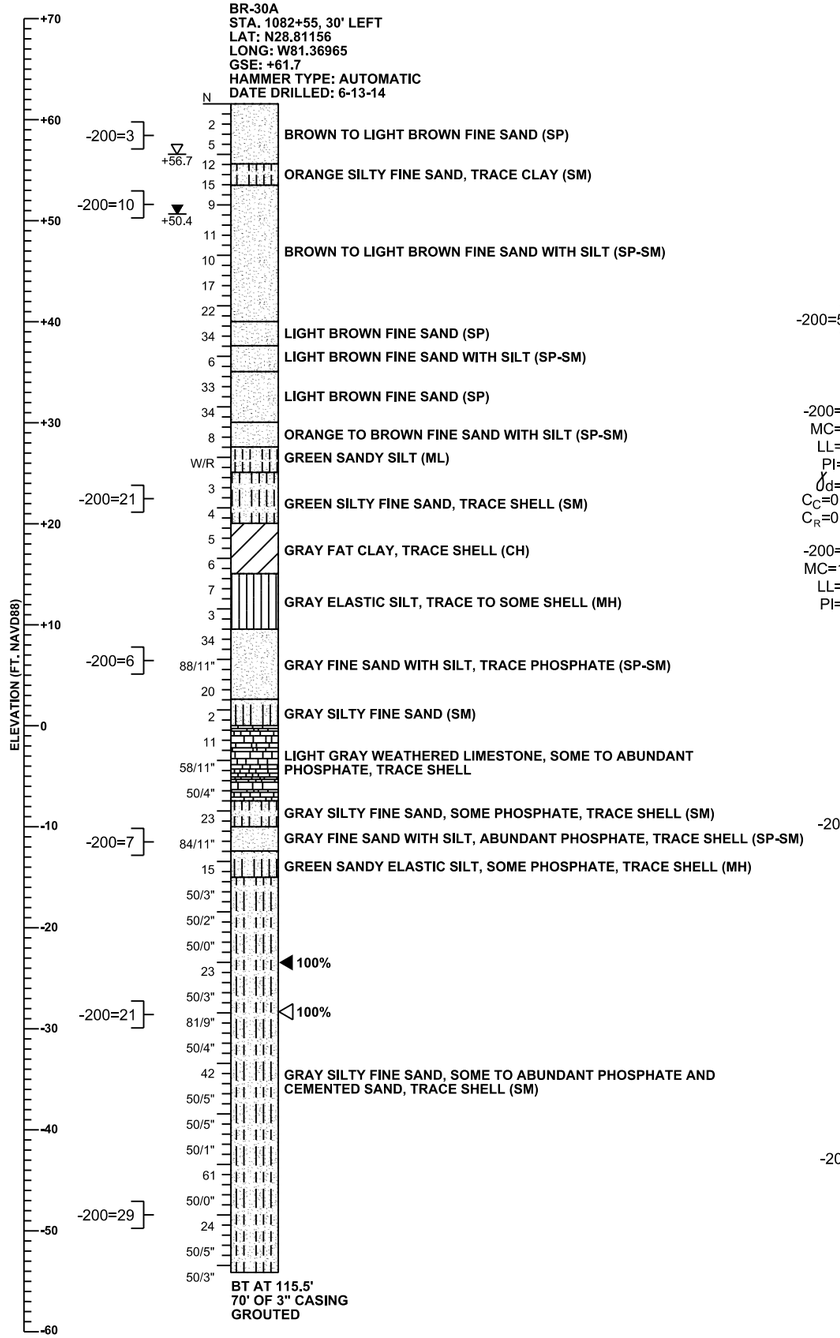
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

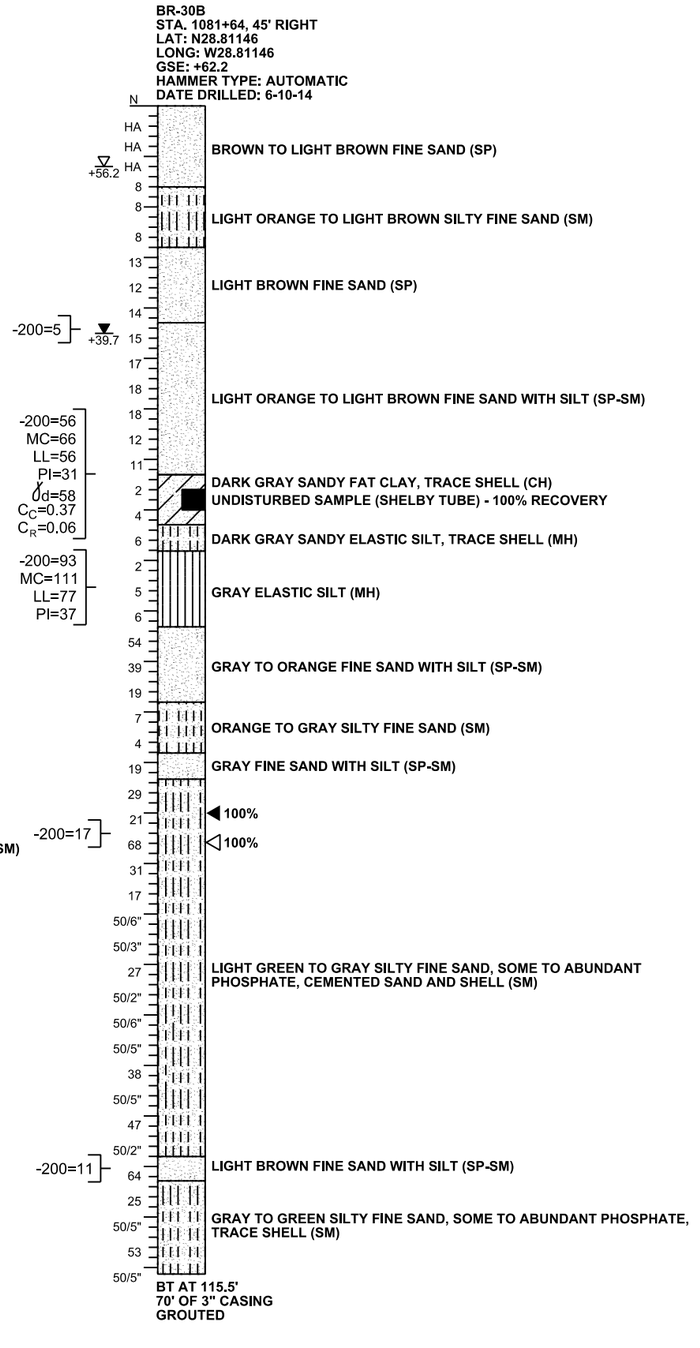
REF. DWG. NO.:

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A AT GLADE VIEW DRIVE

SHEET NO.: B5-8

scott 5/12/2015 1:43:50 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring08.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +56.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +50.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND · CLAY · SAND AND CLAY · SAND AND SILT · SILT · LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.4)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770107 & 770110

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

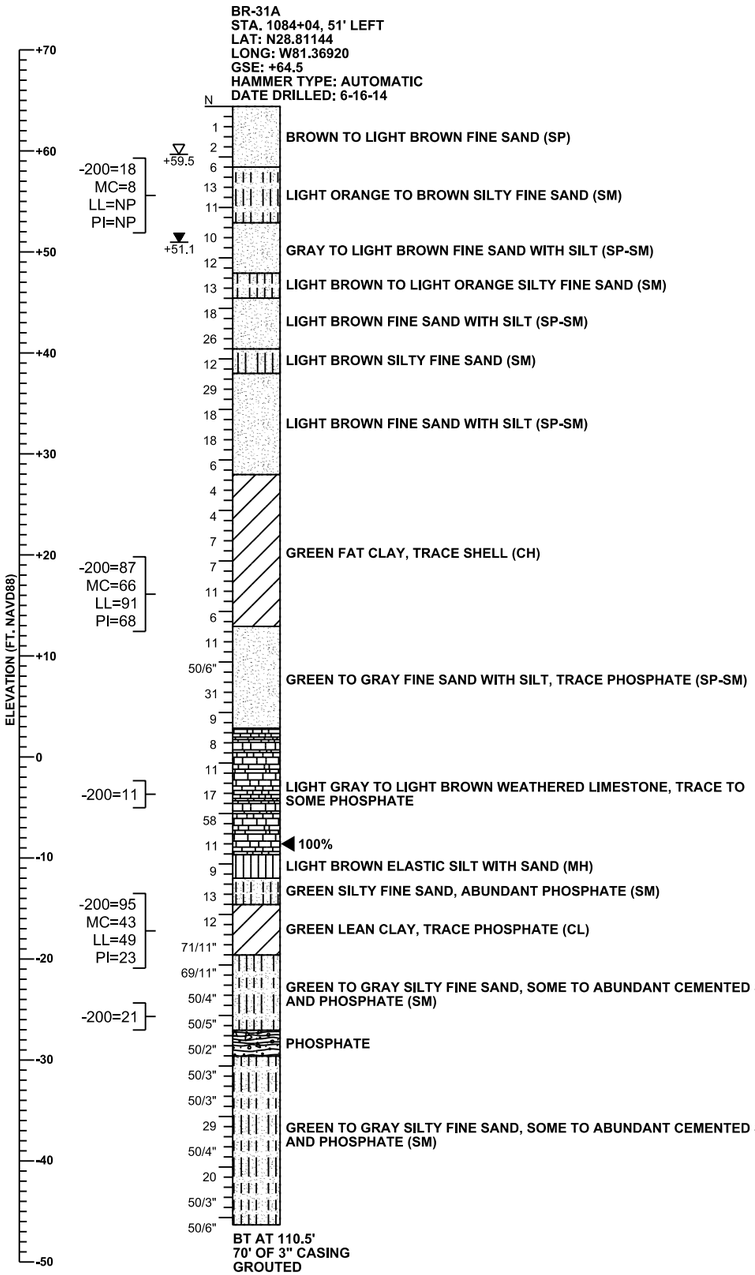
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

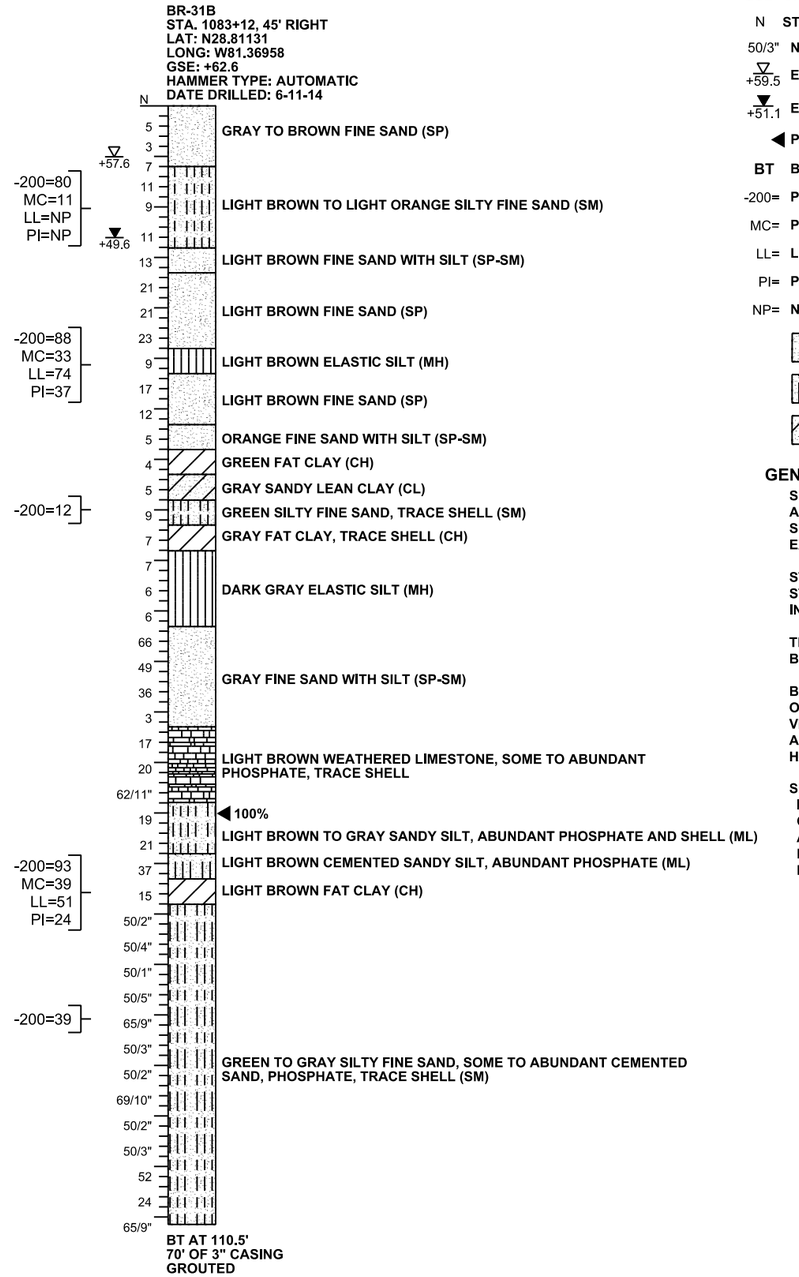
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER EASTBOUND FRONTAGE ROAD
SHEET NO.: B6-4

scott 5/12/2015 1:38:13 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring12.dgn





LEGEND

GSE GROUND SURFACE ELEVATION (FT. NAVD88)

N STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT

50/3" NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION

+59.5 ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)

+51.1 ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED

◀ PERCENT LOSS OF DRILLING FLUID CIRCULATION

BT BORING TERMINATED AT DEPTH INDICATED

-200= PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

MC= PERCENT NATURAL MOISTURE CONTENT

LL= LIQUID LIMIT

PI= PLASTICITY INDEX

NP= NON-PLASTIC

SAND | CLAY | LIMESTONE

SAND AND SILT | SILT | PHOSPHATE

SAND AND CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: EXTREMELY AGGRESSIVE (pH=5.4)
CONCRETE: MODERATELY AGGRESSIVE (pH=5.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770107 & 770110

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

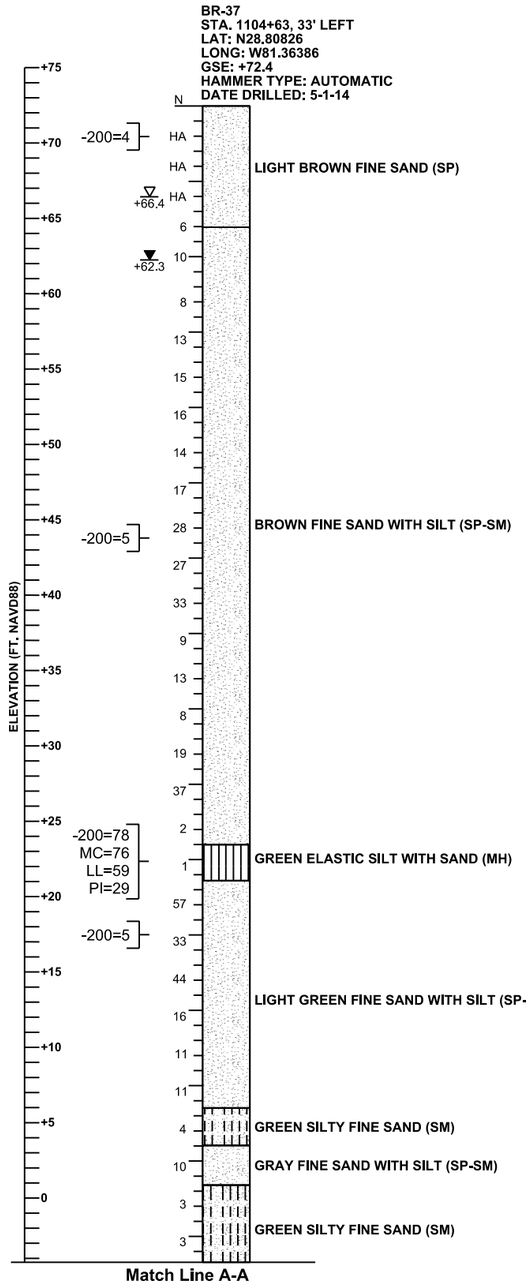
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

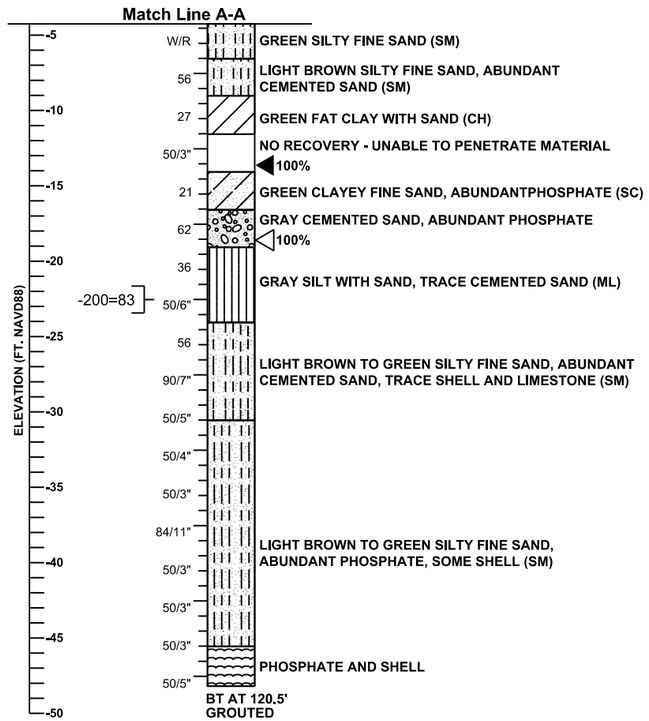
REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER EASTBOUND FRONTAGE ROAD

SHEET NO. B6-5

scott 5/12/2015 1:38:39 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring12.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
+66.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+62.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | CLAY | SILT
PHOSPHATE AND SHELL

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

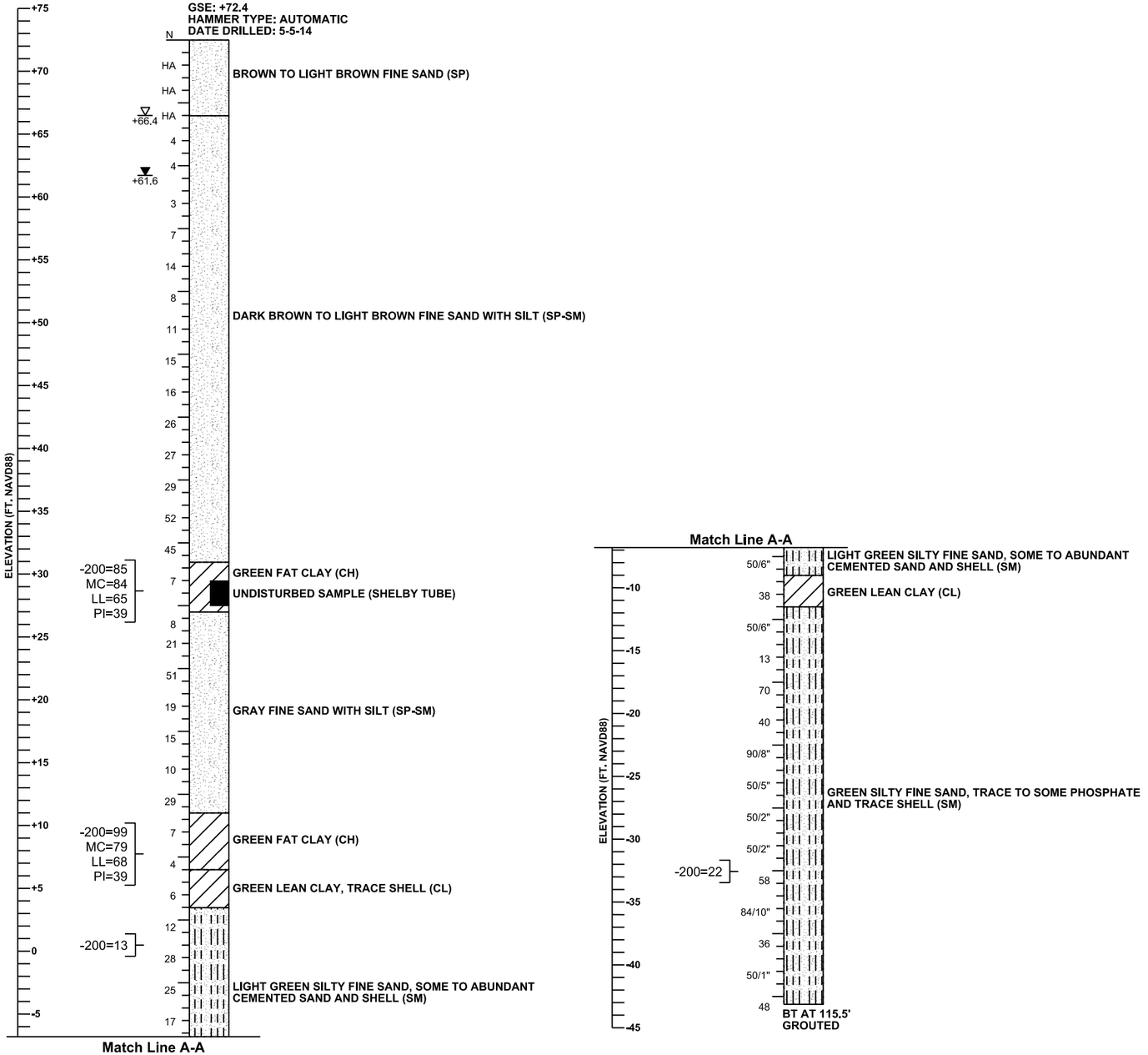
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. B7-6

scott 5/13/2015 2:34:32 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +66.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +61.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND CLAY

SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

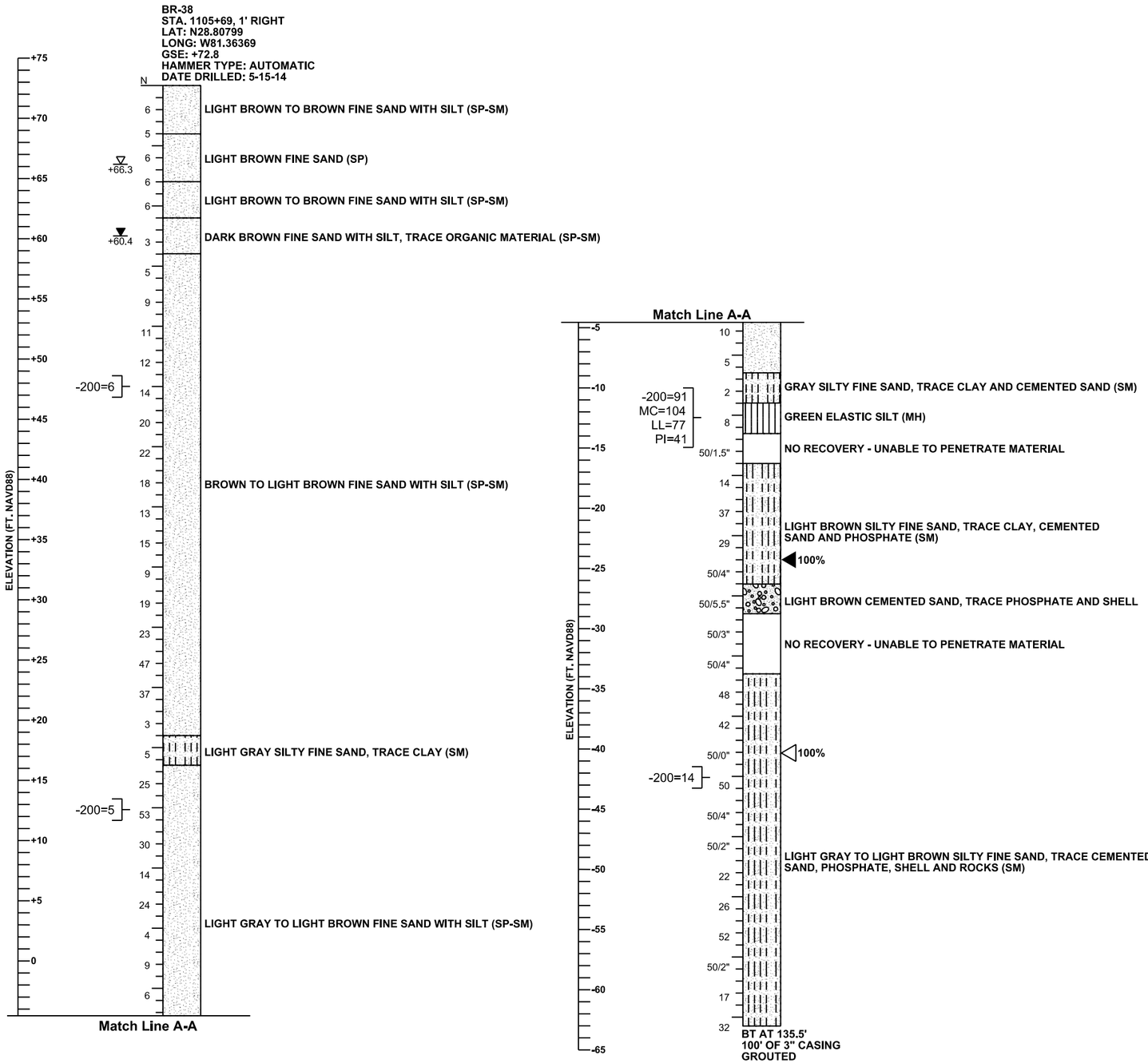
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)

SHEET NO. B7-7

scott 5/13/2015 2:35:59 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
+66.3	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+60.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — CEMENTED SAND
SAND AND SILT — SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

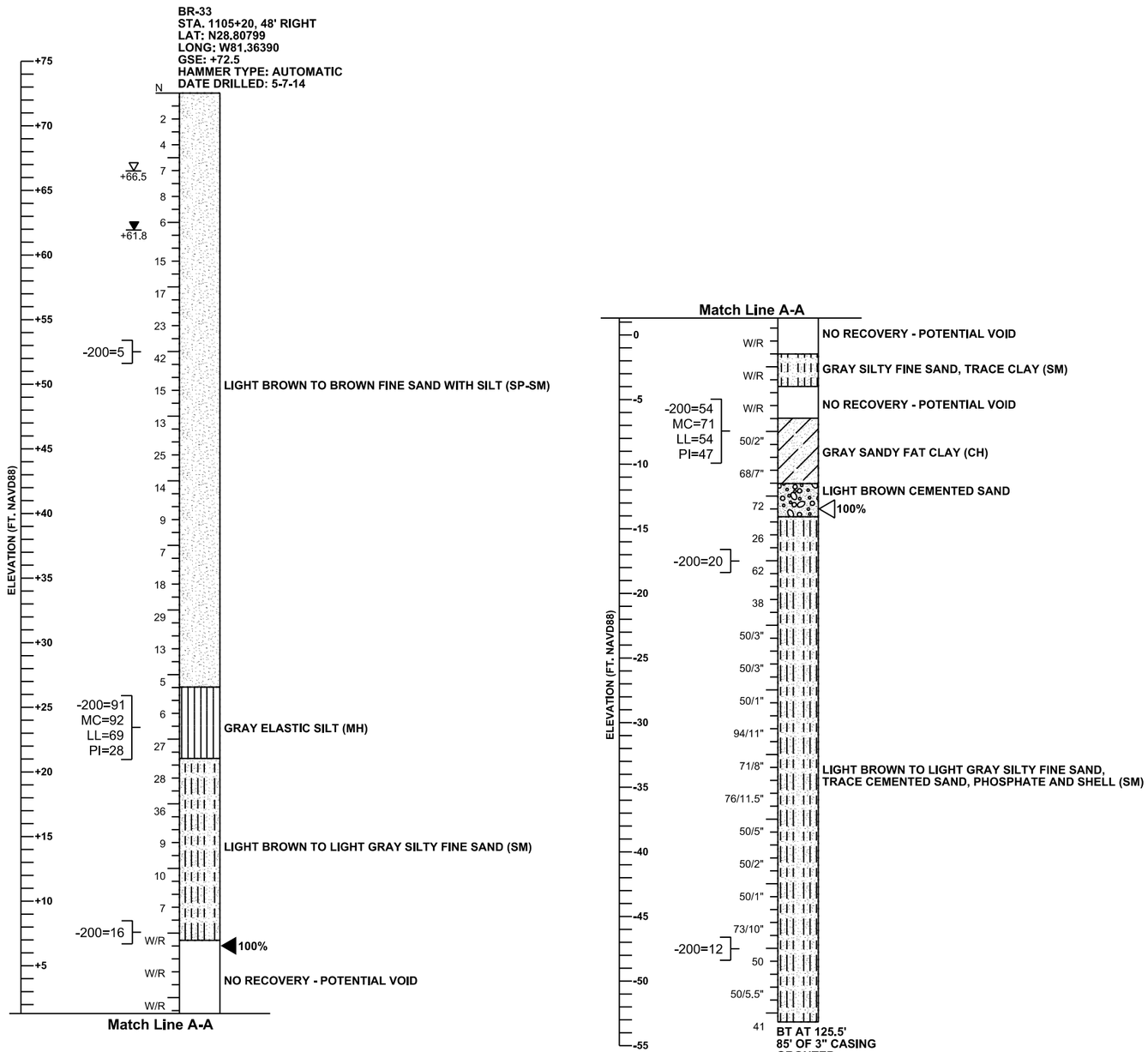
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPT BORINGS FOR STRUCTURES*
REF. DWG. NO.
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A*
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. *B7-8*

scott 5/13/2015 2:36:32 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +66.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +61.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

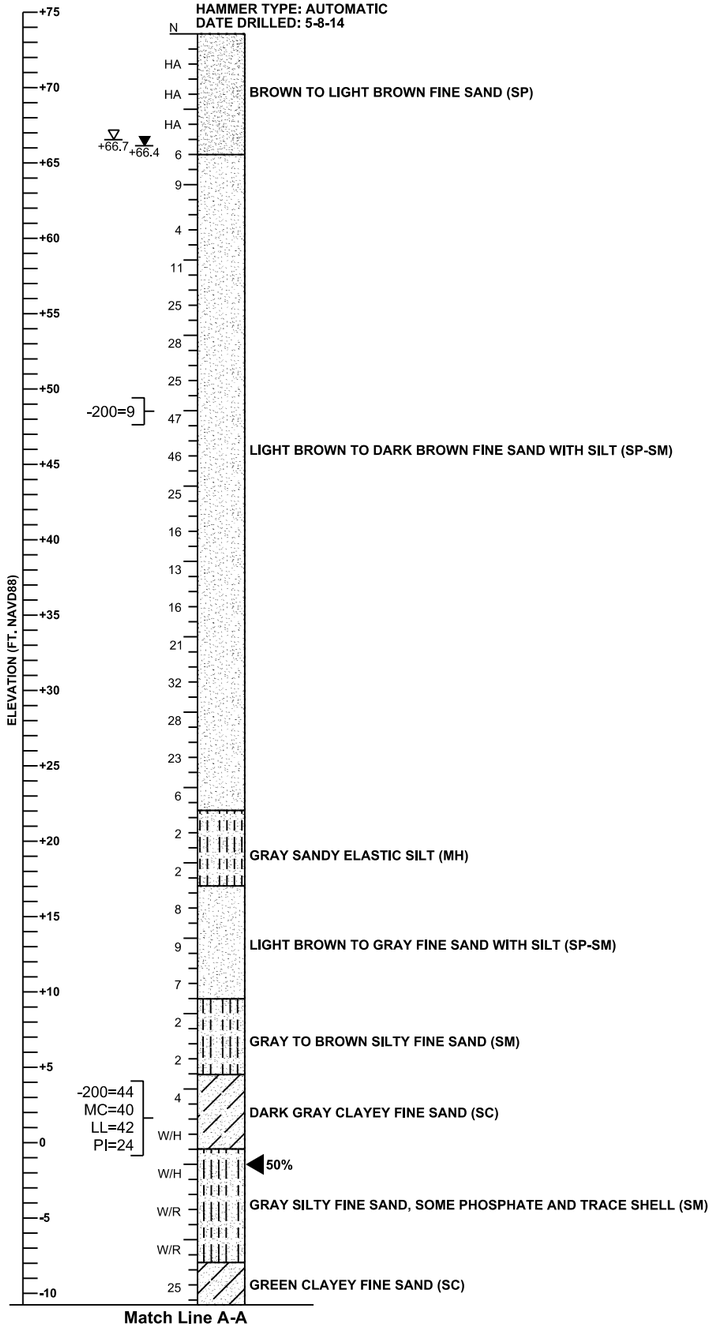
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

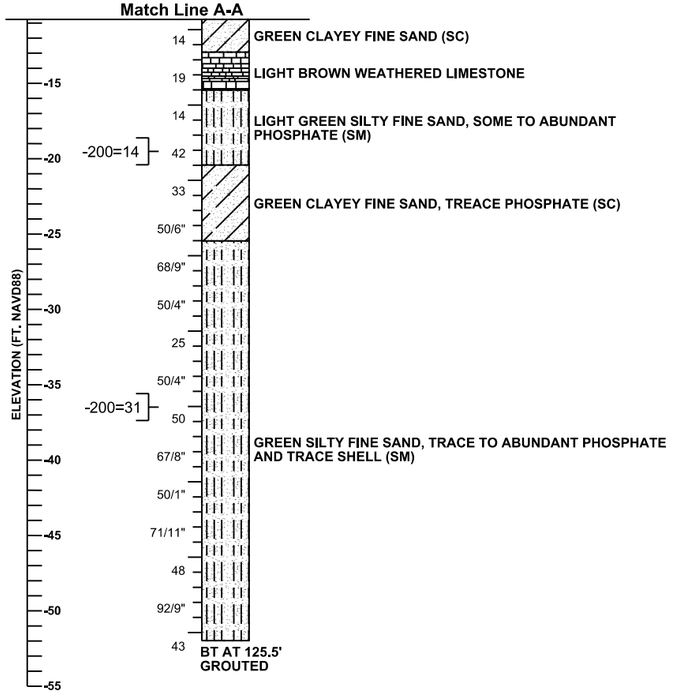
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. B7-9

scott 5/14/2015 9:27:13 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn

BR-39
STA. 1106+69, 80' LEFT
LAT: N28.80796
LONG: W81.36329
GSE: +73.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-8-14



Match Line A-A



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +66.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +66.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND
SAND AND CLAY
SAND AND SILT
LIMESTONE

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

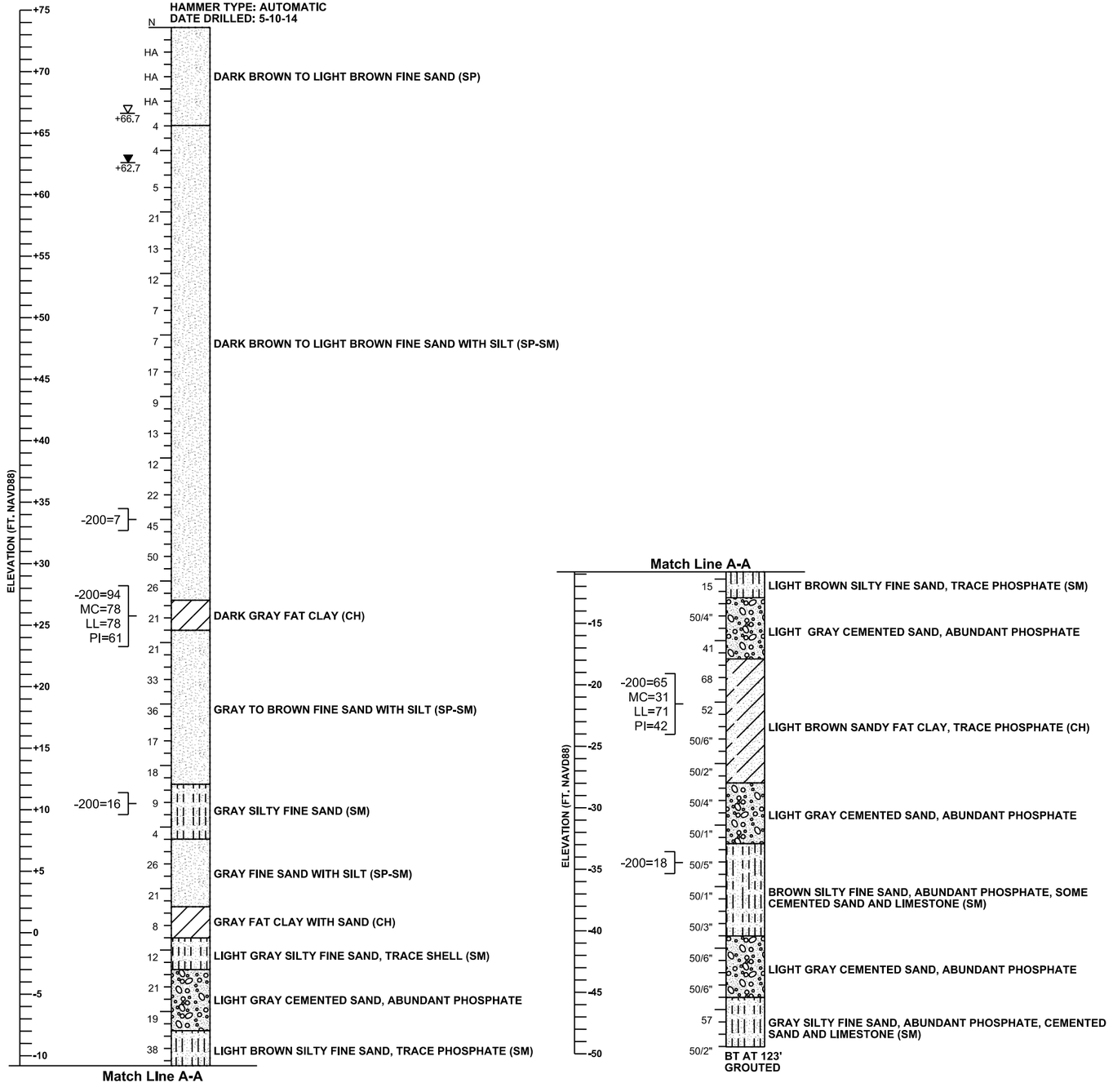
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPT BORINGS FOR STRUCTURES*
REF. DWG. NO.
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A*
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. B7-10

scott 5/13/2015 2:37:42 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn

BR-34
STA. 1106+60, 55' RIGHT
LAT: N28.80771
LONG: W81.36360
GSE: +73.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-10-14



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +66.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +62.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND | SAND AND CLAY | CEMENTED SAND
SAND AND SILT | CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

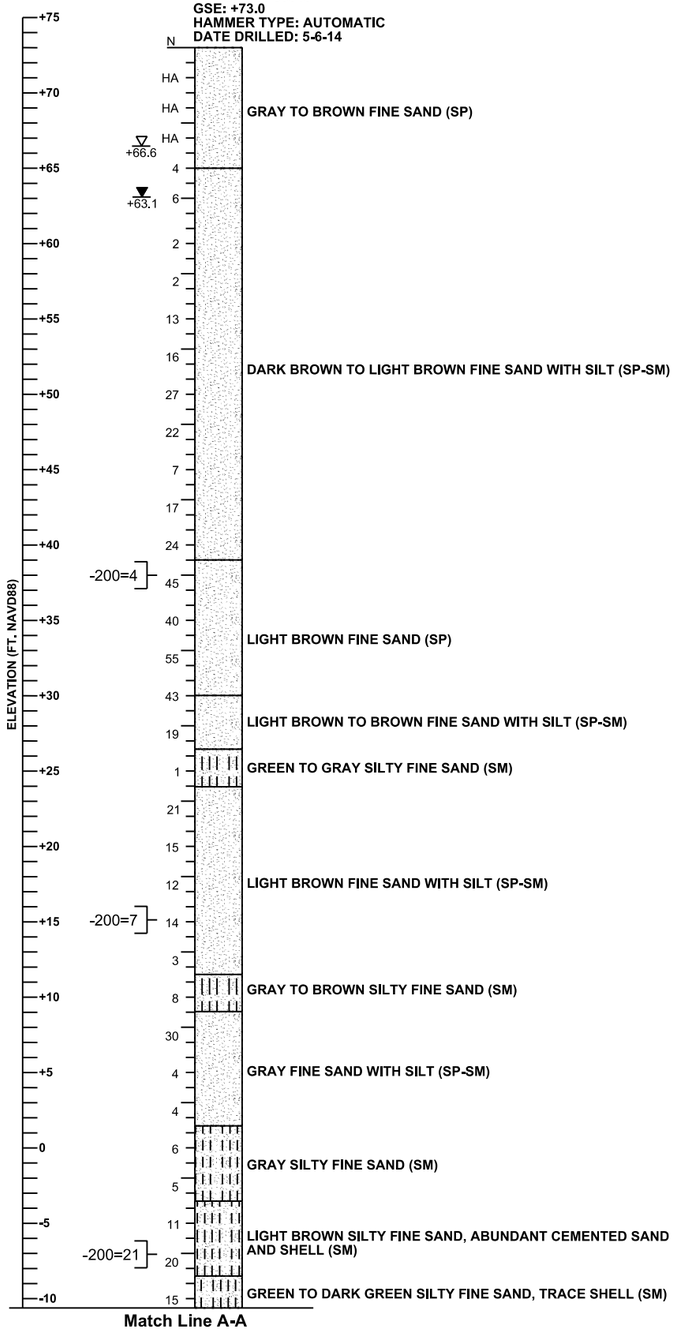
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. B7-11

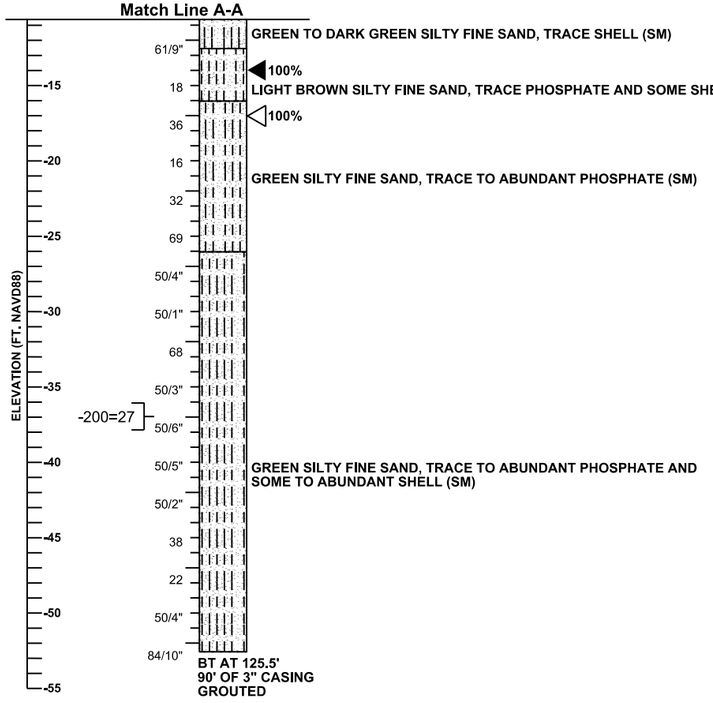
scott 5/13/2015 2:39:49 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn

BR-40
STA. 1107+47, 45' LEFT
LAT: N28.80774
LONG: W81.36319
GSE: +73.0
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-6-14



Match Line A-A

Match Line A-A



BT AT 125.5'
90' OF 3" CASING GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +66.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +63.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

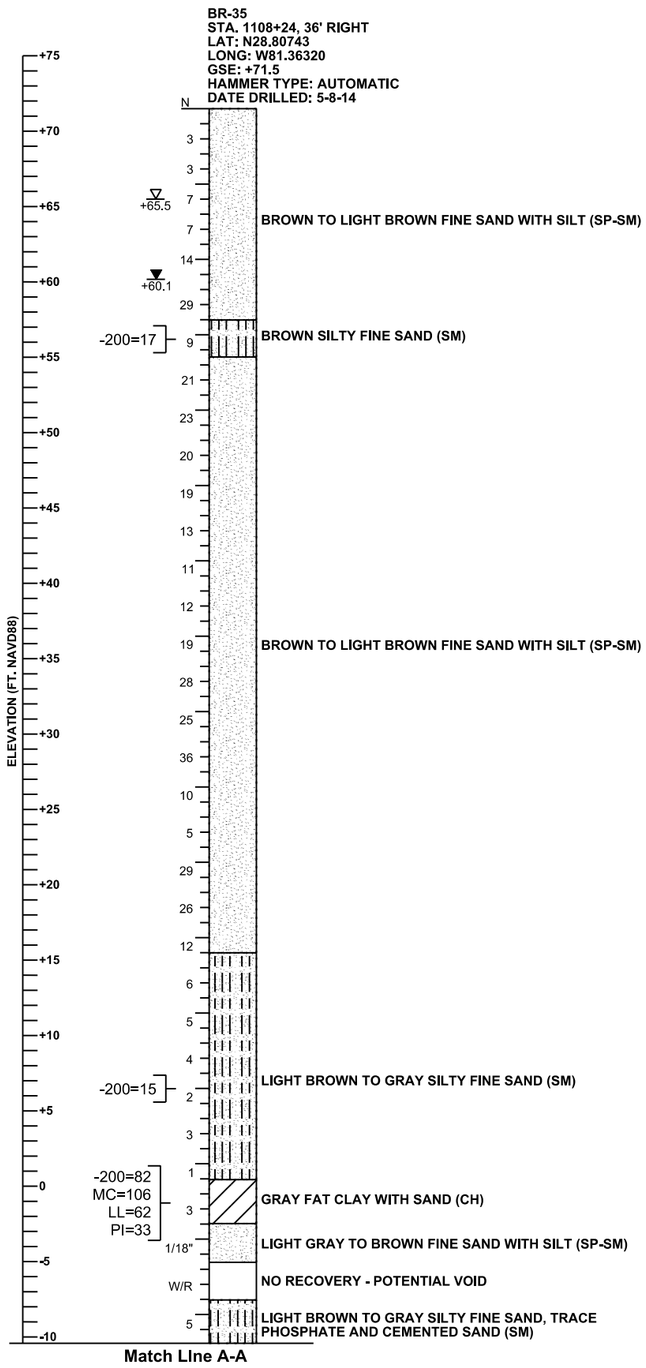
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

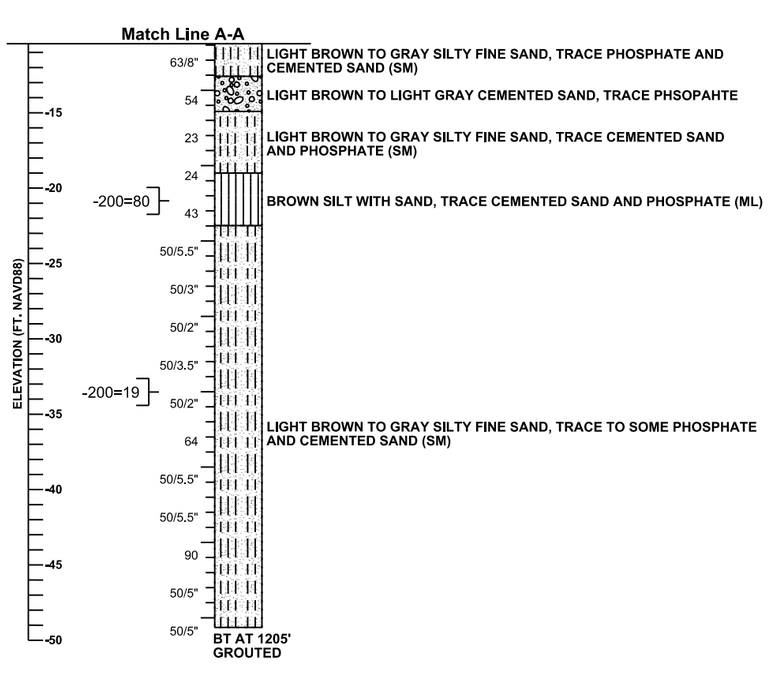
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: *REPORT OF SPT BORINGS FOR STRUCTURES*
REF. DWG. NO.:
PROJECT NAME: *WEKIVA PARKWAY (SR 429) SECTION 7A*
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO.: B7-12

scott 5/13/2015 2:38:56 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +65.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +60.1	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND · CLAY · SILT · SAND AND SILT · CEMENTED SAND

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

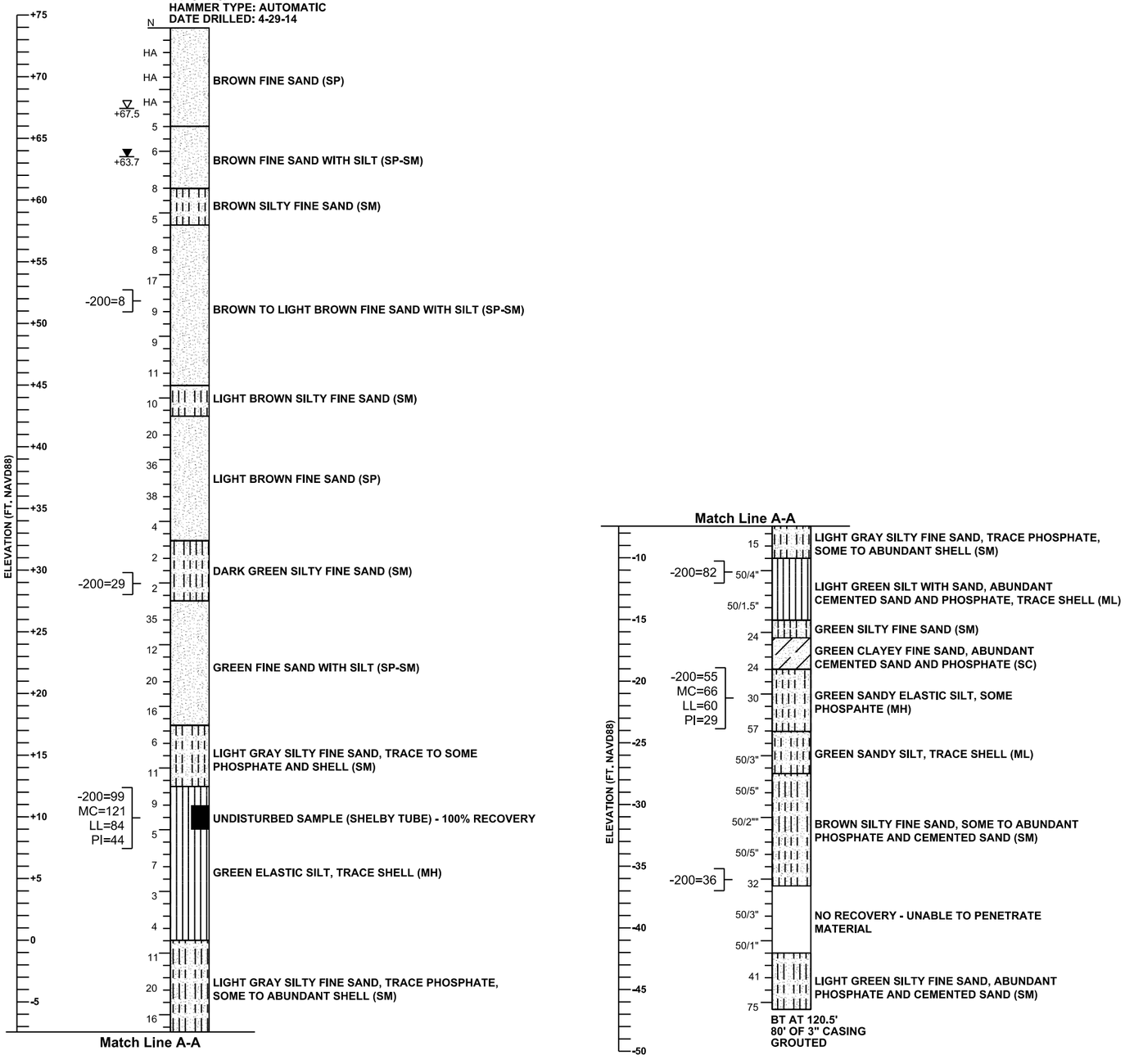
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO.: B7-13

scott 5/13/2015 2:41:09 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +67.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +63.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY

SAND AND SILT — SILT

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

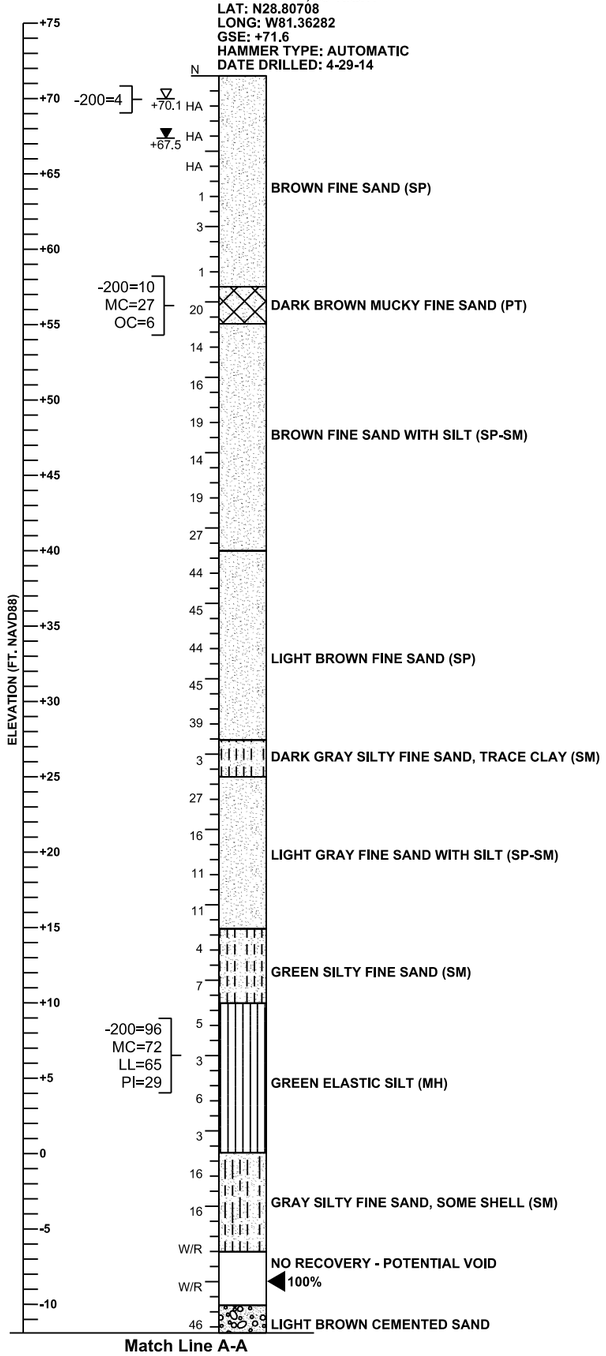
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

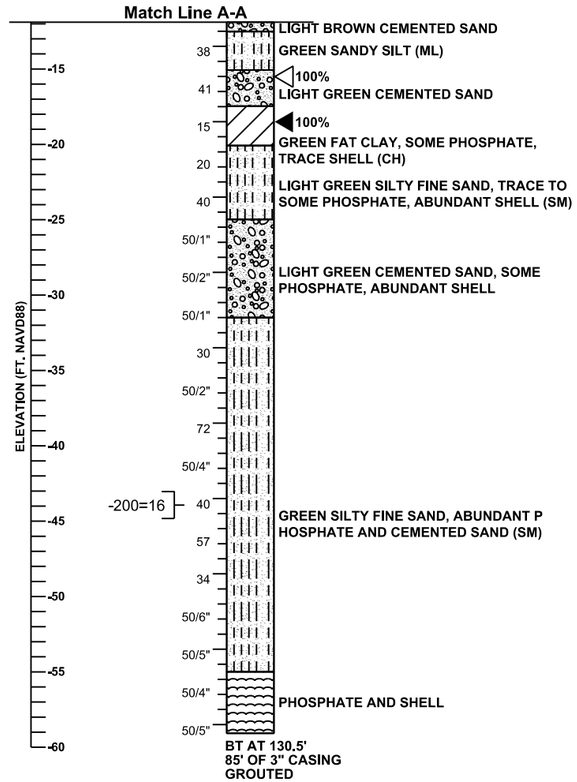
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. B7-14

scott 5/13/2015 2:34:55 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
W/R	WEIGHT OF ROD
50/3"	NUMBER OF BLOWS FOR 3 INCHES OF PENETRATION
▽ +70.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +67.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND | SILT | SAND AND MUCK | PHOSPHATE AND SHELL
SAND AND SILT | CLAY | CEMENTED SAND

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE SURVEYED BY URS CORP. FOR VERTICAL AND HORIZONTAL CONTROL. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +23 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +23 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

ENVIRONMENTAL CLASSIFICATION:
SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE:
STEEL: SLIGHTLY AGGRESSIVE (pH=7.4)
CONCRETE: SLIGHTLY AGGRESSIVE (pH=7.4)

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

Bridge Nos. 770108 & 770109

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

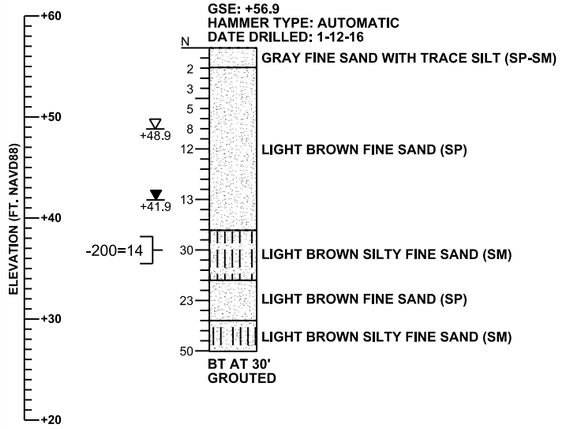
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

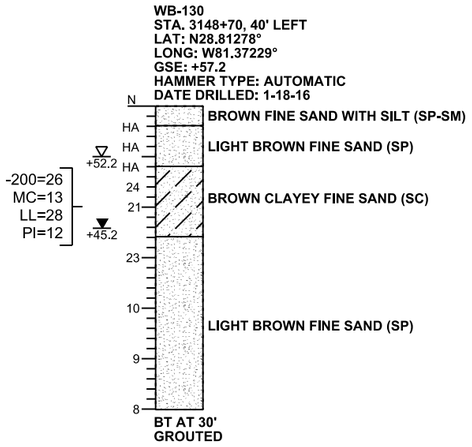
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

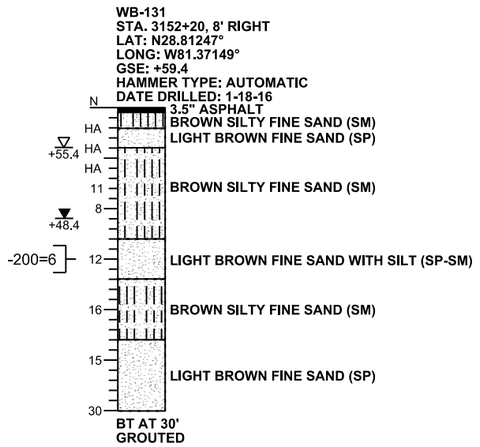
SHEET TITLE: REPORT OF SPT BORINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SR 429 OVER S. ORANGE AVE. & SR 431 (ORANGE BLVD.)
SHEET NO. B7-15

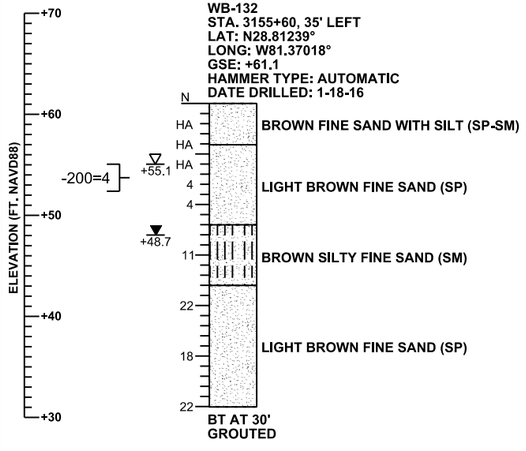
scott 5/13/2015 2:35:18 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring09.dgn

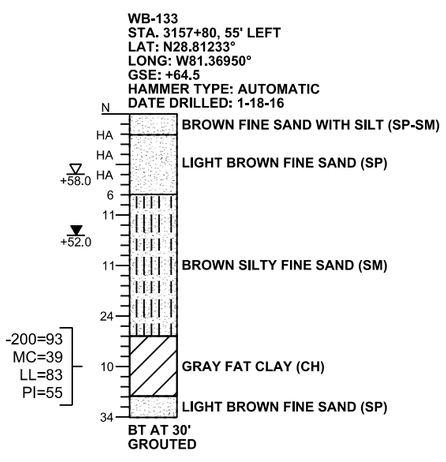
REPORT OF SPT BORINGS
FOR NOISE WALL

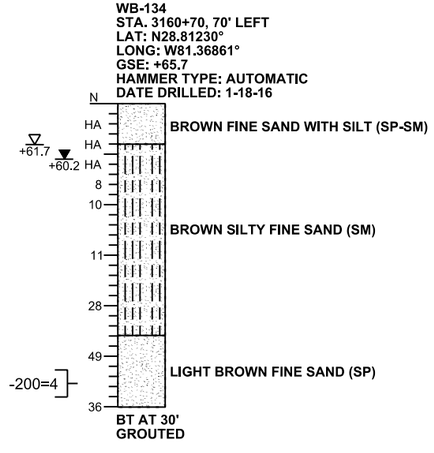












LEGEND

GSE	APPROXIMATE GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +48.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) ON DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — CLAY

SAND AND SILT — SAND AND CLAY

GENERAL NOTES

SUBSURFACE CONDITIONS SHOWN ON THE BORINGS REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

THE BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO 7X). GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE WB FRONTAGE ROAD CENTERLINE.

BASED ON REVIEW OF THE U.S. GEOLOGICAL SURVEY MAP ENTITLED "POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER IN ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND VICINITY, FLORIDA, SEPTEMBER 2008" FOR THE PROJECT AREA, THE MAXIMUM ELEVATION OF THE ARTESIAN HEAD IS ESTIMATED TO BE +29 FT. NAVD88. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN HEAD LEVELS UP TO +29 FT. NAVD88.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS FOR NOISE WALL
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO. SB-4

Scott 4/17/2017 3:07:10 PM J:\D109\3520G Wekiva Parkway Section 7A\2-15-16\b1boring02.dgn

SUMMARY OF RETAINING WALL STRUCTURE LOCATIONS AND SUBSURFACE INVESTIGATION

Table 6

Summary of Wall Locations and Subsurface Exploration

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Structure Location						Boring Data				
Wall No.	Alignments	Approx. Station Start	Approx. Station End	Total Length (ft)	[1]Maximum Height (ft)	No.	Station	Offset (ft)	Depth (ft)	Boring Type
MSE Retaining Walls										
2	SR 429	954+00	955+85	185	10	WB-15	954+40	100 LT	35	CPT
3	SR 429	954+00	964+07	2,069	28	WB-16	956+00	65 RT	40	SPT
						WB-17	957+40	60 LT	50	SPT
						WB-18	959+00	155 RT	40	CPT
						WB-19	960+40	60 LT	60	SPT
						WB-20	962+00	62 RT	60	SPT
						WB-21	963+00	CL	100	SPT
4	SR 429	967+53	978+50	2,434	34	WB-22	968+60	CL	100	SPT
						WB-23	969+00	65 LT	73	CPT
						WB-24	970+50	60 RT	80	SPT
						WB-25	972+00	27 LT	80	SPT
						WB-26	973+50	62 RT	62	CPT
						WB-27	975+00	65 LT	80	SPT
						WB-28	976+50	62 RT	80	SPT
						WB-29	977+40	CL	100	SPT
5	SR 429	981+93	997+44	2,778	30	WB-30	983+00	CL	100	SPT
						WB-30A	983+00	60 LT	100	SPT
						WB-30B	983+00	60 RT	73	CPT
						WB-31	984+00	65 LT	63	CPT
						WB-31A	984+00	CL	70	CPT
						WB-31B	984+00	60 RT	100	SPT
						WB-32	985+50	62 RT	70	SPT
						WB-33	987+00	67 LT	65	SPT
						WB-34	988+50	62 RT	50	CPT
						WB-35	990+00	62 LT	40	SPT
						WB-36	991+50	62 RT	65	SPT
						WB-37	993+00	62 LT	30	CPT
						WB-38	994+50	62 RT	35	SPT
						WB-39	996+00	62 LT	30	SPT
						WB-40	997+50	62 RT	20	CPT

1. Measured from top of leveling pad to top of coping.

Table 6

Summary of Wall Locations and Subsurface Exploration

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Structure Location						Boring Data				
Wall No.	Alignments	Approx. Station Start	Approx. Station End	Total Length (ft)	[1]Maximum Height (ft)	No.	Station	Offset (ft)	Depth (ft)	Boring Type
6	Ramp C / Ramp D / SR 429	999+00	1021+28	4,176	37	WB-41	999+00	100 LT	25	SPT
						WB-42	1002+00	80 LT	20	CPT
						WB-43	1003+50	40 RT	20	SPT
						WB-44	1005+00	64 LT	30	SPT
						WB-45	1006+50	35 RT	35	CPT
						WB-46	1008+00	53 LT	45	SPT
						WB-47	1009+50	74 RT	45	SPT
						WB-48	1011+00	62 LT	51	CPT
						WB-49A	1012+50	70 LT	70	CPT
						WB-49	1012+50	64 RT	70	SPT
						WB-50	1014+00	60 LT	95	SPT
						WB-50A	1014+00	60 RT	105	SPT
						WB-51	1015+50	60 RT	69	CPT
						WB-51A	1015+50	55 LT	100	SPT
						WB-52	1017+00	60 LT	80	SPT
						WB-52A	1017+00	65 RT	100	SPT
						WB-53A	1018+50	60 LT	67	CPT
						WB-53	1018+50	70 RT	110	SPT
						WB-53E	1019+25	60 LT	75	SPT
						WB-53B	1019+50	60 LT	75	SPT
						WB-53G	1019+50	10 LT	50	SPT
						WB-53C	1019+50	60 RT	100	CPT
						WB-53F	1019+75	60 LT	120	SPT
						WB-54	1020+55	34 LT	84	CPT
						WB-55	1020+40	CL	100	SPT
						MB-2	1020+81	59 LT	75	SPT

1. Measured from top of leveling pad to top of coping.

Table 6

Summary of Wall Locations and Subsurface Exploration

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Structure Location						Boring Data				
Wall No.	Alignments	Approx. Station Start	Approx. Station End	Total Length (ft)	[1]Maximum Height (ft)	No.	Station	Offset (ft)	Depth (ft)	Boring Type
7	SR 429	1024+72	1056+12	6,531	33	MB-10	1025+45	56 LT	75	SPT
						MB-9	1025+50	85 RT	85	SPT
						WB-56	1025+80	CL	100	SPT
						MB-12	1026+50	25 RT	68	CPT
						WB-57	1026+50	80 RT	90	SPT
						MB-13	1026+75	58 LT	75	SPT
						MB-14	1027+36	63 RT	115	SPT
						WB-58	1028+07	60 LT	80	SPT
						MB-15	1028+40	65 RT	75	SPT
						WB-59	1029+50	68 RT	71	CPT
						WB-60	1030+60	60 LT	55	SPT
						WB-61	1032+25	60 RT	70	SPT
						WB-62	1034+20	60 LT	40	CPT
						WB-63	1035+50	52 RT	45	SPT
						WB-64	1036+98	62 LT	65	SPT
						WB-65	1038+50	60 RT	40	CPT
						WB-66	1040+00	40 LT	30	SPT
						WB-67	1041+44	60 RT	30	SPT
						WB-68	1043+00	60 LT	35	CPT
						WB-69	1044+50	60 RT	35	SPT
						WB-70	1045+96	60 LT	60	SPT
						WB-71	1047+50	60 RT	40	CPT
						WB-72	1049+00	60 LT	65	SPT
						WB-73	1050+48	65 RT	55	SPT
						WB-74	1052+00	60 LT	55	CPT
						WB-75	1053+48	71 RT	60	SPT
						WB-76	1055+01	61 LT	65	SPT
						WB-77	1055+20	15 RT	90	SPT

1. Measured from top of leveling pad to top of coping.

Table 6

Summary of Wall Locations and Subsurface Exploration

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Structure Location						Boring Data				
Wall No.	Alignments	Approx. Station Start	Approx. Station End	Total Length (ft)	[1]Maximum Height (ft)	No.	Station	Offset (ft)	Depth (ft)	Boring Type
8	SR 429 / Ramp E / Ramp F	1059+46	712+00 (Ramp F) 616+60 (Ramp E)	3,984	32	WB-78	1060+00	70 RT	54	CPT
						WB-79	1060+45	CL	100	SPT
						WB-80	1061+50	60 LT	75	SPT
						WB-81	1063+00	75 RT	70	SPT
						WB-82	1064+50	70 LT	70	SPT
						WB-83	1066+00	95 LT	57	CPT
						WB-84	1067+50	70 LT	65	SPT
						WB-85	2128+50	55 LT	60	SPT
						WB-87	1070+50	70 LT	70	SPT
						WB-88	2131+50	40 LT	65	SPT
						WB-90	1073+50	85 LT	75	SPT
						WB-93	3157+00	45 RT	70	SPT
						WB-100	3157+00	45 RT	60	CPT
						WB-103	3160+00	45 RT	25	SPT
9	SR 429	1068+76	1082+19	2,244	30	WB-86	1069+00	60 RT	65	SPT
						WB-89	1072+00	60 RT	50	CPT
						WB-92	1075+00	60 RT	70	SPT
						WB-94	1077+00	40 LT	55	CPT
						WB-96	1078+50	90 LT	55	SPT
						WB-95	1078+80	60 RT	55	SPT
						WB-97	1079+50	60 LT	60	SPT
						WB-99	1080+80	CL	100	SPT
						WB-98	1081+00	60 RT	49	CPT
10	SR 429	1083+48	1104+70	4,578	32	WB-101	1084+80	CL	100	SPT
						WB-102	1085+00	60 RT	70	SPT
						WB-104	1086+50	60 LT	55	SPT
						WB-105	1088+00	60 RT	55	SPT
						WB-106	1089+50	60 LT	55	SPT
						WB-107	1091+00	60 RT	60	SPT
						WB-108	1092+50	60 LT	45	CPT
						WB-109	1044+00	60 RT	45	SPT
						WB-110	1095+50	60 LT	50	SPT
						WB-111	1097+00	60 RT	50	SPT
						WB-112	1099+50	60 LT	44	CPT
						WB-113	1100+66	60 RT	50	SPT
						WB-114	1101+50	60 LT	55	SPT
						WB-115	1103+00	60 RT	60	CPT
						WB-116	1103+40	CL	100	SPT

1. Measured from top of leveling pad to top of coping.

Table 6

Summary of Wall Locations and Subsurface Exploration

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Structure Location						Boring Data				
Wall No.	Alignments	Approx. Station Start	Approx. Station End	Total Length (ft)	[1]Maximum Height (ft)	No.	Station	Offset (ft)	Depth (ft)	Boring Type
11	SR 429	1109+48	1114+56	1,189	32	WB-117	1110+85	CL	100	SPT
						WB-118	1111+00	60 LT	60	CPT
						WB-119	1112+50	60 RT	80	SPT
						WB-120	1114+00	60 LT	55	SPT
14	WB Frontage Rd.	3088+68	3104+40	1,572	22	WB-50	1014+00	60 LT	95	SPT
						WB-52B	1018+00	123 LT	80	SPT
						WB-53D	1019+50	124 LT	100	SPT
						MB-1	1020+12	162 LT	75	SPT
						MB-3	1021+32	152 LT	75	SPT
						MB-5	1022+60	122 LT	75	SPT
						MB-6	1023+68	118 LT	75	SPT
						MB-8	1024+83	150 LT	75	SPT
						MB-11	1026+04	149 LT	75	SPT
						WB-58	1028+07	60 LT	80	SPT
15	S. Orange Ave. Ext.	814+60	817+50	290	20	WB-113	1100+66	60 RT	50	SPT
						WB-121	815+50	15 LT	60	SPT
						WB-115	1103+00	60 RT	60	CPT
Gravity Walls										
GW1	Wekiva Trail Driveway	71+00	75+00	400	5	GW-1	71+50	15 LT	10	SPT
						GW-2	73+00	15 LT	10	SPT
						GW-3	74+50	15 LT	10	SPT
GW2	EB Frontage Road	2050+03	2052+60	257	2	EB-990	989+99	137 RT	20	AB
						EB-991	990+99	118 RT	5	AB
						EB-992	992+00	142 RT	5	AB
GW3	EB Frontage Road	2110+57	2115+57	500	4	EB-1050	1050+00	130 RT	20	AB
						EB-1051	1051+00	133 RT	5	AB
						EB-1052	1052+00	140 RT	5	AB
						EB-1053	1053+00	141 RT	5	AB
						EB-1054	1054+00	143 RT	5	AB
						EB-1055	1055+01	98 RT	20	AB
GW4	S. Orange Ave. Ext.	812+53	814+60	207	2	OA-813	813+00	18 RT	5	AB
						OA-814	814+00	13 LT	5	AB
						WB-121	815+50	15 LT	60	SPT

1. Measured from top of leveling pad to top of coping.

Table 6

Summary of Wall Locations and Subsurface Exploration

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Structure Location						Boring Data				
Wall No.	Alignments	Approx. Station Start	Approx. Station End	Total Length (ft)	[1]Maximum Height (ft)	No.	Station	Offset (ft)	Depth (ft)	Boring Type
Permanent Sheet Pile Wall										
SPW1	SR 429	1018+30	1029+70	1,140	0	WB-135	1019+30	182 LT	140	SPT
						MB-1	1020+12	162 LT	75	SPT
						WB-136	1020+80	178 LT	165	SPT
						MB-3	1021+32	152 LT	75	SPT
						WB-137	1021+85	170 LT	135	SPT
						MB-5	1022+60	122 LT	75	SPT
						MB-6	1023+68	118 LT	75	SPT
						WB-138	1022+85	175 LT	150	SPT
						WB-139	1023+74	175 LT	125	SPT
						MB-8	1024+83	150 LT	75	SPT
						WB-140	1025+25	178 LT	140	SPT
						MB-11	1026+04	149 LT	75	SPT
						WB-141	1026+80	180 LT	135	SPT
CIP Cantilever Retaining Wall										
CIP1	WB Frontage Rd.	3027+00	3034+00	700	7	WB-124	3028+00	115 LT	15	SPT
						WB-125	3029+50	115 LT	15	SPT
						WB-126	3031+00	115 LT	15	SPT
						WB-127	3032+50	115 LT	15	SPT
						WB-128	3034+00	115 LT	15	SPT
Noise Wall										
NW1	WB Frontage Rd.	3146+50	3160+70	1,420	20	WB-129	3146+50	32 LT	30	SPT
						WB-130	3148+70	40 LT	30	SPT
						WB-131	3152+20	8 RT	30	SPT
						WB-134	3155+60	35 LT	30	SPT
						WB-135	3157+80	55 LT	30	SPT
						WB-136	3160+70	70 LT	30	SPT

1. Measured from top of leveling pad to top of coping.

SUMMARY OF GROUNDWATER TABLES AND PIEZOMETRIC SURFACE ELEVATIONS

Table 7

Summary of Groundwater Tables and Piezometric Surface Elevations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall No.	No.	Station	Offset (ft)	Approximate Existing Ground Surface Elevation (ft NAVD88)	Encountered Groundwater Elevation (ft NAVD8)	Estimated Seasonal High Groundwater Elevation (ft NAVD8)	Approximate Potentiometric Surface Elelvation (ft NAVD88)	NRCS Soil Survey Soil Unit No.
2	WB-15	954+40	100 LT	+56.9	---	---	+20.0	6
3	WB-16	956+00	65 RT	+56.1	+47.9	+49.1	+20.0	6
	WB-17	957+40	60 LT	+58.4	+31.4	+42.4	+20.0	6
	WB-18	959+00	155 RT	+57.4	---	---	+20.0	6
	WB-19	960+40	60 LT	+54.2	+40.2	+46.2	+20.0	6
	WB-20	962+00	62 RT	+56.9	+39.9	+43.9	+20.0	6
	WB-21	963+00	CL	+56.4	+34.4	+42.4	+20.0	6
4	WB-22	968+60	CL	+56.3	+34.3	+42.3	+20.0	6
	WB-23	969+00	65 LT	+54.8	---	---	+20.0	6
	WB-24	970+50	60 RT	+56.1	+43.1	+45.1	+20.0	31
	WB-25	972+00	27 LT	+55.2	+32.2	+41.2	+20.0	31
	WB-26	973+50	62 RT	+55.4	---	---	+20.0	31
	WB-27	975+00	65 LT	+54.6	+37.6	+41.6	+20.0	31
	WB-28	976+50	62 RT	+55.8	+40.8	+42.8	+20.0	31
	WB-29	977+40	CL	+54.1	+37.1	+42.6	+20.0	31
5	WB-30	983+00	CL	+55.0	+43.0	+46.0	+20.0	6
	WB-30A	983+00	60 LT	+54.3	+39.3	+45.8	+20.0	6
	WB-30B	983+00	60 RT	+55.5	---	---	+20.0	6
	WB-31	984+00	65 LT	+54.2	---	---	+20.0	6
	WB-31A	984+00	CL	+55.2	---	---	+20.0	6
	WB-31B	984+00	60 RT	+55.5	+45.5	+46.5	+20.0	6
	WB-32	985+50	62 RT	+55.5	+42.5	+44.5	+20.0	6
	WB-33	987+00	67 LT	+53.3	+41.3	+44.3	+20.0	6
	WB-34	988+50	62 RT	+54.7	---	---	+20.0	6
	WB-35	990+00	62 LT	+53.6	+40.6	+43.6	+20.0	6
	WB-36	991+50	62 RT	+55.7	+46.7	+48.2	+20.0	31
	WB-37	993+00	62 LT	+53.9	---	---	+21.0	6
	WB-38	994+50	62 RT	+55.5	+42.5	+44.5	+21.0	31
	WB-39	996+00	62 LT	+55.2	+42.2	+45.2	+21.0	6
	WB-40	997+50	62 RT	+53.6	---	---	+21.0	6

Table 7

Summary of Groundwater Tables and Piezometric Surface Elevations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall No.	No.	Station	Offset (ft)	Approximate Existing Ground Surface Elevation (ft NAVD88)	Encountered Groundwater Elevation (ft NAVD8)	Estimated Seasonal High Groundwater Elevation (ft NAVD8)	Approximate Potentiometric Surface Elelvation (ft NAVD88)	NRCS Soil Survey Soil Unit No.
6	WB-41	999+00	100 LT	+51.2	+40.2	+43.2	+21.0	6
	WB-42	1002+00	80 LT	+47.6	---	---	+21.0	31
	WB-43	1003+50	40 RT	+46.6	+34.6	+37.6	+21.0	31
	WB-44	1005+00	64 LT	+45.1	+33.1	+35.1	+21.0	27
	WB-45	1006+50	35 RT	+43.9	---	---	+21.0	27
	WB-46	1008+00	53 LT	+42.4	+28.4	+34.4	+21.0	27
	WB-47	1009+50	74 RT	+44.8	+33.3	+35.3	+21.0	27
	WB-48	1011+00	62 LT	+42.5	---	---	+21.0	27
	WB-49A	1012+50	70 LT	+41.5	---	---	+21.0	27
	WB-49	1012+50	64 RT	+42.7	+30.2	+36.7	+21.0	35
	WB-50	1014+00	60 LT	+40.6	+31.6	+35.6	+21.0	35
	WB-50A	1014+00	60 RT	+41.2	+35.2	+36.2	+21.0	35
	WB-51	1015+50	60 RT	+39.5	---	---	+22.0	35
	WB-51A	1015+50	55 LT	+39.7	+33.5	+34.7	+22.0	35
	WB-52	1017+00	60 LT	+39.7	+27.7	+35.7	+22.0	35
	WB-52A	1017+00	65 RT	+38.4	+36.0	+36.4	+22.0	35
	WB-53A	1018+50	60 LT	+39.4	---	---	+22.0	35
	WB-53	1018+50	70 RT	+39.6	+31.2	+35.6	+22.0	35
	WB-53E	1019+25	60 LT	+37.2	+33.1	+35.2	+22.0	10
	WB-53B	1019+50	60 LT	+35.5	+32.5	+33.5	+22.0	10
	WB-53G	1019+50	10 LT	+37.7	+32.0	+34.2	+22.0	10
	WB-53C	1019+50	60 RT	+38.7	---	---	+22.0	10
	WB-53F	1019+75	60 LT	+33.8	+30.3	+32.8	+22.0	10
	WB-54	1020+55	34 LT	+34.3	---	---	+22.0	10
	WB-55	1020+40	CL	+37.1	+30.0	+32.6	+22.0	10
	MB-2	1020+81	59 LT	+36.9	+29.5	+31.9	+23.0	10

Table 7

Summary of Groundwater Tables and Piezometric Surface Elevations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall No.	No.	Station	Offset (ft)	Approximate Existing Ground Surface Elevation (ft NAVD88)	Encountered Groundwater Elevation (ft NAVD8)	Estimated Seasonal High Groundwater Elevation (ft NAVD8)	Approximate Potentiometric Surface Elelvation (ft NAVD88)	NRCS Soil Survey Soil Unit No.
7	MB-10	1025+45	56 LT	+34.4	+28.9	+31.9	+23.0	10
	MB-9	1025+50	85 RT	+39.5	+30.0	+33.0	+23.0	10
	WB-56	1025+80	CL	+37.2	+31.4	+32.9	+23.0	10
	MB-12	1026+50	25 RT	+37.0	---	---	+23.0	10
	WB-57	1026+50	80 RT	+38.8	+28.8	+32.3	+23.0	10
	MB-13	1026+75	58 LT	+38.1	+30.4	+32.1	+23.0	10
	MB-14	1027+36	63 RT	+39.0	+31.0	+32.0	+23.0	10
	WB-58	1028+07	60 LT	+39.4	+26.9	+32.4	+23.0	10
	MB-15	1028+40	65 RT	+41.9	+28.9	+33.9	+23.0	10
	WB-59	1029+50	68 RT	+41.6	---	---	+23.0	20
	WB-60	1030+60	60 LT	+51.5	+38.5	+40.5	+23.0	27
	WB-61	1032+25	60 RT	+49.5	+36.5	+41.0	+24.0	27
	WB-62	1034+20	60 LT	+52.6	---	---	+24.0	6
	WB-63	1035+50	52 RT	+48.7	+33.7	+40.7	+24.0	6
	WB-64	1036+98	62 LT	+54.9	+41.5	+42.9	+24.0	6
	WB-65	1038+50	60 RT	+47.9	---	---	+24.0	6
	WB-66	1040+00	40 LT	+51.0	+38.0	+42.0	+24.0	6
	WB-67	1041+44	60 RT	+49.6	+37.6	+41.6	+24.0	6
	WB-68	1043+00	60 LT	+45.4	---	---	+24.0	6
	WB-69	1044+50	60 RT	+49.1	+37.1	+42.1	+24.0	2
	WB-70	1045+96	60 LT	+46.4	+35.4	+43.4	+24.0	2
	WB-71	1047+50	60 RT	+47.5	---	---	+24.0	2
	WB-72	1049+00	60 LT	+49.4	+38.4	+43.4	+24.0	2
	WB-73	1050+48	65 RT	+47.7	+39.6	+42.7	+24.0	27
	WB-74	1052+00	60 LT	+49.4	---	---	+24.0	2
	WB-75	1053+48	71 RT	+49.1	+41.8	+43.1	+24.0	27
	WB-76	1055+01	61 LT	+49.1	+39.4	+41.6	+25.0	31
	WB-77	1055+20	15 RT	+48.4	+37.9	+40.9	+25.0	27

Table 7

Summary of Groundwater Tables and Piezometric Surface Elevations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall No.	No.	Station	Offset (ft)	Approximate Existing Ground Surface Elevation (ft NAVD88)	Encountered Groundwater Elevation (ft NAVD8)	Estimated Seasonal High Groundwater Elevation (ft NAVD8)	Approximate Potentiometric Surface Elelvation (ft NAVD88)	NRCS Soil Survey Soil Unit No.
8	WB-78	1060+00	70 RT	+47.0	---	---	+25.0	27
	WB-79	1060+45	CL	+51.7	+38.9	+42.2	+25.0	6
	WB-80	1061+50	60 LT	+55.5	+41.5	+42.5	+25.0	6
	WB-81	1063+00	75 RT	+53.3	+38.1	+41.3	+25.0	6
	WB-82	1064+50	70 LT	+53.9	+38.4	+41.4	+25.0	6
	WB-83	1066+00	95 LT	+53.2	---	---	+25.0	6
	WB-84	1067+50	70 LT	+54.5	+40.5	+43.5	+25.0	6
	WB-85	2128+50	55 LT	+54.0	+39.2	+42.0	+25.0	6
	WB-87	1070+50	70 LT	+57.0	+42.0	+44.0	+25.0	31
	WB-88	2131+50	40 LT	+54.7	+41.7	+43.7	+25.0	31
	WB-90	1073+50	85 LT	+57.6	+42.6	+45.6	+25.0	31
	WB-93	3157+00	45 RT	+58.2	+43.2	+50.2	+25.0	31
	WB-100	3157+00	45 RT	+62.1	---	---	+25.0	31
	WB-103	3160+00	45 RT	+64.0	+49.0	+54.0	+25.0	31
9	WB-86	1069+00	60 RT	+53.8	+38.8	+42.8	+25.0	6
	WB-89	1072+00	60 RT	+56.3	---	---	+25.0	31
	WB-92	1075+00	60 RT	+59.0	+45.0	+47.0	+26.0	31
	WB-94	1077+00	40 LT	+60.0	---	---	+26.0	31
	WB-96	1078+50	90 LT	+60.5	+46.5	+46.5	+26.0	31
	WB-95	1078+80	60 RT	+61.5	+46.5	+48.5	+26.0	31
	WB-97	1079+50	60 LT	+60.8	+45.8	+48.8	+26.0	31
	WB-99	1080+80	CL	+61.0	+51.2	+52.0	+26.0	31
	WB-98	1081+00	60 RT	+62.2	---	---	+26.0	31
10	WB-101	1084+80	CL	+68.8	+53.8	+59.8	+26.0	31
	WB-102	1085+00	60 RT	+66.7	+54.7	+57.7	+26.0	31
	WB-104	1086+50	60 LT	+67.4	+54.4	+59.4	+26.0	31
	WB-105	1088+00	60 RT	+66.0	+51.0	+59.0	+26.0	31
	WB-106	1089+50	60 LT	+66.7	+56.7	+59.7	+26.0	31
	WB-107	1091+00	60 RT	+67.4	+52.4	+60.4	+26.0	31
	WB-108	1092+50	60 LT	+68.0	---	---	+27.0	31
	WB-109	1044+00	60 RT	+69.7	+54.7	+59.7	+27.0	31
	WB-110	1095+50	60 LT	+70.7	+55.7	+60.7	+27.0	31
	WB-111	1097+00	60 RT	+72.6	+57.6	+61.6	+27.0	31
	WB-112	1099+50	60 LT	+72.0	---	---	+27.0	31
	WB-113	1100+66	60 RT	+71.2	+58.2	+63.2	+27.0	31
	WB-114	1101+50	60 LT	+71.1	+59.1	+63.1	+28.0	31
	WB-115	1103+00	60 RT	+72.4	---	---	+28.0	31
	WB-116	1103+40	CL	+72.8	+62.8	+64.8	+28.0	31

Table 7

Summary of Groundwater Tables and Piezometric Surface Elevations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall No.	No.	Station	Offset (ft)	Approximate Existing Ground Surface Elevation (ft NAVD88)	Encountered Groundwater Elevation (ft NAVD8)	Estimated Seasonal High Groundwater Elevation (ft NAVD8)	Approximate Potentiometric Surface Elelvation (ft NAVD88)	NRCS Soil Survey Soil Unit No.
11	WB-117	1110+85	CL	+74.4	+62.4	+66.4	+28.0	2
	WB-118	1111+00	60 LT	+74.7	---	---	+28.0	2
	WB-119	1112+50	60 RT	+75.5	+64.5	+66.5	+28.0	2
	WB-120	1114+00	60 LT	+75.8	+65.8	+60.8	+28.0	2
14	WB-50	1014+00	60 LT	+40.6	+31.6	+35.6	+22.0	35
	WB-52B	1018+00	123 LT	+39.7	+32.5	+36.7	+22.0	35
	WB-53D	1019+50	124 LT	+33.9	+30.7	+32.9	+22.0	10
	MB-1	1020+12	162 LT	+32.6	+30.9	+32.6	+23.0	10
	MB-3	1021+32	152 LT	+31.1	+26.3	+31.1	+23.0	10
	MB-5	1022+60	122 LT	+36.7	+29.2	+32.2	+23.0	10
	MB-6	1023+68	118 LT	+35.7	+30.3	+32.2	+23.0	10
	MB-8	1024+83	150 LT	+33.6	+29.5	+32.0	+23.0	10
	MB-11	1026+04	149 LT	+34.8	+29.8	+32.3	+23.0	10
	WB-58	1028+07	60 LT	+39.4	+26.9	+32.4	+23.0	10
15	WB-113	1100+66	60 RT	+71.2	+58.2	+63.2	+27.0	31
	WB-121	815+50	15 LT	+70.9	+62.5	+63.4	+28.0	31
	WB-115	1103+00	60 RT	+72.4	---	---	+28.0	31
GW1	GW-1	71+50	15 LT	+55.3	GNE @ +45.3	---	+21.0	6
	GW-2	73+00	15 LT	+55.4	GNE @ +45.4	---	+21.0	6
	GW-3	74+50	15 LT	+54.8	GNE @ +44.8	---	+21.0	6
GW2	EB-990	989+99	137 RT	+53.0	+38.8	+40.8	+20.0	6
	EB-991	990+99	118 RT	+55.4	GNE @ +50.4	---	+20.0	31
	EB-992	992+00	142 RT	+53.6	GNE @ +48.6	---	+20.0	31
GW3	EB-1050	1050+00	130 RT	+46.8	+36.8	+38.8	+24.0	27
	EB-1051	1051+00	133 RT	+46.8	GNE @ +41.8	---	+24.0	27
	EB-1052	1052+00	140 RT	+46.6	GNE @ +41.6	---	+24.0	27
	EB-1053	1053+00	141 RT	+46.4	GNE @ +41.4	---	+24.0	27
	EB-1054	1054+00	143 RT	+46.2	GNE @ +41.2	---	+24.0	27
	EB-1055	1055+01	98 RT	+48.8	+37.6	+40.0	+25.0	27
GW4	OA-813	813+00	18 RT	+70.3	GNE @ +65.3	---	+28.0	31
	OA-814	814+00	13 LT	+70.6	GNE @ +65.6	---	+28.0	31
	WB-121	815+50	15 LT	+70.9	+62.5	+63.4	+28.0	31

Table 7

Summary of Groundwater Tables and Piezometric Surface Elevations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall No.	No.	Station	Offset (ft)	Approximate Existing Ground Surface Elevation (ft NAVD88)	Encountered Groundwater Elevation (ft NAVD8)	Estimated Seasonal High Groundwater Elevation (ft NAVD8)	Approximate Potentiometric Surface Elelvation (ft NAVD88)	NRCS Soil Survey Soil Unit No.
SPW1	WB-135	1019+30	182 LT	+31.6	+30.8	+31.6	+23.0	10
	MB-1	1020+12	162 LT	+32.6	+30.9	+32.6	+23.0	10
	WB-136	1020+80	178 LT	+30.8	+30.3	AGS	+23.0	10
	MB-3	1021+32	152 LT	+31.1	+26.3	+31.1	+23.0	10
	WB-137	1021+85	170 LT	+32.6	+27.6	+31.6	+23.0	10
	MB-5	1022+60	122 LT	+36.7	+29.2	+32.2	+23.0	10
	MB-6	1023+68	118 LT	+35.7	+30.3	+32.2	+23.0	10
	WB-138	1022+85	175 LT	+35.8	+30.4	+32.8	+23.0	10
	WB-139	1023+74	175 LT	+34.7	+31.5	+33.7	+23.0	10
	MB-8	1024+83	150 LT	+33.6	+29.5	+32.0	+23.0	10
	WB-140	1025+25	178 LT	+33.1	+29.7	+32.6	+23.0	10
	MB-11	1026+04	149 LT	+34.8	+29.8	+32.3	+23.0	10
	WB-141	1026+80	180 LT	+35.3	+31.6	+33.8	+23.0	10
CIP1	WB-124	3028+00	115 LT	+55.0	GNE @ +40.0	---	+21.0	6
	WB-125	3029+50	115 LT	+57.5	GNE @ +42.5	---	+21.0	6
	WB-126	3031+00	115 LT	+59.7	GNE @ +44.7	---	+21.0	6
	WB-127	3032+50	115 LT	+61.2	GNE @ +46.2	---	+21.0	6
	WB-128	3034+00	115 LT	+60.1	GNE @ +45.1	---	+21.0	6
NW1	WB-129	3146+50	32 LT	+56.9	+41.9	+48.9	+29.0	31
	WB-130	3148+70	40 LT	+57.2	+45.2	+52.2	+29.0	31
	WB-131	3152+20	8 RT	+59.4	+48.4	+55.4	+29.0	31
	WB-134	3155+60	35 LT	+61.1	+48.7	+55.1	+29.0	31
	WB-135	3157+80	55 LT	+64.5	+52.0	+58.0	+29.0	31
	WB-136	3160+70	70 LT	+65.7	+60.2	+61.7	+29.0	31

MSE WALL MINIMUM STRAP LENGTHS AND FACTORED BEARING PRESSURES

SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY

Table Date 1-01-11

Wall No. 2	Wall Height (ft.)	0-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Reinforcement Length (ft.)	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Factored Bearing Resistance (psf)	5609	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wall No. 3	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	-	-	-	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	-	-	-	-	-
	Factored Bearing Resistance (psf)	5609	5766	6424	6469	6521	6581	7232	7303	7933	8012	-	-	-	-	-
Wall No. 4	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	34	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	23	24	-	-
	Factored Bearing Resistance (psf)	5609	5766	6424	6469	6521	6581	7232	7303	7933	8012	8094	8714	8801	-	-
Wall No. 5	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	-	-	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	21	22	-	-	-	-
	Factored Bearing Resistance (psf)	3889	3914	4363	4407	4455	4506	4954	5012	5448	5873	5939	-	-	-	-
*Wall No. 6	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	34	36	38
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	23	24	26	27
	Factored Bearing Resistance (psf)	5319	5354	5987	6049	6116	6187	6818	6899	7513	7601	7691	8298	8393	8991	9089
*Wall No. 7 (1024+72 to 1035+00)	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	34	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	23	24	-	-
	Factored Bearing Resistance (psf)	4789	4837	5424	5494	5567	5643	6230	6315	6888	6979	7070	7639	7733	-	-

NOTES:

1. The reinforcement strap lengths shown above are the minimum lengths required for external stability. The reinforcement lengths used in the construction of the retaining walls will be the longer of that required for external or internal stability (determined by proprietary wall companies).
2. The Factored Bearing Resistances shown above are the critical (lowest) values from all the load cases analyzed using LRFD methodology.

* 3. Listed soil reinforcement lengths is dependent on performance of surcharge at wall location. For details regarding surcharge, see Surcharge Control sheets.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (8 of 10)

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-14A

SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY

Table Date 1-01-11

Wall No. 7 (1035+00 to 1053+00)	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	34	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	23	24	-
	Factored Bearing Resistance (psf)	4374	4445	5008	5093	5180	5269	5836	5930	6489	6588	6686	7242	7344	-
Wall No. 7 (1053+00 to 1056+12)	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	34	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	23	24	-
	Factored Bearing Resistance (psf)	5066	5099	5702	5761	5824	5893	6493	6571	7155	7240	7325	7903	7993	-
Wall No. 8	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	23	-	-
	Factored Bearing Resistance (psf)	4883	4942	5550	5628	5710	5794	6404	6496	7093	7191	7289	7882	-	-
Wall No. 9	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	-	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	17	19	20	21	-	-	-
	Factored Bearing Resistance (psf)	5319	5354	5987	6049	6116	6187	6818	6899	7513	7601	7691	-	-	-
Wall No. 10	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	-	-
	Reinforcement Length (ft.)	8	9	11	12	14	15	17	19	20	22	24	25	-	-
	Factored Bearing Resistance (psf)	3270	3328	3742	3810	4219	4292	4698	5099	5179	5578	5975	6059	-	-
Wall No. 11	Wall Height (ft.)	0-10	12	14	16	18	20	22	24	26	28	30	32	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	15	17	18	20	22	23	25	-	-
	Factored Bearing Resistance (psf)	3373	3426	3846	3909	3974	4393	4803	4877	5283	5685	5765	6166	-	-

NOTES:
1. The reinforcement strap lengths shown above are the minimum lengths required for external stability. The reinforcement lengths used in the construction of the retaining walls will be the longer of that required for external or internal stability (determined by proprietary wall companies).
2. The Factored Bearing Resistances shown above are the critical (lowest) values from all the load cases analyzed using LRFD methodology.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (9 of 10)
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO.: BW-14B

SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY

Table Date 1-01-11

* Wall No. 14 (3088+68 to 3095+20)	Wall Height (ft.)	0-10	12	14	16	18	-	-	-
	Reinforcement Length (ft.)	8	9	11	12	13	-	-	-
	Factored Bearing Resistance (psf)	4012	4118	4675	4788	4898	-	-	-
Wall No. 14 (3095+20 to 3102+00)	Wall Height (ft.)	0-10	12	14	16	18	20	22	-
	Reinforcement Length (ft.)	8	9	11	12	13	14	16	-
	Factored Bearing Resistance (psf)	3722	3843	4384	4507	4628	4746	5299	-
Wall No. 14 (3102+00 to 3104+00)	Wall Height (ft.)	0-10	12	14	16	-	-	-	-
	Reinforcement Length (ft.)	8	9	11	12	-	-	-	-
	Factored Bearing Resistance (psf)	4303	4392	4961	5068	-	-	-	-
Wall No. 15	Wall Height (ft.)	0-10	12	14	16	18	20	-	-
	Reinforcement Length (ft.)	10	12	13	15	16	18	-	-
	Factored Bearing Resistance (psf)	2262	2777	3003	3514	3719	4230	-	-

NOTES:

1. The reinforcement strap lengths shown above are the minimum lengths required for external stability. The reinforcement lengths used in the construction of the retaining walls will be the longer of that required for external or internal stability (determined by proprietary wall companies).
2. The Factored Bearing Resistances shown above are the critical (lowest) values from all the load cases analyzed using LRFD methodology.

* 3. Listed soil reinforcement lengths is dependent on performance of surcharge at wall location. For details regarding surcharge, see Surcharge Control sheets.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (10 of 10)

REF. DWG. NO.:

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO.: BW-14C

SOIL PARAMETERS FOR DESIGN OF MSE WALLS

GEOTECHNICAL INFORMATION WALL NO. 2				Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-13	13-50
Effective Unit Weight (pcf)	105	115	100	43
Cohesion (psf)	0	0	0	0
Internal Friction Angle	30^o	32^o	28^o	30^o

GEOTECHNICAL INFORMATION WALL NO. 3				Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-13	13-50
Effective Unit Weight (pcf)	105	115	100	43
Cohesion (psf)	0	0	0	0
Internal Friction Angle	30^o	32^o	28^o	30^o

GEOTECHNICAL INFORMATION WALL NO. 4				Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-13	13-60
Effective Unit Weight (pcf)	105	115	100	43
Cohesion (psf)	0	0	0	0
Internal Friction Angle	30^o	32^o	28^o	30^o

NOTES [Notes Date 07-01-14]:

1. Concrete facing panel surfaces treatment will be Ashlar Stone.

2. If required, the soil reinforcement and fasteners for the abutment back wall will be designed and furnished by the proprietary wall company. The soil reinforcement will be designed to resist a factored horizontal load shown on the individual bridge sheets. The cost of soil reinforcement and fasteners will be included in the cost of the Retaining Wall System.

3. Applicable FDOT Wall Types for each wall location are listed below. See the Approved Products List for approved Wall Systems and Design Standards Index No. 6020 for allowable Wall Type substitutions. All Walls – FDOT Wall Type 2A.

4. Concrete for Coping and/or Junction Slab shall be Class IV (fc = 5,500 psi). without silica fume, metakaolin or ultrafine fly ash.

5. See Design Standards Index. No. 6020 for General Notes and Details.

NOTE:
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (1 of 10)

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-8

GEOTECHNICAL INFORMATION WALL NO. 5						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Stiff Sandy Clay	Loose to Medium Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-10	10-33	33-43	43-60
Effective Unit Weight (pcf)	105	115	100	43	58	43
Cohesion (psf)	0	0	0	0	1500	0
Internal Friction Angle	30°	32°	28°	30°	-	30°

GEOTECHNICAL INFORMATION WALL NO. 6 (999+00 to 1006+50)				Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-10	10-30
Effective Unit Weight (pcf)	105	115	105	43
Cohesion (psf)	0	0	0	0
Internal Friction Angle	30°	32°	30°	30°

NOTE:
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

GEOTECHNICAL INFORMATION WALL NO. 6 (1006+50 to 1014+50)							Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Soft to Stiff Sandy Lean Clay to Fat Clay	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-6	6-23	23-33	33-54	54-70
Effective Unit Weight (pcf)	105	115	105	43	53	43	38
Cohesion (psf)	0	0	0	0	750	0	0
Internal Friction Angle	30°	32°	30°	30°	-	30°	28°

GEOTECHNICAL INFORMATION WALL NO. 6 (1014+50 to 1020+00)							Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-4	4-15	15-33	33-54	54-70
Effective Unit Weight (pcf)	105	115	105	43	38	43	38
Cohesion (psf)	0	0	0	0	0	0	0
Internal Friction Angle	30°	32°	30°	30°	28°	30°	28°

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (2 of 10)
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO.: BW-9

Scott 4/17/2017 12:28:44 PM J:\D109\3520G Wekiva Parkway Section 7A\notesandtables.dgn

*GEOTECHNICAL INFORMATION WALL NO. 6 (1020+00 to 1021+80)							Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand to Clayey Fine Sand	Firm Muck	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-4	4-18	18-32	32-38	38-75
Effective Unit Weight (pcf)	105	115	105	43	38	13	43
Cohesion (psf)	0	0	0	0	0	500	0
Internal Friction Angle	30°	32°	30°	30°	28°	-	30°

*GEOTECHNICAL INFORMATION WALL NO. 7 (1024+72 to 1025+00)						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand	Loose to Medium Dense Fine Sand	Loose Mucky Fine Sand to Firm Sandy Muck	Loose to Medium Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-2	2-16	16-25	25-75
Effective Unit Weight (pcf)	105	115	105	43	23	43
Cohesion (psf)	0	0	0	0	0	0
Internal Friction Angle	30°	32°	30°	30°	20°	30°

*GEOTECHNICAL INFORMATION WALL NO. 7 (1025+00 to 1027+50)						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand	Loose to Medium Dense Fine Sand	Firm Sandy Muck to Muck to Loose Mucky Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-5	5-15	15-70	70-75
Effective Unit Weight (pcf)	105	115	105	43	18	43
Cohesion (psf)	0	0	0	0	750	0
Internal Friction Angle	30°	32°	30°	30°	-	30°

GEOTECHNICAL INFORMATION WALL NO. 7 (1027+50 to 1045+00)				Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-8	8-40
Effective Unit Weight (pcf)	105	115	105	43
Cohesion (psf)	0	0	0	0
Internal Friction Angle	30°	32°	30°	30°

NOTES
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

* Listed geotechnical information is dependent on performance of surcharge at wall location. For details regarding surcharge, see Surcharge Control sheets.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (3 of 10)
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO.: BW-10

Scott 4/17/2017 12:29:05 PM J:\D109\3520G Wekiva Parkway Section 7A\notesandtables.dgn

GEOTECHNICAL INFORMATION WALL NO. 7 (1045+00 to 1056+12)						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Medium Dense Fine Sand to Silty Fine Sand	Very Loose to Loose Silty to Clayey Fine Sand	Medium Dense to Very Dense Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-8	8-24	24-50	50-60
Effective Unit Weight (pcf)	105	115	105	53	38	58
Cohesion (psf)	0	0	0	0	0	0
Internal Friction Angle	30^o	32^o	30^o	32^o	28^o	33^o

GEOTECHNICAL INFORMATION WALL NO. 8						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Medium Dense Fine Sand to Silty Fine Sand	Very Loose to Loose Silty to Clayey Fine Sand	Medium Dense to Very Dense Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-13	13-27	27-50	50-60
Effective Unit Weight (pcf)	105	115	105	53	38	58
Cohesion (psf)	0	0	0	0	0	0
Internal Friction Angle	30^o	32^o	30^o	32^o	28^o	33^o

GEOTECHNICAL INFORMATION WALL NO. 9 (1068+76 to 1079+00)						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Medium Dense Fine Sand to Silty Fine Sand	Very Loose to Loose Silty to Clayey Fine Sand	Medium Dense to Very Dense Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-13	13-27	27-50	50-60
Effective Unit Weight (pcf)	105	115	105	53	38	58
Cohesion (psf)	0	0	0	0	0	0
Internal Friction Angle	30^o	32^o	30^o	32^o	28^o	33^o

GEOTECHNICAL INFORMATION WALL NO. 9 (1079+00 to 1082+19)						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Medium Dense Fine Sand to Silty Fine Sand	Firm to Stiff Fat Clay to Fat Clay with Sand	Medium Dense to Very Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-10	10-35	35-45	45-60
Effective Unit Weight (pcf)	105	115	105	53	58	58
Cohesion (psf)	0	0	0	0	1000	0
Internal Friction Angle	30^o	32^o	30^o	32^o	-	33^o

NOTE:
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (4 of 10)
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO.: BW-11

Scott 4/17/2017 12:29:26 PM J:\D109\3520G Wekiva Parkway Section 7A\notesandtables.dgn

GEOTECHNICAL INFORMATION WALL NO. 10						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Firm to Stiff Fat Clay to Fat Clay with Sand	Medium Dense to Very Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-8	8-35	35-45	45-55
Effective Unit Weight (pcf)	105	115	100	43	58	58
Cohesion (psf)	0	0	0	0	1000	0
Internal Friction Angle	30°	32°	28°	30°	-	33°

GEOTECHNICAL INFORMATION WALL NO. 11							Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Medium Dense to Dense Fine Sand to Silty Fine Sand	Firm Fat Clay to Fat Clay with Sand	Medium Dense to Very Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-10	10-18	18-38	38-48	48-55
Effective Unit Weight (pcf)	105	115	100	38	53	53	58
Cohesion (psf)	0	0	0	0	0	750	0
Internal Friction Angle	30°	32°	28°	28°	33°	-	33°

NOTE:
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (5 of 10)

REF. DWG. NO.:

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
RETAINING WALLS

SHEET NO.: BW-12

Scott 4/17/2017 12:29:47 PM J:\D109\3520G Wekiva Parkway Section 7A\notesandtables.dgn

GEOTECHNICAL INFORMATION WALL NO. 14 (3088+68, to 3095+20)							Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Very Loose to Loose Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-4	4-20	20-37	37-54	54-70
Effective Unit Weight (pcf)	105	115	105	43	38	43	38
Cohesion (psf)	0	0	0	0	0	0	0
Internal Friction Angle	30°	32°	30°	30°	28°	30°	28°

*GEOTECHNICAL INFORMATION WALL NO. 14 (3095+20 to 3102+00)						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Firm Sandy Muck to Muck to Loose Mucky Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-1	1-15	18-30	30-75
Effective Unit Weight (pcf)	105	115	105	43	13	43
Cohesion (psf)	0	0	0	0	500	0
Internal Friction Angle	30°	32°	30°	30°	-	30°

GEOTECHNICAL INFORMATION WALL NO. 14 (3102+00 to 3104+40)				Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand to Clayey Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-8	8-40
Effective Unit Weight (pcf)	105	115	105	43
Cohesion (psf)	0	0	0	0
Internal Friction Angle	30°	32°	30°	30°

GEOTECHNICAL INFORMATION WALL NO. 15						Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Very Loose to Loose Fine Sand to Silty Fine Sand	Loose to Medium Dense Fine Sand to Silty Fine Sand	Firm to Stiff Fat Clay to Fat Clay with Sand	Medium Dense to Very Dense Fine Sand to Silty Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-8	8-32	32-45	45-55
Effective Unit Weight (pcf)	105	115	38	43	58	58
Cohesion (psf)	0	0	0	0	1000	0
Internal Friction Angle	30°	32°	28°	30°	-	33°

NOTES
If the unit weight and/or internal friction angle of the fill proposed by the Contractor differs from that shown above, the Project Engineer will contact both the District Geotechnical Engineer and the Wall Designer for a possible redesign.

* Listed geotechnical information is dependent on performance of surcharge at wall location. For details regarding surcharge, see Surcharge Control sheets.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (6 of 10)
REF. DWG. NO.:
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS
SHEET NO.: BW-13

Scott 4/17/2017 12:30:08 PM J:\D109\3520G Wekiva Parkway Section 7A\notesandtables.dgn

MSE WALL SETTLEMENT ESTIMATES

RETAINING WALL VARIABLES

Table Date 7-01-13

Wall No.	Wall Settlement				Design High Water Elevation (ft.)
	Long Term Settlement (in.)	Short Term Settlement (in.)	Differential Settlement		
			Longitudinal (%) (ft./100ft.)	Transverse (in.)	
2 (954+00 to 955+85)	1.0	1.0-3.0	0.10	N/A	N/A
3 (954+00 to 958+00)	1.0	2.0-3.0	0.10	N/A	N/A
3 (958+00 to 964+07)	1.0	3.0-5.0	0.10	N/A	N/A
4	1.5	3.5-4.5	0.10	N/A	N/A
5 (981+93 to 989+00)	1.5	3.0-4.0	0.10	N/A	N/A
5 (989+00 to 997+44)	1.0	1.0-3.0	0.10	N/A	N/A
6 (999+00 to 1010+00)	1.0	1.0-3.0	0.10	N/A	N/A
*6 (1010+00 to 1021+28)	1.0	3.0-5.0	0.25	N/A	N/A
*7 (1024+72 to 1029+00)	1.0	0.5-1.5	0.25	N/A	N/A
7 (1029+00 to 1045+00)	1.0	1.5-3.5	0.10	N/A	N/A
7 (1045+00 to 10556+05)	1.5	3.5-5.0	0.20	N/A	N/A
8	1.5	2.5-4.5	0.10	N/A	N/A
9	1.5	3.0-4.5	0.25	N/A	N/A
10	1.5	3.0-4.5	0.50	N/A	N/A
11	1.5	4.0-4.5	0.10	N/A	N/A
*14	1.0	0.5-1.5	0.25	N/A	N/A
15	0.5	2.0-3.0	0.10	N/A	70.2

NOTE:
Design walls for the settlements noted in the table.
Long term settlement is measured from the end of wall fill placement.
Transverse differential settlement is measured from the face of wall to the end of the soil reinforcement.

* Listed settlements are dependent on performance of surcharge at wall location. For details regarding surcharge, see Surcharge Control sheets.

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SHEET TITLE: RETAINING WALL NOTES AND TABLES (7 of 10)

REF. DWG. NO.

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A RETAINING WALLS

SHEET NO. BW-14

SOIL PARAMETERS FOR DESIGN OF NOISE WALLS

Table 11

Soil Parameters for Design of Noise Wall Foundations

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3440G

Boring No.	Station	Offset (ft)	Depth Below Existing Ground Surface (feet)	Soil Type	[1]General N-Value Range	[1]Average N-Value	Soil Moist Unit Weight (pcf)	Soil Saturated Unit Weight (pcf)	Soil Effective (Buoyant) Unit Weight (pcf)	Soil Angle of Internal Friction (Φ)	Soil Cohesion (psf)	[2]Soil Type	Design Groundwater Depth (ft)
WB-129	3146+50	32 LT	0 - 8	Sand	2 - 9	5	100	105	45	28	---	1	0
			8 - 30	Sand	14 - 62	31	115	120	60	33	---	2	
WB-130	3148+70	40 LT	0 - 30	Sand	9 - 29	19	105	110	50	30	---	2	0
[3]WB-131	3152+20	8 RT	0 - 30	Sand	9 - 37	18	105	110	50	30	---	2	0
WB-132	3155+60	35 LT	0 - 12	Sand	4	4	100	105	45	28	---	1	0
			12 - 30	Sand	13 - 27	22	110	115	55	32	---	2	
WB-133	3157+80	55 LT	0 - 8	Sand	7	7	100	105	45	28	---	1	0
			8 - 22	Sand	13 - 29	18	105	110	50	30	---	2	
			22 - 28	Clay	12	12	115	120	60	---	1500	---	
			28 - 30	Sand	13 - 27	22	110	115	55	32	---	2	
WB-134	3160+70	70 LT	0 - 30	Sand	9 - 60	29	110	115	55	32	---	2	0

1. N-Value obtained with automatic hammer. N-Value corrected using correction factor of 1.24 to reflect standard hammer.

2. Soil Type No. in accordance with FDOT Index No. 5200 Tables 1B, 2B and 3B.

3. Soil parameters presented in this Table are recommended for shallow foundation design between Stations 3152+00 and 3154+00. In additional a Maximum Nominal Bearing Capacity of 6,000 PSF is recommended for shallow foundation design.

RECOMMENDED SOIL PARAMETERS FOR SHEET PILE WALL DESIGN

Table 12

Recommended Soil Parameters for Sheet Pile Wall Design

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

FGT Wall 1 (Station 1018+25 to 1021+50)							
	Very Soft Muck	Loose Sand	Very Soft Sandy Muck	Medium Dense Sand	Very Soft Sandy Muck	Medium Dense Sand	Loose Silty Sand
Depth Below Exist. Grade	0 - 2	2 - 13	13 - 24	24 - 35	35 - 44	44 - 74	74 - 100
Moist Unit Weight (pcf)	70	100	75	105	75	105	100
Saturated Unit Weight (pcf)	75	105	80	110	80	110	105
Cohesion (pcf)	100	0	200	0	250	0	0
Internal Friction Angle	0	29	0	30	0	30	29
Design High Groundwater Elevation (ft)	+32.6 (Front of Wall) / +32.6 (Back of Wall)						

FGT Wall 1 (Station 1021+50 to 1025+00)										
	Very Loose Sand	Very Soft Muck	Loose Sand	Soft Sandy Muck	Medium Dense Sand	Soft Sandy Muck	Medium Dense Sand	Medium Dense Mucky Sand	Loose Sand	Medium Dense Sand
Depth Below Exist. Grade	0 - 2	2 - 8	8 - 13	13 - 23	23 - 42	42 - 48	48 - 62	62 - 67	67 - 85	85 - 100
Moist Unit Weight (pcf)	95	70	100	75	105	75	105	95	100	105
Saturated Unit Weight (pcf)	100	75	105	80	110	80	110	100	105	110
Cohesion (pcf)	0	100	0	200	0	250	0	0	0	0
Internal Friction Angle	28	0	29	0	30	0	30	28	29	30
Design High Groundwater Elevation (ft)	+32.6 (Front of Wall) / +32.6 (Back of Wall)									

Table 12

Recommended Soil Parameters for Sheet Pile Wall Design

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

FGT Wall 1 (Station 1025+00 to 1026+00)						
	Loose Sand	Soft Muck	Dense Sand	Medium Dense Sand	Firm Sandy Muck	Medium Dense Sand
Depth Below Exist. Grade	0 - 4	4 - 27	27 - 37	37 - 47	47 - 78	78 - 100
Moist Unit Weight (pcf)	100	75	110	105	85	105
Saturated Unit Weight (pcf)	105	80	115	110	90	110
Cohesion (pcf)	0	125	0	0	350	0
Internal Friction Angle	29	0	32	30	0	30
Design High Groundwater Elevation (ft)	+32.6 (Front of Wall) / +32.6 (Back of Wall)					

FGT Wall 1 (Station 1026+00 to 1029+70)								
	Very Loose Sand	Soft Sandy Muck	Loose Sand	Very Soft Organic Silt	Medium Dense Sand	Very Loose Sand	Medium Dense Sand	Loose Silty Sand
Depth Below Exist. Grade	0 - 2	2 - 6	6 - 13	13 - 28	28 - 33	33 - 54	54 - 78	78 - 100
Moist Unit Weight (pcf)	95	75	100	75	105	95	105	100
Saturated Unit Weight (pcf)	100	80	105	80	110	100	110	105
Cohesion (pcf)	0	250	0	200	0	0	0	0
Internal Friction Angle	28	0	29	0	30	28	30	29
Design High Groundwater Elevation (ft)	+35.0 (Front of Wall) / +35.0 (Back of Wall)							

SUMMARY OF CIP WALL
CORROSION SERIES TEST RESULTS

Table 13

Summary of CIP Wall Corrosion Series Test Results

Wekiva Parkway (SR 429) - Section 7A

FPID No. 240200-2-52-01

GEC Project No. 3520G

Wall	Boring No.	Soil Classification	Sample Depth (feet)	pH	Minimum Resistivity (ohm-cm)	Chlorides (ppm)	Sulfates (ppm)	Substructural Environmental Classification	
								Concrete	Steel
CIP Retaining Wall	WB-125	SP-SM	6 - 15	6.0	19,000	45	60	Moderately Aggressive	Extremely Aggressive
	WB-126	SM	0 - 8	6.2	91,000	60	44	Slightly Aggressive	Moderately Aggressive

MSE WALL EXTERNAL STABILITY ANALYSES

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**3.35**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.36**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**2.06**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.98
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**2.11**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.89
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.87**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.86
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.69**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.83
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.54**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.81
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.60**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.77
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.48**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.75
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.53**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.73
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.44**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.72
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.36**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.71
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

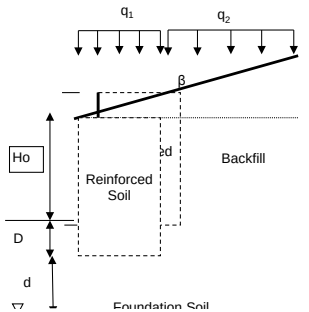
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
f [bf] — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
f [fs] — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
f u — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**6183**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**5609**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**5766**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**6424**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**6469**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**6521**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**6581**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**7232**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**7303**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7933**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**8012**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**8094**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note: This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb	Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr	Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h	h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1	Reinforced fill weight (lbs/ft)
W_2	Sloped backfill weight over reinforced area (lbs/ft)
W_3	Flat backfill weight over reinforced area (lbs/ft)
q_{1V}	Surcharge vertical force over reinforced area (lbs/ft)
α	Resultant earth pressure inclination (deg)
Ft	Total resultant horizontal backfill force (lbs/ft)
qt	Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd	Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr	Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv	Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2	Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr	Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2	Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo	Sum of Overturning Moments(lbs-ft/ft)
Mo_2	Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e	Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2	Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L'	Effective foundation width (feet): L'= L - 2*e_2

Nc	Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng	Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq	Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh	Backfill earth pressure coefficient when retained soil is horizontal
Kabs	Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2	Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**3.35**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.36**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**2.06**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.98
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**2.11**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.89
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.87**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.86
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.69**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.83
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.54**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.81
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.60**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.77
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.48**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.75
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.53**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.73
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.44**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.72
12	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

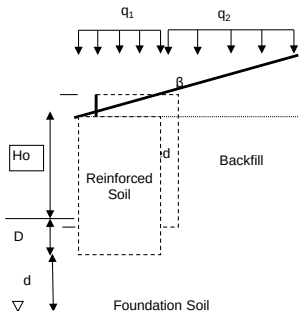
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**6183**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**5609**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**5766**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**6424**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**6469**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**6521**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**6581**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**7232**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**7303**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7933**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**8012**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note: This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 Reinforced fill weight (lbs/ft)
W_2 Sloped backfill weight over reinforced area (lbs/ft)
W_3 Flat backfill weight over reinforced area (lbs/ft)
q_{1V} Surcharge vertical force over reinforced area (lbs/ft)
α Resultant earth pressure inclination (deg)
Ft Total resultant horizontal backfill force (lbs/ft)
qt Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo Sum of Overturning Moments(lbs-ft/ft)
Mo_2 Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' Effective foundation width (feet): L'= L - 2*e_2

Nc Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh Backfill earth pressure coefficient when retained soil is horizontal
Kabs Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**3.35**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.36**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**2.06**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.98
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**2.11**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.89
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.87**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.86
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.69**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.83
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.54**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.81
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.60**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.77
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.48**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.75
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.53**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.73
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.44**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.72
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.36**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.71
13	**32.0**	30.0	2.0	**23.0**	**OK**	**2.48**	**0.81**	**1.42**	**1.40**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.69
14	**34.0**	32.0	2.0	**24.0**	**OK**	**2.42**	**0.83**	**1.41**	**1.33**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.68
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	13.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

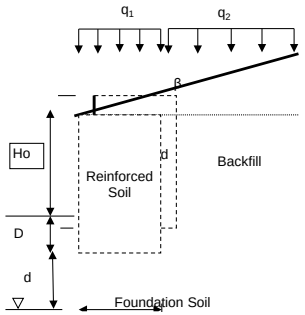
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
f_u — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**6183**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**5609**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**5766**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**6424**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**6469**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**6521**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**6581**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**7232**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**7303**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7933**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**8012**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**8094**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
6835	**8714**	0.00	77280	0	0	10063	0.0	18091	2458	27137	44618	77280	114391	888720	1315491	358288	358288	4.64	3.13	16.74	30.14	18.40	22.40	0.307	0.000	0.000
7308	**8801**	0.00	85680	0	0	10500	0.0	20423	2612	30635	49467	85680	126168	1028160	1514016	424897	424897	4.96	3.37	17.26	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 — Reinforced fill weight (lbs/ft)
W_2 — Sloped backfill weight over reinforced area (lbs/ft)
W_3 — Flat backfill weight over reinforced area (lbs/ft)
q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
α — Resultant earth pressure inclination (deg)
Ft — Total resultant horizontal backfill force (lbs/ft)
qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo — Sum of Overturning Moments(lbs-ft/ft)
Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' — Effective foundation width (feet): L'= L - 2*e_2

Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh — Backfill earth pressure coefficient when retained soil is horizontal
Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**2.31**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.92
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**1.63**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.92
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.39**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.87
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.43**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.80
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.27**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.78
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.15**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.76
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.05**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.74
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.09**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.71
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.01**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.70
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.05**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.68
11	**28.0**	26.0	2.0	**21.0**	**OK**	**2.63**	**0.76**	**1.45**	**1.08**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.66
12	**30.0**	28.0	2.0	**22.0**	**OK**	**2.55**	**0.78**	**1.43**	**1.02**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.65
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

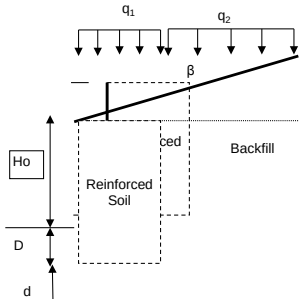
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**4263**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	25.80	14.72	16.72	0.307	0.000	0.000
2514	**3889**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	25.80	14.72	16.72	0.307	0.000	0.000
3004	**3914**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	25.80	14.72	16.72	0.307	0.000	0.000
3252	**4363**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	25.80	14.72	16.72	0.307	0.000	0.000
3727	**4407**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	25.80	14.72	16.72	0.307	0.000	0.000
4211	**4455**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	25.80	14.72	16.72	0.307	0.000	0.000
4703	**4506**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	25.80	14.72	16.72	0.307	0.000	0.000
4926	**4954**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	25.80	14.72	16.72	0.307	0.000	0.000
5407	**5012**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	25.80	14.72	16.72	0.307	0.000	0.000
5645	**5448**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	25.80	14.72	16.72	0.307	0.000	0.000
5905	**5873**	0.00	61740	0	0	9188	0.0	13851	2151	20777	35646	61740	92537	648270	971633	246612	246612	3.99	2.67	15.67	25.80	14.72	16.72	0.307	0.000	0.000
6367	**5939**	0.00	69300	0	0	9625	0.0	15901	2304	23851	40010	69300	103180	762300	1134980	299001	299001	4.31	2.90	16.20	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 — Reinforced fill weight (lbs/ft)
W_2 — Sloped backfill weight over reinforced area (lbs/ft)
W_3 — Flat backfill weight over reinforced area (lbs/ft)
q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
α — Resultant earth pressure inclination (deg)
Ft — Total resultant horizontal backfill force (lbs/ft)
qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo — Sum of Overturning Moments(lbs-ft/ft)
Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' — Effective foundation width (feet): L'= L - 2*e_2

Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh — Backfill earth pressure coefficient when retained soil is horizontal
Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**3.17**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.92
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.24**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.92
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.91**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.87
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.96**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.80
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.75**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.78
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.58**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.76
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.44**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.74
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.51**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.71
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.40**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.70
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.45**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.68
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.36**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.67
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.29**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.66
13	**32.0**	30.0	2.0	**23.0**	**OK**	**2.48**	**0.81**	**1.42**	**1.33**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.64
14	**34.0**	32.0	2.0	**24.0**	**OK**	**2.42**	**0.83**	**1.41**	**1.27**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.64
15	**36.0**	34.0	2.0	**26.0**	**OK**	**2.56**	**0.78**	**1.45**	**1.31**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.63
16	**38.0**	36.0	2.0	**27.0**	**OK**	**2.50**	**0.80**	**1.43**	**1.25**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.62
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

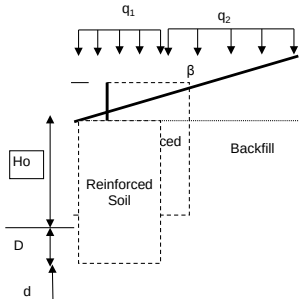
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**5845**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**5319**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**5354**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**5987**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**6049**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**6116**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**6187**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**6818**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**6899**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7513**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**7601**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**7691**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
6835	**8298**	0.00	77280	0	0	10063	0.0	18091	2458	27137	44618	77280	114391	888720	1315491	358288	358288	4.64	3.13	16.74	30.14	18.40	22.40	0.307	0.000	0.000
7308	**8393**	0.00	85680	0	0	10500	0.0	20423	2612	30635	49467	85680	126168	1028160	1514016	424897	424897	4.96	3.37	17.26	30.14	18.40	22.40	0.307	0.000	0.000
7555	**8991**	0.00	98280	0	0	11375	0.0	22897	2765	34345	56742	98280	144053	1277640	1872689	499252	499252	5.08	3.47	19.07	30.14	18.40	22.40	0.307	0.000	0.000
8023	**9089**	0.00	107730	0	0	11813	0.0	25512	2919	38268	62198	107730	157248	1454355	2122848	581777	581777	5.40	3.70	19.60	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 — Reinforced fill weight (lbs/ft)
W_2 — Sloped backfill weight over reinforced area (lbs/ft)
W_3 — Flat backfill weight over reinforced area (lbs/ft)
q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
α — Resultant earth pressure inclination (deg)
Ft — Total resultant horizontal backfill force (lbs/ft)
qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo — Sum of Overturning Moments(lbs-ft/ft)
Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' — Effective foundation width (feet): L'= L - 2*e_2

Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh — Backfill earth pressure coefficient when retained soil is horizontal
Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**2.84**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.83
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.01**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.83
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.72**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.80
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.77**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.74
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.58**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.72
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.43**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.71
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.31**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.69
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.37**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.67
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.28**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.66
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.33**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.64
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.25**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.63
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.18**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.63
13	**32.0**	30.0	2.0	**23.0**	**OK**	**2.48**	**0.81**	**1.42**	**1.23**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.62
14	**34.0**	32.0	2.0	**24.0**	**OK**	**2.42**	**0.83**	**1.41**	**1.17**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.61
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	8.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

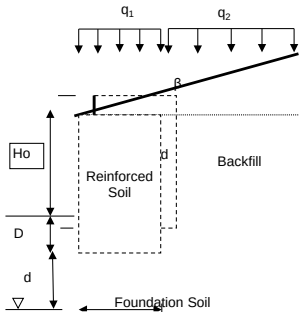
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**5245**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**4789**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**4837**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**5424**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**5494**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**5567**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**5643**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**6230**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**6315**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**6888**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**6979**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**7070**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
6835	**7639**	0.00	77280	0	0	10063	0.0	18091	2458	27137	44618	77280	114391	888720	1315491	358288	358288	4.64	3.13	16.74	30.14	18.40	22.40	0.307	0.000	0.000
7308	**7733**	0.00	85680	0	0	10500	0.0	20423	2612	30635	49467	85680	126168	1028160	1514016	424897	424897	4.96	3.37	17.26	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb	Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr	Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h	h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1	Reinforced fill weight (lbs/ft)
W_2	Sloped backfill weight over reinforced area (lbs/ft)
W_3	Flat backfill weight over reinforced area (lbs/ft)
q_{1V}	Surcharge vertical force over reinforced area (lbs/ft)
α	Resultant earth pressure inclination (deg)
Ft	Total resultant horizontal backfill force (lbs/ft)
qt	Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd	Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr	Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv	Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2	Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr	Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2	Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo	Sum of Overturning Moments(lbs-ft/ft)
Mo_2	Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e	Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2	Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L'	Effective foundation width (feet): L'= L - 2*e_2

Nc	Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng	Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq	Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh	Backfill earth pressure coefficient when retained soil is horizontal
Kabs	Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2	Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**2.57**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.71
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**1.83**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.71
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.57**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.69
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.63**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.65
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.46**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.64
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.33**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.63
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.22**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.62
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.28**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.60
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.20**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.60
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.25**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.59
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.18**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.58
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.11**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.58
13	**32.0**	30.0	2.0	**23.0**	**OK**	**2.48**	**0.81**	**1.42**	**1.16**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.57
14	**34.0**	32.0	2.0	**24.0**	**OK**	**2.42**	**0.83**	**1.41**	**1.11**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.57
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00

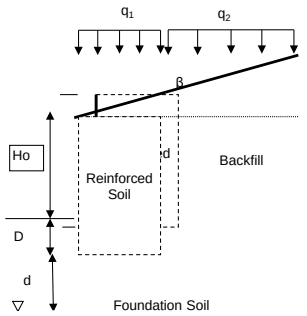
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
f_u — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**4762**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**4374**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**4445**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**5008**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**5093**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**5180**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**5269**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**5836**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**5930**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**6489**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**6588**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**6686**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
6835	**7242**	0.00	77280	0	0	10063	0.0	18091	2458	27137	44618	77280	114391	888720	1315491	358288	358288	4.64	3.13	16.74	30.14	18.40	22.40	0.307	0.000	0.000
7308	**7344**	0.00	85680	0	0	10500	0.0	20423	2612	30635	49467	85680	126168	1028160	1514016	424897	424897	4.96	3.37	17.26	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

- qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
- qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
- h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
- W_1 — Reinforced fill weight (lbs/ft)
- W_2 — Sloped backfill weight over reinforced area (lbs/ft)
- W_3 — Flat backfill weight over reinforced area (lbs/ft)
- q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
- α — Resultant earth pressure inclination (deg)
- Ft — Total resultant horizontal backfill force (lbs/ft)
- qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
- Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
- Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
- Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
- Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
- Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
- Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
- Mo — Sum of Overturning Moments(lbs-ft/ft)
- Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
- e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
- e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
- L' — Effective foundation width (feet): L'= L - 2*e_2

- Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
- Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
- Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
- Kabh — Backfill earth pressure coefficient when retained soil is horizontal
- Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
- Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**3.02**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.92
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.13**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.92
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.82**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.87
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.87**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.80
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.66**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.78
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.50**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.76
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.37**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.74
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.43**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.71
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.33**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.70
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.38**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.68
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.30**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.67
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.23**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.66
13	**32.0**	30.0	2.0	**23.0**	**OK**	**2.48**	**0.81**	**1.42**	**1.27**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.64
14	**34.0**	32.0	2.0	**24.0**	**OK**	**2.42**	**0.83**	**1.41**	**1.21**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	0.64
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	100.0	30.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

f [bf] — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

f [fs] — Foundation Soil angle of internal friction (degrees)

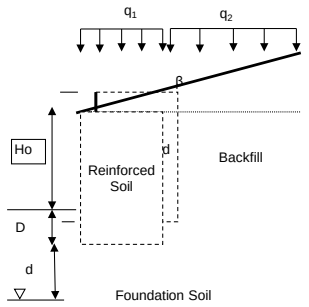
c[fs] — Foundation Soil cohesion (pounds per square foot)

f u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



External Stability_Wall 7_1053+00 to 1056+12

MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**5567**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**5066**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**5099**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**5702**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**5761**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**5824**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**5893**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**6493**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**6571**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7155**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**7240**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**7325**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
6835	**7903**	0.00	77280	0	0	10063	0.0	18091	2458	27137	44618	77280	114391	888720	1315491	358288	358288	4.64	3.13	16.74	30.14	18.40	22.40	0.307	0.000	0.000
7308	**7993**	0.00	85680	0	0	10500	0.0	20423	2612	30635	49467	85680	126168	1028160	1514016	424897	424897	4.96	3.37	17.26	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 — Reinforced fill weight (lbs/ft)
W_2 — Sloped backfill weight over reinforced area (lbs/ft)
W_3 — Flat backfill weight over reinforced area (lbs/ft)
q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
α — Resultant earth pressure inclination (deg)
Ft — Total resultant horizontal backfill force (lbs/ft)
qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo — Sum of Overturning Moments(lbs-ft/ft)
Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' — Effective foundation width (feet): L'= L - 2*e_2

Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh — Backfill earth pressure coefficient when retained soil is horizontal
Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**2.89**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.79
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.05**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.79
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.76**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.76
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.81**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.71
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.62**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.69
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.47**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.68
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.35**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.67
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.41**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.65
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.31**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.64
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.37**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.62
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.29**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.62
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.22**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.61
13	**32.0**	30.0	2.0	**23.0**	**OK**	**2.48**	**0.81**	**1.42**	**1.26**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.60
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	7.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

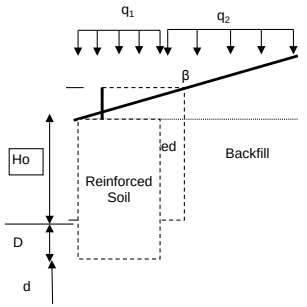
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**5338**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**4883**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**4942**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**5550**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**5628**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**5710**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**5794**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**6404**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**6496**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7093**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**7191**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**7289**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
6835	**7882**	0.00	77280	0	0	10063	0.0	18091	2458	27137	44618	77280	114391	888720	1315491	358288	358288	4.64	3.13	16.74	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

- qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
- qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
- h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
- W_1 — Reinforced fill weight (lbs/ft)
- W_2 — Sloped backfill weight over reinforced area (lbs/ft)
- W_3 — Flat backfill weight over reinforced area (lbs/ft)
- q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
- α — Resultant earth pressure inclination (deg)
- Ft — Total resultant horizontal backfill force (lbs/ft)
- qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
- Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
- Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
- Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
- Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
- Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
- Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
- Mo — Sum of Overturning Moments(lbs-ft/ft)
- Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
- e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
- e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
- L' — Effective foundation width (feet): L'= L - 2*e_2

- Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
- Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
- Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
- Kabh — Backfill earth pressure coefficient when retained soil is horizontal
- Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
- Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**3.17**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.92
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**2.24**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.92
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.91**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.87
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.96**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.80
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.75**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.78
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.58**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.76
7	**20.0**	18.0	2.0	**14.0**	**OK**	**2.11**	**0.95**	**1.28**	**1.44**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.74
8	**22.0**	20.0	2.0	**16.0**	**OK**	**2.34**	**0.86**	**1.35**	**1.51**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.71
9	**24.0**	22.0	2.0	**17.0**	**OK**	**2.26**	**0.88**	**1.34**	**1.40**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.70
10	**26.0**	24.0	2.0	**19.0**	**OK**	**2.46**	**0.81**	**1.40**	**1.45**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.68
11	**28.0**	26.0	2.0	**20.0**	**OK**	**2.38**	**0.84**	**1.38**	**1.36**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.67
12	**30.0**	28.0	2.0	**21.0**	**OK**	**2.32**	**0.86**	**1.37**	**1.29**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.66
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	10.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

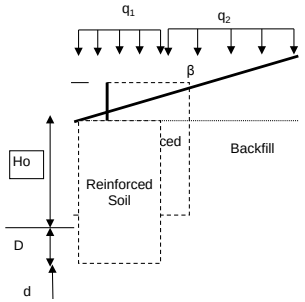
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
f_u — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**5845**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**5319**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**5354**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**5987**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**6049**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**6116**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
4703	**6187**	0.00	29400	0	0	6125	0.0	7067	1536	10600	16974	29400	45815	205800	320705	97555	97555	3.32	2.13	9.74	30.14	18.40	22.40	0.307	0.000	0.000
4926	**6818**	0.00	36960	0	0	7000	0.0	8551	1690	12827	21339	36960	56896	295680	455168	126592	126592	3.43	2.22	11.55	30.14	18.40	22.40	0.307	0.000	0.000
5407	**6899**	0.00	42840	0	0	7438	0.0	10176	1844	15265	24734	42840	65272	364140	554808	160831	160831	3.75	2.46	12.07	30.14	18.40	22.40	0.307	0.000	0.000
5645	**7513**	0.00	51870	0	0	8313	0.0	11943	1997	17915	29947	51870	78337	492765	744202	200697	200697	3.87	2.56	13.88	30.14	18.40	22.40	0.307	0.000	0.000
6119	**7601**	0.00	58800	0	0	8750	0.0	13851	2151	20777	33948	58800	88130	588000	881300	246612	246612	4.19	2.80	14.40	30.14	18.40	22.40	0.307	0.000	0.000
6598	**7691**	0.00	66150	0	0	9188	0.0	15901	2304	23851	38192	66150	98490	694575	1034145	299001	299001	4.52	3.04	14.93	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 Reinforced fill weight (lbs/ft)
W_2 Sloped backfill weight over reinforced area (lbs/ft)
W_3 Flat backfill weight over reinforced area (lbs/ft)
q_{1V} Surcharge vertical force over reinforced area (lbs/ft)
α Resultant earth pressure inclination (deg)
Ft Total resultant horizontal backfill force (lbs/ft)
qt Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo Sum of Overturning Moments(lbs-ft/ft)
Mo_2 Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' Effective foundation width (feet): L'= L - 2*e_2

Nc Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh Backfill earth pressure coefficient when retained soil is horizontal
Kabs Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**1.91**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.67
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**1.36**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.67
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.17**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.65
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.22**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.62
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.09**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.61
6	**18.0**	16.0	2.0	**14.0**	**OK**	**2.53**	**0.79**	**1.39**	**1.13**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.60
7	**20.0**	18.0	2.0	**15.0**	**OK**	**2.42**	**0.83**	**1.37**	**1.03**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.59
8	**22.0**	20.0	2.0	**17.0**	**OK**	**2.64**	**0.76**	**1.44**	**1.07**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.58
9	**24.0**	22.0	2.0	**19.0**	**OK**	**2.83**	**0.71**	**1.49**	**1.09**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.57
10	**26.0**	24.0	2.0	**20.0**	**OK**	**2.72**	**0.74**	**1.47**	**1.02**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.57
11	**28.0**	26.0	2.0	**22.0**	**OK**	**2.89**	**0.69**	**1.52**	**1.04**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.56
12	**30.0**	28.0	2.0	**24.0**	**OK**	**3.03**	**0.66**	**1.57**	**1.06**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.56
13	**32.0**	30.0	2.0	**25.0**	**OK**	**2.93**	**0.68**	**1.54**	**1.01**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.55
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	4.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00

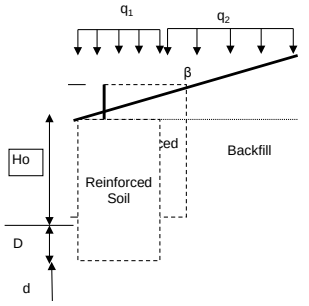
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
f [bf] — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
f [fs] — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
f u — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**3542**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	25.80	14.72	16.72	0.307	0.000	0.000
2514	**3270**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	25.80	14.72	16.72	0.307	0.000	0.000
3004	**3328**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	25.80	14.72	16.72	0.307	0.000	0.000
3252	**3742**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	25.80	14.72	16.72	0.307	0.000	0.000
3727	**3810**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	25.80	14.72	16.72	0.307	0.000	0.000
3987	**4219**	0.00	26460	0	0	6125	0.0	5724	1383	8586	15277	26460	41846	185220	292922	73295	73295	2.77	1.75	10.50	25.80	14.72	16.72	0.307	0.000	0.000
4452	**4292**	0.00	31500	0	0	6563	0.0	7067	1536	10600	18187	31500	49088	236250	368156	97555	97555	3.10	1.99	11.03	25.80	14.72	16.72	0.307	0.000	0.000
4718	**4698**	0.00	39270	0	0	7438	0.0	8551	1690	12827	22673	39270	60452	333795	513842	126592	126592	3.22	2.09	12.81	25.80	14.72	16.72	0.307	0.000	0.000
5000	**5099**	0.00	47880	0	0	8313	0.0	10176	1844	15265	27644	47880	72951	454860	693030	160831	160831	3.36	2.20	14.59	25.80	14.72	16.72	0.307	0.000	0.000
5449	**5179**	0.00	54600	0	0	8750	0.0	11943	1997	17915	31523	54600	82460	546000	824600	200697	200697	3.68	2.43	15.13	25.80	14.72	16.72	0.307	0.000	0.000
5732	**5578**	0.00	64680	0	0	9625	0.0	13851	2151	20777	37343	64680	96943	711480	1066373	246612	246612	3.81	2.54	16.91	25.80	14.72	16.72	0.307	0.000	0.000
6023	**5975**	0.00	75600	0	0	10500	0.0	15901	2304	23851	43648	75600	112560	907200	1350720	299001	299001	3.96	2.66	18.69	25.80	14.72	16.72	0.307	0.000	0.000
6464	**6059**	0.00	84000	0	0	10938	0.0	18091	2458	27137	48497	84000	124338	1050000	1554219	358288	358288	4.27	2.88	19.24	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 — Reinforced fill weight (lbs/ft)
W_2 — Sloped backfill weight over reinforced area (lbs/ft)
W_3 — Flat backfill weight over reinforced area (lbs/ft)
q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
α — Resultant earth pressure inclination (deg)
Ft — Total resultant horizontal backfill force (lbs/ft)
qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo — Sum of Overturning Moments(lbs-ft/ft)
Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' — Effective foundation width (feet): L'= L - 2*e_2

Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh — Backfill earth pressure coefficient when retained soil is horizontal
Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**1.98**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.71
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**1.41**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.71
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.21**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.69
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.25**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.65
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.12**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.64
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.02**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.63
7	**20.0**	18.0	2.0	**15.0**	**OK**	**2.42**	**0.83**	**1.37**	**1.06**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.61
8	**22.0**	20.0	2.0	**17.0**	**OK**	**2.64**	**0.76**	**1.44**	**1.09**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.60
9	**24.0**	22.0	2.0	**18.0**	**OK**	**2.54**	**0.79**	**1.42**	**1.01**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.59
10	**26.0**	24.0	2.0	**20.0**	**OK**	**2.72**	**0.74**	**1.47**	**1.04**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.58
11	**28.0**	26.0	2.0	**22.0**	**OK**	**2.89**	**0.69**	**1.52**	**1.06**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.58
12	**30.0**	28.0	2.0	**23.0**	**OK**	**2.79**	**0.72**	**1.50**	**1.01**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.57
13	**32.0**	30.0	2.0	**25.0**	**OK**	**2.93**	**0.68**	**1.54**	**1.03**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	0.57
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	5.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

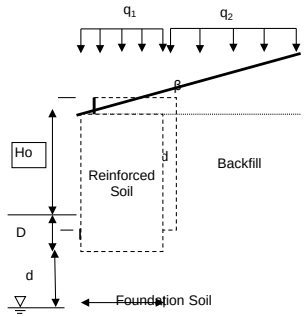
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**3662**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	25.80	14.72	16.72	0.307	0.000	0.000
2514	**3373**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	25.80	14.72	16.72	0.307	0.000	0.000
3004	**3426**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	25.80	14.72	16.72	0.307	0.000	0.000
3252	**3846**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	25.80	14.72	16.72	0.307	0.000	0.000
3727	**3909**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	25.80	14.72	16.72	0.307	0.000	0.000
4211	**3974**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	25.80	14.72	16.72	0.307	0.000	0.000
4452	**4393**	0.00	31500	0	0	6563	0.0	7067	1536	10600	18187	31500	49088	236250	368156	97555	97555	3.10	1.99	11.03	25.80	14.72	16.72	0.307	0.000	0.000
4718	**4803**	0.00	39270	0	0	7438	0.0	8551	1690	12827	22673	39270	60452	333795	513842	126592	126592	3.22	2.09	12.81	25.80	14.72	16.72	0.307	0.000	0.000
5179	**4877**	0.00	45360	0	0	7875	0.0	10176	1844	15265	26189	45360	69111	408240	621999	160831	160831	3.55	2.33	13.35	25.80	14.72	16.72	0.307	0.000	0.000
5449	**5283**	0.00	54600	0	0	8750	0.0	11943	1997	17915	31523	54600	82460	546000	824600	200697	200697	3.68	2.43	15.13	25.80	14.72	16.72	0.307	0.000	0.000
5732	**5685**	0.00	64680	0	0	9625	0.0	13851	2151	20777	37343	64680	96943	711480	1066373	246612	246612	3.81	2.54	16.91	25.80	14.72	16.72	0.307	0.000	0.000
6179	**5765**	0.00	72450	0	0	10063	0.0	15901	2304	23851	41829	72450	107870	833175	1240505	299001	299001	4.13	2.77	17.46	25.80	14.72	16.72	0.307	0.000	0.000
6464	**6166**	0.00	84000	0	0	10938	0.0	18091	2458	27137	48497	84000	124338	1050000	1554219	358288	358288	4.27	2.88	19.24	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	25.80	14.72	16.72	0.307	0.000	0.000

** **Note: This spreadsheet does not analyze Global Stability or Wall Settlement.**

- qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
- qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
- h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
- W_1 — Reinforced fill weight (lbs/ft)
- W_2 — Sloped backfill weight over reinforced area (lbs/ft)
- W_3 — Flat backfill weight over reinforced area (lbs/ft)
- q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
- α — Resultant earth pressure inclination (deg)
- Ft — Total resultant horizontal backfill force (lbs/ft)
- qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
- Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
- Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
- Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
- Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
- Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
- Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
- Mo — Sum of Overturning Moments(lbs-ft/ft)
- Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
- e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
- e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
- L' — Effective foundation width (feet): L'= L - 2*e_2

- Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
- Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
- Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
- Kabh — Backfill earth pressure coefficient when retained soil is horizontal
- Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
- Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**2.33**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.54
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**1.67**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.54
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.45**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.54
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.52**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.53
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.37**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.53
6	**18.0**	16.0	2.0	**13.0**	**OK**	**2.18**	**0.92**	**1.29**	**1.25**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.53
7	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
8	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
9	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
10	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
11	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
12	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	1.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

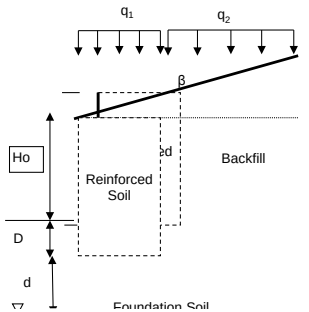
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for :
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
f_u — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**4323**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**4012**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**4118**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**4675**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**4788**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
4211	**4898**	0.00	24570	0	0	5688	0.0	5724	1383	8586	14185	24570	38857	159705	252571	73295	73295	2.98	1.89	9.23	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 Reinforced fill weight (lbs/ft)
W_2 Sloped backfill weight over reinforced area (lbs/ft)
W_3 Flat backfill weight over reinforced area (lbs/ft)
q_{1V} Surcharge vertical force over reinforced area (lbs/ft)
α Resultant earth pressure inclination (deg)
Ft Total resultant horizontal backfill force (lbs/ft)
qt Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo Sum of Overturning Moments(lbs-ft/ft)
Mo_2 Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' Effective foundation width (feet): L'= L - 2*e_2

Nc Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh Backfill earth pressure coefficient when retained soil is horizontal
Kabs Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**8.0**	**OK**	**3.05**	**0.66**	**1.40**	**2.51**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.63
2	**10.0**	8.0	2.0	**8.0**	**OK**	**2.16**	**0.93**	**1.21**	**1.80**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.63
3	**12.0**	10.0	2.0	**9.0**	**OK**	**2.05**	**0.98**	**1.21**	**1.55**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.61
4	**14.0**	12.0	2.0	**11.0**	**OK**	**2.38**	**0.84**	**1.32**	**1.62**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.59
5	**16.0**	14.0	2.0	**12.0**	**OK**	**2.27**	**0.88**	**1.30**	**1.45**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.58
6	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
7	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
8	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
9	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
10	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
11	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
12	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	3.0	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	1.00

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

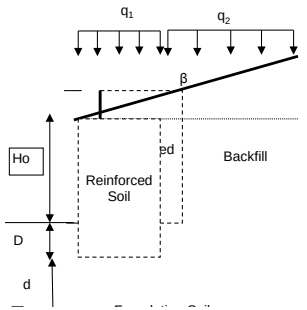
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1906	**4662**	0.00	6720	0	0	3500	0.0	1131	615	1696	3880	6720	12572	26880	50288	8824	8824	1.31	0.70	6.60	30.14	18.40	22.40	0.307	0.000	0.000
2514	**4303**	0.00	8400	0	0	3500	0.0	1767	768	2650	4850	8400	14840	33600	59360	15555	15555	1.85	1.05	5.90	30.14	18.40	22.40	0.307	0.000	0.000
3004	**4392**	0.00	11340	0	0	3938	0.0	2544	922	3816	6547	11340	19247	51030	86609	24943	24943	2.20	1.30	6.41	30.14	18.40	22.40	0.307	0.000	0.000
3252	**4967**	0.00	16170	0	0	4813	0.0	3463	1075	5194	9336	16170	26642	88935	146531	37413	37413	2.31	1.40	8.19	30.14	18.40	22.40	0.307	0.000	0.000
3727	**5068**	0.00	20160	0	0	5250	0.0	4523	1229	6784	11639	20160	32466	120960	194796	53389	53389	2.65	1.64	8.71	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb — Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr — Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h — h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 — Reinforced fill weight (lbs/ft)
W_2 — Sloped backfill weight over reinforced area (lbs/ft)
W_3 — Flat backfill weight over reinforced area (lbs/ft)
q_{1V} — Surcharge vertical force over reinforced area (lbs/ft)
α — Resultant earth pressure inclination (deg)
Ft — Total resultant horizontal backfill force (lbs/ft)
qt — Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd — Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr — Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv — Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 — Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr — Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 — Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo — Sum of Overturning Moments(lbs-ft/ft)
Mo_2 — Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e — Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2 — Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L' — Effective foundation width (feet): L'= L - 2*e_2

Nc — Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng — Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq — Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh — Backfill earth pressure coefficient when retained soil is horizontal
Kabs — Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 — Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**8.0**	6.0	2.0	**9.0**	**OK**	**3.86**	**0.52**	**1.57**	**1.09**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	-0.03
2	**10.0**	8.0	2.0	**10.0**	**OK**	**3.38**	**0.59**	**1.52**	**1.02**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.03
3	**12.0**	10.0	2.0	**12.0**	**OK**	**3.64**	**0.55**	**1.61**	**1.10**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.11
4	**14.0**	12.0	2.0	**13.0**	**OK**	**3.32**	**0.60**	**1.56**	**1.03**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.14
5	**16.0**	14.0	2.0	**15.0**	**OK**	**3.54**	**0.56**	**1.63**	**1.10**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.18
6	**18.0**	16.0	2.0	**16.0**	**OK**	**3.30**	**0.61**	**1.59**	**1.04**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.20
7	**20.0**	18.0	2.0	**18.0**	**OK**	**3.49**	**0.57**	**1.64**	**1.09**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	0.24
8	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
9	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
10	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
11	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
12	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	-14.2	105.0	115.0	32.0	105.0	30.0	0.0	30.0	250	250	#DIV/0!

* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D

Ho — Wall Height above ground (feet)

D — Wall Embeddment Depth (feet)

L — Reinforcing Strap Length (feet)

CDR — Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β — Slope of backfill soil (degrees)

λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d — Water depth below base of leveling pad (feet)

γ[rf] — Reinforced fill unit weight (pounds per cubic foot)

γ[bf] — Backfill soil unit weight (pounds per cubic foot)

$f_{[bf]}$ — Backfill soil angle of internal friction (degrees)

γ[fs] — Foundation Soil unit weight (pounds per cubic foot)

$f_{[fs]}$ — Foundation Soil angle of internal friction (degrees)

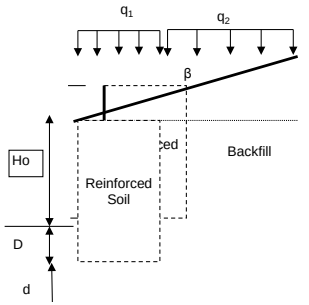
c[fs] — Foundation Soil cohesion (pounds per square foot)

f_u — Base Angle of Internal Friction (degrees) (Sliding)

q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
version 2.5.1

qvb (psf)	**qr (psf)**	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{1V} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
1824	**1931**	0.00	7560	0	0	3938	0.0	1131	615	1696	4365	7560	14144	34020	63646	8824	8824	1.17	0.62	7.75	30.14	18.40	22.40	0.307	0.000	0.000
2229	**2262**	0.00	10500	0	0	4375	0.0	1767	768	2650	6062	10500	18550	52500	92750	15555	15555	1.48	0.84	8.32	30.14	18.40	22.40	0.307	0.000	0.000
2552	**2777**	0.00	15120	0	0	5250	0.0	2544	922	3816	8730	15120	25662	90720	153972	24943	24943	1.65	0.97	10.06	30.14	18.40	22.40	0.307	0.000	0.000
2964	**3003**	0.00	19110	0	0	5688	0.0	3463	1075	5194	11033	19110	31486	124215	204659	37413	37413	1.96	1.19	10.62	30.14	18.40	22.40	0.307	0.000	0.000
3281	**3514**	0.00	25200	0	0	6563	0.0	4523	1229	6784	14549	25200	40583	189000	304369	53389	53389	2.12	1.32	12.37	30.14	18.40	22.40	0.307	0.000	0.000
3697	**3719**	0.00	30240	0	0	7000	0.0	5724	1383	8586	17459	30240	47824	241920	382592	73295	73295	2.42	1.53	12.93	30.14	18.40	22.40	0.307	0.000	0.000
4010	**4230**	0.00	37800	0	0	7875	0.0	7067	1536	10600	21824	37800	58905	340200	530145	97555	97555	2.58	1.66	14.69	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000
#DIV/0!	**#DIV/0!**	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	30.14	18.40	22.40	0.307	0.000	0.000

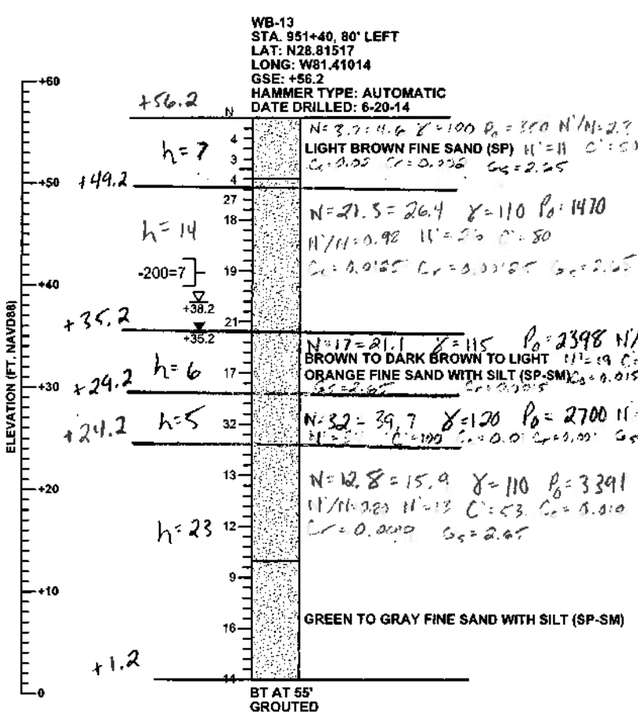
** **Note:** **This spreadsheet does not analyze Global Stability or Wall Settlement.**

qvb	Maximum Vertical Pressure at base of the structure (psf): qvb = Rv_2 / L'
qr	Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h	h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1	Reinforced fill weight (lbs/ft)
W_2	Sloped backfill weight over reinforced area (lbs/ft)
W_3	Flat backfill weight over reinforced area (lbs/ft)
q_{1V}	Surcharge vertical force over reinforced area (lbs/ft)
α	Resultant earth pressure inclination (deg)
Ft	Total resultant horizontal backfill force (lbs/ft)
qt	Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd	Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr	Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv	Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2	Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr	Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2	Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo	Sum of Overturning Moments(lbs-ft/ft)
Mo_2	Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e	Eccentricity {L/2 - [(Mr-Mo)/Rv]} (ft) [for overturning]
e_2	Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2]} (ft) [for bearing stress calculation]
L'	Effective foundation width (feet): L'= L - 2*e_2

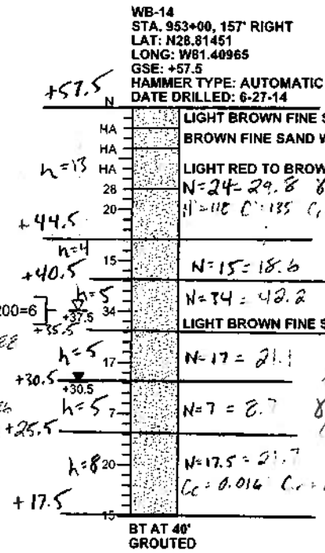
Nc	Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(f) if f>0; for f=0 Nc=5.14
Ng	Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(f)
Nq	Embedment Bearing Resistance Factor : Nq = [e^PI*tan(f)]*N(f); N(f)=tan^2(PI/4 + f/2)
Kabh	Backfill earth pressure coefficient when retained soil is horizontal
Kabs	Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2	Backfill earth pressure coefficient for broken back slopes

MSE WALL SETTLEMENT AND GLOBAL STABILITY ANALYSES

Wall 2



Wall 2



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
+38.2 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+35.2 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

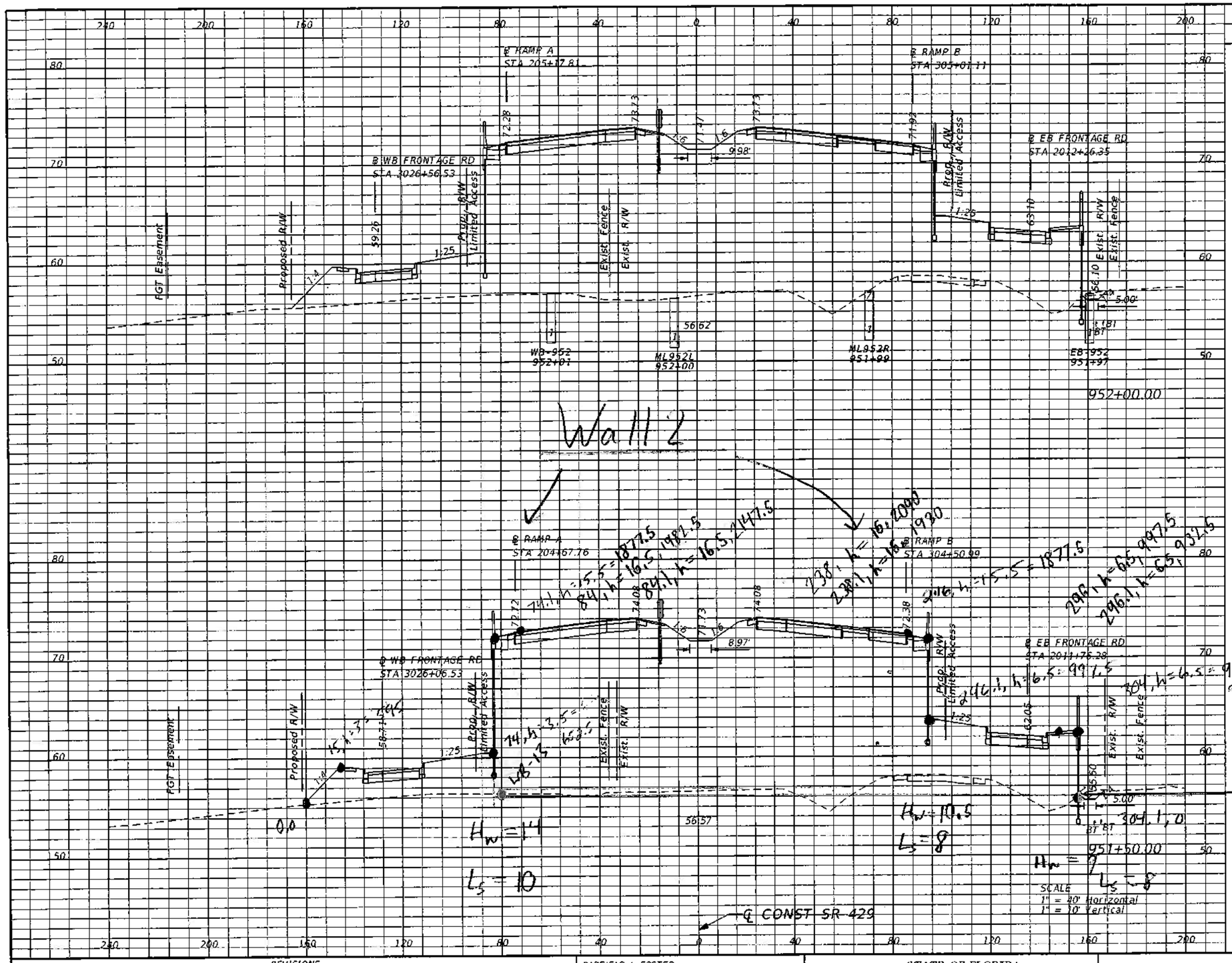
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A

REF. DWG. NO.

SHEET NO.

scott 2/6/2015 2:09:52 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring15.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			21.0

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

scott_harris 12/8/2014 5:02:17 PM O:\Projects\CADD\240200025201\roadway\Xsect\RDXSRD01_429.DGN

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-13 (951+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/6/2015 Computed by : BMM

Wall 2 Total Emb. Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 74.10 (ft)

Point #	X(ft)	Load (psf)
1	15.00	595.00
2	74.00	652.50
3	74.10	1877.50
4	84.00	1982.50
5	84.10	2147.50
6	238.00	2090.00
7	238.10	1930.00
8	246.00	1877.50
9	246.10	997.50
10	304.00	997.50

Foundation Elev. = 56.20 (ft) Ground Surface Elev.= 56.20 (ft)
Water table Elev. = 35.20 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.020	0.002	0.002	100.00	1.23	0.00
2	COMP.	14.0	0.013	0.001	0.001	110.00	0.64	0.00
3	COMP.	6.0	0.015	0.002	0.002	115.00	0.21	0.00
4	COMP.	5.0	0.010	0.001	0.001	120.00	0.10	0.00
5	COMP.	23.0	0.019	0.002	0.002	110.00	0.75	0.00
					Total Settlement =		2.93	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	54.45	175.00	1292.79	175.00	0.78
2	3.50	50.95	525.00	1290.82	525.00	0.45
3	4.67	46.87	956.67	1304.23	956.67	0.27
4	4.67	42.20	1470.00	1318.47	1470.00	0.20
5	4.67	37.53	1983.33	1327.82	1983.33	0.16
6	3.00	33.70	2318.90	1332.04	2318.90	0.11
7	3.00	30.70	2476.70	1333.53	2476.70	0.10
8	5.00	26.70	2699.60	1333.48	2699.60	0.10
9	4.60	21.90	2953.08	1330.92	2953.08	0.17
10	4.60	17.30	3172.04	1326.46	3172.04	0.16
11	4.60	12.70	3391.00	1320.45	3391.00	0.15
12	4.60	8.10	3609.96	1313.23	3609.96	0.14

13	4.60	3.50	3828.92	1305.06	3828.92		0.13

Wall 2 Total Emb

Total Settlement = 2.93 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-13 (951+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/6/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 84.00 (ft)

Point #	X(ft)	Load (psf)
1	15.00	595.00
2	74.00	652.50
3	74.10	1877.50
4	84.00	1982.50
5	84.10	2147.50
6	238.00	2090.00
7	238.10	1930.00
8	246.00	1877.50
9	246.10	997.50
10	304.00	997.50

Foundation Elev. = 56.20 (ft) Ground Surface Elev.= 56.20 (ft)
Water table Elev. = 35.20 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.020	0.002	0.002	100.00	1.50	0.00
2	COMP.	14.0	0.013	0.001	0.001	110.00	0.81	0.00
3	COMP.	6.0	0.015	0.002	0.002	115.00	0.25	0.00
4	COMP.	5.0	0.010	0.001	0.001	120.00	0.12	0.00
5	COMP.	23.0	0.019	0.002	0.002	110.00	0.86	0.00
					Total Settlement =		3.55	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	54.45	175.00	2054.59	175.00	0.93
2	3.50	50.95	525.00	2018.53	525.00	0.58
3	4.67	46.87	956.67	1937.95	956.67	0.35
4	4.67	42.20	1470.00	1841.06	1470.00	0.26
5	4.67	37.53	1983.33	1761.55	1983.33	0.20
6	3.00	33.70	2318.90	1709.67	2318.90	0.13
7	3.00	30.70	2476.70	1675.74	2476.70	0.12
8	5.00	26.70	2699.60	1637.40	2699.60	0.12
9	4.60	21.90	2953.08	1598.99	2953.08	0.20
10	4.60	17.30	3172.04	1567.63	3172.04	0.18
11	4.60	12.70	3391.00	1540.02	3391.00	0.17
12	4.60	8.10	3609.96	1515.09	3609.96	0.16

13	4.60	3.50	3828.92	1492.13	3828.92	0.15

Wall 2
Total Emb

Total Settlement = 3.55 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-13 (951+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/6/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 238.10 (ft)

Point #	X(ft)	Load (psf)
1	15.00	595.00
2	74.00	652.50
3	74.10	1877.50
4	84.00	1982.50
5	84.10	2147.50
6	238.00	2090.00
7	238.10	1930.00
8	246.00	1877.50
9	246.10	997.50
10	304.00	997.50

Foundation Elev. = 56.20 (ft) Ground Surface Elev.= 56.20 (ft)
Water table Elev. = 35.20 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.020	0.002	0.002	100.00	1.49	0.00
2	COMP.	14.0	0.013	0.001	0.001	110.00	0.80	0.00
3	COMP.	6.0	0.015	0.002	0.002	115.00	0.25	0.00
4	COMP.	5.0	0.010	0.001	0.001	120.00	0.13	0.00
5	COMP.	23.0	0.019	0.002	0.002	110.00	0.89	0.00
					Total Settlement =		3.56	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	54.45	175.00	2001.75	175.00	0.92
2	3.50	50.95	525.00	1965.04	525.00	0.57
3	4.67	46.87	956.67	1891.27	956.67	0.34
4	4.67	42.20	1470.00	1816.39	1470.00	0.25
5	4.67	37.53	1983.33	1761.18	1983.33	0.20
6	3.00	33.70	2318.90	1726.58	2318.90	0.13
7	3.00	30.70	2476.70	1704.03	2476.70	0.12
8	5.00	26.70	2699.60	1678.12	2699.60	0.13
9	4.60	21.90	2953.08	1651.10	2953.08	0.20
10	4.60	17.30	3172.04	1627.76	3172.04	0.19
11	4.60	12.70	3391.00	1605.93	3391.00	0.18
12	4.60	8.10	3609.96	1585.02	3609.96	0.17

13	4.60	3.50	3828.92	1564.71	3828.92	0.16

Wall 2 Total Emb

Total Settlement = 3.56 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-13 (951+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/6/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 246.00 (ft)

Point #	X(ft)	Load (psf)
1	15.00	595.00
2	74.00	652.50
3	74.10	1877.50
4	84.00	1982.50
5	84.10	2147.50
6	238.00	2090.00
7	238.10	1930.00
8	246.00	1877.50
9	246.10	997.50
10	304.00	997.50

Foundation Elev. = 56.20 (ft) Ground Surface Elev.= 56.20 (ft)
Water table Elev. = 35.20 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.020	0.002	0.002	100.00	1.30	0.00
2	COMP.	14.0	0.013	0.001	0.001	110.00	0.69	0.00
3	COMP.	6.0	0.015	0.002	0.002	115.00	0.23	0.00
4	COMP.	5.0	0.010	0.001	0.001	120.00	0.11	0.00
5	COMP.	23.0	0.019	0.002	0.002	110.00	0.82	0.00
					Total Settlement =		3.16	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	54.45	175.00	1457.47	175.00	0.81
2	3.50	50.95	525.00	1458.85	525.00	0.48
3	4.67	46.87	956.67	1473.31	956.67	0.29
4	4.67	42.20	1470.00	1486.67	1470.00	0.22
5	4.67	37.53	1983.33	1494.04	1983.33	0.18
6	3.00	33.70	2318.90	1496.26	2318.90	0.12
7	3.00	30.70	2476.70	1496.00	2476.70	0.11
8	5.00	26.70	2699.60	1493.37	2699.60	0.11
9	4.60	21.90	2953.08	1487.34	2953.08	0.19
10	4.60	17.30	3172.04	1479.18	3172.04	0.17
11	4.60	12.70	3391.00	1469.17	3391.00	0.16
12	4.60	8.10	3609.96	1457.73	3609.96	0.15

13	4.60	3.50	3828.92	1445.18	3828.92	0.15

Wall 2 Total Emb

Total Settlement = 3.16 (in.)

Wall 2 Global Stability

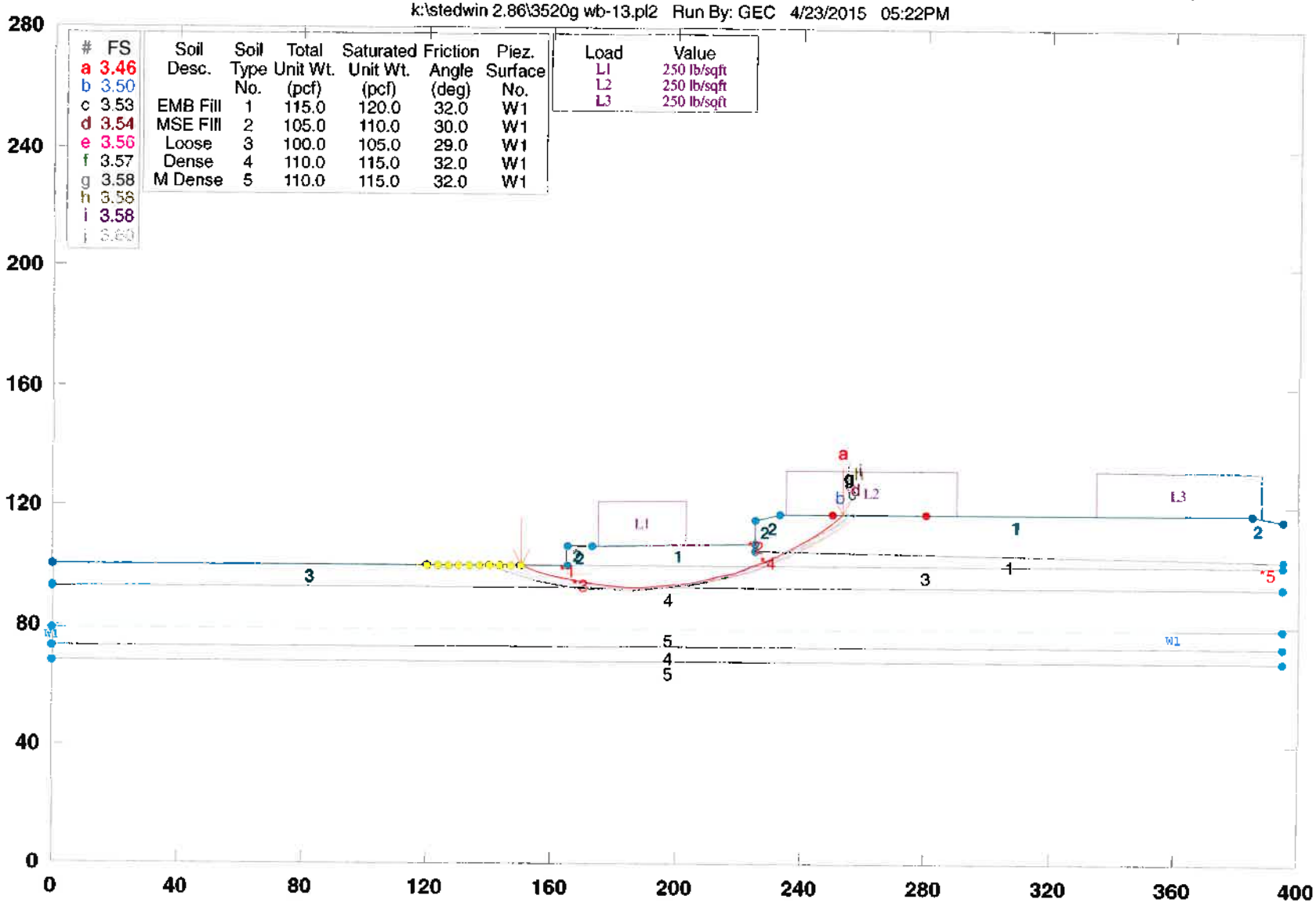
Wekiva 7A WB-13 (951+40)

k:\stedwin 2.86\3520g wb-13.pl2 Run By: GEC 4/23/2015 05:22PM

#	FS
a	3.46
b	3.50
c	3.53
d	3.54
e	3.56
f	3.57
g	3.58
h	3.58
i	3.58
j	3.60

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	32.0	W1
MSE Fill	2	105.0	110.0	30.0	W1
Loose	3	100.0	105.0	29.0	W1
Dense	4	110.0	115.0	32.0	W1
M Dense	5	110.0	115.0	32.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft

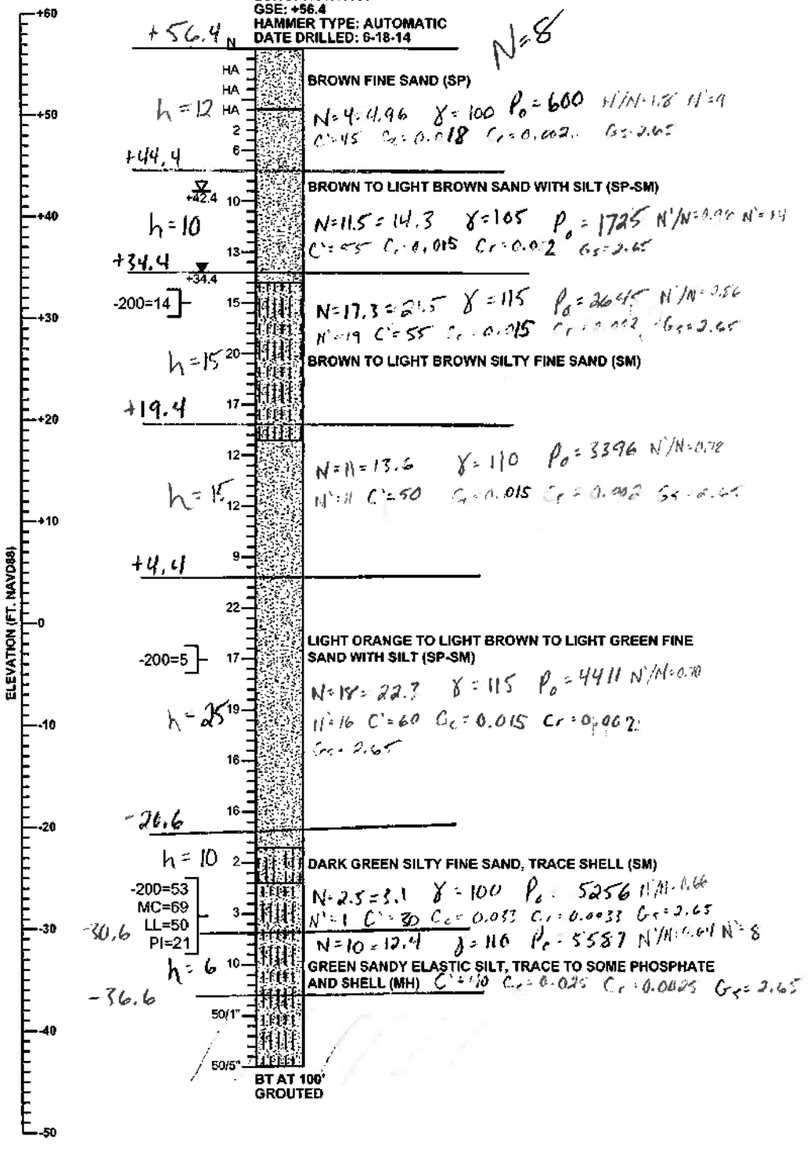


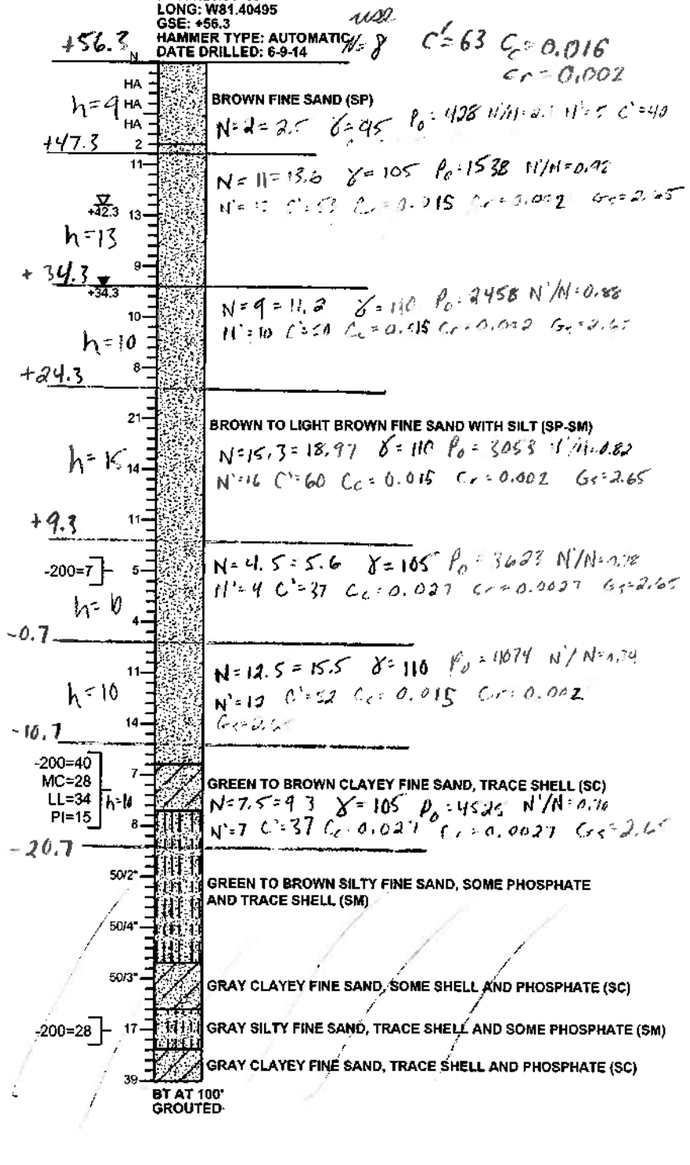
STABL6H FSmin=3.46

Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 3





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +42.4	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +34.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 39
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5682
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

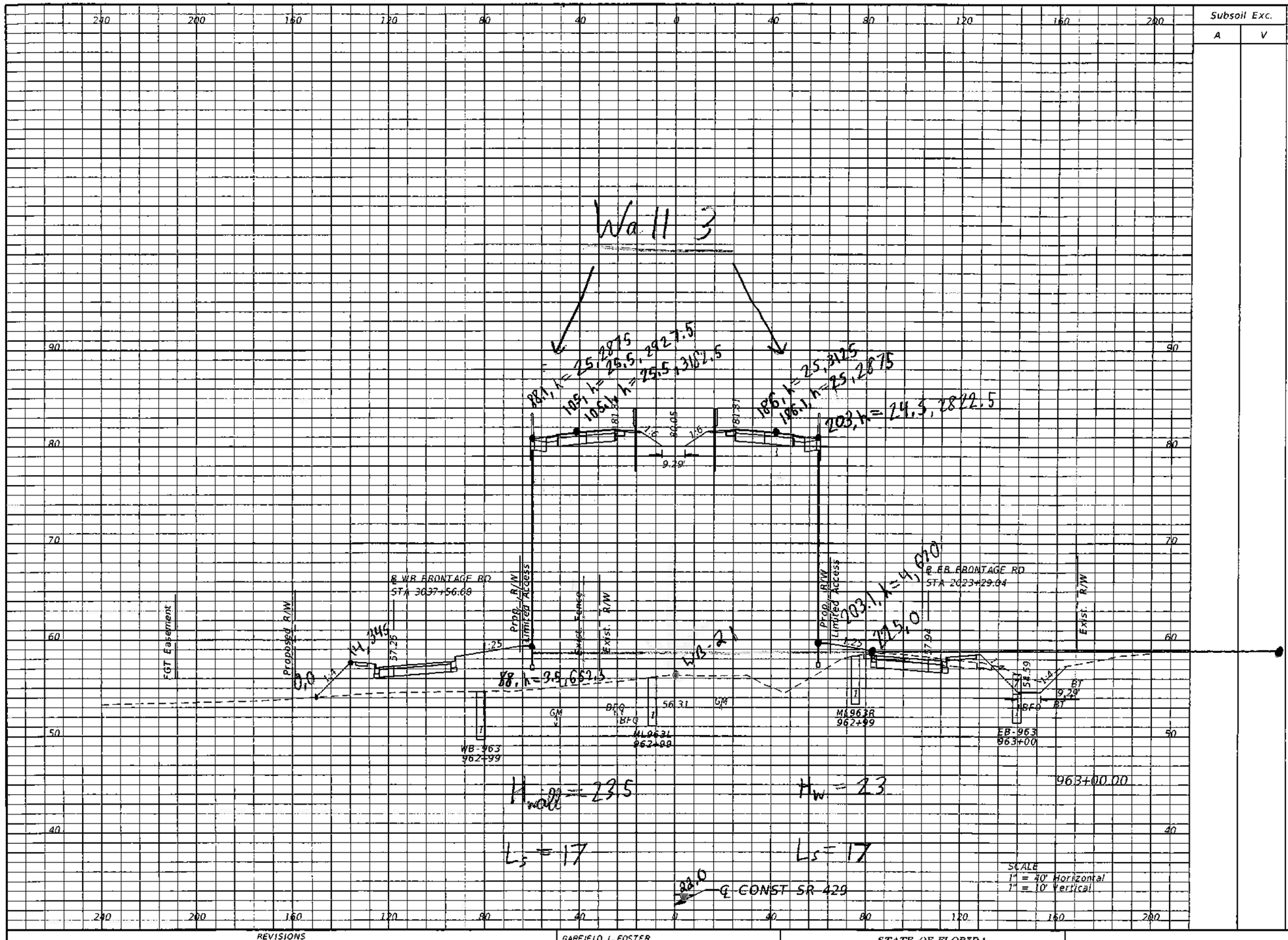
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott 2/5/2015 10:29:31 AM I:\ND109\3520G Wekiva Parkway Section 7A\plboring75.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V



PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

scott_harris 12/8/2014 5:02:21 PM O:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD01_429.DGN

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-21 (963+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Wall 3 Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 88.10 (ft)

Point #	X(ft)	Load (psf)
1	14.00	345.00
2	88.00	652.50
3	88.10	2875.00
4	105.00	2927.50
5	105.10	3182.50
6	186.00	3125.00
7	186.10	2875.00
8	203.00	2822.50
9	203.10	670.00
10	225.00	0.00

Foundation Elev. = 56.40 (ft) Ground Surface Elev.= 56.40 (ft)
Water table Elev. = 34.40 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.018	0.002	0.002	100.00	1.76	0.00
2	COMP.	10.0	0.015	0.002	0.002	105.00	0.56	0.00
3	COMP.	15.0	0.015	0.002	0.002	115.00	0.61	0.00
4	COMP.	15.0	0.015	0.002	0.002	110.00	0.49	0.00
5	COMP.	25.0	0.015	0.002	0.002	115.00	0.64	0.00
6	COMP.	10.0	0.033	0.003	0.003	100.00	0.46	0.00
7	COMP.	6.0	0.025	0.003	0.003	110.00	0.19	0.00
						Total Settlement =	4.71	0.00

N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	54.40	200.00	1798.70	200.00	0.86
2	4.00	50.40	600.00	1775.43	600.00	0.52
3	4.00	46.40	1000.00	1773.73	1000.00	0.38
4	5.00	41.90	1462.50	1776.71	1462.50	0.31
5	5.00	36.90	1987.50	1780.47	1987.50	0.25
6	5.00	31.90	2381.50	1781.94	2381.50	0.22
7	5.00	26.90	2644.50	1780.15	2644.50	0.20
8	5.00	21.90	2907.50	1774.99	2907.50	0.19
9	5.00	16.90	3158.00	1766.65	3158.00	0.17
10	5.00	11.90	3396.00	1755.40	3396.00	0.16

11	5.00	6.90	3634.00	1741.56	3634.00	0.15
12	5.00	1.90	3884.50	1725.42	3884.50	0.14
13	5.00	-3.10	4147.50	1707.27	4147.50	0.13
14	5.00	-8.10	4410.50	1687.38	4410.50	0.13
15	5.00	-13.10	4673.50	1666.01	4673.50	0.12
16	5.00	-18.10	4936.50	1643.40	4936.50	0.11
17	5.00	-23.10	5162.00	1619.77	5162.00	0.23
18	5.00	-28.10	5350.00	1595.34	5350.00	0.22
19	3.00	-32.10	5515.40	1575.34	5515.40	0.10
20	3.00	-35.10	5658.20	1560.13	5658.20	0.10

Wall 3 Total Emb

Total Settlement = 4.71 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-21 (963+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 105.00 (ft)

Point #	X(ft)	Load (psf)
1	14.00	345.00
2	88.00	652.50
3	88.10	2875.00
4	105.00	2927.50
5	105.10	3182.50
6	186.00	3125.00
7	186.10	2875.00
8	203.00	2822.50
9	203.10	670.00
10	225.00	0.00

Foundation Elev. = 56.40 (ft) Ground Surface Elev.= 56.40 (ft)
Water table Elev. = 34.40 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.018	0.002	0.002	100.00	2.24	0.00
2	COMP.	10.0	0.015	0.002	0.002	105.00	0.77	0.00
3	COMP.	15.0	0.015	0.002	0.002	115.00	0.80	0.00
4	COMP.	15.0	0.015	0.002	0.002	110.00	0.61	0.00
5	COMP.	25.0	0.015	0.002	0.002	115.00	0.76	0.00
6	COMP.	10.0	0.033	0.003	0.003	100.00	0.53	0.00
7	COMP.	6.0	0.025	0.003	0.003	110.00	0.22	0.00
					Total Settlement =		5.93	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	54.40	200.00	3047.78	200.00	1.05
2	4.00	50.40	600.00	3028.01	600.00	0.68
3	4.00	46.40	1000.00	2973.56	1000.00	0.52
4	5.00	41.90	1462.50	2882.67	1462.50	0.43
5	5.00	36.90	1987.50	2769.29	1987.50	0.34
6	5.00	31.90	2381.50	2660.09	2381.50	0.29
7	5.00	26.90	2644.50	2561.31	2644.50	0.26
8	5.00	21.90	2907.50	2473.33	2907.50	0.24
9	5.00	16.90	3158.00	2394.56	3158.00	0.22
10	5.00	11.90	3396.00	2323.10	3396.00	0.20

11	5.00	6.90	3634.00	2257.29	3634.00	0.19
12	5.00	1.90	3884.50	2195.83	3884.50	0.18
13	5.00	-3.10	4147.50	2137.77	4147.50	0.16
14	5.00	-8.10	4410.50	2082.44	4410.50	0.15
15	5.00	-13.10	4673.50	2029.36	4673.50	0.14
16	5.00	-18.10	4936.50	1978.20	4936.50	0.13
17	5.00	-23.10	5162.00	1928.74	5162.00	0.27
18	5.00	-28.10	5350.00	1880.85	5350.00	0.26
19	3.00	-32.10	5515.40	1843.60	5515.40	0.11
20	3.00	-35.10	5658.20	1816.26	5658.20	0.11

Wall 3
Total Emb

Total Settlement = 5.93 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-21 (963+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 186.00 (ft)

Point #	X(ft)	Load (psf)
1	14.00	345.00
2	88.00	652.50
3	88.10	2875.00
4	105.00	2927.50
5	105.10	3182.50
6	186.00	3125.00
7	186.10	2875.00
8	203.00	2822.50
9	203.10	670.00
10	225.00	0.00

Foundation Elev. = 56.40 (ft) Ground Surface Elev.= 56.40 (ft)
Water table Elev. = 34.40 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.018	0.002	0.002	100.00	2.22	0.00
2	COMP.	10.0	0.015	0.002	0.002	105.00	0.76	0.00
3	COMP.	15.0	0.015	0.002	0.002	115.00	0.78	0.00
4	COMP.	15.0	0.015	0.002	0.002	110.00	0.59	0.00
5	COMP.	25.0	0.015	0.002	0.002	115.00	0.73	0.00
6	COMP.	10.0	0.033	0.003	0.003	100.00	0.51	0.00
7	COMP.	6.0	0.025	0.003	0.003	110.00	0.21	0.00
						Total Settlement =	5.80	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	54.40	200.00	3001.81	200.00	1.04
2	4.00	50.40	600.00	2977.91	600.00	0.67
3	4.00	46.40	1000.00	2921.96	1000.00	0.51
4	5.00	41.90	1462.50	2827.30	1462.50	0.42
5	5.00	36.90	1987.50	2706.98	1987.50	0.34
6	5.00	31.90	2381.50	2589.22	2381.50	0.29
7	5.00	26.90	2644.50	2481.69	2644.50	0.26
8	5.00	21.90	2907.50	2385.72	2907.50	0.23
9	5.00	16.90	3158.00	2300.21	3158.00	0.21
10	5.00	11.90	3396.00	2223.46	3396.00	0.20

11	5.00	6.90	3634.00	2153.81	3634.00	0.18
12	5.00	1.90	3884.50	2089.87	3884.50	0.17
13	5.00	-3.10	4147.50	2030.53	4147.50	0.16
14	5.00	-8.10	4410.50	1974.95	4410.50	0.14
15	5.00	-13.10	4673.50	1922.50	4673.50	0.13
16	5.00	-18.10	4936.50	1872.68	4936.50	0.13
17	5.00	-23.10	5162.00	1825.16	5162.00	0.26
18	5.00	-28.10	5350.00	1779.65	5350.00	0.25
19	3.00	-32.10	5515.40	1744.56	5515.40	0.11
20	3.00	-35.10	5658.20	1718.96	5658.20	0.10

Wall 3
Total Emb

Total Settlement = 5.80 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-21 (963+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 203.00 (ft)

Point #	X(ft)	Load (psf)
1	14.00	345.00
2	88.00	652.50
3	88.10	2875.00
4	105.00	2927.50
5	105.10	3182.50
6	186.00	3125.00
7	186.10	2875.00
8	203.00	2822.50
9	203.10	670.00
10	225.00	0.00

Foundation Elev. = 56.40 (ft) Ground Surface Elev.= 56.40 (ft)
Water table Elev. = 34.40 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.018	0.002	0.002	100.00	1.73	0.00
2	COMP.	10.0	0.015	0.002	0.002	105.00	0.53	0.00
3	COMP.	15.0	0.015	0.002	0.002	115.00	0.56	0.00
4	COMP.	15.0	0.015	0.002	0.002	110.00	0.45	0.00
5	COMP.	25.0	0.015	0.002	0.002	115.00	0.58	0.00
6	COMP.	10.0	0.033	0.003	0.003	100.00	0.42	0.00
7	COMP.	6.0	0.025	0.003	0.003	110.00	0.18	0.00
					Total Settlement =		4.45	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	54.40	200.00	1764.59	200.00	0.86
2	4.00	50.40	600.00	1709.84	600.00	0.51
3	4.00	46.40	1000.00	1679.54	1000.00	0.37
4	5.00	41.90	1462.50	1655.82	1462.50	0.30
5	5.00	36.90	1987.50	1637.03	1987.50	0.23
6	5.00	31.90	2381.50	1622.59	2381.50	0.20
7	5.00	26.90	2644.50	1610.27	2644.50	0.19
8	5.00	21.90	2907.50	1598.76	2907.50	0.17
9	5.00	16.90	3158.00	1587.27	3158.00	0.16
10	5.00	11.90	3396.00	1575.33	3396.00	0.15

11	5.00	6.90	3634.00	1562.64	3634.00	0.14
12	5.00	1.90	3884.50	1549.06	3884.50	0.13
13	5.00	-3.10	4147.50	1534.51	4147.50	0.12
14	5.00	-8.10	4410.50	1519.00	4410.50	0.12
15	5.00	-13.10	4673.50	1502.56	4673.50	0.11
16	5.00	-18.10	4936.50	1485.26	4936.50	0.10
17	5.00	-23.10	5162.00	1467.19	5162.00	0.22
18	5.00	-28.10	5350.00	1448.45	5350.00	0.21
19	3.00	-32.10	5515.40	1433.04	5515.40	0.09
20	3.00	-35.10	5658.20	1421.29	5658.20	0.09

Wall 3 Total Emb

Total Settlement = 4.45 (in.)

Wall 3 Global Stability

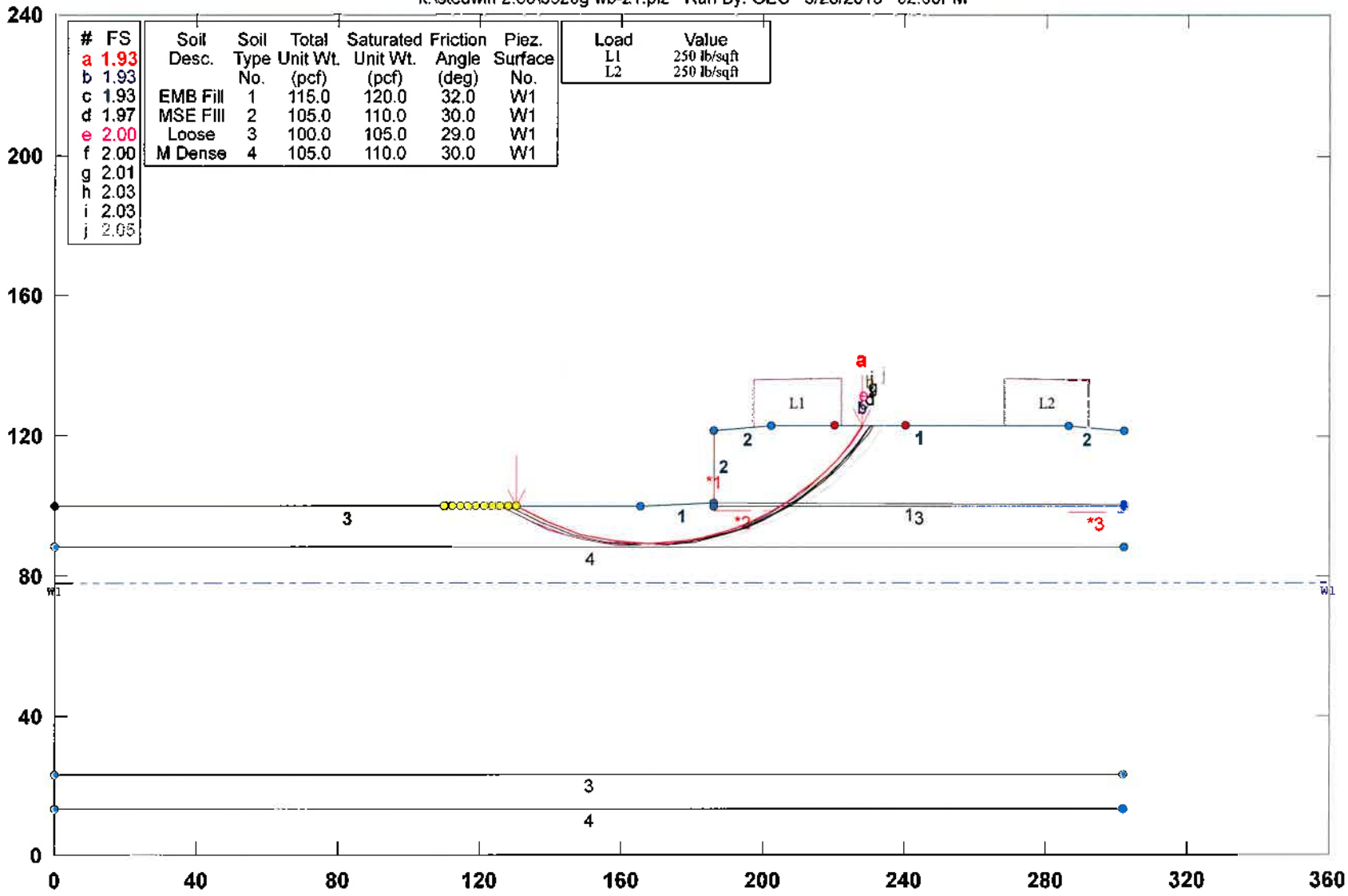
Wekiva 7A WB-21 (963+00)

k:\stedwin 2.86\3520g wb-21.pl2 Run By: GEC 3/28/2015 02:00PM

#	FS
a	1.93
b	1.93
c	1.93
d	1.97
e	2.00
f	2.00
g	2.01
h	2.03
i	2.03
j	2.05

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	32.0	W1
MSE Fill	2	105.0	110.0	30.0	W1
Loose	3	100.0	105.0	29.0	W1
M Dense	4	105.0	110.0	30.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft



STABL6H FSmin=1.93

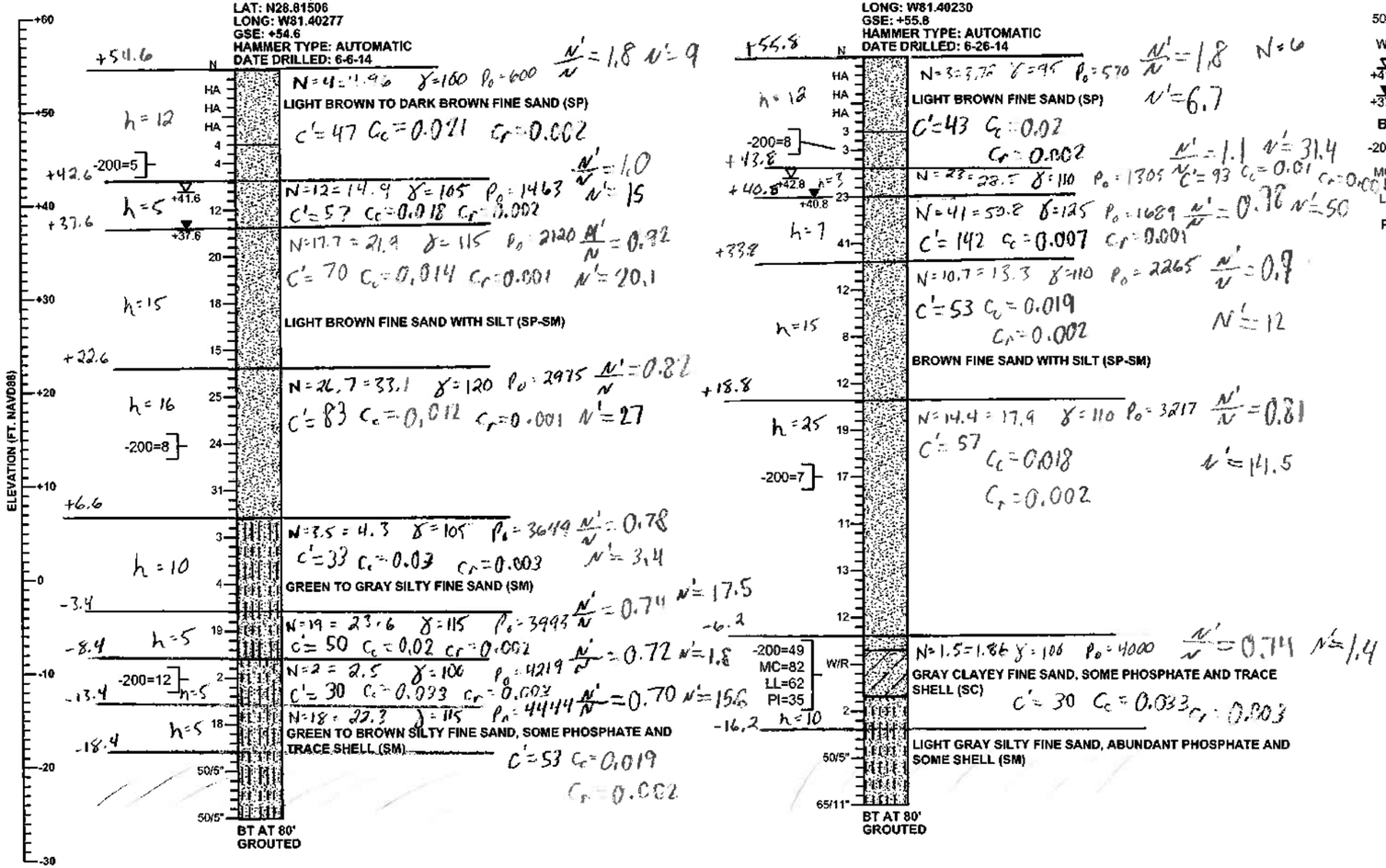
Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 4

Wall 4

16



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
▽ +41.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▽ +37.6	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — SAND AND CLAY — SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-896-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

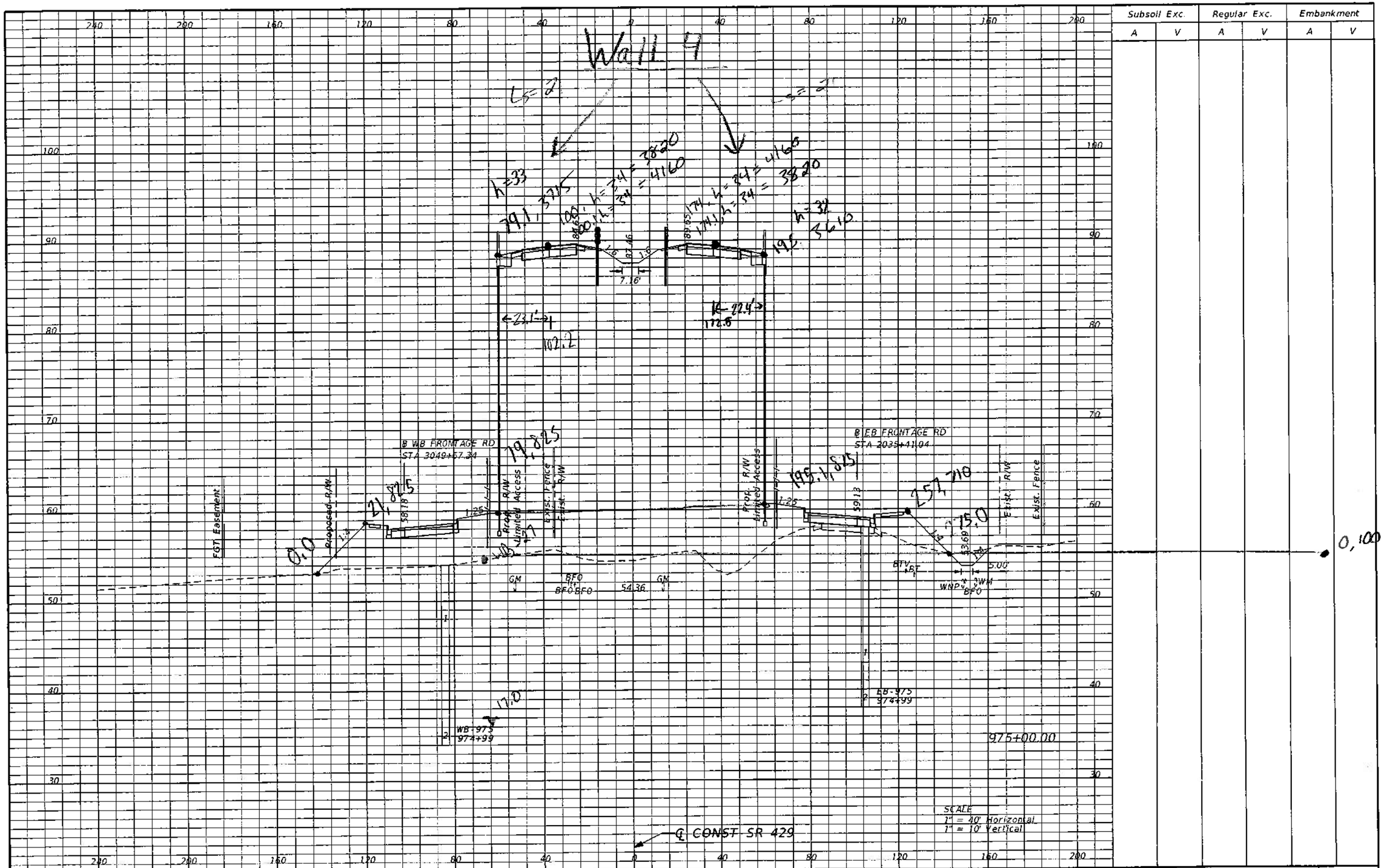
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott 2/5/2015 10:30:03 AM J:\D109\35206 Wekiva Parkway Section 7A\blboring15.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

scott_harris 12/8/2014 5:02:25 PM O:\Projects\CADD\240200252011\roadway\Xsect\RDXSRD01_429.DGN

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Wall 4 Pre LP Placement Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 79.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	345.00
3	79.10	345.00
4	100.00	345.00
5	100.10	345.00
6	174.00	345.00
7	174.10	345.00
8	195.00	345.00
9	195.10	345.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	0.76	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.09	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	0.15	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.09	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.11	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.03	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.05	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.03	0.00
					Total Settlement =		1.33	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	342.22	200.00	0.44
2	4.00	48.60	600.00	336.67	600.00	0.19
3	4.00	44.60	1000.00	331.15	1000.00	0.13
4	1.00	42.10	1252.50	327.72	1252.50	0.02
5	1.00	41.10	1357.50	326.36	1357.50	0.02
6	1.00	40.10	1462.50	325.00	1462.50	0.02
7	1.00	39.10	1567.50	323.64	1567.50	0.02
8	1.00	38.10	1672.50	322.29	1672.50	0.02
9	5.00	35.10	1856.50	318.26	1856.50	0.06

10	5.00	30.10	2119.50	311.66	2119.50	0.05
11	5.00	25.10	2382.50	305.22	2382.50	0.04
12	4.00	20.60	2629.20	299.56	2629.20	0.03
13	4.00	16.60	2859.60	294.65	2859.60	0.02
14	4.00	12.60	3090.00	289.86	3090.00	0.02
15	4.00	8.60	3320.40	285.19	3320.40	0.02
16	5.00	4.10	3542.10	280.08	3542.10	0.06
17	5.00	-0.90	3755.10	274.57	3755.10	0.06
18	5.00	-5.90	3993.10	269.23	3993.10	0.03
19	5.00	-10.90	4218.60	264.06	4218.60	0.05
20	5.00	-15.90	4444.10	259.05	4444.10	0.03

Wall 4
Pre LP

Total Settlement = 1.33 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 100.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	345.00
3	79.10	345.00
4	100.00	345.00
5	100.10	345.00
6	174.00	345.00
7	174.10	345.00
8	195.00	345.00
9	195.10	345.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	0.77	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.10	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	0.16	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.10	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.13	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.04	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.06	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.03	0.00
						Total Settlement =	1.39	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	344.99	200.00	0.44
2	4.00	48.60	600.00	344.79	600.00	0.20
3	4.00	44.60	1000.00	344.08	1000.00	0.13
4	1.00	42.10	1252.50	343.32	1252.50	0.02
5	1.00	41.10	1357.50	342.94	1357.50	0.02
6	1.00	40.10	1462.50	342.52	1462.50	0.02
7	1.00	39.10	1567.50	342.05	1567.50	0.02
8	1.00	38.10	1672.50	341.55	1672.50	0.02
9	5.00	35.10	1856.50	339.82	1856.50	0.06

10	5.00	30.10	2119.50	336.27	2119.50	0.05
11	5.00	25.10	2382.50	332.07	2382.50	0.05
12	4.00	20.60	2629.20	327.87	2629.20	0.03
13	4.00	16.60	2859.60	323.89	2859.60	0.03
14	4.00	12.60	3090.00	319.75	3090.00	0.02
15	4.00	8.60	3320.40	315.48	3320.40	0.02
16	5.00	4.10	3542.10	310.58	3542.10	0.07
17	5.00	-0.90	3755.10	305.04	3755.10	0.06
18	5.00	-5.90	3993.10	299.47	3993.10	0.04
19	5.00	-10.90	4218.60	293.88	4218.60	0.06
20	5.00	-15.90	4444.10	288.31	4444.10	0.03

Wall 4
Pre LP

Total Settlement = 1.39 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 174.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	345.00
3	79.10	345.00
4	100.00	345.00
5	100.10	345.00
6	174.00	345.00
7	174.10	345.00
8	195.00	345.00
9	195.10	345.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	0.77	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.10	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	0.16	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.10	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.13	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.04	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.06	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.03	0.00
						Total Settlement =	1.39	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	344.99	200.00	0.44
2	4.00	48.60	600.00	344.79	600.00	0.20
3	4.00	44.60	1000.00	344.10	1000.00	0.13
4	1.00	42.10	1252.50	343.35	1252.50	0.02
5	1.00	41.10	1357.50	342.97	1357.50	0.02
6	1.00	40.10	1462.50	342.56	1462.50	0.02
7	1.00	39.10	1567.50	342.10	1567.50	0.02
8	1.00	38.10	1672.50	341.61	1672.50	0.02
9	5.00	35.10	1856.50	339.90	1856.50	0.06

10	5.00	30.10	2119.50	336.40	2119.50	0.05
11	5.00	25.10	2382.50	332.24	2382.50	0.05
12	4.00	20.60	2629.20	328.08	2629.20	0.03
13	4.00	16.60	2859.60	324.14	2859.60	0.03
14	4.00	12.60	3090.00	320.03	3090.00	0.02
15	4.00	8.60	3320.40	315.79	3320.40	0.02
16	5.00	4.10	3542.10	310.91	3542.10	0.07
17	5.00	-0.90	3755.10	305.41	3755.10	0.06
18	5.00	-5.90	3993.10	299.85	3993.10	0.04
19	5.00	-10.90	4218.60	294.28	4218.60	0.06
20	5.00	-15.90	4444.10	288.72	4444.10	0.03

Wall 4
Pre LP

Total Settlement = 1.39 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 195.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	345.00
3	79.10	345.00
4	100.00	345.00
5	100.10	345.00
6	174.00	345.00
7	174.10	345.00
8	195.00	345.00
9	195.10	345.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	0.76	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.10	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	0.15	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.09	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.11	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.03	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.05	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.03	0.00
					Total Settlement =		1.33	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	342.46	200.00	0.44
2	4.00	48.60	600.00	336.98	600.00	0.20
3	4.00	44.60	1000.00	331.52	1000.00	0.13
4	1.00	42.10	1252.50	328.13	1252.50	0.02
5	1.00	41.10	1357.50	326.78	1357.50	0.02
6	1.00	40.10	1462.50	325.43	1462.50	0.02
7	1.00	39.10	1567.50	324.09	1567.50	0.02
8	1.00	38.10	1672.50	322.75	1672.50	0.02
9	5.00	35.10	1856.50	318.77	1856.50	0.06

10	5.00	30.10	2119.50	312.22	2119.50	0.05
11	5.00	25.10	2382.50	305.83	2382.50	0.04
12	4.00	20.60	2629.20	300.21	2629.20	0.03
13	4.00	16.60	2859.60	295.33	2859.60	0.02
14	4.00	12.60	3090.00	290.57	3090.00	0.02
15	4.00	8.60	3320.40	285.92	3320.40	0.02
16	5.00	4.10	3542.10	280.82	3542.10	0.06
17	5.00	-0.90	3755.10	275.32	3755.10	0.06
18	5.00	-5.90	3993.10	269.99	3993.10	0.03
19	5.00	-10.90	4218.60	264.82	4218.60	0.05
20	5.00	-15.90	4444.10	259.81	4444.10	0.03

Wall 4
Pre LP

Total Settlement = 1.33 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Wall 4 Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 79.00 (ft)

Point #	X(ft)	Load (psf)	Point	Total Emb. Settl	Settl. Prior To Placement	Effective Wall Settl.
1	0.00	0.00				
2	79.00	825.00	LT Wall	5.58	1.33	4.25
3	79.10	3715.00				
4	100.00	3820.00	LT End of Strap	7.24	1.39	5.85
5	100.10	4160.00				
6	174.00	4160.00				
7	174.10	3820.00	RT End of Strap	7.23	1.39	5.84
8	195.00	3610.00				
9	195.10	825.00	RT Wall	5.58	1.33	4.25
10	275.00	0.00				

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	2.29	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.44	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	0.80	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.56	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.73	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.22	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.35	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.19	0.00
					Total Settlement =		5.58	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	2220.40	200.00	1.09
2	4.00	48.60	600.00	2245.26	600.00	0.68
3	4.00	44.60	1000.00	2247.91	1000.00	0.52
4	1.00	42.10	1252.50	2248.63	1252.50	0.10
5	1.00	41.10	1357.50	2248.87	1357.50	0.09
6	1.00	40.10	1462.50	2249.10	1462.50	0.09
7	1.00	39.10	1567.50	2249.29	1567.50	0.08
8	1.00	38.10	1672.50	2249.45	1672.50	0.08
9	5.00	35.10	1856.50	2249.56	1856.50	0.29

10	5.00	30.10	2119.50	2247.96	2119.50	0.26
11	5.00	25.10	2382.50	2243.38	2382.50	0.24
12	4.00	20.60	2629.20	2236.45	2629.20	0.15
13	4.00	16.60	2859.60	2228.07	2859.60	0.14
14	4.00	12.60	3090.00	2217.69	3090.00	0.14
15	4.00	8.60	3320.40	2205.45	3320.40	0.13
16	5.00	4.10	3542.10	2189.64	3542.10	0.38
17	5.00	-0.90	3755.10	2169.78	3755.10	0.36
18	5.00	-5.90	3993.10	2147.78	3993.10	0.22
19	5.00	-10.90	4218.60	2123.91	4218.60	0.35
20	5.00	-15.90	4444.10	2098.44	4444.10	0.19

Wall 4
Total Emb

Total Settlement = 5.58 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 100.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	825.00
3	79.10	3715.00
4	100.00	3820.00
5	100.10	4160.00
6	174.00	4160.00
7	174.10	3820.00
8	195.00	3610.00
9	195.10	825.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	2.92	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.61	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	1.09	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.74	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.93	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.28	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.43	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.24	0.00
					Total Settlement =		7.24	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	3980.85	200.00	1.33
2	4.00	48.60	600.00	3965.03	600.00	0.89
3	4.00	44.60	1000.00	3918.82	1000.00	0.70
4	1.00	42.10	1252.50	3875.20	1252.50	0.13
5	1.00	41.10	1357.50	3855.12	1357.50	0.13
6	1.00	40.10	1462.50	3833.81	1462.50	0.12
7	1.00	39.10	1567.50	3811.42	1567.50	0.12
8	1.00	38.10	1672.50	3788.15	1672.50	0.11
9	5.00	35.10	1856.50	3714.60	1856.50	0.40

10	5.00	30.10	2119.50	3587.27	2119.50	0.36
11	5.00	25.10	2382.50	3462.82	2382.50	0.33
12	4.00	20.60	2629.20	3357.06	2629.20	0.21
13	4.00	16.60	2859.60	3268.75	2859.60	0.19
14	4.00	12.60	3090.00	3185.59	3090.00	0.18
15	4.00	8.60	3320.40	3107.10	3320.40	0.17
16	5.00	4.10	3542.10	3023.72	3542.10	0.48
17	5.00	-0.90	3755.10	2936.31	3755.10	0.45
18	5.00	-5.90	3993.10	2853.60	3993.10	0.28
19	5.00	-10.90	4218.60	2774.90	4218.60	0.43 Wall 4
20	5.00	-15.90	4444.10	2699.71	4444.10	0.24 Total Emb

Total Settlement = 7.24 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 174.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	825.00
3	79.10	3715.00
4	100.00	3820.00
5	100.10	4160.00
6	174.00	4160.00
7	174.10	3820.00
8	195.00	3610.00
9	195.10	825.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	2.92	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.60	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	1.09	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.74	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.93	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.28	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.43	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.23	0.00
						Total Settlement =	7.23	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	3988.99	200.00	1.33
2	4.00	48.60	600.00	3960.45	600.00	0.89
3	4.00	44.60	1000.00	3909.10	1000.00	0.70
4	1.00	42.10	1252.50	3863.71	1252.50	0.13
5	1.00	41.10	1357.50	3843.16	1357.50	0.13
6	1.00	40.10	1462.50	3821.48	1462.50	0.12
7	1.00	39.10	1567.50	3798.82	1567.50	0.12
8	1.00	38.10	1672.50	3775.36	1672.50	0.11
9	5.00	35.10	1856.50	3701.63	1856.50	0.40

10	5.00	30.10	2119.50	3574.81	2119.50	0.36
11	5.00	25.10	2382.50	3451.33	2382.50	0.33
12	4.00	20.60	2629.20	3346.56	2629.20	0.21
13	4.00	16.60	2859.60	3259.12	2859.60	0.19
14	4.00	12.60	3090.00	3176.80	3090.00	0.18
15	4.00	8.60	3320.40	3099.10	3320.40	0.16
16	5.00	4.10	3542.10	3016.52	3542.10	0.48
17	5.00	-0.90	3755.10	2929.93	3755.10	0.45
18	5.00	-5.90	3993.10	2847.94	3993.10	0.28
19	5.00	-10.90	4218.60	2769.89	4218.60	0.43
20	5.00	-15.90	4444.10	2695.28	4444.10	0.23

Wall 4 Total Emb

Total Settlement = 7.23 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-27 (975+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/26/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 195.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	79.00	825.00
3	79.10	3715.00
4	100.00	3820.00
5	100.10	4160.00
6	174.00	4160.00
7	174.10	3820.00
8	195.00	3610.00
9	195.10	825.00
10	275.00	0.00

Foundation Elev. = 54.60 (ft) Ground Surface Elev.= 54.60 (ft)
Water table Elev. = 37.60 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	12.0	0.021	0.002	0.002	100.00	2.29	0.00
2	COMP.	5.0	0.018	0.002	0.002	105.00	0.44	0.00
3	COMP.	15.0	0.014	0.001	0.001	115.00	0.79	0.00
4	COMP.	16.0	0.012	0.001	0.001	120.00	0.56	0.00
5	COMP.	10.0	0.030	0.003	0.003	105.00	0.73	0.00
6	COMP.	5.0	0.020	0.002	0.002	115.00	0.22	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.35	0.00
8	COMP.	5.0	0.019	0.002	0.000	115.00	0.19	0.00
						Total Settlement =	5.58	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.00	52.60	200.00	2262.15	200.00	1.10
2	4.00	48.60	600.00	2233.21	600.00	0.68
3	4.00	44.60	1000.00	2229.59	1000.00	0.51
4	1.00	42.10	1252.50	2229.92	1252.50	0.10
5	1.00	41.10	1357.50	2230.30	1357.50	0.09
6	1.00	40.10	1462.50	2230.76	1462.50	0.09
7	1.00	39.10	1567.50	2231.26	1567.50	0.08
8	1.00	38.10	1672.50	2231.76	1672.50	0.08
9	5.00	35.10	1856.50	2233.09	1856.50	0.29

10	5.00	30.10	2119.50	2233.60	2119.50	0.26
11	5.00	25.10	2382.50	2230.95	2382.50	0.24
12	4.00	20.60	2629.20	2225.52	2629.20	0.15
13	4.00	16.60	2859.60	2218.29	2859.60	0.14
14	4.00	12.60	3090.00	2208.93	3090.00	0.13
15	4.00	8.60	3320.40	2197.57	3320.40	0.13
16	5.00	4.10	3542.10	2182.63	3542.10	0.38
17	5.00	-0.90	3755.10	2163.61	3755.10	0.36
18	5.00	-5.90	3993.10	2142.33	3993.10	0.22
19	5.00	-10.90	4218.60	2119.09	4218.60	0.35
20	5.00	-15.90	4444.10	2094.16	4444.10	0.19

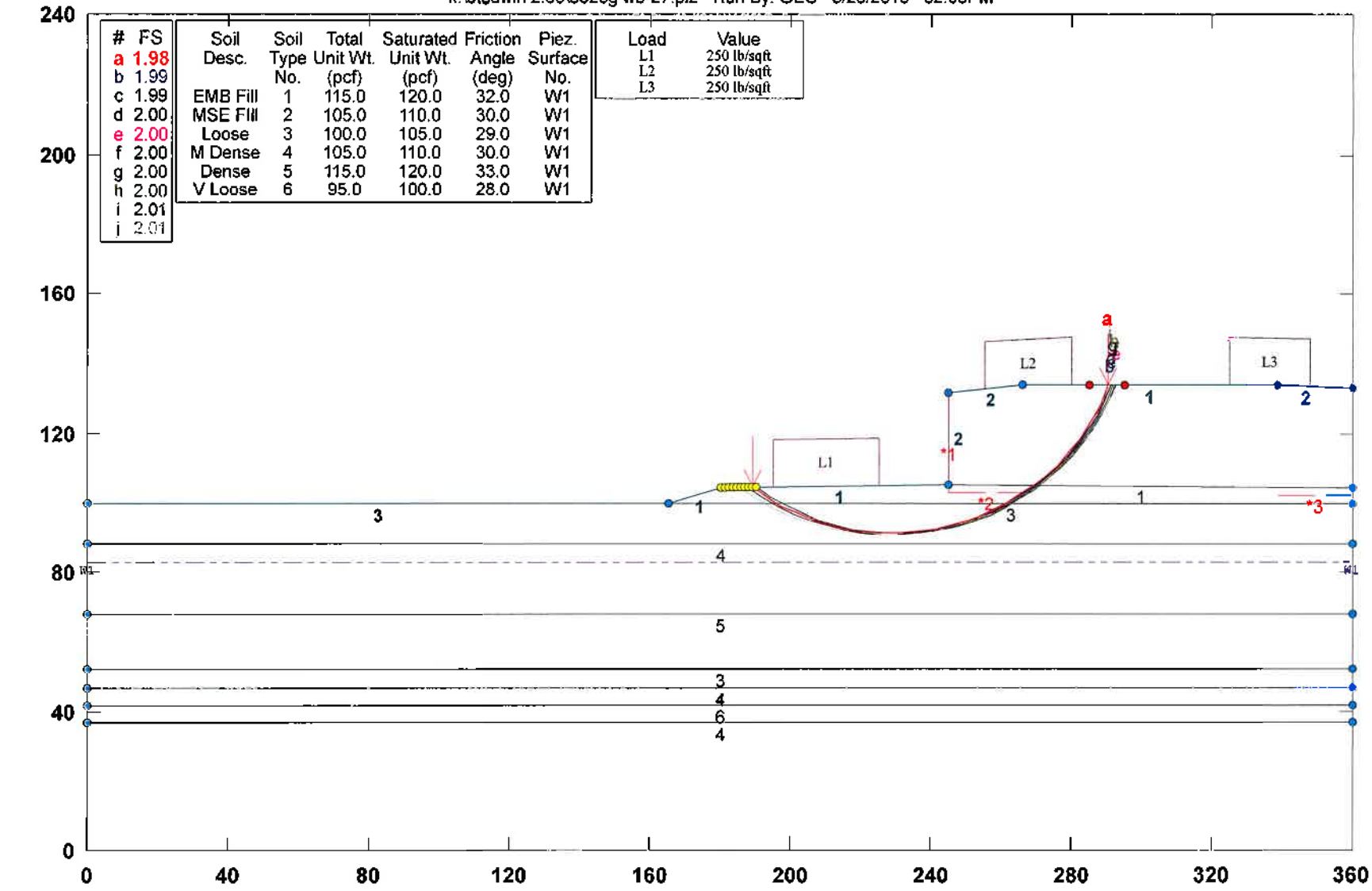
Wall 4 Total Emb

Total Settlement = 5.58 (in.)

Wall 4 Global Stability

Wekiva 7A WB-27 (975+00)

k:\stedwin 2.86\3520g wb-27.pl2 Run By: GEC 3/28/2015 02:06PM



#	FS
a	1.98
b	1.99
c	1.99
d	2.00
e	2.00
f	2.00
g	2.00
h	2.00
i	2.01
j	2.01

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	32.0	W1
MSE Fill	2	105.0	110.0	30.0	W1
Loose	3	100.0	105.0	29.0	W1
M Dense	4	105.0	110.0	30.0	W1
Dense	5	115.0	120.0	33.0	W1
V Loose	6	95.0	100.0	28.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft

STABL6H FSmin=1.98

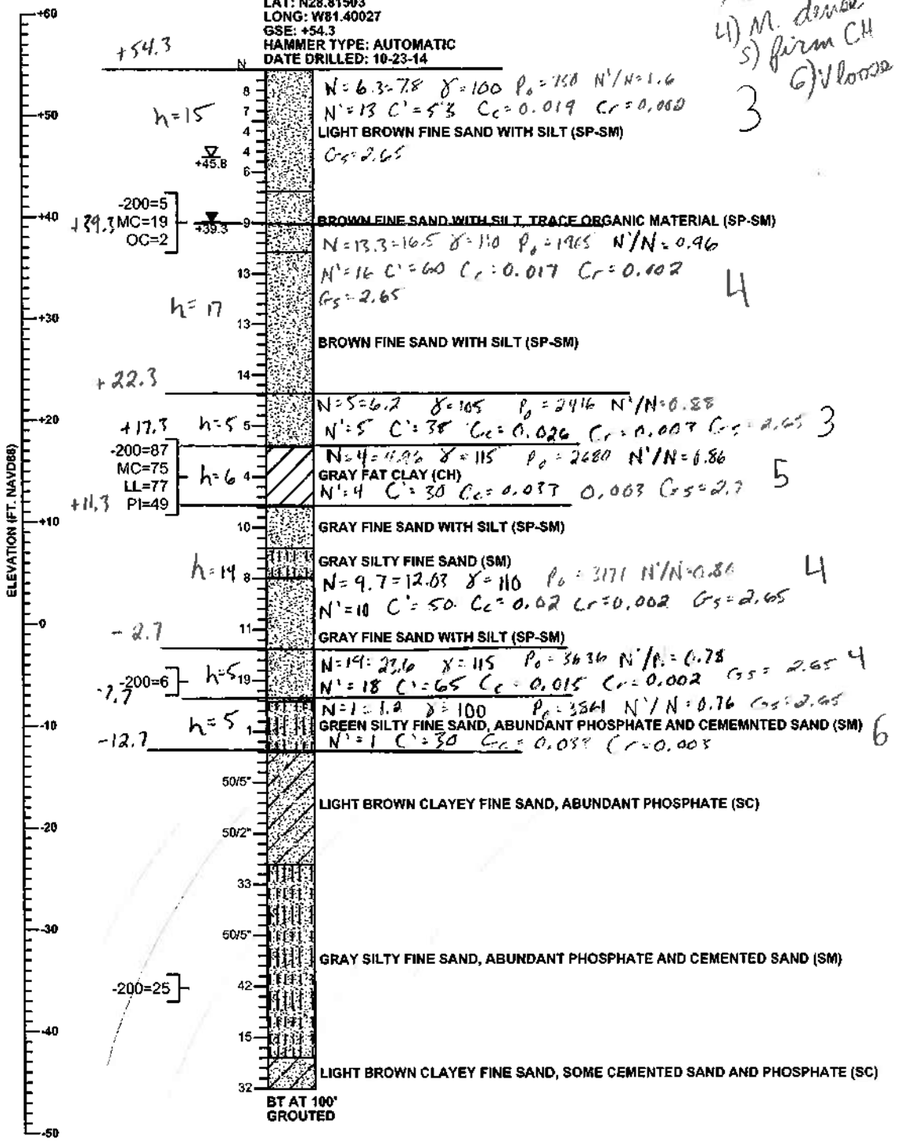
Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 5

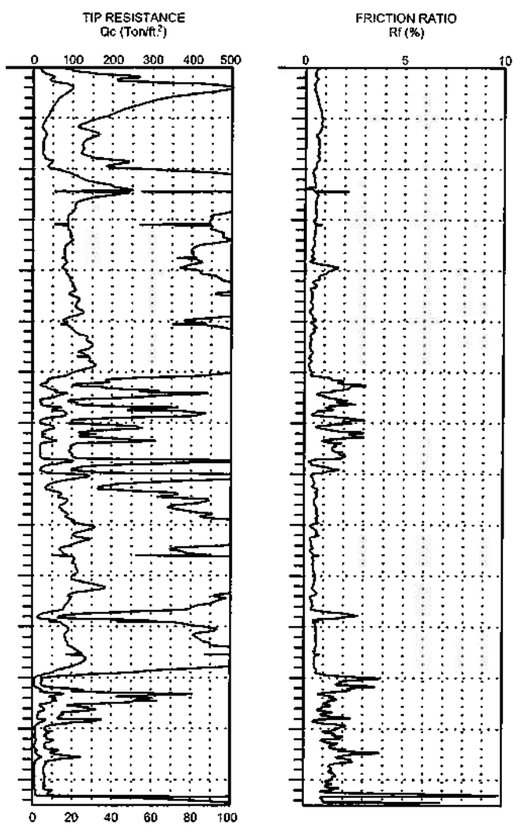
soils
1) ends fill
2) MSE fill
3) Loose
4) M. dense
5) firm CH
6) V loose

WB-30A
STA. 983+00, 60' LEFT
LAT: N28.81503
LONG: W81.40027
GSE: +54.3
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-23-14



BT AT 100'
GROUTED

WB-30B
STA. 983+00, 60' RIGHT
LAT: N28.81471
LONG: W81.40027
GSE: +55.5
DATE DRILLED: 10-2-14



ST AT 72.5'

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
+45.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+39.3	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT

SAND — SAND AND CLAY
SAND AND SILT — CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 22
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

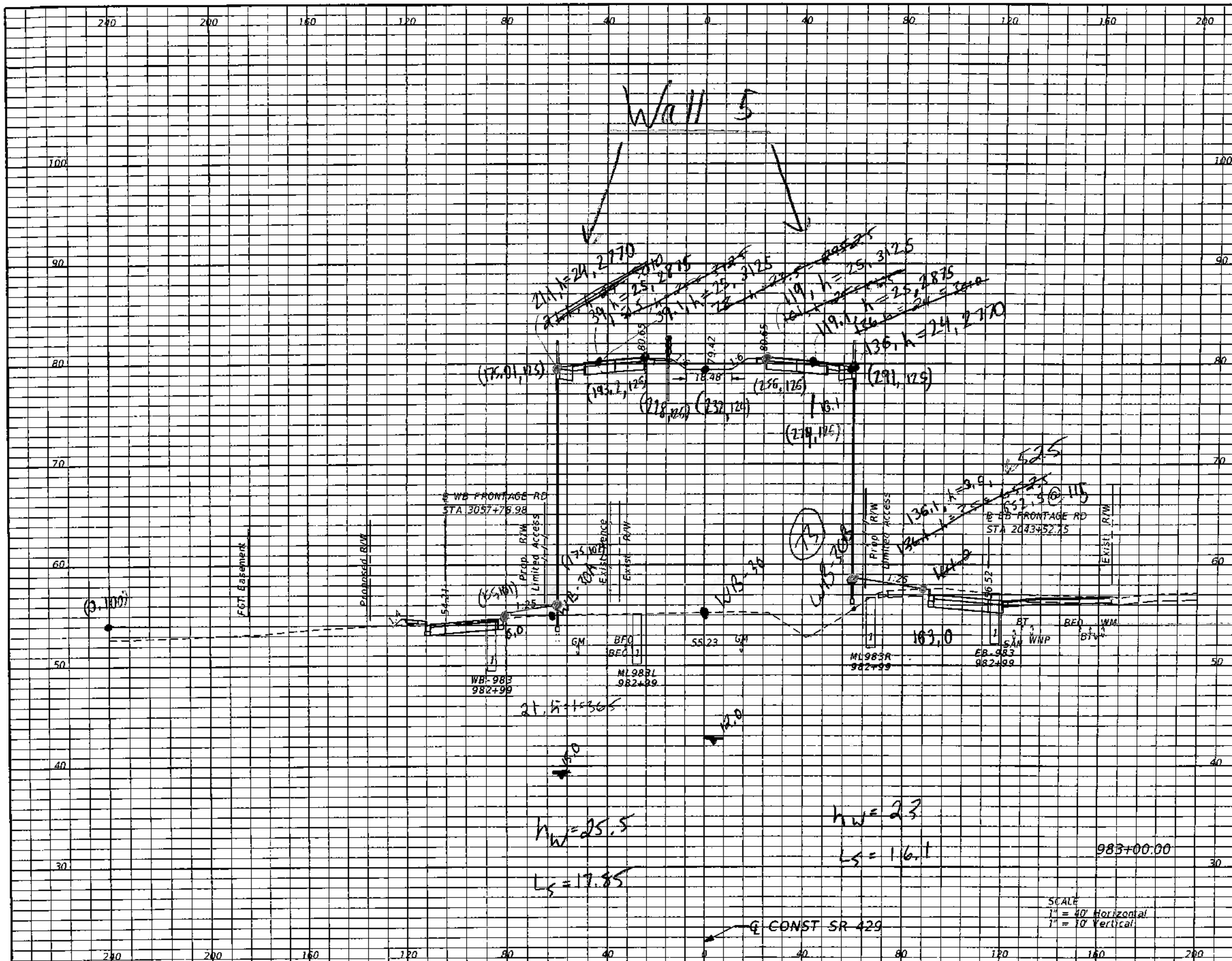
DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott 2/5/2015 10:30:24 AM J:\D109\35206 Wekiva Parkway Section 7A\blboring15.dgn



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-30A (983+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/9/2015 Computed by : BMM

Wall 5
Total Embankment
Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 21.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	21.00	365.00
3	21.10	2770.00
4	39.00	2875.00
5	39.10	3125.00
6	119.00	3125.00
7	119.10	2875.00
8	136.00	2770.00
9	136.10	652.50
10	163.00	0.00

Foundation Elev. = 54.30 (ft) Ground Surface Elev.= 54.30 (ft)
Water table Elev. = 39.30 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	15.0	0.019	0.002	0.002	100.00	1.94	0.00
2	COMP.	17.0	0.017	0.002	0.002	110.00	0.90	0.00
3	COMP.	5.0	0.026	0.003	0.003	105.00	0.33	0.00
4	COMP.	6.0	0.033	0.003	0.003	115.00	0.04	0.00
5	COMP.	14.0	0.020	0.002	0.002	110.00	0.06	0.00
6	COMP.	5.0	0.015	0.002	0.002	115.00	0.02	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.03	0.00
					Total Settlement =		3.31	0.00

N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	51.80	250.00	1589.96	250.00	0.99
2	5.00	46.80	750.00	1554.97	750.00	0.56
3	5.00	41.80	1250.00	1542.67	1250.00	0.40
4	4.25	37.17	1601.15	1537.50	1600.77	0.25
5	4.25	32.92	1803.45	1534.83	1803.21	0.23
6	4.25	28.67	2005.75	1532.56	2005.51	0.21
7	4.25	24.42	2208.05	1529.85	2207.81	0.20
8	5.00	19.80	2415.70	1525.88	2415.70	0.33
9	3.00	15.80	2601.10	1521.36	5202.20	0.02
10	3.00	12.80	2758.90	1517.27	5517.80	0.02

11	4.67	8.97	2948.87	1511.11	5898.38	0.02
12	4.67	4.30	3171.00	1502.24	6342.00	0.02
13	4.67	-0.37	3393.13	1491.89	6785.62	0.02
14	5.00	-5.20	3635.70	1479.69	7246.07	0.02
15	5.00	-10.20	3861.20	1465.61	7722.40	0.03

Wall 5 Total Emb

Total Settlement = 3.31 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-30A (983+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/9/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 39.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	21.00	365.00
3	21.10	2770.00
4	39.00	2875.00
5	39.10	3125.00
6	119.00	3125.00
7	119.10	2875.00
8	136.00	2770.00
9	136.10	652.50
10	163.00	0.00

Foundation Elev. = 54.30 (ft) Ground Surface Elev.= 54.30 (ft)
Water table Elev. = 39.30 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	15.0	0.019	0.002	0.002	100.00	2.65	0.00
2	COMP.	17.0	0.017	0.002	0.002	110.00	1.31	0.00
3	COMP.	5.0	0.026	0.003	0.003	105.00	0.46	0.00
4	COMP.	6.0	0.033	0.003	0.003	115.00	0.06	0.00
5	COMP.	14.0	0.020	0.002	0.002	110.00	0.08	0.00
6	COMP.	5.0	0.015	0.002	0.002	115.00	0.02	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.03	0.00
					Total Settlement =		4.61	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	51.80	250.00	2997.42	250.00	1.27
2	5.00	46.80	750.00	2955.90	750.00	0.79
3	5.00	41.80	1250.00	2867.34	1250.00	0.59
4	4.25	37.17	1601.15	2759.33	1600.77	0.38
5	4.25	32.92	1803.45	2655.04	1803.21	0.34
6	4.25	28.67	2005.75	2554.93	2005.51	0.31
7	4.25	24.42	2208.05	2462.50	2207.81	0.28
8	5.00	19.80	2415.70	2371.35	2415.70	0.46
9	3.00	15.80	2601.10	2299.88	5202.20	0.03
10	3.00	12.80	2758.90	2250.20	5517.80	0.03

11	4.67	8.97	2948.87	2190.97	5898.38	0.03
12	4.67	4.30	3171.00	2124.32	6342.00	0.02
13	4.67	-0.37	3393.13	2062.61	6785.62	0.02
14	5.00	-5.20	3635.70	2002.95	7246.07	0.02
15	5.00	-10.20	3861.20	1944.98	7722.40	0.03

Wall 5 Total Emb

Total Settlement = 4.61 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-30A (983+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/9/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 119.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	21.00	365.00
3	21.10	2770.00
4	39.00	2875.00
5	39.10	3125.00
6	119.00	3125.00
7	119.10	2875.00
8	136.00	2770.00
9	136.10	652.50
10	163.00	0.00

Foundation Elev. = 54.30 (ft) Ground Surface Elev.= 54.30 (ft)
Water table Elev. = 39.30 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	15.0	0.019	0.002	0.002	100.00	2.65	0.00
2	COMP.	17.0	0.017	0.002	0.002	110.00	1.31	0.00
3	COMP.	5.0	0.026	0.003	0.003	105.00	0.46	0.00
4	COMP.	6.0	0.033	0.003	0.003	115.00	0.06	0.00
5	COMP.	14.0	0.020	0.002	0.002	110.00	0.08	0.00
6	COMP.	5.0	0.015	0.002	0.002	115.00	0.02	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.03	0.00
					Total Settlement =		4.61	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	51.80	250.00	2997.07	250.00	1.27
2	5.00	46.80	750.00	2953.41	750.00	0.79
3	5.00	41.80	1250.00	2862.52	1250.00	0.59
4	4.25	37.17	1601.15	2754.51	1600.77	0.38
5	4.25	32.92	1803.45	2651.97	1803.21	0.34
6	4.25	28.67	2005.75	2554.40	2005.51	0.31
7	4.25	24.42	2208.05	2464.60	2207.81	0.28
8	5.00	19.80	2415.70	2375.99	2415.70	0.46
9	3.00	15.80	2601.10	2306.28	5202.20	0.03
10	3.00	12.80	2758.90	2257.67	5517.80	0.03

11	4.67	8.97	2948.87	2199.51	5898.38	0.03
12	4.67	4.30	3171.00	2133.76	6342.00	0.03
13	4.67	-0.37	3393.13	2072.60	6785.62	0.02
14	5.00	-5.20	3635.70	2013.24	7246.07	0.02
15	5.00	-10.20	3861.20	1955.34	7722.40	0.03

Wall 5 Total Emb

Total Settlement = 4.61 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-30A (983+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/9/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 136.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	21.00	365.00
3	21.10	2770.00
4	39.00	2875.00
5	39.10	3125.00
6	119.00	3125.00
7	119.10	2875.00
8	136.00	2770.00
9	136.10	652.50
10	163.00	0.00

Foundation Elev. = 54.30 (ft) Ground Surface Elev.= 54.30 (ft)
Water table Elev. = 39.30 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	15.0	0.019	0.002	0.002	100.00	2.02	0.00
2	COMP.	17.0	0.017	0.002	0.002	110.00	0.94	0.00
3	COMP.	5.0	0.026	0.003	0.003	105.00	0.34	0.00
4	COMP.	6.0	0.033	0.003	0.003	115.00	0.04	0.00
5	COMP.	14.0	0.020	0.002	0.002	110.00	0.06	0.00
6	COMP.	5.0	0.015	0.002	0.002	115.00	0.02	0.00
7	COMP.	5.0	0.033	0.003	0.003	100.00	0.03	0.00
					Total Settlement =		3.45	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	51.80	250.00	1725.20	250.00	1.02
2	5.00	46.80	750.00	1682.43	750.00	0.58
3	5.00	41.80	1250.00	1660.43	1250.00	0.42
4	4.25	37.17	1601.15	1645.94	1600.77	0.27
5	4.25	32.92	1803.45	1634.82	1803.21	0.24
6	4.25	28.67	2005.75	1624.53	2005.51	0.22
7	4.25	24.42	2208.05	1614.40	2207.81	0.21
8	5.00	19.80	2415.70	1603.14	2415.70	0.34
9	3.00	15.80	2601.10	1592.96	5202.20	0.02
10	3.00	12.80	2758.90	1584.97	5517.80	0.02

11	4.67	8.97	2948.87	1574.27	5898.38	0.02
12	4.67	4.30	3171.00	1560.41	6342.00	0.02
13	4.67	-0.37	3393.13	1545.62	6785.62	0.02
14	5.00	-5.20	3635.70	1529.30	7246.07	0.02
15	5.00	-10.20	3861.20	1511.39	7722.40	0.03

Wall 5
Total Emb

Total Settlement = 3.45 (in.)

Wall 5 Global Stability

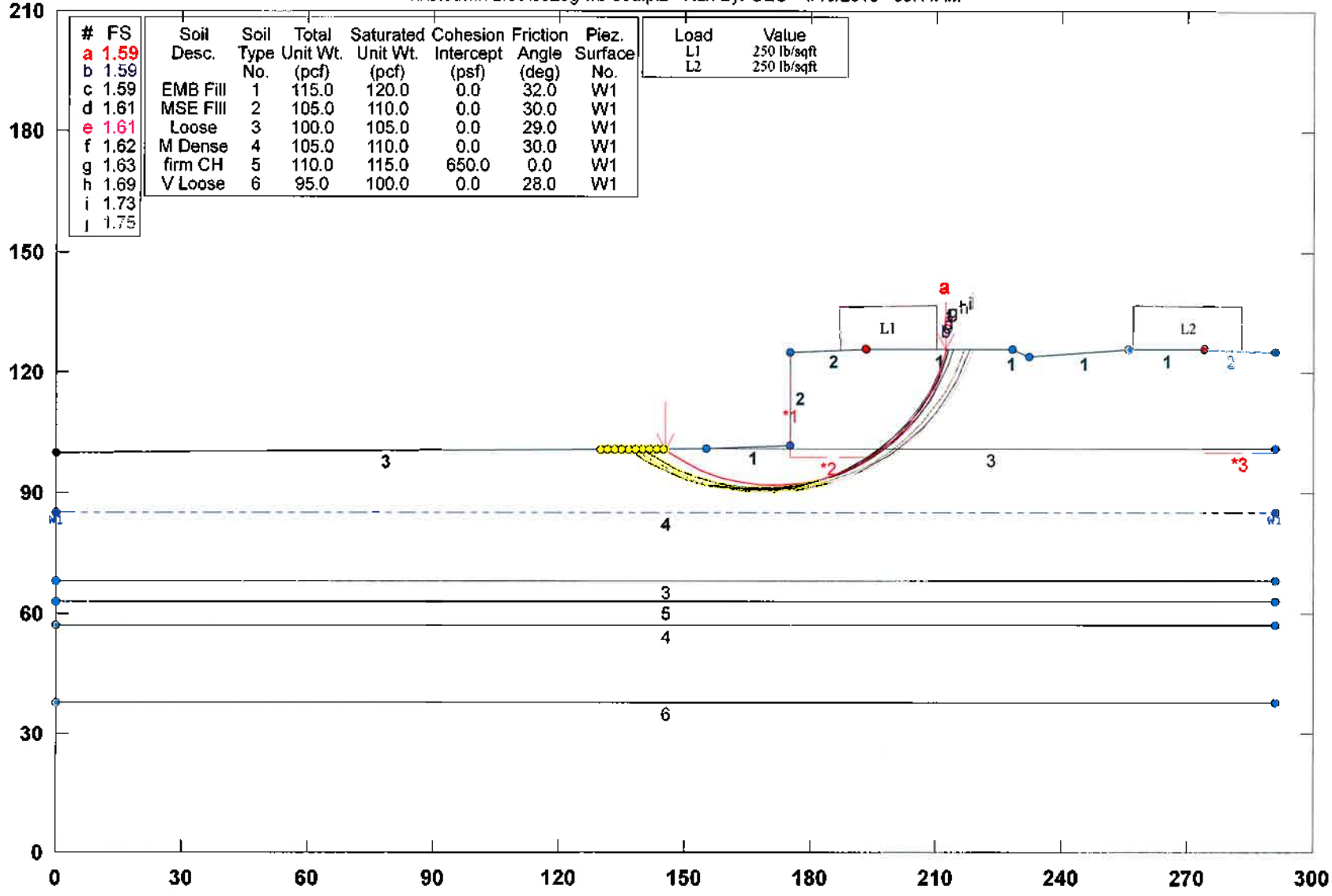
Wekiva 7A WB-30A (983+00)

k:\stedwin 2.86\3520g wb-30a.pl2 Run By: GEC 4/10/2015 09:11AM

#	FS
a	1.59
b	1.59
c	1.59
d	1.61
e	1.61
f	1.62
g	1.63
h	1.69
i	1.73
j	1.75

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	0.0	32.0	W1
MSE Fill	2	105.0	110.0	0.0	30.0	W1
Loose	3	100.0	105.0	0.0	29.0	W1
M Dense	4	105.0	110.0	0.0	30.0	W1
firm CH	5	110.0	115.0	650.0	0.0	W1
V Loose	6	95.0	100.0	0.0	28.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft



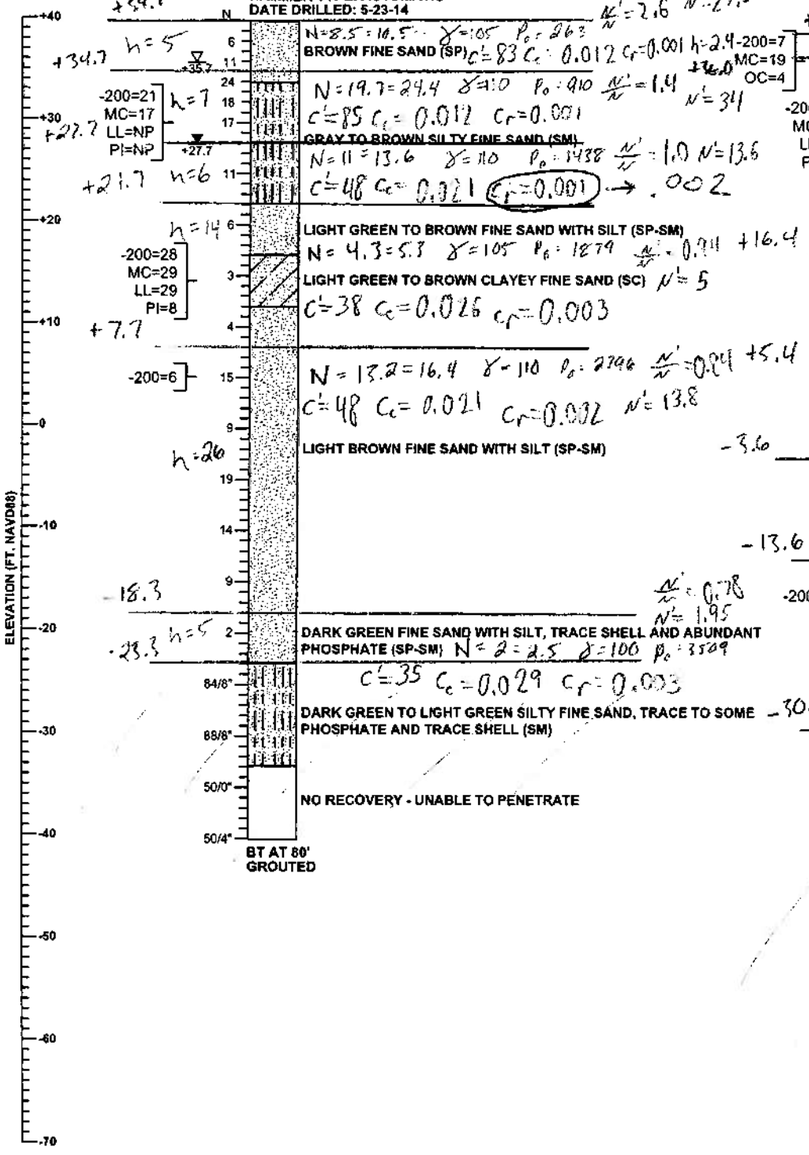
STABL6H FSmin=1.59

Safety Factors Are Calculated By The Modified Bishop Method

STED

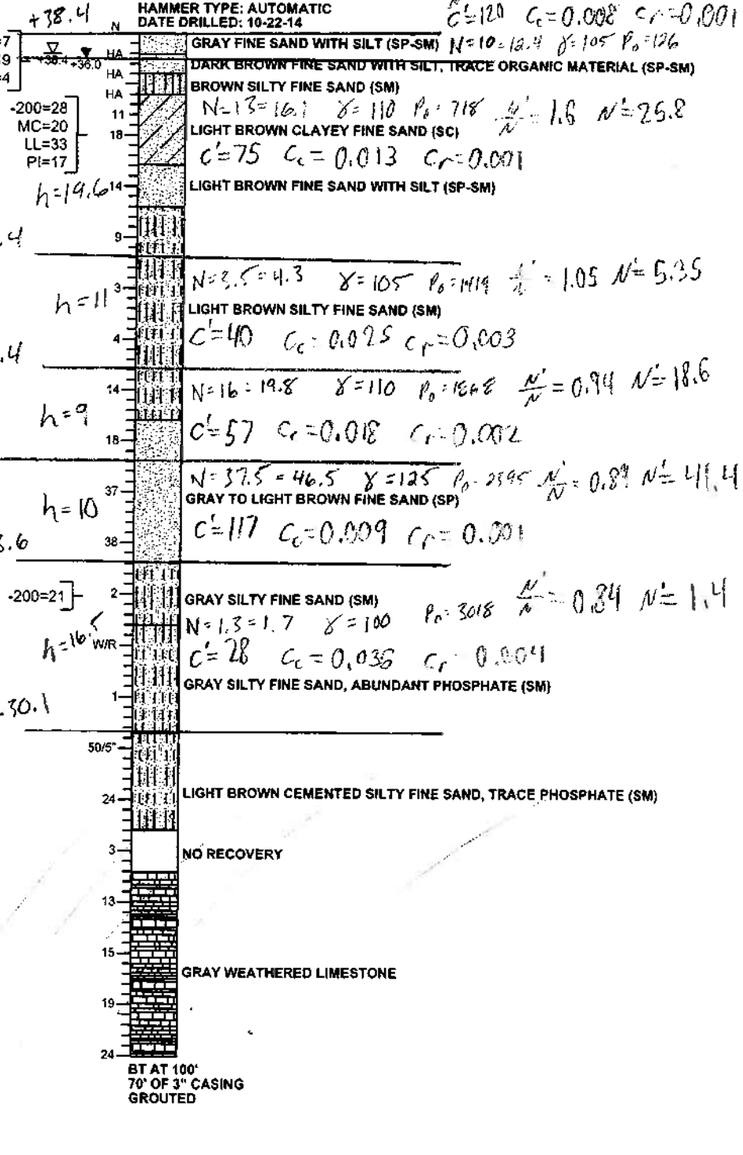
Wall 6

WB-52
STA. 1017+00, 60' LEFT
LAT: N28.81410
LONG: W81.38972
GSE: +39.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-23-14



Wall 6

WB-52A
STA. 1017+00, 65' RIGHT
LAT: N28.81378
LONG: W81.38987
GSE: +38.4
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-22-14



LEGEND

- GSE GROUND SURFACE ELEVATION (FT. NAVD88)
- N STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
- HA HAND AUGERED FOR UTILITY CLEARANCE
- 50/5" NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
- W/R WEIGHT OF ROD
- ▽ +36.4 ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
- ▽ +36.0 ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
- BT BORING TERMINATED AT DEPTH INDICATED
- -200= PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
- MC= PERCENT NATURAL MOISTURE CONTENT
- LL= LIQUID LIMIT
- PI= PLASTICITY INDEX
- OC= PERCENT ORGANIC CONTENT
- NP= NON-PLASTIC

SAND | SAND AND CLAY | SAND AND SILT | LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

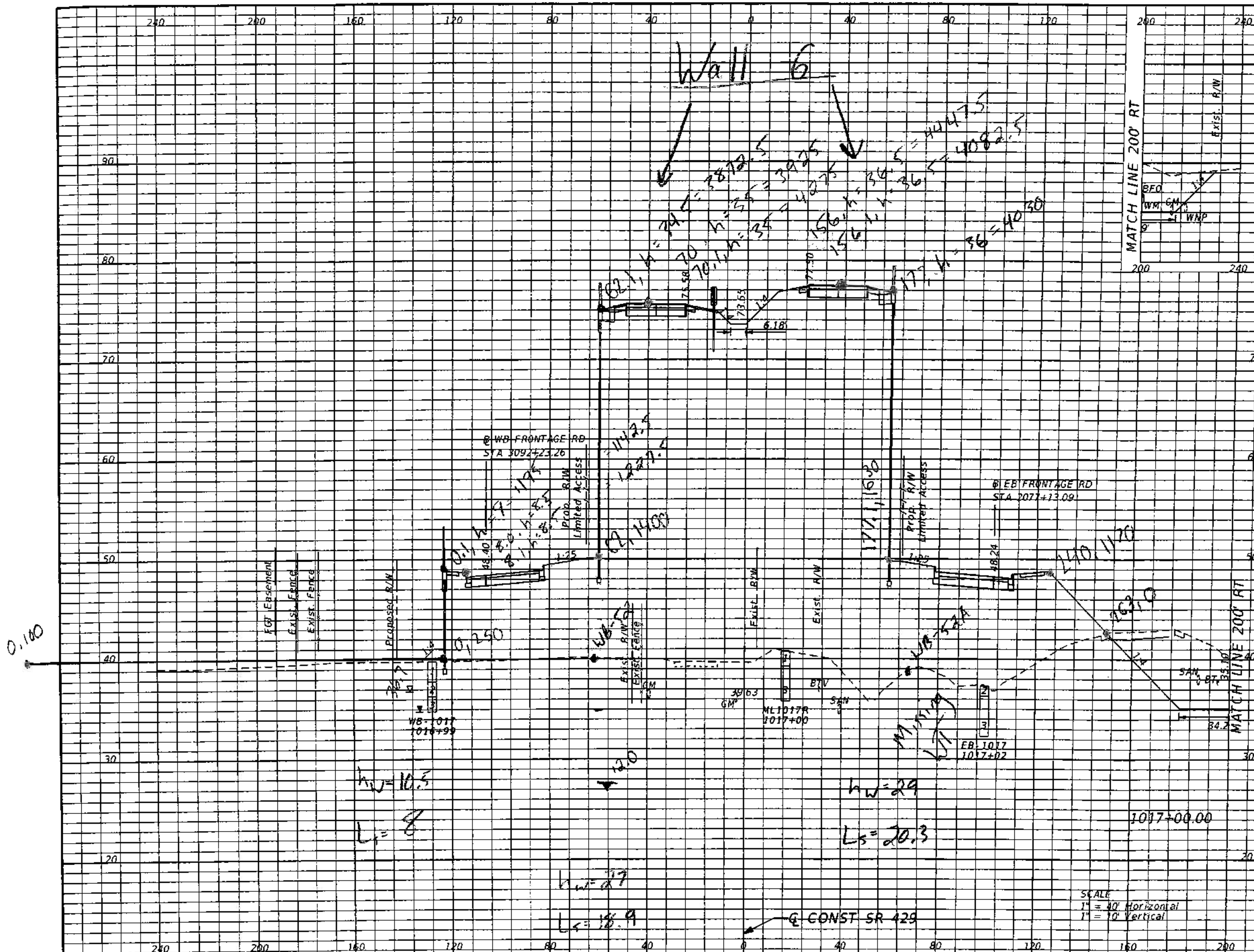
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	CHECKED BY:	DESIGNED BY:	CHECKED BY:
SKR	CGB 71571	CGB 71571	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Wall 6 Pre LP Placement

Increment of stresses obtained using : Boussinesq

Settlement for X = 62.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	0.10	805.00
3	62.00	805.00
4	62.10	805.00
5	108.00	805.00
6	133.00	805.00
7	177.00	805.00
8	177.10	805.00
9	240.00	805.00
10	263.00	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.50	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.28	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.29	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	0.67	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	0.70	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.14	0.00
					Total Settlement =		2.59	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	805.00	87.50	0.24
2	1.67	37.20	262.50	804.99	262.50	0.15
3	1.67	35.53	437.50	804.95	437.50	0.11
4	3.50	32.95	717.50	804.77	717.50	0.16
5	3.50	29.45	1102.50	804.22	1102.50	0.12
6	3.00	26.20	1366.40	803.27	1366.40	0.15
7	3.00	23.20	1509.20	801.92	1509.20	0.14
8	4.67	19.37	1680.00	799.45	1680.00	0.25
9	4.67	14.70	1878.80	795.25	1878.80	0.22
10	4.67	10.03	2077.60	789.74	2077.60	0.20
11	4.33	5.53	2280.13	783.24	2280.13	0.14

12	4.33	1.20	2486.40	776.02	2486.40	0.13
13	4.33	-3.13	2692.67	767.98	2692.67	0.12
14	4.33	-7.47	2898.93	759.29	2898.93	0.11
15	4.33	-11.80	3105.20	750.08	3105.20	0.10
16	4.33	-16.13	3311.47	740.50	3311.47	0.10
17	5.00	-20.80	3508.60	729.89	3508.60	0.14

Wall 6
Pre LP

Total Settlement = 2.59 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 70.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	0.10	805.00
3	62.00	805.00
4	62.10	805.00
5	108.00	805.00
6	133.00	805.00
7	177.00	805.00
8	177.10	805.00
9	240.00	805.00
10	263.00	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.50	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.28	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.29	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	0.67	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	0.70	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.15	0.00
						Total Settlement =	2.60	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	805.00	87.50	0.24
2	1.67	37.20	262.50	804.99	262.50	0.15
3	1.67	35.53	437.50	804.96	437.50	0.11
4	3.50	32.95	717.50	804.84	717.50	0.16
5	3.50	29.45	1102.50	804.45	1102.50	0.12
6	3.00	26.20	1366.40	803.75	1366.40	0.15
7	3.00	23.20	1509.20	802.77	1509.20	0.14
8	4.67	19.37	1680.00	800.96	1680.00	0.25
9	4.67	14.70	1878.80	797.81	1878.80	0.22
10	4.67	10.03	2077.60	793.60	2077.60	0.20
11	4.33	5.53	2280.13	788.52	2280.13	0.14

12	4.33	1.20	2486.40	782.76	2486.40	0.13	
13	4.33	-3.13	2692.67	776.21	2692.67	0.12	
14	4.33	-7.47	2898.93	768.97	2898.93	0.11	
15	4.33	-11.80	3105.20	761.14	3105.20	0.10	Wall 6
16	4.33	-16.13	3311.47	752.83	3311.47	0.10	Pre LP
17	5.00	-20.80	3508.60	743.45	3508.60	0.15	

Total Settlement = 2.60 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 156.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	0.10	805.00
3	62.00	805.00
4	62.10	805.00
5	108.00	805.00
6	133.00	805.00
7	177.00	805.00
8	177.10	805.00
9	240.00	805.00
10	263.00	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.50	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.28	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.29	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	0.68	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	0.71	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.15	0.00
					Total Settlement =		2.62	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	805.00	87.50	0.24
2	1.67	37.20	262.50	805.00	262.50	0.15
3	1.67	35.53	437.50	804.98	437.50	0.11
4	3.50	32.95	717.50	804.92	717.50	0.16
5	3.50	29.45	1102.50	804.74	1102.50	0.12
6	3.00	26.20	1366.40	804.41	1366.40	0.15
7	3.00	23.20	1509.20	803.93	1509.20	0.14
8	4.67	19.37	1680.00	803.02	1680.00	0.25
9	4.67	14.70	1878.80	801.41	1878.80	0.22
10	4.67	10.03	2077.60	799.17	2077.60	0.21
11	4.33	5.53	2280.13	796.37	2280.13	0.14

12	4.33	1.20	2486.40	793.06	2486.40	0.13
13	4.33	-3.13	2692.67	789.14	2692.67	0.12
14	4.33	-7.47	2898.93	784.62	2898.93	0.11
15	4.33	-11.80	3105.20	779.53	3105.20	0.11
16	4.33	-16.13	3311.47	773.89	3311.47	0.10
17	5.00	-20.80	3508.60	767.26	3508.60	0.15

Wall 6
Pre LP

Total Settlement = 2.62 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 177.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	0.10	805.00
3	62.00	805.00
4	62.10	805.00
5	108.00	805.00
6	133.00	805.00
7	177.00	805.00
8	177.10	805.00
9	240.00	805.00
10	263.00	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.50	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.28	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.29	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	0.68	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	0.71	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.15	0.00
					Total Settlement =		2.60	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	805.00	87.50	0.24
2	1.67	37.20	262.50	804.99	262.50	0.15
3	1.67	35.53	437.50	804.97	437.50	0.11
4	3.50	32.95	717.50	804.86	717.50	0.16
5	3.50	29.45	1102.50	804.51	1102.50	0.12
6	3.00	26.20	1366.40	803.90	1366.40	0.15
7	3.00	23.20	1509.20	803.03	1509.20	0.14
8	4.67	19.37	1680.00	801.42	1680.00	0.25
9	4.67	14.70	1878.80	798.62	1878.80	0.22
10	4.67	10.03	2077.60	794.85	2077.60	0.20
11	4.33	5.53	2280.13	790.28	2280.13	0.14

12	4.33	1.20	2486.40	785.06	2486.40	0.13
13	4.33	-3.13	2692.67	779.09	2692.67	0.12
14	4.33	-7.47	2898.93	772.44	2898.93	0.11
15	4.33	-11.80	3105.20	765.21	3105.20	0.10
16	4.33	-16.13	3311.47	757.47	3311.47	0.10
17	5.00	-20.80	3508.60	748.68	3508.60	0.15

Wall 6
Pre LP

Total Settlement = 2.60 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Wall 6 Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 62.00 (ft)

Point #	X(ft)	Load (psf)	Point	Total Emb. Settl.	Settl. Prior to LP Placement	Effective Wall Settl.
1	0.00	250.00				
2	0.10	1285.00	LT Wall	6.16	2.59	3.57
3	62.00	1400.00				
4	62.10	3872.50	LT End of Strap	6.97	2.60	4.37
5	70.00	3925.00				
6	70.10	4275.00				
7	156.00	4447.50	RT End of Strap	7.33	2.62	4.71
8	156.10	4082.50				
9	177.00	4030.00				
10	177.10	0.00	RT Wall	5.21	2.60	2.61

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.81	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.61	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.70	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	1.71	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	1.93	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.42	0.00
					Total Settlement =		6.16	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	2543.30	87.50	0.35
2	1.67	37.20	262.50	2610.12	262.50	0.25
3	1.67	35.53	437.50	2630.51	437.50	0.20
4	3.50	32.95	717.50	2655.19	717.50	0.34
5	3.50	29.45	1102.50	2684.27	1102.50	0.27
6	3.00	26.20	1366.40	2704.81	1366.40	0.36
7	3.00	23.20	1509.20	2718.10	1509.20	0.34
8	4.67	19.37	1680.00	2728.28	1680.00	0.61
9	4.67	14.70	1878.80	2732.24	1878.80	0.57
10	4.67	10.03	2077.60	2728.66	2077.60	0.53
11	4.33	5.53	2280.13	2719.27	2280.13	0.37

12	4.33	1.20	2486.40	2705.49	2486.40	0.35
13	4.33	-3.13	2692.67	2687.69	2692.67	0.33
14	4.33	-7.47	2898.93	2666.39	2898.93	0.31
15	4.33	-11.80	3105.20	2642.06	3105.20	0.29
16	4.33	-16.13	3311.47	2615.13	3311.47	0.28
17	5.00	-20.80	3508.60	2583.66	3508.60	0.42

Wall 6
Total Emb

Total Settlement = 6.16 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 70.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1285.00
3	62.00	1400.00
4	62.10	3872.50
5	70.00	3925.00
6	70.10	4275.00
7	156.00	4447.50
8	156.10	4082.50
9	177.00	4030.00
10	177.10	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.94	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.73	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.82	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	1.93	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	2.10	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.45	0.00
					Total Settlement =		6.97	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	4084.78	87.50	0.40
2	1.67	37.20	262.50	4077.29	262.50	0.29
3	1.67	35.53	437.50	4035.13	437.50	0.24
4	3.50	32.95	717.50	3923.85	717.50	0.41
5	3.50	29.45	1102.50	3750.69	1102.50	0.32
6	3.00	26.20	1366.40	3610.10	1366.40	0.42
7	3.00	23.20	1509.20	3504.47	1509.20	0.39
8	4.67	19.37	1680.00	3397.26	1680.00	0.70
9	4.67	14.70	1878.80	3296.10	1878.80	0.64
10	4.67	10.03	2077.60	3215.31	2077.60	0.59
11	4.33	5.53	2280.13	3149.08	2280.13	0.41

12	4.33	1.20	2486.40	3091.88	2486.40	0.38
13	4.33	-3.13	2692.67	3038.58	2692.67	0.36
14	4.33	-7.47	2898.93	2987.61	2898.93	0.34
15	4.33	-11.80	3105.20	2937.98	3105.20	0.32
16	4.33	-16.13	3311.47	2889.08	3311.47	0.30
17	5.00	-20.80	3508.60	2836.84	3508.60	0.45

Wall 6
Total Emb

Total Settlement = 6.97 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 156.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1285.00
3	62.00	1400.00
4	62.10	3872.50
5	70.00	3925.00
6	70.10	4275.00
7	156.00	4447.50
8	156.10	4082.50
9	177.00	4030.00
10	177.10	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.95	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.77	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.88	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	2.09	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	2.20	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.45	0.00
						Total Settlement =	7.33	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	4277.74	87.50	0.41
2	1.67	37.20	262.50	4264.76	262.50	0.30
3	1.67	35.53	437.50	4255.57	437.50	0.25
4	3.50	32.95	717.50	4231.99	717.50	0.42
5	3.50	29.45	1102.50	4174.84	1102.50	0.34
6	3.00	26.20	1366.40	4097.20	1366.40	0.46
7	3.00	23.20	1509.20	4010.55	1509.20	0.43
8	4.67	19.37	1680.00	3888.95	1680.00	0.76
9	4.67	14.70	1878.80	3737.87	1878.80	0.69
10	4.67	10.03	2077.60	3593.35	2077.60	0.63
11	4.33	5.53	2280.13	3464.37	2280.13	0.44

12	4.33	1.20	2486.40	3350.55	2486.40	0.40
13	4.33	-3.13	2692.67	3246.31	2692.67	0.38
14	4.33	-7.47	2898.93	3150.58	2898.93	0.35
15	4.33	-11.80	3105.20	3062.20	3105.20	0.33
16	4.33	-16.13	3311.47	2980.10	3311.47	0.30
17	5.00	-20.80	3508.60	2897.65	3508.60	0.45

Wall 6
Total Emb

Total Settlement = 7.33 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 177.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1285.00
3	62.00	1400.00
4	62.10	3872.50
5	70.00	3925.00
6	70.10	4275.00
7	156.00	4447.50
8	156.10	4082.50
9	177.00	4030.00
10	177.10	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.75	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.52	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.58	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	1.41	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	1.59	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.35	0.00
					Total Settlement =		5.21	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	2168.87	87.50	0.34
2	1.67	37.20	262.50	2068.39	262.50	0.23
3	1.67	35.53	437.50	2049.58	437.50	0.18
4	3.50	32.95	717.50	2041.24	717.50	0.29
5	3.50	29.45	1102.50	2041.19	1102.50	0.23
6	3.00	26.20	1366.40	2045.63	1366.40	0.30
7	3.00	23.20	1509.20	2051.38	1509.20	0.28
8	4.67	19.37	1680.00	2059.30	1680.00	0.51
9	4.67	14.70	1878.80	2068.03	1878.80	0.47
10	4.67	10.03	2077.60	2074.51	2077.60	0.44
11	4.33	5.53	2280.13	2078.11	2280.13	0.31

12	4.33	1.20	2486.40	2079.01	2486.40	0.29
13	4.33	-3.13	2692.67	2077.42	2692.67	0.27
14	4.33	-7.47	2898.93	2073.47	2898.93	0.26
15	4.33	-11.80	3105.20	2067.30	3105.20	0.24
16	4.33	-16.13	3311.47	2059.09	3311.47	0.23
17	5.00	-20.80	3508.60	2048.13	3508.60	0.35

Wall 6 Total Emb

Total Settlement = 5.21 (in.)

Wall 6 Global Stability

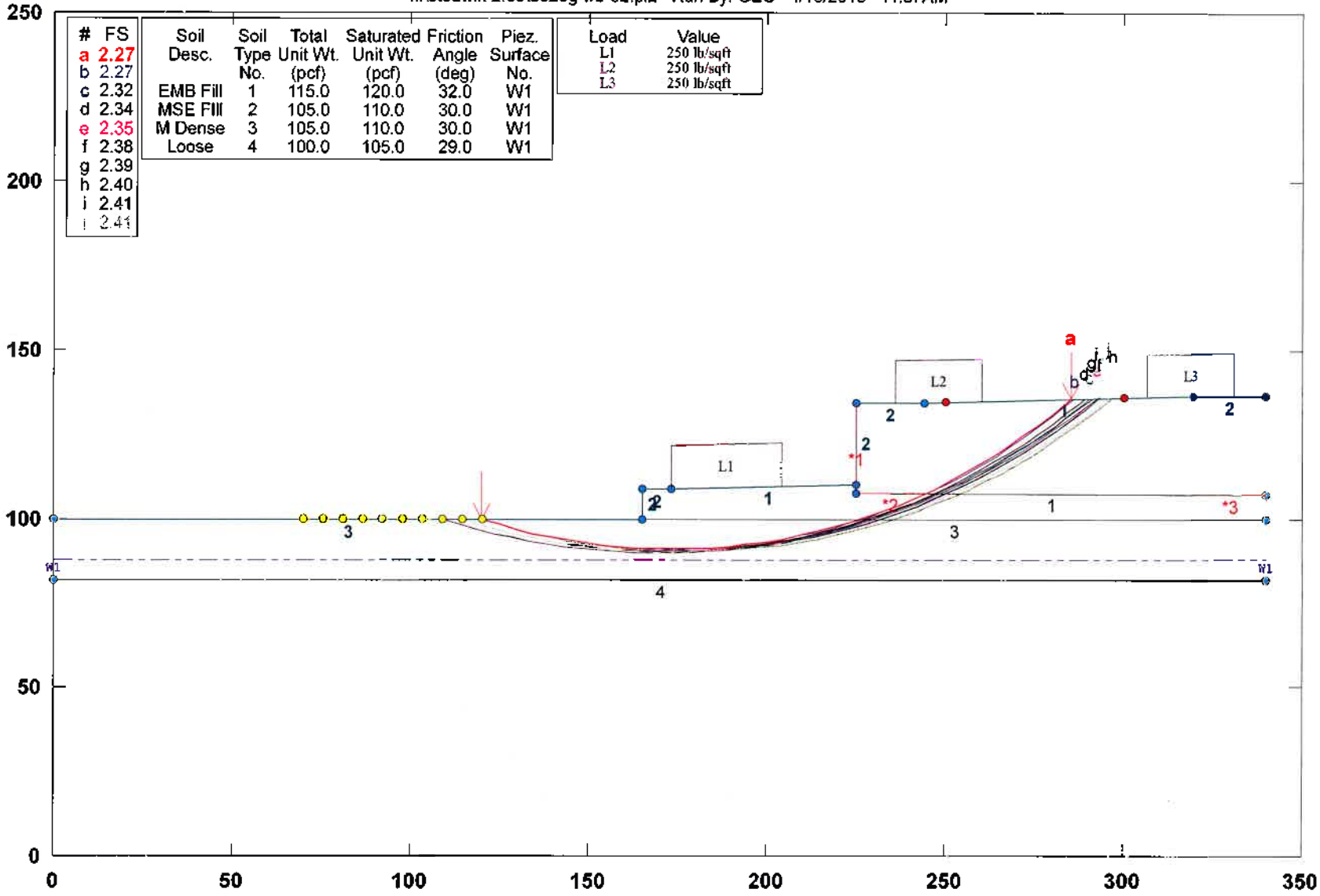
Wekiva 7A WB-52 (1017+00)

k:\stedwin 2.86\3520g wb-52.pl2 Run By: GEC 4/10/2015 11:37AM

#	FS
a	2.27
b	2.27
c	2.32
d	2.34
e	2.35
f	2.38
g	2.39
h	2.40
i	2.41
j	2.41

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	32.0	W1
MSE Fill	2	105.0	110.0	30.0	W1
M Dense	3	105.0	110.0	30.0	W1
Loose	4	100.0	105.0	29.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft

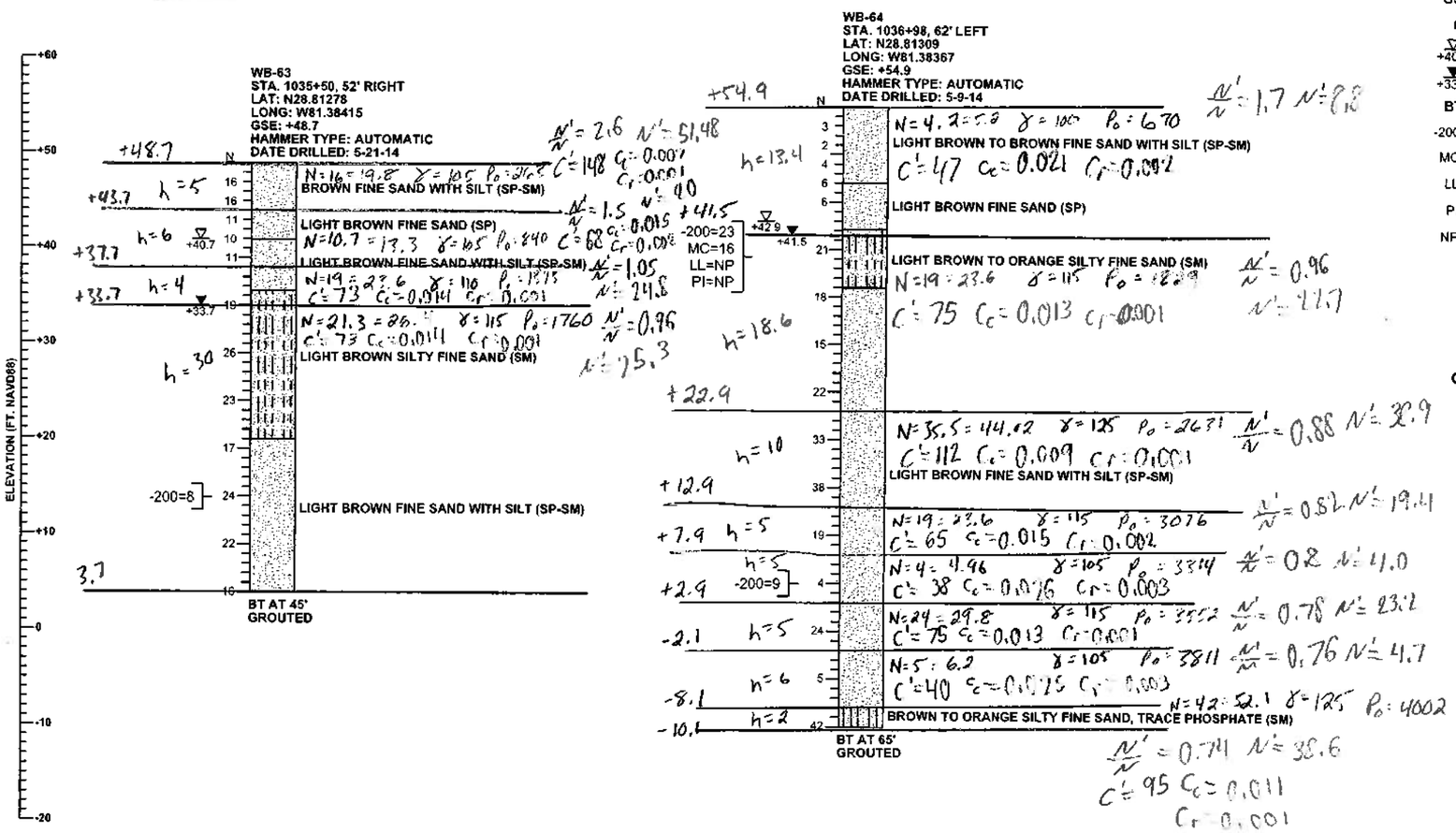


STABL6H FSmin=2.27

Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 7



Wall 7

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +40.7	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +33.7	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

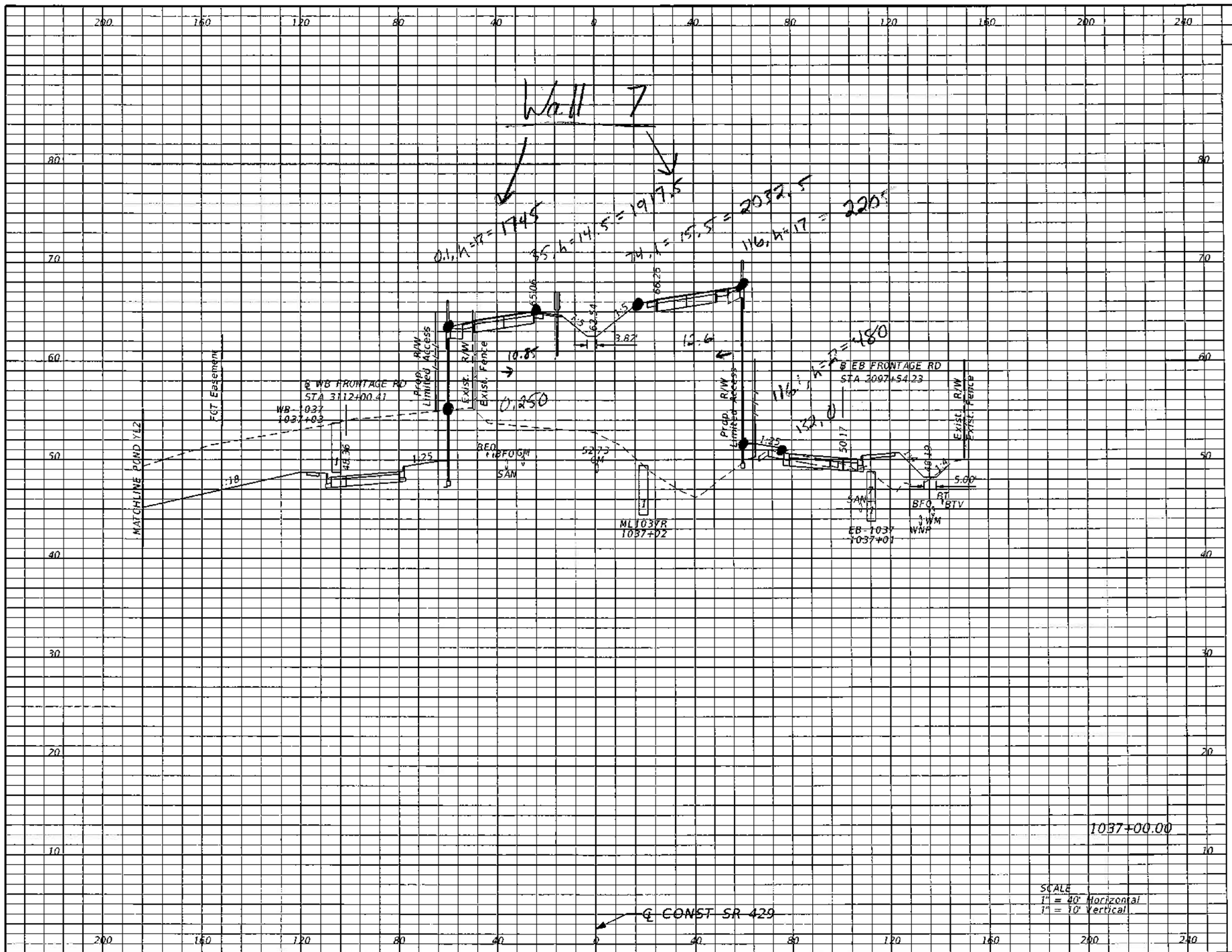
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
REF. DWG. NO.
SHEET NO.

scott 2/5/2015 3:46:14 PM J:\D109\35206 Wekiva Parkway Section 7A\b1boring16.dgn



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO. 799

PRELIMINARY; NOT FOR CONSTRUCTION

glen_dvorovy 2/7/2015 4:34:16 PM O:\Projects\CADD\240200252O1\roadway\Xsect\RDXSRD03_429.DGN

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-64 (1036+98) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/31/2015 Computed by : BMM

Wall 7 Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 0.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1745.00
3	35.00	1917.50
4	74.00	2032.50
5	116.00	2205.00
6	116.10	480.00
7	132.00	0.00

Foundation Elev. = 54.90 (ft) Ground Surface Elev.= 54.90 (ft)
Water table Elev. = 41.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	13.4	0.021	0.002	0.002	100.00	1.49	0.00
2	COMP.	18.6	0.013	0.001	0.001	115.00	0.51	0.00
3	COMP.	10.0	0.009	0.001	0.001	125.00	0.14	0.00
4	COMP.	5.0	0.015	0.002	0.002	115.00	0.10	0.00
5	COMP.	5.0	0.026	0.003	0.003	105.00	0.16	0.00
6	COMP.	5.0	0.013	0.001	0.001	115.00	0.08	0.00
7	COMP.	6.0	0.025	0.003	0.003	105.00	0.17	0.00
8	COMP.	2.0	0.011	0.001	0.000	125.00	0.02	0.00
					Total Settlement =		2.68	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.47	52.67	223.33	904.42	223.33	0.79
2	4.47	48.20	670.00	892.38	670.00	0.41
3	4.47	43.73	1116.67	895.12	1116.67	0.29
4	4.65	39.17	1462.30	899.54	1462.30	0.15
5	4.65	34.52	1706.89	904.00	1706.89	0.13
6	4.65	29.87	1951.48	907.85	1951.48	0.12
7	4.65	25.22	2196.07	910.82	2196.07	0.11
8	5.00	20.40	2474.86	912.82	2474.86	0.07
9	5.00	15.40	2787.86	913.63	2787.86	0.07
10	5.00	10.40	3075.86	913.13	3075.86	0.10
11	5.00	5.40	3313.86	911.32	3313.86	0.16
12	5.00	0.40	3551.86	908.22	3551.86	0.08

13	3.00	-3.60	3747.26	904.85	3747.26	0.08
14	3.00	-6.60	3875.06	901.83	3875.06	0.08
15	2.00	-9.10	4001.56	899.00	4001.56	0.02

Wall 7 Total Emb

Total Settlement = 2.68 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-64 (1036+98) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/31/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 10.95 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1745.00
3	35.00	1917.50
4	74.00	2032.50
5	116.00	2205.00
6	116.10	480.00
7	132.00	0.00

Foundation Elev. = 54.90 (ft) Ground Surface Elev.= 54.90 (ft)
Water table Elev. = 41.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	13.4	0.021	0.002	0.002	100.00	2.14	0.00
2	COMP.	18.6	0.013	0.001	0.001	115.00	0.73	0.00
3	COMP.	10.0	0.009	0.001	0.001	125.00	0.18	0.00
4	COMP.	5.0	0.015	0.002	0.002	115.00	0.13	0.00
5	COMP.	5.0	0.026	0.003	0.003	105.00	0.20	0.00
6	COMP.	5.0	0.013	0.001	0.001	115.00	0.09	0.00
7	COMP.	6.0	0.025	0.003	0.003	105.00	0.20	0.00
8	COMP.	2.0	0.011	0.001	0.000	125.00	0.03	0.00
					Total Settlement =		3.71	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.47	52.67	223.33	1795.64	223.33	1.08
2	4.47	48.20	670.00	1741.26	670.00	0.63
3	4.47	43.73	1116.67	1636.42	1116.67	0.44
4	4.65	39.17	1462.30	1528.69	1462.30	0.23
5	4.65	34.52	1706.89	1438.43	1706.89	0.19
6	4.65	29.87	1951.48	1368.00	1951.48	0.17
7	4.65	25.22	2196.07	1312.74	2196.07	0.15
8	5.00	20.40	2474.86	1266.80	2474.86	0.10
9	5.00	15.40	2787.86	1227.68	2787.86	0.09
10	5.00	10.40	3075.86	1194.46	3075.86	0.13
11	5.00	5.40	3313.86	1165.27	3313.86	0.20
12	5.00	0.40	3551.86	1138.85	3551.86	0.09

13	3.00	-3.60	3747.26	1119.13	3747.26	0.10
14	3.00	-6.60	3875.06	1104.95	3875.06	0.10
15	2.00	-9.10	4001.56	1093.45	4001.56	0.03

Wall 7 Total Emb

Total Settlement = 3.71 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-64 (1036+98) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/31/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 103.40 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1745.00
3	35.00	1917.50
4	74.00	2032.50
5	116.00	2205.00
6	116.10	480.00
7	132.00	0.00

Foundation Elev. = 54.90 (ft) Ground Surface Elev.= 54.90 (ft)
Water table Elev. = 41.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	13.4	0.021	0.002	0.002	100.00	2.35	0.00
2	COMP.	18.6	0.013	0.001	0.001	115.00	0.86	0.00
3	COMP.	10.0	0.009	0.001	0.001	125.00	0.21	0.00
4	COMP.	5.0	0.015	0.002	0.002	115.00	0.15	0.00
5	COMP.	5.0	0.026	0.003	0.003	105.00	0.23	0.00
6	COMP.	5.0	0.013	0.001	0.001	115.00	0.11	0.00
7	COMP.	6.0	0.025	0.003	0.003	105.00	0.23	0.00
8	COMP.	2.0	0.011	0.001	0.000	125.00	0.03	0.00
					Total Settlement =		4.17	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.47	52.67	223.33	2151.10	223.33	1.16
2	4.47	48.20	670.00	2108.15	670.00	0.70
3	4.47	43.73	1116.67	2011.36	1116.67	0.50
4	4.65	39.17	1462.30	1894.94	1462.30	0.26
5	4.65	34.52	1706.89	1783.83	1706.89	0.23
6	4.65	29.87	1951.48	1687.88	1951.48	0.20
7	4.65	25.22	2196.07	1606.55	2196.07	0.17
8	5.00	20.40	2474.86	1534.87	2474.86	0.11
9	5.00	15.40	2787.86	1471.22	2787.86	0.10
10	5.00	10.40	3075.86	1415.79	3075.86	0.15
11	5.00	5.40	3313.86	1366.61	3313.86	0.23
12	5.00	0.40	3551.86	1322.20	3551.86	0.11

13	3.00	-3.60	3747.26	1289.39	3747.26	0.12
14	3.00	-6.60	3875.06	1266.09	3875.06	0.11
15	2.00	-9.10	4001.56	1247.42	4001.56	0.03

Wall 7 Total Emb

Total Settlement = 4.17 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-64 (1036+98) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/31/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 116.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1745.00
3	35.00	1917.50
4	74.00	2032.50
5	116.00	2205.00
6	116.10	480.00
7	132.00	0.00

Foundation Elev. = 54.90 (ft) Ground Surface Elev.= 54.90 (ft)
Water table Elev. = 41.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	13.4	0.021	0.002	0.002	100.00	1.84	0.00
2	COMP.	18.6	0.013	0.001	0.001	115.00	0.63	0.00
3	COMP.	10.0	0.009	0.001	0.001	125.00	0.17	0.00
4	COMP.	5.0	0.015	0.002	0.002	115.00	0.12	0.00
5	COMP.	5.0	0.026	0.003	0.003	105.00	0.19	0.00
6	COMP.	5.0	0.013	0.001	0.001	115.00	0.09	0.00
7	COMP.	6.0	0.025	0.003	0.003	105.00	0.19	0.00
8	COMP.	2.0	0.011	0.001	0.000	125.00	0.03	0.00
					Total Settlement =		3.25	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.47	52.67	223.33	1344.29	223.33	0.95
2	4.47	48.20	670.00	1282.41	670.00	0.52
3	4.47	43.73	1116.67	1240.41	1116.67	0.37
4	4.65	39.17	1462.30	1206.89	1462.30	0.19
5	4.65	34.52	1706.89	1179.55	1706.89	0.17
6	4.65	29.87	1951.48	1156.93	1951.48	0.15
7	4.65	25.22	2196.07	1137.45	2196.07	0.13
8	5.00	20.40	2474.86	1119.34	2474.86	0.09
9	5.00	15.40	2787.86	1101.98	2787.86	0.08
10	5.00	10.40	3075.86	1085.43	3075.86	0.12
11	5.00	5.40	3313.86	1069.30	3313.86	0.19
12	5.00	0.40	3551.86	1053.33	3551.86	0.09

13	3.00	-3.60	3747.26	1040.57	3747.26	0.10
14	3.00	-6.60	3875.06	1030.96	3875.06	0.09
15	2.00	-9.10	4001.56	1022.93	4001.56	0.03

Wall 7
Total Emb

Total Settlement = 3.25 (in.)

Wall 7 Global Stability

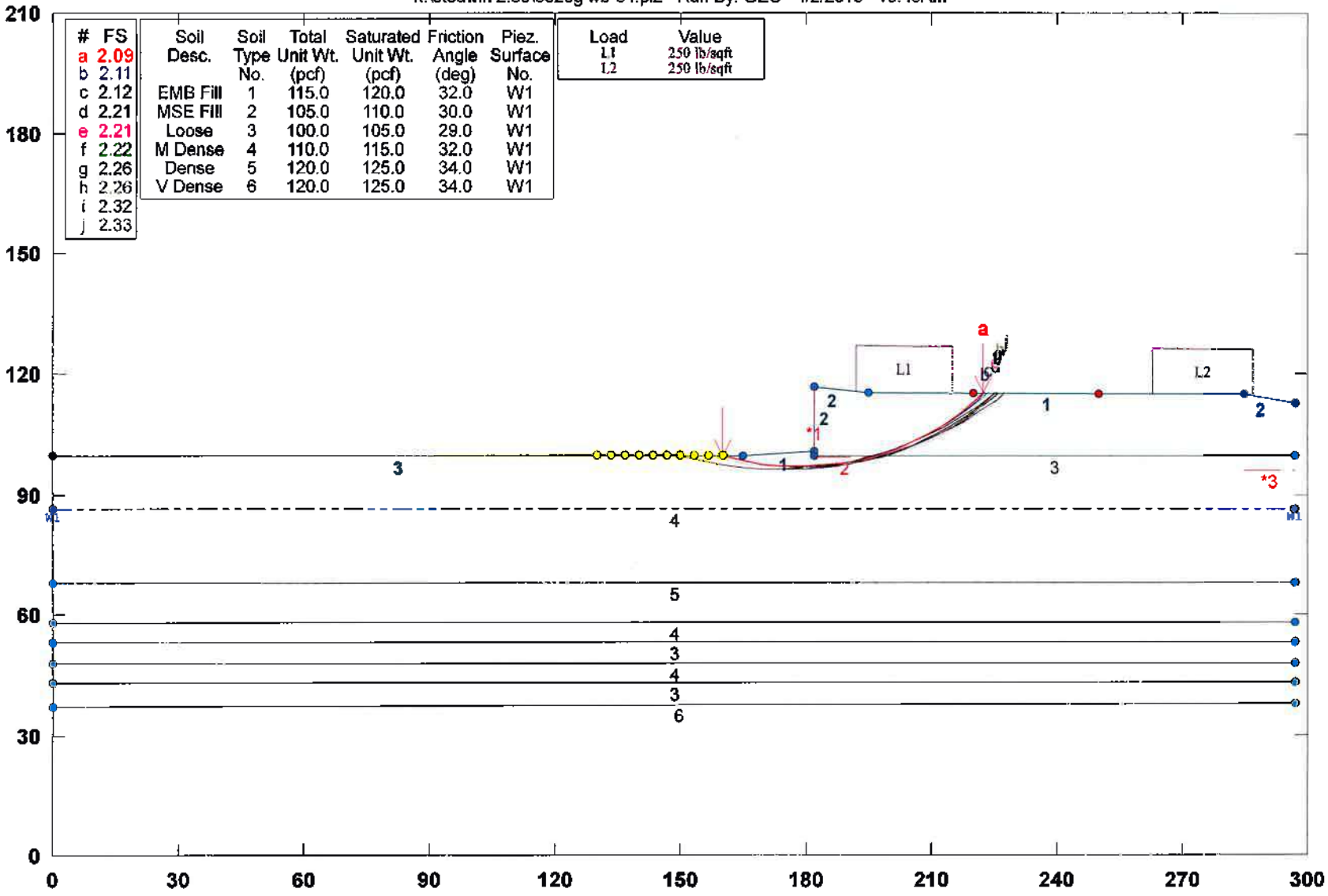
Wekiva 7A WB-64 (1036+98)

k:\stedwin 2.86\3520g wb-64.pl2 Run By: GEC 4/2/2015 10:49AM

#	FS
a	2.09
b	2.11
c	2.12
d	2.21
e	2.21
f	2.22
g	2.26
h	2.26
i	2.32
j	2.33

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	32.0	W1
MSE Fill	2	105.0	110.0	30.0	W1
Loose	3	100.0	105.0	29.0	W1
M Dense	4	110.0	115.0	32.0	W1
Dense	5	120.0	125.0	34.0	W1
V Dense	6	120.0	125.0	34.0	W1

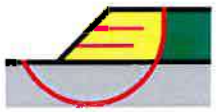
Load	Value
L1	250 lb/sqft
L2	250 lb/sqft



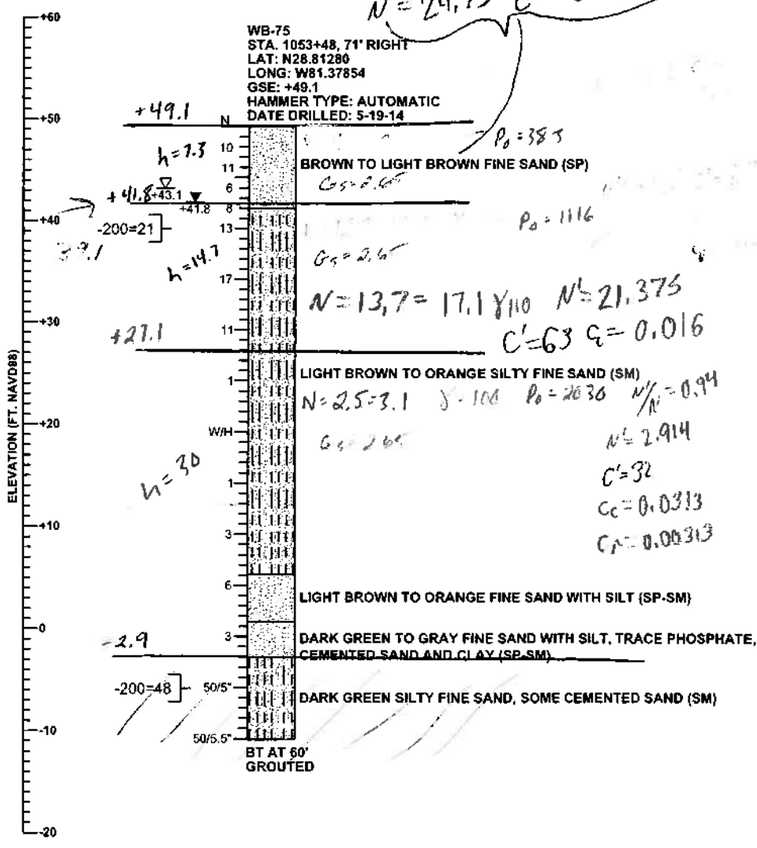
STABL6H FSmin=2.09

Safety Factors Are Calculated By The Modified Bishop Method

STED

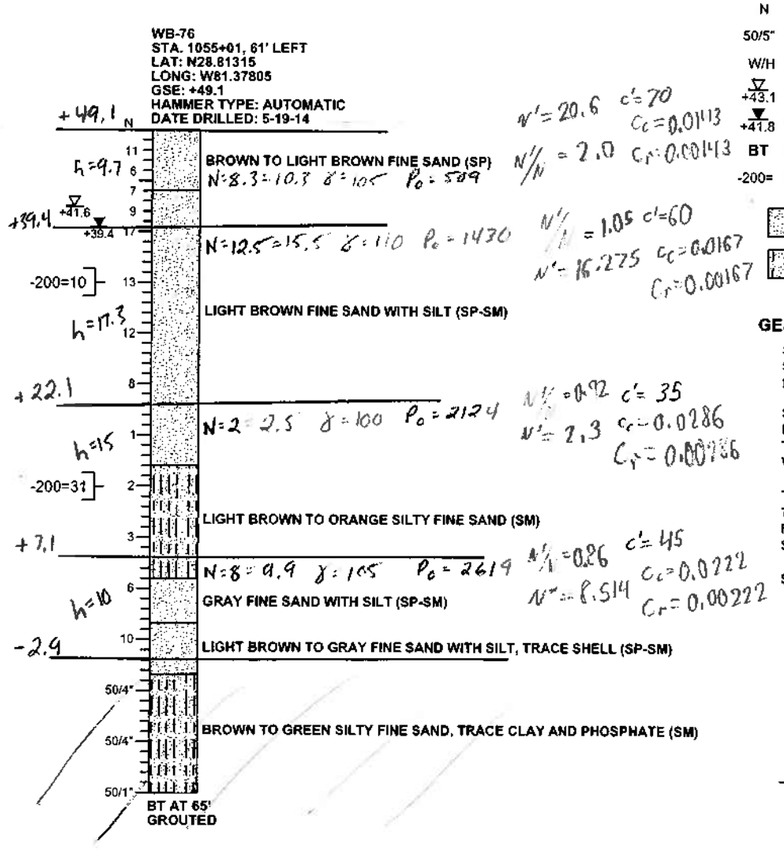


Wall 7



N=8.8=11 γ105 c_c=0.013
N'=24.75 C'=78
P_o=385
G_s=2.65
P_o=1116
G_s=2.65
N=13,7=17.1 γ110 N'=21.375
C'=63 c_r=0.016
N=2.5=3.1 γ=100 P_o=2636 N'/N=0.94
G_s=2.65
N'=2.914
C'=32
c_c=0.0313
c_r=0.00313

Wall 7



N'=20.6 c'=70
C_c=0.01113
N/N=2.0 C_r=0.001113
N/N=1.05 c'=60
N'=16.275 C_c=0.0167
C_r=0.00167
N/N=0.92 c'=35
N'=7.3 C_c=0.0286
C_r=0.00286
N=8=9.9 γ=105 P_o=2619 N/N=0.26 c'=45
N'=8.514 C_c=0.0222
C_r=0.00222

2nd=35.8

LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
▽ +43.1	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +41.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott 2/5/2015 3:47:02 PM J:\D109\3520G Wekiva Parkway Section 7A\blboring16.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

Wall 1

Hw = 26.5
Ls = 19

Hw = 22.5
Ls = 16

℄ WB FRONTAGE RD
STA 3128+48.04

℄ EB FRONTAGE RD
STA 2114+06.67

℄ CONST SR 429

1053+50.00

SCALE
1" = 30' Horizontal
1" = 10' Vertical

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

peter_osborne 12/10/2014 5:04:14 PM O:\Projects\CADD\240200252DT\roadway\Xsect\RDXSRD03_429.DGN

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Wall 7 Pre LP Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 87.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	7.00	230.00
3	68.10	230.00
4	87.00	230.00
5	87.10	230.00
6	172.00	230.00
7	172.10	230.00
8	188.00	230.00
9	257.00	230.00
10	275.00	0.00

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	0.30	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	0.16	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	0.49	0.00
						Total Settlement =	0.95	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	230.00	262.50	0.21
2	5.00	41.60	787.50	229.96	787.50	0.09
3	4.00	37.10	1145.20	229.84	1145.20	0.06
4	4.00	33.10	1335.60	229.64	1335.60	0.05
5	4.00	29.10	1526.00	229.30	1526.00	0.05
6	5.00	24.60	1715.20	228.76	1715.20	0.10
7	5.00	19.60	1903.20	227.91	1903.20	0.09
8	5.00	14.60	2091.20	226.81	2091.20	0.08
9	5.00	9.60	2279.20	225.44	2279.20	0.08
10	5.00	4.60	2467.20	223.83	2467.20	0.07
11	5.00	-0.40	2655.20	221.97	2655.20	0.06

Wall 7 Pre LP

Total Settlement = 0.95 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 68.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	7.00	230.00
3	68.10	230.00
4	87.00	230.00
5	87.10	230.00
6	172.00	230.00
7	172.10	230.00
8	188.00	230.00
9	257.00	230.00
10	275.00	0.00

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	0.30	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	0.16	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	0.48	0.00
					Total Settlement =		0.94	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	230.00	262.50	0.21
2	5.00	41.60	787.50	229.92	787.50	0.09
3	4.00	37.10	1145.20	229.69	1145.20	0.06
4	4.00	33.10	1335.60	229.28	1335.60	0.05
5	4.00	29.10	1526.00	228.65	1526.00	0.05
6	5.00	24.60	1715.20	227.63	1715.20	0.10
7	5.00	19.60	1903.20	226.13	1903.20	0.09
8	5.00	14.60	2091.20	224.24	2091.20	0.08
9	5.00	9.60	2279.20	222.01	2279.20	0.08
10	5.00	4.60	2467.20	219.49	2467.20	0.07
11	5.00	-0.40	2655.20	216.73	2655.20	0.06
					Total Settlement =	0.94 (in.)

Wall 7
Pre LP

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 172.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	7.00	230.00
3	68.10	230.00
4	87.00	230.00
5	87.10	230.00
6	172.00	230.00
7	172.10	230.00
8	188.00	230.00
9	257.00	230.00
10	275.00	0.00

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	0.30	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	0.16	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	0.49	0.00
						Total Settlement =	0.95	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	230.00	262.50	0.21
2	5.00	41.60	787.50	229.97	787.50	0.09
3	4.00	37.10	1145.20	229.88	1145.20	0.06
4	4.00	33.10	1335.60	229.72	1335.60	0.05
5	4.00	29.10	1526.00	229.47	1526.00	0.05
6	5.00	24.60	1715.20	229.04	1715.20	0.10
7	5.00	19.60	1903.20	228.38	1903.20	0.09
8	5.00	14.60	2091.20	227.50	2091.20	0.08
9	5.00	9.60	2279.20	226.39	2279.20	0.08
10	5.00	4.60	2467.20	225.06	2467.20	0.07
11	5.00	-0.40	2655.20	223.51	2655.20	0.07

Wall 7 Pre LP

Total Settlement = 0.95 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 188.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	7.00	230.00
3	68.10	230.00
4	87.00	230.00
5	87.10	230.00
6	172.00	230.00
7	172.10	230.00
8	188.00	230.00
9	257.00	230.00
10	275.00	0.00

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	0.30	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	0.16	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	0.49	0.00
						Total Settlement =	0.95	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	230.00	262.50	0.21
2	5.00	41.60	787.50	229.95	787.50	0.09
3	4.00	37.10	1145.20	229.81	1145.20	0.06
4	4.00	33.10	1335.60	229.56	1335.60	0.05
5	4.00	29.10	1526.00	229.16	1526.00	0.05
6	5.00	24.60	1715.20	228.51	1715.20	0.10
7	5.00	19.60	1903.20	227.51	1903.20	0.09
8	5.00	14.60	2091.20	226.22	2091.20	0.08
9	5.00	9.60	2279.20	224.65	2279.20	0.08
10	5.00	4.60	2467.20	222.81	2467.20	0.07
11	5.00	-0.40	2655.20	220.73	2655.20	0.06
					Total Settlement =	0.95 (in.)

Wall 7
Pre LP

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Wall 7 Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 68.10 (ft)

Point #	X(ft)	Load (psf)	Point	Total Emb. Settl.	Settl. Prior to LP Placement	Effective Wall Settl.
1	7.00	422.50				
2	68.00	882.50	LT Wall	5.42	0.95	4.47
3	68.10	3347.50				
4	87.00	3400.00	LT End of Strap	6.88	0.95	5.93
5	87.10	3700.00				
6	172.00	3412.50				
7	172.10	3137.50	RT End of Strap	6.62	0.95	5.67
8	188.00	3085.00				
9	188.10	1055.00				
10	257.00	882.50	RT Wall	5.45	0.95	4.5

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	1.19	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	0.95	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	3.27	0.00
						Total Settlement =	5.42	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	2143.05	262.50	0.75
2	5.00	41.60	787.50	2116.87	787.50	0.44
3	4.00	37.10	1145.20	2111.08	1145.20	0.35
4	4.00	33.10	1335.60	2108.68	1335.60	0.32
5	4.00	29.10	1526.00	2106.23	1526.00	0.29
6	5.00	24.60	1715.20	2101.85	1715.20	0.65
7	5.00	19.60	1903.20	2094.14	1903.20	0.60
8	5.00	14.60	2091.20	2083.27	2091.20	0.56
9	5.00	9.60	2279.20	2069.48	2279.20	0.52
10	5.00	4.60	2467.20	2053.10	2467.20	0.49
11	5.00	-0.40	2655.20	2034.51	2655.20	0.46

Wall 7 Total Emb

Total Settlement = 5.42 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 87.00 (ft)

Point #	X(ft)	Load (psf)
1	7.00	422.50
2	68.00	882.50
3	68.10	3347.50
4	87.00	3400.00
5	87.10	3700.00
6	172.00	3412.50
7	172.10	3137.50
8	188.00	3085.00
9	188.10	1055.00
10	257.00	882.50

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	1.48	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	1.26	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	4.14	0.00
					Total Settlement =		6.88	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	3540.24	262.50	0.91
2	5.00	41.60	787.50	3506.18	787.50	0.57
3	4.00	37.10	1145.20	3434.61	1145.20	0.46
4	4.00	33.10	1335.60	3348.39	1335.60	0.42
5	4.00	29.10	1526.00	3253.48	1526.00	0.38
6	5.00	24.60	1715.20	3146.79	1715.20	0.84
7	5.00	19.60	1903.20	3035.17	1903.20	0.77
8	5.00	14.60	2091.20	2933.16	2091.20	0.71
9	5.00	9.60	2279.20	2840.45	2279.20	0.65
10	5.00	4.60	2467.20	2755.78	2467.20	0.61
11	5.00	-0.40	2655.20	2677.76	2655.20	0.56

Wall 7 Total Emb

Total Settlement = 6.88 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 172.00 (ft)

Point #	X(ft)	Load (psf)
1	7.00	422.50
2	68.00	882.50
3	68.10	3347.50
4	87.00	3400.00
5	87.10	3700.00
6	172.00	3412.50
7	172.10	3137.50
8	188.00	3085.00
9	188.10	1055.00
10	257.00	882.50

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	1.43	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	1.21	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	3.98	0.00
						Total Settlement =	6.62	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	3277.14	262.50	0.88
2	5.00	41.60	787.50	3241.62	787.50	0.55
3	4.00	37.10	1145.20	3170.07	1145.20	0.44
4	4.00	33.10	1335.60	3089.80	1335.60	0.40
5	4.00	29.10	1526.00	3007.67	1526.00	0.36
6	5.00	24.60	1715.20	2921.20	1715.20	0.80
7	5.00	19.60	1903.20	2835.44	1903.20	0.74
8	5.00	14.60	2091.20	2759.79	2091.20	0.68
9	5.00	9.60	2279.20	2692.18	2279.20	0.63
10	5.00	4.60	2467.20	2630.54	2467.20	0.59
11	5.00	-0.40	2655.20	2573.19	2655.20	0.55

Wall 7 Total Emb

Total Settlement = 6.62 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-75 (1053+48) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 188.00 (ft)

Point #	X(ft)	Load (psf)
1	7.00	422.50
2	68.00	882.50
3	68.10	3347.50
4	87.00	3400.00
5	87.10	3700.00
6	172.00	3412.50
7	172.10	3137.50
8	188.00	3085.00
9	188.10	1055.00
10	257.00	882.50

Foundation Elev. = 49.10 (ft) Ground Surface Elev.= 49.10 (ft)
Water table Elev. = 39.10 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.013	0.001	0.001	105.00	1.18	0.00
2	COMP.	12.0	0.016	0.002	0.002	110.00	0.95	0.00
3	COMP.	30.0	0.031	0.003	0.003	100.00	3.31	0.00
						Total Settlement =	5.45	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	46.60	262.50	2096.79	262.50	0.74
2	5.00	41.60	787.50	2085.02	787.50	0.44
3	4.00	37.10	1145.20	2091.36	1145.20	0.35
4	4.00	33.10	1335.60	2099.61	1335.60	0.32
5	4.00	29.10	1526.00	2107.21	1526.00	0.29
6	5.00	24.60	1715.20	2113.25	1715.20	0.65
7	5.00	19.60	1903.20	2116.02	1903.20	0.60
8	5.00	14.60	2091.20	2114.51	2091.20	0.56
9	5.00	9.60	2279.20	2108.94	2279.20	0.53
10	5.00	4.60	2467.20	2099.67	2467.20	0.50
11	5.00	-0.40	2655.20	2087.09	2655.20	0.47

Wall 7 Total Emb

Total Settlement = 5.45 (in.)

Wall 7 Global Stability

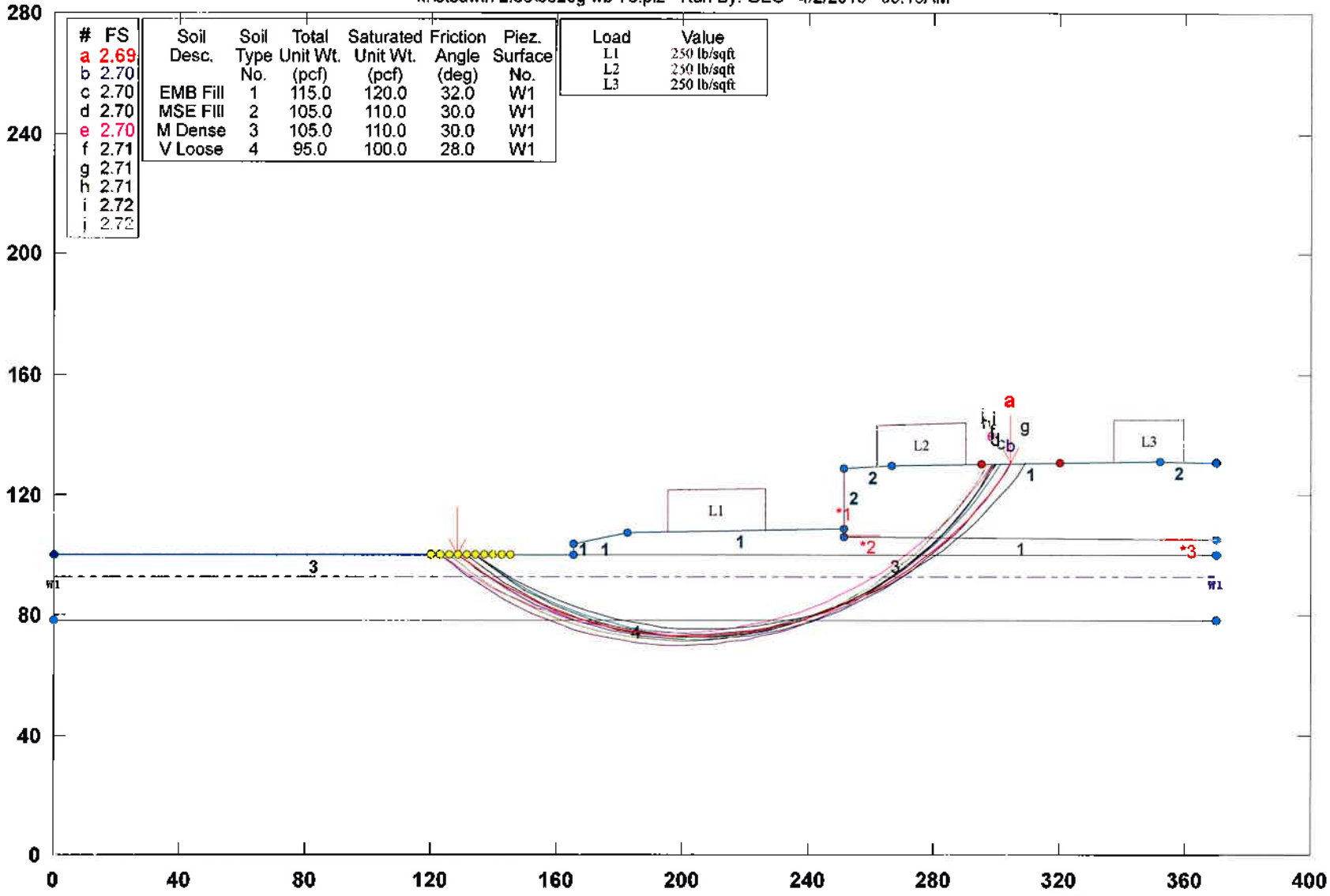
Wekiva 7A WB-75 (1053+48)

k:\stedwin 2.86\3520g wb-75.pl2 Run By: GEC 4/2/2015 09:15AM

#	FS
a	2.69
b	2.70
c	2.70
d	2.70
e	2.70
f	2.71
g	2.71
h	2.71
i	2.72
j	2.72

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	32.0	W1
MSE Fill	2	105.0	110.0	30.0	W1
M Dense	3	105.0	110.0	30.0	W1
V Loose	4	95.0	100.0	28.0	W1

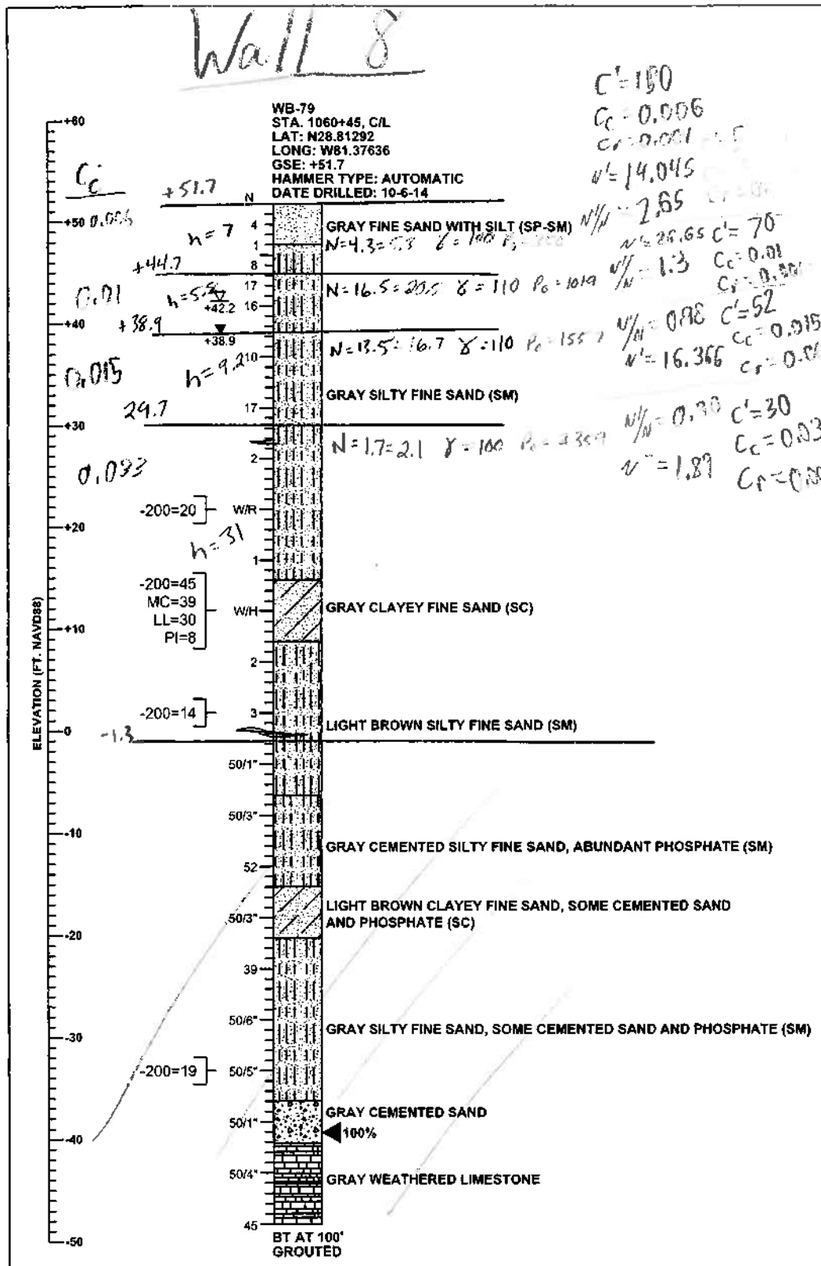
Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft

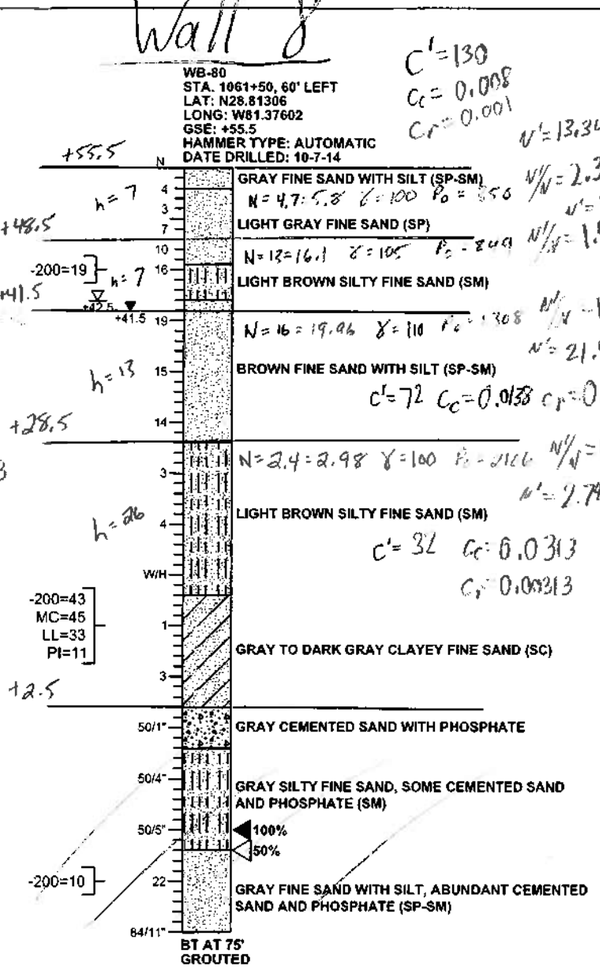


STABL6H FSmin=2.69

Safety Factors Are Calculated By The Modified Bishop Method

STED





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
+42.2 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+38.9 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND · SAND AND CLAY · CEMENTED SAND · SAND AND SILT · LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

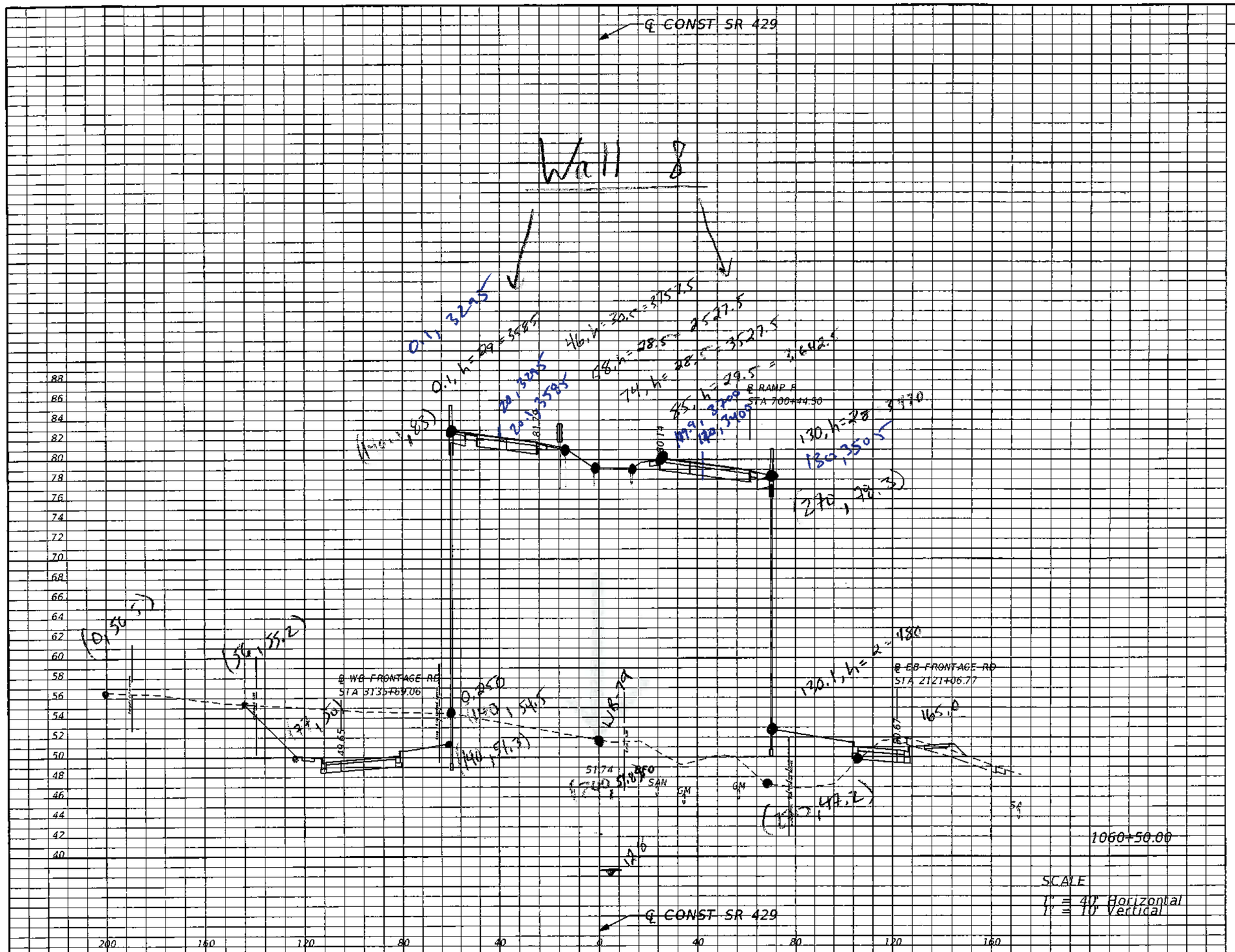
DRAWN BY:	CHECKED BY:	DESIGNED BY:	CHECKED BY:
SKR	CGB 71571	CGB 71571	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO

scott 2/6/2015 2:41:14 PM J:\D109\35206 Wekiva Parkway Section 7A\b1boring16.dgn



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

andy_stilling 8/22/2014 1:38:38 PM O:\Projects\CADD\240200025201\roadway\Xsect\RDXSRD00_429.DGN

STRIP LOADING VARIABLE SHAPE

Wall 8 Total Embankment Settlement

Project Name: WPKY 7: WB-79 (1060+45) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 0.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3585.00
3	46.00	3757.50
4	58.00	3527.50
5	74.00	3527.50
6	85.00	3642.50
7	130.00	3470.00
8	130.10	480.00
9	165.00	0.00

Foundation Elev. = 51.70 (ft) Ground Surface Elev.= 51.70 (ft)
Water table Elev. = 38.90 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.006	0.001	0.001	100.00	0.43	0.00
2	COMP.	5.8	0.010	0.001	0.001	110.00	0.31	0.00
3	COMP.	11.2	0.015	0.001	0.001	110.00	0.67	0.00
4	COMP.	28.0	0.033	0.003	0.003	100.00	2.73	0.00
					Total Settlement =		4.14	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	49.95	175.00	1864.26	175.00	0.27
2	3.50	46.45	525.00	1821.91	525.00	0.16
3	2.90	43.25	859.50	1816.55	859.50	0.17
4	2.90	40.35	1178.50	1815.63	1178.50	0.14
5	5.60	36.10	1471.28	1815.95	1471.28	0.35
6	5.60	30.50	1737.84	1816.36	1737.84	0.31
7	4.00	25.70	1946.32	1815.56	1946.32	0.45
8	4.00	21.70	2096.72	1813.77	2096.72	0.43
9	4.00	17.70	2247.12	1810.83	2247.12	0.41
10	4.00	13.70	2397.52	1806.73	2397.52	0.39
11	4.00	9.70	2547.92	1801.45	2547.92	0.37
12	4.00	5.70	2698.32	1795.04	2698.32	0.35
13	4.00	1.70	2848.72	1787.51	2848.72	0.34

Wall 8 Total Emb

Total Settlement = 4.14 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-79 (1060+45) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 20.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3585.00
3	46.00	3757.50
4	58.00	3527.50
5	74.00	3527.50
6	85.00	3642.50
7	130.00	3470.00
8	130.10	480.00
9	165.00	0.00

Foundation Elev. = 51.70 (ft) Ground Surface Elev.= 51.70 (ft)
Water table Elev. = 38.90 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.006	0.001	0.001	100.00	0.56	0.00
2	COMP.	5.8	0.010	0.001	0.001	110.00	0.46	0.00
3	COMP.	11.2	0.015	0.001	0.001	110.00	0.99	0.00
4	COMP.	28.0	0.033	0.003	0.003	100.00	3.82	0.00
					Total Settlement =		5.83	0.00

N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	49.95	175.00	3659.27	175.00	0.34
2	3.50	46.45	525.00	3646.77	525.00	0.23
3	2.90	43.25	859.50	3611.48	859.50	0.25
4	2.90	40.35	1178.50	3557.81	1178.50	0.21
5	5.60	36.10	1471.28	3450.91	1471.28	0.53
6	5.60	30.50	1737.84	3286.47	1737.84	0.46
7	4.00	25.70	1946.32	3145.46	1946.32	0.66
8	4.00	21.70	2096.72	3035.31	2096.72	0.62
9	4.00	17.70	2247.12	2933.84	2247.12	0.57
10	4.00	13.70	2397.52	2841.16	2397.52	0.54
11	4.00	9.70	2547.92	2756.62	2547.92	0.50
12	4.00	5.70	2698.32	2679.28	2698.32	0.47
13	4.00	1.70	2848.72	2608.16	2848.72	0.45

Wall 8 Total Emb

Total Settlement = 5.83 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-79 (1060+45) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 109.90 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3585.00
3	46.00	3757.50
4	58.00	3527.50
5	74.00	3527.50
6	85.00	3642.50
7	130.00	3470.00
8	130.10	480.00
9	165.00	0.00

Foundation Elev. = 51.70 (ft) Ground Surface Elev.= 51.70 (ft)
Water table Elev. = 38.90 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.006	0.001	0.001	100.00	0.56	0.00
2	COMP.	5.8	0.010	0.001	0.001	110.00	0.45	0.00
3	COMP.	11.2	0.015	0.001	0.001	110.00	0.98	0.00
4	COMP.	28.0	0.033	0.003	0.003	100.00	3.80	0.00
					Total Settlement =		5.79	0.00

N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	49.95	175.00	3546.62	175.00	0.33
2	3.50	46.45	525.00	3536.11	525.00	0.22
3	2.90	43.25	859.50	3506.33	859.50	0.25
4	2.90	40.35	1178.50	3460.74	1178.50	0.21
5	5.60	36.10	1471.28	3369.09	1471.28	0.52
6	5.60	30.50	1737.84	3226.16	1737.84	0.46
7	4.00	25.70	1946.32	3101.78	1946.32	0.66
8	4.00	21.70	2096.72	3003.42	2096.72	0.61
9	4.00	17.70	2247.12	2911.81	2247.12	0.57
10	4.00	13.70	2397.52	2827.25	2397.52	0.54
11	4.00	9.70	2547.92	2749.32	2547.92	0.50
12	4.00	5.70	2698.32	2677.32	2698.32	0.47
13	4.00	1.70	2848.72	2610.49	2848.72	0.45

Wall 8 Total Emb

Total Settlement = 5.79 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-79 (1060+45) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/10/2015 Computed by : BMM

Increment of stresses obtained using : Boussinesq

Settlement for X = 130.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3585.00
3	46.00	3757.50
4	58.00	3527.50
5	74.00	3527.50
6	85.00	3642.50
7	130.00	3470.00
8	130.10	480.00
9	165.00	0.00

Foundation Elev. = 51.70 (ft) Ground Surface Elev.= 51.70 (ft)
Water table Elev. = 38.90 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	7.0	0.006	0.001	0.001	100.00	0.45	0.00
2	COMP.	5.8	0.010	0.001	0.001	110.00	0.33	0.00
3	COMP.	11.2	0.015	0.001	0.001	110.00	0.69	0.00
4	COMP.	28.0	0.033	0.003	0.003	100.00	2.80	0.00
					Total Settlement =		4.27	0.00

N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.50	49.95	175.00	2024.47	175.00	0.28
2	3.50	46.45	525.00	1977.30	525.00	0.17
3	2.90	43.25	859.50	1960.56	859.50	0.18
4	2.90	40.35	1178.50	1948.92	1178.50	0.15
5	5.60	36.10	1471.28	1934.17	1471.28	0.37
6	5.60	30.50	1737.84	1916.80	1737.84	0.33
7	4.00	25.70	1946.32	1902.93	1946.32	0.47
8	4.00	21.70	2096.72	1891.75	2096.72	0.44
9	4.00	17.70	2247.12	1880.69	2247.12	0.42
10	4.00	13.70	2397.52	1869.60	2397.52	0.40
11	4.00	9.70	2547.92	1858.33	2547.92	0.38
12	4.00	5.70	2698.32	1846.78	2698.32	0.36
13	4.00	1.70	2848.72	1834.85	2848.72	0.34

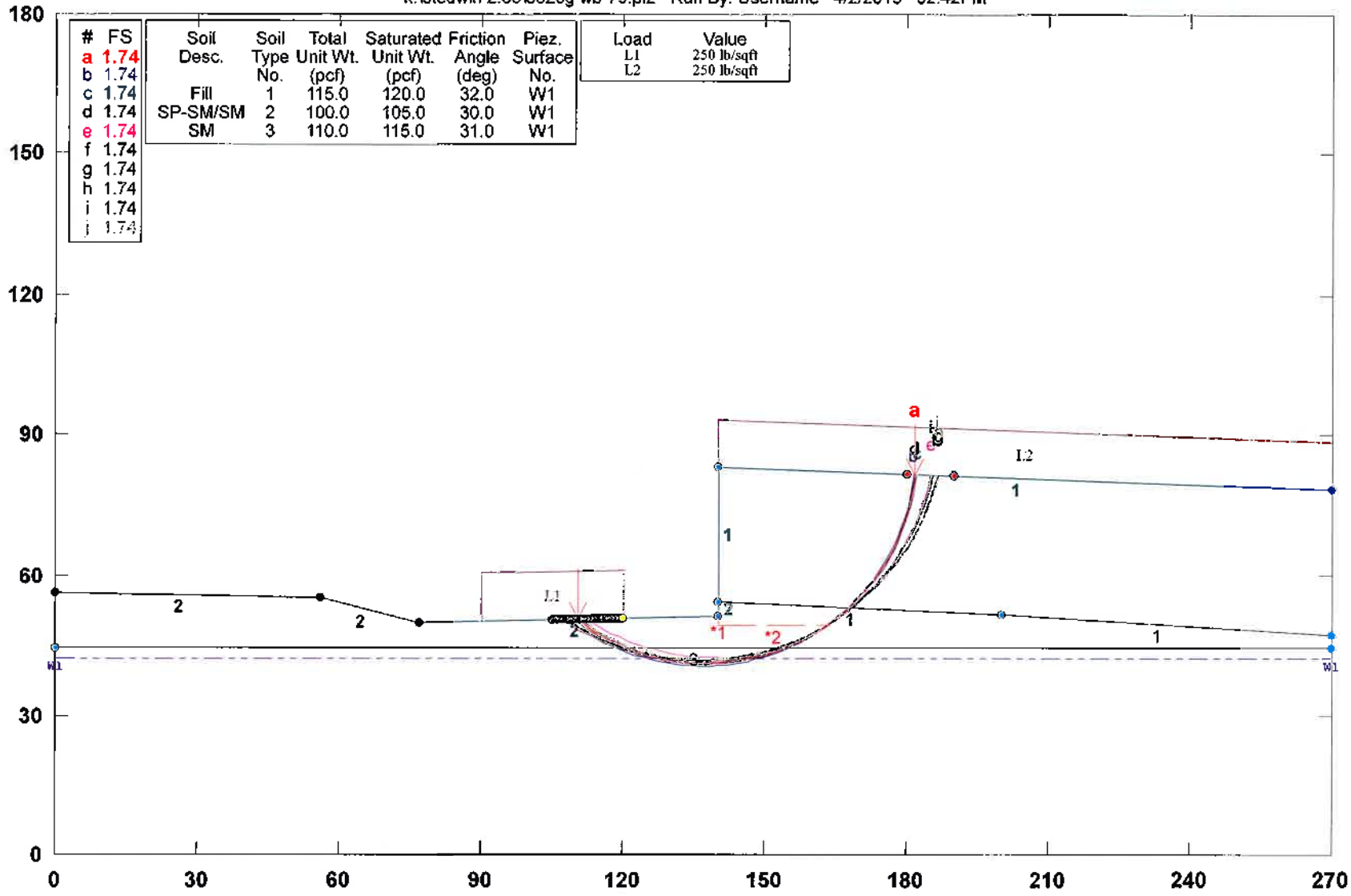
Wall 8 Total Emb

Total Settlement = 4.27 (in.)

Wall 8 Global Stability

Wekiva 7A WB-79

k:\stedwin 2.86\3520g wb-79.pl2 Run By: Username 4/2/2015 02:42PM



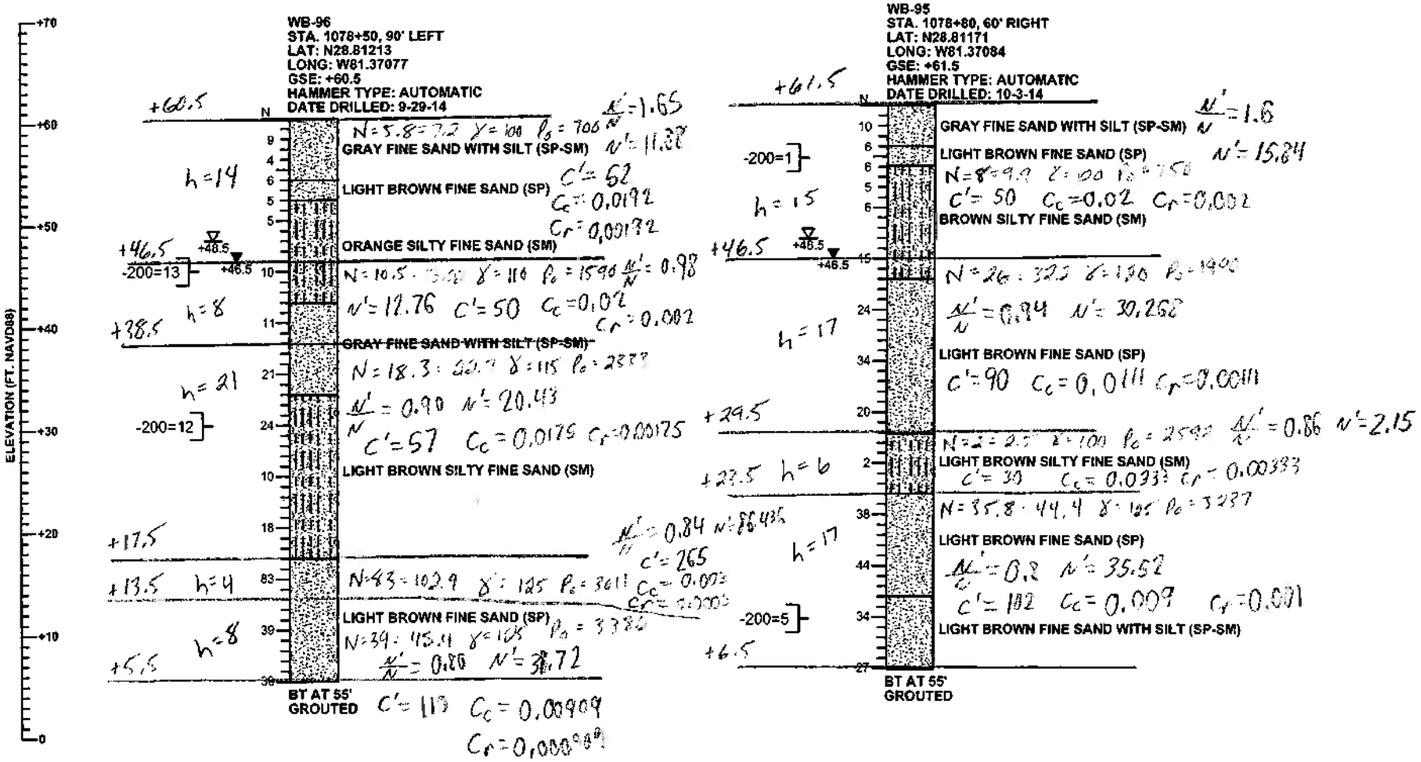
STABL6H FSmin=1.74

Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 9

Wall 9



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
+48.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+46.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE

SAND

SAND AND SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY:	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

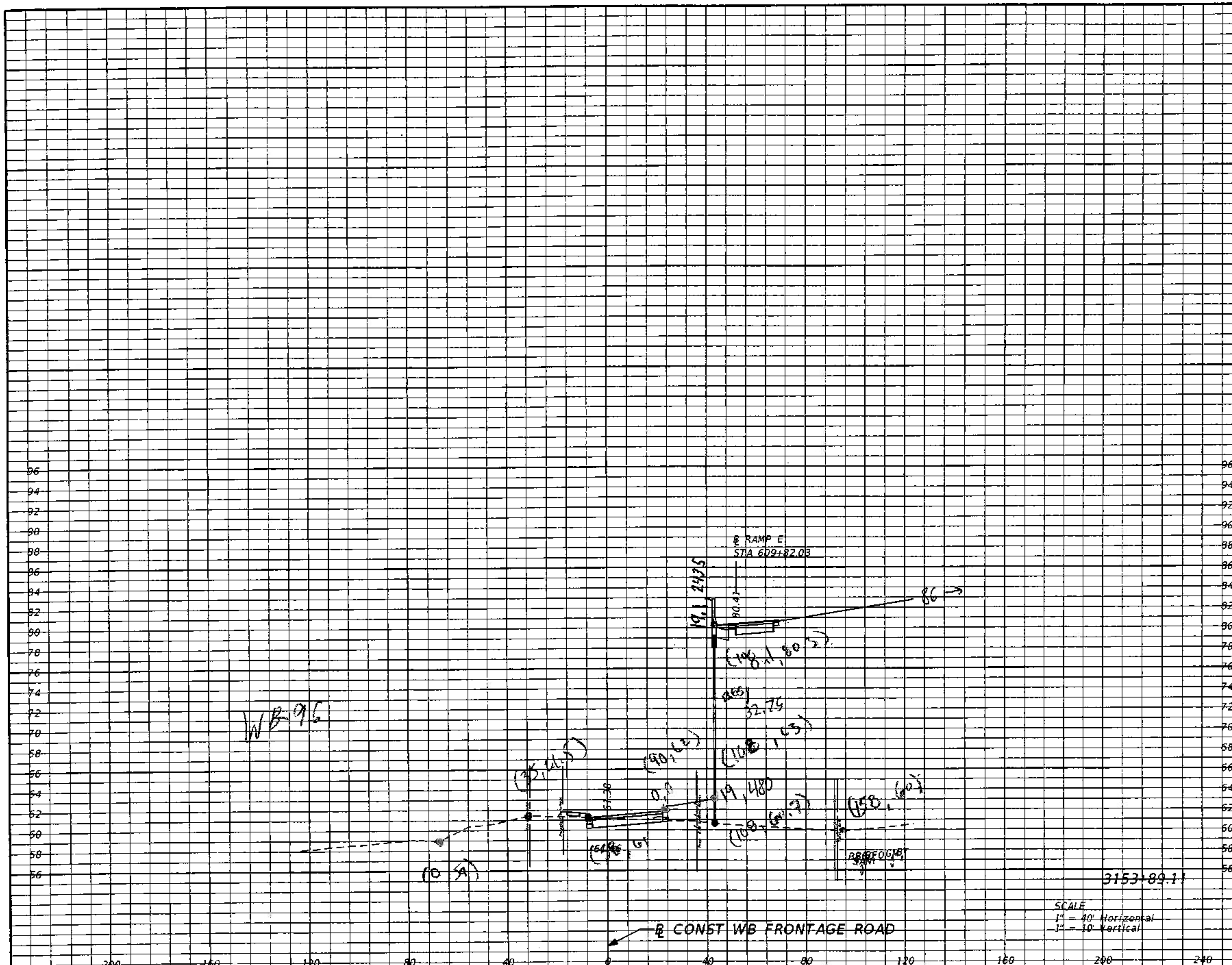
SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES

PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A

REF. DWG. NO.

SHEET NO.

scott 2/6/2015 7:30:36 AM J:\D109\3520G Wekiva Parkway Section 7A\blboring17.dgn



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

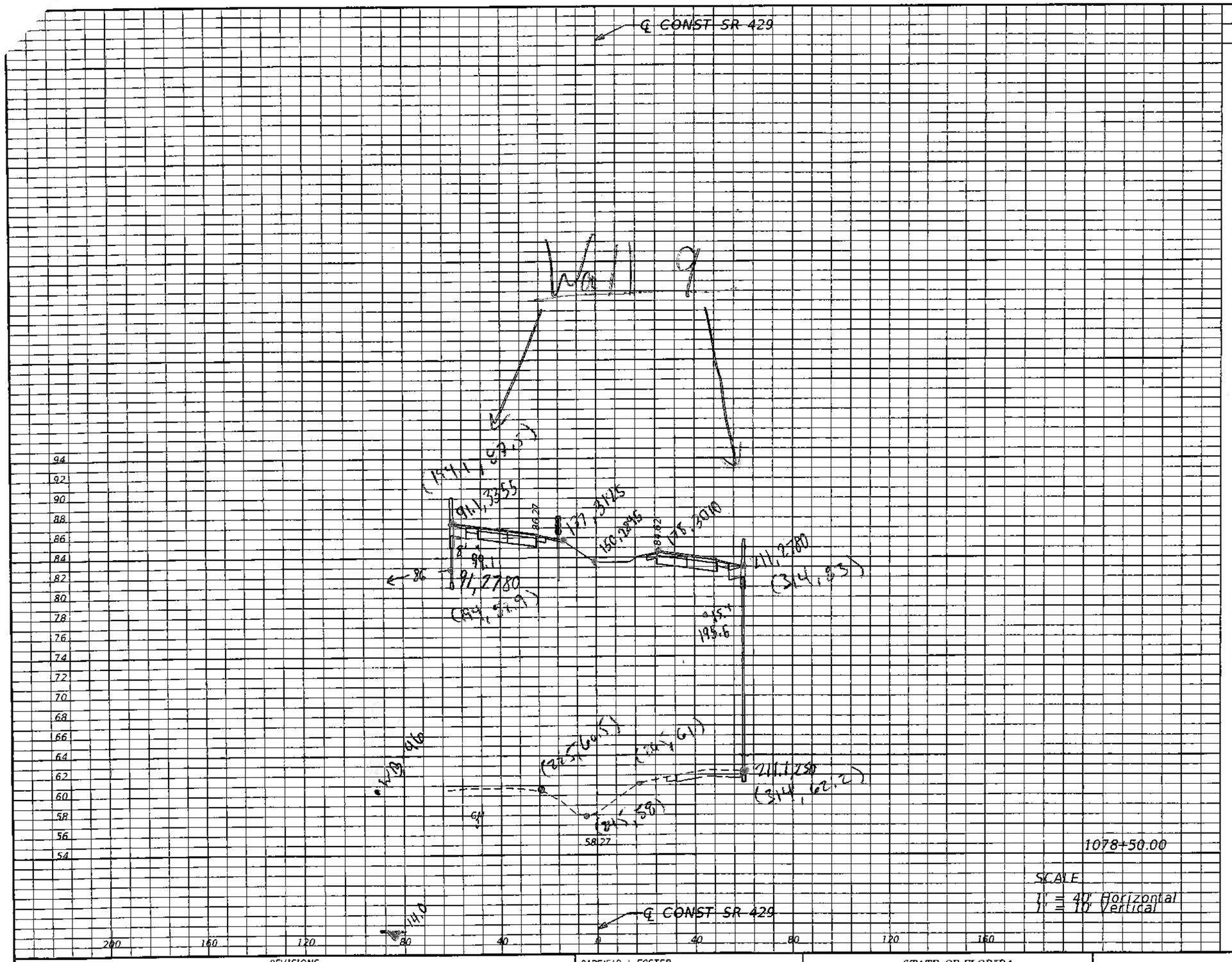
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

WB FRONTAGE RD CROSS SECTIONS

SHEET NO.

glen_dvoravy 8/22/2014 2:32:18 PM O:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD00_WB.DGN

PRELIMINARY: NOT FOR CONSTRUCTION



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

1078+50.00

SCALE
1" = 40' Horizontal
1" = 10' Vertical

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

STRIP LOADING VARIABLE SHAPE

Project Name: Wekiva 7A:WB-96 | Project Number : 3520G
Client : FDOT | Project Manager: CGB
Date : 4/1/2015 | Computed by : GW

Wall 9 Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 91.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	19.00	480.00
3	19.10	2435.00
4	91.00	2780.00
5	91.10	3355.00
6	137.00	3125.00
7	150.00	2895.00
8	178.00	3010.00
9	211.00	2780.00
10	211.10	250.00

Wall 9

Foundation Elev. = 60.50 (ft) Ground Surface Elev.= 60.50 (ft)
Water table Elev. = 48.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	14.0	0.019	0.002	0.000	100.00	2.66	0.00
2	COMP.	8.0	0.020	0.002	0.000	110.00	0.93	0.00
3	COMP.	21.0	0.018	0.001	0.000	115.00	1.68	0.00
4	COMP.	4.0	0.003	0.000	0.000	125.00	0.04	0.00
5	COMP.	8.0	0.009	0.001	0.000	125.00	0.23	0.00
					Total Settlement =		5.54	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	2.80	59.10	140.00	3076.40	140.00	0.87
2	2.80	56.30	420.00	3058.86	420.00	0.59
3	2.80	53.50	700.00	3047.95	700.00	0.47
4	2.80	50.70	980.00	3037.51	980.00	0.39
5	2.80	47.90	1222.56	3026.72	1222.56	0.35
6	1.60	45.70	1313.28	3017.77	1313.28	0.20
7	1.60	44.10	1389.44	3010.92	1389.44	0.19
8	1.60	42.50	1465.60	3003.77	1465.60	0.19
9	1.60	40.90	1541.76	2996.28	1541.76	0.18
10	1.60	39.30	1617.92	2988.45	1617.92	0.17
11	4.20	36.40	1766.46	2973.30	1766.46	0.39
12	4.20	32.20	1987.38	2949.12	1987.38	0.36

13	4.20	28.00	2208.30	2922.27	2208.30	0.33
14	4.20	23.80	2429.22	2892.82	2429.22	0.31
15	4.20	19.60	2650.14	2860.93	2650.14	0.29
16	0.80	17.10	2785.64	2840.88	2785.64	0.01
17	0.80	16.30	2835.72	2834.30	2835.72	0.01
18	0.80	15.50	2885.80	2827.65	2885.80	0.01
19	0.80	14.70	2935.88	2820.93	2935.88	0.01
20	0.80	13.90	2985.96	2814.15	2985.96	0.01
21	1.60	12.70	3061.08	2803.84	3061.08	0.05
22	1.60	11.10	3161.24	2789.87	3161.24	0.05
23	1.60	9.50	3261.40	2775.65	3261.40	0.05
24	1.60	7.90	3361.56	2761.21	3361.56	0.04
25	1.60	6.30	3461.72	2746.56	3461.72	0.04

Wall 9
Total Emb

Total Settlement = 5.54 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: Wekiva 7A:WB-96 | Project Number : 3520G
Client : FDOT | Project Manager: CGB
Date : 4/1/2015 | Computed by : GW

Increment of stresses obtained using : Boussinesq

Settlement for X = 99.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	19.00	480.00
3	19.10	2435.00
4	91.00	2780.00
5	91.10	3355.00
6	137.00	3125.00
7	150.00	2895.00
8	178.00	3010.00
9	211.00	2780.00
10	211.10	250.00

Wall 9

Foundation Elev. = 60.50 (ft) Ground Surface Elev.= 60.50 (ft)
Water table Elev. = 48.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	14.0	0.019	0.002	0.000	100.00	2.74	0.00
2	COMP.	8.0	0.020	0.002	0.000	110.00	0.96	0.00
3	COMP.	21.0	0.018	0.001	0.000	115.00	1.71	0.00
4	COMP.	4.0	0.003	0.000	0.000	125.00	0.04	0.00
5	COMP.	8.0	0.009	0.001	0.000	125.00	0.24	0.00
					Total Settlement =		5.68	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	2.80	59.10	140.00	3314.25	140.00	0.89
2	2.80	56.30	420.00	3300.82	420.00	0.60
3	2.80	53.50	700.00	3270.17	700.00	0.48
4	2.80	50.70	980.00	3233.30	980.00	0.40
5	2.80	47.90	1222.56	3197.54	1222.56	0.36
6	1.60	45.70	1313.28	3171.67	1313.28	0.20
7	1.60	44.10	1389.44	3154.09	1389.44	0.20
8	1.60	42.50	1465.60	3137.42	1465.60	0.19
9	1.60	40.90	1541.76	3121.51	1541.76	0.18
10	1.60	39.30	1617.92	3106.22	1617.92	0.18
11	4.20	36.40	1766.46	3079.68	1766.46	0.40
12	4.20	32.20	1987.38	3042.81	1987.38	0.37

13	4.20	28.00	2208.30	3006.60	2208.30	0.34
14	4.20	23.80	2429.22	2970.19	2429.22	0.31
15	4.20	19.60	2650.14	2933.08	2650.14	0.29
16	0.80	17.10	2785.64	2910.54	2785.64	0.01
17	0.80	16.30	2835.72	2903.25	2835.72	0.01
18	0.80	15.50	2885.80	2895.93	2885.80	0.01
19	0.80	14.70	2935.88	2888.56	2935.88	0.01
20	0.80	13.90	2985.96	2881.15	2985.96	0.01
21	1.60	12.70	3061.08	2869.97	3061.08	0.05
22	1.60	11.10	3161.24	2854.93	3161.24	0.05
23	1.60	9.50	3261.40	2839.74	3261.40	0.05
24	1.60	7.90	3361.56	2824.39	3361.56	0.05
25	1.60	6.30	3461.72	2808.91	3461.72	0.04

Wall 9
Total Emb

Total Settlement = 5.68 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: Wekiva 7A:WB-96 | Project Number : 3520G
Client : FDOT | Project Manager: CGB
Date : 4/1/2015 | Computed by : GW

Increment of stresses obtained using : Boussinesq

Settlement for X = 195.60 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	19.00	480.00
3	19.10	2435.00
4	91.00	2780.00
5	91.10	3355.00
6	137.00	3125.00
7	150.00	2895.00
8	178.00	3010.00
9	211.00	2780.00
10	211.10	250.00

Wall 9

Foundation Elev. = 60.50 (ft) Ground Surface Elev.= 60.50 (ft)
Water table Elev. = 48.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	14.0	0.019	0.002	0.000	100.00	2.57	0.00
2	COMP.	8.0	0.020	0.002	0.000	110.00	0.85	0.00
3	COMP.	21.0	0.018	0.001	0.000	115.00	1.40	0.00
4	COMP.	4.0	0.003	0.000	0.000	125.00	0.03	0.00
5	COMP.	8.0	0.009	0.001	0.000	125.00	0.18	0.00
					Total Settlement =		5.03	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	2.80	59.10	140.00	2886.90	140.00	0.85
2	2.80	56.30	420.00	2876.45	420.00	0.57
3	2.80	53.50	700.00	2843.48	700.00	0.45
4	2.80	50.70	980.00	2787.21	980.00	0.37
5	2.80	47.90	1222.56	2714.92	1222.56	0.32
6	1.60	45.70	1313.28	2652.68	1313.28	0.18
7	1.60	44.10	1389.44	2606.65	1389.44	0.18
8	1.60	42.50	1465.60	2561.10	1465.60	0.17
9	1.60	40.90	1541.76	2516.71	1541.76	0.16
10	1.60	39.30	1617.92	2473.92	1617.92	0.15
11	4.20	36.40	1766.46	2401.28	1766.46	0.34
12	4.20	32.20	1987.38	2308.06	1987.38	0.30

13	4.20	28.00	2208.30	2228.29	2208.30	0.27
14	4.20	23.80	2429.22	2160.15	2429.22	0.25
15	4.20	19.60	2650.14	2101.64	2650.14	0.23
16	0.80	17.10	2785.64	2070.63	2785.64	0.01
17	0.80	16.30	2835.72	2061.23	2835.72	0.01
18	0.80	15.50	2885.80	2052.08	2885.80	0.01
19	0.80	14.70	2935.88	2043.15	2935.88	0.01
20	0.80	13.90	2985.96	2034.44	2985.96	0.01
21	1.60	12.70	3061.08	2021.78	3061.08	0.04
22	1.60	11.10	3161.24	2005.57	3161.24	0.04
23	1.60	9.50	3261.40	1990.10	3261.40	0.04
24	1.60	7.90	3361.56	1975.29	3361.56	0.03
25	1.60	6.30	3461.72	1961.10	3461.72	0.03

Wall 9
Total Emb

Total Settlement = 5.03 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: Wekiva 7A:WB-96 | Project Number : 3520G
Client : FDOT | Project Manager: CGB
Date : 4/1/2015 | Computed by : GW

Increment of stresses obtained using : Boussinesq

Settlement for X = 211.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	19.00	480.00
3	19.10	2435.00
4	91.00	2780.00
5	91.10	3355.00
6	137.00	3125.00
7	150.00	2895.00
8	178.00	3010.00
9	211.00	2780.00
10	211.10	250.00

Wall 9

Foundation Elev. = 60.50 (ft) Ground Surface Elev.= 60.50 (ft)
Water table Elev. = 48.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	14.0	0.019	0.002	0.000	100.00	1.86	0.00
2	COMP.	8.0	0.020	0.002	0.000	110.00	0.57	0.00
3	COMP.	21.0	0.018	0.001	0.000	115.00	1.00	0.00
4	COMP.	4.0	0.003	0.000	0.000	125.00	0.03	0.00
5	COMP.	8.0	0.009	0.001	0.000	125.00	0.14	0.00
					Total Settlement =		3.59	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	2.80	59.10	140.00	1461.86	140.00	0.68
2	2.80	56.30	420.00	1422.21	420.00	0.41
3	2.80	53.50	700.00	1419.01	700.00	0.31
4	2.80	50.70	980.00	1420.78	980.00	0.25
5	2.80	47.90	1222.56	1423.95	1222.56	0.21
6	1.60	45.70	1313.28	1426.75	1313.28	0.12
7	1.60	44.10	1389.44	1428.81	1389.44	0.12
8	1.60	42.50	1465.60	1430.84	1465.60	0.11
9	1.60	40.90	1541.76	1432.81	1541.76	0.11
10	1.60	39.30	1617.92	1434.71	1617.92	0.11
11	4.20	36.40	1766.46	1437.90	1766.46	0.23
12	4.20	32.20	1987.38	1441.92	1987.38	0.21

13	4.20	28.00	2208.30	1445.20	2208.30	0.20
14	4.20	23.80	2429.22	1447.76	2429.22	0.18
15	4.20	19.60	2650.14	1449.62	2650.14	0.17
16	0.80	17.10	2785.64	1450.41	2785.64	0.01
17	0.80	16.30	2835.72	1450.61	2835.72	0.01
18	0.80	15.50	2885.80	1450.79	2885.80	0.01
19	0.80	14.70	2935.88	1450.94	2935.88	0.01
20	0.80	13.90	2985.96	1451.08	2985.96	0.00
21	1.60	12.70	3061.08	1451.23	3061.08	0.03
22	1.60	11.10	3161.24	1451.35	3161.24	0.03
23	1.60	9.50	3261.40	1451.39	3261.40	0.03
24	1.60	7.90	3361.56	1451.33	3361.56	0.03
25	1.60	6.30	3461.72	1451.18	3461.72	0.03

Wall 9
Total Emb

Total Settlement = 3.59 (in.)

Wall 9 Global Stability

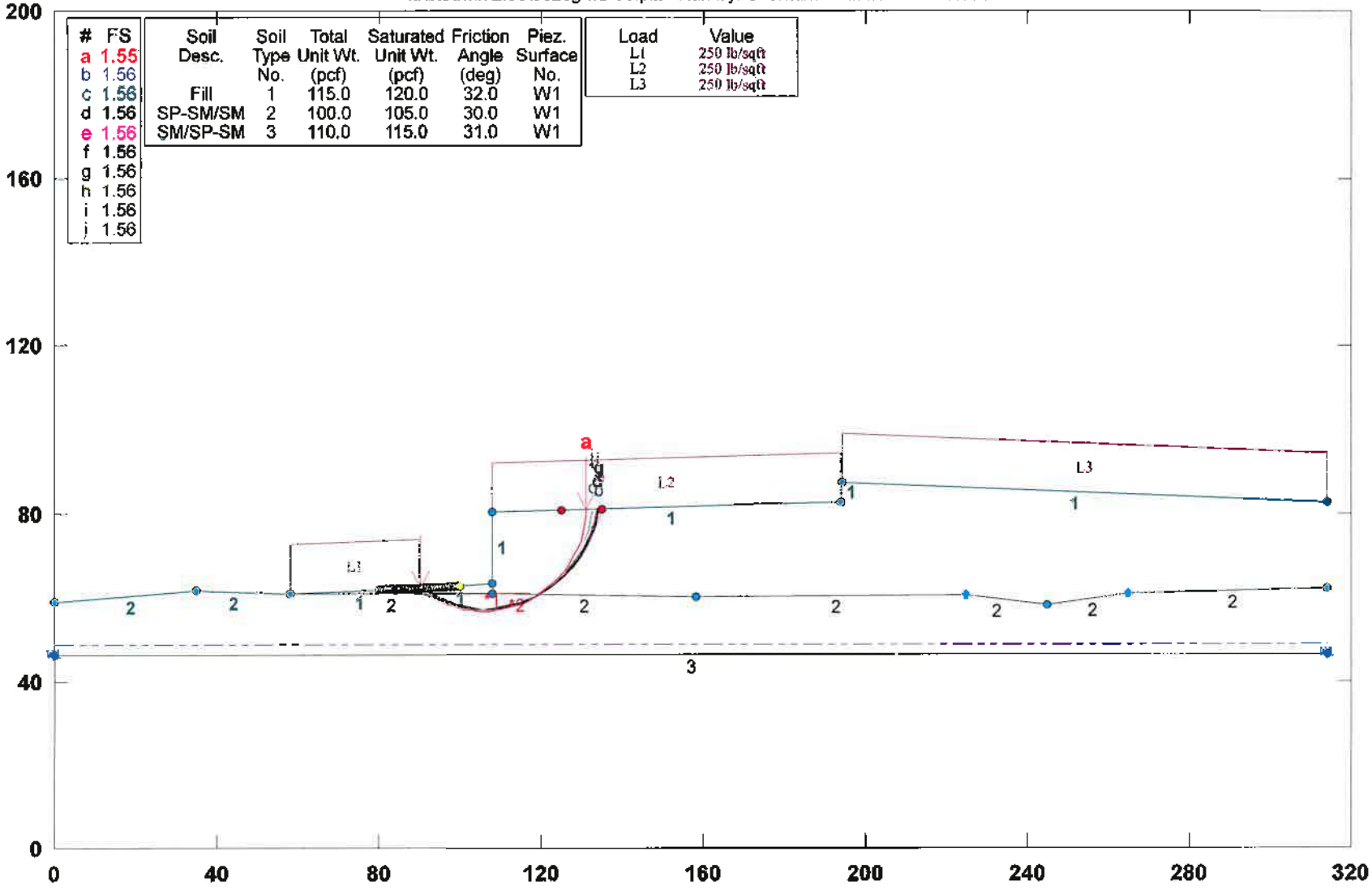
Wekiva 7A WB-96

k:\stedwin 2.86\3520g wb-96.pl2 Run By: Username 4/2/2015 03:16PM

#	FS
a	1.55
b	1.56
c	1.56
d	1.56
e	1.56
f	1.56
g	1.56
h	1.56
i	1.56
j	1.56

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Friction Angle (deg)	Piez. Surface No.
Fill	1	115.0	120.0	32.0	W1
SP-SM/SM	2	100.0	105.0	30.0	W1
SM/SP-SM	3	110.0	115.0	31.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft

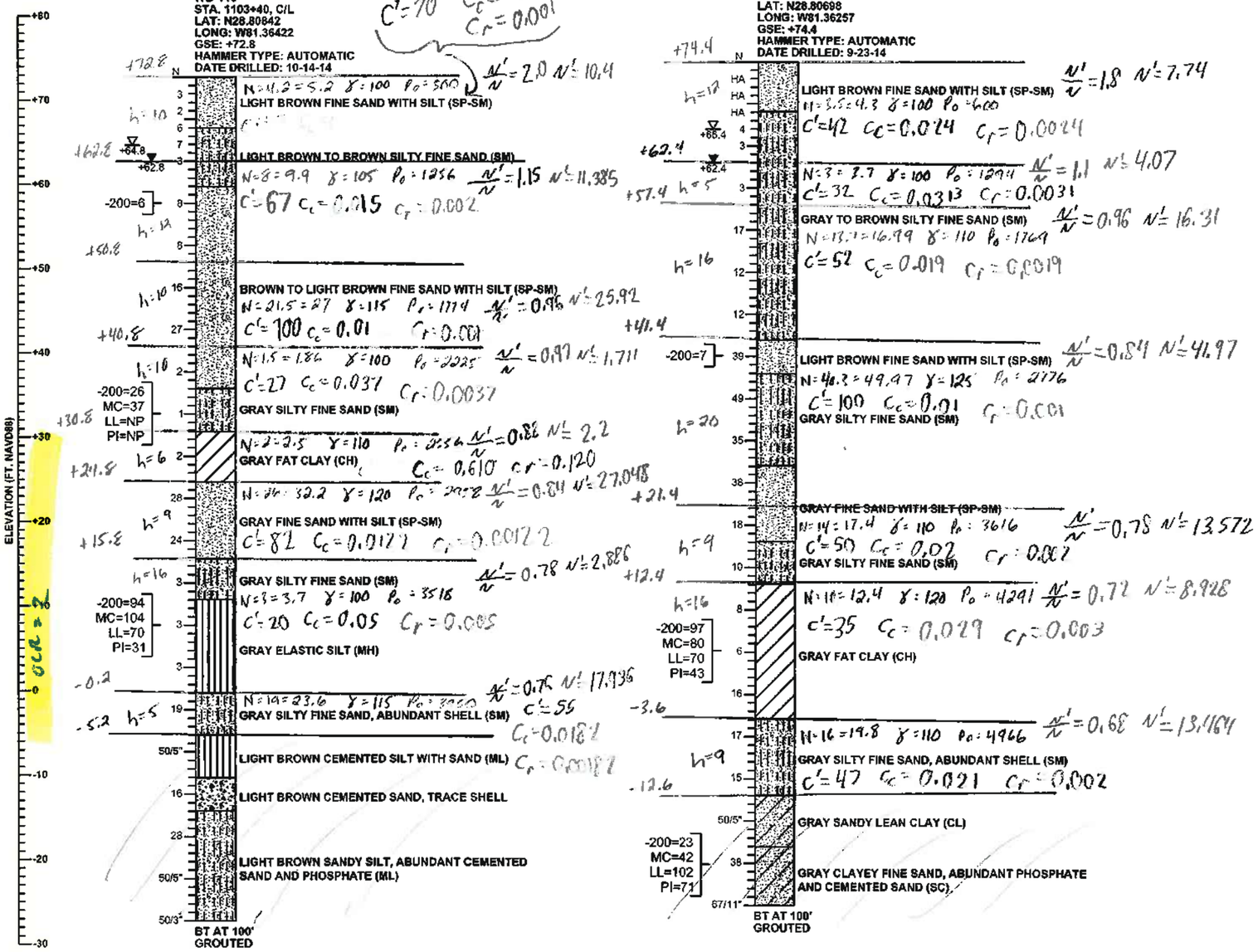


STABL6H FSmin=1.55

Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 10



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
▽ +64.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +62.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
NP=	NON-PLASTIC

SAND | SAND AND CLAY | SILT | SAND AND SILT | CLAY | CEMENTED SAND

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-116
SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-117
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 30 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

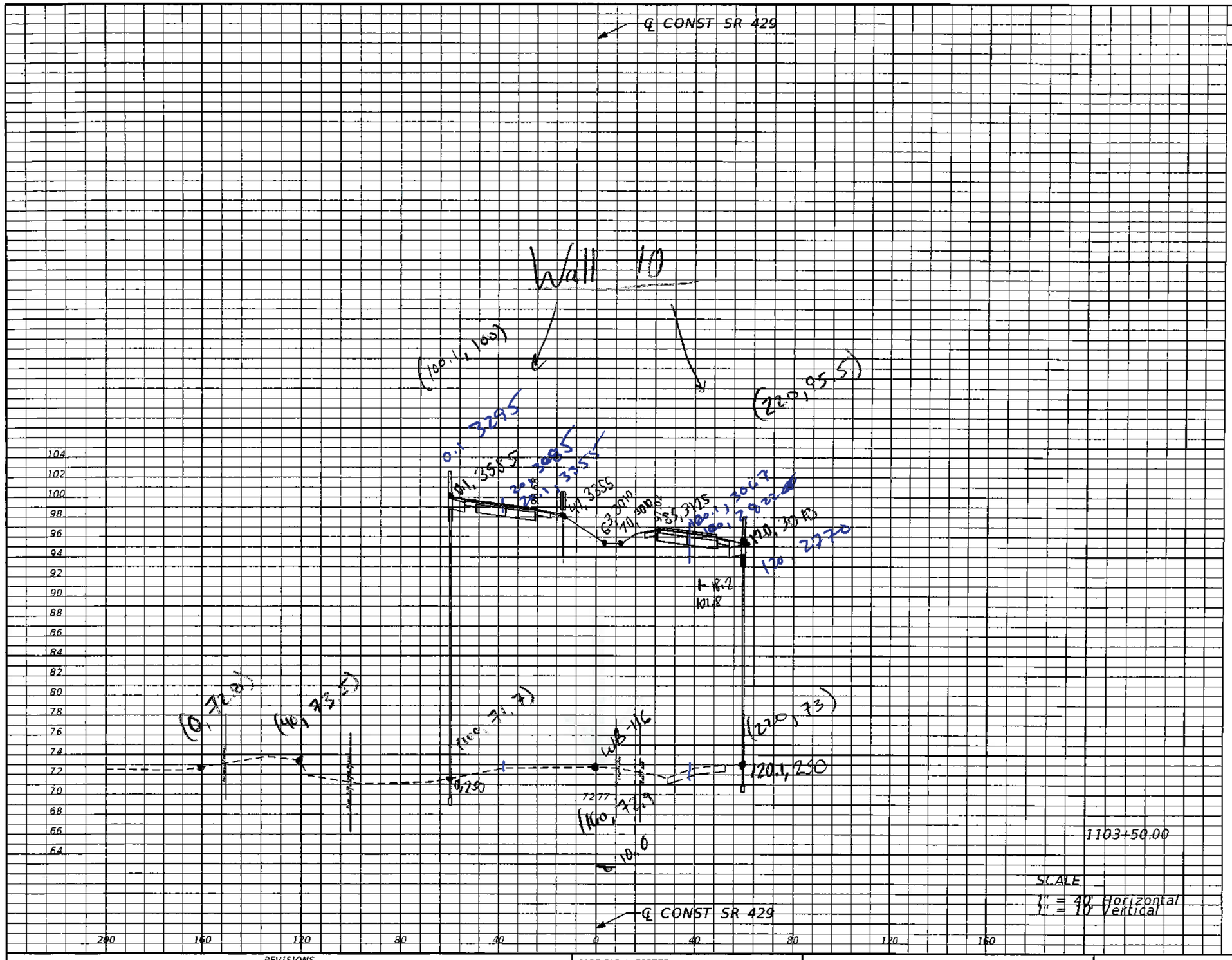
DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott 2/6/2015 7:32:06 AM J:\D109\3520C Wekiva Parkway Section 7A\b1boring17.dgn



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

andy_stilling 8/22/2014 2:04:05 PM O:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD00_429.DGN

STRIP LOADING VARIABLE SHAPE

Wall 10 Total Embankment Settlement

Project Name: WPKY 7: WB-116 (1103+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/16/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 0.10 (ft)

W/OCR

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3295.00
3	20.00	3085.00
4	20.10	3355.00
5	99.90	3067.00
6	100.00	2822.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 72.80 (ft) Ground Surface Elev.= 72.80 (ft)
Water table Elev. = 62.80 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.014	0.001	0.001	100.00	1.26	0.00
2	COMP.	12.0	0.015	0.002	0.002	105.00	0.87	0.00
3	COMP.	10.0	0.010	0.001	0.001	115.00	0.35	0.00
4	COMP.	10.0	0.037	0.004	0.004	100.00	1.06	0.00
5	COMP.	6.0	0.610	0.120	0.120	110.00	0.56	0.00
6	COMP.	9.0	0.012	0.001	0.001	120.00	0.02	0.00
7	COMP.	16.0	0.050	0.005	0.005	100.00	0.15	0.00
8	COMP.	5.0	0.018	0.002	0.000	115.00	0.02	0.00
					Total Settlement =		4.29	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	70.30	250.00	1684.35	250.00	0.75
2	5.00	65.30	750.00	1640.52	586.00	0.51
3	4.00	60.80	1085.20	1627.22	888.40	0.35
4	4.00	56.80	1255.60	1621.10	1157.20	0.28
5	4.00	52.80	1426.00	1617.38	1426.00	0.24
6	5.00	48.30	1642.70	1614.05	1632.12	0.18
7	5.00	43.30	1905.70	1609.90	1861.15	0.17
8	5.00	38.30	2131.20	1604.41	2090.17	0.56
9	5.00	33.30	2319.20	1597.19	2319.20	0.51
10	3.00	29.30	2484.60	1590.09	4968.00	0.29
11	3.00	26.30	2627.40	1583.99	5254.00	0.27

12	4.50	22.55	2828.40	1575.45	5656.00	0.01
13	4.50	18.05	3087.60	1563.93	6174.00	0.01
14	4.00	13.80	3292.40	1551.85	6586.00	0.04
15	4.00	9.80	3442.80	1539.49	6886.00	0.04
16	4.00	5.80	3593.20	1526.26	7186.00	0.04
17	4.00	1.80	3743.60	1512.24	7486.00	0.04
18	5.00	-2.70	3950.30	1495.63	7900.00	0.02

Total Settlement = 4.29 (in.)

Wall 10
Total Emb

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-116 (1103+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/16/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 20.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3295.00
3	20.00	3085.00
4	20.10	3355.00
5	99.90	3067.00
6	100.00	2822.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 72.80 (ft) Ground Surface Elev.= 72.80 (ft)
Water table Elev. = 62.80 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.014	0.001	0.001	100.00	1.66	0.00
2	COMP.	12.0	0.015	0.002	0.002	105.00	1.25	0.00
3	COMP.	10.0	0.010	0.001	0.001	115.00	0.50	0.00
4	COMP.	10.0	0.037	0.004	0.004	100.00	1.49	0.00
5	COMP.	6.0	0.610	0.120	0.120	110.00	0.77	0.00
6	COMP.	9.0	0.012	0.001	0.001	120.00	0.03	0.00
7	COMP.	16.0	0.050	0.005	0.005	100.00	0.19	0.00
8	COMP.	5.0	0.018	0.002	0.000	115.00	0.02	0.00
					Total Settlement =		5.90	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	70.30	250.00	3220.86	250.00	0.96
2	5.00	65.30	750.00	3202.57	586.00	0.70
3	4.00	60.80	1085.20	3136.20	888.40	0.49
4	4.00	56.80	1255.60	3046.99	1157.20	0.41
5	4.00	52.80	1426.00	2944.00	1426.00	0.35
6	5.00	48.30	1642.70	2825.24	1632.12	0.26
7	5.00	43.30	1905.70	2699.52	1861.15	0.24
8	5.00	38.30	2131.20	2584.58	2090.17	0.78
9	5.00	33.30	2319.20	2480.88	2319.20	0.70
10	3.00	29.30	2484.60	2405.28	4968.00	0.39
11	3.00	26.30	2627.40	2352.36	5254.00	0.37

12	4.50	22.55	2828.40	2290.20	5656.00	0.01
13	4.50	18.05	3087.60	2220.70	6174.00	0.01
14	4.00	13.80	3292.40	2159.41	6586.00	0.05
15	4.00	9.80	3442.80	2105.01	6886.00	0.05
16	4.00	5.80	3593.20	2053.38	7186.00	0.05
17	4.00	1.80	3743.60	2004.18	7486.00	0.04
18	5.00	-2.70	3950.30	1951.39	7900.00	0.02

Total Settlement = 5.90 (in.)

Wall 10
Total Emb

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-116 (1103+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/16/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 101.80 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3295.00
3	20.00	3085.00
4	20.10	3355.00
5	99.90	3067.00
6	100.00	2822.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 72.80 (ft) Ground Surface Elev.= 72.80 (ft)
Water table Elev. = 62.80 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.014	0.001	0.001	100.00	1.58	0.00
2	COMP.	12.0	0.015	0.002	0.002	105.00	1.18	0.00
3	COMP.	10.0	0.010	0.001	0.001	115.00	0.47	0.00
4	COMP.	10.0	0.037	0.004	0.004	100.00	1.39	0.00
5	COMP.	6.0	0.610	0.120	0.120	110.00	0.72	0.00
6	COMP.	9.0	0.012	0.001	0.001	120.00	0.02	0.00
7	COMP.	16.0	0.050	0.005	0.005	100.00	0.18	0.00
8	COMP.	5.0	0.018	0.002	0.000	115.00	0.02	0.00
					Total Settlement =		5.56	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	70.30	250.00	2851.58	250.00	0.92
2	5.00	65.30	750.00	2870.56	586.00	0.66
3	4.00	60.80	1085.20	2810.85	888.40	0.46
4	4.00	56.80	1255.60	2727.92	1157.20	0.39
5	4.00	52.80	1426.00	2635.37	1426.00	0.33
6	5.00	48.30	1642.70	2532.69	1632.12	0.24
7	5.00	43.30	1905.70	2427.89	1861.15	0.22
8	5.00	38.30	2131.20	2334.79	2090.17	0.73
9	5.00	33.30	2319.20	2252.44	2319.20	0.65
10	3.00	29.30	2484.60	2193.07	4968.00	0.37
11	3.00	26.30	2627.40	2151.72	5254.00	0.35

12	4.50	22.55	2828.40	2103.23	5656.00	0.01
13	4.50	18.05	3087.60	2048.96	6174.00	0.01
14	4.00	13.80	3292.40	2000.91	6586.00	0.05
15	4.00	9.80	3442.80	1958.01	6886.00	0.05
16	4.00	5.80	3593.20	1917.00	7186.00	0.04
17	4.00	1.80	3743.60	1877.59	7486.00	0.04
18	5.00	-2.70	3950.30	1834.90	7900.00	0.02

Total Settlement = 5.56 (in.)

Wall 10
Total Emb

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-116 (1103+40) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/16/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 120.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3295.00
3	20.00	3085.00
4	20.10	3355.00
5	99.90	3067.00
6	100.00	2822.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 72.80 (ft) Ground Surface Elev.= 72.80 (ft)
Water table Elev. = 62.80 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	10.0	0.014	0.001	0.001	100.00	1.17	0.00
2	COMP.	12.0	0.015	0.002	0.002	105.00	0.80	0.00
3	COMP.	10.0	0.010	0.001	0.001	115.00	0.32	0.00
4	COMP.	10.0	0.037	0.004	0.004	100.00	0.99	0.00
5	COMP.	6.0	0.610	0.120	0.120	110.00	0.53	0.00
6	COMP.	9.0	0.012	0.001	0.001	120.00	0.02	0.00
7	COMP.	16.0	0.050	0.005	0.005	100.00	0.14	0.00
8	COMP.	5.0	0.018	0.002	0.000	115.00	0.02	0.00
					Total Settlement =		3.98	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	5.00	70.30	250.00	1425.59	250.00	0.69
2	5.00	65.30	750.00	1406.25	586.00	0.48
3	4.00	60.80	1085.20	1410.21	888.40	0.32
4	4.00	56.80	1255.60	1417.67	1157.20	0.26
5	4.00	52.80	1426.00	1426.25	1426.00	0.22
6	5.00	48.30	1642.70	1435.59	1632.12	0.17
7	5.00	43.30	1905.70	1444.36	1861.15	0.15
8	5.00	38.30	2131.20	1450.80	2090.17	0.52
9	5.00	33.30	2319.20	1454.66	2319.20	0.47
10	3.00	29.30	2484.60	1455.88	4968.00	0.27
11	3.00	26.30	2627.40	1455.72	5254.00	0.26

12	4.50	22.55	2828.40	1454.27	5656.00	0.01
13	4.50	18.05	3087.60	1450.78	6174.00	0.01
14	4.00	13.80	3292.40	1445.82	6586.00	0.04
15	4.00	9.80	3442.80	1439.78	6886.00	0.04
16	4.00	5.80	3593.20	1432.50	7186.00	0.03
17	4.00	1.80	3743.60	1424.09	7486.00	0.03
18	5.00	-2.70	3950.30	1413.38	7900.00	0.02

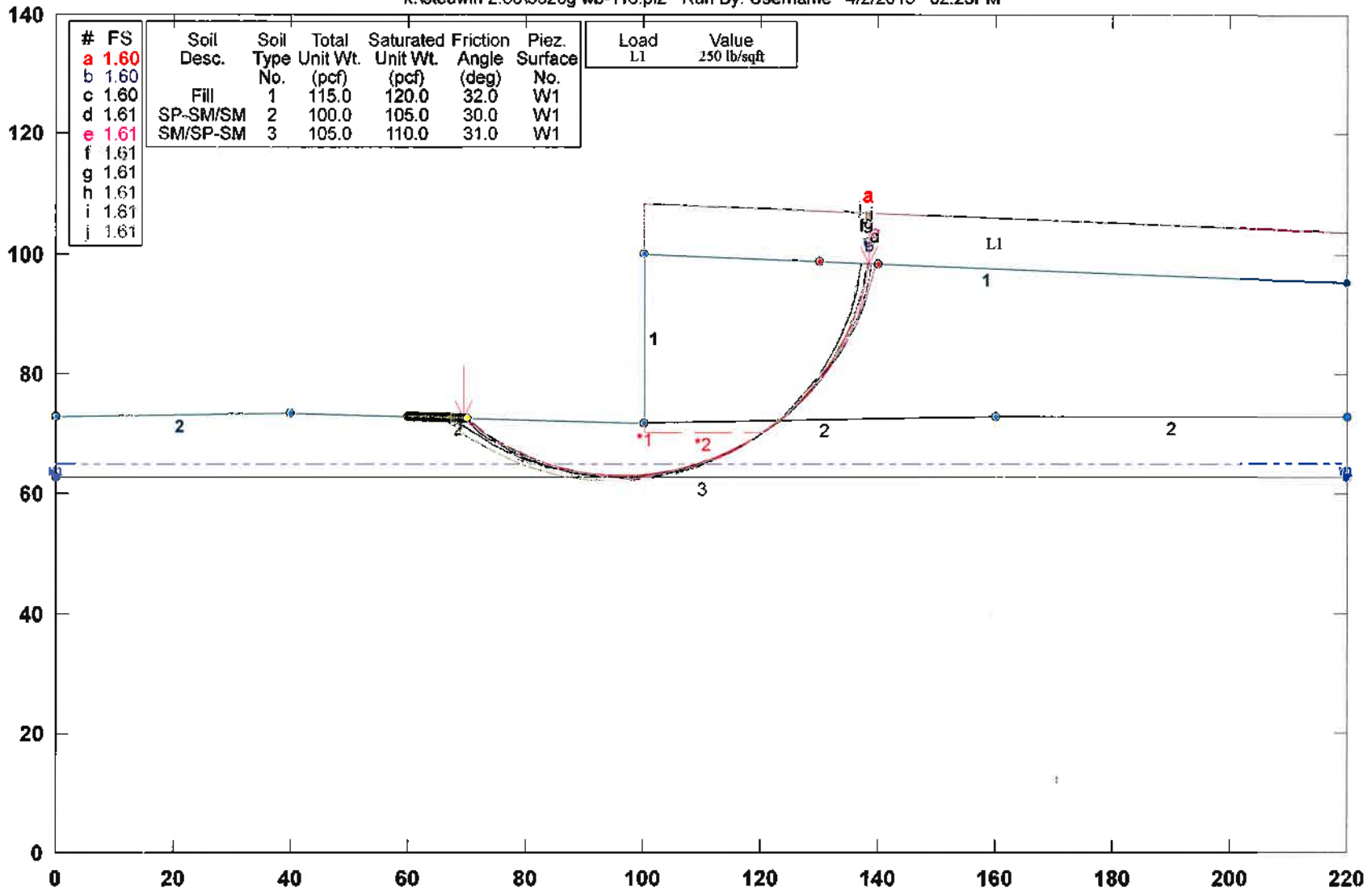
Total Settlement = 3.98 (in.)

Wall 10
Total Emb

Wall 10 Global Stability

Wekiva 7A WB-116

k:\stedwin 2.86\3520g wb-116.pl2 Run By: Username 4/2/2015 02:23PM



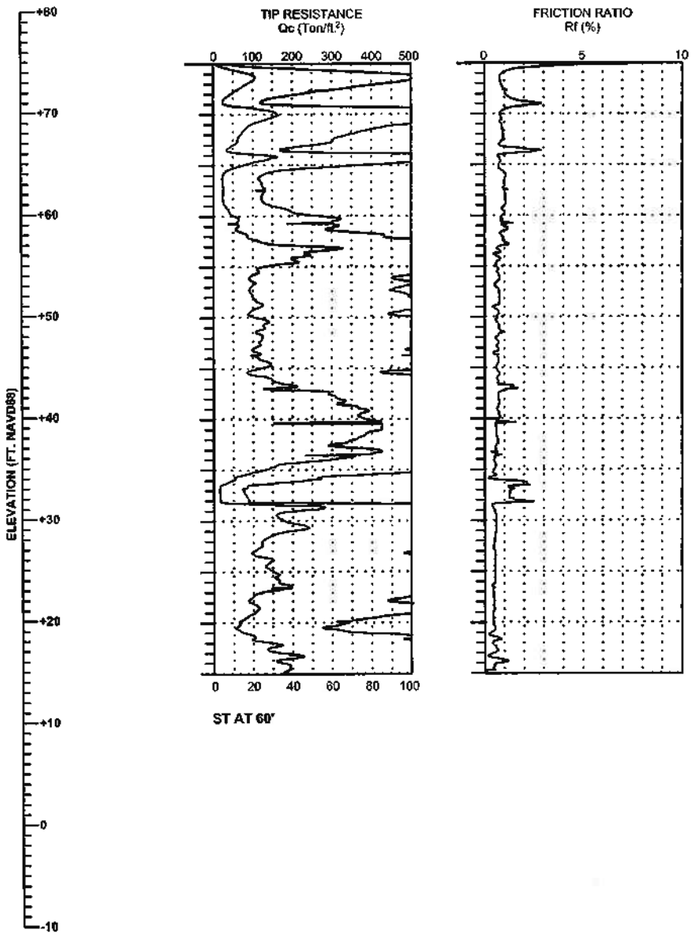
STABL6H FSmin=1.60

Safety Factors Are Calculated By The Modified Bishop Method

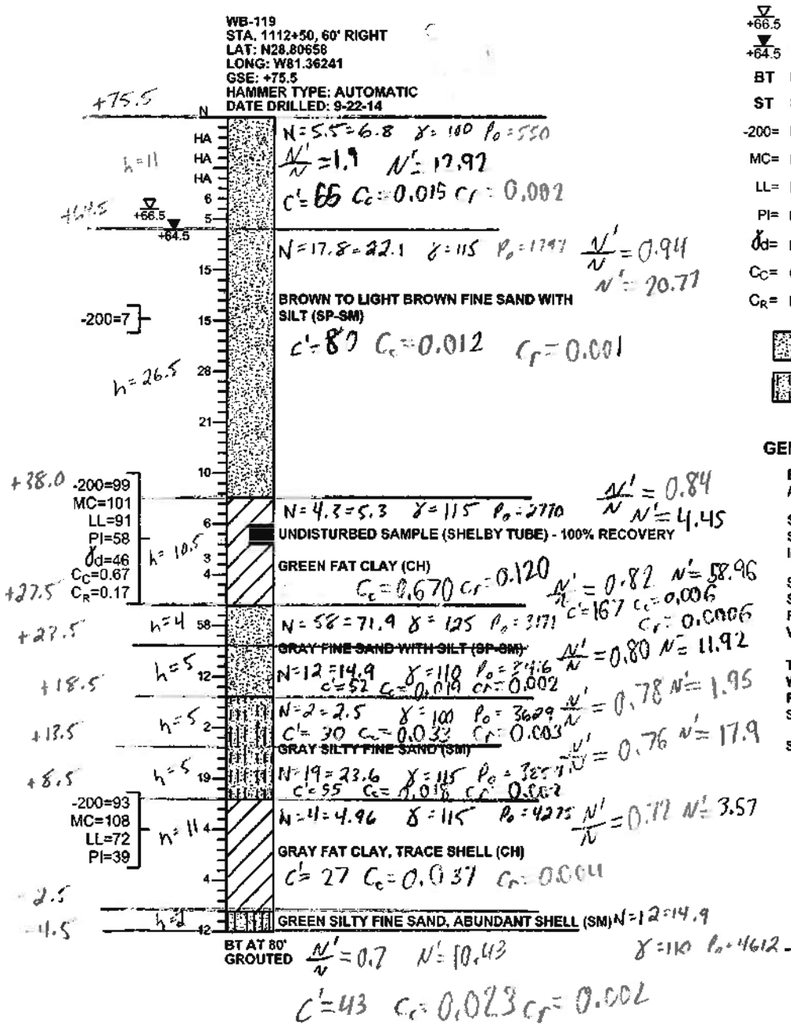
STED

Wall 11

WB-118
STA. 1111+00, 60' LEFT
LAT: N28.80706
LONG: W81.36239
GSE: +74.7
DATE DRILLED: 9-26-14



WB-119
STA. 1112+50, 60' RIGHT
LAT: N28.80658
LONG: W81.36241
GSE: +75.5
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 9-22-14



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +66.5	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +64.5	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
γ_d=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX

SAND CLAY SAND AND SILT

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-118
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

WB-119
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 30 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

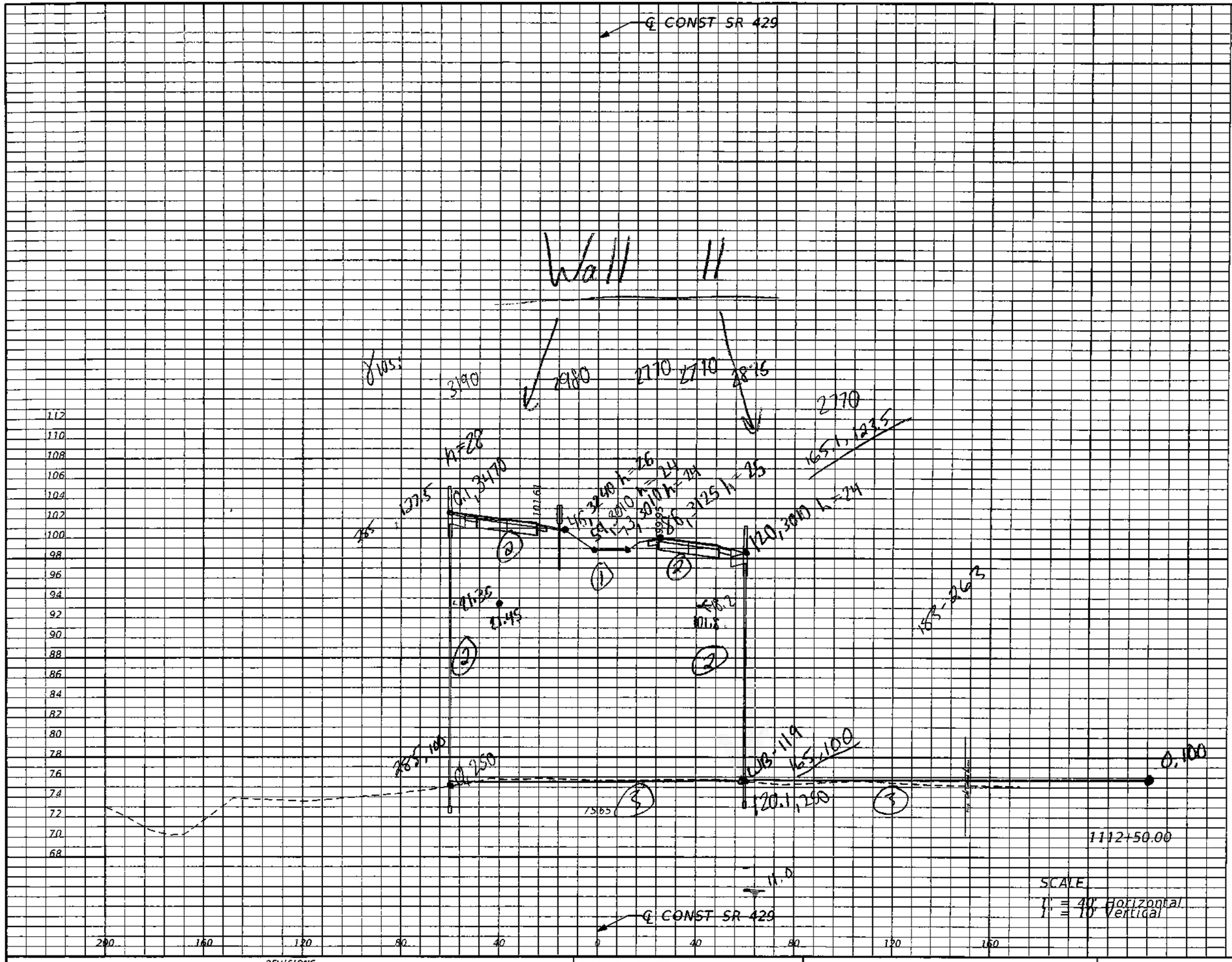
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
REF. DWG. NO.
SHEET NO.

scott 2/6/2015 7:32:16 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring17.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V



PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

andy_stilling 8/22/2014 2:07:29 PM O:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD00_429.DGN

STRIP LOADING VARIABLE SHAPE

Wall 11 Total Embankment Settlement

Project Name: WPKY 7: WB-119 (1112+50) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/25/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

OCR

Settlement for X = 0.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3190.00
3	46.00	2980.00
4	59.00	2770.00
5	73.00	2770.00
6	86.00	2875.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 75.50 (ft) Ground Surface Elev.= 75.50 (ft)
Water table Elev. = 64.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	11.0	0.015	0.002	0.002	100.00	1.38	0.00
2	COMP.	26.5	0.012	0.001	0.001	115.00	1.07	0.00
3	COMP.	10.5	0.670	0.170	0.170	115.00	1.12	0.00
4	COMP.	4.0	0.006	0.001	0.001	125.00	0.05	0.00
5	COMP.	5.0	0.019	0.002	0.002	110.00	0.18	0.00
6	COMP.	5.0	0.033	0.003	0.003	100.00	0.28	0.00
7	COMP.	5.0	0.018	0.002	0.002	115.00	0.14	0.00
8	COMP.	11.0	0.037	0.004	0.000	115.00	0.07	0.00
9	COMP.	2.0	0.023	0.002	0.000	110.00	0.01	0.00
					Total Settlement =		4.28	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.67	73.67	183.33	1651.99	183.30	0.66
2	3.67	70.00	550.00	1606.83	516.14	0.41
3	3.67	66.33	916.67	1593.29	848.97	0.31
4	4.42	62.29	1216.16	1583.16	1215.85	0.23
5	4.42	57.88	1448.48	1573.48	1448.15	0.20
6	4.42	53.46	1680.79	1563.97	1680.38	0.18
7	4.42	49.04	1913.11	1554.14	1912.62	0.16
8	4.42	44.63	2145.42	1543.76	2144.85	0.15
9	4.42	40.21	2377.74	1532.72	2378.30	0.14
10	2.63	36.69	2562.94	1523.41	5125.26	0.30

11	2.63	34.06	2701.01	1516.16	5401.42	0.29
12	2.63	31.44	2839.09	1508.65	5677.58	0.27
13	2.63	28.81	2977.16	1500.88	5953.74	0.26
14	4.00	25.50	3171.40	1490.71	3171.00	0.05
15	5.00	21.00	3415.60	1476.25	3414.00	0.18
16	5.00	16.00	3628.60	1459.36	3684.00	0.28
17	5.00	11.00	3854.10	1441.67	3954.00	0.14
18	2.75	7.13	4057.92	1427.44	8115.53	0.02
19	2.75	4.38	4202.57	1417.10	8404.51	0.02
20	2.75	1.63	4347.22	1406.58	8693.49	0.02
21	2.75	-1.13	4491.87	1395.88	8982.47	0.02
22	2.00	-3.50	4611.80	1386.51	9222.00	0.01

Total Settlement = 4.28 (in.)

Wall 11
Total Emb

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-119 (1112+50) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/25/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 21.45 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3190.00
3	46.00	2980.00
4	59.00	2770.00
5	73.00	2770.00
6	86.00	2875.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 75.50 (ft) Ground Surface Elev.= 75.50 (ft)
Water table Elev. = 64.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	11.0	0.015	0.002	0.002	100.00	1.83	0.00
2	COMP.	26.5	0.012	0.001	0.001	115.00	1.57	0.00
3	COMP.	10.5	0.670	0.170	0.170	115.00	1.56	0.00
4	COMP.	4.0	0.006	0.001	0.001	125.00	0.07	0.00
5	COMP.	5.0	0.019	0.002	0.002	110.00	0.24	0.00
6	COMP.	5.0	0.033	0.003	0.003	100.00	0.37	0.00
7	COMP.	5.0	0.018	0.002	0.002	115.00	0.18	0.00
8	COMP.	11.0	0.037	0.004	0.000	115.00	0.08	0.00
9	COMP.	2.0	0.023	0.002	0.000	110.00	0.01	0.00
					Total Settlement =		5.90	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.67	73.67	183.33	3091.88	183.30	0.83
2	3.67	70.00	550.00	3081.29	516.14	0.56
3	3.67	66.33	916.67	3047.22	848.97	0.44
4	4.42	62.29	1216.16	2980.05	1215.85	0.34
5	4.42	57.88	1448.48	2881.28	1448.15	0.30
6	4.42	53.46	1680.79	2770.46	1680.38	0.27
7	4.42	49.04	1913.11	2658.69	1912.62	0.24
8	4.42	44.63	2145.42	2552.07	2144.85	0.22
9	4.42	40.21	2377.74	2453.12	2378.30	0.20
10	2.63	36.69	2562.94	2380.08	5125.26	0.42

11	2.63	34.06	2701.01	2328.89	5401.42	0.40
12	2.63	31.44	2839.09	2280.32	5677.58	0.38
13	2.63	28.81	2977.16	2234.17	5953.74	0.36
14	4.00	25.50	3171.40	2179.10	3171.00	0.07
15	5.00	21.00	3415.60	2109.31	3414.00	0.24
16	5.00	16.00	3628.60	2037.61	3684.00	0.37
17	5.00	11.00	3854.10	1971.12	3954.00	0.18
18	2.75	7.13	4057.92	1922.65	8115.53	0.02
19	2.75	4.38	4202.57	1889.69	8404.51	0.02
20	2.75	1.63	4347.22	1857.80	8693.49	0.02
21	2.75	-1.13	4491.87	1826.93	8982.47	0.02
22	2.00	-3.50	4611.80	1801.01	9222.00	0.01

Total Settlement = 5.90 (in.)

Wall 11
Total Emb

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-119 (1112+50) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/25/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 101.80 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3190.00
3	46.00	2980.00
4	59.00	2770.00
5	73.00	2770.00
6	86.00	2875.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 75.50 (ft) Ground Surface Elev.= 75.50 (ft)
Water table Elev. = 64.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	11.0	0.015	0.002	0.002	100.00	1.76	0.00
2	COMP.	26.5	0.012	0.001	0.001	115.00	1.46	0.00
3	COMP.	10.5	0.670	0.170	0.170	115.00	1.44	0.00
4	COMP.	4.0	0.006	0.001	0.001	125.00	0.06	0.00
5	COMP.	5.0	0.019	0.002	0.002	110.00	0.22	0.00
6	COMP.	5.0	0.033	0.003	0.003	100.00	0.34	0.00
7	COMP.	5.0	0.018	0.002	0.002	115.00	0.17	0.00
8	COMP.	11.0	0.037	0.004	0.000	115.00	0.08	0.00
9	COMP.	2.0	0.023	0.002	0.000	110.00	0.01	0.00
					Total Settlement =		5.53	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.67	73.67	183.33	2825.60	183.30	0.80
2	3.67	70.00	550.00	2811.29	516.14	0.54
3	3.67	66.33	916.67	2767.71	848.97	0.42
4	4.42	62.29	1216.16	2688.30	1215.85	0.32
5	4.42	57.88	1448.48	2581.47	1448.15	0.28
6	4.42	53.46	1680.79	2471.19	1680.38	0.25
7	4.42	49.04	1913.11	2367.39	1912.62	0.22
8	4.42	44.63	2145.42	2273.67	2144.85	0.20
9	4.42	40.21	2377.74	2190.32	2378.30	0.18
10	2.63	36.69	2562.94	2130.59	5125.26	0.39

11	2.63	34.06	2701.01	2089.47	5401.42	0.37
12	2.63	31.44	2839.09	2050.91	5677.58	0.35
13	2.63	28.81	2977.16	2014.62	5953.74	0.33
14	4.00	25.50	3171.40	1971.64	3171.00	0.06
15	5.00	21.00	3415.60	1917.52	3414.00	0.22
16	5.00	16.00	3628.60	1862.07	3684.00	0.34
17	5.00	11.00	3854.10	1810.55	3954.00	0.17
18	2.75	7.13	4057.92	1772.81	8115.53	0.02
19	2.75	4.38	4202.57	1747.02	8404.51	0.02
20	2.75	1.63	4347.22	1721.96	8693.49	0.02
21	2.75	-1.13	4491.87	1697.56	8982.47	0.02
22	2.00	-3.50	4611.80	1676.97	9222.00	0.01

Total Settlement = 5.53 (in.)

Wall 11
Total Emb

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-119 (1112+50) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 3/25/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 120.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	3190.00
3	46.00	2980.00
4	59.00	2770.00
5	73.00	2770.00
6	86.00	2875.00
7	120.00	2770.00
8	120.10	250.00

Foundation Elev. = 75.50 (ft) Ground Surface Elev.= 75.50 (ft)
Water table Elev. = 64.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	11.0	0.015	0.002	0.002	100.00	1.30	0.00
2	COMP.	26.5	0.012	0.001	0.001	115.00	0.99	0.00
3	COMP.	10.5	0.670	0.170	0.170	115.00	1.05	0.00
4	COMP.	4.0	0.006	0.001	0.001	125.00	0.05	0.00
5	COMP.	5.0	0.019	0.002	0.002	110.00	0.17	0.00
6	COMP.	5.0	0.033	0.003	0.003	100.00	0.26	0.00
7	COMP.	5.0	0.018	0.002	0.002	115.00	0.13	0.00
8	COMP.	11.0	0.037	0.004	0.000	115.00	0.06	0.00
9	COMP.	2.0	0.023	0.002	0.000	110.00	0.01	0.00
					Total Settlement =		4.00	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	3.67	73.67	183.33	1439.17	183.30	0.63
2	3.67	70.00	550.00	1407.75	516.14	0.38
3	3.67	66.33	916.67	1403.89	848.97	0.29
4	4.42	62.29	1216.16	1403.50	1215.85	0.21
5	4.42	57.88	1448.48	1403.83	1448.15	0.19
6	4.42	53.46	1680.79	1403.78	1680.38	0.17
7	4.42	49.04	1913.11	1402.94	1912.62	0.15
8	4.42	44.63	2145.42	1401.13	2144.85	0.14
9	4.42	40.21	2377.74	1398.29	2378.30	0.13
10	2.63	36.69	2562.94	1395.28	5125.26	0.28

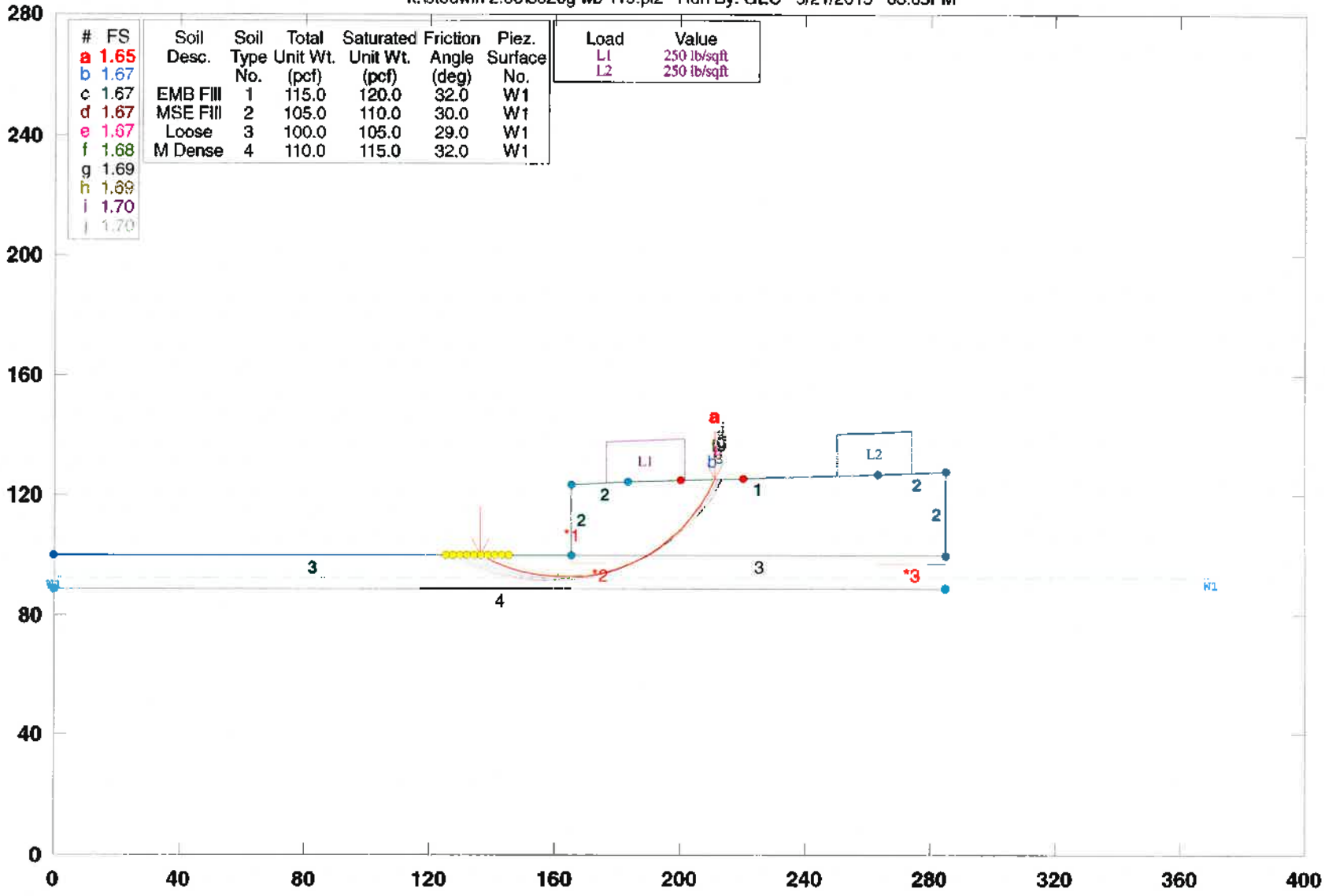
11	2.63	34.06	2701.01	1392.59	5401.42	0.27
12	2.63	31.44	2839.09	1389.52	5677.58	0.26
13	2.63	28.81	2977.16	1386.08	5953.74	0.25
14	4.00	25.50	3171.40	1381.20	3171.00	0.05
15	5.00	21.00	3415.60	1373.64	3414.00	0.17
16	5.00	16.00	3628.60	1364.02	3684.00	0.26
17	5.00	11.00	3854.10	1353.16	3954.00	0.13
18	2.75	7.13	4057.92	1343.94	8115.53	0.02
19	2.75	4.38	4202.57	1336.99	8404.51	0.02
20	2.75	1.63	4347.22	1329.73	8693.49	0.02
21	2.75	-1.13	4491.87	1322.17	8982.47	0.01
22	2.00	-3.50	4611.80	1315.41	9222.00	0.01

Total Settlement = 4.00 (in.)

Wall 11
Total Emb

Wekiva 7A WB-119 (1112+50)

k:\stedwin 2.86\3520g wb-119.pl2 Run By: GEC 5/21/2015 03:05PM



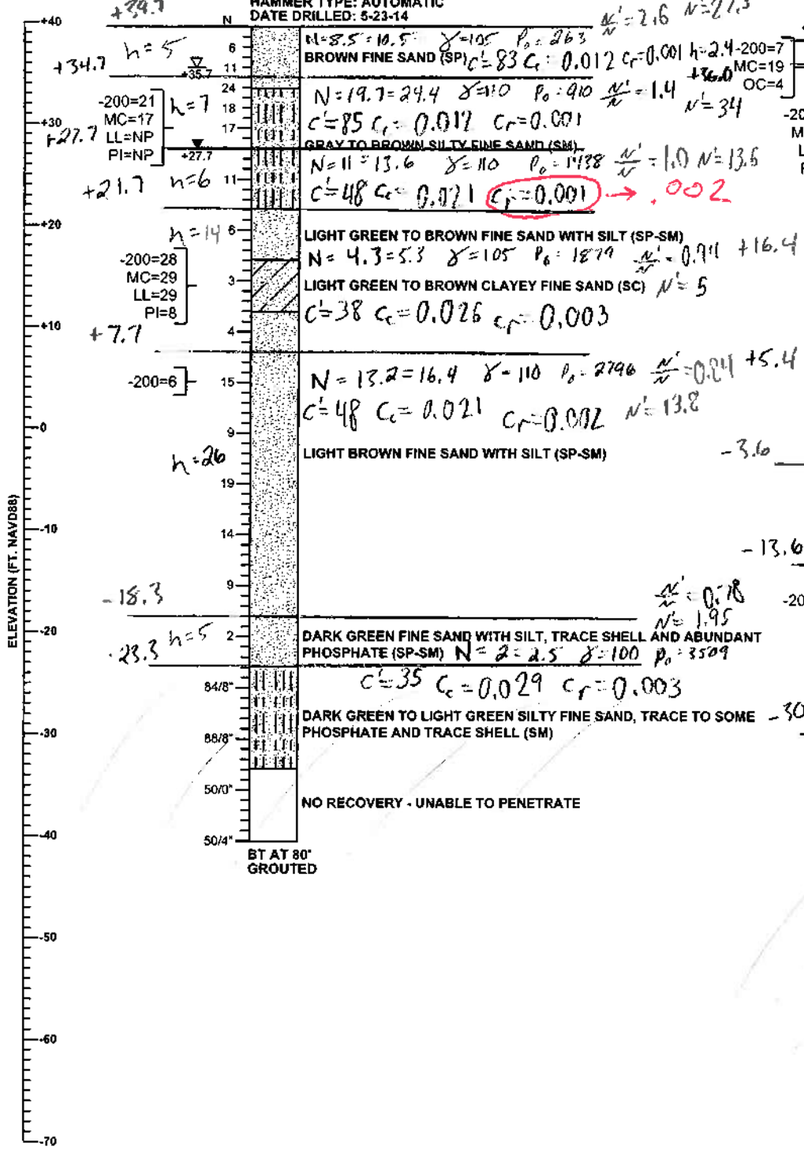
STABL6H FSmin=1.65

Safety Factors Are Calculated By The Modified Bishop Method

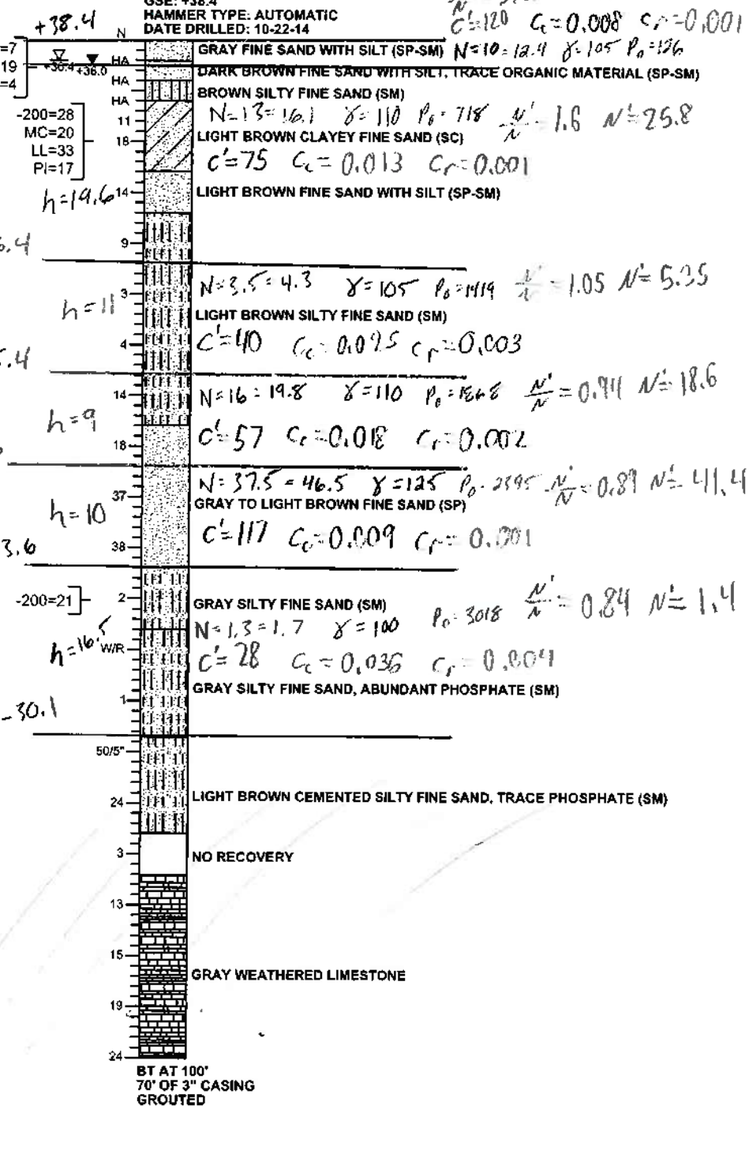
STED

Wall 14

WB-52
STA. 1017+00, 60' LEFT
LAT: N28.81410
LONG: W81.38972
GSE: +39.7
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-23-14



WB-52A
STA. 1017+00, 65' RIGHT
LAT: N28.81378
LONG: W81.38987
GSE: +38.4
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 10-22-14



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/R	WEIGHT OF ROD
+36.4 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+36.0 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
NP=	NON-PLASTIC

SAND
SAND AND CLAY
SAND AND SILT
LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE SURVEYED BY AECOM FOR VERTICAL AND HORIZONTAL CONTROL. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY:	SKR
CHECKED BY:	CGB 71571
DESIGNED BY:	CGB 71571
CHECKED BY	DCS 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott 2/6/2015 3:11:01 PM J:\D109\3520G Wekiva Parkway Section 7A\01boring15.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

Wall 14

MATCH LINE 200' RT

MATCH LINE 200' RT

℄ WB FRONTAGE RD
STA 3092+23.26

℄ EB FRONTAGE RD
STA 2077+13.09

WB-1017
1016+99

ML1017R
1017+00

EB-1017
1017+02

1017+00.00

℄ CONST SR 429

SCALE
1" = 30' Horizontal
1" = 10' Vertical

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO.

peter_osborne 12/10/2014 5:00:39 PM O:\Projects\CADD\24020025201\roadway\Xsect\RDXSAD02_429.DGN

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Wall 14
Total Embankment Settlement

Increment of stresses obtained using : Boussinesq

Settlement for X = 0.10 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1195.00
3	8.00	1142.50
4	8.10	1227.50
5	62.00	1400.00
6	62.10	3872.50
7	70.00	4275.00
8	156.00	4447.50
9	177.00	4030.00
10	177.10	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.44	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.23	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.23	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	0.57	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	0.69	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.17	0.00
					Total Settlement =		2.32	0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	650.61	87.50	0.22
2	1.67	37.20	262.50	611.38	262.50	0.13
3	1.67	35.53	437.50	602.86	437.50	0.09
4	3.50	32.95	717.50	600.05	717.50	0.13
5	3.50	29.45	1102.50	603.67	1102.50	0.10
6	3.00	26.20	1366.40	610.37	1366.40	0.12
7	3.00	23.20	1509.20	618.33	1509.20	0.11
8	4.67	19.37	1680.00	630.71	1680.00	0.20
9	4.67	14.70	1878.80	649.06	1878.80	0.19
10	4.67	10.03	2077.60	670.91	2077.60	0.18
11	4.33	5.53	2280.13	694.97	2280.13	0.13

12	4.33	1.20	2486.40	720.43	2486.40	0.12
13	4.33	-3.13	2692.67	747.62	2692.67	0.12
14	4.33	-7.47	2898.93	775.96	2898.93	0.11
15	4.33	-11.80	3105.20	804.92	3105.20	0.11
16	4.33	-16.13	3311.47	833.98	3311.47	0.11
17	5.00	-20.80	3508.60	864.89	3508.60	0.17

Wall 14 Total Emb

Total Settlement = 2.32 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7A: WB-52 (1017+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/6/2015 Computed by : RJP

Increment of stresses obtained using : Boussinesq

Settlement for X = 8.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	250.00
2	0.10	1195.00
3	8.00	1142.50
4	8.10	1227.50
5	62.00	1400.00
6	62.10	3872.50
7	70.00	4275.00
8	156.00	4447.50
9	177.00	4030.00
10	177.10	0.00

Foundation Elev. = 39.70 (ft) Ground Surface Elev.= 39.70 (ft)
Water table Elev. = 27.70 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	5.0	0.012	0.001	0.001	105.00	0.59	0.00
2	COMP.	7.0	0.012	0.001	0.001	110.00	0.35	0.00
3	COMP.	6.0	0.021	0.002	0.002	110.00	0.34	0.00
4	COMP.	14.0	0.026	0.003	0.003	105.00	0.75	0.00
5	COMP.	26.0	0.021	0.002	0.002	110.00	0.84	0.00
6	COMP.	5.0	0.029	0.003	0.003	100.00	0.20	0.00
					Total Settlement =		3.08	0.00

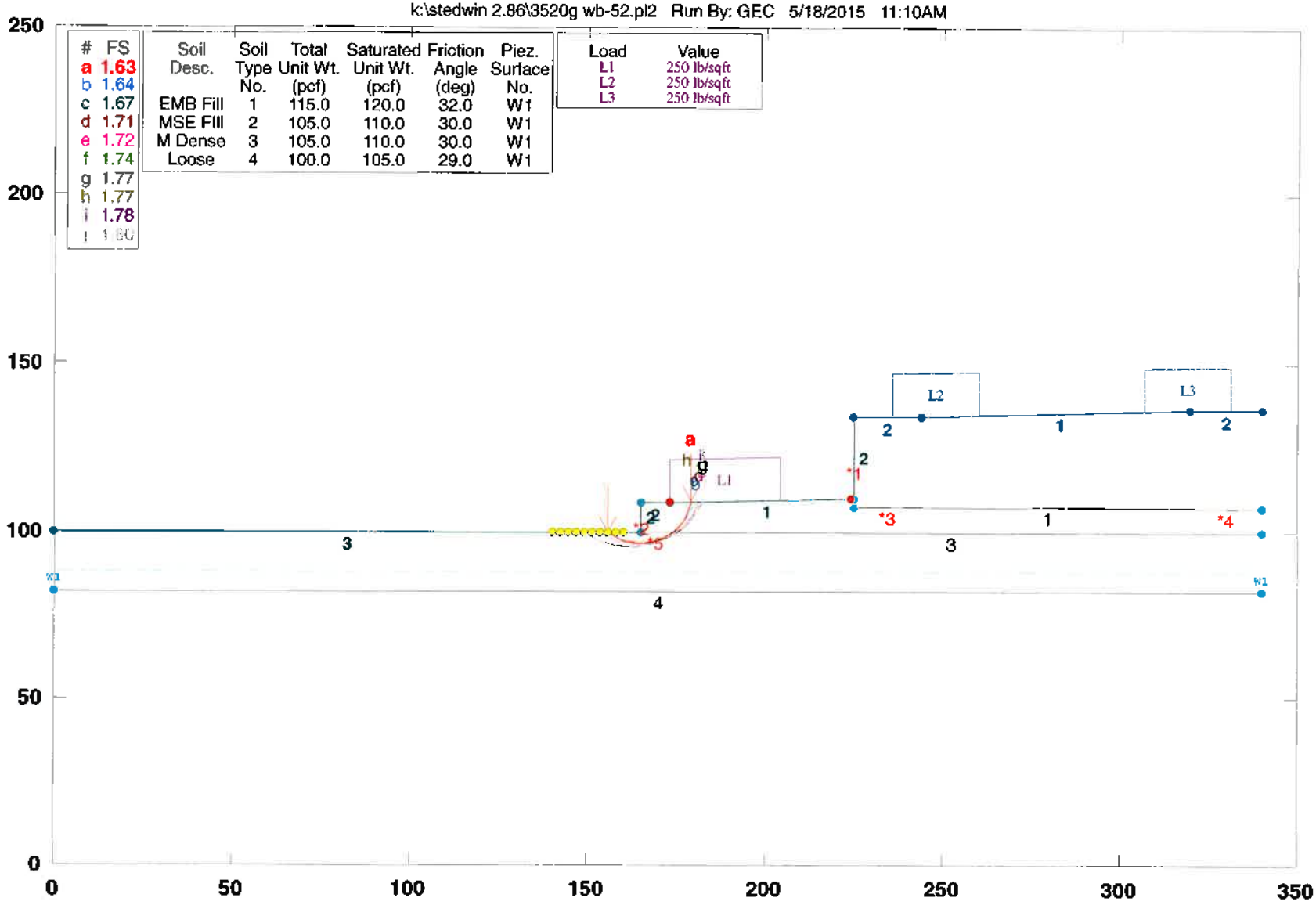
N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	1.67	38.87	87.50	1183.94	87.50	0.28
2	1.67	37.20	262.50	1184.47	262.50	0.18
3	1.67	35.53	437.50	1169.66	437.50	0.14
4	3.50	32.95	717.50	1124.29	717.50	0.21
5	3.50	29.45	1102.50	1051.84	1102.50	0.15
6	3.00	26.20	1366.40	995.35	1366.40	0.18
7	3.00	23.20	1509.20	956.65	1509.20	0.16
8	4.67	19.37	1680.00	923.89	1680.00	0.28
9	4.67	14.70	1878.80	903.74	1878.80	0.25
10	4.67	10.03	2077.60	899.49	2077.60	0.23
11	4.33	5.53	2280.13	906.21	2280.13	0.16

12	4.33	1.20	2486.40	919.85	2486.40	0.15	
13	4.33	-3.13	2692.67	938.39	2692.67	0.14	
14	4.33	-7.47	2898.93	960.19	2898.93	0.14	
15	4.33	-11.80	3105.20	983.95	3105.20	0.13	
16	4.33	-16.13	3311.47	1008.63	3311.47	0.13	Wall 14
17	5.00	-20.80	3508.60	1035.34	3508.60	0.20	Total Emb

Total Settlement = 3.08 (in.)

Wekiva 7A WB-52 (1017+00)

k:\stedwin 2.86\3520g wb-52.pl2 Run By: GEC 5/18/2015 11:10AM

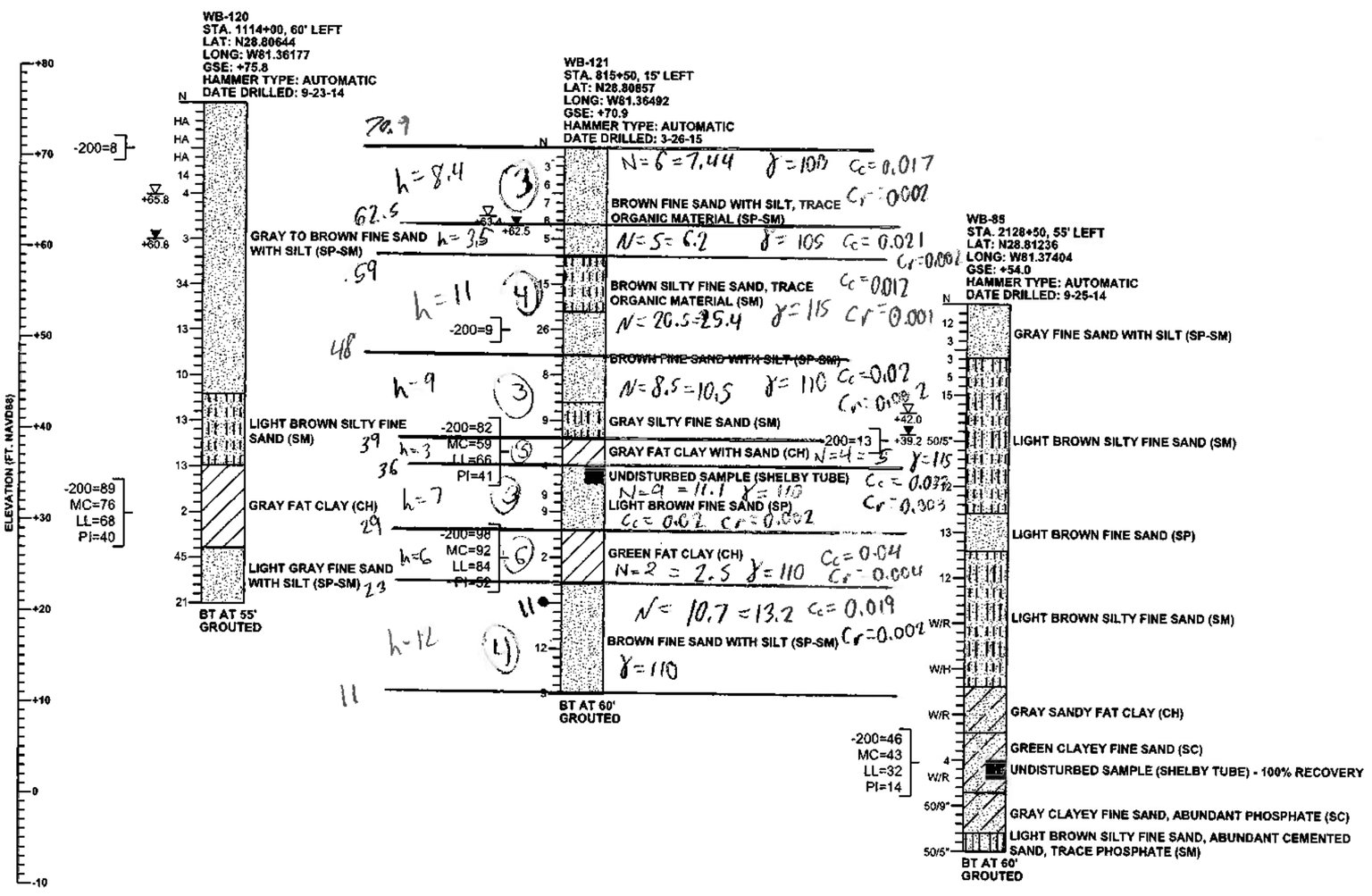


STABL6H FSmin=1.63

Safety Factors Are Calculated By The Modified Bishop Method

STED

Wall 15



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
50/5"	NUMBER OF BLOWS FOR 5 INCHES OF PENETRATION
W/H	WEIGHT OF HAMMER
W/R	WEIGHT OF ROD
▽ +65.8	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +60.8	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX

SAND — CLAY — SAND AND SILT — SAND AND CLAY

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATION WB-120 REFERENCES THE SR 429 CENTERLINE AND BORING LOCATION WB-85 REFERENCES THE EB FRONTAGE ROAD CENTERLINE. BORING LOCATION WB-121 REFERENCES THE ORANGE AVENUE CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

WB-120
SECTION: 30
TOWNSHIP: 19 SOUTH
RANGE: 30 EAST

WB-85 / WB-121
SECTION: 25
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

DRAWN BY: SKR
CHECKED BY: CGB 71571
DESIGNED BY: CGB 71571
CHECKED BY: DCS 42763

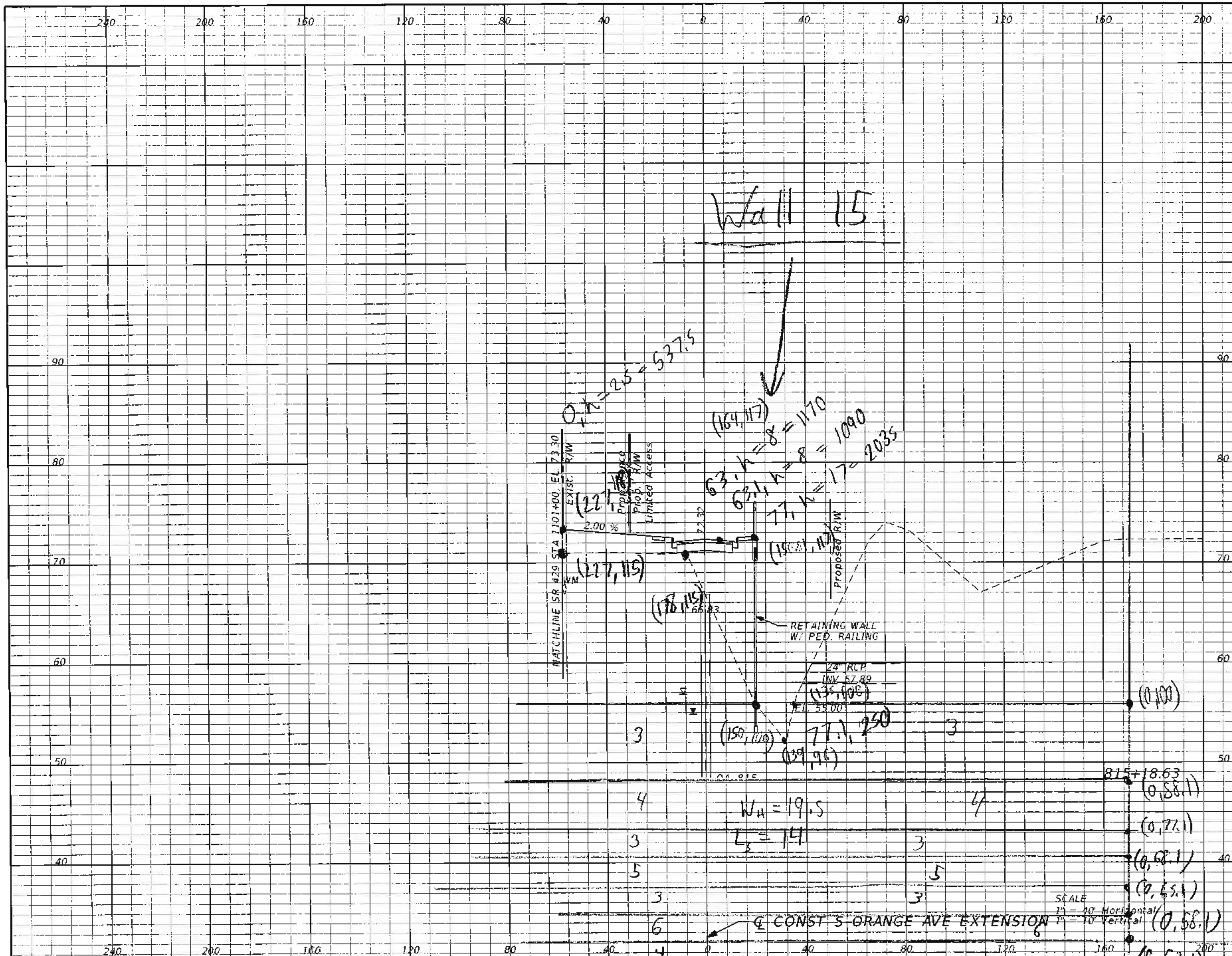
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SHEET TITLE: REPORT OF SPT BORINGS AND CPT SOUNDINGS FOR STRUCTURES
REF. DWG. NO.
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
SHEET NO.

scott
4/23/2015 7:39:49 AM J:\D0709\35206 Wekiva Parkway Section 7A\plan\plan17.dgn

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

S ORANGE AVE EXTENSION
CROSS SECTIONS

SHEET NO. 1027

PRELIMINARY: NOT FOR CONSTRUCTION

glen_dvorovy 2/7/2015 4:37:27 PM O:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD01_ORANGEEXT.DGN

STRIP LOADING VARIABLE SHAPE

Wall 15
Total Embankment Settlement

Project Name: WPKY 7: WB-121 (815+50) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/23/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 63.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	537.50
2	63.00	1170.00
3	63.10	1090.00
4	77.00	2035.00
5	77.10	250.00

Foundation Elev. = 70.90 (ft) Ground Surface Elev.= 70.90 (ft)
Water table Elev. = 62.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	8.4	0.017	0.002	0.002	100.00	1.10	0.00
2	COMP.	3.5	0.021	0.002	0.002	105.00	0.32	0.00
3	COMP.	11.0	0.012	0.001	0.001	115.00	0.43	0.00
4	COMP.	9.0	0.020	0.002	0.002	110.00	0.39	0.00
5	COMP.	3.0	0.033	0.003	0.003	115.00	0.18	0.00
6	COMP.	7.0	0.020	0.002	0.002	110.00	0.21	0.00
7	COMP.	6.0	0.040	0.004	0.004	110.00	0.30	0.00
8	COMP.	12.0	0.019	0.002	0.000	110.00	0.23	0.00
					Total Settlement =		3.16	0.00

N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.20	68.80	210.00	1164.91	210.00	0.70
2	4.20	64.60	630.00	1203.79	630.00	0.40
3	3.50	60.75	914.55	1186.63	914.55	0.32
4	3.67	57.17	1085.53	1140.07	1085.53	0.16
5	3.67	53.50	1278.40	1080.22	1278.40	0.14
6	3.67	49.83	1471.27	1018.90	1471.27	0.12
7	4.50	45.75	1674.80	954.67	1674.80	0.21
8	4.50	41.25	1889.00	891.03	1889.00	0.18
9	3.00	37.50	2075.00	843.71	2075.00	0.18
10	3.50	34.25	2237.20	806.47	2237.20	0.11
11	3.50	30.75	2403.80	769.80	2403.80	0.10
12	3.00	27.50	2558.50	738.56	2558.50	0.16
13	3.00	24.50	2701.30	711.83	2701.30	0.15
14	4.00	21.00	2867.90	682.89	2867.90	0.08

15	4.00	17.00	3058.30	652.42	3058.30	0.08 Wall
16	4.00	13.00	3248.70	624.39	3248.70	0.07 Total Emb

Total Settlement = 3.16 (in.)

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: WB-121 (815+50) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 4/23/2015 Computed by : VRS

Increment of stresses obtained using : Boussinesq

Settlement for X = 77.00 (ft)

Point #	X(ft)	Load (psf)
1	0.00	537.50
2	63.00	1170.00
3	63.10	1090.00
4	77.00	2035.00
5	77.10	250.00

Foundation Elev. = 70.90 (ft) Ground Surface Elev.= 70.90 (ft)
Water table Elev. = 62.50 (ft) Unit weight of Wat. = 62.40 (pcf)

N°	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Primary Settlement (in.)	Secondary Settlement (in.)
1	COMP.	8.4	0.017	0.002	0.002	100.00	0.98	0.00
2	COMP.	3.5	0.021	0.002	0.002	105.00	0.25	0.00
3	COMP.	11.0	0.012	0.001	0.001	115.00	0.32	0.00
4	COMP.	9.0	0.020	0.002	0.002	110.00	0.30	0.00
5	COMP.	3.0	0.033	0.003	0.003	115.00	0.14	0.00
6	COMP.	7.0	0.020	0.002	0.002	110.00	0.17	0.00
7	COMP.	6.0	0.040	0.004	0.004	110.00	0.25	0.00
8	COMP.	12.0	0.019	0.002	0.000	110.00	0.19	0.00
					Total Settlement =		2.60	0.00

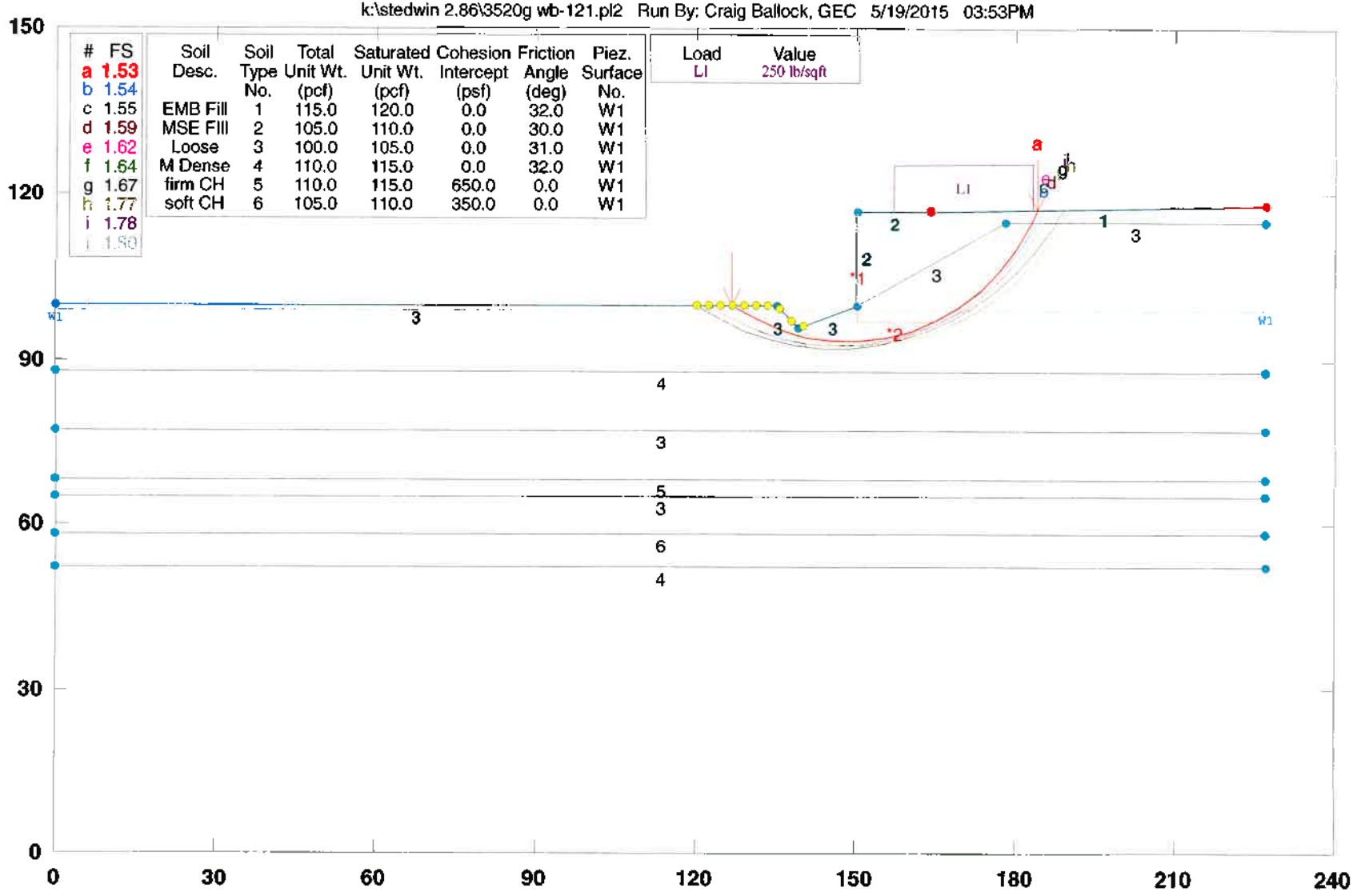
N°	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Increment (psf)	Max.Past Press. (psf)	Settlement (in.)
1	4.20	68.80	210.00	1007.01	210.00	0.65
2	4.20	64.60	630.00	901.06	630.00	0.33
3	3.50	60.75	914.55	834.41	914.55	0.25
4	3.67	57.17	1085.53	786.08	1085.53	0.12
5	3.67	53.50	1278.40	746.33	1278.40	0.11
6	3.67	49.83	1471.27	713.46	1471.27	0.09
7	4.50	45.75	1674.80	682.42	1674.80	0.16
8	4.50	41.25	1889.00	652.89	1889.00	0.14
9	3.00	37.50	2075.00	630.92	2075.00	0.14
10	3.50	34.25	2237.20	613.32	2237.20	0.09
11	3.50	30.75	2403.80	595.56	2403.80	0.08
12	3.00	27.50	2558.50	579.96	2558.50	0.13
13	3.00	24.50	2701.30	566.22	2701.30	0.12
14	4.00	21.00	2867.90	550.89	2867.90	0.07

15	4.00	17.00	3058.30	534.16	3058.30	0.06 Wall
16	4.00	13.00	3248.70	518.19	3248.70	0.06 Total Emb

Total Settlement = 2.60 (in.)

Wekiva 7A WB-121 (815+50)

k:\stedwin 2.86\3520g wb-121.pl2 Run By: Craig Ballock, GEC 5/19/2015 03:53PM



#	FS
a	1.53
b	1.54
c	1.55
d	1.59
e	1.62
f	1.64
g	1.67
h	1.77
i	1.78
j	1.80

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	0.0	32.0	W1
MSE Fill	2	105.0	110.0	0.0	30.0	W1
Loose	3	100.0	105.0	0.0	31.0	W1
M Dense	4	110.0	115.0	0.0	32.0	W1
firm CH	5	110.0	115.0	650.0	0.0	W1
soft CH	6	105.0	110.0	350.0	0.0	W1

Load	Value
LI	250 lb/sqft

STABL6H FSmin=1.53

Safety Factors Are Calculated By The Modified Bishop Method

STED

GRAVITY WALL STABILITY ANALYSES

Sliding, Overturning & Bearing Capacity LRFD Analyses FDOT Standard Index 6011 Gravity Wall with granular backfill (i.e. cohesion = 0 & phi >= alpha) "gravity5.mcd"

ANALYSES ASSUME ONLY STRENGTH I LIMIT STATE LOAD AND RESISTANCE FACTORS

Wall Geometry:

Ground slope behind wall (α): $\alpha := 4.46deg$

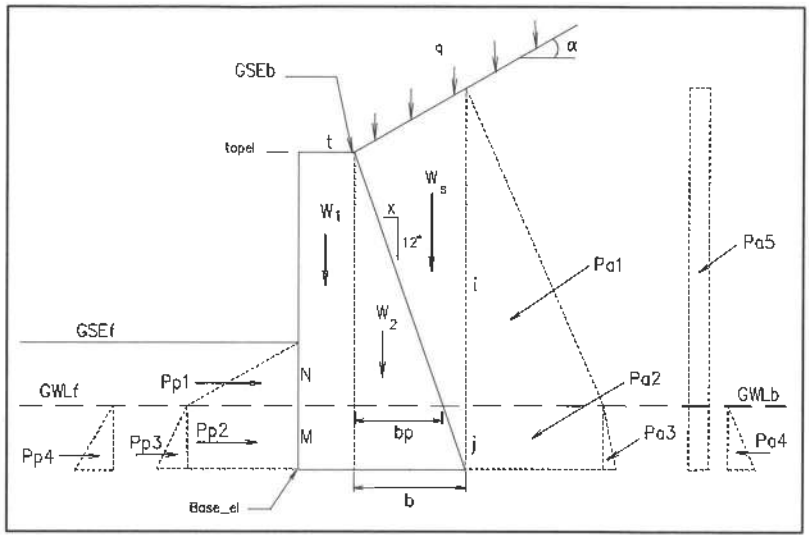
Wall top elevation (topel): $topel := 57.5 \cdot ft$

Wall base elevation (Base_el): $Base\_el := 52 \cdot ft$

Wall top thickness (t): $t := 8 \cdot in$

Wall backside batter (x): $x := 9 \cdot in$

Wall material unit weight (γ_c): $\gamma c := 150 \cdot \frac{lb}{ft^3}$



Ground Surface Conditions:

Ground surface elevation behind wall (GSE_b): $GSEb := 57.5 \cdot ft$

Ground surface elevation in front of wall (GSE_f): $GSEf := 54 \cdot ft$

Groundwater Table Conditions:

Groundwater elevation behind wall (GWL_b): $GWLb := 48 \cdot ft$

Groundwater elevation in front of wall (GWL_f): $GWLf := 48 \cdot ft$

Unit weight of water (γ_w): $\gamma w := 62.4 \cdot \frac{lb}{ft^3}$

Surcharge load behind wall(q):

Note: If you want the surcharge load to contirbute to the sliding & overturning resisting forces, make qr = q; otherwise qr should be zero.

$q := 250 \cdot \frac{lb}{ft^2}$ $qr := 0 \cdot \frac{lb}{ft^2}$ **Live load=250; Meets minimum offset req per Index 6011**

Soil Properties:	Behind Wall	In Front of and below Wall
Angle of internal friction(ϕ):	$\phi b := 32 \cdot deg$	$\phi f := 30 \cdot deg$
Cohesion(c):	cb = 0 lb/ft^2	$cf := 0 \cdot \frac{lb}{ft^2}$
Moist unit weight (γ):	$\gamma b := 115 \cdot \frac{lb}{ft^3}$	$\gamma f := 105 \cdot \frac{lb}{ft^3}$
Saturated unit weight (γ_{sat}):	$\gamma bsat := 120 \cdot \frac{lb}{ft^3}$	$\gamma fsat := 110 \cdot \frac{lb}{ft^3}$

$\gamma bsub := \gamma bsat - \gamma w$ $\gamma fsub := \gamma fsat - \gamma w$

Wall Base Friction/Cohesion Reduction Factors(frf/crf) typically 1/2 to 2/3: $frf := 1$ $crf := 1$

Rankine Lateral Earth Pressure Coefficients ($\phi b >= \alpha$):

$$Ka := \cos(\alpha) \cdot \left(\frac{\cos(\alpha) - \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}}{\cos(\alpha) + \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}} \right)$$

$Ka = 0.31$

$$Kp := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2$$

$Kp = 3$

$hpx := \frac{GSEb - Base\_el}{1 \cdot ft} \cdot x$ $hpx = 4.125\,ft$

$hpy := hpx \cdot \tan(\alpha)$ $hpy = 0.322\,ft$

$Hp := hpy + (GSEb - Base\_el) + Base\_el$ $Hp = 57.822\,ft$

Conditional Statements:

$i := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), Hp - GWLb, if(GWLb \geq Hp, 0 \cdot ft, Hp - Base\_el)]$ $i = 5.822\,ft$

$j := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), GWLb - Base\_el, if(GWLb > Hp, Hp - Base\_el, 0 \cdot ft)]$ $j = 0\,ft$

Active Forces:

$Pa1h := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \cos(\alpha)$ $Pa1h = 602.053\,ft^{-1} \cdot lb$

$Pa1v := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \sin(\alpha)$ $Pa1v = 46.96\,ft^{-1} \cdot lb$

$Pa2h := i \cdot \gamma b \cdot Ka \cdot j \cdot \cos(\alpha)$ $Pa2h = 0\,ft^{-1} \cdot lb$

$Pa2v := i \cdot \gamma b \cdot Ka \cdot j \cdot \sin(\alpha)$ $Pa2v = 0\,ft^{-1} \cdot lb$

$Pa3h := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \cos(\alpha)$ $Pa3h = 0\,ft^{-1} \cdot lb$

$Pa3v := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \sin(\alpha)$ $Pa3v = 0\,ft^{-1} \cdot lb$

$$Pa4 := if\left[(GWLb \le Hp)\cdot(GWLb > Base\_el), 0.5\cdot j^2\cdot\gamma w, if\left[GWLb \le Base\_el, 0\cdot lb\cdot ft^{-1}, (GWLb - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right] \qquad Pa4 = 0\,ft^{-1}\cdot lb$$

$$Pa5h := (Hp - Base\_el)\cdot q\cdot Ka\cdot\cos(\alpha) \qquad Pa5h = 449.628\,ft^{-1}\cdot lb$$

$$Pa5v := (Hp - Base\_el)\cdot q\cdot Ka\cdot\sin(\alpha) \qquad Pa5v = 35.071\,ft^{-1}\cdot lb$$

Conditional Statements:

$$M := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GWLf - Base\_el, if(GWLf > GSEf, GSEf - Base\_el, 0\cdot ft)] \qquad M = 0\,ft$$

$$N := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GSEf - GWLf, if(GWLf > GSEf, 0\cdot ft, GSEf - Base\_el)] \qquad N = 2\,ft$$

$$wf := GWLf - Base\_el \qquad wf = -4\,ft \qquad wb := GWLb - Base\_el \qquad wb = -4\,ft$$

Passive Forces:

$$Pp1 := 0.5\cdot\gamma f\cdot N^2\cdot Kp + 2\cdot cf\cdot N\cdot\sqrt{Kp} \qquad Pp1 = 630\,ft^{-1}\cdot lb$$

$$Pp2 := \left(Kp\cdot\gamma f\cdot N + 2\cdot cf\cdot\sqrt{Kp}\right)\cdot M \qquad Pp2 = 0\,ft^{-1}\cdot lb$$

$$Pp3 := 0.5\cdot\gamma fsub\cdot M^2\cdot Kp \qquad Pp3 = 0\,ft^{-1}\cdot lb$$

$$Pp4 := if\left[(GWLf \le Hp)\cdot(GWLf > Base\_el), 0.5\cdot wf^2\cdot\gamma w, if\left[(GWLf \le Base\_el), 0\cdot lb\cdot ft^{-1}, (GWLf - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right] \qquad Pp4 = 0\,ft^{-1}\cdot lb$$

SLIDING:

Resistance Factor Φb:
Refer to LRFD Table 10.5.5.2.2-1

$$\Phi_b := 0.8$$

Load Factors for Strength I-a:
Refer to LRFD Tables

$$DC := 0.9 \qquad LS := 1.75 \qquad EH := 1.5 \qquad EV := 1.00 \qquad EP := 0.5$$

CDR = Summation Resisting Forces divided by Summation Driving Forces

Summation Resisting Forces(RF) = tan phi(Sum Vertical Forces) + B(cohesion) + Passive forces

$$I := if[(topel > GWLb)\cdot(GWLb > Base\_el), topel - GWLb, if(GWLb \le Base\_el, topel - Base\_el, 0\cdot ft)]$$

$$J := if[(topel > GWLb)\cdot(GWLb > Base\_el), GWLb - Base\_el, if(GWLb \le Base\_el, 0\cdot ft, topel - Base\_el)]$$

$$b := (topel - Base\_el)\cdot\frac{x}{12\cdot in} \qquad b = 4.125\,ft$$

$$bp := if\left[GWLb \ge topel, 0\cdot ft, if\left[GWLb > Base\_el, (topel - GWLb)\cdot\frac{x}{12\cdot in}, b\right]\right] \qquad bp = 4.125\,ft$$

Vertical Forces:

$$wst := \frac{GSEb - Base\_el}{12\cdot in}\cdot x$$

$$W1 := I\cdot t\cdot\gamma c + J\cdot t\cdot(\gamma c - \gamma w) \qquad W1 = 550\,ft^{-1}\cdot lb \qquad wst = 4.125\,ft$$

$$W2 := 0.5\cdot bp\cdot I\cdot\gamma c + \frac{bp + b}{2}\cdot J\cdot(\gamma c - \gamma w) \qquad W2 = 1.702\times 10^3\,ft^{-1}\cdot lb \qquad wsw := \frac{j}{12\cdot in}\cdot x$$

$$Ws := \left[\frac{wst + wsw}{2}\cdot i\cdot\gamma b + \frac{wsw}{2}\cdot j\cdot(\gamma bsat - \gamma w)\right] \qquad Ws = 1.381\times 10^3\,ft^{-1}\cdot lb \qquad wsw = 0\,ft$$

$$Wq := qr\cdot wst \qquad Wq = 0$$

$$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v) \qquad V = 3.714\times 10^3\,ft^{-1}\cdot lb$$

$$Vf := (W1 + W2)\cdot DC + Ws\cdot EV + Wq\cdot LS + EV\cdot(Pa1v + Pa2v + Pa3v + Pa5v) \qquad Vf = 3.489\times 10^3\,ft^{-1}\cdot lb$$

Factored Summation Resisting Forces (RF) = Φb * [tan phi(Sum Vertical Forces) + Passive Forces]

$RF := \Phi_b \cdot [\tan(frf \cdot \phi f) \cdot Vf + (b + t) \cdot crf \cdot cf + EP \cdot (Pp1 + Pp2 + Pp3 + Pp4)]$ $RF = 1.864 \times 10^3\ ft^{-1} \cdot lb$

Factored Summation of Driving Forces (DF): $DF := EH(Pa1h + Pa2h + Pa3h + Pa4 + Pa5h)$ $DF = 1.578 \times 10^3\ ft^{-1} \cdot lb$

$CDR\_Sliding := \frac{RF}{DF}$ $CDR\_Sliding = 1.18$ $CDR \geq 1$ OK

OVERTURNING: = Check Eccentricity

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{ov} := 0.9$ $LS_{ov} := 1.75$ $EH_{ov} := 1.5$ $EV_{ov} := 1.00$ $EP_{ov} := 0.5$

$V_{DL} := (W1 + W2) \cdot DC_{ov} + Ws \cdot EV_{ov} + EV_{ov} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $V_{DL} = 3.489 \times 10^3\ ft^{-1} \cdot lb$

$b1 := \frac{b}{3} + t$ $b1 = 2.042\ ft$ $b2 := b + t - \frac{wst}{3}$ $b2 = 3.417\ ft$ $b3 := b - \left(\frac{wst}{2}\right) + t$ $b3 = 2.729\ ft$

$RMwater := if\left[(GWLf \leq Hp) \cdot (GWLf > Base\_el), \frac{Pp4}{3} \cdot wf, if\left[GWLf \leq Base\_el, 0 \cdot lb, (GWLf - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \frac{Hp^3}{6} \cdot \gamma w\right]\right]$

$RMav := (Pa1v + Pa2v + Pa3v + Pa5v) \cdot (b + t)$ $RMav = 393.062\ lb$ $RMwater = 0\ lb$

$RM := \left[W1 \cdot DC_{ov} \cdot \frac{t}{2} + W2 \cdot DC_{ov} \cdot (b1) + Wq \cdot b3 \cdot LS_{ov} + Ws \cdot EV_{ov} \cdot (b2) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{ov} + RMwater + RM\right.$

$RM = 8.613 \times 10^3\ ft \cdot lb$

$OMwater := if\left[(GWLb \leq Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \leq Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$

$OMwater = 0\ lb$

$OM := \left[EH_{ov} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{ov} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH_{ov} \cdot Pa3h}{3} \cdot j + OMwater + \frac{LS_{ov} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$

$OM = 4.043 \times 10^3\ ft \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{V_{DL} \cdot 1 \cdot ft}$ $X = 1.31\ ft$ $B := b + t$ $B = 4.792\ ft$

$e_o := \frac{B}{2} - X$ $e_o = 1.09\ ft$ AND $e_{max} := \frac{B}{4}$ $e_{max} = 1.2\ ft$

Since $e_{max} > e_o$ the wall design is adequate

BEARING CAPACITY:

(Ref: "Principles of Foundation Engineering" 1984 Braja M. Das pages. 250, 119, 111, 110)

qu = [(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(γ)(Bp)(Nγ)(Fγd)(Fγi)]

qr = Φbc.*[(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(γ)(Bp)(Nγ)(Fγd)(Fγi)]

Resistance Factor Φbc:
Refer to LRFD Table 10.5.5.2.2-1

$\Phi_{bc} := 0.55$

Load Factors for Strength I-a:
Refer to LRFD Tables

$DC_{bc} := 1.25$ $LS_{bc} := 1.75$ $EH_{bc} := 1.5$ $EV_{bc} := 1.35$ $EP_{bc} := 0.5$

$$RM := \left[W1 \cdot DC_{bc} \cdot \frac{t}{2} + W2 \cdot DC_{bc} \cdot (b1) + Ws \cdot EV_{bc} \cdot (b2) + Wq \cdot LS_{bc} \cdot (b3) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{bc} + RMwater + RM\right.$$

$RM = 1.154 \times 10^{4}\ ft \cdot lb$

$$OMwater := if\left[(GWLb \le Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \le Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$$

$OMwater = 0\ lb$

$$OM := \left[EH_{bc} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{bc} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH \cdot Pa3h}{3} \cdot j + OMwater + \frac{EH_{bc} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$$

$OM = 3.716 \times 10^{3}\ ft \cdot lb$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 3.714 \times 10^{3}\ ft^{-1} \cdot lb$

$Vf := (W1 + W2) \cdot DC_{bc} + Ws \cdot EV_{bc} + Wq \cdot LS_{bc} + EV_{bc} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 4.789 \times 10^{3}\ ft^{-1} \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{Vf \cdot 1 \cdot ft}$ $X = 1.635\ ft$ $B := b + t$ $B = 4.792\ ft$

$L := 1$

$eb := if\left(X \ge \frac{B}{2}, 0 \cdot ft, \frac{B}{2} - X\right)$ $eb = 0.761\ ft$ $d := if(GWLf < Base\_el, Base\_el - GWLf, 0 \cdot ft)$ $d = 4\ ft$

$Bp := if\left(eb \ge \frac{B}{2}, 0 \cdot ft, B - 2 \cdot eb\right)$ $Bp = 3.269\ ft$ $\frac{B}{6} = 0.799\ ft$ $\psi := atan\left(\frac{DF}{Vf}\right)$ $\psi = 18.231 \cdot deg$

$\gamma bc := if\left[GWLf \ge Base\_el, \gamma fsub, if\left[d \le B, \gamma fsub + \frac{d}{B} \cdot (\gamma f - \gamma fsub), \gamma f\right]\right]$ $\gamma bc = 95.517\ ft^{-3} \cdot lb$

$qbc := if[(GWLf > Base\_el) \cdot (GWLf < GSEf), N \cdot \gamma f + M \cdot \gamma fsub, if[GWLf \ge GSEf, (M + N) \cdot \gamma fsub, (M + N) \cdot \gamma f]]$ $qbc = 210\ ft^{-2} \cdot lb$

$Nq := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2 \cdot e^{\pi \cdot \tan(\phi f)}$ $Nq = 18.401$ $Fqi := \left(1 - \frac{\psi}{90 \cdot deg}\right)^2$ $Fqi = 0.636$

$Fqd := if\left[Bp \le 0 \cdot ft, 1, 1 + 2 \cdot \tan(\phi f) \cdot (1 - \sin(\phi f))^2 \cdot \frac{D}{Bp}\right]$ $Fqd = 1.177$

$Nc := (Nq - 1) \cdot \cot(\phi f)$ $Nc = 30.14$ $Fcd := 1 + 0.4 \cdot \frac{D}{Bp}$ $Fcd = 1.245$

$Fci := Fqi$ $Fci = 0.636$

$N\gamma := 2 \cdot (Nq + 1) \cdot \tan(\phi f)$ $N\gamma = 22.402$ $F\gamma i := \left(1 - \frac{\psi}{\phi f}\right)^2$ $F\gamma i = 0.154$ $F\gamma d := 1$

$qu := (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qu = 3.43 \times 10^{3}\ ft^{-2} \cdot lb$

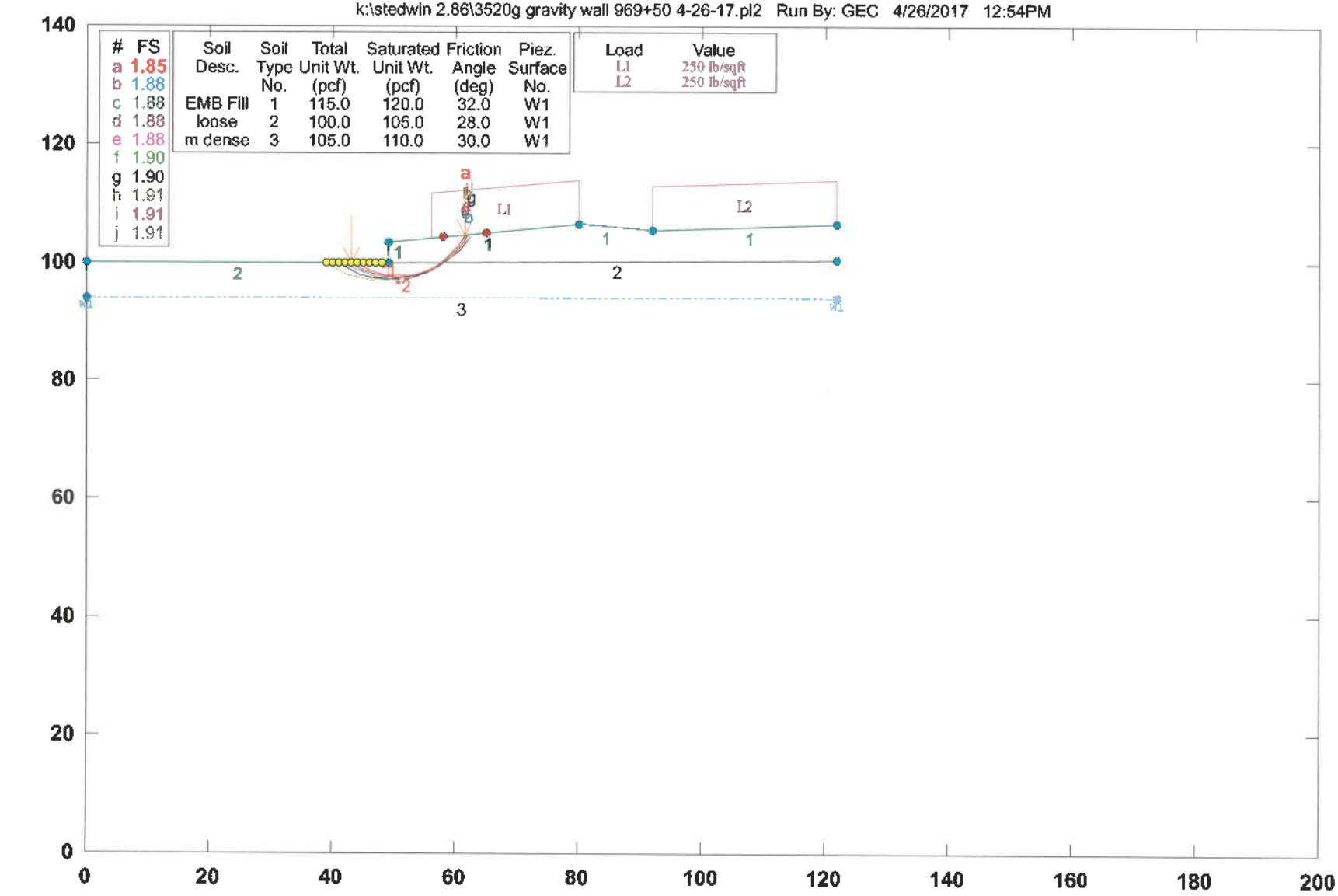
$qr := \Phi_{bc} \cdot (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qr = 1.886 \times 10^{3}\ ft^{-2} \cdot lb$

$\sigma_v := \frac{Vf}{Bp}$ $\sigma_v = 1.465 \times 10^{3}\ ft^{-2} \cdot lb$ $CDR_{bc} := \frac{qr}{\sigma_v}$ $CDR_{bc} = 1.3$

Since $CDR_{bc} > 1.0$ the Wall design is Adequate

Wekiva 7A Gravity Wall (969+50)

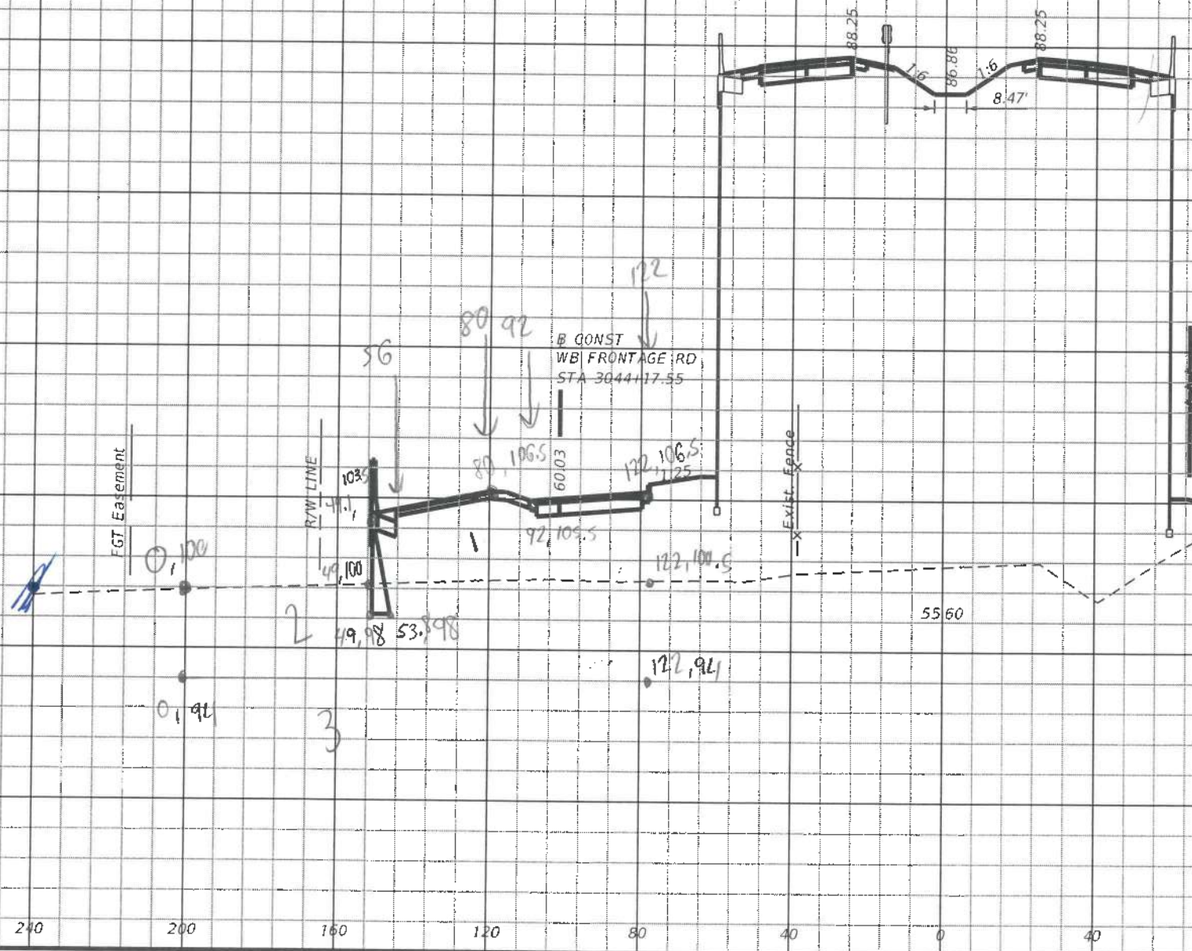
k:\stedwin 2.86\3520g gravity wall 969+50 4-26-17.pl2 Run By: GEC 4/26/2017 12:54PM



STABL6H FSmin=1.85

Safety Factors Are Calculated By The Modified Bishop Method

STED



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

SHEET NO.

Scott 4/25/2017 4:46:21 PM J:\D122\Wekiva Parkway 7A\RDXSRD01_429.DGN

EB Frontage Rd 2050+03 to 2052+53

Sliding, Overturning & Bearing Capacity LRFD Analyses FDOT Standard Index 6011 Gravity Wall with granular backfill (i.e. cohesion = 0 & phi >= alpha) "gravity5.mcd"

ANALYSES ASSUME ONLY STRENGTH I LIMIT STATE LOAD AND RESISTANCE FACTORS

Wall Geometry:

Ground slope behind wall (α): $\alpha := 0deg$

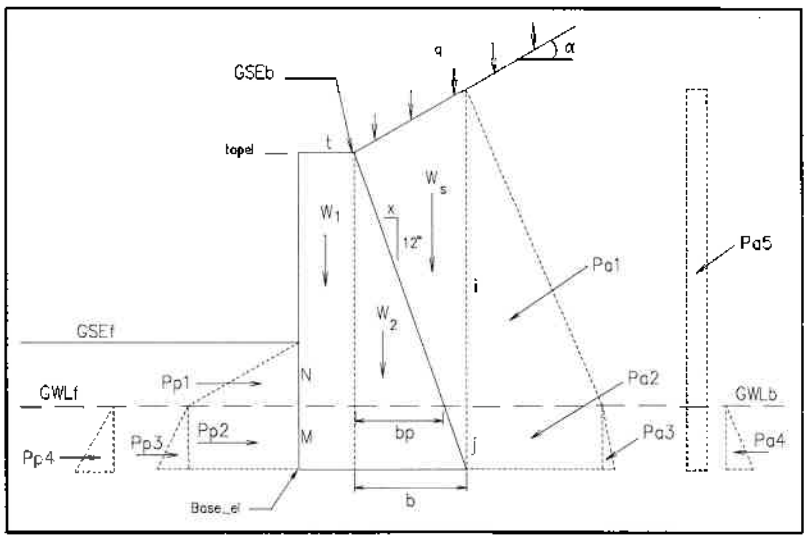
Wall top elevation (topel): $topel := 55 \cdot ft$

Wall base elevation (Base_el): $Base\_el := 51.5 \cdot ft$

Wall top thickness (t): $t := 8 \cdot in$

Wall backside batter (x): $x := 9 \cdot in$

Wall material unit weight (γ_c): $\gamma c := 150 \cdot \frac{lb}{ft^3}$



Ground Surface Conditions:

Ground surface elevation behind wall (GSE_b): $GSEb := 55 \cdot ft$

Ground surface elevation in front of wall (GSE_f): $GSEf := 53.5 \cdot ft$

Groundwater Table Conditions:

Groundwater elevation behind wall (GWL_b): $GWLb := 41 \cdot ft$

Groundwater elevation in front of wall (GWL_f): $GWLf := 41 \cdot ft$

Unit weight of water (γ_w): $\gamma w := 62.4 \cdot \frac{lb}{ft^3}$

Surcharge load behind wall(q):

Note: If you want the surcharge load to contirbute to the sliding & overturning resisting forces, make qr = q; otherwise qr should be zero.

$q := 250 \cdot \frac{lb}{ft^2}$ $qr := 0 \cdot \frac{lb}{ft^2}$ **Live load=250; Meets minimum offset req per Index 6011**

Soil Properties:	Behind Wall	In Front of and below Wall
Angle of internal friction(ϕ):	$\phi b := 32 \cdot deg$	$\phi f := 30 \cdot deg$
Cohesion(c):	cb = 0 lb/ft^2	$cf := 0 \cdot \frac{lb}{ft^2}$
Moist unit weight (γ):	$\gamma b := 115 \cdot \frac{lb}{ft^3}$	$\gamma f := 100 \cdot \frac{lb}{ft^3}$
Saturated unit weight (γ_{sat}):	$\gamma bsat := 120 \cdot \frac{lb}{ft^3}$	$\gamma fsat := 105 \cdot \frac{lb}{ft^3}$

$\gamma bsub := \gamma bsat - \gamma w$ $\gamma fsub := \gamma fsat - \gamma w$

Wall Base Friction/Cohesion Reduction Factors(frf/crf) typically 1/2 to 2/3: $frf := 1$ $crf := 1$

Rankine Lateral Earth Pressure Coefficients ($\phi b >= \alpha$):

$$Ka := \cos(\alpha) \cdot \left(\frac{\cos(\alpha) - \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}}{\cos(\alpha) + \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}} \right)$$

$Ka = 0.307$

$$Kp := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2$$

$Kp = 3$

$hpx := \frac{GSEb - Base\_el}{1 \cdot ft} \cdot x$ $hpx = 2.625\,ft$

$hpy := hpx \cdot \tan(\alpha)$ $hpy = 0\,ft$

$Hp := hpy + (GSEb - Base\_el) + Base\_el$ $Hp = 55\,ft$

Conditional Statements:

$i := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), Hp - GWLb, if(GWLb \geq Hp, 0 \cdot ft, Hp - Base\_el)]$ $i = 3.5\,ft$

$j := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), GWLb - Base\_el, if(GWLb > Hp, Hp - Base\_el, 0 \cdot ft)]$ $j = 0\,ft$

Active Forces:

$Pa1h := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \cos(\alpha)$ $Pa1h = 216.425\,ft^{-1} \cdot lb$

$Pa1v := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \sin(\alpha)$ $Pa1v = 0\,ft^{-1} \cdot lb$

$Pa2h := i \cdot \gamma b \cdot Ka \cdot j \cdot \cos(\alpha)$ $Pa2h = 0\,ft^{-1} \cdot lb$

$Pa2v := i \cdot \gamma b \cdot Ka \cdot j \cdot \sin(\alpha)$ $Pa2v = 0\,ft^{-1} \cdot lb$

$Pa3h := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \cos(\alpha)$ $Pa3h = 0\,ft^{-1} \cdot lb$

$Pa3v := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \sin(\alpha)$ $Pa3v = 0\,ft^{-1} \cdot lb$

$Pa4 := if\left[(GWLb \le Hp)\cdot(GWLb > Base\_el), 0.5\cdot j^2\cdot\gamma w, if\left[GWLb \le Base\_el, 0\cdot lb\cdot ft^{-1}, (GWLb - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right]$ $Pa4 = 0\,ft^{-1}\cdot lb$

$Pa5h := (Hp - Base\_el)\cdot q\cdot Ka\cdot\cos(\alpha)$ $Pa5h = 268.851\,ft^{-1}\cdot lb$

$Pa5v := (Hp - Base\_el)\cdot q\cdot Ka\cdot\sin(\alpha)$ $Pa5v = 0\,ft^{-1}\cdot lb$

Conditional Statements:

$M := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GWLf - Base\_el, if(GWLf > GSEf, GSEf - Base\_el, 0\cdot ft)]$ $M = 0\,ft$

$N := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GSEf - GWLf, if(GWLf > GSEf, 0\cdot ft, GSEf - Base\_el)]$ $N = 2\,ft$

$wf := GWLf - Base\_el$ $wf = -10.5\,ft$ $wb := GWLb - Base\_el$ $wb = -10.5\,ft$

Passive Forces:

$Pp1 := 0.5\cdot\gamma f\cdot N^2\cdot Kp + 2\cdot cf\cdot N\cdot\sqrt{Kp}$ $Pp1 = 600\,ft^{-1}\cdot lb$

$Pp2 := \left(Kp\cdot\gamma f\cdot N + 2\cdot cf\cdot\sqrt{Kp}\right)\cdot M$ $Pp2 = 0\,ft^{-1}\cdot lb$

$Pp3 := 0.5\cdot\gamma fsub\cdot M^2\cdot Kp$ $Pp3 = 0\,ft^{-1}\cdot lb$

$Pp4 := if\left[(GWLf \le Hp)\cdot(GWLf > Base\_el), 0.5\cdot wf^2\cdot\gamma w, if\left[(GWLf \le Base\_el), 0\cdot lb\cdot ft^{-1}, (GWLf - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right]$ $Pp4 = 0\,ft^{-1}\cdot lb$

SLIDING:

Resistance Factor Φb:
Refer to LRFD Table 10.5.5.2.2-1 $\Phi_b := 0.8$

Load Factors for Strength I-a:
Refer to LRFD Tables $DC := 0.9$ $LS := 1.75$ $EH := 1.5$ $EV := 1.00$ $EP := 0.5$

CDR = Summation Resisting Forces divided by Summation Driving Forces

Summation Resisting Forces(RF) = tan phi(Sum Vertical Forces) + B(cohesion) + Passive forces

$I := if[(topel > GWLb)\cdot(GWLb > Base\_el), topel - GWLb, if(GWLb \le Base\_el, topel - Base\_el, 0\cdot ft)]$

$J := if[(topel > GWLb)\cdot(GWLb > Base\_el), GWLb - Base\_el, if(GWLb \le Base\_el, 0\cdot ft, topel - Base\_el)]$

$b := (topel - Base\_el)\cdot\frac{x}{12\cdot in}$ $b = 2.625\,ft$

$bp := if\left[GWLb \ge topel, 0\cdot ft, if\left[GWLb > Base\_el, (topel - GWLb)\cdot\frac{x}{12\cdot in}, b\right]\right]$ $bp = 2.625\,ft$

Vertical Forces:

$wst := \frac{GSEb - Base\_el}{12\cdot in}\cdot x$

$W1 := I\cdot t\cdot\gamma c + J\cdot t\cdot(\gamma c - \gamma w)$ $W1 = 350\,ft^{-1}\cdot lb$ $wst = 2.625\,ft$

$W2 := 0.5\cdot bp\cdot I\cdot\gamma c + \frac{bp + b}{2}\cdot J\cdot(\gamma c - \gamma w)$ $W2 = 689.062\,ft^{-1}\cdot lb$ $wsw := \frac{j}{12\cdot in}\cdot x$

$Ws := \left[\frac{wst + wsw}{2}\cdot i\cdot\gamma b + \frac{wsw}{2}\cdot j\cdot(\gamma bsat - \gamma w)\right]$ $Ws = 528.281\,ft^{-1}\cdot lb$ $wsw = 0\,ft$

$Wq := qr\cdot wst$ $Wq = 0$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 1.567\times 10^3\,ft^{-1}\cdot lb$

$Vf := (W1 + W2)\cdot DC + Ws\cdot EV + Wq\cdot LS + EV\cdot(Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 1.463\times 10^3\,ft^{-1}\cdot lb$

Factored Summation Resisting Forces (RF) = Φb * [tan phi(Sum Vertical Forces) + Passive Forces]

$RF := \Phi_b \cdot [\tan(frf \cdot \phi f) \cdot Vf + (b + t) \cdot crf \cdot cf + EP \cdot (Pp1 + Pp2 + Pp3 + Pp4)]$ $RF = 915.933\ ft^{-1} \cdot lb$

Factored Summation of Driving Forces (DF): $DF := EH(Pa1h + Pa2h + Pa3h + Pa4 + Pa5h)$ $DF = 727.915\ ft^{-1} \cdot lb$

$CDR\_Sliding := \frac{RF}{DF}$ $CDR\_Sliding = 1.26$ $CDR \geq 1$ OK

OVERTURNING: = Check Eccentricity

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{ov} := 0.9$ $LS_{ov} := 1.75$ $EH_{ov} := 1.5$ $EV_{ov} := 1.00$ $EP_{ov} := 0.5$

$V_{DL} := (W1 + W2) \cdot DC_{ov} + Ws \cdot EV_{ov} + EV_{ov} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $V_{DL} = 1.463 \times 10^3\ ft^{-1} \cdot lb$

$b1 := \frac{b}{3} + t$ $b1 = 1.542\,ft$ $b2 := b + t - \frac{wst}{3}$ $b2 = 2.417\,ft$ $b3 := b - \left(\frac{wst}{2}\right) + t$ $b3 = 1.979\,ft$

$RMwater := if\left[(GWLf \leq Hp) \cdot (GWLf > Base\_el), \frac{Pp4}{3} \cdot wf, if\left[GWLf \leq Base\_el, 0 \cdot lb, (GWLf - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \frac{Hp^3}{6} \cdot \gamma w\right]\right]$

$RMav := (Pa1v + Pa2v + Pa3v + Pa5v) \cdot (b + t)$ $RMav = 0\,lb$ $RMwater = 0\,lb$

$RM := \left[W1 \cdot DC_{ov} \cdot \frac{t}{2} + W2 \cdot DC_{ov} \cdot (b1) + Wq \cdot b3 \cdot LS_{ov} + Ws \cdot EV_{ov} \cdot (b2) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{ov} + RMwater + RMa\right.$

$RM = 2.538 \times 10^3\ ft \cdot lb$

$OMwater := if\left[(GWLb \leq Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \leq Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$

$OMwater = 0\,lb$

$OM := \left[EH_{ov} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{ov} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH_{ov} \cdot Pa3h}{3} \cdot j + OMwater + \frac{LS_{ov} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$

$OM = 1.202 \times 10^3\ ft \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{V_{DL} \cdot 1 \cdot ft}$ $X = 0.913\,ft$ $B := b + t$ $B = 3.292\,ft$

$e_o := \frac{B}{2} - X$ $e_o = 0.73\,ft$ AND $e_{max} := \frac{B}{4}$ $e_{max} = 0.82\,ft$

Since $e_{max} > e_o$ the wall design is adequate

BEARING CAPACITY:

(Ref: "Principles of Foundation Engineering" 1984 Braja M. Das pages. 250, 119, 111, 110)

$qu = [(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(\gamma)(Bp)(N\gamma)(F\gamma d)(F\gamma i)]$

$qr = \Phi bc.*[(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(\gamma)(Bp)(N\gamma)(F\gamma d)(F\gamma i)]$

Resistance Factor Φbc:
Refer to LRFD Table 10.5.5.2.2-1 $\Phi_{bc} := 0.55$

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{bc} := 1.25$ $LS_{bc} := 1.75$ $EH_{bc} := 1.5$ $EV_{bc} := 1.35$ $EP_{bc} := 0.5$

$$RM := \left[W1 \cdot DC_{bc} \cdot \frac{t}{2} + W2 \cdot DC_{bc} \cdot (b1) + Ws \cdot EV_{bc} \cdot (b2) + Wq \cdot LS_{bc} \cdot (b3) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{bc} + RMwater + R\right.$$

$RM = 3.397 \times 10^{3}\ ft \cdot lb$

$$OMwater := if\left[(GWLb \le Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \le Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$$

$OMwater = 0\ lb$

$$OM := \left[EH_{bc} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{bc} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH \cdot Pa3h}{3} \cdot j + OMwater + \frac{EH_{bc} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$$

$OM = 1.084 \times 10^{3}\ ft \cdot lb$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 1.567 \times 10^{3}\ ft^{-1} \cdot lb$

$Vf := (W1 + W2) \cdot DC_{bc} + Ws \cdot EV_{bc} + Wq \cdot LS_{bc} + EV_{bc} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 2.012 \times 10^{3}\ ft^{-1} \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{Vf \cdot 1 \cdot ft}$ $X = 1.149\ ft$ $B := b + t$ $B = 3.292\ ft$

$L := 1$

$eb := if\left(X \ge \frac{B}{2}, 0 \cdot ft, \frac{B}{2} - X\right)$ $eb = 0.496\ ft$ $d := if(GWLf < Base\_el, Base\_el - GWLf, 0 \cdot ft)$ $d = 10.5\ ft$

$Bp := if\left(eb \ge \frac{B}{2}, 0 \cdot ft, B - 2 \cdot eb\right)$ $Bp = 2.299\ ft$ $\frac{B}{6} = 0.549\ ft$ $\psi := atan\left(\frac{DF}{Vf}\right)$ $\psi = 19.889 \cdot deg$

$$\gamma bc := if\left[GWLf \ge Base\_el, \gamma fsub, if\left[d \le B, \gamma fsub + \frac{d}{B} \cdot (\gamma f - \gamma fsub), \gamma f\right]\right] \quad \gamma bc = 100\ ft^{-3} \cdot lb$$

$qbc := if[(GWLf > Base\_el) \cdot (GWLf < GSEf), N \cdot \gamma f + M \cdot \gamma fsub, if[GWLf \ge GSEf, (M + N) \cdot \gamma fsub, (M + N) \cdot \gamma f]]$ $qbc = 200\ ft^{-2} \cdot lb$

$Nq := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2 \cdot e^{\pi \cdot \tan(\phi f)}$ $Nq = 18.401$ $Fqi := \left(1 - \frac{\psi}{90 \cdot deg}\right)^2$ $Fqi = 0.607$

$Fqd := if\left[Bp \le 0 \cdot ft, 1, 1 + 2 \cdot \tan(\phi f) \cdot (1 - \sin(\phi f))^2 \cdot \frac{D}{Bp}\right]$ $Fqd = 1.251$

$Nc := (Nq - 1) \cdot \cot(\phi f)$ $Nc = 30.14$ $Fcd := 1 + 0.4 \cdot \frac{D}{Bp}$ $Fcd = 1.348$

$Fci := Fqi$ $Fci = 0.607$

$N\gamma := 2 \cdot (Nq + 1) \cdot \tan(\phi f)$ $N\gamma = 22.402$ $F\gamma i := \left(1 - \frac{\psi}{\phi f}\right)^2$ $F\gamma i = 0.114$ $F\gamma d := 1$

$qu := (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qu = 3.087 \times 10^{3}\ ft^{-2} \cdot lb$

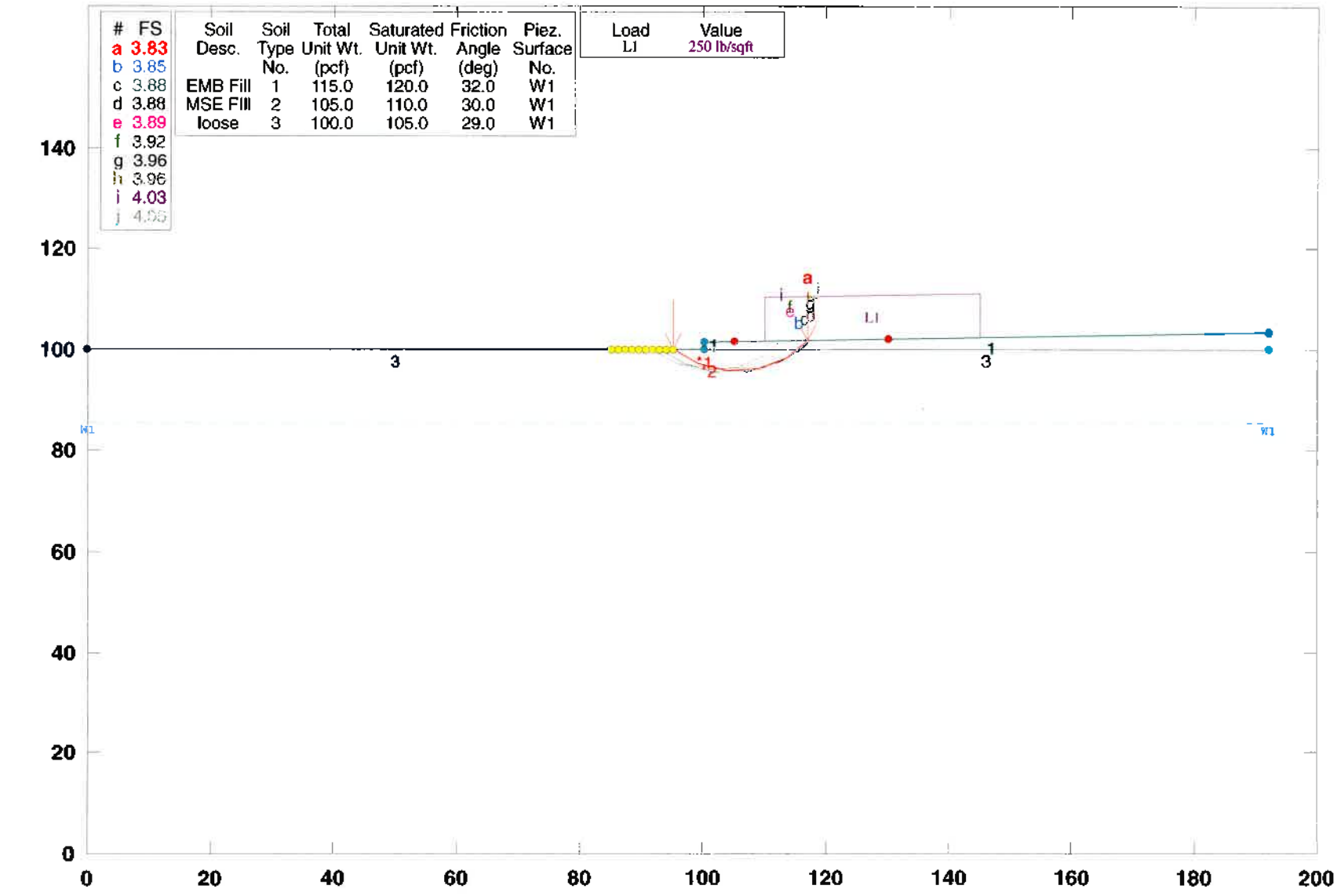
$qr := \Phi_{bc} \cdot (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qr = 1.698 \times 10^{3}\ ft^{-2} \cdot lb$

$\sigma_v := \frac{Vf}{Bp}$ $\sigma_v = 875.185\ ft^{-2} \cdot lb$ $CDR_{bc} := \frac{qr}{\sigma_v}$ $CDR_{bc} = 1.9$

Since $CDR_{bc} > 1.0$ the Wall design is Adequate

Wekiva 7A Gravity Wall (990+00)

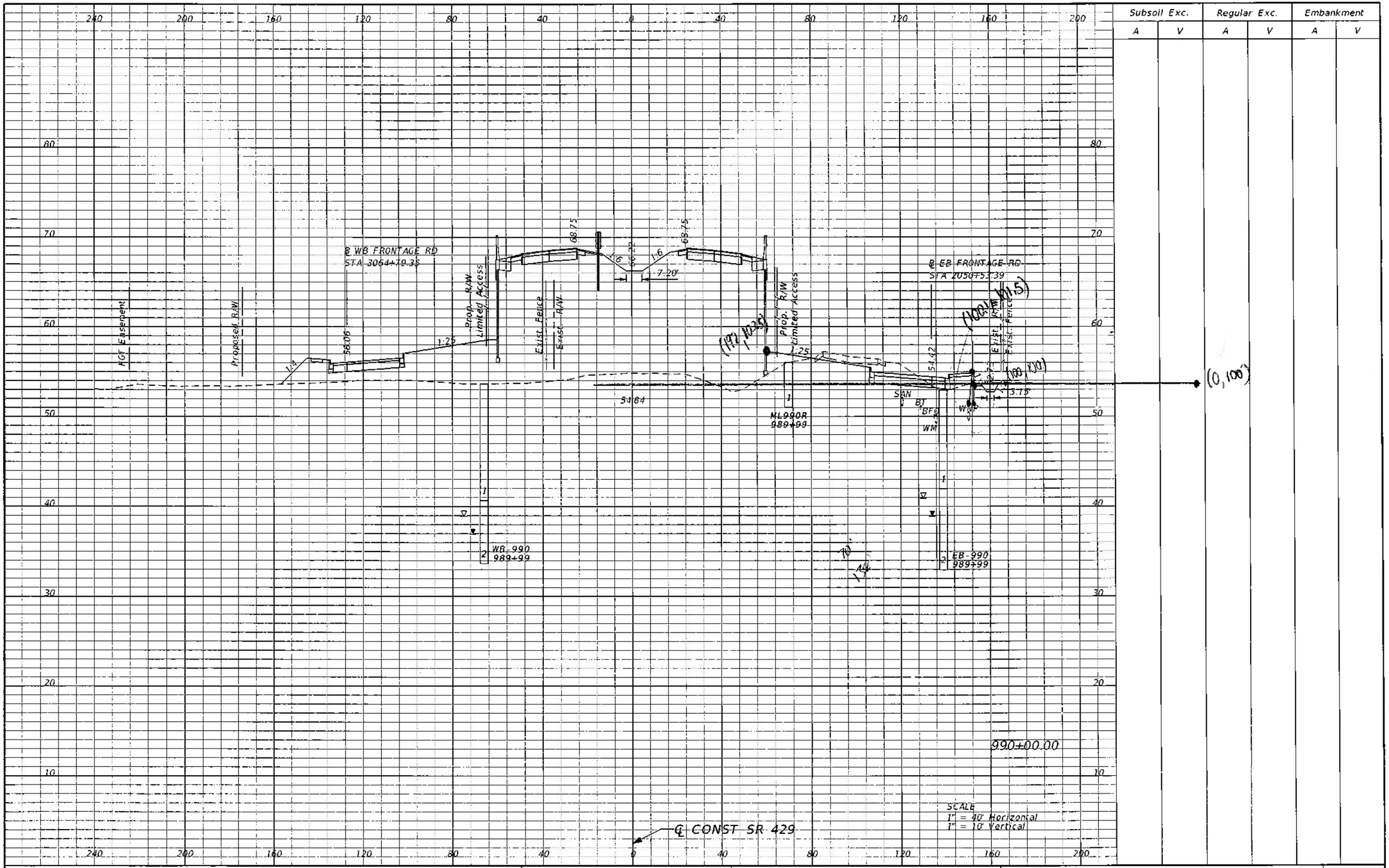
k:\stedwin 2.86\3520g gravity wall 990+00.pl2 Run By: GEC 5/18/2015 03:21PM



STABL6H FSmin=3.83

Safety Factors Are Calculated By The Modified Bishop Method

STED



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO. 701

PRELIMINARY: NOT FOR CONSTRUCTION

glen_dvorovy 2/7/2015 4:33:16 PM O:\Projects\CADD\240200252D1\roadway\Xsect\RDXSRD02_429.DGN

EB Frontage Rd 2110+57 to 2115+56

Sliding, Overturning & Bearing Capacity LRFD Analyses FDOT Standard Index 6011 Gravity Wall with granular backfill (i.e. cohesion = 0 & phi >= alpha) "gravity5.mcd"

ANALYSES ASSUME ONLY STRENGTH I LIMIT STATE LOAD AND RESISTANCE FACTORS

Wall Geometry:

Ground slope behind wall (α): $\alpha := 14deg$

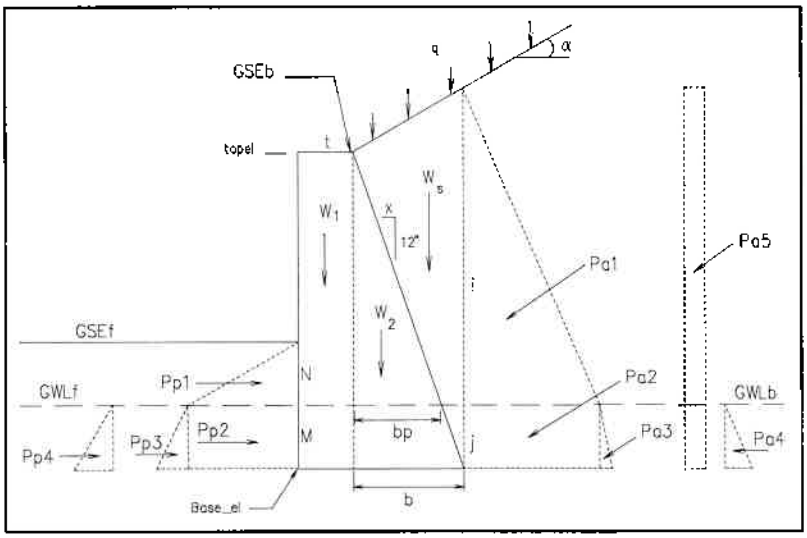
Wall top elevation (topel): $topel := 48.7 \cdot ft$

Wall base elevation (Base_el): $Base\_el := 43 \cdot ft$

Wall top thickness (t): $t := 8 \cdot in$

Wall backside batter (x): $x := 9 \cdot in$

Wall material unit weight (γ_c): $\gamma c := 150 \cdot \frac{lb}{ft^3}$



Ground Surface Conditions:

Ground surface elevation behind wall (GSE_b): $GSEb := 48.7 \cdot ft$

Ground surface elevation in front of wall (GSE_f): $GSEf := 45 \cdot ft$

Groundwater Table Conditions:

Groundwater elevation behind wall (GWL_b): $GWLb := 40 \cdot ft$

Groundwater elevation in front of wall (GWL_f): $GWLf := 40 \cdot ft$

Unit weight of water (γ_w): $\gamma w := 62.4 \cdot \frac{lb}{ft^3}$

Surcharge load behind wall(q):

Note: If you want the surcharge load to contirbute to the sliding & overturning resisting forces, make qr = q; otherwise qr should be zero.

$q := 250 \cdot \frac{lb}{ft^2}$ $qr := 0 \cdot \frac{lb}{ft^2}$ **Live load=250; Meets minimum offset req per Index 6011**

Soil Properties:	Behind Wall	In Front of and below Wall
Angle of internal friction(ϕ):	$\phi b := 32 \cdot deg$	$\phi f := 32 \cdot deg$
Cohesion(c):	cb = 0 lb/ft^2	$cf := 0 \cdot \frac{lb}{ft^2}$
Moist unit weight (γ):	$\gamma b := 115 \cdot \frac{lb}{ft^3}$	$\gamma f := 105 \cdot \frac{lb}{ft^3}$
Saturated unit weight (γ_{sat}):	$\gamma bsat := 120 \cdot \frac{lb}{ft^3}$	$\gamma fsat := 110 \cdot \frac{lb}{ft^3}$

$\gamma bsub := \gamma bsat - \gamma w$ $\gamma fsub := \gamma fsat - \gamma w$

Wall Base Friction/Cohesion Reduction Factors(frf/crf) typically 1/2 to 2/3: $frf := 1$ $crf := 1$

Rankine Lateral Earth Pressure Coefficients ($\phi b >= \alpha$):

$$Ka := \cos(\alpha) \cdot \left(\frac{\cos(\alpha) - \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}}{\cos(\alpha) + \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}} \right)$$

$Ka = 0.336$

$Kp := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2$ $Kp = 3.255$

$hpx := \frac{GSEb - Base\_el}{1 \cdot ft} \cdot x$ $hpx = 4.275\,ft$

$hpy := hpx \cdot \tan(\alpha)$ $hpy = 1.066\,ft$

$Hp := hpy + (GSEb - Base\_el) + Base\_el$ $Hp = 49.766\,ft$

Conditional Statements:

$i := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), Hp - GWLb, if(GWLb \geq Hp, 0 \cdot ft, Hp - Base\_el)]$ $i = 6.766\,ft$

$j := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), GWLb - Base\_el, if(GWLb > Hp, Hp - Base\_el, 0 \cdot ft)]$ $j = 0\,ft$

Active Forces:

$Pa1h := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \cos(\alpha)$ $Pa1h = 857.38\,ft^{-1} \cdot lb$

$Pa1v := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \sin(\alpha)$ $Pa1v = 213.769\,ft^{-1} \cdot lb$

$Pa2h := i \cdot \gamma b \cdot Ka \cdot j \cdot \cos(\alpha)$ $Pa2h = 0\,ft^{-1} \cdot lb$

$Pa2v := i \cdot \gamma b \cdot Ka \cdot j \cdot \sin(\alpha)$ $Pa2v = 0\,ft^{-1} \cdot lb$

$Pa3h := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \cos(\alpha)$ $Pa3h = 0\,ft^{-1} \cdot lb$

$Pa3v := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \sin(\alpha)$ $Pa3v = 0\,ft^{-1} \cdot lb$

$Pa4 := if\left[(GWLb \le Hp)\cdot(GWLb > Base\_el), 0.5\cdot j^2\cdot\gamma w, if\left[GWLb \le Base\_el, 0\cdot lb\cdot ft^{-1}, (GWLb - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right]$ $Pa4 = 0\,ft^{-1}\cdot lb$

$Pa5h := (Hp - Base\_el)\cdot q\cdot Ka\cdot\cos(\alpha)$ $Pa5h = 550.961\,ft^{-1}\cdot lb$

$Pa5v := (Hp - Base\_el)\cdot q\cdot Ka\cdot\sin(\alpha)$ $Pa5v = 137.37\,ft^{-1}\cdot lb$

Conditional Statements:

$M := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GWLf - Base\_el, if(GWLf > GSEf, GSEf - Base\_el, 0\cdot ft)]$ $M = 0\,ft$

$N := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GSEf - GWLf, if(GWLf > GSEf, 0\cdot ft, GSEf - Base\_el)]$ $N = 2\,ft$

$wf := GWLf - Base\_el$ $wf = -3\,ft$ $wb := GWLb - Base\_el$ $wb = -3\,ft$

Passive Forces:

$Pp1 := 0.5\cdot\gamma f\cdot N^2\cdot Kp + 2\cdot cf\cdot N\cdot\sqrt{Kp}$ $Pp1 = 683.464\,ft^{-1}\cdot lb$

$Pp2 := \left(Kp\cdot\gamma f\cdot N + 2\cdot cf\cdot\sqrt{Kp}\right)\cdot M$ $Pp2 = 0\,ft^{-1}\cdot lb$

$Pp3 := 0.5\cdot\gamma fsub\cdot M^2\cdot Kp$ $Pp3 = 0\,ft^{-1}\cdot lb$

$Pp4 := if\left[(GWLf \le Hp)\cdot(GWLf > Base\_el), 0.5\cdot wf^2\cdot\gamma w, if\left[(GWLf \le Base\_el), 0\cdot lb\cdot ft^{-1}, (GWLf - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right]$ $Pp4 = 0\,ft^{-1}\cdot lb$

SLIDING:

Resistance Factor Φb:
Refer to LRFD Table 10.5.5.2.2-1 $\Phi_b := 0.8$

Load Factors for Strength I-a:
Refer to LRFD Tables $DC := 0.9$ $LS := 1.75$ $EH := 1.5$ $EV := 1.00$ $EP := 0.5$

CDR = Summation Resisting Forces divided by Summation Driving Forces

Summation Resisting Forces(RF) = tan phi(Sum Vertical Forces) + B(cohesion) + Passive forces

$I := if[(topel > GWLb)\cdot(GWLb > Base\_el), topel - GWLb, if(GWLb \le Base\_el, topel - Base\_el, 0\cdot ft)]$

$J := if[(topel > GWLb)\cdot(GWLb > Base\_el), GWLb - Base\_el, if(GWLb \le Base\_el, 0\cdot ft, topel - Base\_el)]$

$b := (topel - Base\_el)\cdot\frac{x}{12\cdot in}$ $b = 4.275\,ft$

$bp := if\left[GWLb \ge topel, 0\cdot ft, if\left[GWLb > Base\_el, (topel - GWLb)\cdot\frac{x}{12\cdot in}, b\right]\right]$ $bp = 4.275\,ft$

Vertical Forces:

$wst := \frac{GSEb - Base\_el}{12\cdot in}\cdot x$

$W1 := I\cdot t\cdot\gamma c + J\cdot t\cdot(\gamma c - \gamma w)$ $W1 = 570\,ft^{-1}\cdot lb$ $wst = 4.275\,ft$

$W2 := 0.5\cdot bp\cdot I\cdot\gamma c + \frac{bp + b}{2}\cdot J\cdot(\gamma c - \gamma w)$ $W2 = 1.828\times 10^3\,ft^{-1}\cdot lb$ $wsw := \frac{j}{12\cdot in}\cdot x$

$Ws := \left[\frac{wst + wsw}{2}\cdot i\cdot\gamma b + \frac{wsw}{2}\cdot j\cdot(\gamma bsat - \gamma w)\right]$ $Ws = 1.663\times 10^3\,ft^{-1}\cdot lb$ $wsw = 0\,ft$

$Wq := qr\cdot wst$ $Wq = 0$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 4.412\times 10^3\,ft^{-1}\cdot lb$

$Vf := (W1 + W2)\cdot DC + Ws\cdot EV + Wq\cdot LS + EV\cdot(Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 4.172\times 10^3\,ft^{-1}\cdot lb$

Factored Summation Resisting Forces (RF) = Φb * [tan phi(Sum Vertical Forces) + Passive Forces]

$RF := \Phi_b \cdot [\tan(frf \cdot \phi f) \cdot Vf + (b + t) \cdot crf \cdot cf + EP \cdot (Pp1 + Pp2 + Pp3 + Pp4)]$ $RF = 2.359 \times 10^3\ ft^{-1} \cdot lb$

Factored Summation of Driving Forces (DF): $DF := EH(Pa1h + Pa2h + Pa3h + Pa4 + Pa5h)$ $DF = 2.113 \times 10^3\ ft^{-1} \cdot lb$

$CDR\_Sliding := \frac{RF}{DF}$ $CDR\_Sliding = 1.12$ $CDR \geq 1$ OK

OVERTURNING: = Check Eccentricity

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{ov} := 0.9$ $LS_{ov} := 1.75$ $EH_{ov} := 1.5$ $EV_{ov} := 1.00$ $EP_{ov} := 0.5$

$V_{DL} := (W1 + W2) \cdot DC_{ov} + Ws \cdot EV_{ov} + EV_{ov} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $V_{DL} = 4.172 \times 10^3\ ft^{-1} \cdot lb$

$b1 := \frac{b}{3} + t$ $b1 = 2.092\,ft$ $b2 := b + t - \frac{wst}{3}$ $b2 = 3.517\,ft$ $b3 := b - \left(\frac{wst}{2}\right) + t$ $b3 = 2.804\,ft$

$RMwater := if\left[(GWLf \leq Hp) \cdot (GWLf > Base\_el), \frac{Pp4}{3} \cdot wf, if\left[GWLf \leq Base\_el, 0 \cdot lb, (GWLf - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \frac{Hp^3}{6} \cdot \gamma w\right]\right]$

$RMav := (Pa1v + Pa2v + Pa3v + Pa5v) \cdot (b + t)$ $RMav = 1.735 \times 10^3\ lb$ $RMwater = 0\ lb$

$RM := \left[W1 \cdot DC_{ov} \cdot \frac{t}{2} + W2 \cdot DC_{ov} \cdot (b1) + Wq \cdot b3 \cdot LS_{ov} + Ws \cdot EV_{ov} \cdot (b2) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{ov} + RMwater + RMa\right.$

$RM = 1.142 \times 10^4\ ft \cdot lb$

$OMwater := if\left[(GWLb \leq Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \leq Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$

$OMwater = 0\ lb$

$OM := \left[EH_{ov} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{ov} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH_{ov} \cdot Pa3h}{3} \cdot j + OMwater + \frac{LS_{ov} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$

$OM = 6.162 \times 10^3\ ft \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{V_{DL} \cdot 1 \cdot ft}$ $X = 1.261\,ft$ $B := b + t$ $B = 4.942\,ft$

$e_o := \frac{B}{2} - X$ $e_o = 1.21\,ft$ AND $e_{max} := \frac{B}{4}$ $e_{max} = 1.24\,ft$

Since $e_{max} > e_o$ the wall design is adequate

BEARING CAPACITY:

(Ref: "Principles of Foundation Engineering" 1984 Braja M. Das pages. 250, 119, 111, 110)

qu = [(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(γ)(Bp)(Nγ)(Fγd)(Fγi)]

qr = Φbc.*[(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(γ)(Bp)(Nγ)(Fγd)(Fγi)]

Resistance Factor Φbc:
Refer to LRFD Table 10.5.5.2.2-1 $\Phi_{bc} := 0.55$

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{bc} := 1.25$ $LS_{bc} := 1.75$ $EH_{bc} := 1.5$ $EV_{bc} := 1.35$ $EP_{bc} := 0.5$

$$RM := \left[W1 \cdot DC_{bc} \cdot \frac{t}{2} + W2 \cdot DC_{bc} \cdot (b1) + Ws \cdot EV_{bc} \cdot (b2) + Wq \cdot LS_{bc} \cdot (b3) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{bc} + RMwater + RM\right.$$

$RM = 1.487 \times 10^{4}\ ft \cdot lb$

$$OMwater := if\left[(GWLb \le Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \le Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$$

$OMwater = 0\ lb$

$$OM := \left[EH_{bc} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{bc} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH \cdot Pa3h}{3} \cdot j + OMwater + \frac{EH_{bc} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$$

$OM = 5.696 \times 10^{3}\ ft \cdot lb$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 4.412 \times 10^{3}\ ft^{-1} \cdot lb$

$Vf := (W1 + W2) \cdot DC_{bc} + Ws \cdot EV_{bc} + Wq \cdot LS_{bc} + EV_{bc} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 5.716 \times 10^{3}\ ft^{-1} \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{Vf \cdot 1 \cdot ft}$ $X = 1.606\ ft$ $B := b + t$ $B = 4.942\ ft$

$L := 1$

$eb := if\left(X \ge \frac{B}{2}, 0 \cdot ft, \frac{B}{2} - X\right)$ $eb = 0.865\ ft$ $d := if(GWLf < Base\_el, Base\_el - GWLf, 0 \cdot ft)$ $d = 3\ ft$

$Bp := if\left(eb \ge \frac{B}{2}, 0 \cdot ft, B - 2 \cdot eb\right)$ $Bp = 3.211\ ft$ $\frac{B}{6} = 0.824\ ft$ $\psi := atan\left(\frac{DF}{Vf}\right)$ $\psi = 20.283 \cdot deg$

$\gamma bc := if\left[GWLf \ge Base\_el, \gamma fsub, if\left[d \le B, \gamma fsub + \frac{d}{B} \cdot (\gamma f - \gamma fsub), \gamma f\right]\right]$ $\gamma bc = 82.447\ ft^{-3} \cdot lb$

$qbc := if[(GWLf > Base\_el) \cdot (GWLf < GSEf), N \cdot \gamma f + M \cdot \gamma fsub, if[GWLf \ge GSEf, (M + N) \cdot \gamma fsub, (M + N) \cdot \gamma f]]$ $qbc = 210\ ft^{-2} \cdot lb$

$Nq := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2 \cdot e^{\pi \cdot \tan(\phi f)}$ $Nq = 23.177$ $Fqi := \left(1 - \frac{\psi}{90 \cdot deg}\right)^2$ $Fqi = 0.6$

$Fqd := if\left[Bp \le 0 \cdot ft, 1, 1 + 2 \cdot \tan(\phi f) \cdot (1 - \sin(\phi f))^2 \cdot \frac{D}{Bp}\right]$ $Fqd = 1.172$

$Nc := (Nq - 1) \cdot \cot(\phi f)$ $Nc = 35.49$ $Fcd := 1 + 0.4 \cdot \frac{D}{Bp}$ $Fcd = 1.249$

$Fci := Fqi$ $Fci = 0.6$

$N\gamma := 2 \cdot (Nq + 1) \cdot \tan(\phi f)$ $N\gamma = 30.215$ $F\gamma i := \left(1 - \frac{\psi}{\phi f}\right)^2$ $F\gamma i = 0.134$ $F\gamma d := 1$

$qu := (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qu = 3.959 \times 10^{3}\ ft^{-2} \cdot lb$

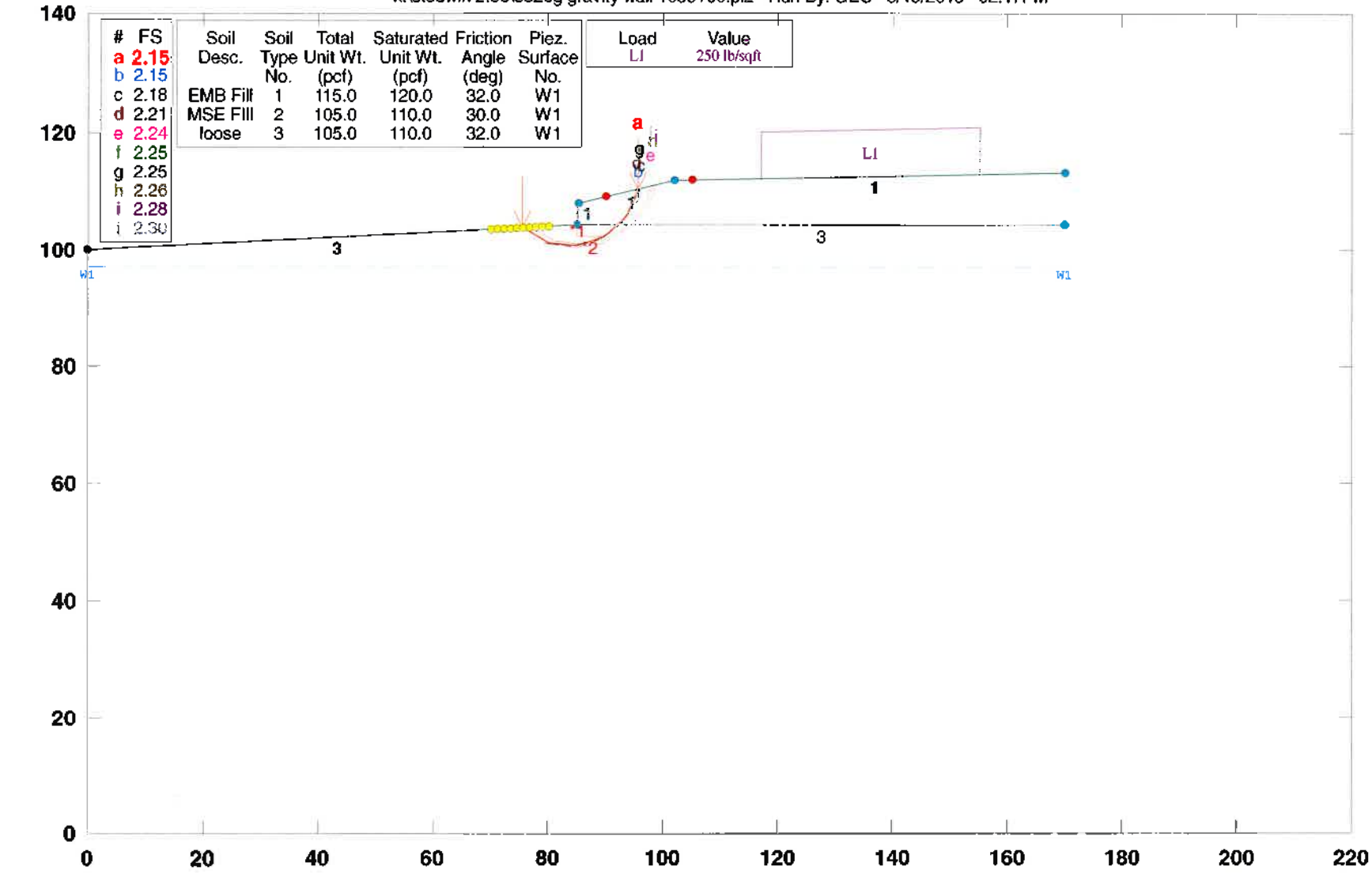
$qr := \Phi_{bc} \cdot (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qr = 2.178 \times 10^{3}\ ft^{-2} \cdot lb$

$\sigma_v := \frac{Vf}{Bp}$ $\sigma_v = 1.78 \times 10^{3}\ ft^{-2} \cdot lb$ $CDR_{bc} := \frac{qr}{\sigma_v}$ $CDR_{bc} = 1.2$

Since $CDR_{bc} > 1.0$ the Wall design is Adequate

Wekiva 7A Gravity Wall (1055+00)

k:\stedwin 2.86\3520g gravity wall 1055+00.pl2 Run By: GEC 5/19/2015 02:17PM



STABL6H FSmin=2.15

Safety Factors Are Calculated By The Modified Bishop Method

STED

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

END GRAVITY WALL RT
℄ EB FRONTAGE RD
STA 2115+60.00

℄ WB FRONTAGE RD
STA 3129+98.60

℄ EB FRONTAGE RD
STA 2115+56.11

Proposed R/W

Prop. R/W Limited Access

Exist. R/W

WB-1055
1055+03

EB-1055
1055+01

1055+00.00

(170, 113.4)

(102, 112)

(85.1, 109.2)

(89.3, 104.2)

(0, 100)

SCALE
1" = 40' Horizontal
1" = 10' Vertical

℄ CONST SR 429

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO. 828

glen_dvorovy 2/7/2015 4:34:38 PM D:\Projects\CADD\240200252O1\roadway\Xsect\RDXSRD03_429.DGN

Orange Ave. 812+45 to 814+60

Sliding, Overturning & Bearing Capacity LRFD Analyses FDOT Standard Index 6011 Gravity Wall with granular backfill (i.e. cohesion = 0 & phi >= alpha) "gravity5.mcd"

ANALYSES ASSUME ONLY STRENGTH I LIMIT STATE LOAD AND RESISTANCE FACTORS

Wall Geometry:

Ground slope behind wall (α): $\alpha := 0deg$

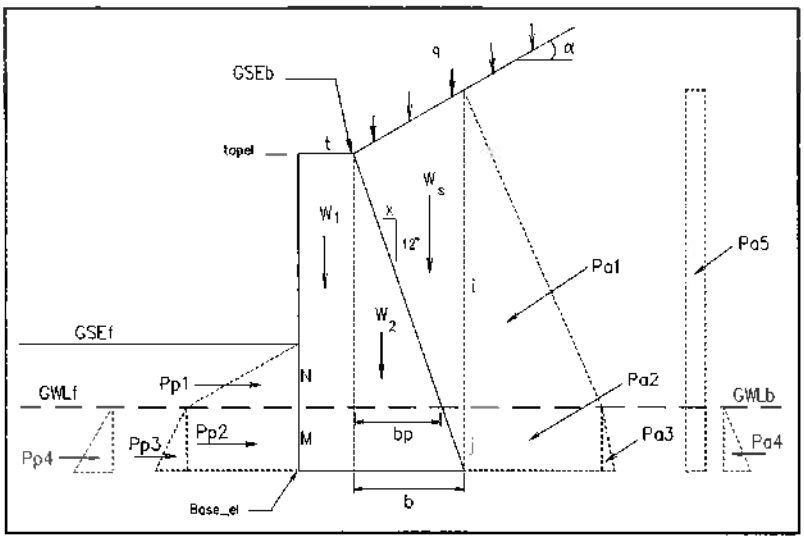
Wall top elevation (topel): $topel := 71.3 \cdot ft$

Wall base elevation (Base_el): $Base\_el := 67.5 \cdot ft$

Wall top thickness (t): $t := 8 \cdot in$

Wall backside batter (x): $x := 9 \cdot in$

Wall material unit weight (γ_c): $\gamma c := 150 \cdot \frac{lb}{ft^3}$



Ground Surface Conditions:

Ground surface elevation behind wall (GSE_b): $GSEb := 71.3 \cdot ft$

Ground surface elevation in front of wall (GSE_f): $GSEf := 69.5 \cdot ft$

Groundwater Table Conditions:

Groundwater elevation behind wall (GWL_b): $GWLb := 62.5 \cdot ft$

Groundwater elevation in front of wall (GWL_f): $GWLf := 62.5 \cdot ft$

Unit weight of water (γ_w): $\gamma w := 62.4 \cdot \frac{lb}{ft^3}$

Surcharge load behind wall(q):

Note: If you want the surcharge load to contirbute to the sliding & overturning resisting forces, make qr = q; otherwise qr should be zero.

$q := 250 \cdot \frac{lb}{ft^2}$ $qr := 0 \cdot \frac{lb}{ft^2}$ **Live load=250; Meets minimun offset req per Index 6011**

Soil Properties:	Behind Wall	In Front of and below Wall
Angle of internal friction(ϕ):	$\phi b := 32 \cdot deg$	$\phi f := 30 \cdot deg$
Cohesion(c):	cb = 0 lb/ft^2	$cf := 0 \cdot \frac{lb}{ft^2}$
Moist unit weight (γ):	$\gamma b := 115 \cdot \frac{lb}{ft^3}$	$\gamma f := 100 \cdot \frac{lb}{ft^3}$
Saturated unit weight (γ_{sat}):	$\gamma bsat := 120 \cdot \frac{lb}{ft^3}$	$\gamma fsat := 105 \cdot \frac{lb}{ft^3}$

$\gamma bsub := \gamma bsat - \gamma w$ $\gamma fsub := \gamma fsat - \gamma w$

Wall Base Friction/Cohesion Reduction Factors(frf/crf) typically 1/2 to 2/3: $frf := 1$ $crf := 1$

Rankine Lateral Earth Pressure Coefficients ($\phi b >= \alpha$):

$$Ka := \cos(\alpha) \cdot \left(\frac{\cos(\alpha) - \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}}{\cos(\alpha) + \sqrt{\cos(\alpha)^2 - \cos(\phi b)^2}} \right)$$

$Ka = 0.307$

$$Kp := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2$$

$Kp = 3$

$hpx := \frac{GSEb - Base\_el}{1 \cdot ft} \cdot x$ $hpx = 2.85\,ft$

$hpy := hpx \cdot \tan(\alpha)$ $hpy = 0\,ft$

$Hp := hpy + (GSEb - Base\_el) + Base\_el$ $Hp = 71.3\,ft$

Conditional Statements:

$i := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), Hp - GWLb, if(GWLb \geq Hp, 0 \cdot ft, Hp - Base\_el)]$ $i = 3.8\,ft$

$j := if[(Hp \geq GWLb) \cdot (GWLb \geq Base\_el), GWLb - Base\_el, if(GWLb > Hp, Hp - Base\_el, 0 \cdot ft)]$ $j = 0\,ft$

Active Forces:

$Pa1h := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \cos(\alpha)$ $Pa1h = 255.117\,ft^{-1} \cdot lb$

$Pa1v := 0.5 \cdot \gamma b \cdot i^2 \cdot Ka \cdot \sin(\alpha)$ $Pa1v = 0\,ft^{-1} \cdot lb$

$Pa2h := i \cdot \gamma b \cdot Ka \cdot j \cdot \cos(\alpha)$ $Pa2h = 0\,ft^{-1} \cdot lb$

$Pa2v := i \cdot \gamma b \cdot Ka \cdot j \cdot \sin(\alpha)$ $Pa2v = 0\,ft^{-1} \cdot lb$

$Pa3h := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \cos(\alpha)$ $Pa3h = 0\,ft^{-1} \cdot lb$

$Pa3v := [[(i \cdot \gamma b + j \cdot \gamma bsub) \cdot Ka - i \cdot \gamma b \cdot Ka] \cdot 0.5 \cdot j] \cdot \sin(\alpha)$ $Pa3v = 0\,ft^{-1} \cdot lb$

$Pa4 := if\left[(GWLb \le Hp)\cdot(GWLb > Base\_el), 0.5\cdot j^2\cdot\gamma w, if\left[GWLb \le Base\_el, 0\cdot lb\cdot ft^{-1}, (GWLb - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right]$ $Pa4 = 0\,ft^{-1}\cdot lb$

$Pa5h := (Hp - Base\_el)\cdot q\cdot Ka\cdot\cos(\alpha)$ $Pa5h = 291.896\,ft^{-1}\cdot lb$

$Pa5v := (Hp - Base\_el)\cdot q\cdot Ka\cdot\sin(\alpha)$ $Pa5v = 0\,ft^{-1}\cdot lb$

Conditional Statements:

$M := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GWLf - Base\_el, if(GWLf > GSEf, GSEf - Base\_el, 0\cdot ft)]$ $M = 0\,ft$

$N := if[(GSEf \ge GWLf)\cdot(GWLf \ge Base\_el), GSEf - GWLf, if(GWLf > GSEf, 0\cdot ft, GSEf - Base\_el)]$ $N = 2\,ft$

$wf := GWLf - Base\_el$ $wf = -5\,ft$ $wb := GWLb - Base\_el$ $wb = -5\,ft$

Passive Forces:

$Pp1 := 0.5\cdot\gamma f\cdot N^2\cdot Kp + 2\cdot cf\cdot N\cdot\sqrt{Kp}$ $Pp1 = 600\,ft^{-1}\cdot lb$

$Pp2 := \left(Kp\cdot\gamma f\cdot N + 2\cdot cf\cdot\sqrt{Kp}\right)\cdot M$ $Pp2 = 0\,ft^{-1}\cdot lb$

$Pp3 := 0.5\cdot\gamma fsub\cdot M^2\cdot Kp$ $Pp3 = 0\,ft^{-1}\cdot lb$

$Pp4 := if\left[(GWLf \le Hp)\cdot(GWLf > Base\_el), 0.5\cdot wf^2\cdot\gamma w, if\left[(GWLf \le Base\_el), 0\cdot lb\cdot ft^{-1}, (GWLf - Hp)\cdot\gamma w\cdot Hp + 0.5\cdot Hp^2\cdot\gamma w\right]\right]$ $Pp4 = 0\,ft^{-1}\cdot lb$

SLIDING:

Resistance Factor Φb:
Refer to LRFD Table 10.5.5.2.2-1 $\Phi_b := 0.8$

Load Factors for Strength I-a:
Refer to LRFD Tables $DC := 0.9$ $LS := 1.75$ $EH := 1.5$ $EV := 1.00$ $EP := 0.5$

CDR = Summation Resisting Forces divided by Summation Driving Forces

Summation Resisting Forces(RF) = tan phi(Sum Vertical Forces) + B(cohesion) + Passive forces

$I := if[(topel > GWLb)\cdot(GWLb > Base\_el), topel - GWLb, if(GWLb \le Base\_el, topel - Base\_el, 0\cdot ft)]$

$J := if[(topel > GWLb)\cdot(GWLb > Base\_el), GWLb - Base\_el, if(GWLb \le Base\_el, 0\cdot ft, topel - Base\_el)]$

$b := (topel - Base\_el)\cdot\frac{x}{12\cdot in}$ $b = 2.85\,ft$

$bp := if\left[GWLb \ge topel, 0\cdot ft, if\left[GWLb > Base\_el, (topel - GWLb)\cdot\frac{x}{12\cdot in}, b\right]\right]$ $bp = 2.85\,ft$

Vertical Forces:

$wst := \frac{GSEb - Base\_el}{12\cdot in}\cdot x$ $wst = 2.85\,ft$

$W1 := I\cdot t\cdot\gamma c + J\cdot t\cdot(\gamma c - \gamma w)$ $W1 = 380\,ft^{-1}\cdot lb$

$W2 := 0.5\cdot bp\cdot I\cdot\gamma c + \frac{bp + b}{2}\cdot J\cdot(\gamma c - \gamma w)$ $W2 = 812.25\,ft^{-1}\cdot lb$

$wsw := \frac{j}{12\cdot in}\cdot x$ $wsw = 0\,ft$

$Ws := \left[\frac{wst + wsw}{2}\cdot i\cdot\gamma b + \frac{wsw}{2}\cdot j\cdot(\gamma bsat - \gamma w)\right]$ $Ws = 622.725\,ft^{-1}\cdot lb$

$Wq := qr\cdot wst$ $Wq = 0$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 1.815\times 10^3\,ft^{-1}\cdot lb$

$Vf := (W1 + W2)\cdot DC + Ws\cdot EV + Wq\cdot LS + EV\cdot(Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 1.696\times 10^3\,ft^{-1}\cdot lb$

Factored Summation Resisting Forces (RF) = Φb * [tan phi(Sum Vertical Forces) + Passive Forces]

$RF := \Phi_b \cdot [\tan(frf \cdot \phi f) \cdot Vf + (b + t) \cdot crf \cdot cf + EP \cdot (Pp1 + Pp2 + Pp3 + Pp4)]$ $RF = 1.023 \times 10^{3}\ ft^{-1} \cdot lb$

Factored Summation of Driving Forces (DF): $DF := EH(Pa1h + Pa2h + Pa3h + Pa4 + Pa5h)$ $DF = 820.519\ ft^{-1} \cdot lb$

$CDR\_Sliding := \frac{RF}{DF}$ $CDR\_Sliding = 1.25$ $CDR \geq 1$ OK

OVERTURNING: = Check Eccentricity

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{ov} := 0.9$ $LS_{ov} := 1.75$ $EH_{ov} := 1.5$ $EV_{ov} := 1.00$ $EP_{ov} := 0.5$

$V_{DL} := (W1 + W2) \cdot DC_{ov} + Ws \cdot EV_{ov} + EV_{ov} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $V_{DL} = 1.696 \times 10^{3}\ ft^{-1} \cdot lb$

$b1 := \frac{b}{3} + t$ $b1 = 1.617\ ft$ $b2 := b + t - \frac{wst}{3}$ $b2 = 2.567\ ft$ $b3 := b - \left(\frac{wst}{2}\right) + t$ $b3 = 2.092\ ft$

$RMwater := if\left[(GWLf \leq Hp) \cdot (GWLf > Base\_el), \frac{Pp4}{3} \cdot wf, if\left[GWLf \leq Base\_el, 0 \cdot lb, (GWLf - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \frac{Hp^3}{6} \cdot \gamma w\right]\right]$

$RMav := (Pa1v + Pa2v + Pa3v + Pa5v) \cdot (b + t)$ $RMav = 0\ lb$ $RMwater = 0\ lb$

$RM := \left[W1 \cdot DC_{ov} \cdot \frac{t}{2} + W2 \cdot DC_{ov} \cdot (b1) + Wq \cdot b3 \cdot LS_{ov} + Ws \cdot EV_{ov} \cdot (b2) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{ov} + RMwater + RMa\right.$

$RM = 3.094 \times 10^{3}\ ft \cdot lb$

$OMwater := if\left[(GWLb \leq Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \leq Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$

$OMwater = 0\ lb$

$OM := \left[EH_{ov} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{ov} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH_{ov} \cdot Pa3h}{3} \cdot j + OMwater + \frac{LS_{ov} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$

$OM = 1.455 \times 10^{3}\ ft \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{V_{DL} \cdot 1 \cdot ft}$ $X = 0.966\ ft$ $B := b + t$ $B = 3.517\ ft$

$e_o := \frac{B}{2} - X$ $e_o = 0.79\ ft$ AND $e_{max} := \frac{B}{4}$ $e_{max} = 0.88\ ft$

Since $e_{max} > e_o$ the wall design is adequate

BEARING CAPACITY:

(Ref: "Principles of Foundation Engineering" 1984 Braja M. Das pages. 250, 119, 111, 110)

qu = [(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(γ)(Bp)(Nγ)(Fγd)(Fγi)]

qr = Φbc.*[(c)(Nc)(Fcd)(Fci) + (q)(Nq)(Fqd)(Fqi) + 1/2(γ)(Bp)(Nγ)(Fγd)(Fγi)]

Resistance Factor Φbc:
Refer to LRFD Table 10.5.5.2.2-1 $\Phi_{bc} := 0.55$

Load Factors for Strength I-a:
Refer to LRFD Tables $DC_{bc} := 1.25$ $LS_{bc} := 1.75$ $EH_{bc} := 1.5$ $EV_{bc} := 1.35$ $EP_{bc} := 0.5$

$$RM := \left[W1 \cdot DC_{bc} \cdot \frac{t}{2} + W2 \cdot DC_{bc} \cdot (b1) + Ws \cdot EV_{bc} \cdot (b2) + Wq \cdot LS_{bc} \cdot (b3) + \left[Pp1 \cdot \left(\frac{1}{3} \cdot N + M\right) + Pp2 \cdot 0.5 \cdot M + \frac{Pp3}{3} \cdot M\right] \cdot EP_{bc} + RMwater + RM\right.$$

$RM = 4.157 \times 10^{3}\ ft \cdot lb$

$$OMwater := if\left[(GWLb \le Hp) \cdot (GWLb > Base\_el), Pa4 \cdot \frac{wb}{3}, if\left[GWLb \le Base\_el, 0 \cdot lb, (GWLb - Hp) \cdot \gamma w \cdot \frac{Hp^2}{2} + \gamma w \cdot \frac{Hp^3}{6}\right]\right]$$

$OMwater = 0\ lb$

$$OM := \left[EH_{bc} \cdot Pa1h \cdot \left[\frac{(Hp - Base\_el) - j}{3} + j\right] + EH_{bc} \cdot Pa2h \cdot \frac{j}{2} + \frac{EH \cdot Pa3h}{3} \cdot j + OMwater + \frac{EH_{bc} \cdot Pa5h}{2} \cdot (Hp - Base\_el)\right] \cdot 1 \cdot ft$$

$OM = 1.317 \times 10^{3}\ ft \cdot lb$

$V := (W1 + W2) + Ws + Wq + (Pa1v + Pa2v + Pa3v + Pa5v)$ $V = 1.815 \times 10^{3}\ ft^{-1} \cdot lb$

$Vf := (W1 + W2) \cdot DC_{bc} + Ws \cdot EV_{bc} + Wq \cdot LS_{bc} + EV_{bc} \cdot (Pa1v + Pa2v + Pa3v + Pa5v)$ $Vf = 2.331 \times 10^{3}\ ft^{-1} \cdot lb$

$D := GSEf - Base\_el$ $X := \frac{RM - OM}{Vf \cdot 1 \cdot ft}$ $X = 1.219\ ft$ $B := b + t$ $B = 3.517\ ft$

$L := 1$

$eb := if\left(X \ge \frac{B}{2}, 0 \cdot ft, \frac{B}{2} - X\right)$ $eb = 0.54\ ft$ $d := if(GWLf < Base\_el, Base\_el - GWLf, 0 \cdot ft)$ $d = 5\ ft$

$Bp := if\left(eb \ge \frac{B}{2}, 0 \cdot ft, B - 2 \cdot eb\right)$ $Bp = 2.437\ ft$ $\frac{B}{6} = 0.586\ ft$ $\psi := atan\left(\frac{DF}{Vf}\right)$ $\psi = 19.392 \cdot deg$

$\gamma bc := if\left[GWLf \ge Base\_el, \gamma fsub, if\left[d \le B, \gamma fsub + \frac{d}{B} \cdot (\gamma f - \gamma fsub), \gamma f\right]\right]$ $\gamma bc = 100\ ft^{-3} \cdot lb$

$qbc := if[(GWLf > Base\_el) \cdot (GWLf < GSEf), N \cdot \gamma f + M \cdot \gamma fsub, if[GWLf \ge GSEf, (M + N) \cdot \gamma fsub, (M + N) \cdot \gamma f]]$ $qbc = 200\ ft^{-2} \cdot lb$

$Nq := \tan\left(45 \cdot deg + \frac{\phi f}{2}\right)^2 \cdot e^{\pi \cdot \tan(\phi f)}$ $Nq = 18.401$ $Fqi := \left(1 - \frac{\psi}{90 \cdot deg}\right)^2$ $Fqi = 0.615$

$Fqd := if\left[Bp \le 0 \cdot ft, 1, 1 + 2 \cdot \tan(\phi f) \cdot (1 - \sin(\phi f))^2 \cdot \frac{D}{Bp}\right]$ $Fqd = 1.237$

$Nc := (Nq - 1) \cdot \cot(\phi f)$ $Nc = 30.14$ $Fcd := 1 + 0.4 \cdot \frac{D}{Bp}$ $Fcd = 1.328$

$Fci := Fqi$ $Fci = 0.615$

$N\gamma := 2 \cdot (Nq + 1) \cdot \tan(\phi f)$ $N\gamma = 22.402$ $F\gamma i := \left(1 - \frac{\psi}{\phi f}\right)^2$ $F\gamma i = 0.125$ $F\gamma d := 1$

$qu := (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qu = 3.143 \times 10^{3}\ ft^{-2} \cdot lb$

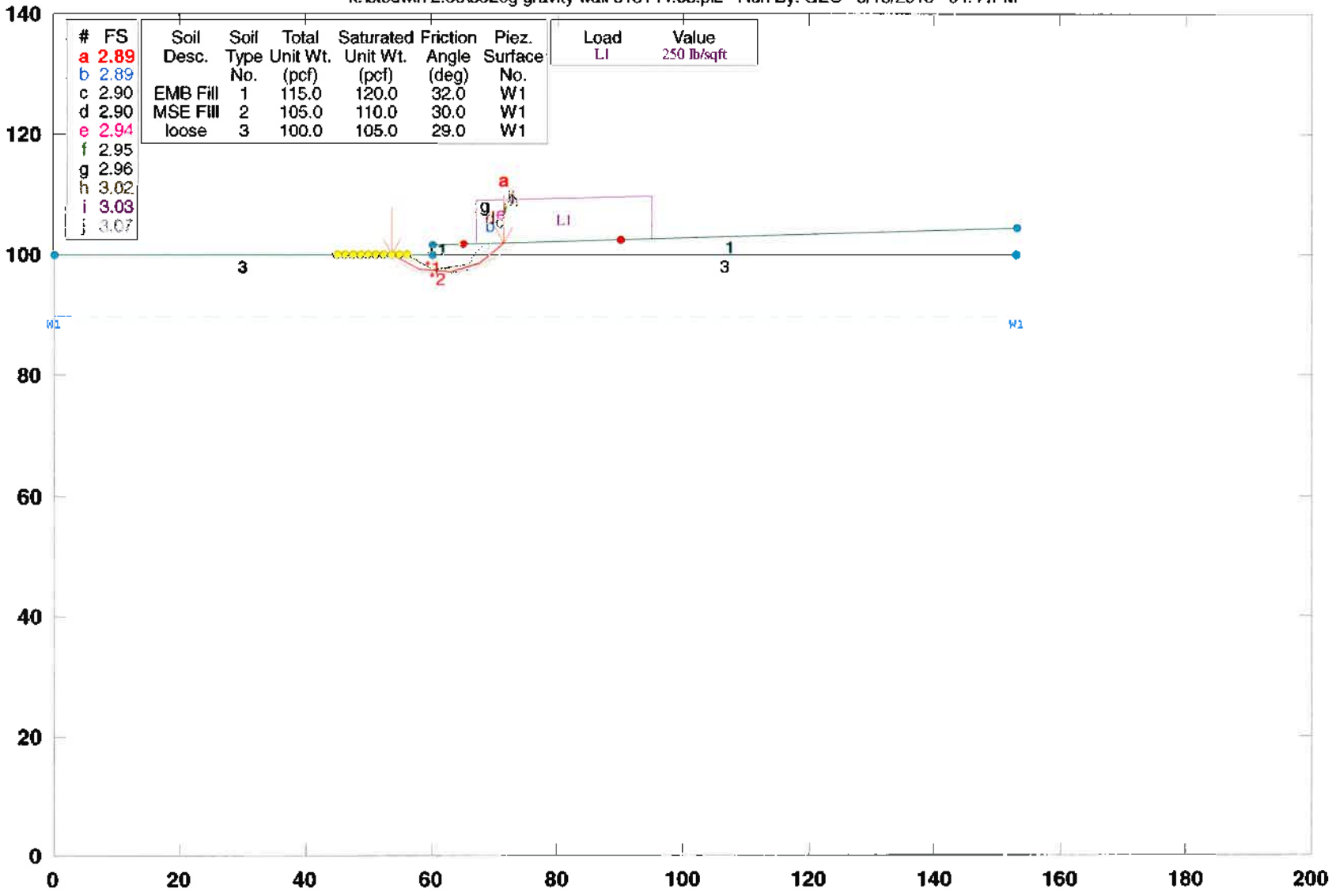
$qr := \Phi_{bc} \cdot (cf \cdot Nc \cdot Fcd \cdot Fci + qbc \cdot Nq \cdot Fqd \cdot Fqi + 0.5 \cdot \gamma bc \cdot Bp \cdot N\gamma \cdot F\gamma d \cdot F\gamma i)$ $qr = 1.729 \times 10^{3}\ ft^{-2} \cdot lb$

$\sigma_v := \frac{Vf}{Bp}$ $\sigma_v = 956.312\ ft^{-2} \cdot lb$ $CDR_{bc} := \frac{qr}{\sigma_v}$ $CDR_{bc} = 1.8$

Since $CDR_{bc} > 1.0$ the Wall design is Adequate

Wekiva 7A Gravity Wall (813+44.63)

k:\stedwin 2.86\3520g gravity wall 813+44.63.pl2 Run By: GEC 5/18/2015 04:44PM



STABL6H FSmin=2.89

Safety Factors Are Calculated By The Modified Bishop Method

STED

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

MATCHLINE SR 429 STA 1099+50, EL 73.71'

Prop. Fence
Prop. R/W
Limited Access
Exist. R/W
Proposed R/W
2.00 %
71.63
5.00'
7102
WM
BT
SAN
OA-814
814+00
813+81.77

MATCHLINE SR 429 STA 1099+00, EL 73.77

Exist. R/W
Prop. fence
Prop. R/W
Limited Access
Exist. R/W
Proposed R/W
2.00 %
71.45
5.00'
7067
BT
WM
SAN
813+44.63

SCALE
1" = 40' Horizontal
1" = 10' Vertical

℄ CONST S ORANGE AVE EXTENSION

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GARFIELD L. FOSTER
P.E. LICENSE NO. 59893
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

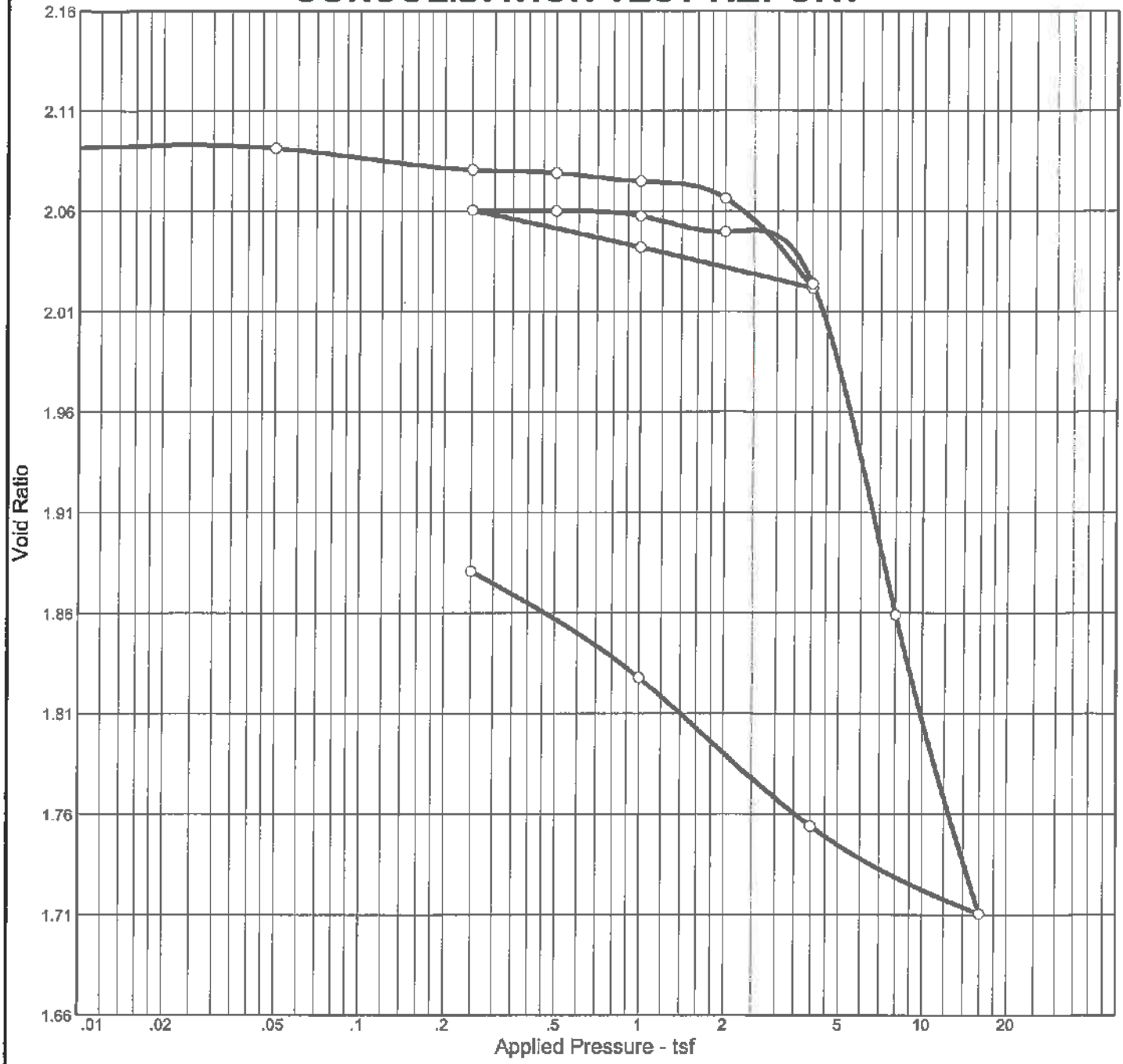
S ORANGE AVE EXTENSION
CROSS SECTIONS

SHEET NO.
1025

glen_dyonovy 2/7/2015 4:37:26 PM G:\Projects\CADD\240200025201\roadway\Xsect\RDXSRD01_ORANGEEXT.DGN

CONSOLIDATION TEST RESULTS

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
102.1 %	82.2 %	54.1	47	30	2.60	1.02	3.67	0.57	0.04			2.092

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Lean Clay w/ Sand	(CL)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: WB-49 27'-29'

Remarks:
Fines Content= 79.3%

CONSOLIDATION TEST REPORT

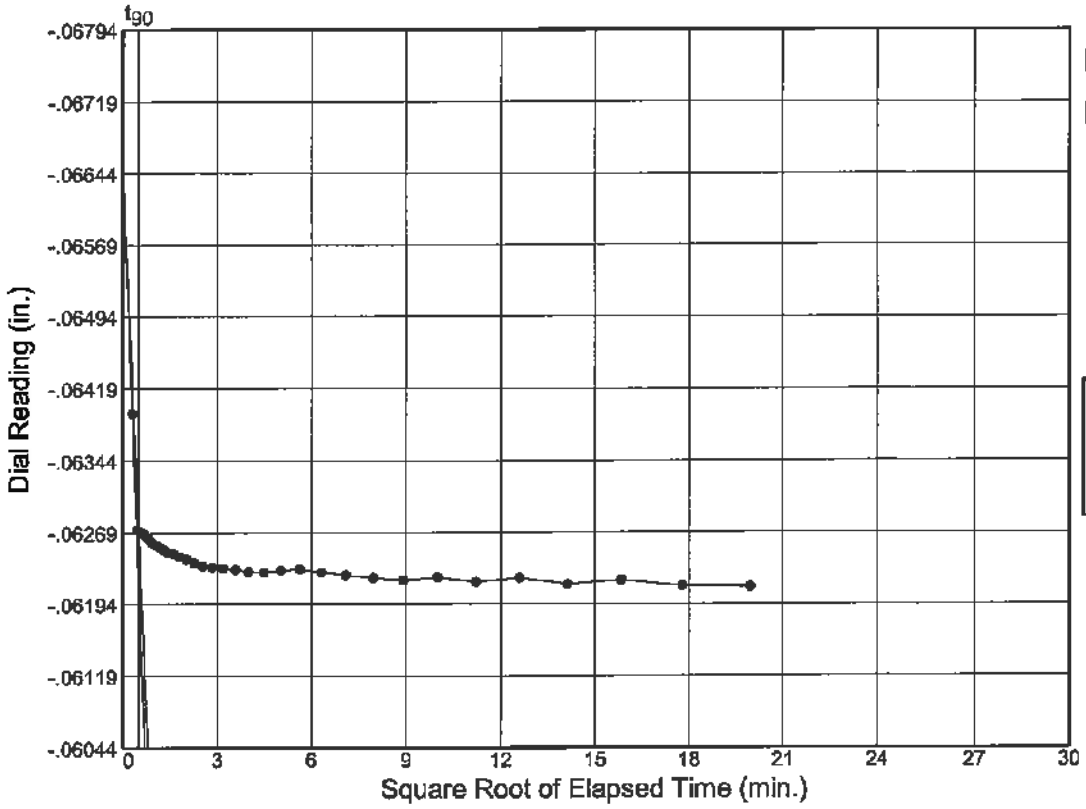
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

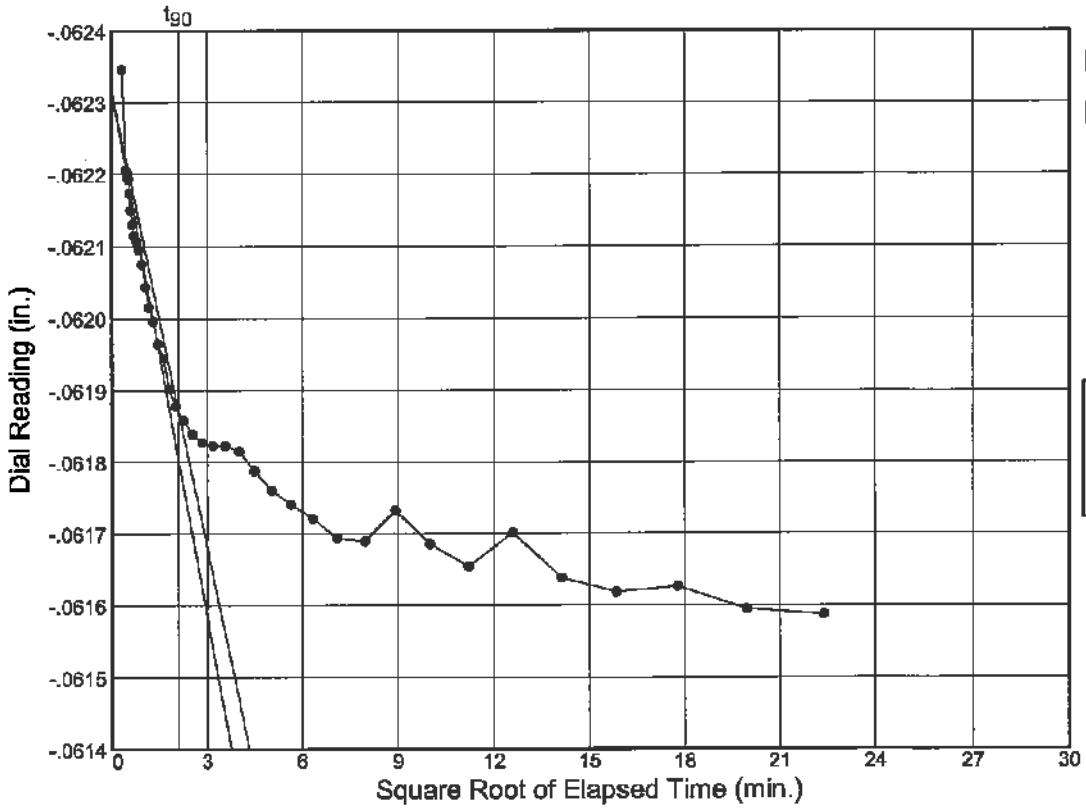
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 2
Load= 0.25 tsf
D_0 = -0.06644
D_{90} = -0.06271
D_{100} = -0.06229
T_{90} = 0.24 min.

C_v @ T_{90}
8.67 ft.^{2}/day



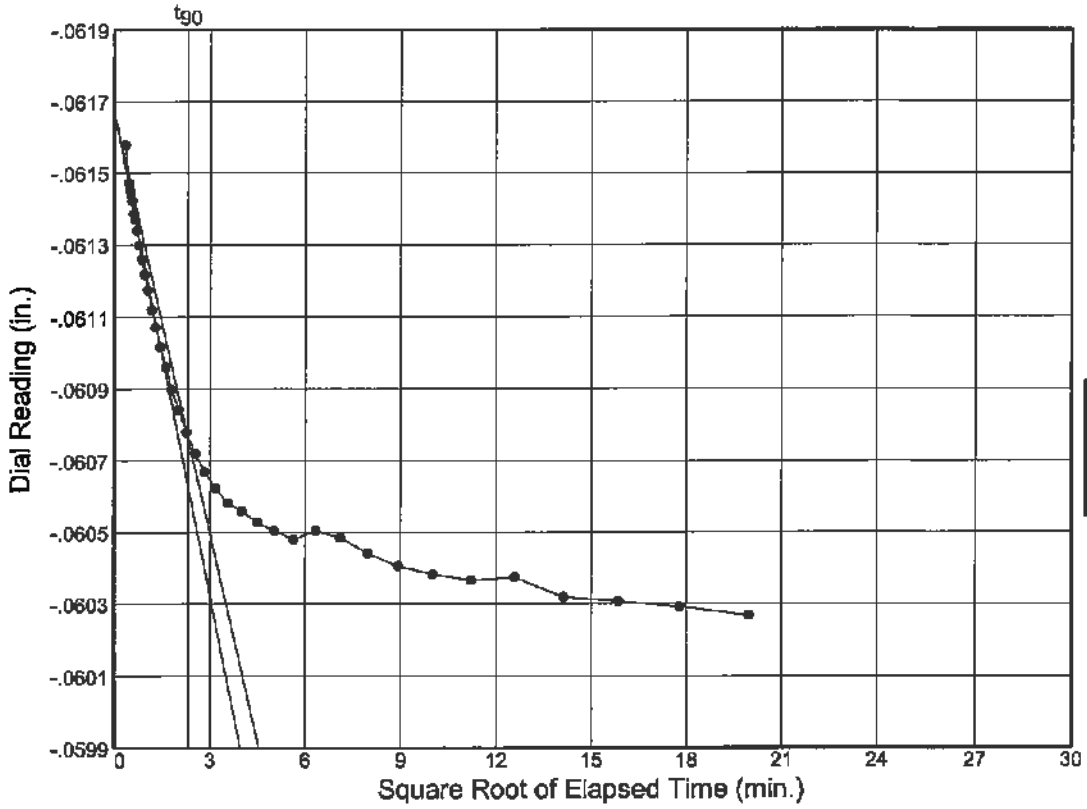
Load No.= 3
Load= 0.50 tsf
D_0 = -0.06232
D_{90} = -0.06187
D_{100} = -0.06182
T_{90} = 4.37 min.

C_v @ T_{90}
0.48 ft.^{2}/day

Dial Reading vs. Time

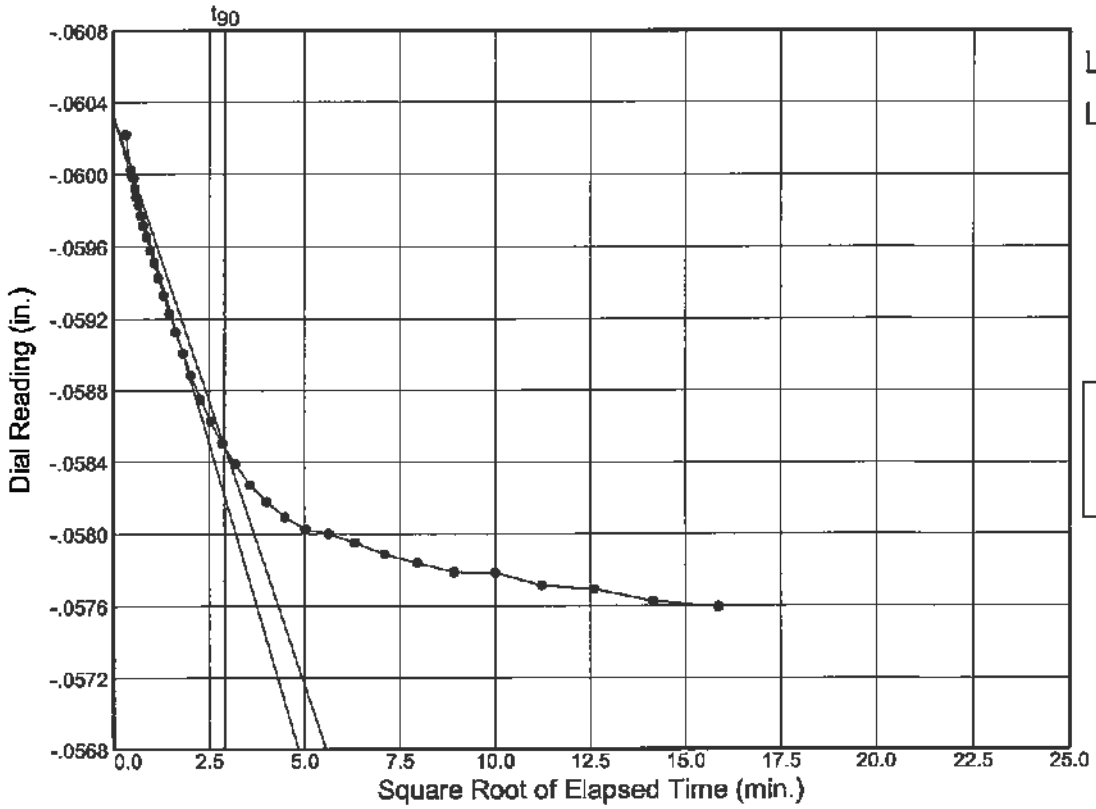
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 4
Load= 1.00 tsf
D_0 = -0.06167
D_{90} = -0.06077
D_{100} = -0.06067
T_{90} = 5.29 min.

C_v @ T_{90}
0.40 ft.^{2}/day



Load No.= 5
Load= 2.00 tsf
D_0 = -0.06032
D_{90} = -0.05848
D_{100} = -0.05828
T_{90} = 8.46 min.

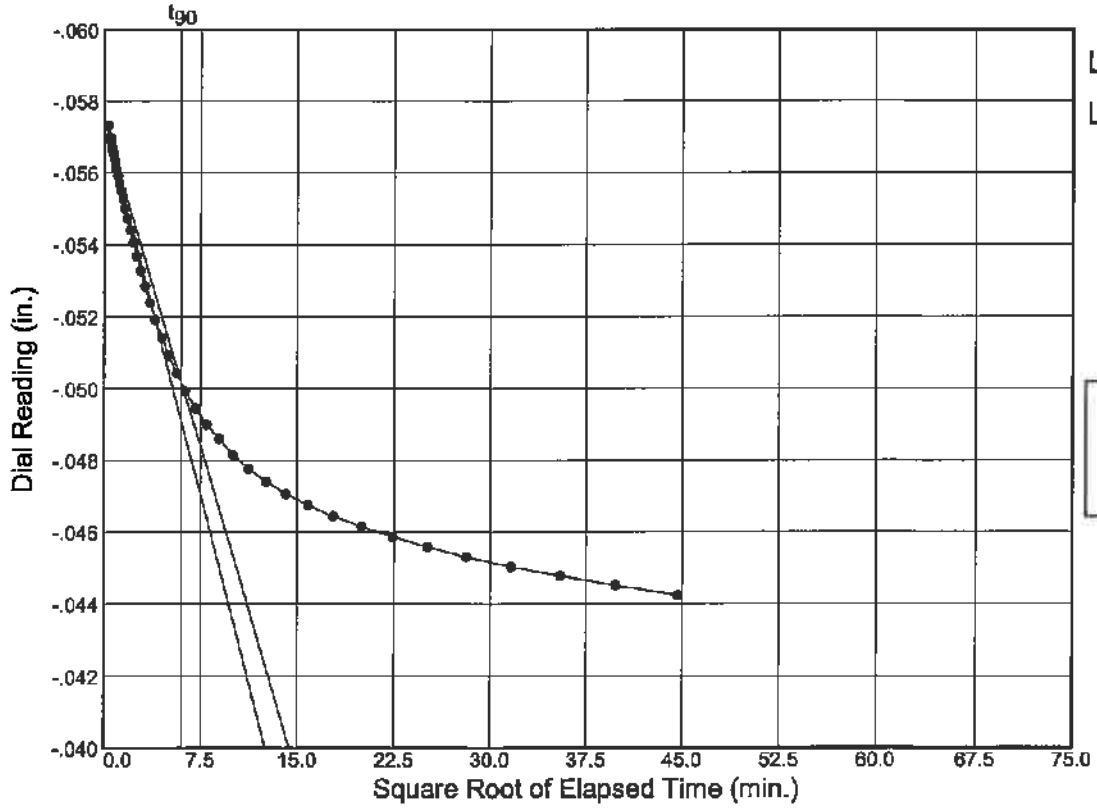
C_v @ T_{90}
0.25 ft.^{2}/day

Plate

Dial Reading vs. Time

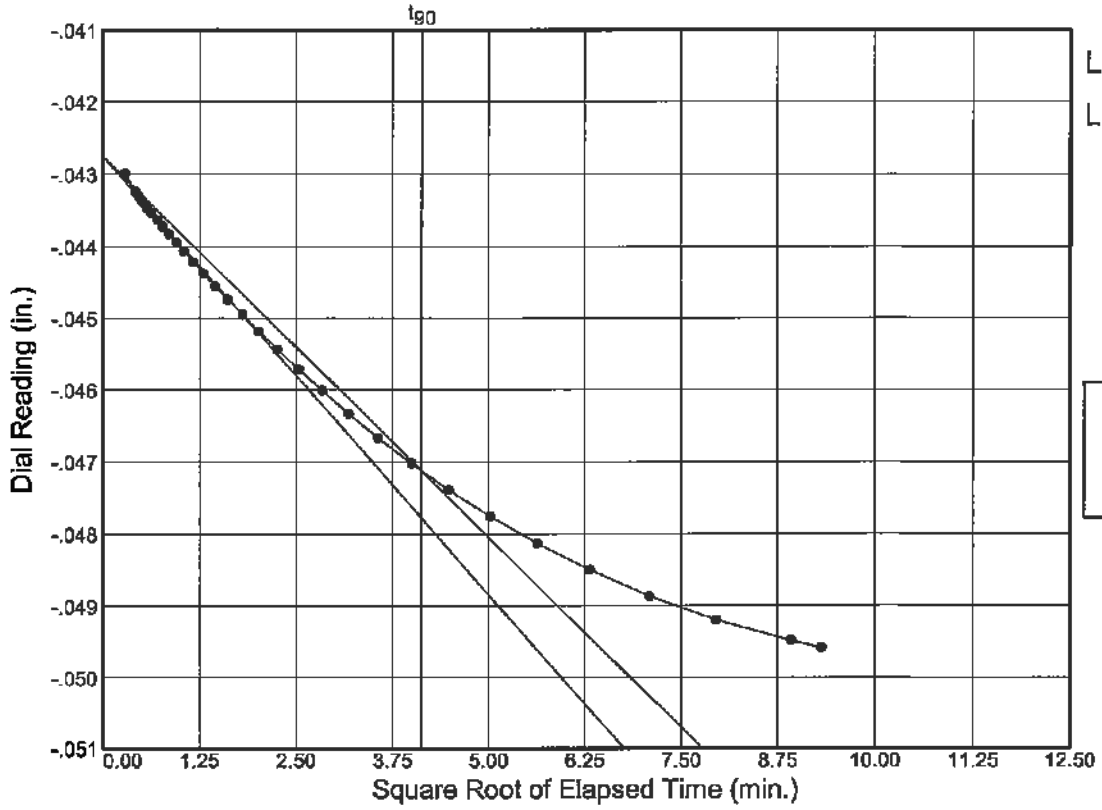
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 6
Load= 4.00 tsf
D_0 = -0.05744
D_{90} = -0.05016
D_{100} = -0.04935
T_{90} = 36.19 min.

C_v @ T_{90}
0.06 ft.^{2}/day



Load No.= 7
Load= 1.00 tsf
D_0 = -0.04275
D_{90} = -0.04713
D_{100} = -0.04761
T_{90} = 17.03 min.

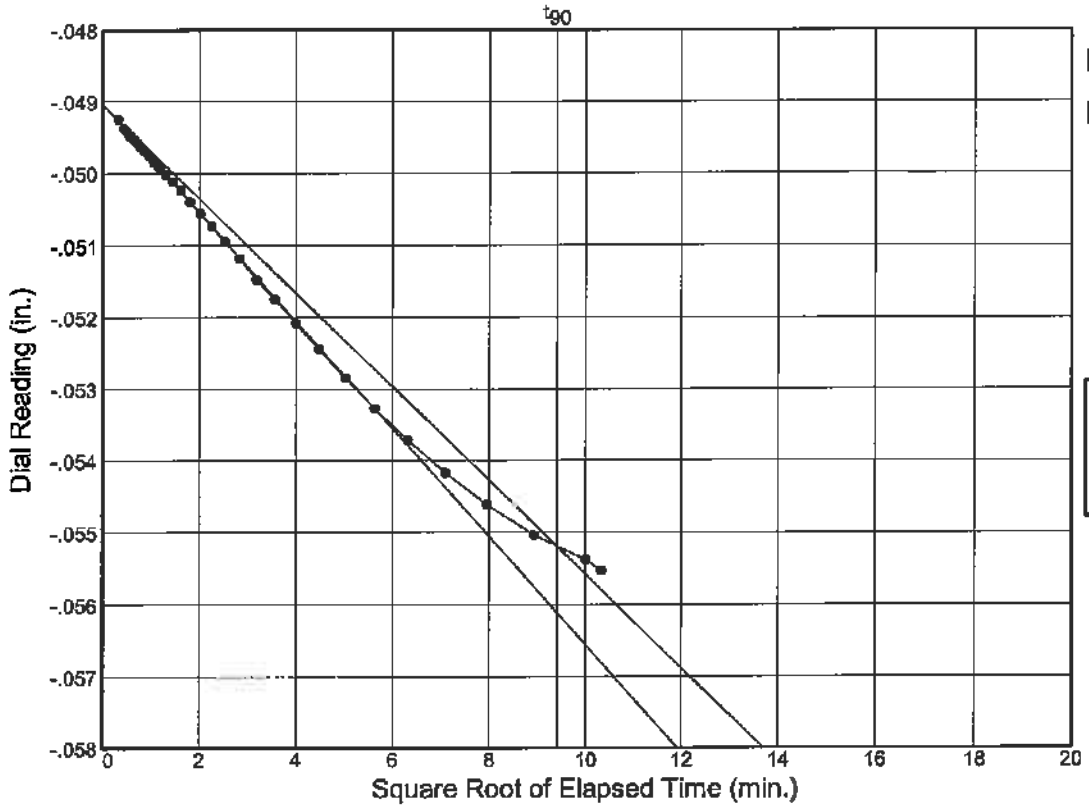
C_v @ T_{90}
0.12 ft.^{2}/day

Plate

Dial Reading vs. Time

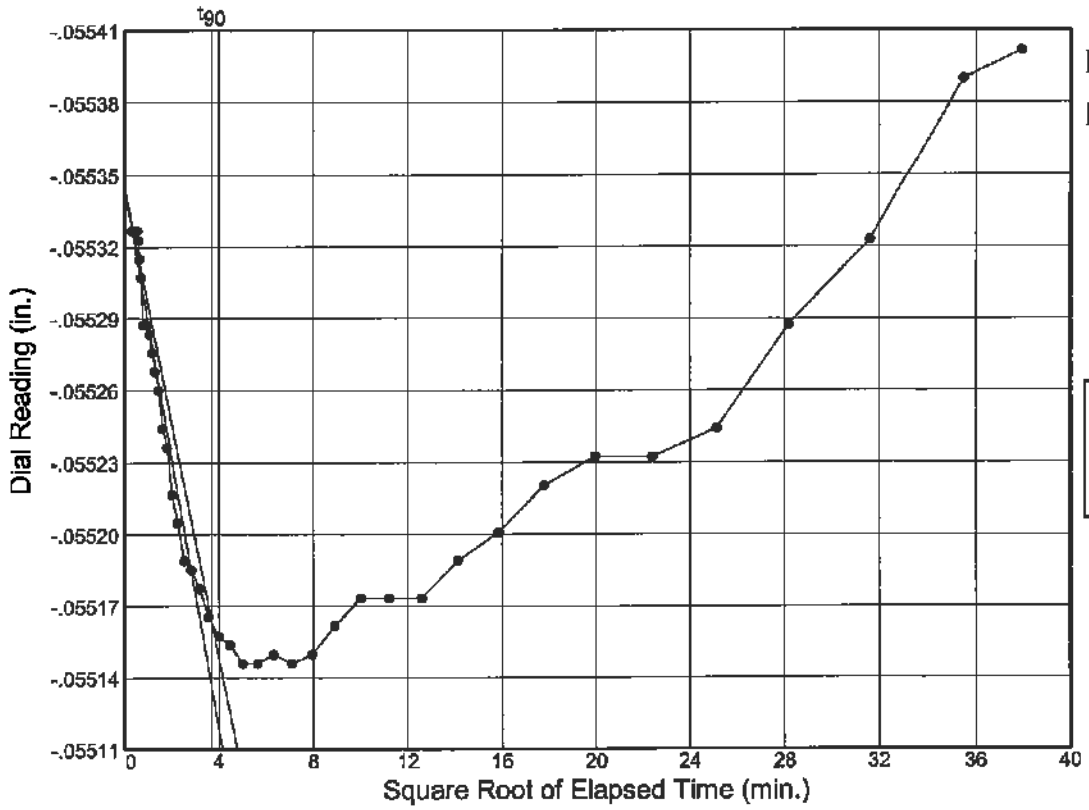
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 8
Load= 0.25 tsf
D_0 = -0.04904
D_{90} = -0.05519
D_{100} = -0.05588
T_{90} = 88.45 min.

C_v @ T_{90}
0.02 ft.^{2}/day



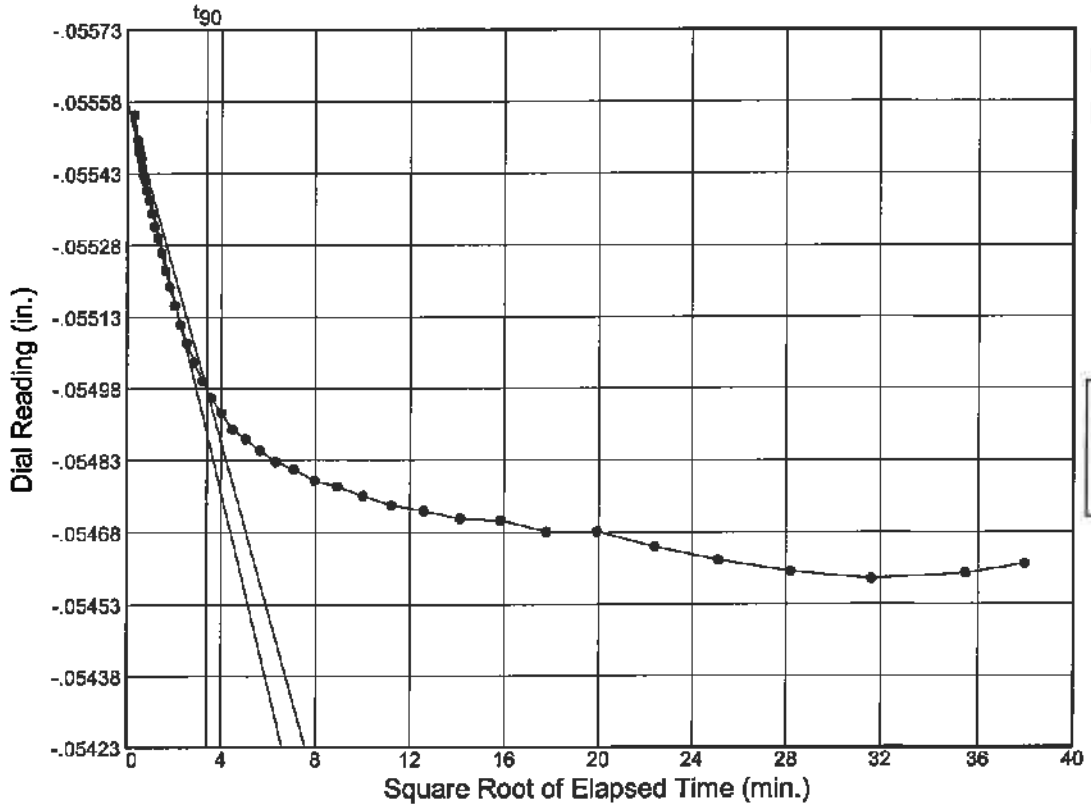
Load No.= 9
Load= 0.50 tsf
D_0 = -0.05535
D_{90} = -0.05516
D_{100} = -0.05514
T_{90} = 13.70 min.

C_v @ T_{90}
0.15 ft.^{2}/day

Dial Reading vs. Time

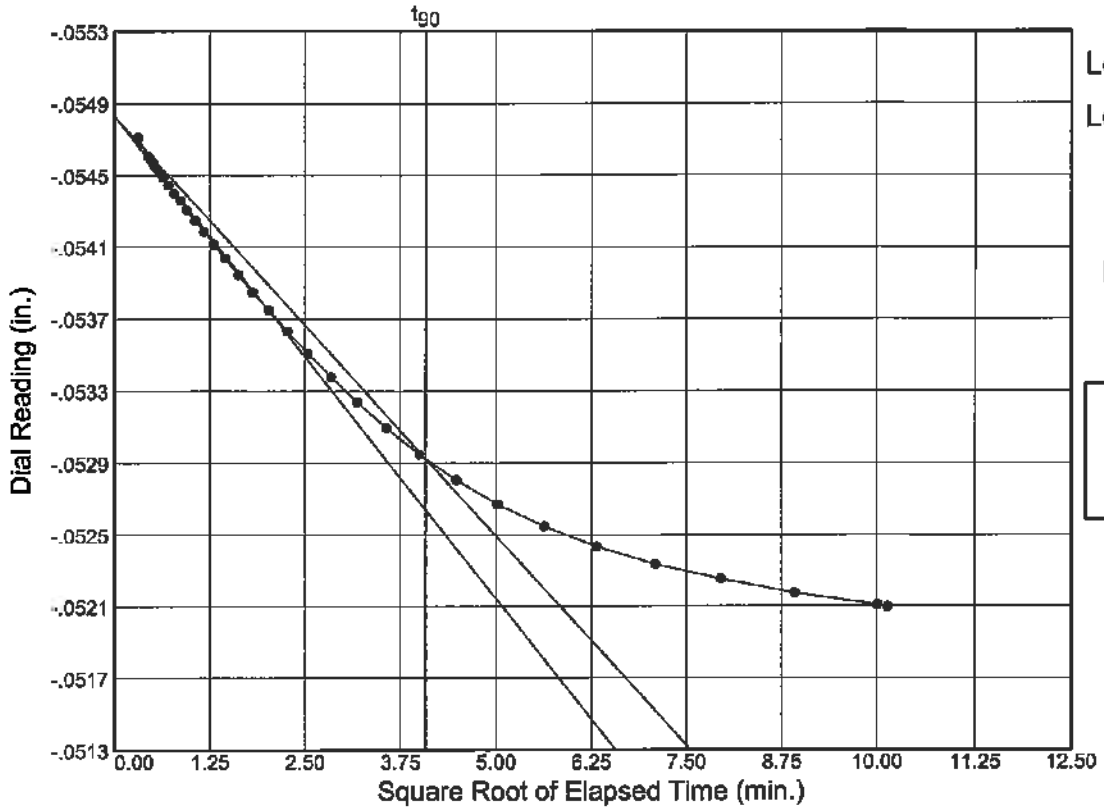
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 10
Load= 1.00 tsf
D_0 = -0.05558
D_{90} = -0.05498
D_{100} = -0.05491
T_{90} = 11.33 min.

C_v @ T_{90}
0.18 ft.^{2}/day



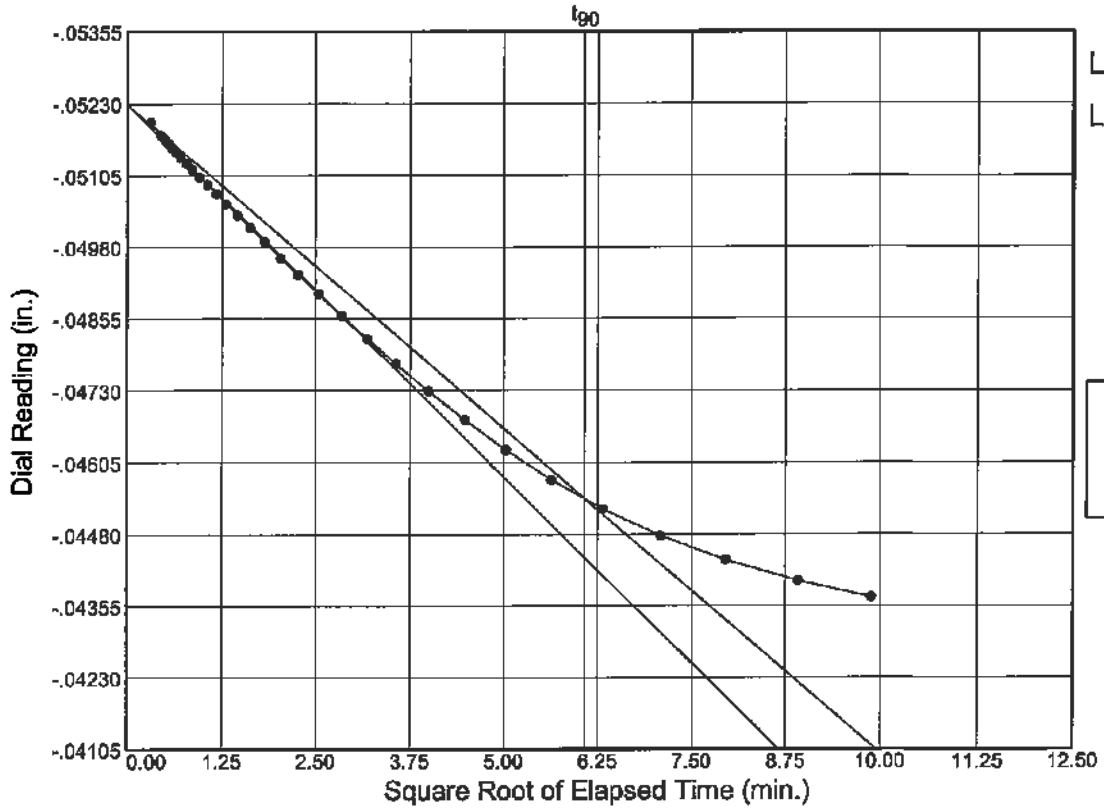
Load No.= 11
Load= 2.00 tsf
D_0 = -0.05483
D_{90} = -0.05293
D_{100} = -0.05271
T_{90} = 16.63 min.

C_v @ T_{90}
0.12 ft.^{2}/day

Dial Reading vs. Time

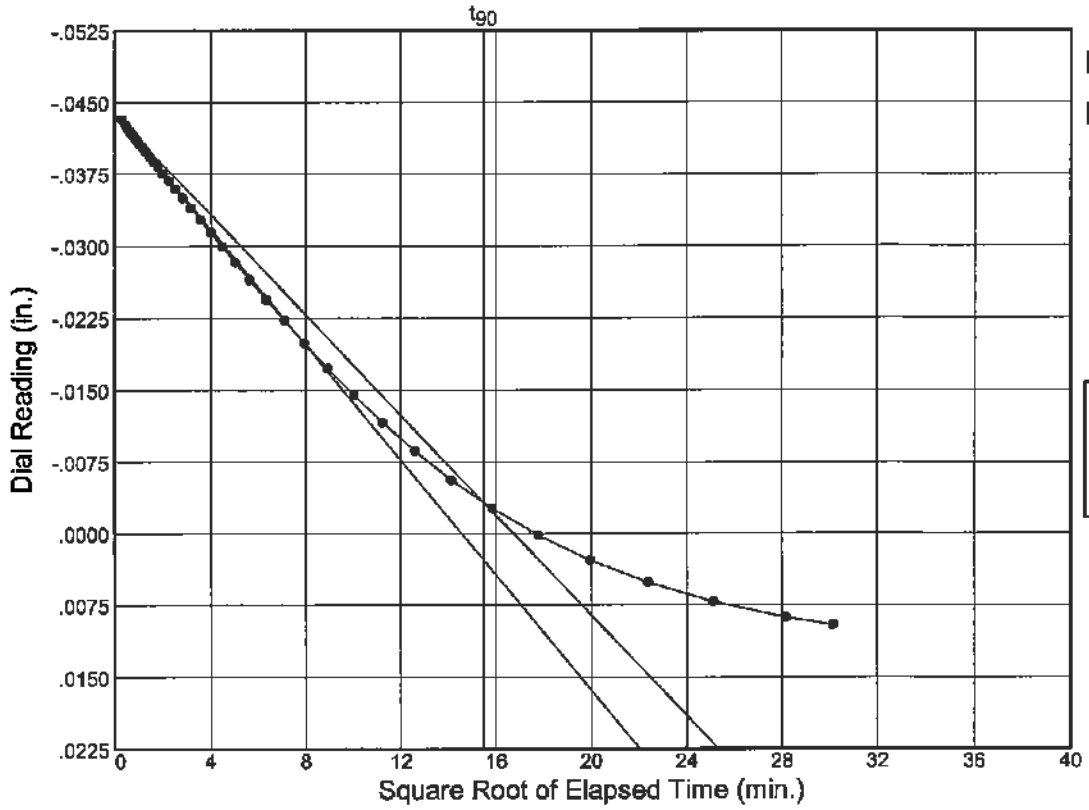
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 12
Load= 4.00 tsf
D_0 = -0.05229
D_{90} = -0.04542
D_{100} = -0.04466
T_{90} = 36.92 min.

C_v @ T_{90}
0.06 ft.^{2}/day



Load No.= 13
Load= 8.00 tsf
D_0 = -0.04375
D_{90} = -0.00331
D_{100} = 0.00119
T_{90} = 239.22 min.

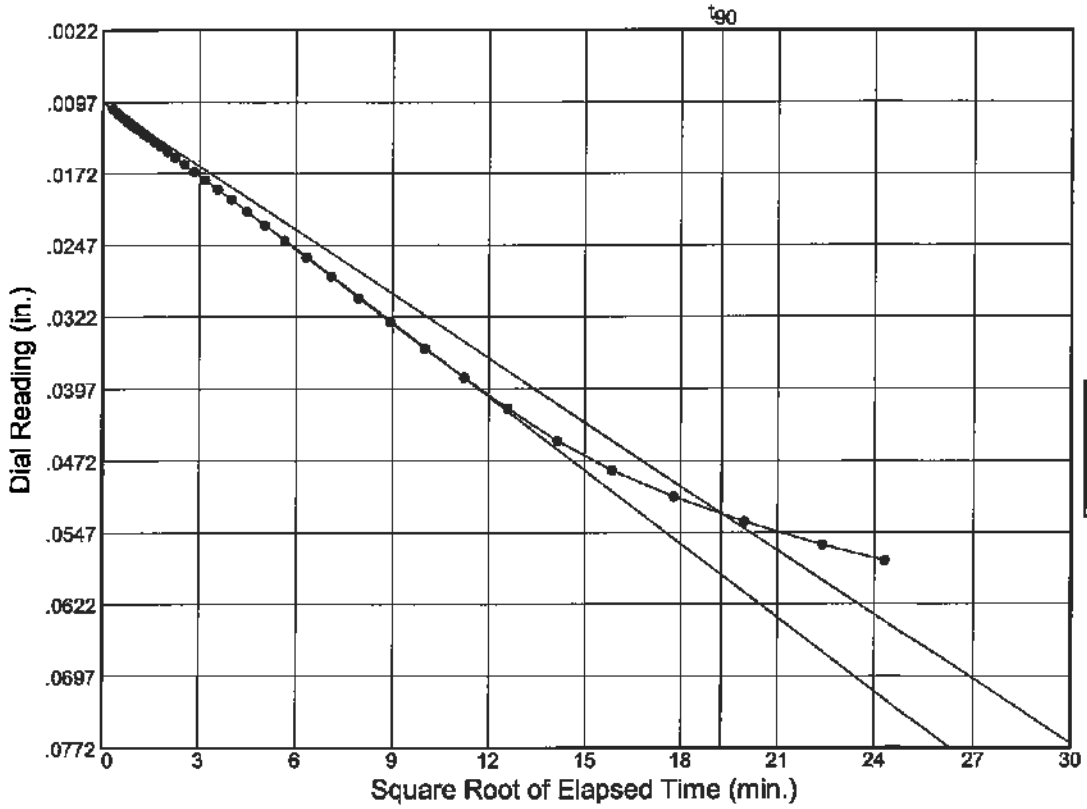
C_v @ T_{90}
0.01 ft.^{2}/day

Plate

Dial Reading vs. Time

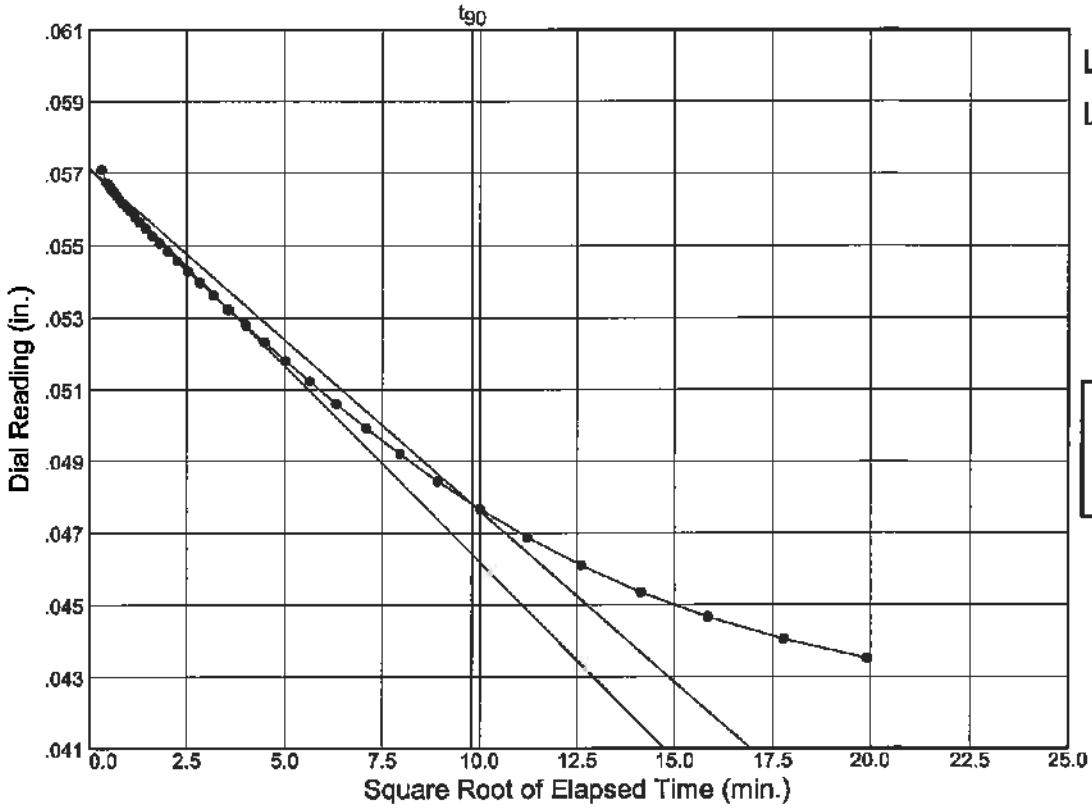
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 14
Load= 16.00 tsf
D_0 = 0.00974
D_{90} = 0.05271
D_{100} = 0.05748
T_{90} = 370.54 min.

C_v @ T_{90}
0.00 ft.^{2}/day



Load No.= 15
Load= 4.00 tsf
D_0 = 0.05714
D_{90} = 0.04781
D_{100} = 0.04677
T_{90} = 95.99 min.

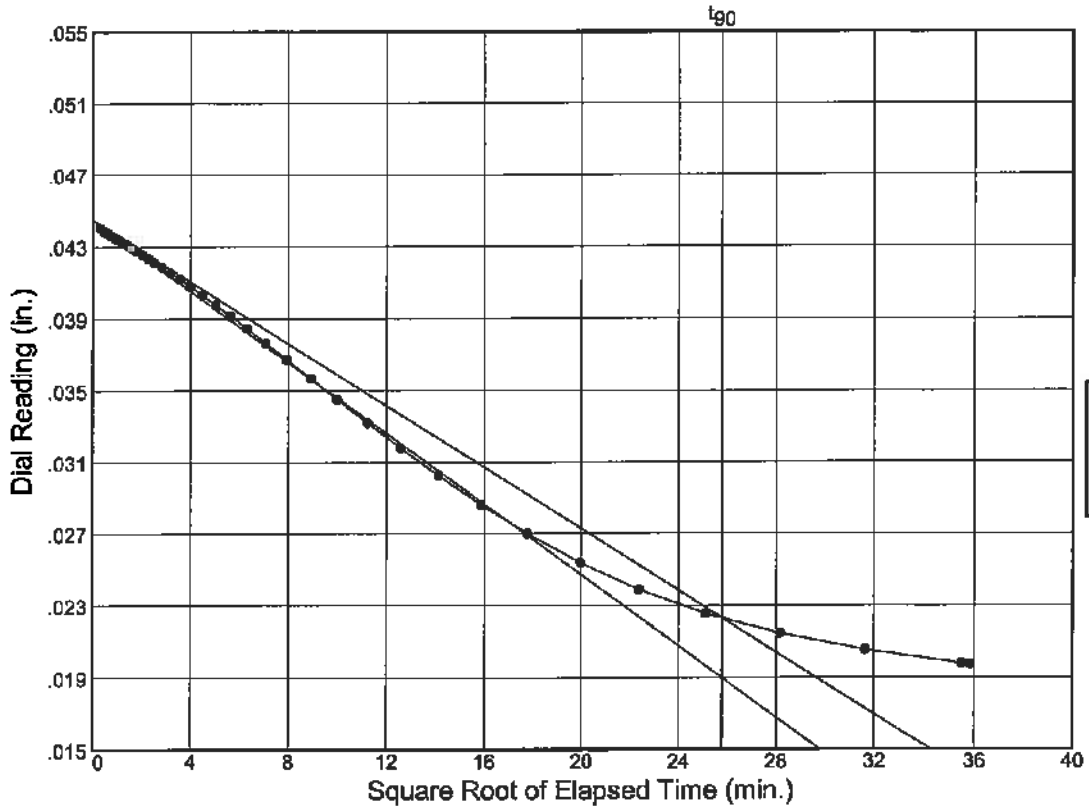
C_v @ T_{90}
0.02 ft.^{2}/day

Plate

Dial Reading vs. Time

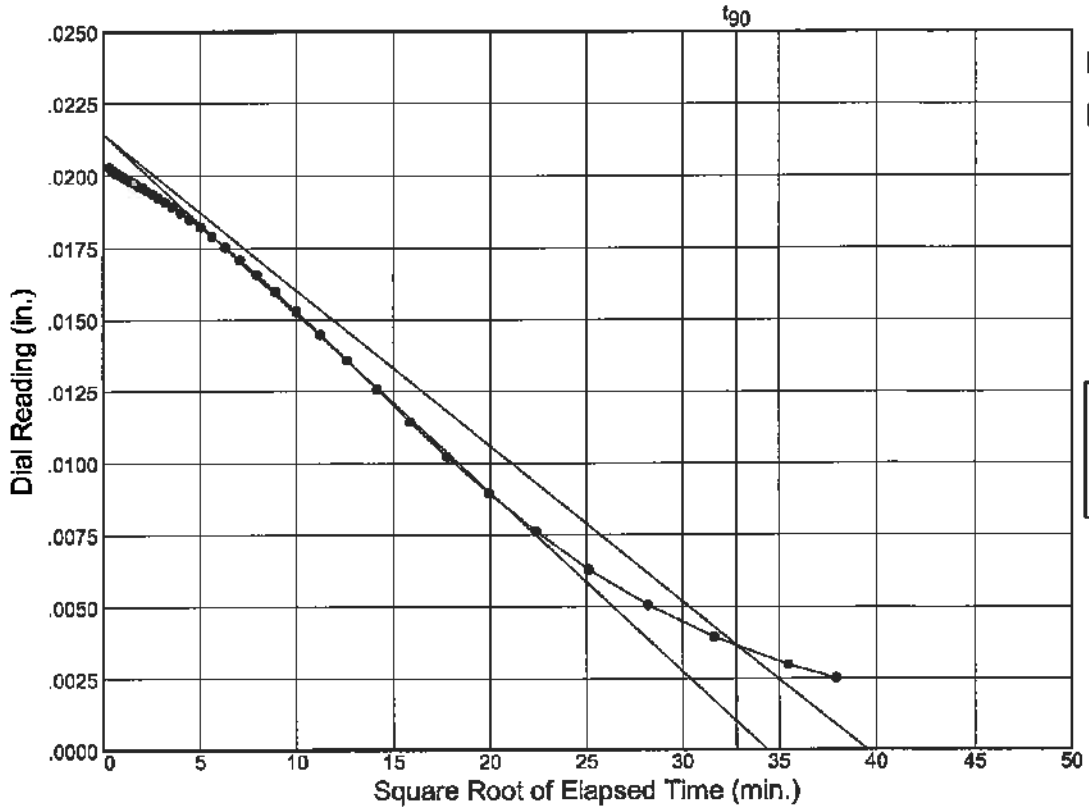
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 16
Load= 1.00 tsf
D_0 = 0.04449
D_{90} = 0.02229
D_{100} = 0.01982
T_{90} = 664.62 min.

C_v @ T_{90}
0.00 ft.^{2}/day



Load No.= 17
Load= 0.25 tsf
D_0 = 0.02144
D_{90} = 0.00366
D_{100} = 0.00168
T_{90} = 1075.91 min.

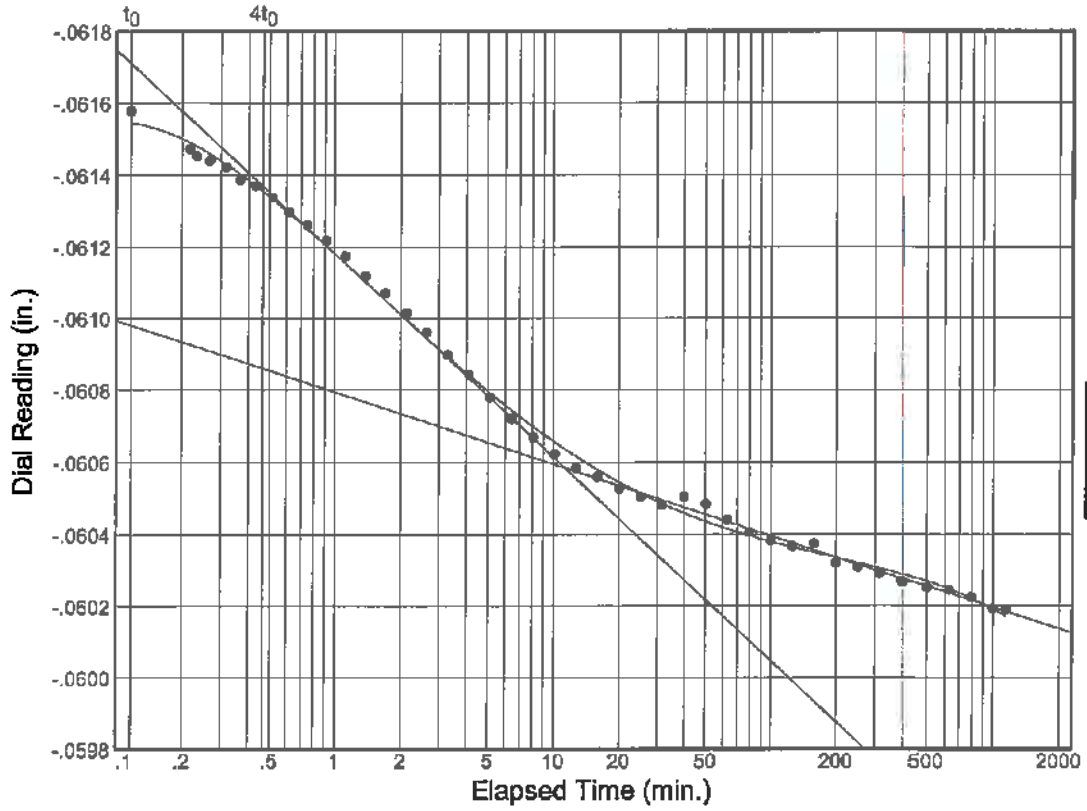
C_v @ T_{90}
0.00 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

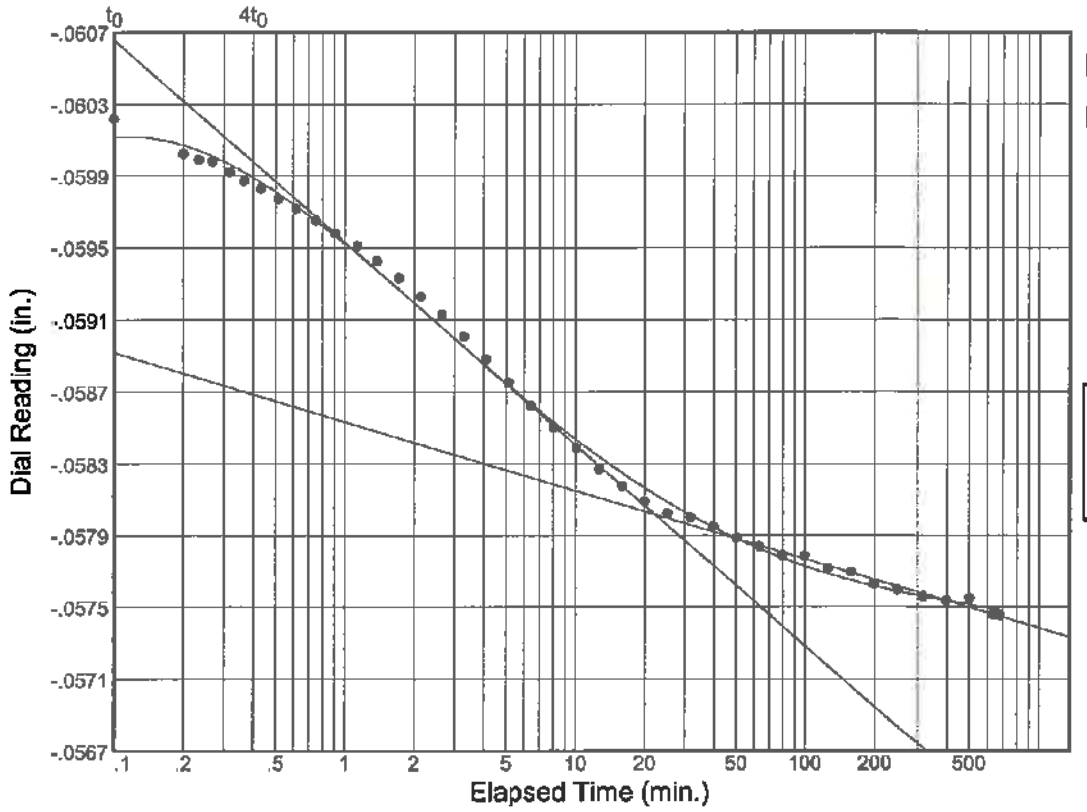
Location: WB-49 27'-29'



Load No.= 4
Load= 1.00 tsf
D_0 = -0.06174
D_{50} = -0.06116
D_{100} = -0.06058
T_{50} = 1.09 min.

C_v @ T_{50}
0.45 ft.^{2}/day

C_α = 0.000



Load No.= 5
Load= 2.00 tsf
D_0 = -0.06034
D_{50} = -0.05918
D_{100} = -0.05802
T_{50} = 2.07 min.

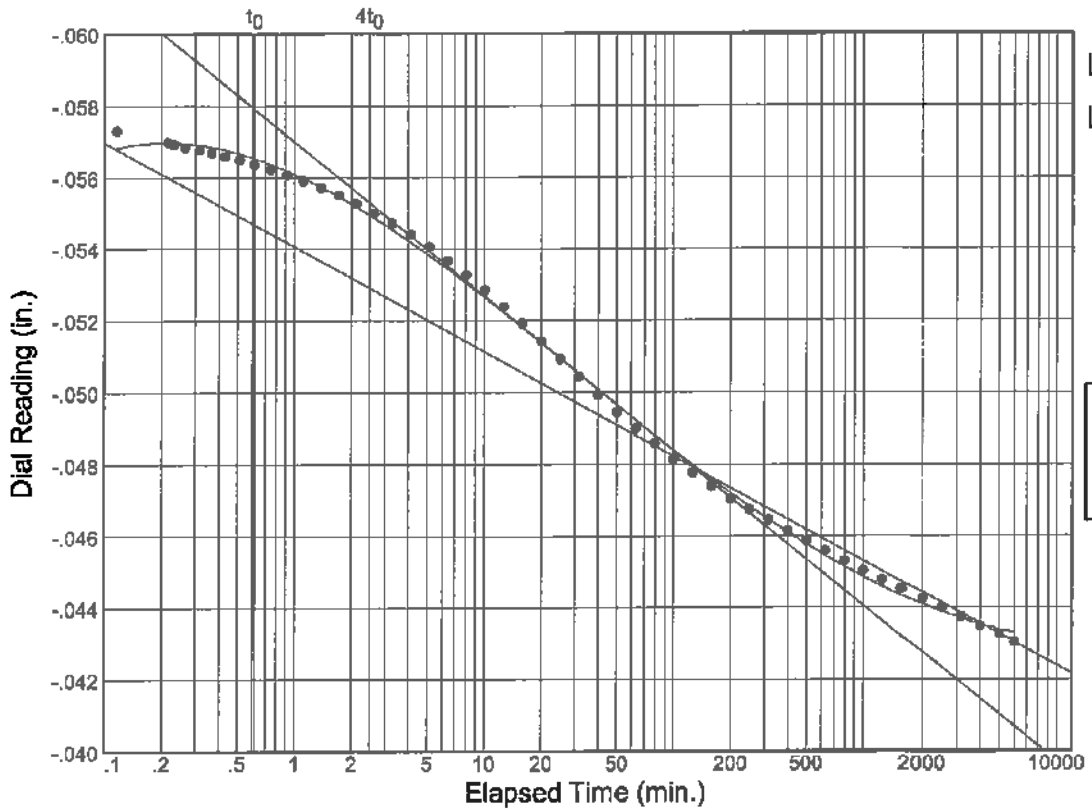
C_v @ T_{50}
0.24 ft.^{2}/day

C_α = 0.000

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-49 27'-29'



Load No.= 6

Load= 4.00 tsf

D_0 = -0.05812

D_{50} = -0.05301

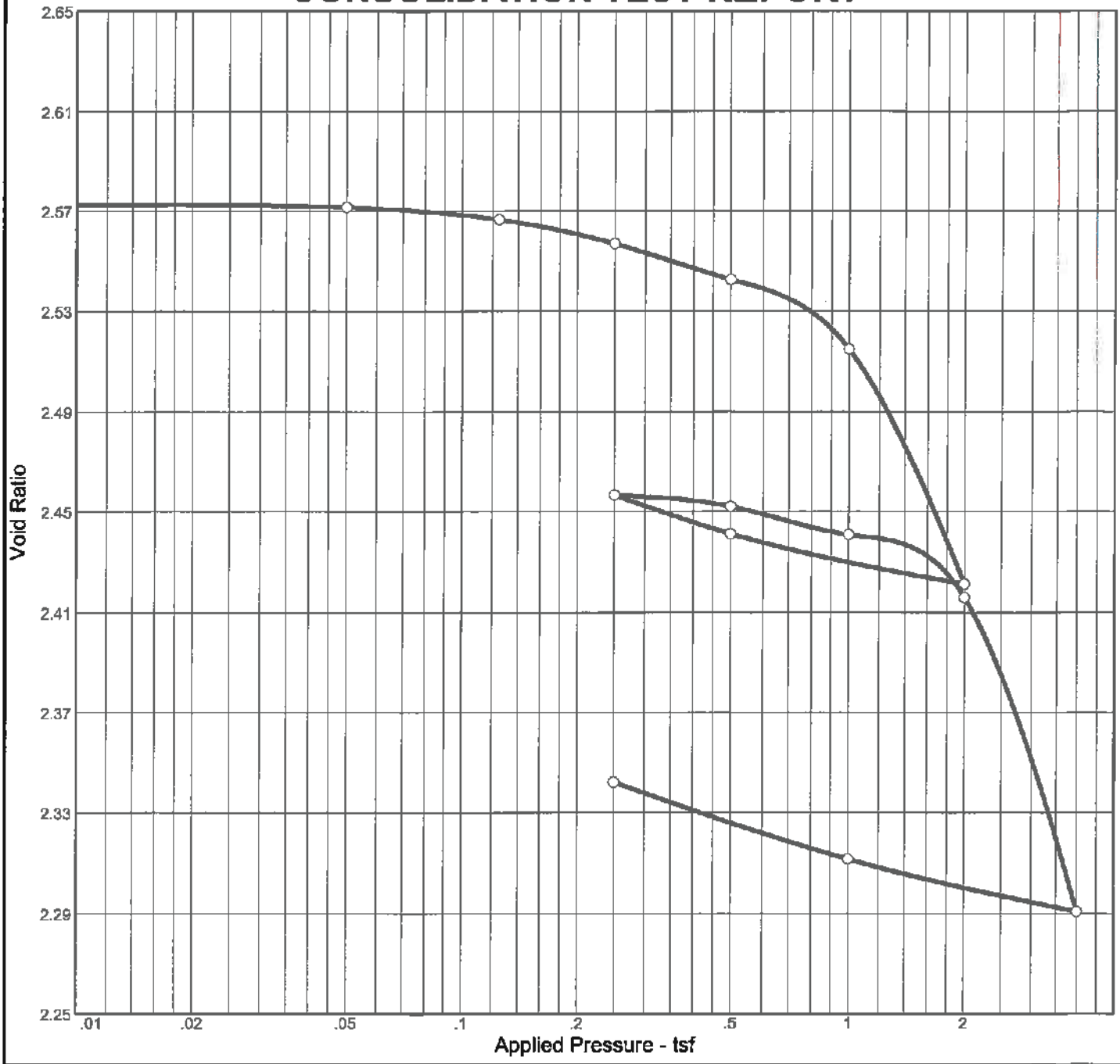
D_{100} = -0.04791

T_{50} = 8.18 min.

C_v @ T_{50}
0.06 ft.^{2}/day

C_α = 0.003

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
Sat.	Moist.											
95.1 %	120.4 %	35.4			2.03	0.49	1.06	0.38	0.04			2.572

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Mucky Fine Sand	(PT)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'

Remarks:

Organic Content= 27.8%
Percent Fines= 49.6%

CONSOLIDATION TEST REPORT

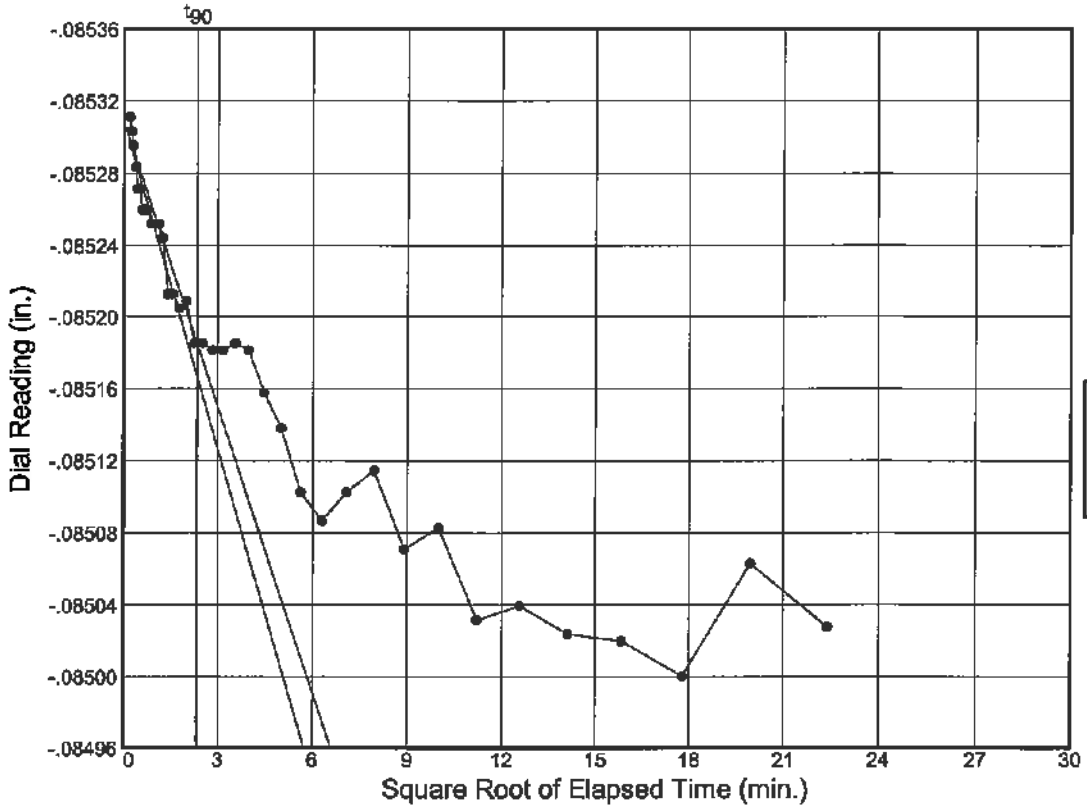
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

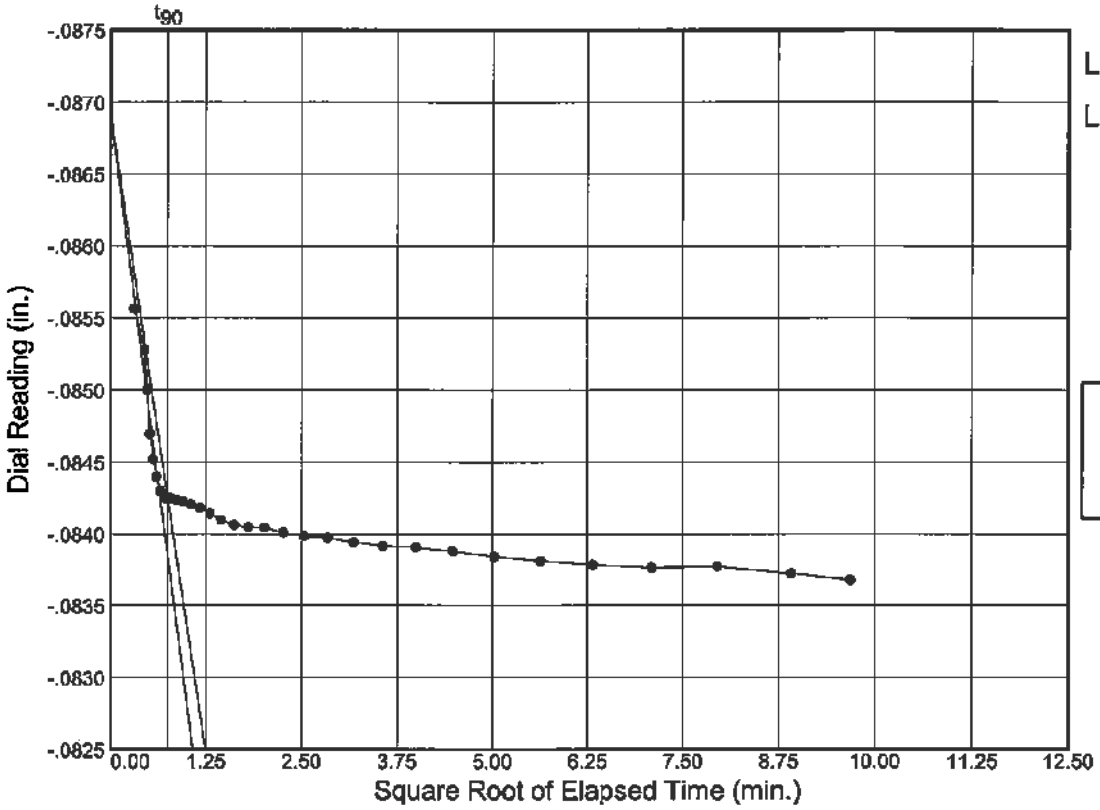
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.08531
D_{90} = -0.08519
D_{100} = -0.08517
T_{90} = 5.41 min.

C_v @ T_{90}
0.39 ft.^{2}/day



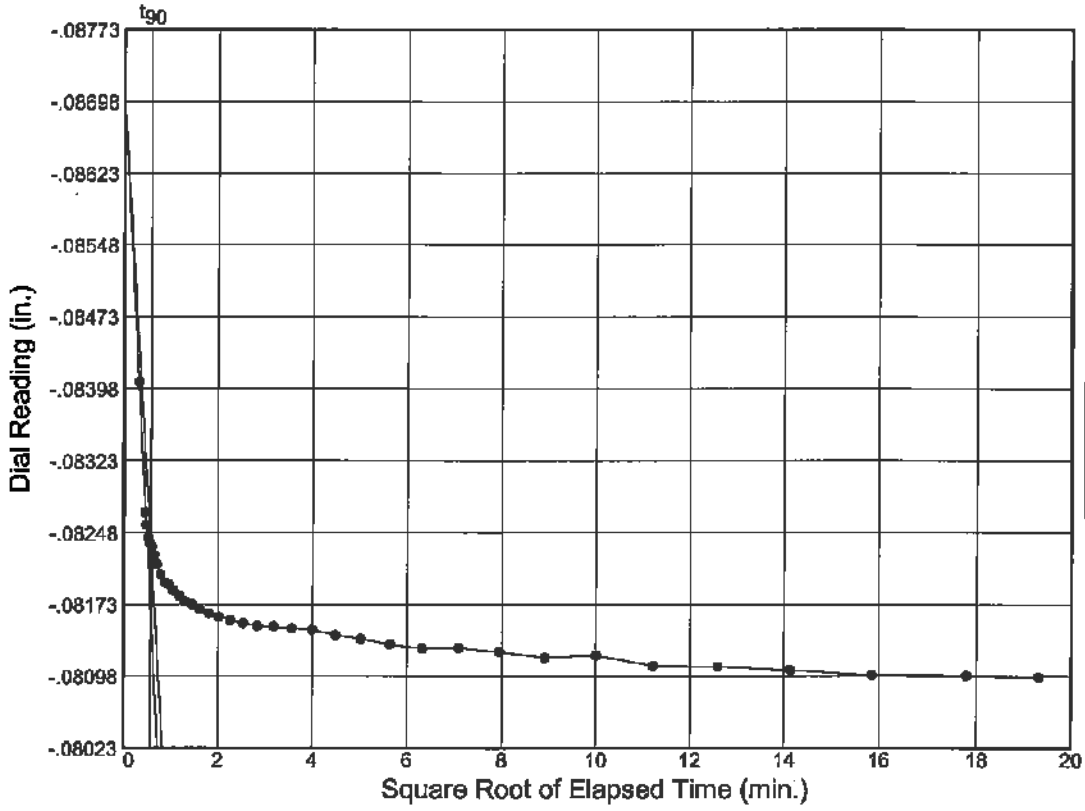
Load No.= 2
Load= 0.13 tsf
D_0 = -0.08692
D_{90} = -0.08425
D_{100} = -0.08395
T_{90} = 0.56 min.

C_v @ T_{90}
3.75 ft.^{2}/day

Dial Reading vs. Time

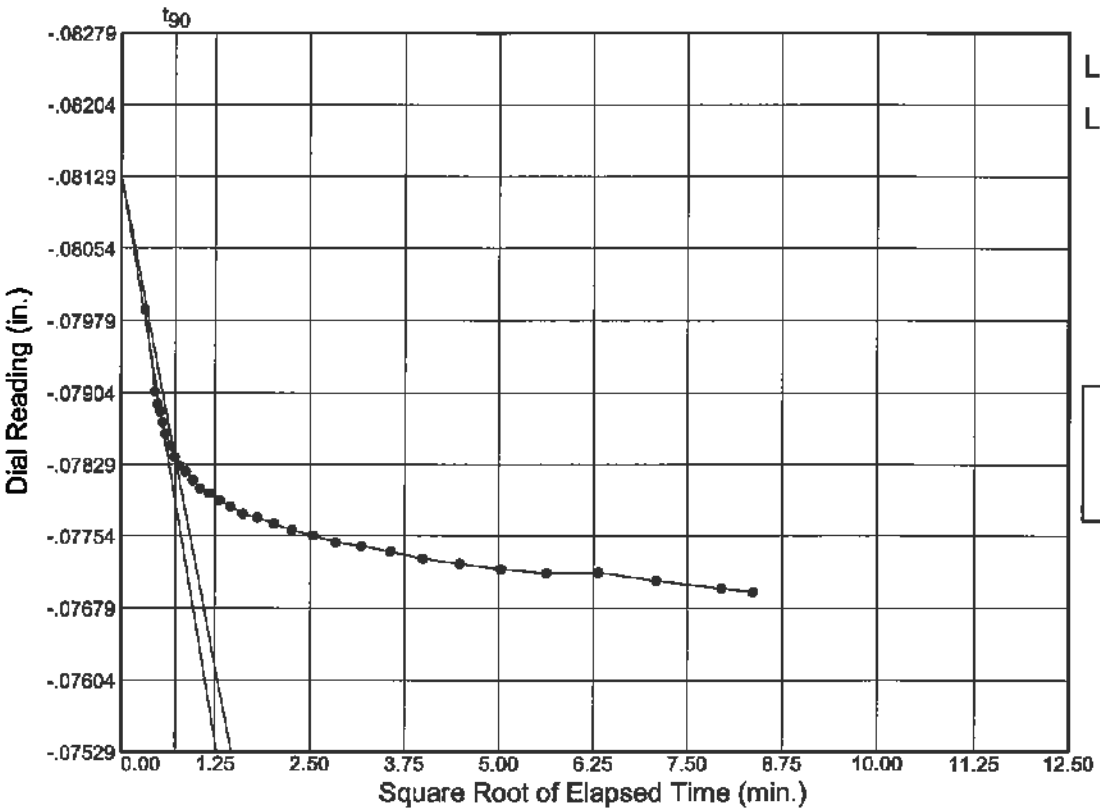
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 3
Load= 0.25 tsf
D_0 = -0.08698
D_{90} = -0.08236
D_{100} = -0.08184
T_{90} = 0.32 min.

C_v @ T_{90}
6.50 ft.^{2}/day



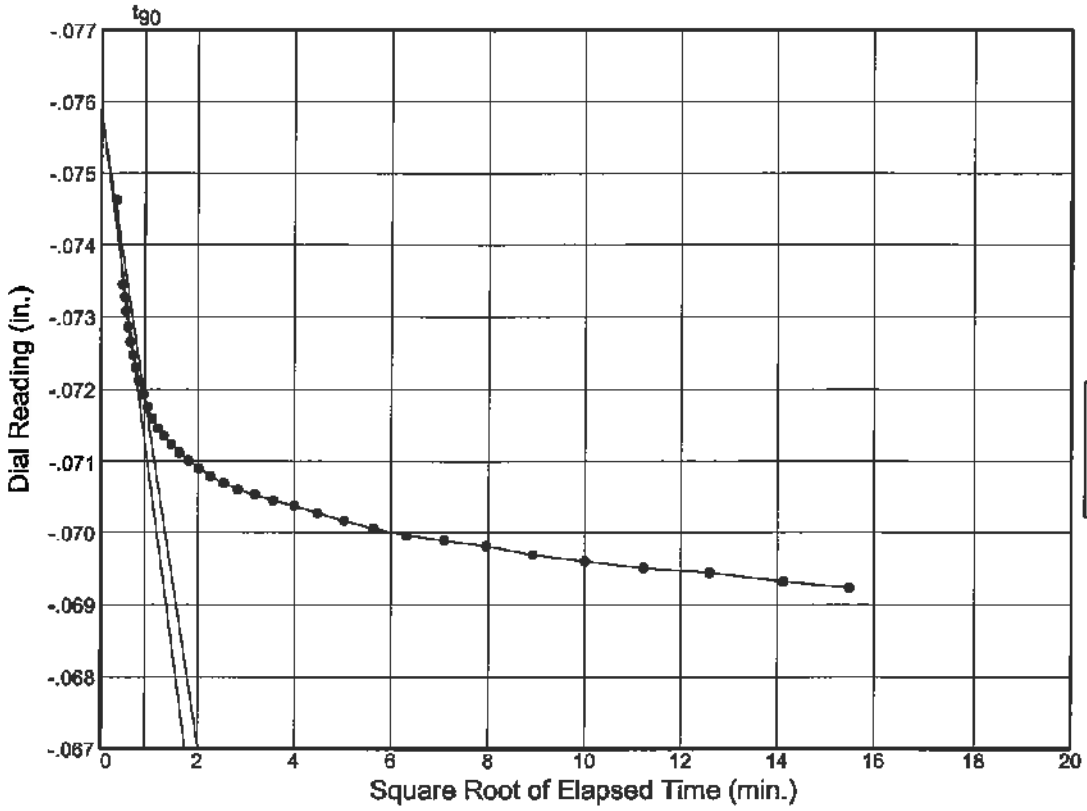
Load No.= 4
Load= 0.50 tsf
D_0 = -0.08129
D_{90} = -0.07835
D_{100} = -0.07802
T_{90} = 0.51 min.

C_v @ T_{90}
4.07 ft.^{2}/day

Dial Reading vs. Time

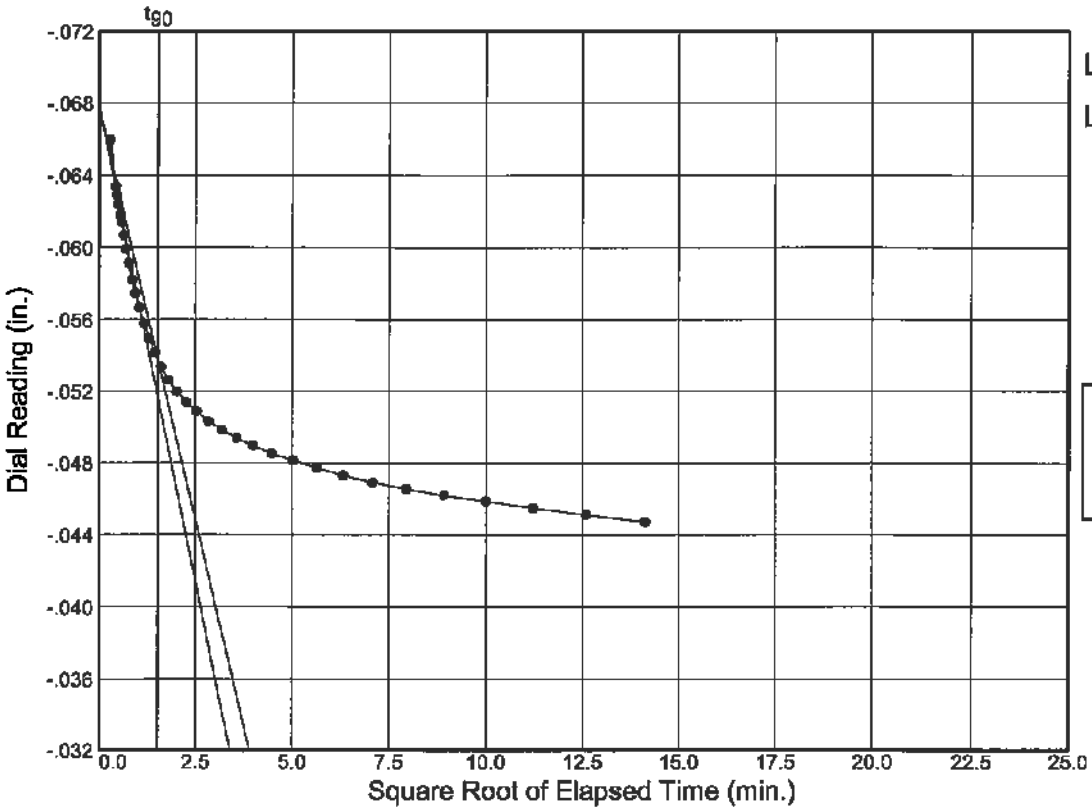
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 5
Load= 1.00 tsf
D_0 = -0.07584
D_{90} = -0.07185
D_{100} = -0.07141
T_{90} = 0.82 min.

C_v @ T_{90}
2.52 ft.^{2}/day



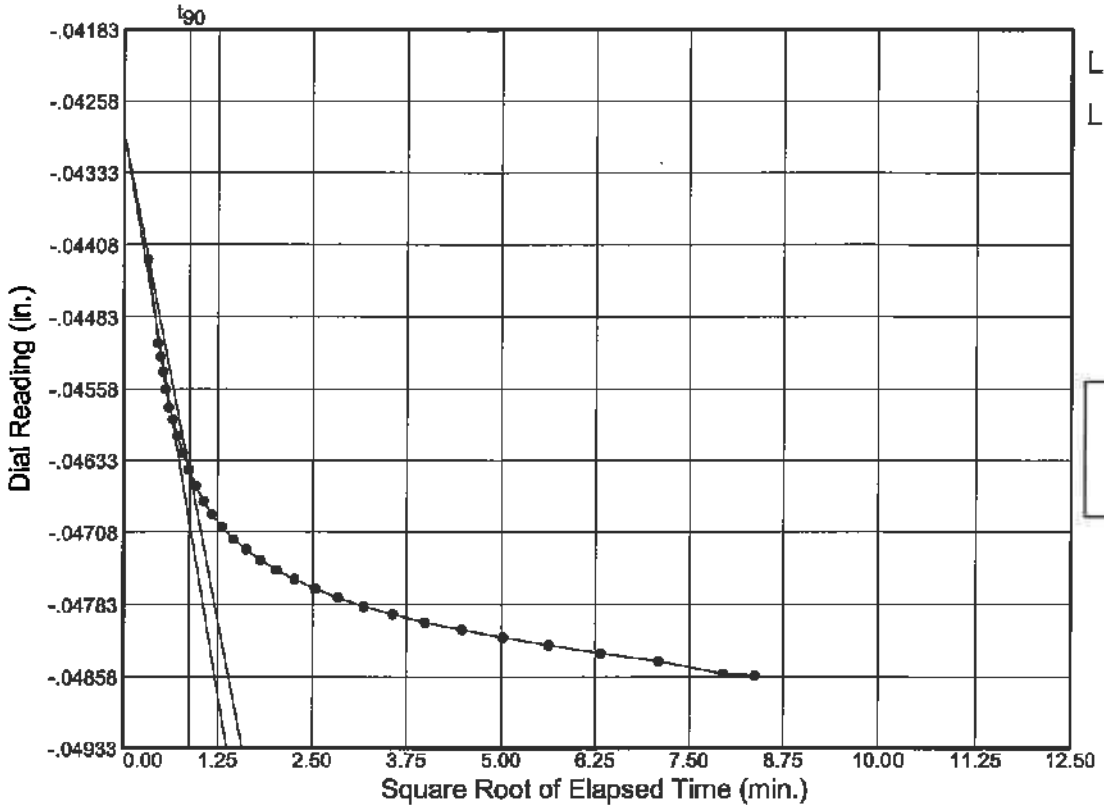
Load No.= 6
Load= 2.00 tsf
D_0 = -0.06777
D_{90} = -0.05378
D_{100} = -0.05223
T_{90} = 2.33 min.

C_v @ T_{90}
0.86 ft.^{2}/day

Dial Reading vs. Time

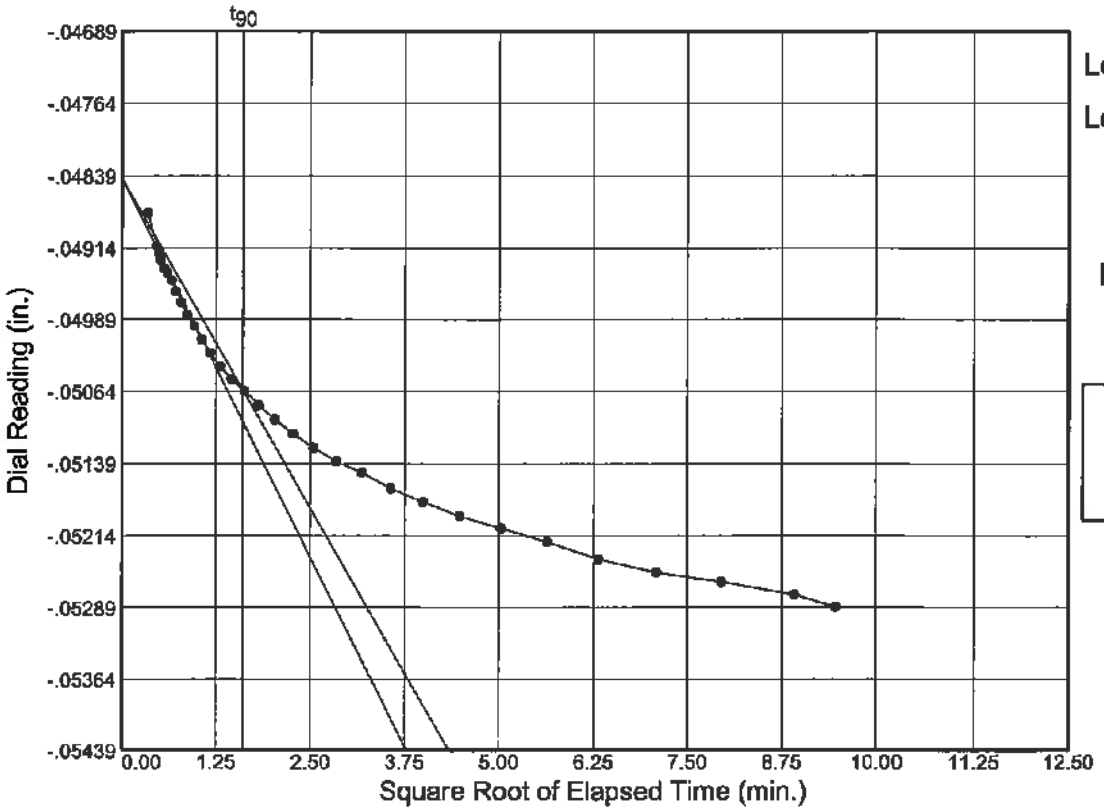
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 7
Load= 0.50 tsf
D_0 = -0.04293
D_{90} = -0.04645
D_{100} = -0.04684
T_{90} = 0.75 min.

C_v @ T_{90}
2.61 ft.^{2}/day



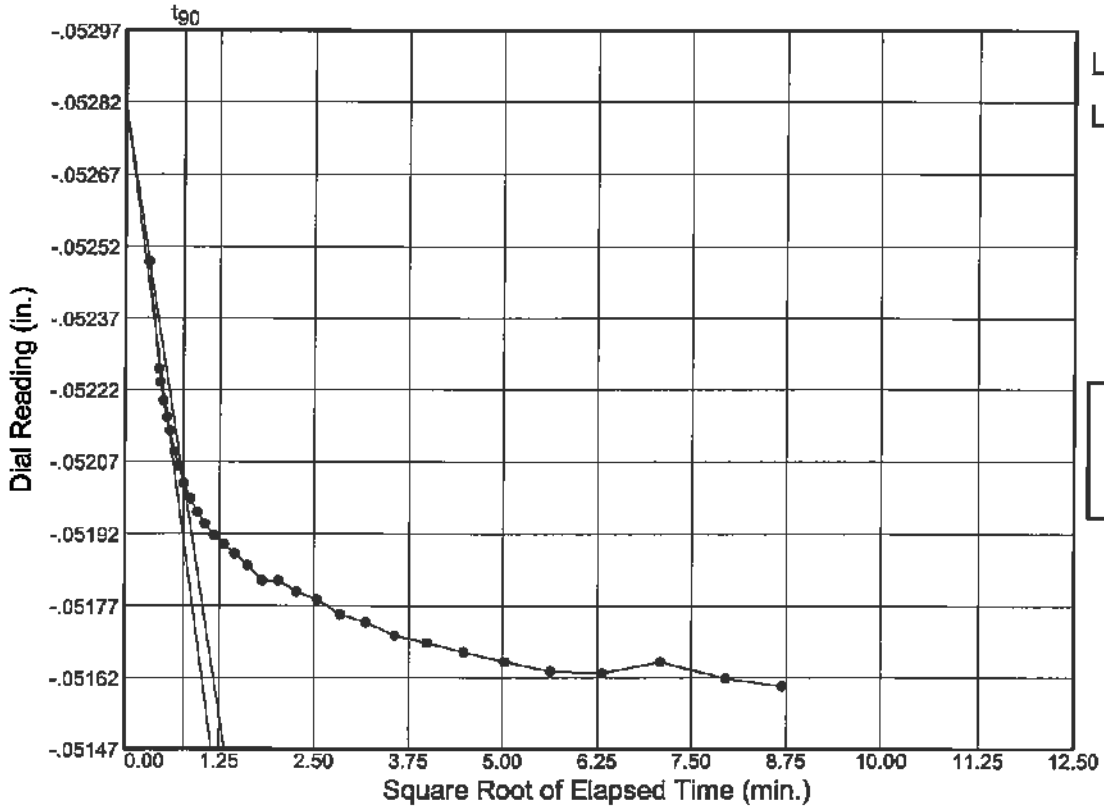
Load No.= 8
Load= 0.25 tsf
D_0 = -0.04842
D_{90} = -0.05062
D_{100} = -0.05087
T_{90} = 2.57 min.

C_v @ T_{90}
0.77 ft.^{2}/day

Dial Reading vs. Time

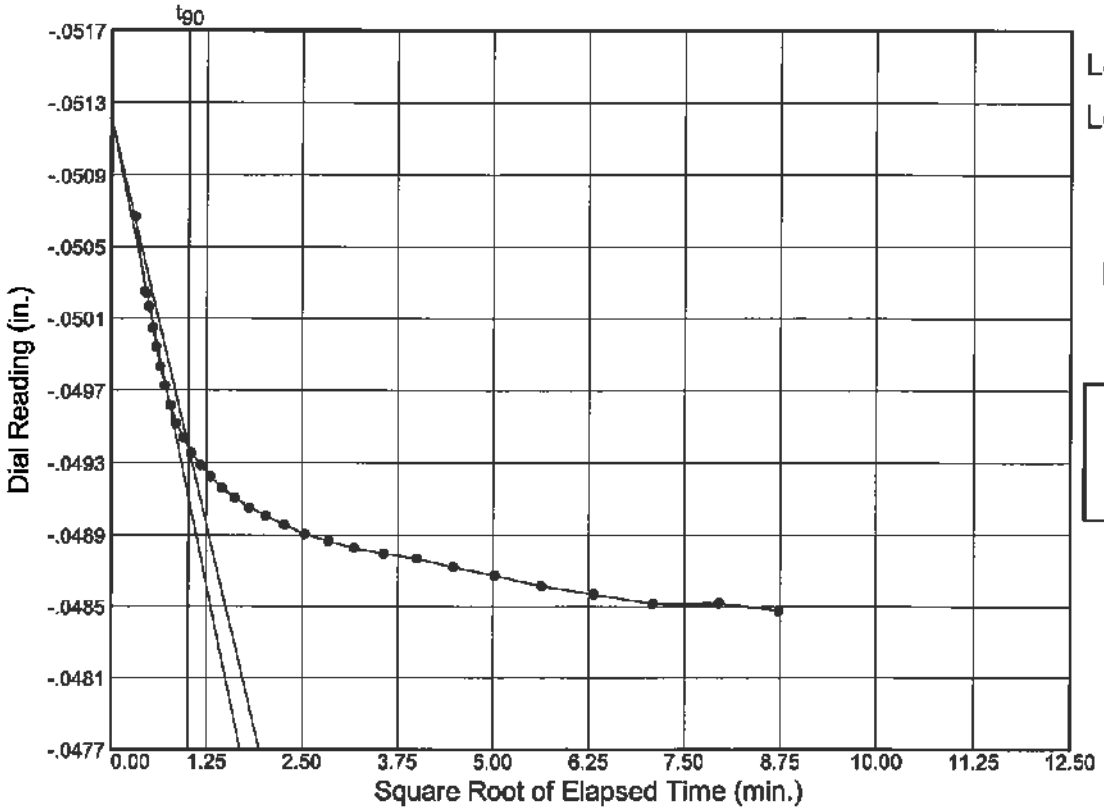
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.05281
D_{90} = -0.05202
D_{100} = -0.05194
T_{90} = 0.60 min.

C_v @ T_{90}
3.32 ft.^{2}/day



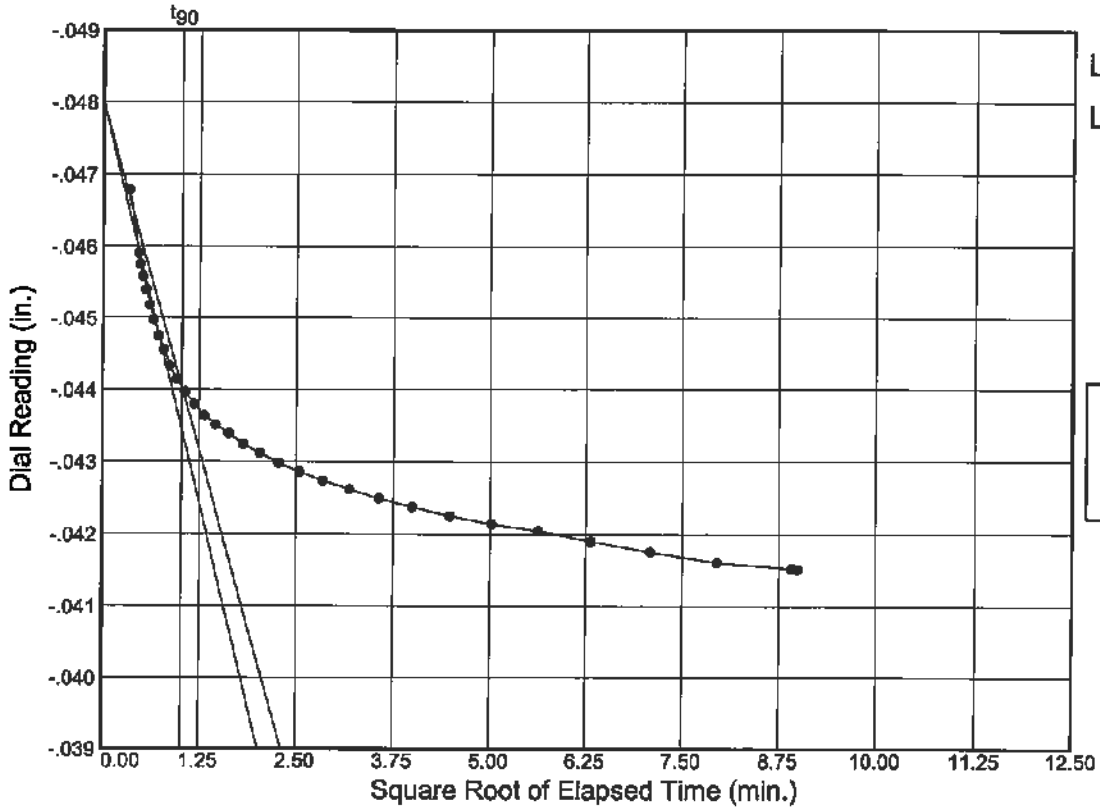
Load No.= 10
Load= 1.00 tsf
D_0 = -0.05122
D_{90} = -0.04939
D_{100} = -0.04918
T_{90} = 1.02 min.

C_v @ T_{90}
1.93 ft.^{2}/day

Dial Reading vs. Time

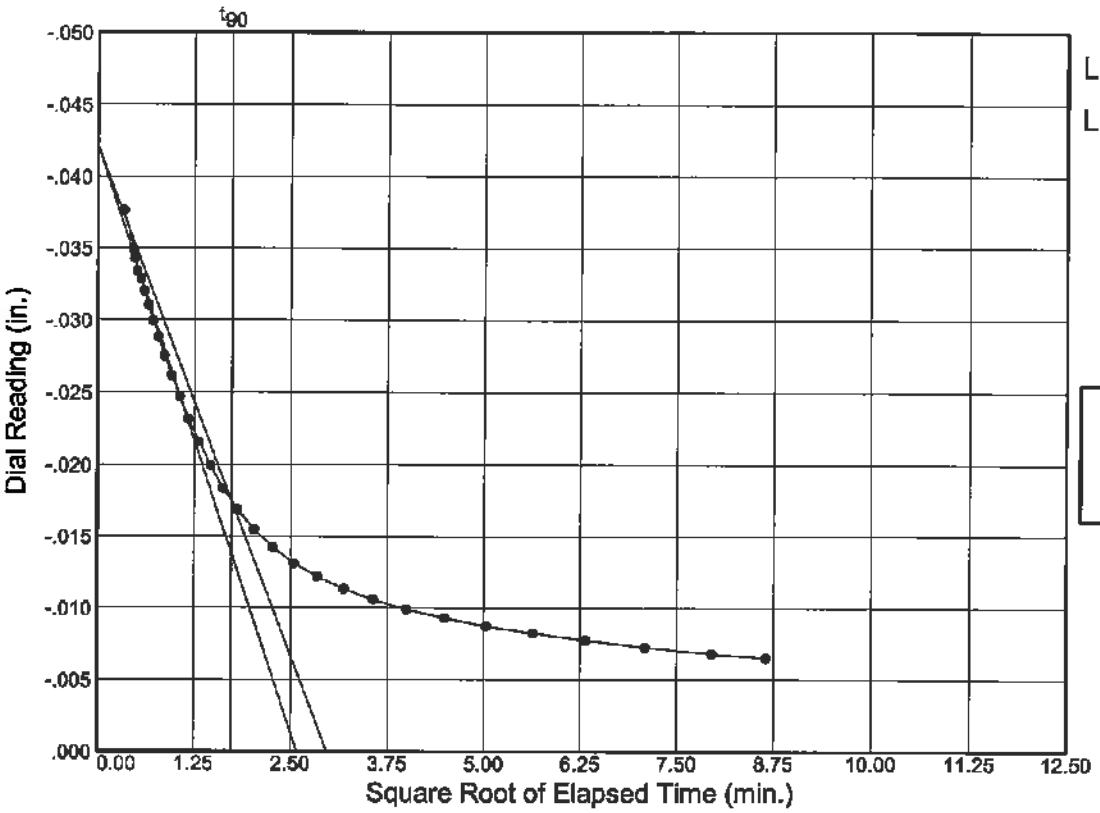
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.04800
D_{90} = -0.04403
D_{100} = -0.04359
T_{90} = 1.04 min.

C_v @ T_{90}
1.88 ft.^{2}/day



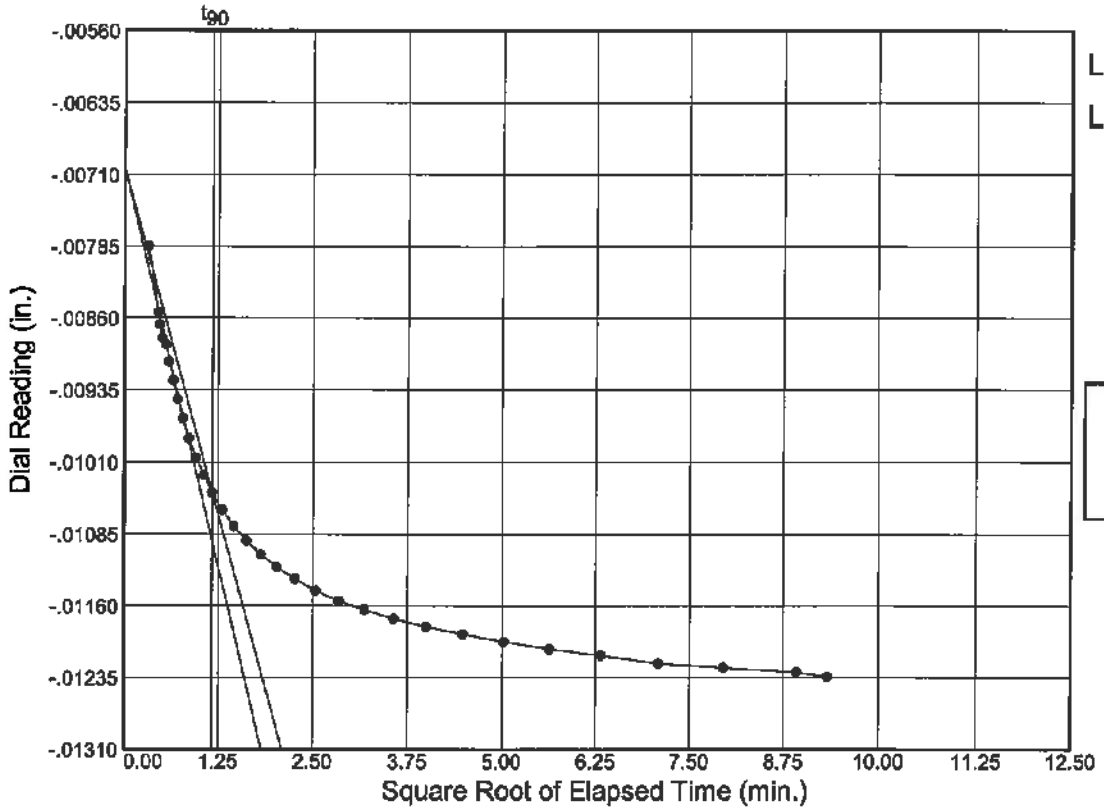
Load No.= 12
Load= 4.00 tsf
D_0 = -0.04210
D_{90} = -0.01752
D_{100} = -0.01479
T_{90} = 3.00 min.

C_v @ T_{90}
0.62 ft.^{2}/day

Dial Reading vs. Time

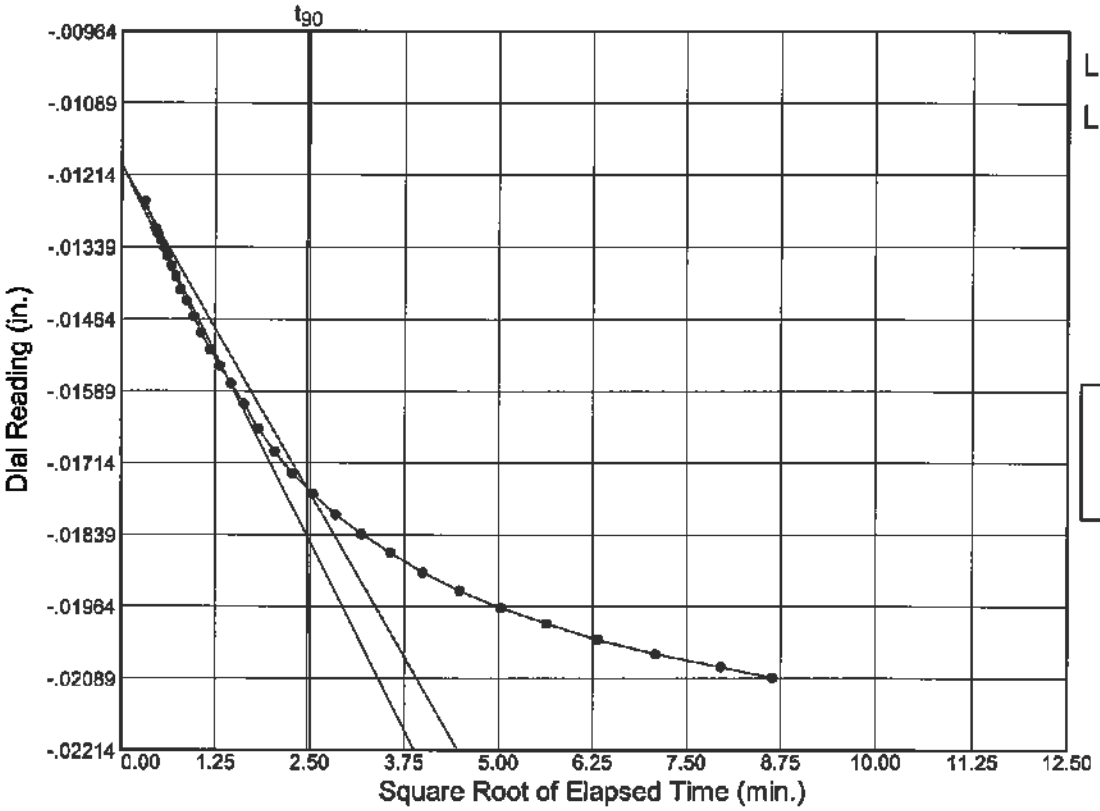
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 13
Load= 1.00 tsf
D_0 = -0.00704
D_{90} = -0.01042
D_{100} = -0.01079
T_{90} = 1.36 min.

C_v @ T_{90}
1.32 ft.^{2}/day



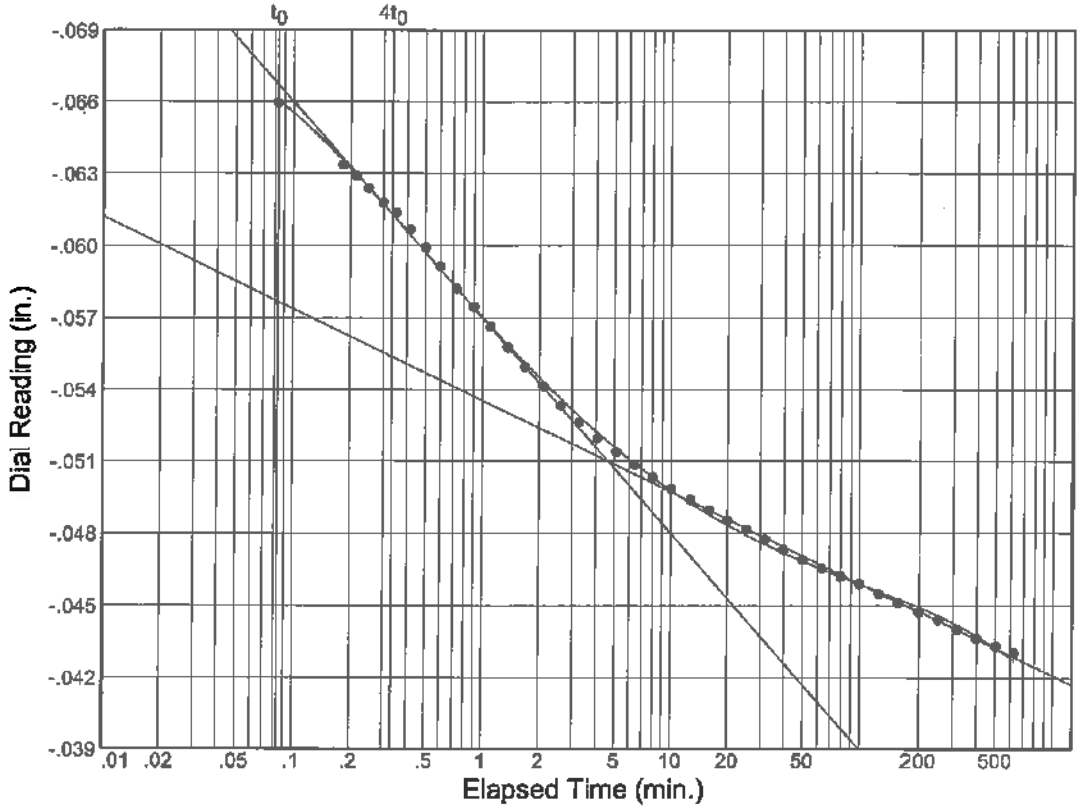
Load No.= 14
Load= 0.25 tsf
D_0 = -0.01196
D_{90} = -0.01759
D_{100} = -0.01821
T_{90} = 6.09 min.

C_v @ T_{90}
0.30 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

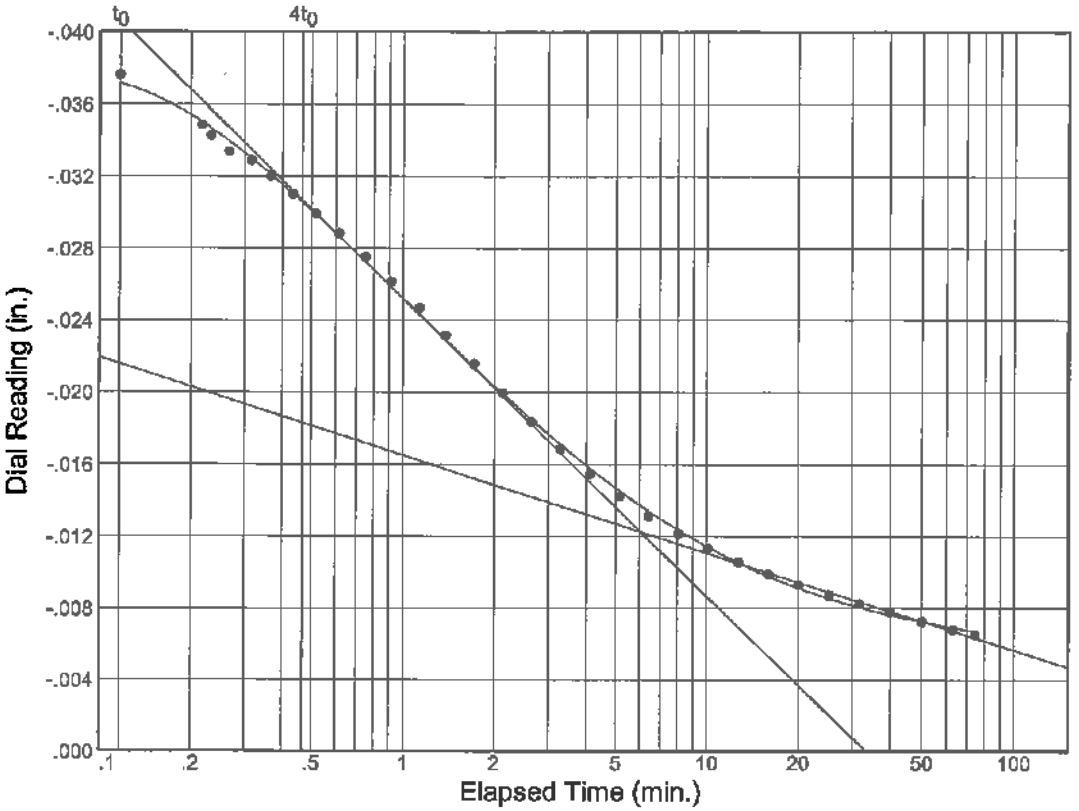
Location: BR-24 20.5'-22.5'



Load No.= 6
Load= 2.00 tsf
D_0 = -0.07084
D_{50} = -0.06092
D_{100} = -0.05100
T_{50} = 0.37 min.

C_v @ T_{50}
1.27 ft.^{2}/day

C_α = 0.004



Load No.= 12
Load= 4.00 tsf
D_0 = -0.04375
D_{50} = -0.02801
D_{100} = -0.01227
T_{50} = 0.67 min.

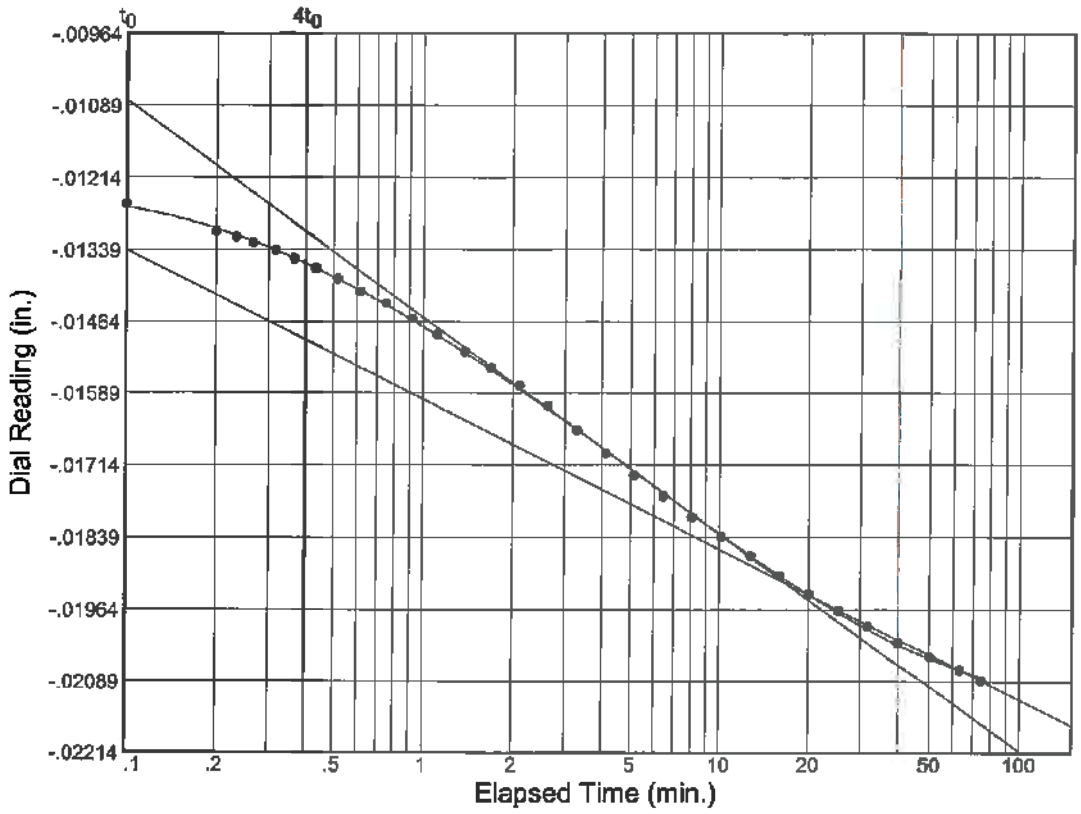
C_v @ T_{50}
0.65 ft.^{2}/day

C_α = 0.006

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-24 20.5'-22.5'



Load No.= 14

Load= 0.25 tsf

D_0 = -0.01166

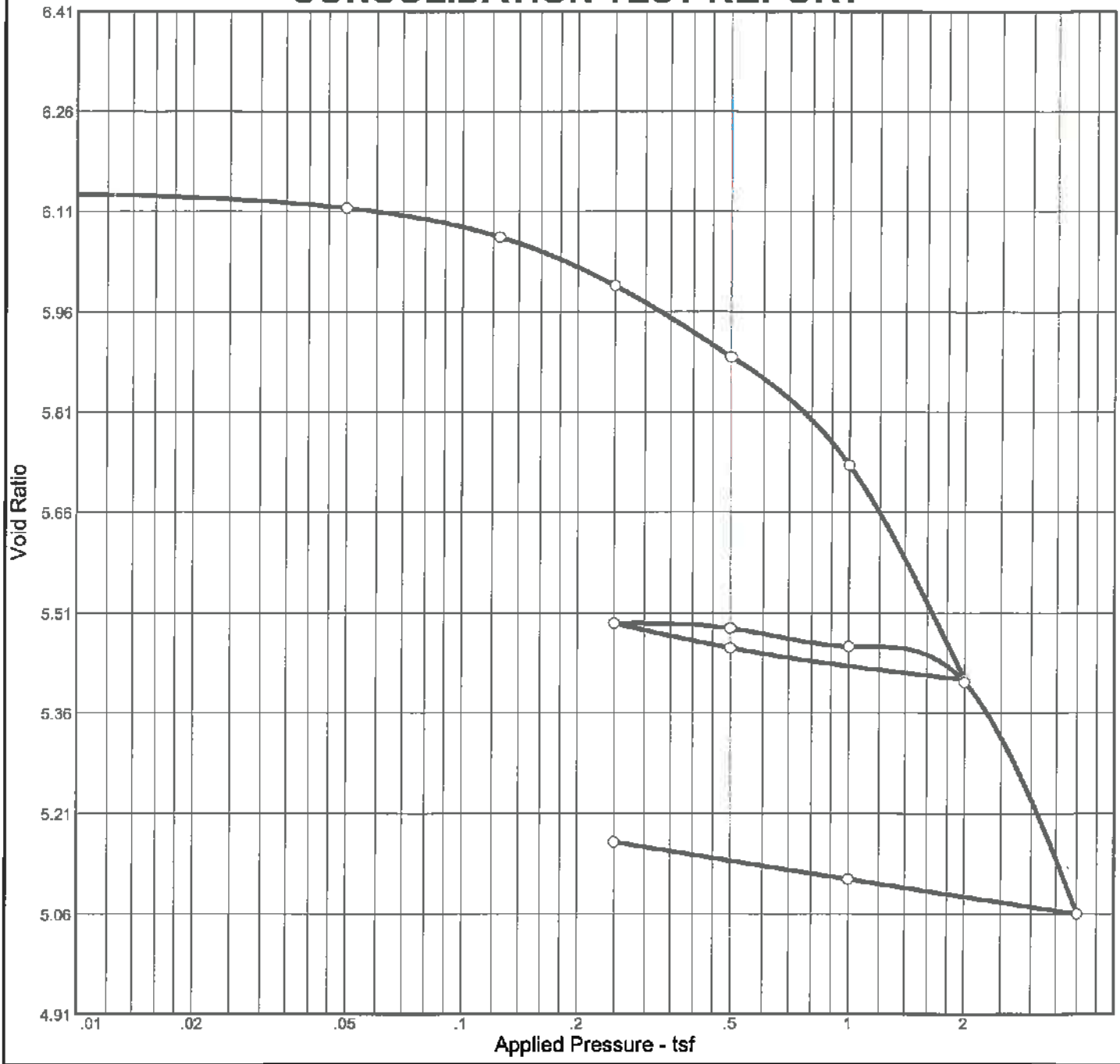
D_{50} = -0.01543

D_{100} = -0.01919

T_{50} = 1.63 min.

C_v @ T_{50}
0.26 ft.^{2}/day

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
Sat.	Moist.											
100.7 %	412.1 %	13.1			1.50	0.54	0.73	1.14	0.11			6.136

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Muck	(PT)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: MB-10 20'-22'

Remarks:

Fines Content=93.6%

Organic Content= 78.2%

CONSOLIDATION TEST REPORT

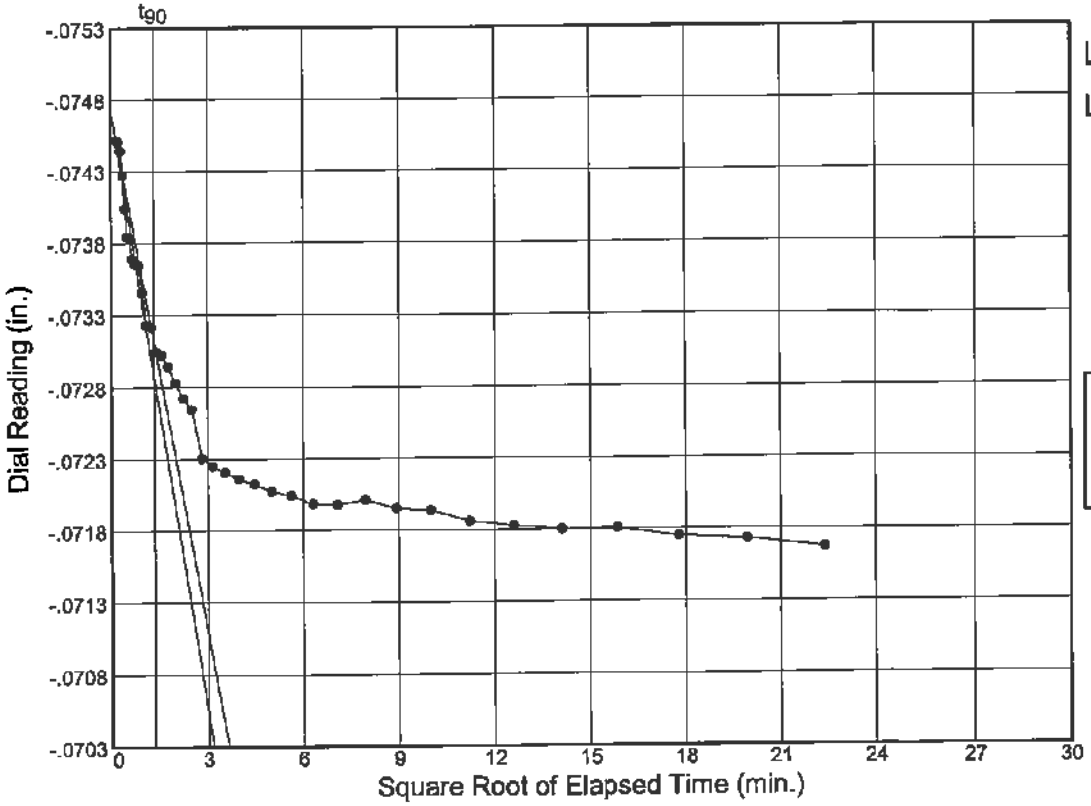
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

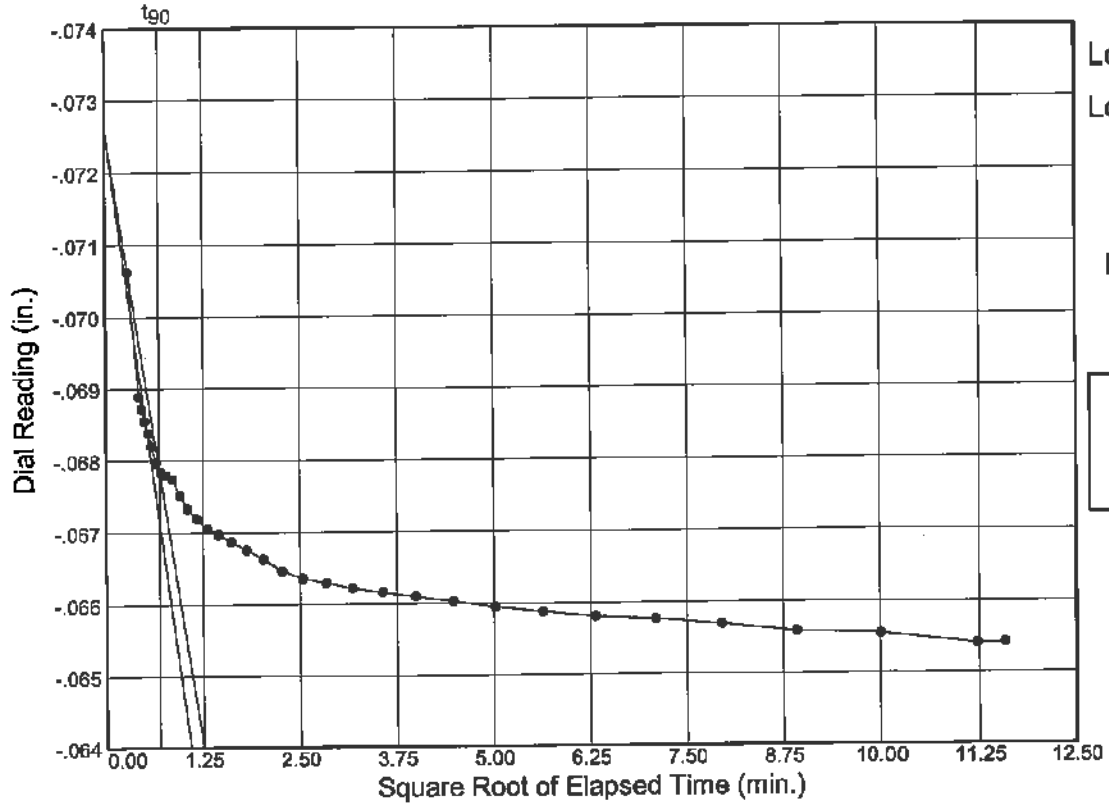
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.07473
D_{90} = -0.07312
D_{100} = -0.07294
T_{90} = 1.77 min.

C_v @ T_{90}
1.20 ft.^{2}/day



Load No.= 2
Load= 0.13 tsf
D_0 = -0.07262
D_{90} = -0.06788
D_{100} = -0.06735
T_{90} = 0.47 min.

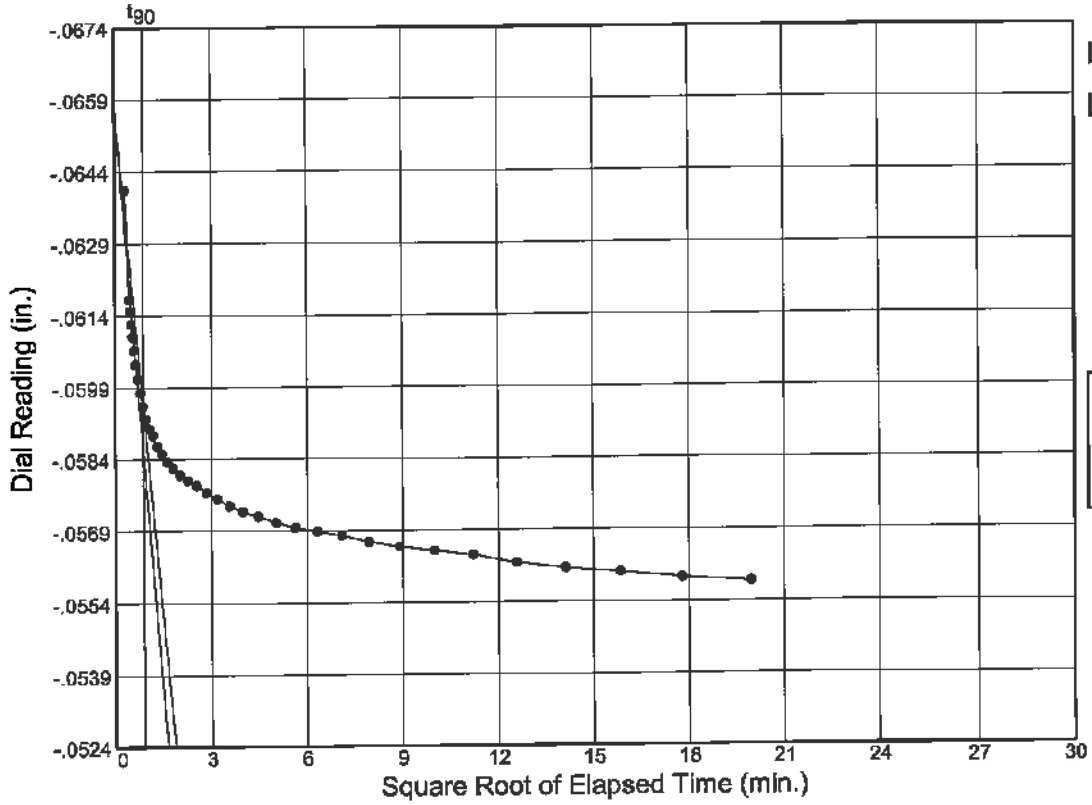
C_v @ T_{90}
4.43 ft.^{2}/day

Plate

Dial Reading vs. Time

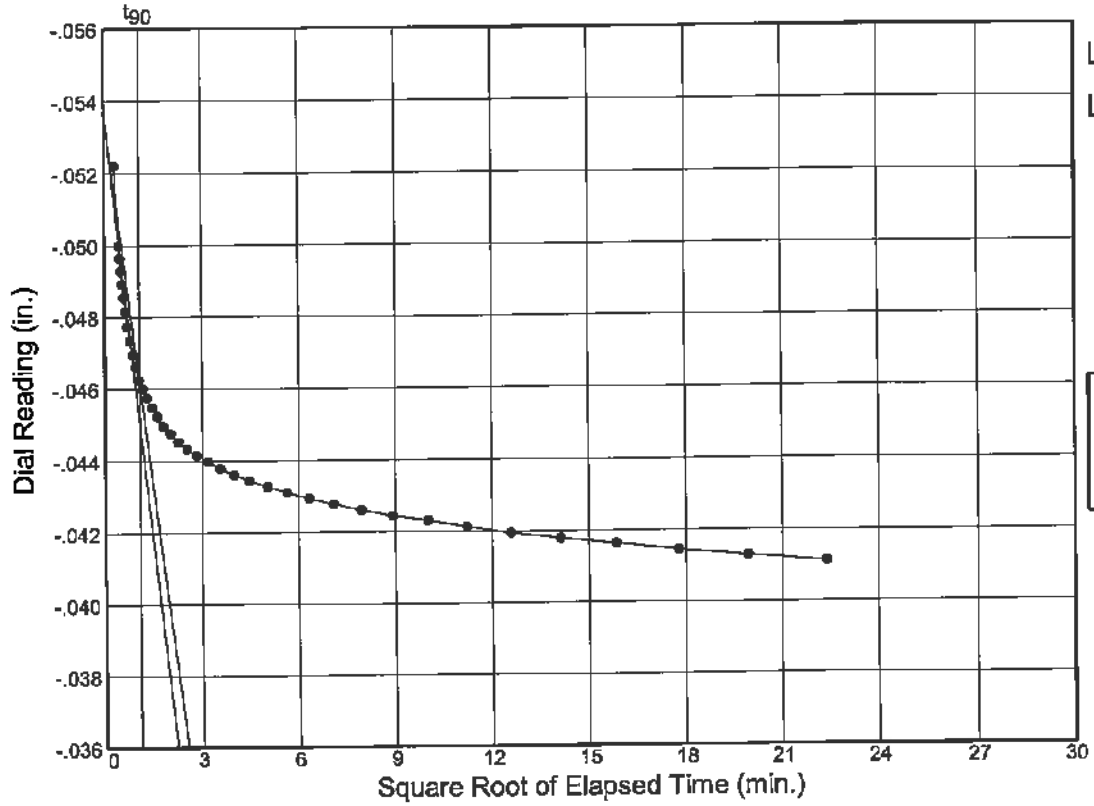
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 3
Load= 0.25 tsf
D_0 = -0.06581
D_{90} = -0.05947
D_{100} = -0.05877
T_{90} = 0.77 min.

C_v @ T_{90}
2.68 ft.^{2}/day



Load No.= 4
Load= 0.50 tsf
D_0 = -0.05370
D_{90} = -0.04620
D_{100} = -0.04536
T_{90} = 1.15 min.

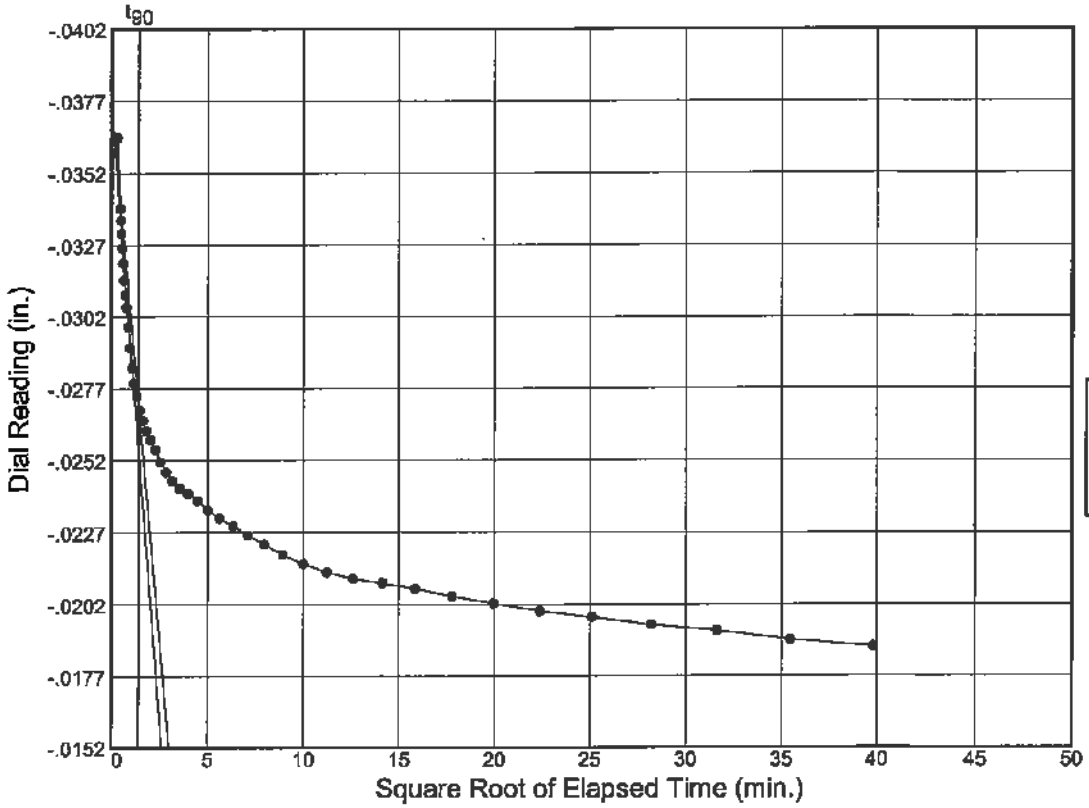
C_v @ T_{90}
1.74 ft.^{2}/day

Plate

Dial Reading vs. Time

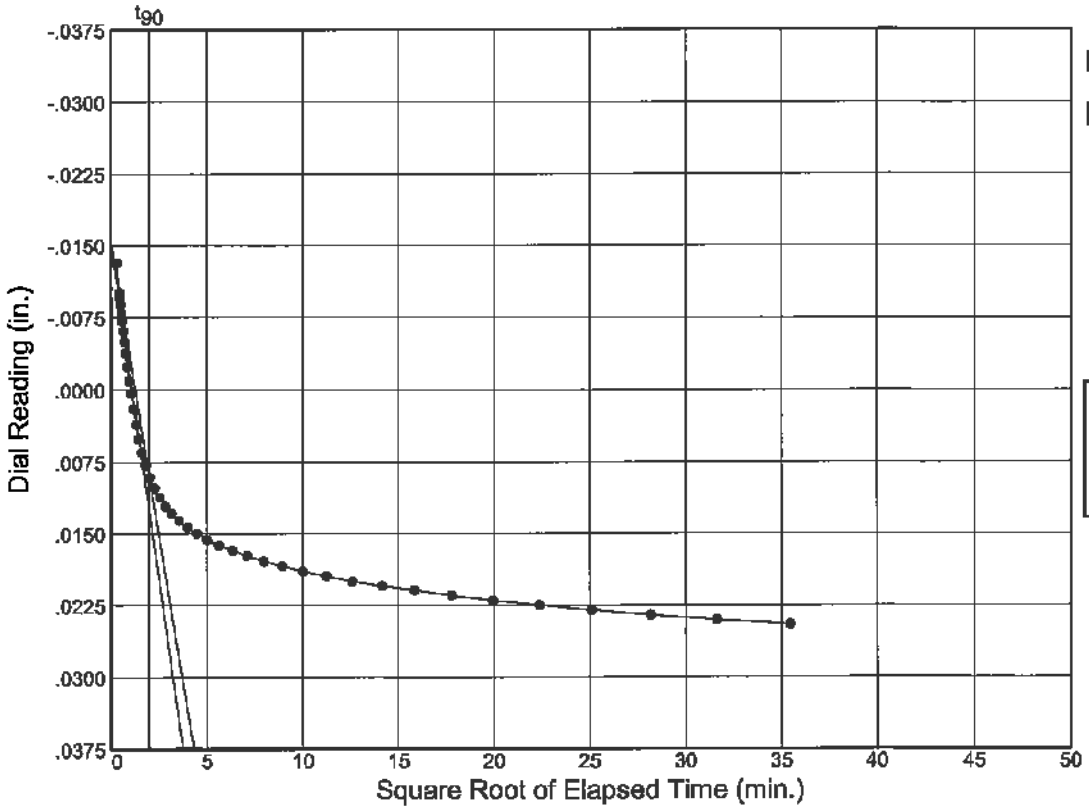
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 5
Load= 1.00 tsf
D_0 = -0.03766
D_{90} = -0.02706
D_{100} = -0.02588
T_{90} = 2.01 min.

C_v @ T_{90}
0.96 ft.^{2}/day



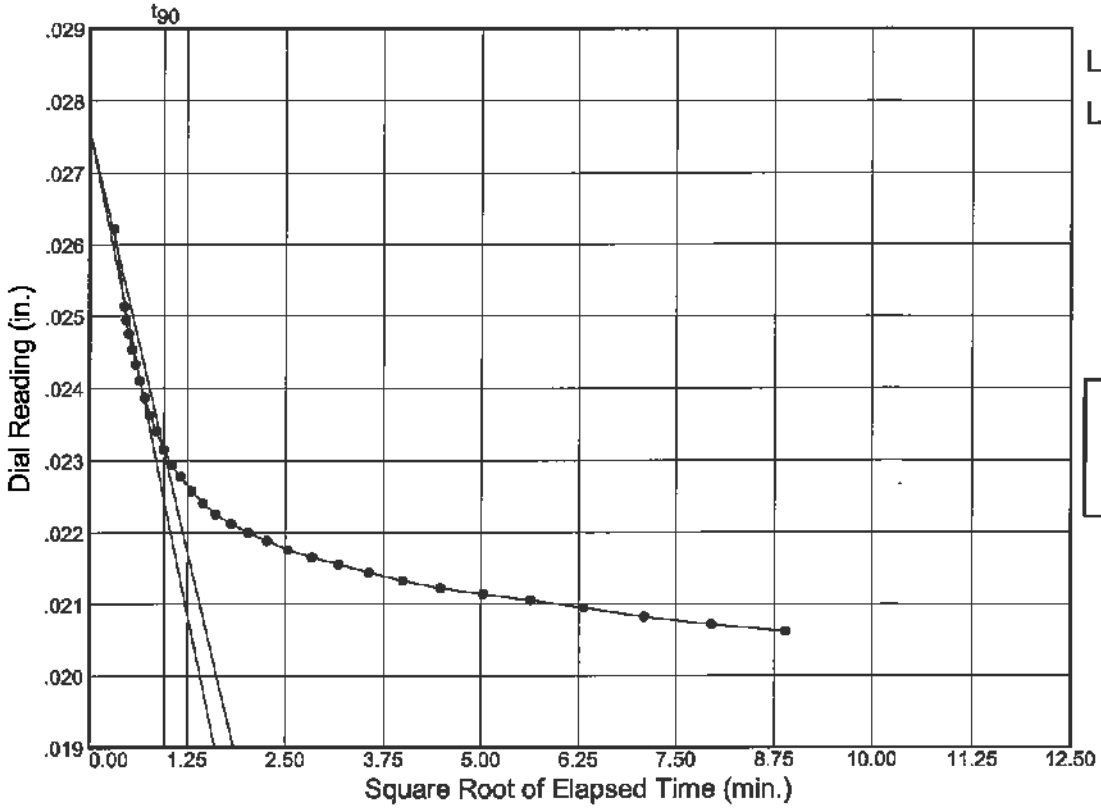
Load No.= 6
Load= 2.00 tsf
D_0 = -0.01552
D_{90} = 0.00891
D_{100} = 0.01162
T_{90} = 3.95 min.

C_v @ T_{90}
0.46 ft.^{2}/day

Dial Reading vs. Time

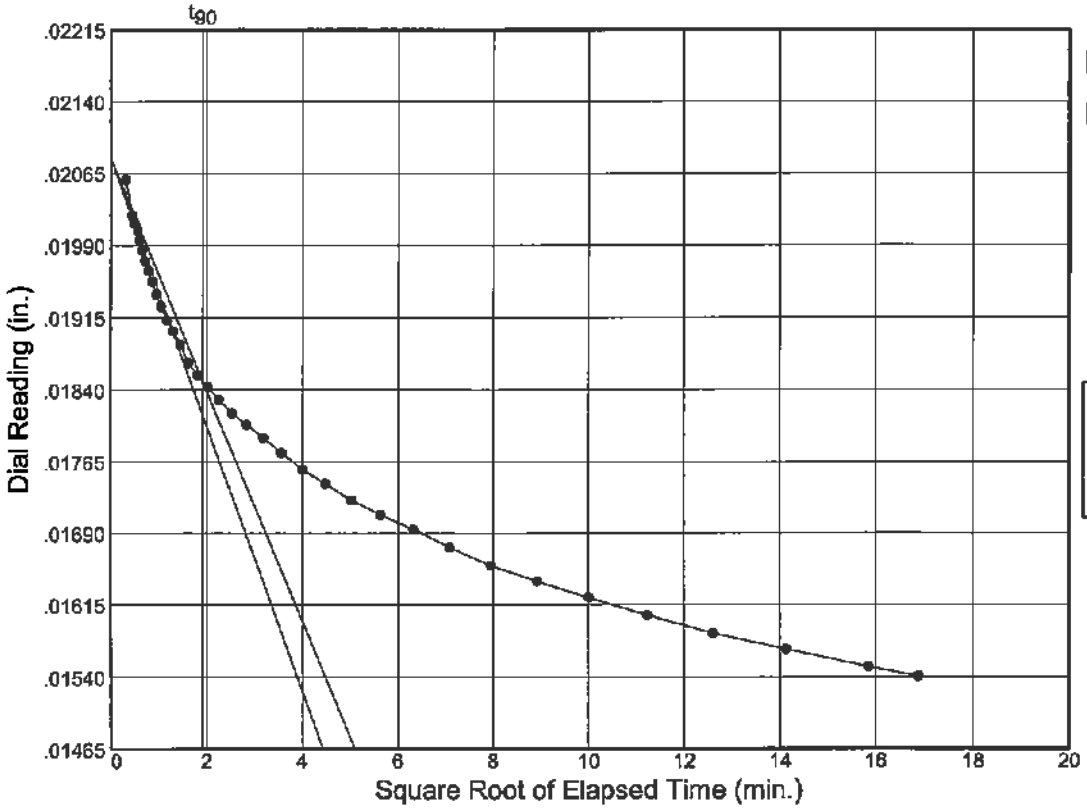
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 7
Load= 0.50 tsf
D_0 = 0.02760
D_{90} = 0.02314
D_{100} = 0.02264
T_{90} = 0.91 min.

C_v @ T_{90}
1.89 ft.^{2}/day



Load No.= 8
Load= 0.25 tsf
D_0 = 0.02081
D_{90} = 0.01850
D_{100} = 0.01824
T_{90} = 3.66 min.

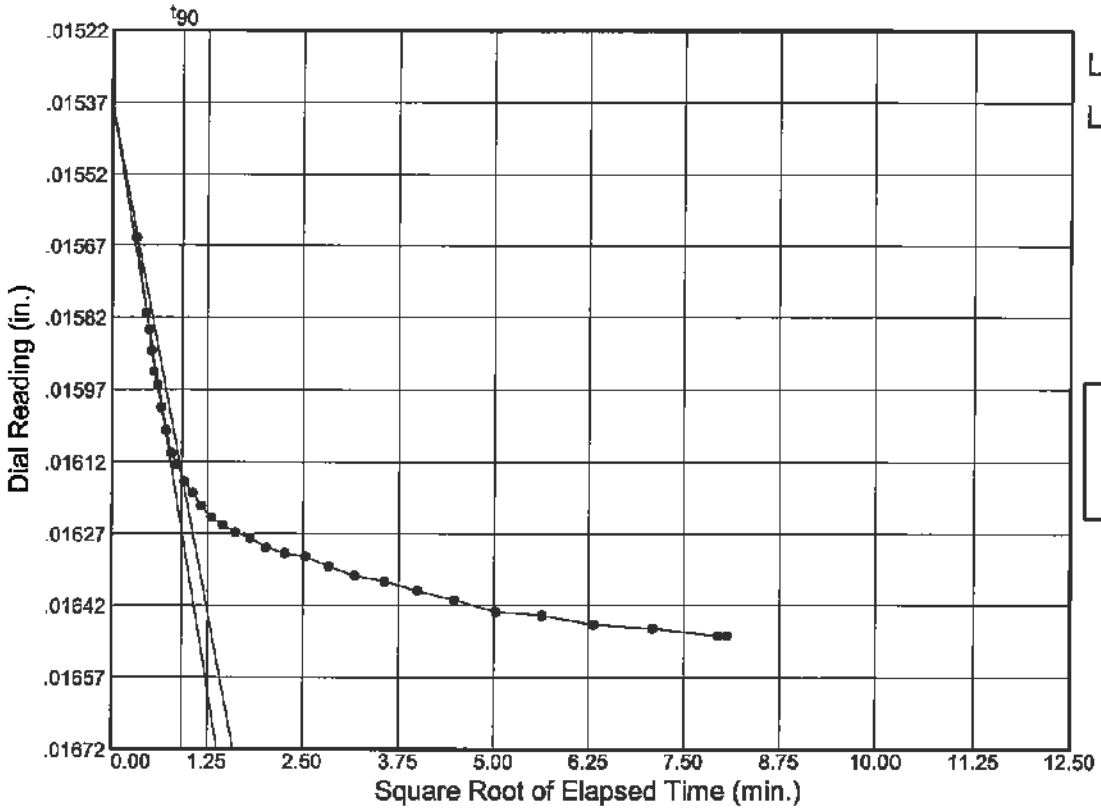
C_v @ T_{90}
0.48 ft.^{2}/day

Plate

Dial Reading vs. Time

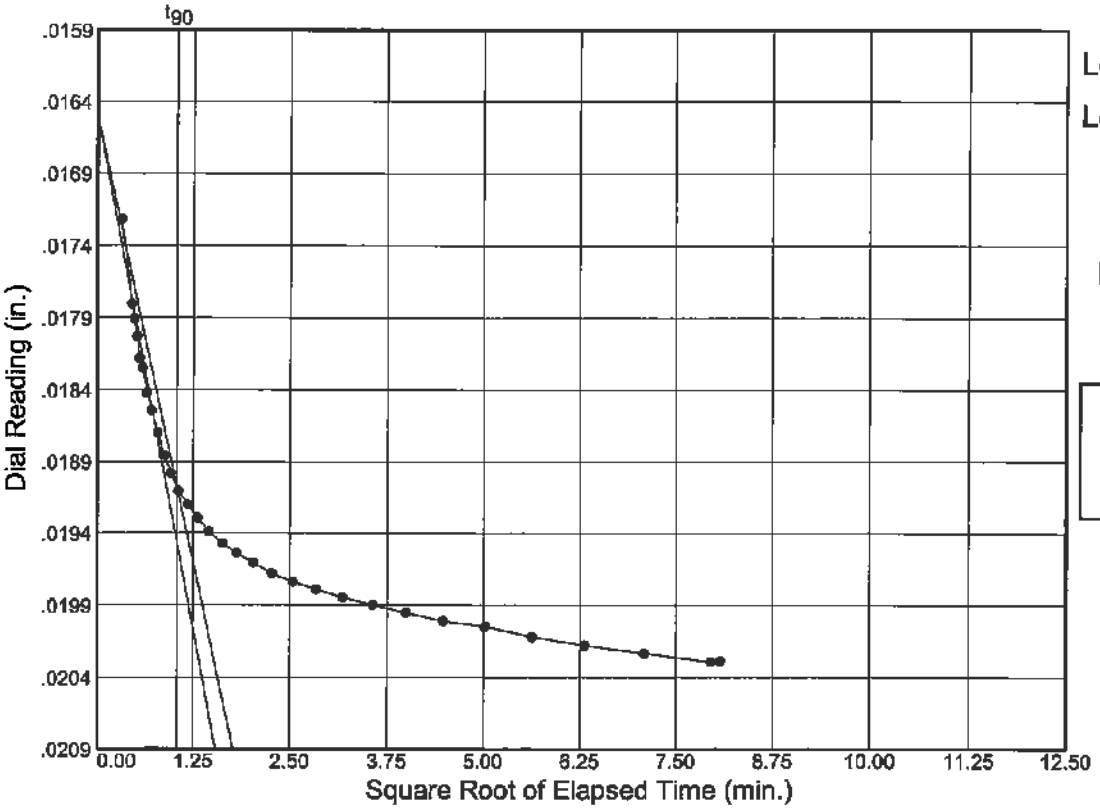
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 9
Load= 0.50 tsf
D_0 = 0.01537
D_{90} = 0.01615
D_{100} = 0.01623
T_{90} = 0.84 min.

C_v @ T_{90}
2.09 ft.^{2}/day



Load No.= 10
Load= 1.00 tsf
D_0 = 0.01650
D_{90} = 0.01908
D_{100} = 0.01937
T_{90} = 1.07 min.

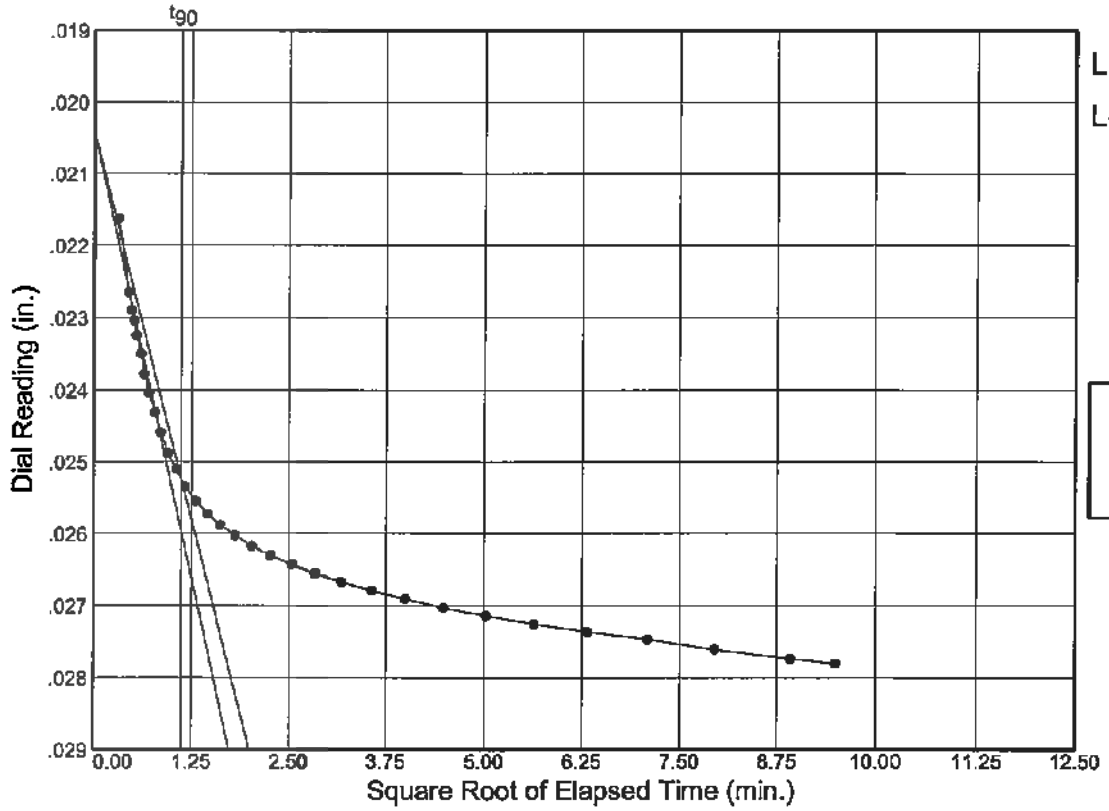
C_v @ T_{90}
1.63 ft.^{2}/day

Plate

Dial Reading vs. Time

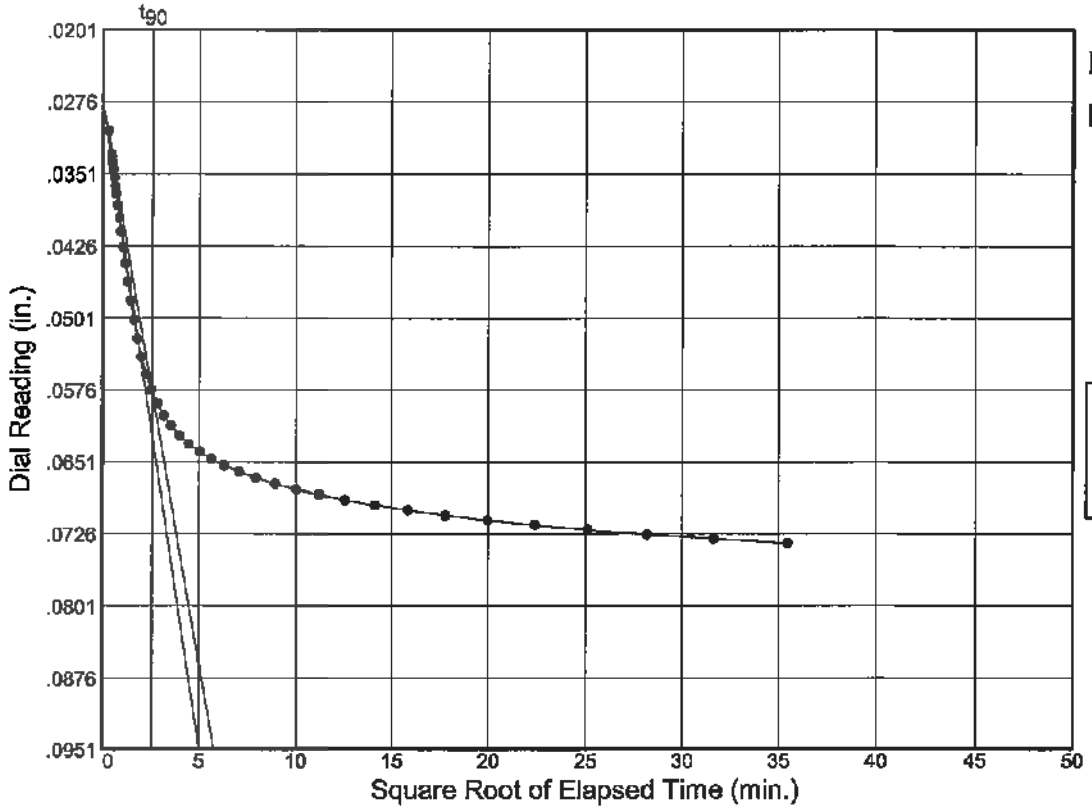
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 11
Load= 2.00 tsf
D_0 = 0.02042
D_{90} = 0.02524
D_{100} = 0.02578
T_{90} = 1.25 min.

C_v @ T_{90}
1.38 ft.^{2}/day



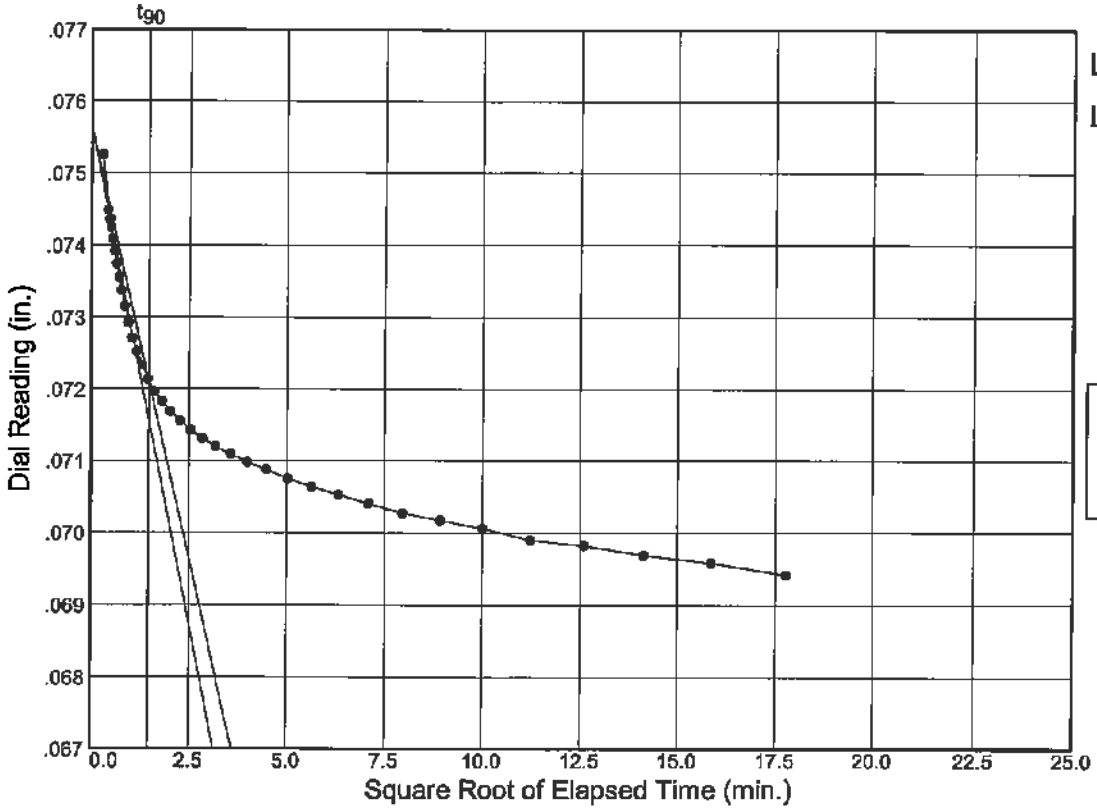
Load No.= 12
Load= 4.00 tsf
D_0 = 0.02761
D_{90} = 0.05774
D_{100} = 0.06109
T_{90} = 6.62 min.

C_v @ T_{90}
0.25 ft.^{2}/day

Dial Reading vs. Time

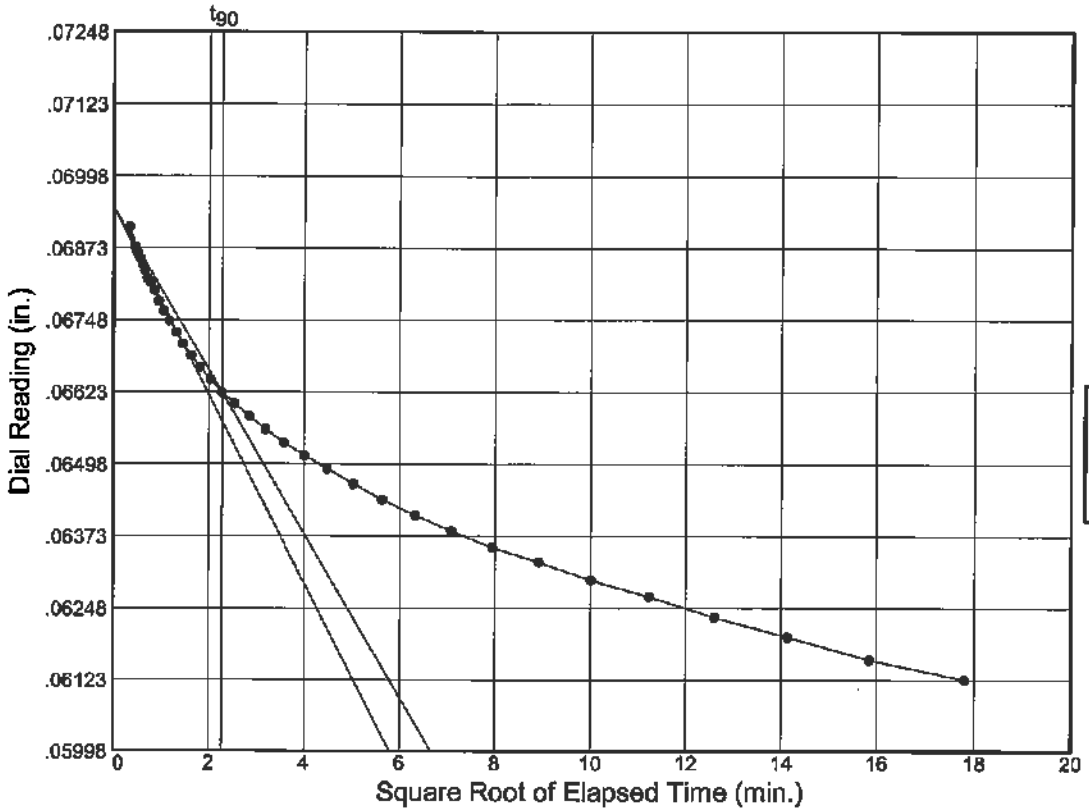
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 13
Load= 1.00 tsf
D_0 = 0.07563
D_{90} = 0.07211
D_{100} = 0.07172
T_{90} = 2.17 min.

C_v @ T_{90}
0.71 ft.^{2}/day



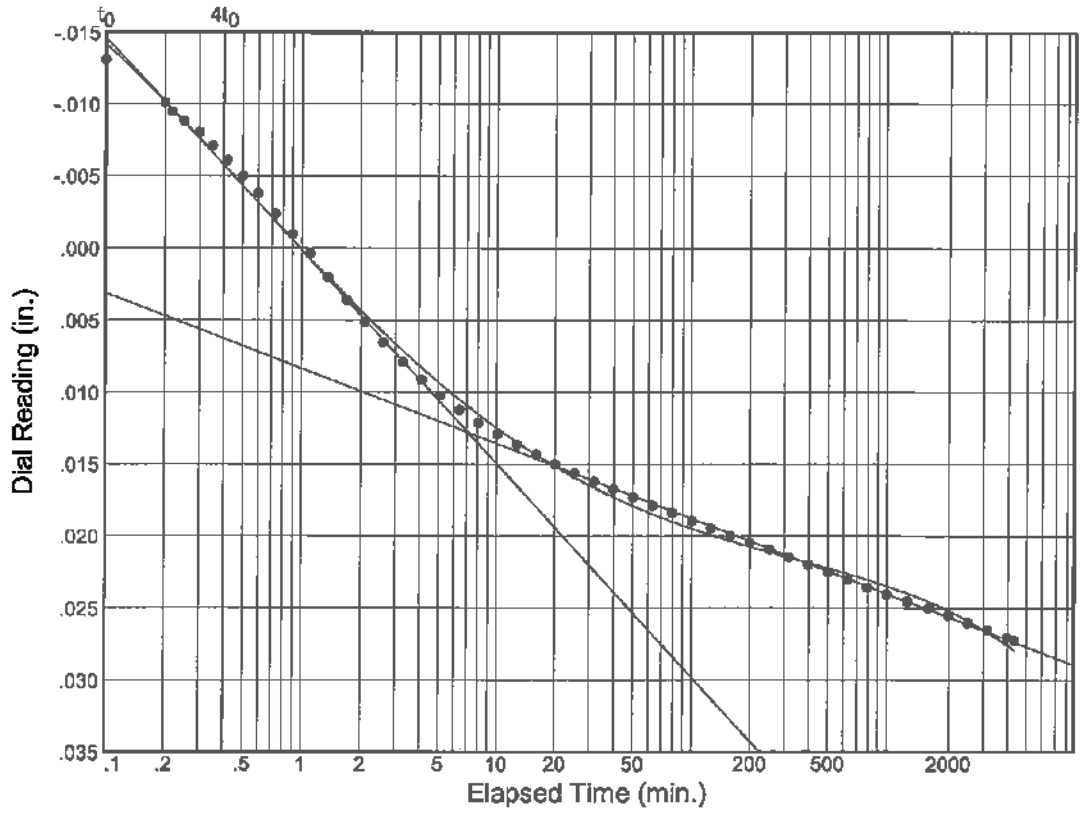
Load No.= 14
Load= 0.25 tsf
D_0 = 0.06945
D_{90} = 0.06621
D_{100} = 0.06585
T_{90} = 5.20 min.

C_v @ T_{90}
0.30 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

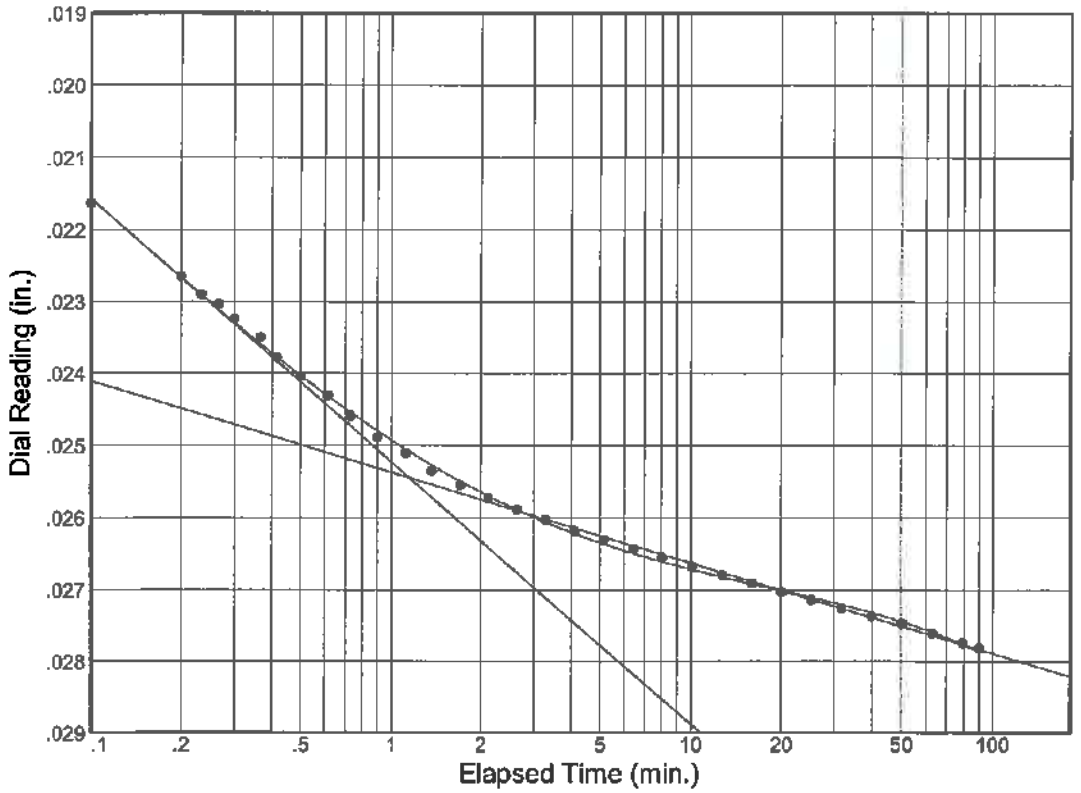
Location: MB-10 20'-22'



Load No.= 6
Load= 2.00 tsf
D_0 = -0.02266
D_{50} = -0.00493
D_{100} = 0.01280
T_{50} = 0.45 min.

C_v @ T_{50}
0.92 ft.^{2}/day

C_α = 0.006



Load No.= 11
Load= 2.00 tsf
D_0 = 0.01909
D_{50} = 0.02227
D_{100} = 0.02545
T_{50} = 0.16 min.

C_v @ T_{50}
2.58 ft.^{2}/day

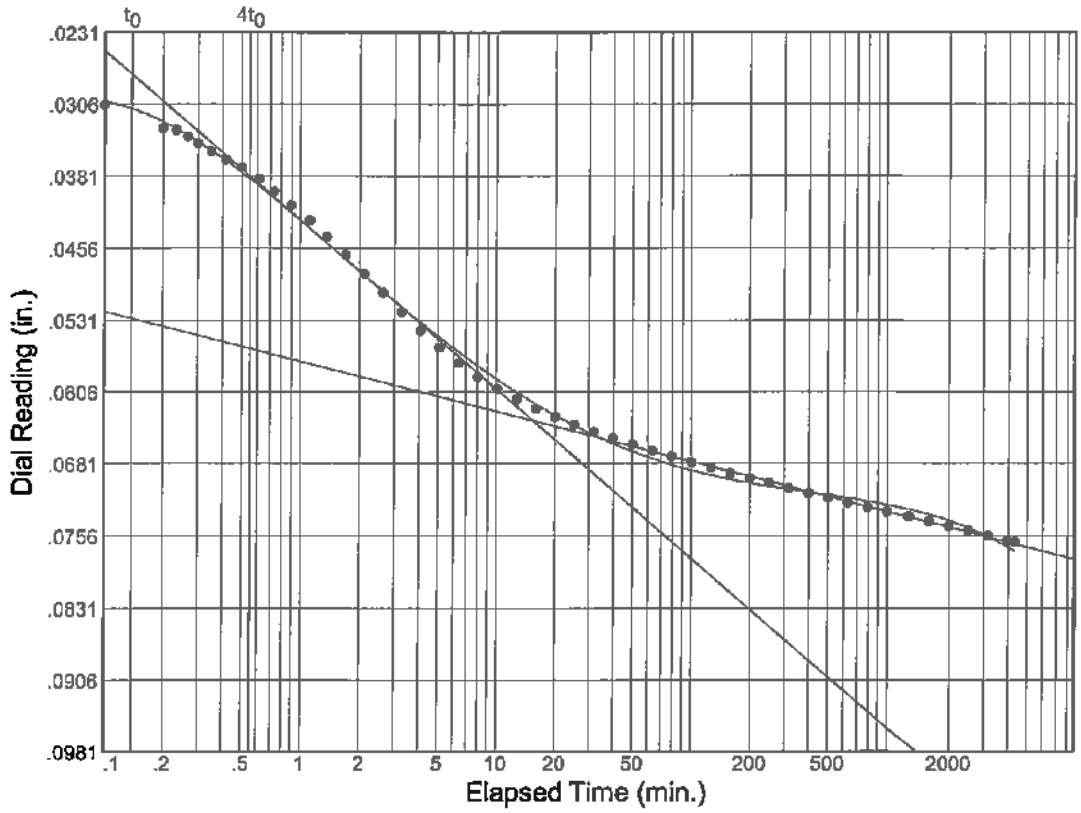
C_α = 0.001

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-10 20'-22'



Load No.= 12

Load= 4.00 tsf

D_0 = 0.02380

D_{50} = 0.04370

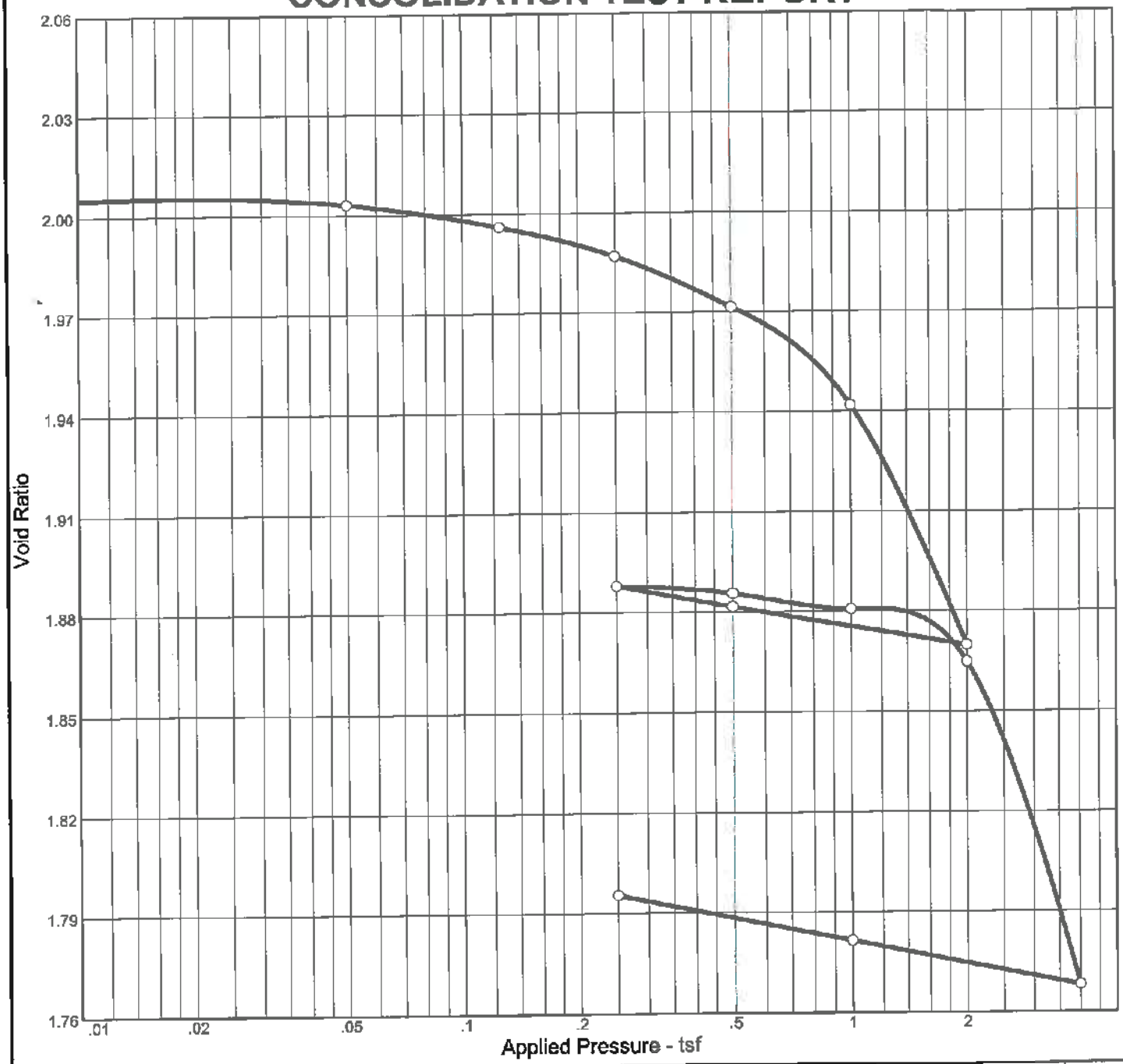
D_{100} = 0.06360

T_{50} = 1.15 min.

C_v @ T_{50}
0.33 ft.^{2}/day

C_α = 0.006

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
97.4 %	92.6 %	43.8			2.11	0.41	1.17	0.32	0.01			2.005

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Sandy Muck	(PT)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: WB-56 20'-22'

Remarks:
Organic Content= 24.7%
Fines Content= 50.8%

CONSOLIDATION TEST REPORT

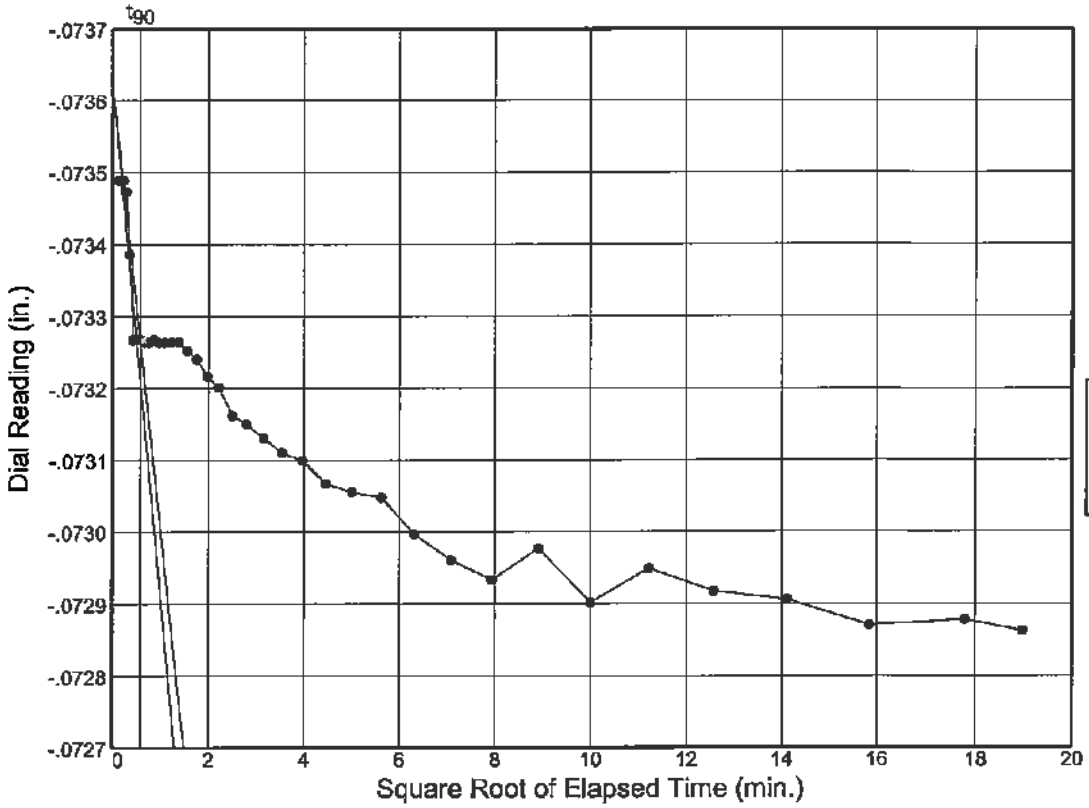
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

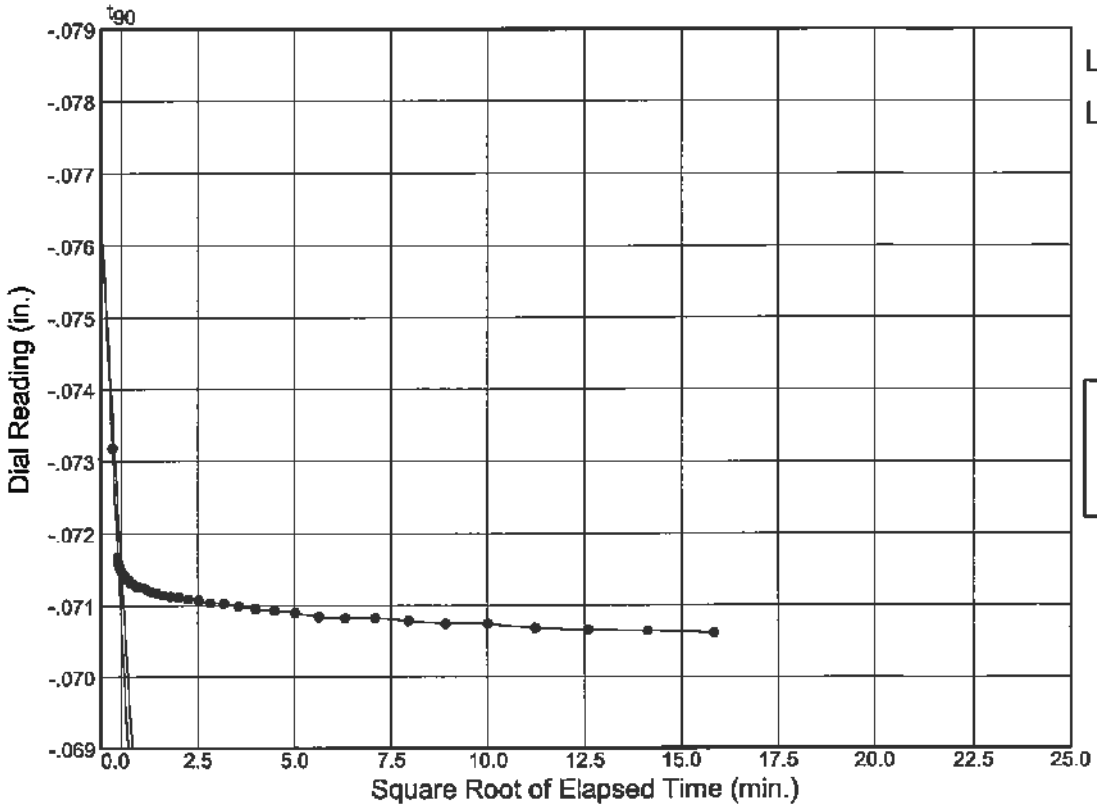
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.07363
D_{90} = -0.07327
D_{100} = -0.07323
T_{90} = 0.33 min.

C_v @ T_{90}
6.39 ft.^{2}/day



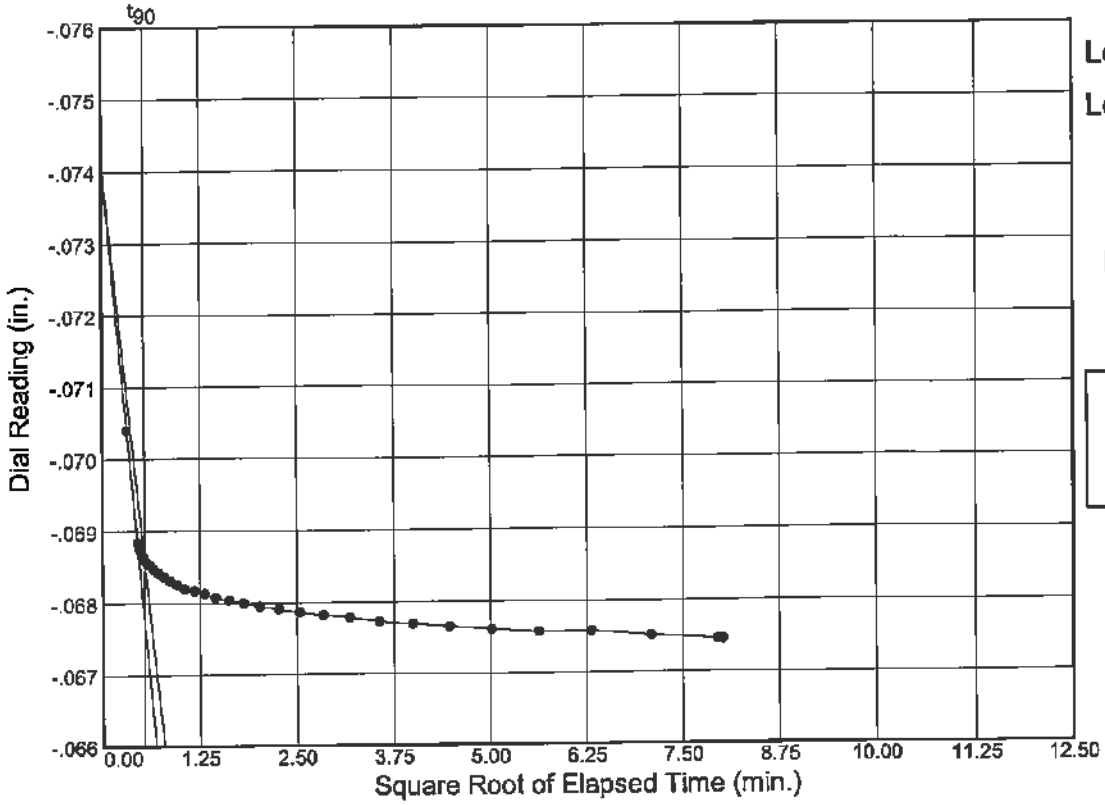
Load No.= 2
Load= 0.13 tsf
D_0 = -0.07662
D_{90} = -0.07148
D_{100} = -0.07091
T_{90} = 0.29 min.

C_v @ T_{90}
7.21 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 3

Load= 0.25 tsf

D_0 = -0.07415

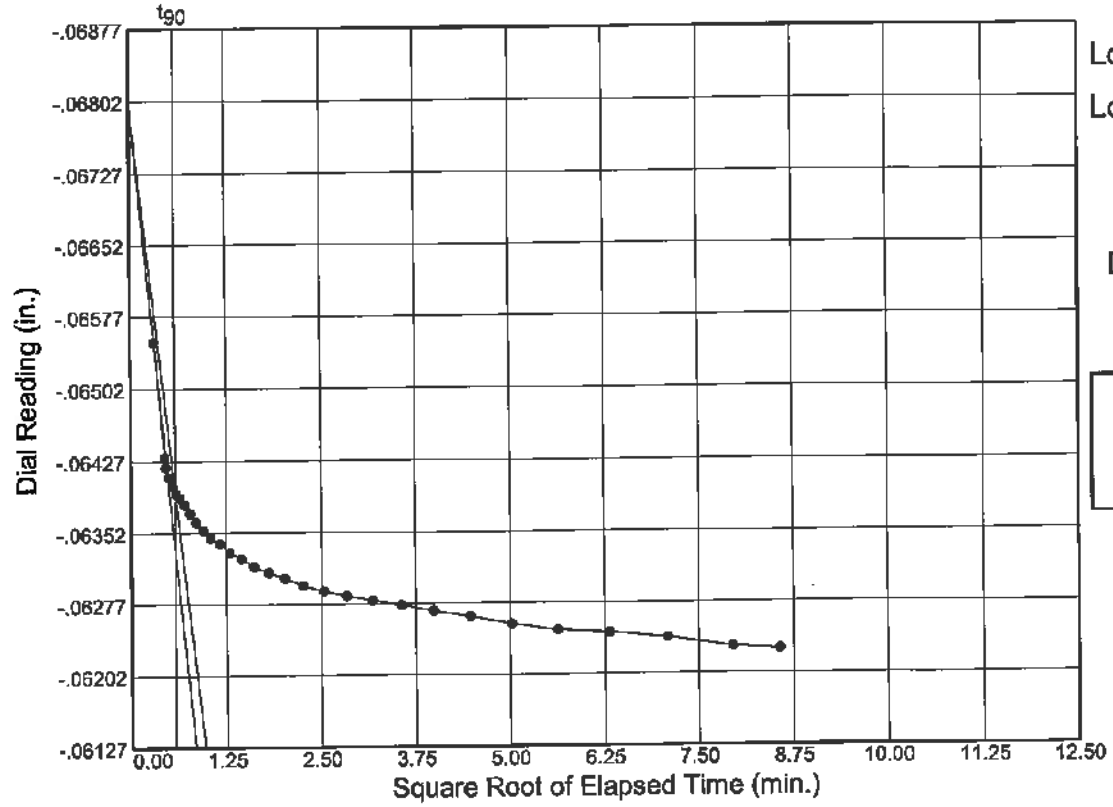
D_{90} = -0.06862

D_{100} = -0.06801

T_{90} = 0.29 min.

C_v @ T_{90}

7.34 ft.^{2}/day



Load No.= 4

Load= 0.50 tsf

D_0 = -0.06801

D_{90} = -0.06395

D_{100} = -0.06350

T_{90} = 0.34 min.

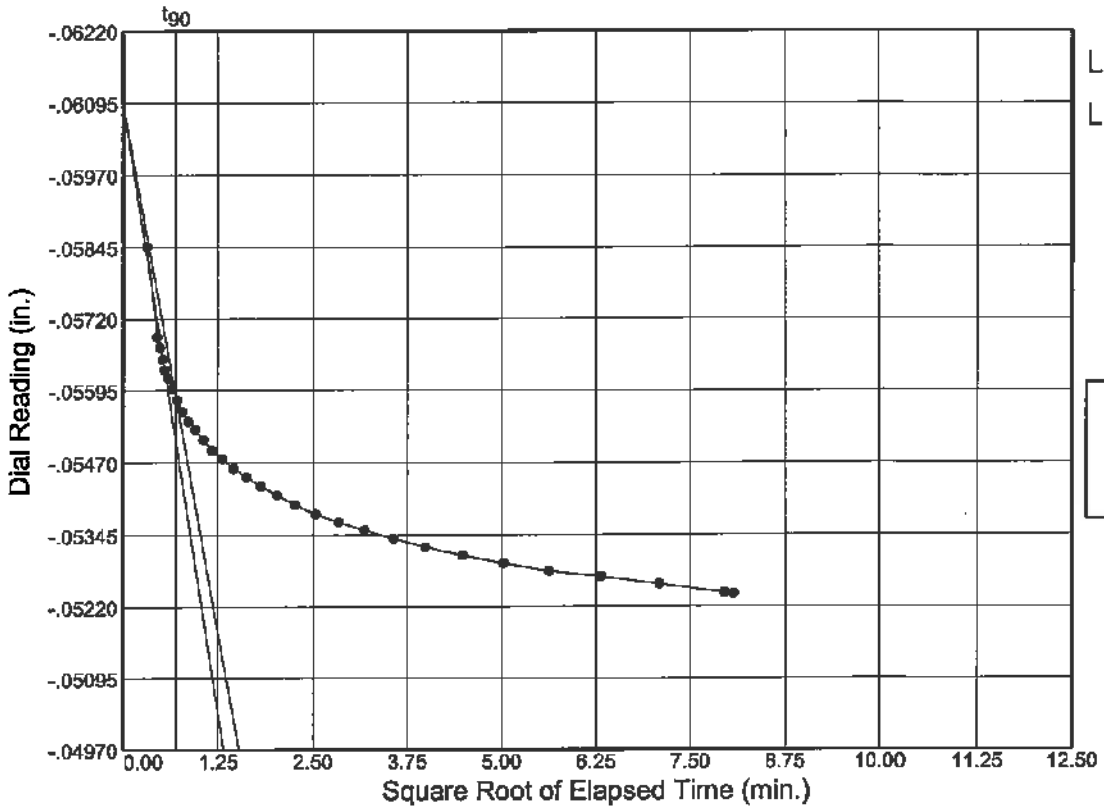
C_v @ T_{90}

6.20 ft.^{2}/day

Dial Reading vs. Time

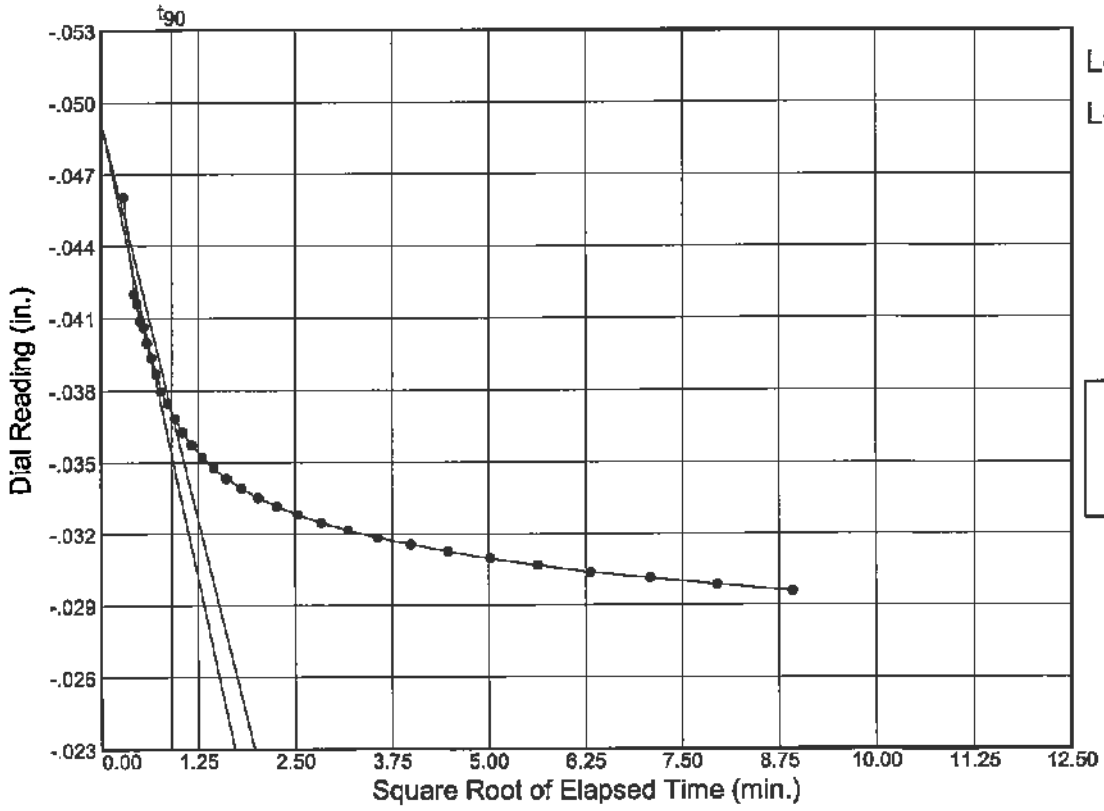
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 5
Load= 1.00 tsf
D_0 = -0.06094
D_{90} = -0.05582
D_{100} = -0.05525
T_{90} = 0.48 min.

C_v @ T_{90}
4.28 ft.^{2}/day



Load No.= 6
Load= 2.00 tsf
D_0 = -0.04918
D_{90} = -0.03710
D_{100} = -0.03575
T_{90} = 0.83 min.

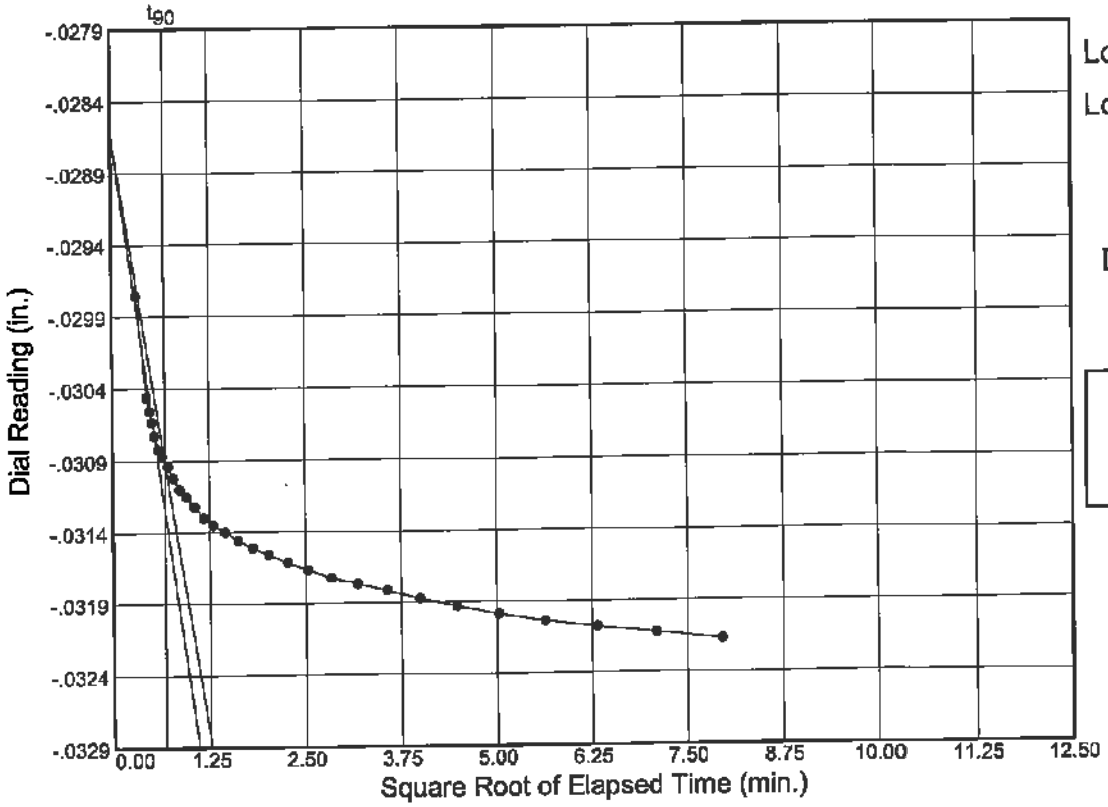
C_v @ T_{90}
2.40 ft.^{2}/day

Plate

Dial Reading vs. Time

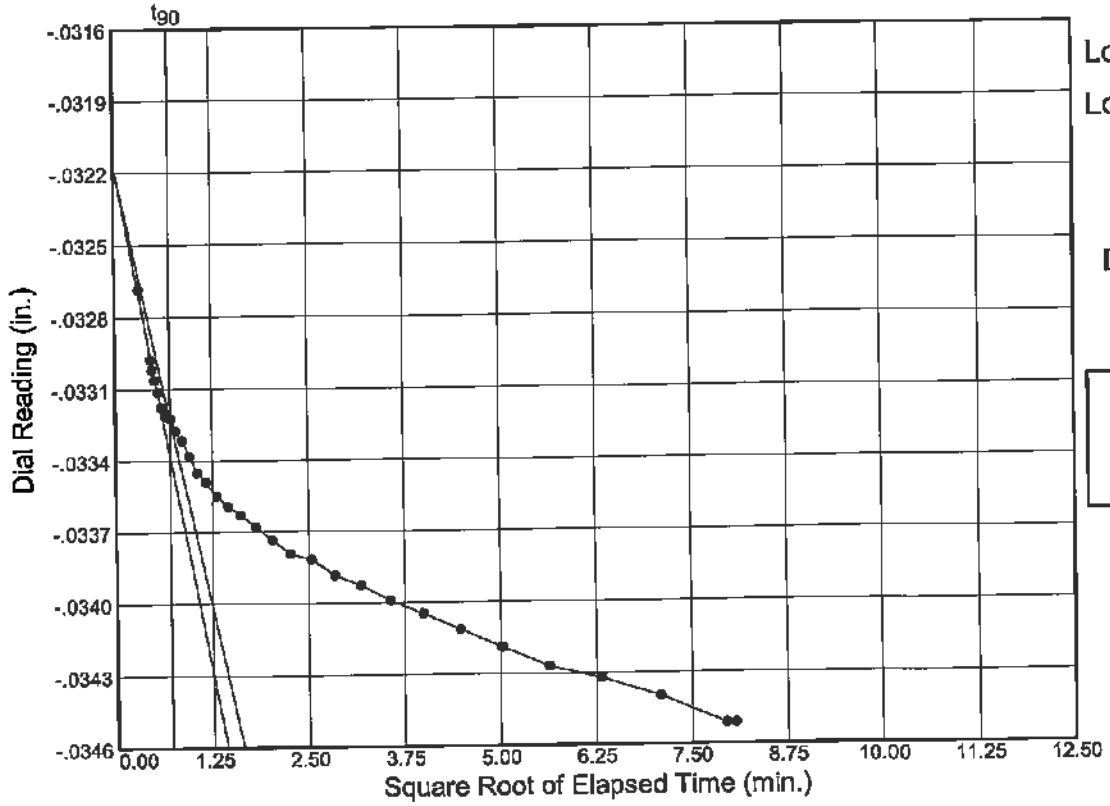
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 7
Load= 0.50 tsf
D_0 = -0.02861
D_{90} = -0.03090
D_{100} = -0.03115
T_{90} = 0.46 min.

C_v @ T_{90}
4.23 ft.^{2}/day



Load No.= 8
Load= 0.25 tsf
D_0 = -0.03217
D_{90} = -0.03322
D_{100} = -0.03334
T_{90} = 0.51 min.

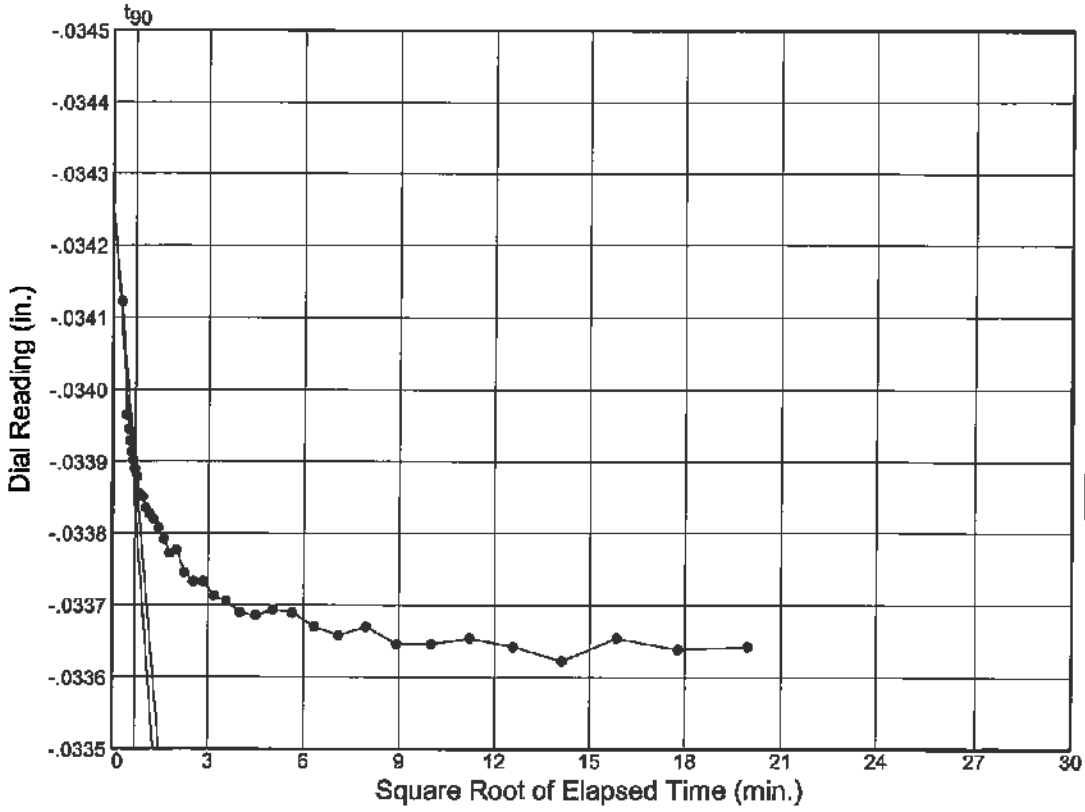
C_v @ T_{90}
3.85 ft.^{2}/day

Plate

Dial Reading vs. Time

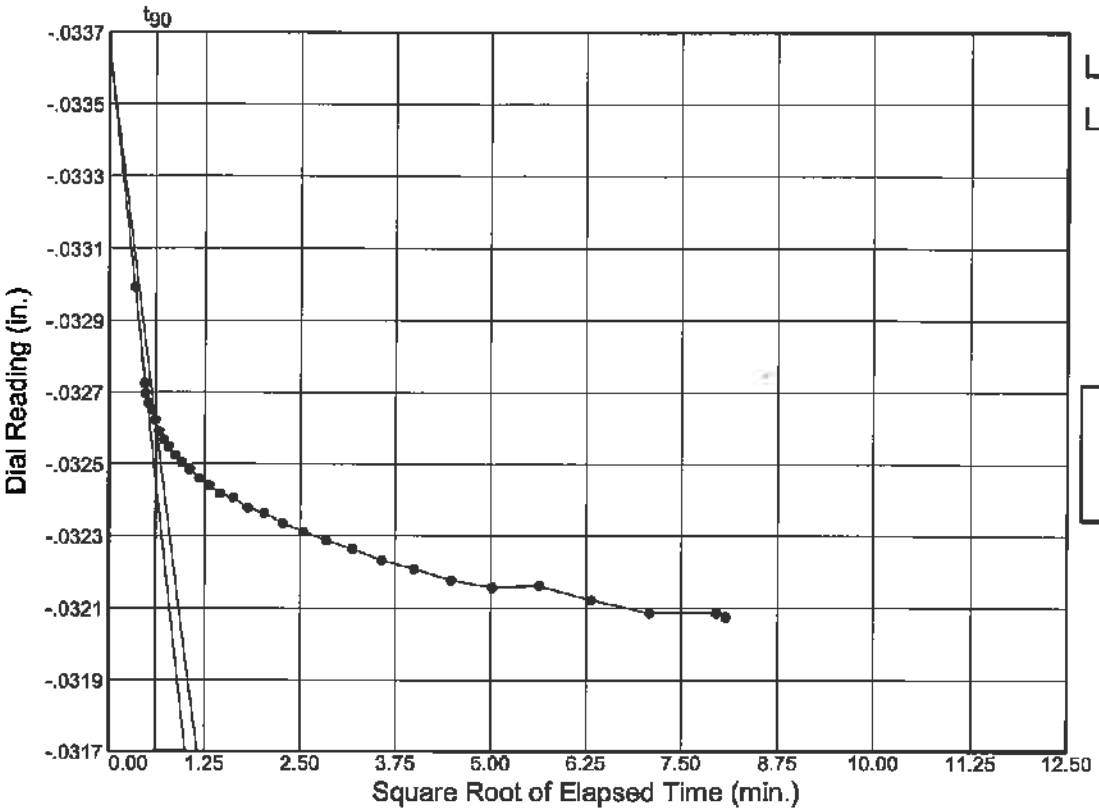
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.03426
D_{90} = -0.03389
D_{100} = -0.03385
T_{90} = 0.51 min.

C_v @ T_{90}
3.84 ft.^{2}/day



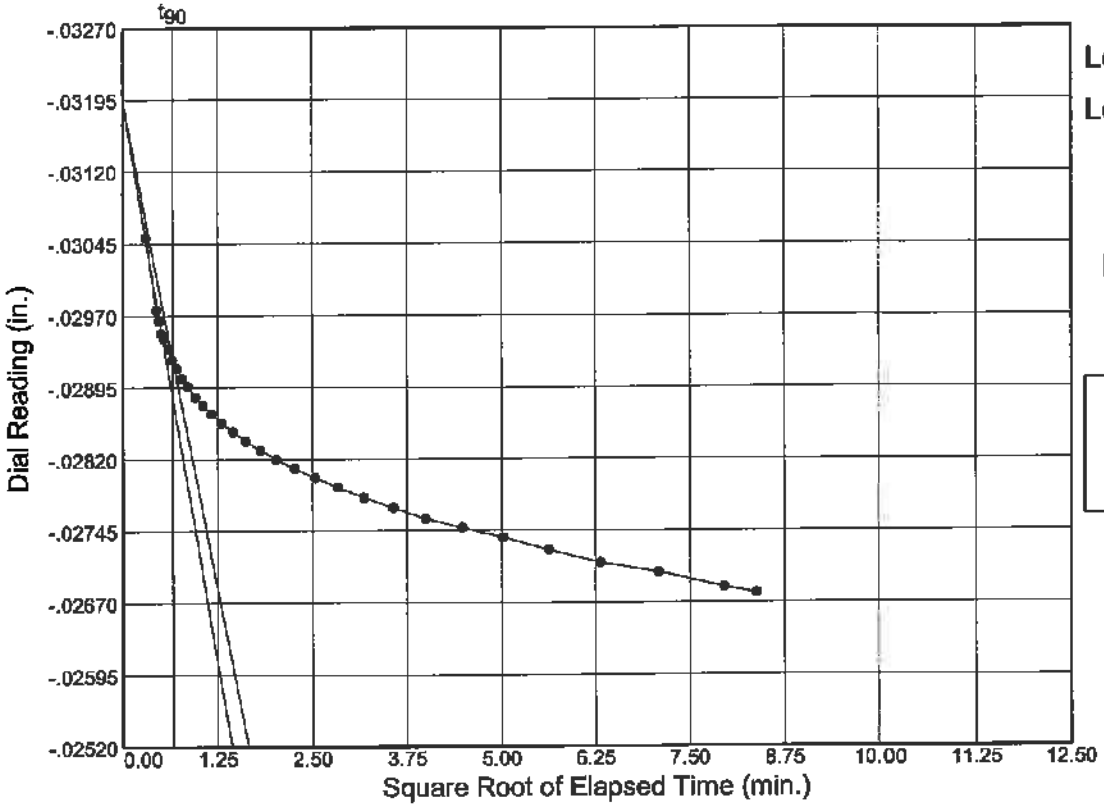
Load No.= 10
Load= 1.00 tsf
D_0 = -0.03365
D_{90} = -0.03262
D_{100} = -0.03251
T_{90} = 0.37 min.

C_v @ T_{90}
5.27 ft.^{2}/day

Dial Reading vs. Time

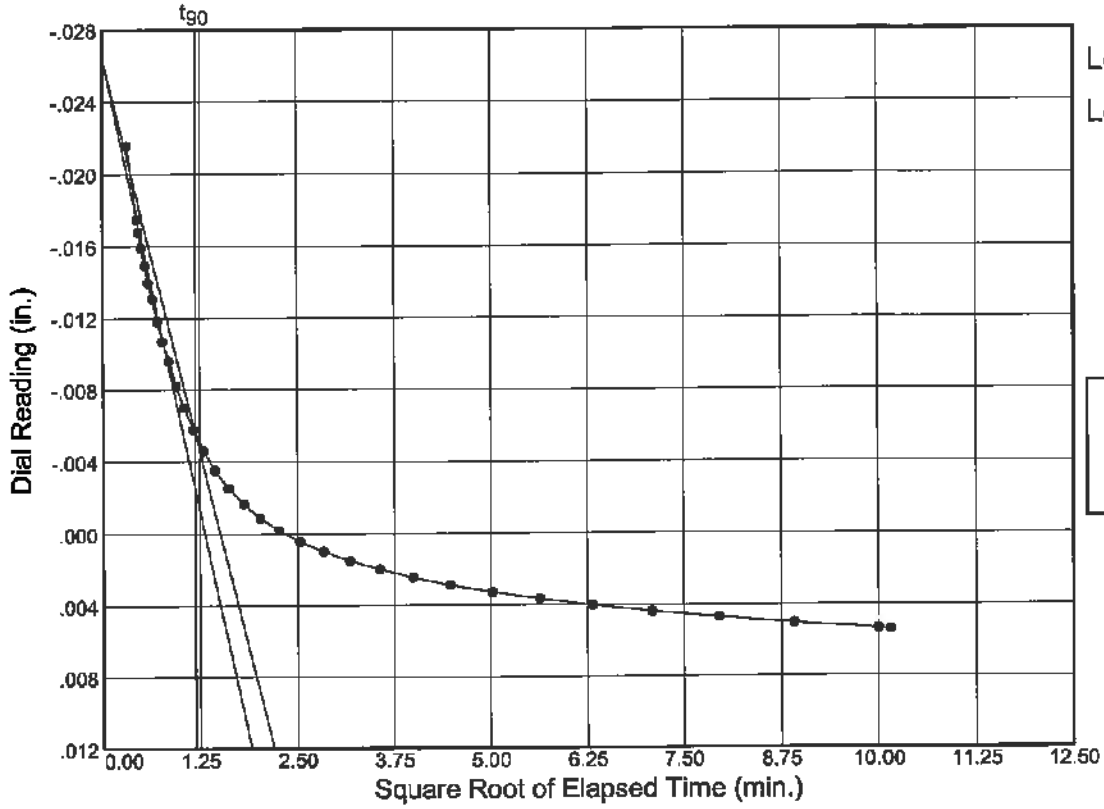
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.03194
D_{90} = -0.02923
D_{100} = -0.02893
T_{90} = 0.44 min.

C_v @ T_{90}
4.37 ft.^{2}/day



Load No.= 12
Load= 4.00 tsf
D_0 = -0.02646
D_{90} = -0.00557
D_{100} = -0.00324
T_{90} = 1.42 min.

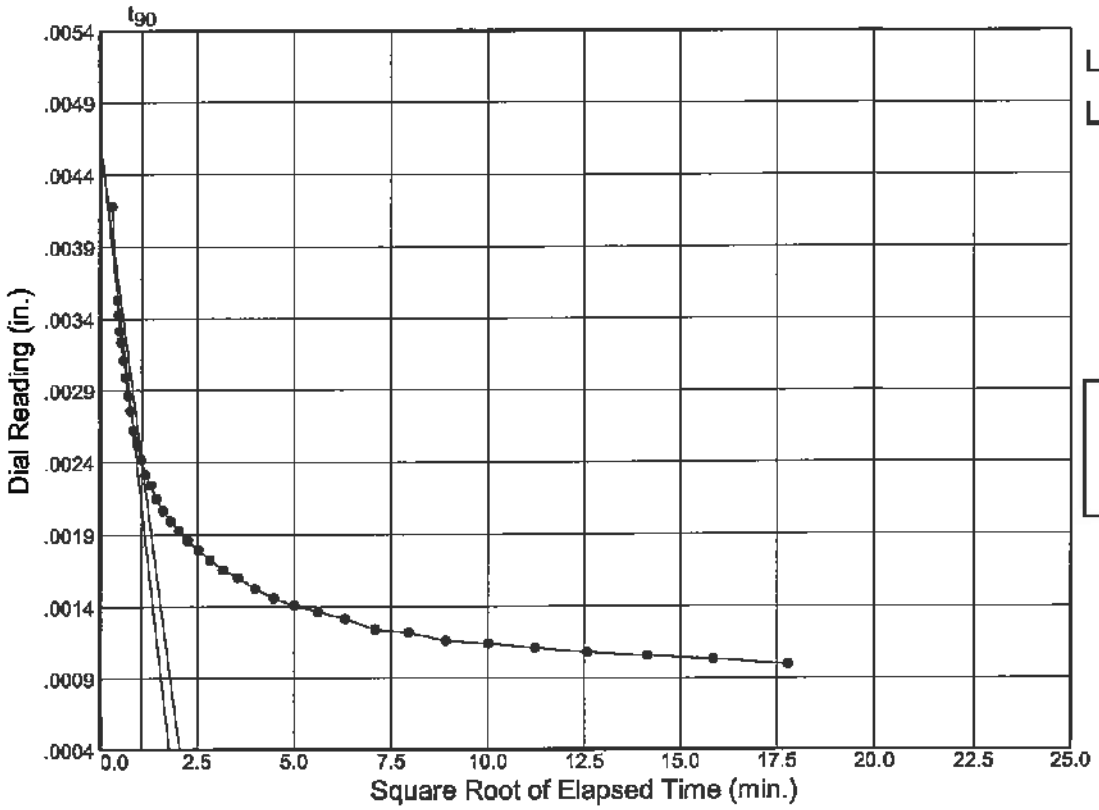
C_v @ T_{90}
1.31 ft.^{2}/day

Plate

Dial Reading vs. Time

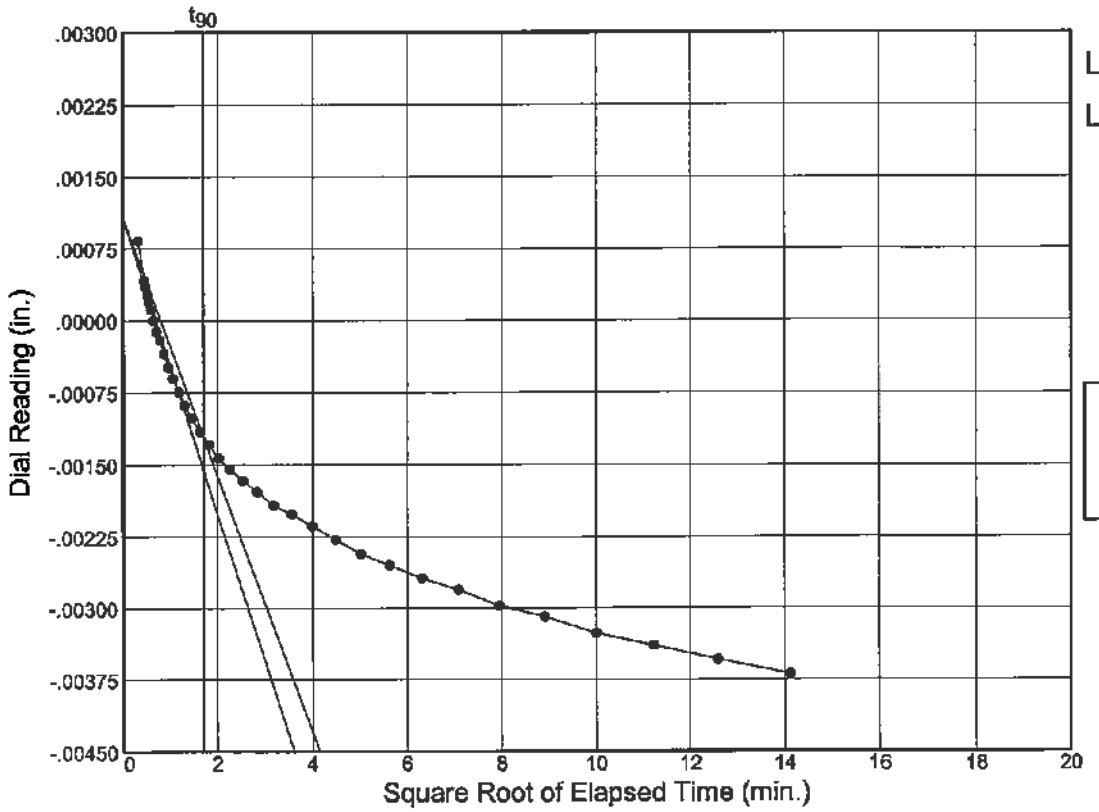
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 20'-22'



Load No.= 13
Load= 1.00 tsf
D_0 = 0.00464
D_{90} = 0.00239
D_{100} = 0.00215
T_{90} = 1.17 min.

C_v @ T_{90}
1.54 ft.^{2}/day



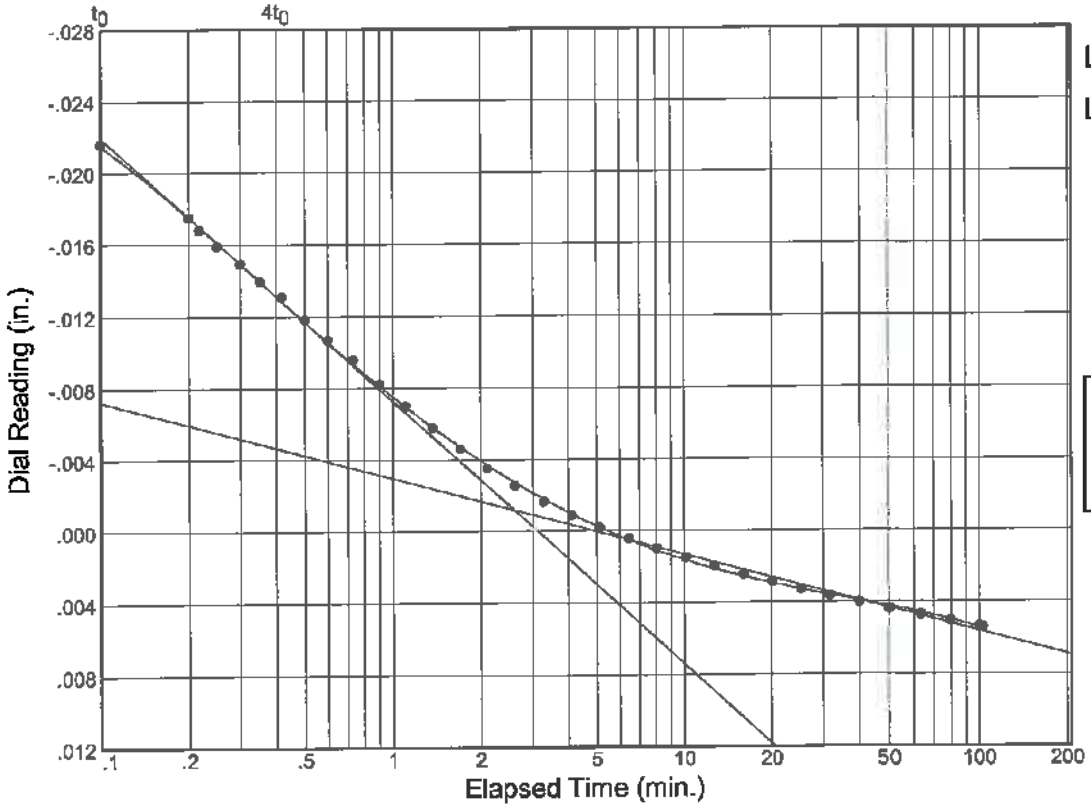
Load No.= 14
Load= 0.25 tsf
D_0 = 0.00107
D_{90} = -0.00121
D_{100} = -0.00146
T_{90} = 2.88 min.

C_v @ T_{90}
0.63 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

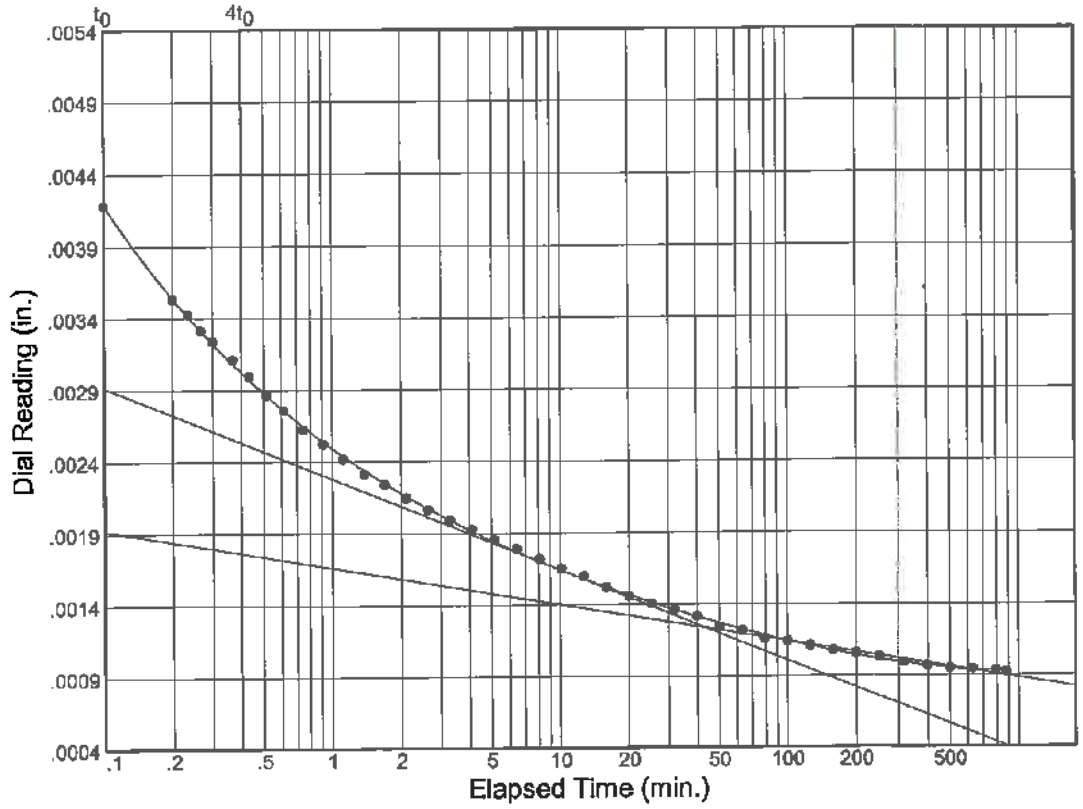
Location: WB-56 20'-22'



Load No.= 12
Load= 4.00 tsf
D_0 = -0.02988
D_{50} = -0.01553
D_{100} = -0.00118
T_{50} = 0.27 min.

C_v @ T_{50}
1.59 ft.2/day

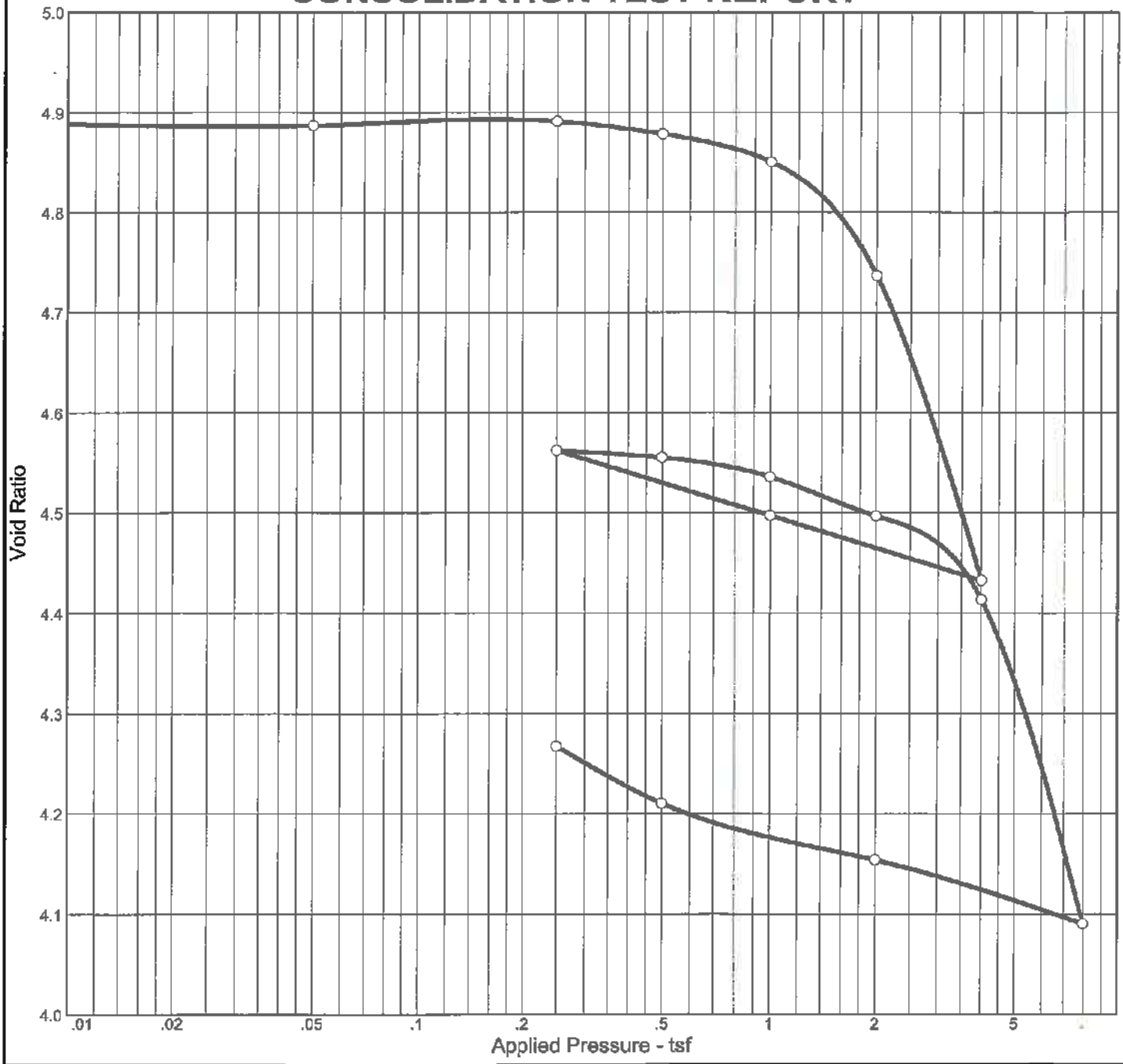
C_α = 0.004



Load No.= 13
Load= 1.00 tsf
D_0 = 0.00536
D_{50} = 0.00330
D_{100} = 0.00124
T_{50} = 0.27 min.

C_v @ T_{50}
1.53 ft.2/day

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
94.3 %	320.0 %	16.9			1.44	0.83	1.81	1.09	0.12			4.889

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Muck	(A-8)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: WB-56 50'-52'

Remarks:

Oragnic Content= 79.5%
Fines Content= 98.2%

CONSOLIDATION TEST REPORT

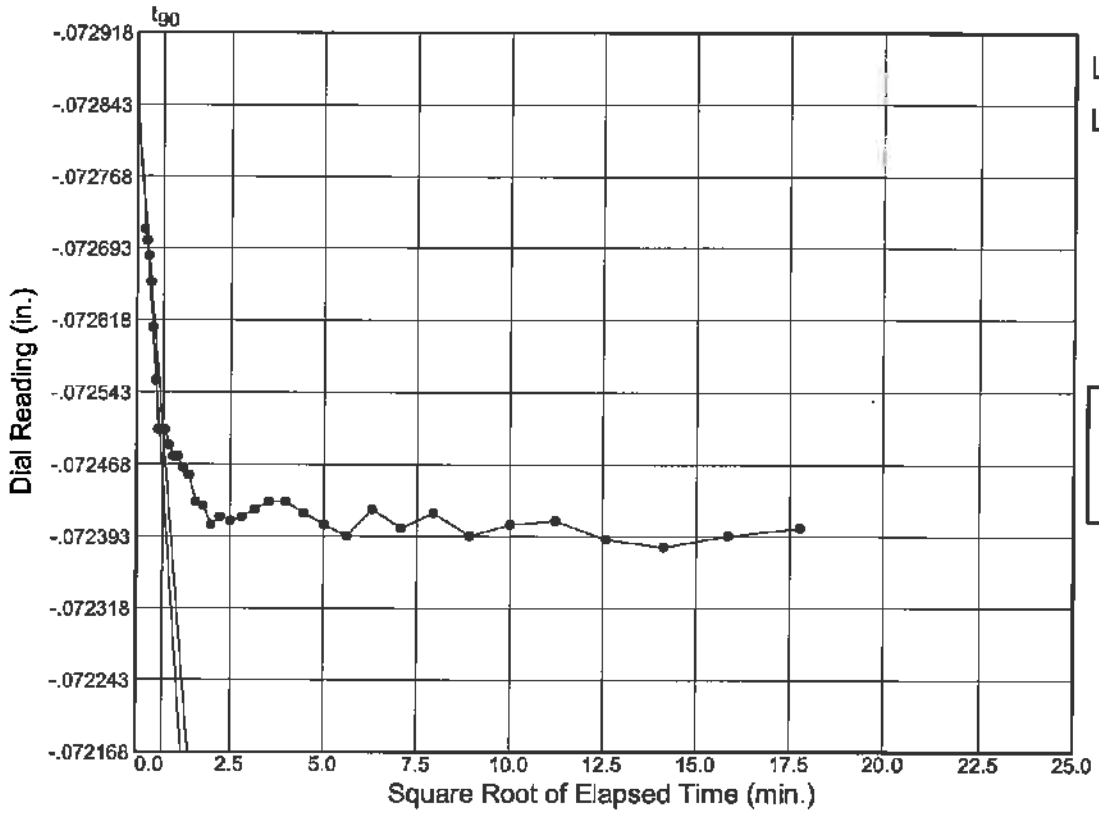
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

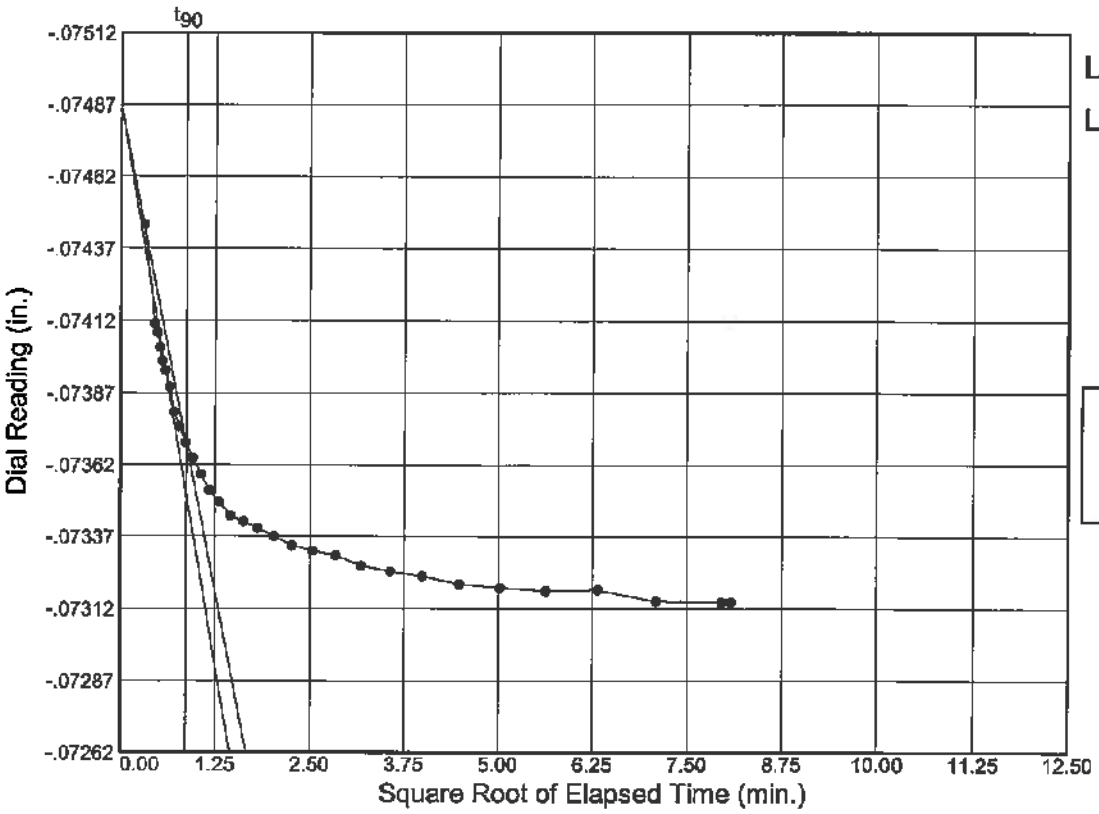
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.07284
D_{90} = -0.07250
D_{100} = -0.07247
T_{90} = 0.48 min.

C_v @ T_{90}
4.39 ft.^{2}/day



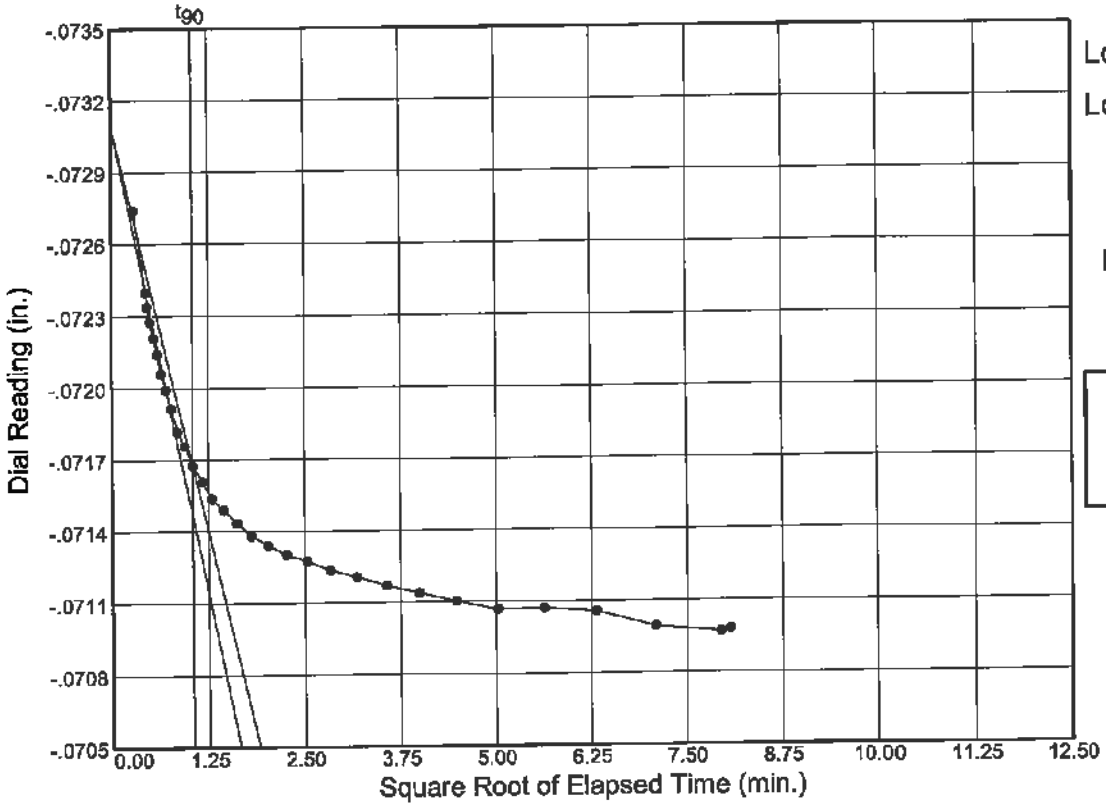
Load No.= 2
Load= 0.25 tsf
D_0 = -0.07487
D_{90} = -0.07369
D_{100} = -0.07356
T_{90} = 0.75 min.

C_v @ T_{90}
2.83 ft.^{2}/day

Dial Reading vs. Time

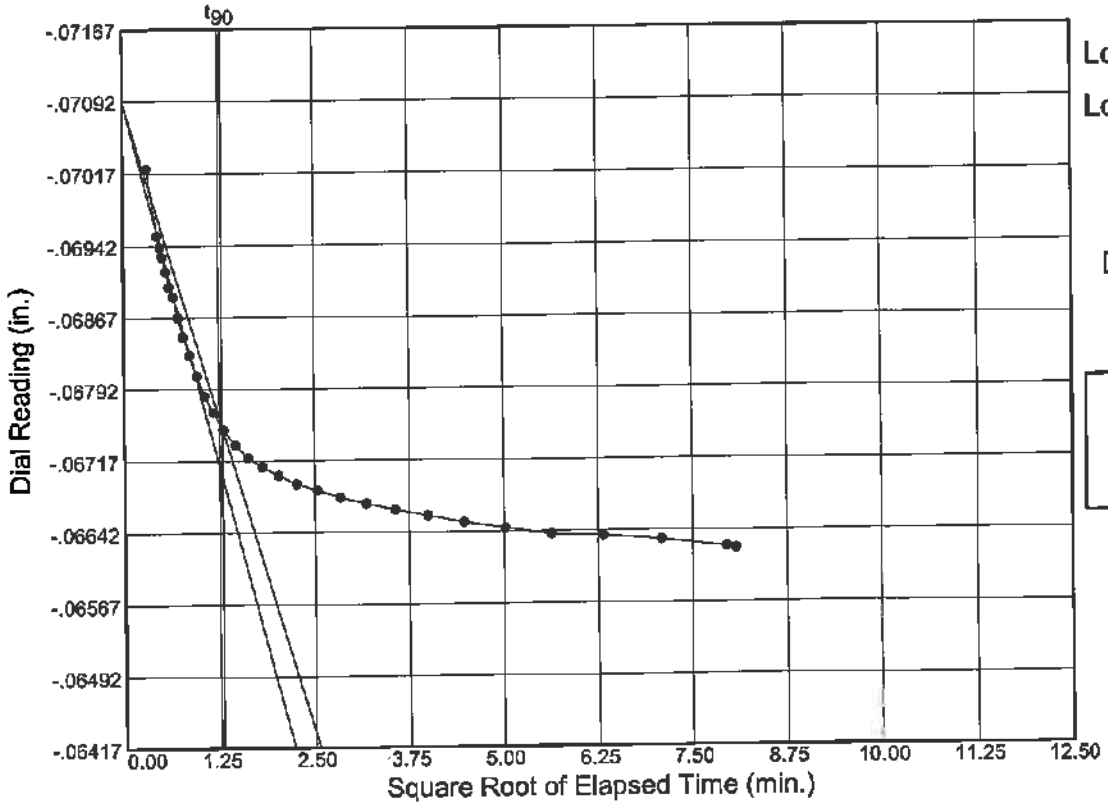
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 3
Load= 0.50 tsf
D_0 = -0.07310
D_{90} = -0.07168
D_{100} = -0.07152
T_{90} = 1.09 min.

C_v @ T_{90}
1.94 ft.^{2}/day



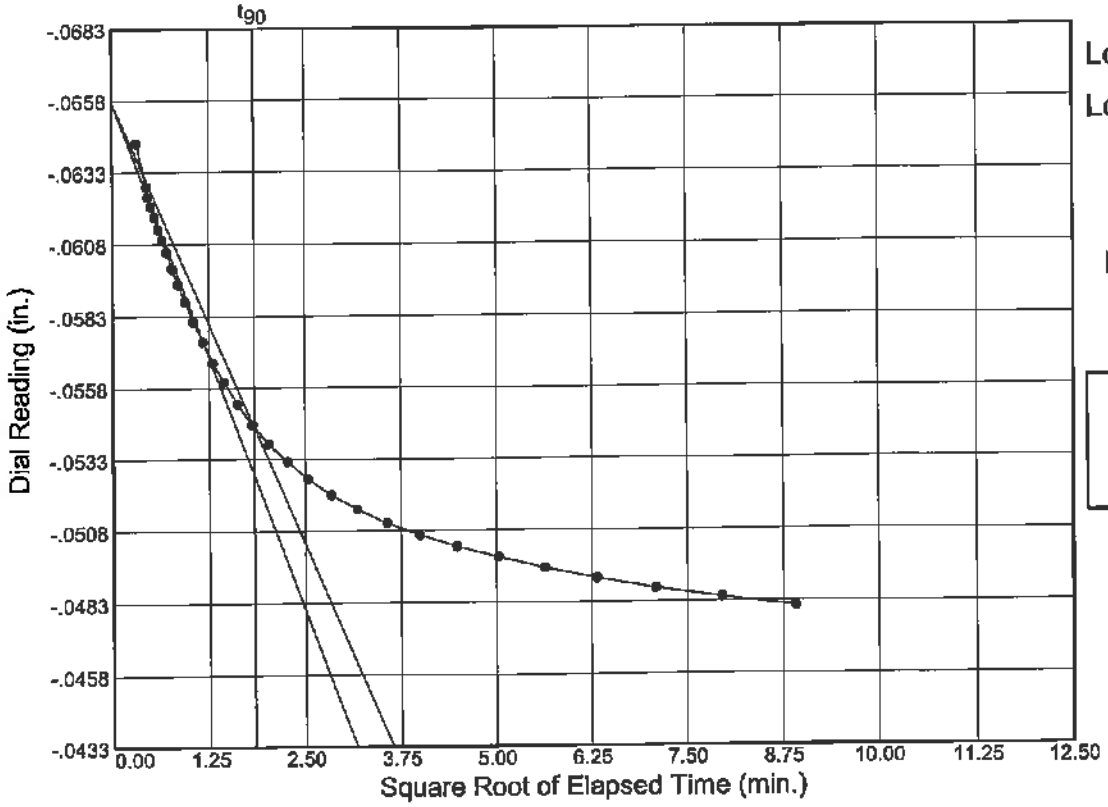
Load No.= 4
Load= 1.00 tsf
D_0 = -0.07092
D_{90} = -0.06752
D_{100} = -0.06714
T_{90} = 1.66 min.

C_v @ T_{90}
1.27 ft.^{2}/day

Dial Reading vs. Time

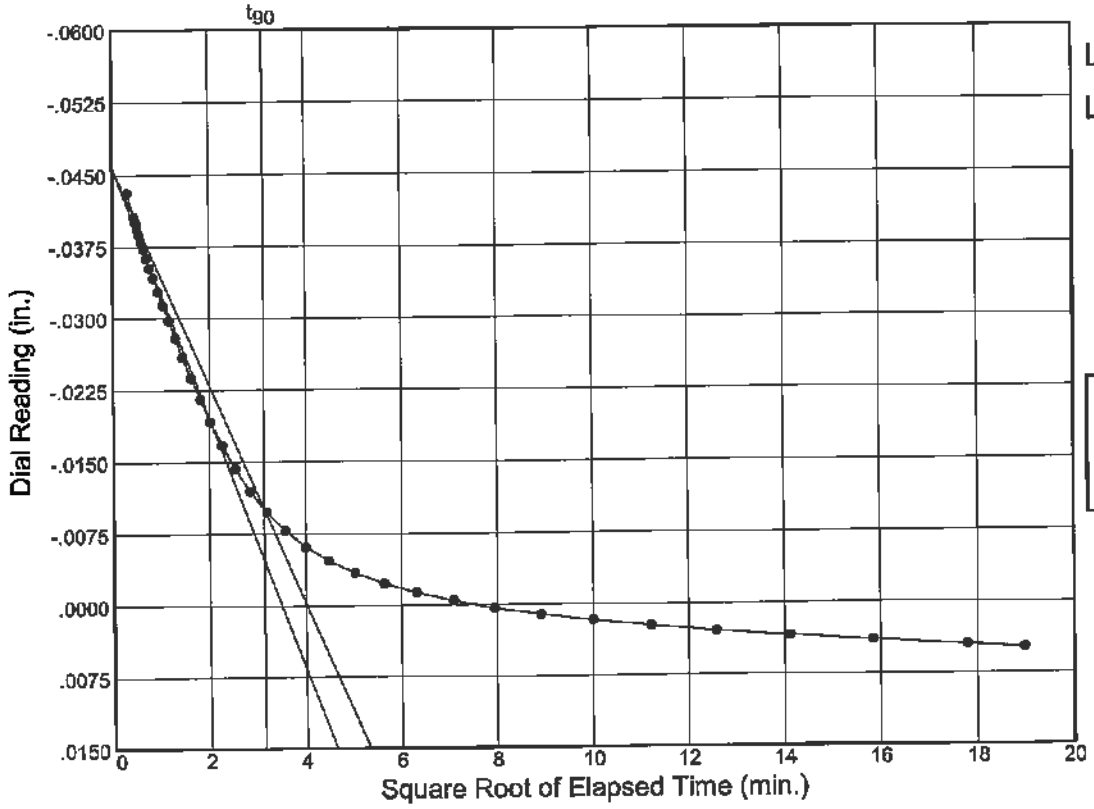
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 5
Load= 2.00 tsf
D_0 = -0.06572
D_{90} = -0.05441
D_{100} = -0.05316
T_{90} = 3.38 min.

C_v @ T_{90}
0.61 ft.^{2}/day



Load No.= 6
Load= 4.00 tsf
D_0 = -0.04578
D_{90} = -0.01007
D_{100} = -0.00610
T_{90} = 9.80 min.

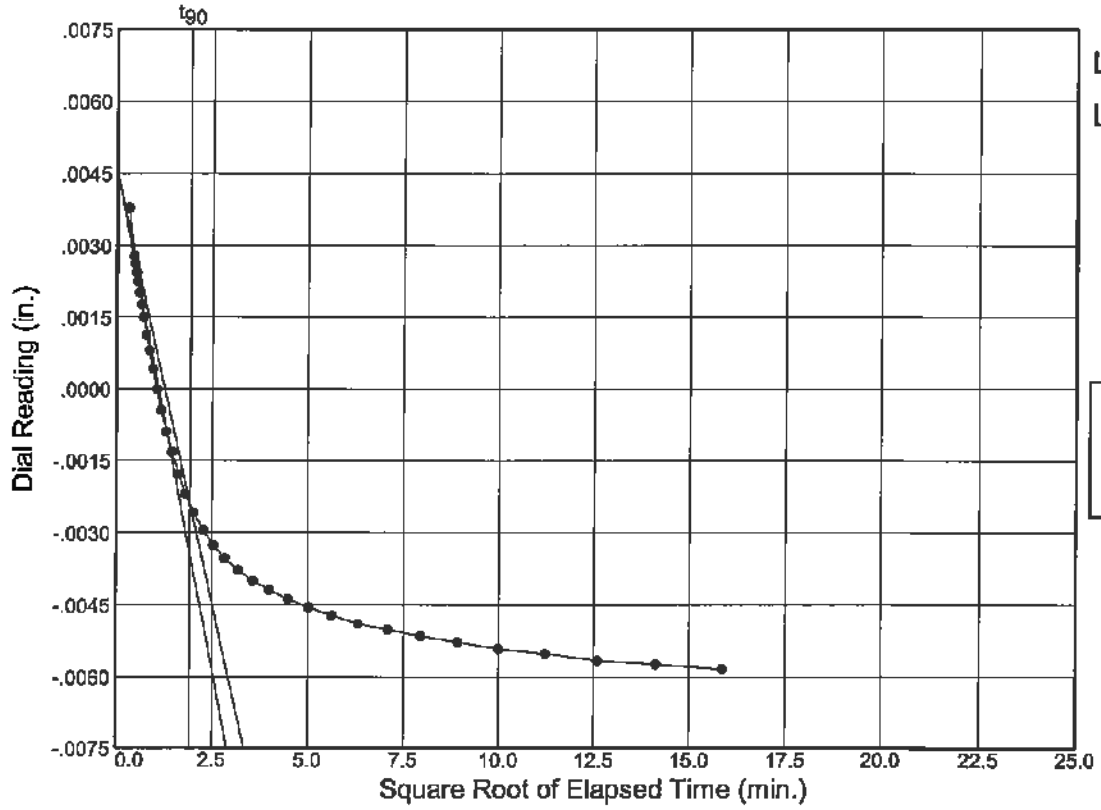
C_v @ T_{90}
0.19 ft.^{2}/day

Plate

Dial Reading vs. Time

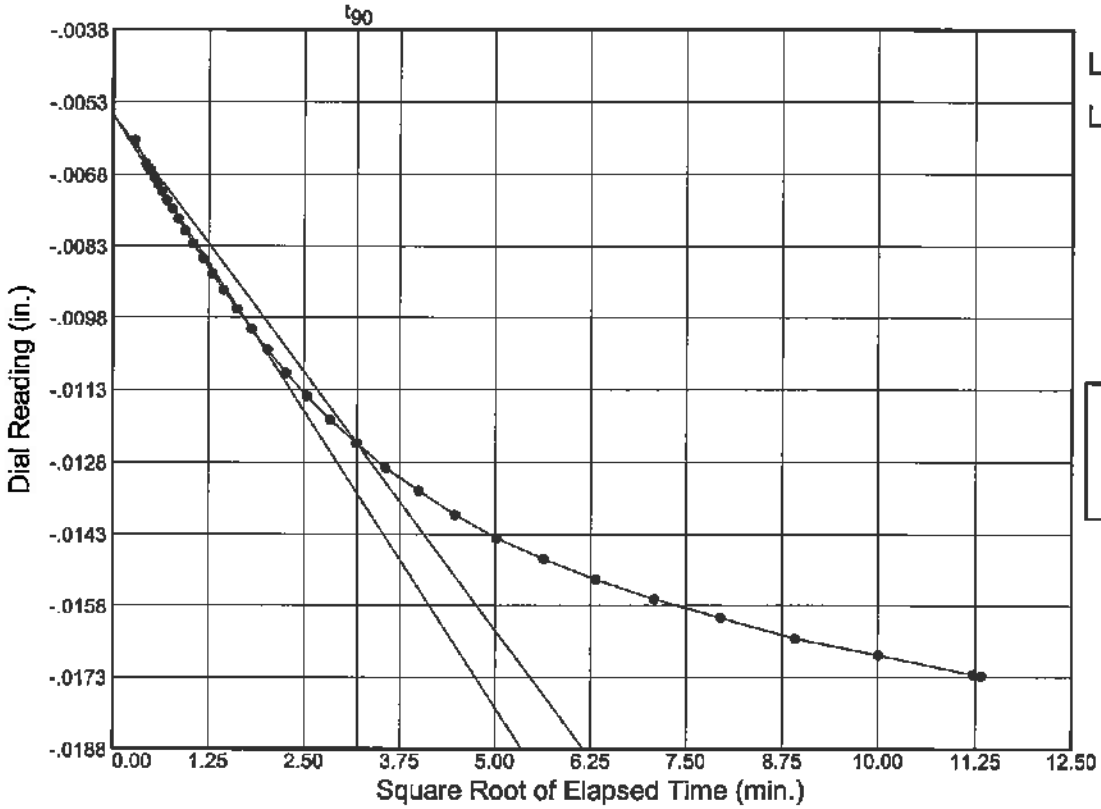
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 7
Load= 1.00 tsf
D_0 = 0.00455
D_{90} = -0.00242
D_{100} = -0.00319
T_{90} = 3.72 min.

C_v @ T_{90}
0.49 ft.^{2}/day



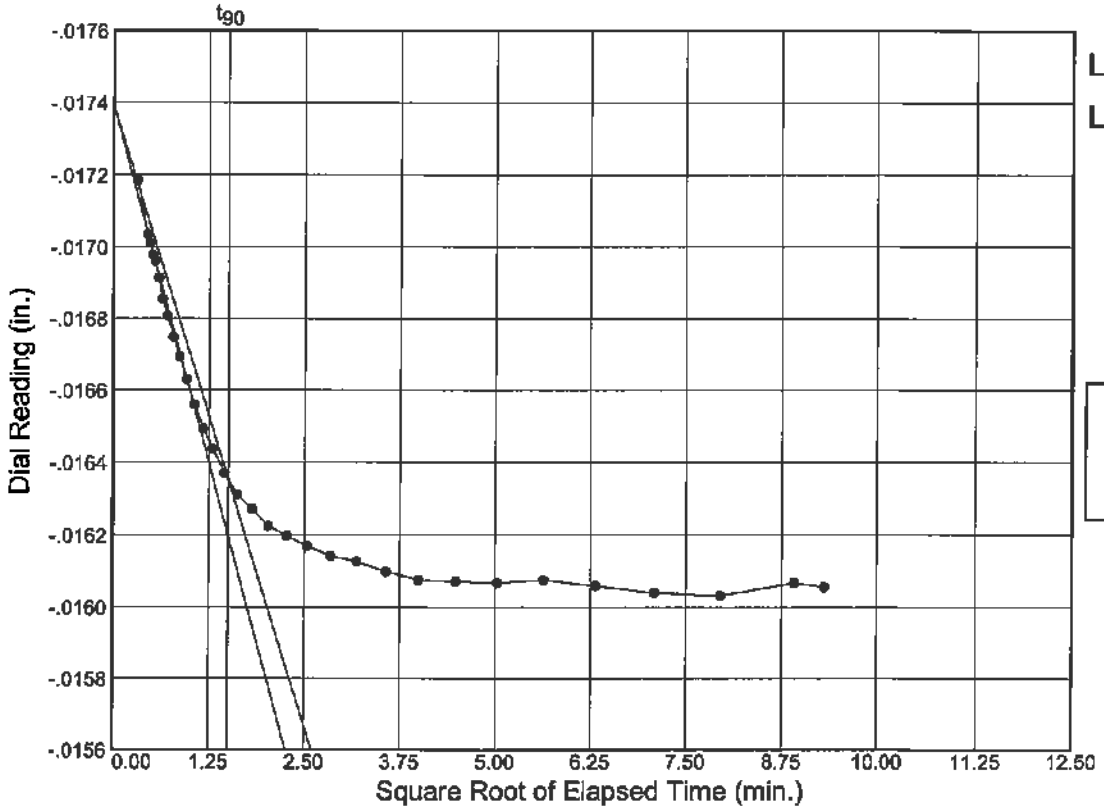
Load No.= 8
Load= 0.25 tsf
D_0 = -0.00556
D_{90} = -0.01242
D_{100} = -0.01319
T_{90} = 10.17 min.

C_v @ T_{90}
0.18 ft.^{2}/day

Dial Reading vs. Time

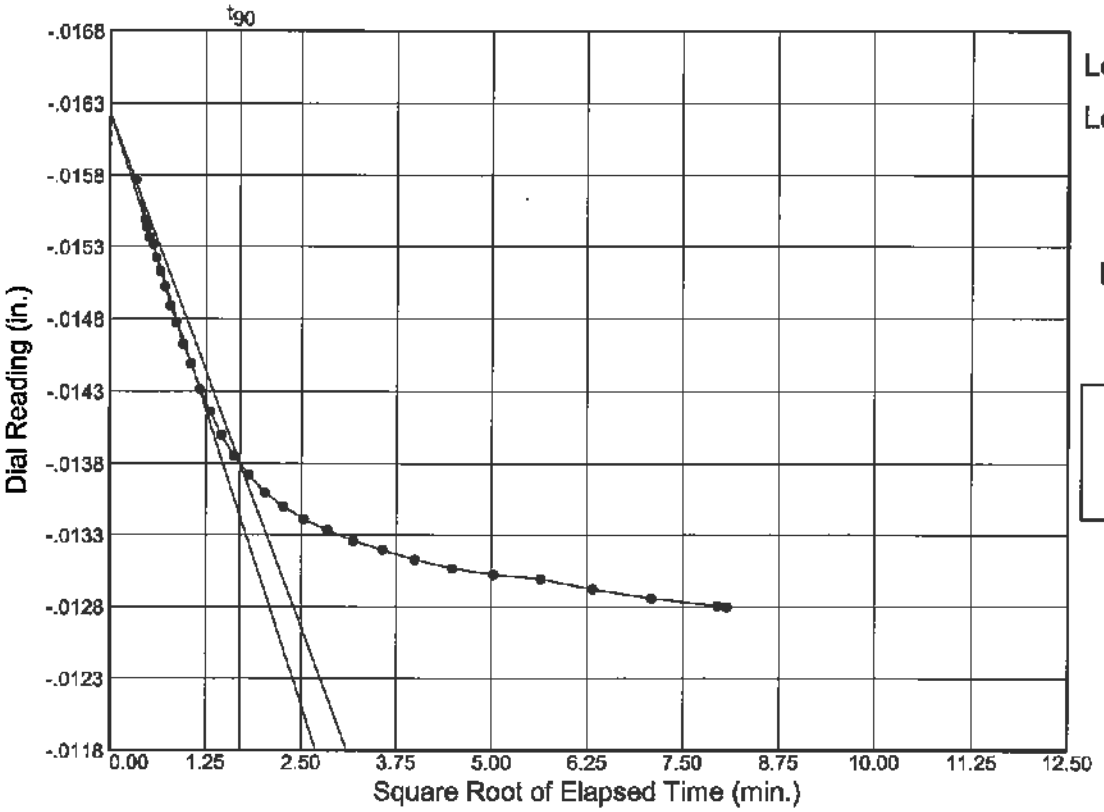
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.01739
D_{90} = -0.01635
D_{100} = -0.01624
T_{90} = 2.26 min.

C_v @ T_{90}
0.84 ft.^{2}/day



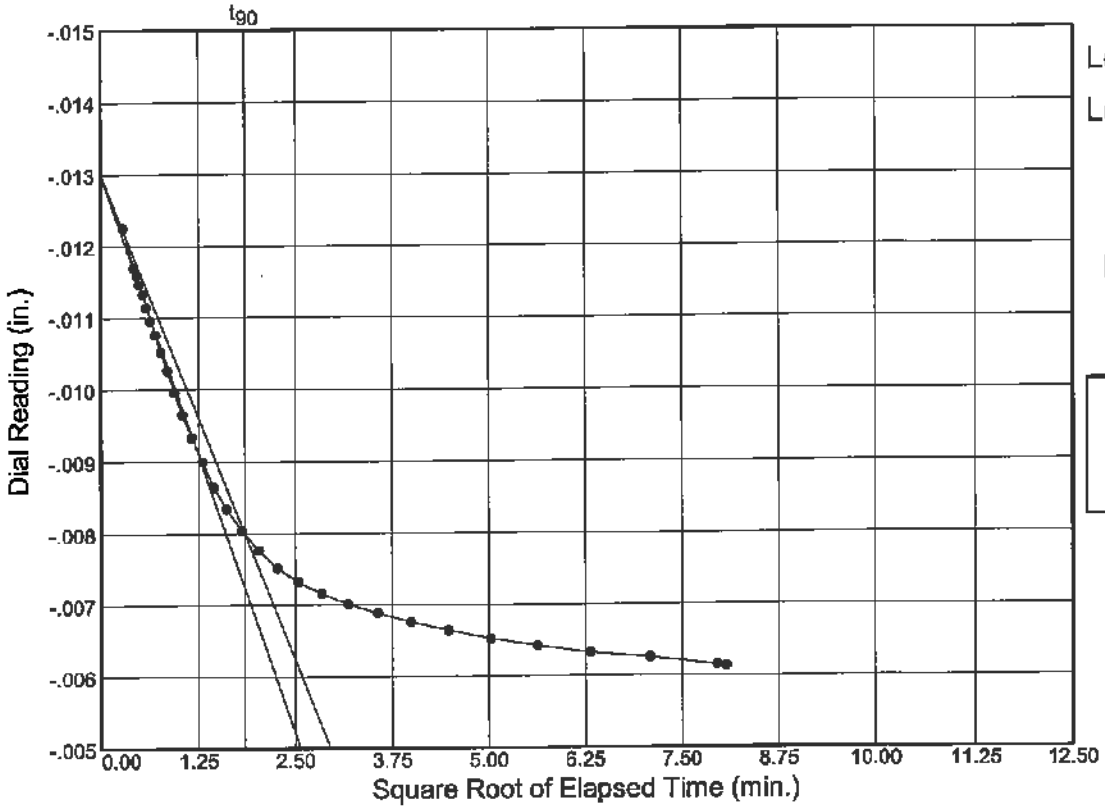
Load No.= 10
Load= 1.00 tsf
D_0 = -0.01624
D_{90} = -0.01380
D_{100} = -0.01353
T_{90} = 2.89 min.

C_v @ T_{90}
0.65 ft.^{2}/day

Dial Reading vs. Time

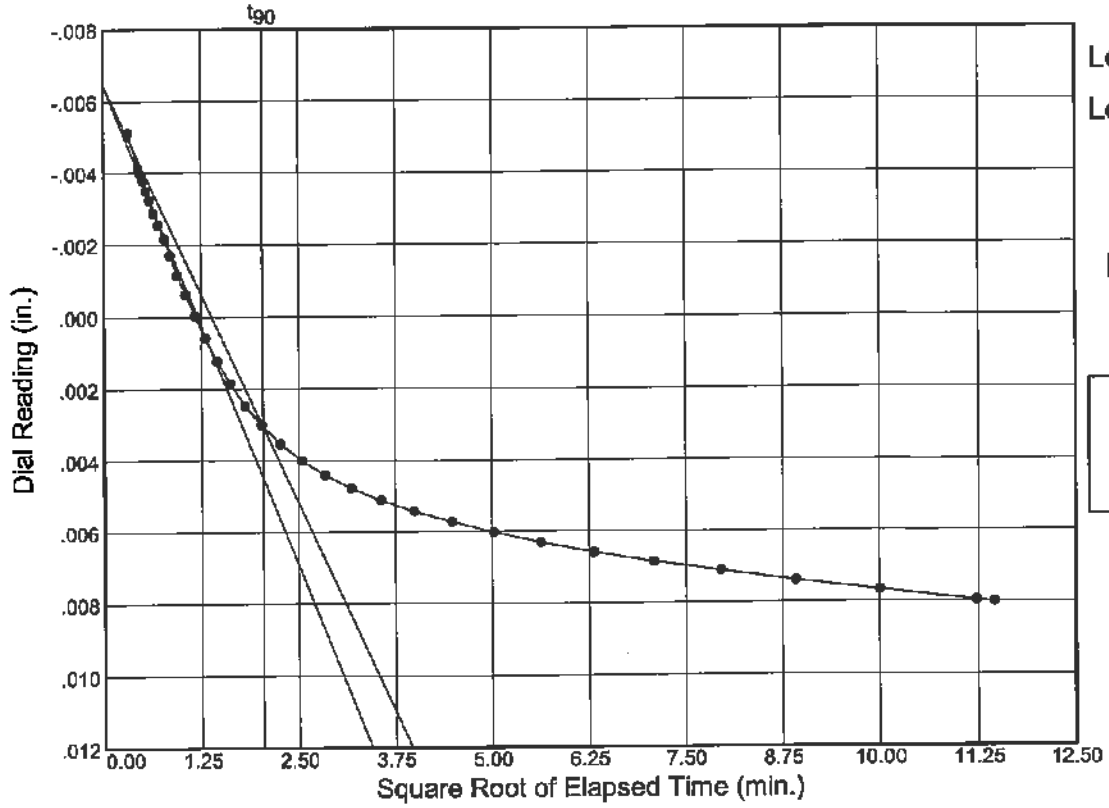
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.01301
D_{90} = -0.00799
D_{100} = -0.00744
T_{90} = 3.41 min.

C_v @ T_{90}
0.55 ft.^{2}/day



Load No.= 12
Load= 4.00 tsf
D_0 = -0.00644
D_{90} = 0.00304
D_{100} = 0.00409
T_{90} = 4.15 min.

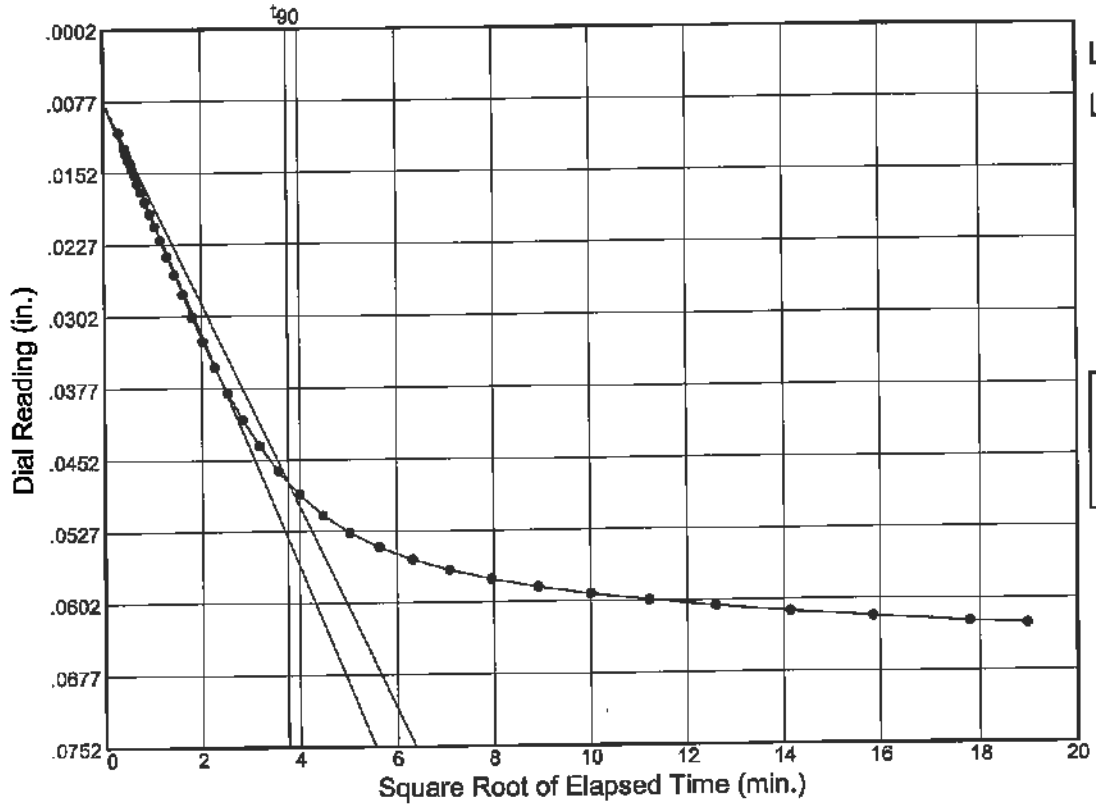
C_v @ T_{90}
0.44 ft.^{2}/day

Plate

Dial Reading vs. Time

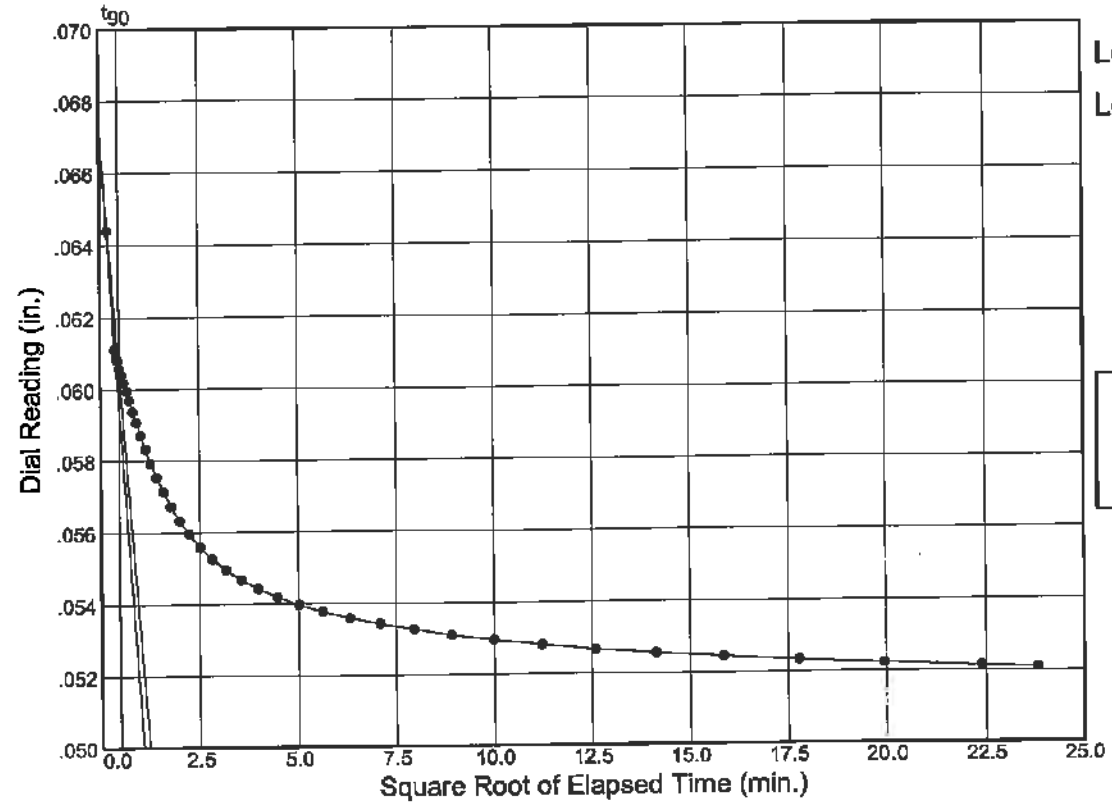
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 13
Load= 8.00 tsf
D_0 = 0.00771
D_{90} = 0.04750
D_{100} = 0.05192
T_{90} = 14.13 min.

C_v @ T_{90}
0.12 ft.^{2}/day



Load No.= 14
Load= 2.00 tsf
D_0 = 0.06732
D_{90} = 0.06063
D_{100} = 0.05989
T_{90} = 0.22 min.

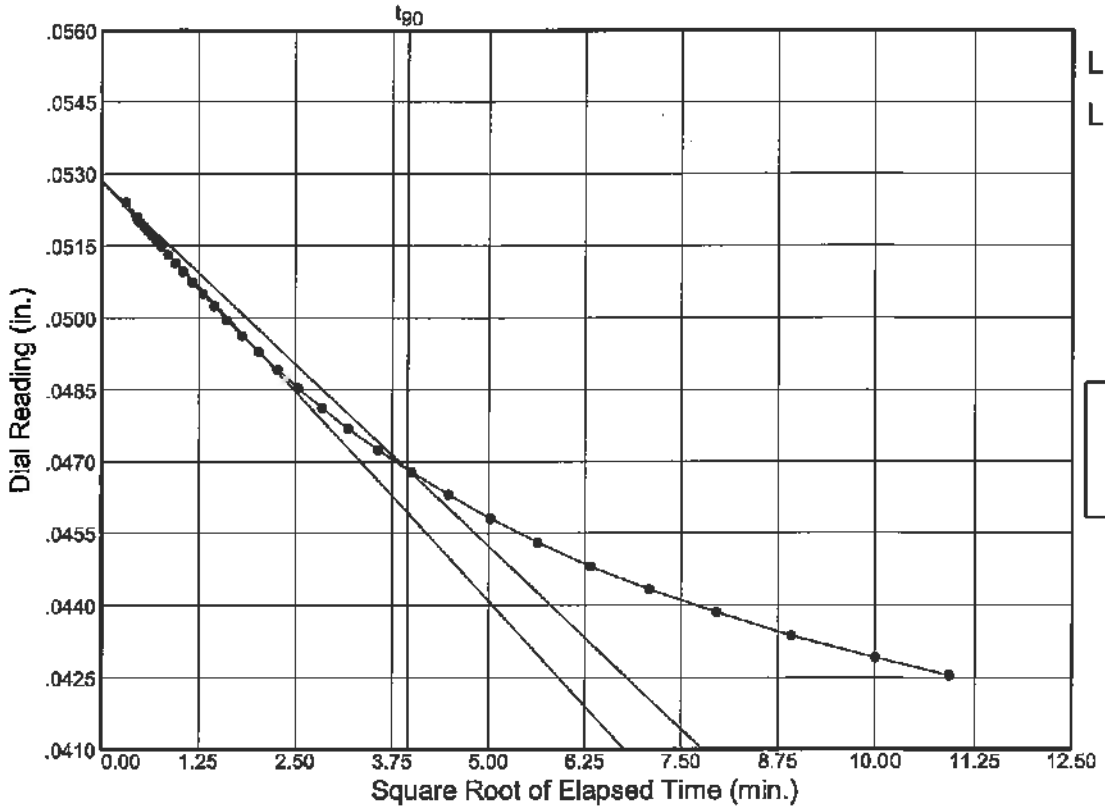
C_v @ T_{90}
7.12 ft.^{2}/day

Plate

Dial Reading vs. Time

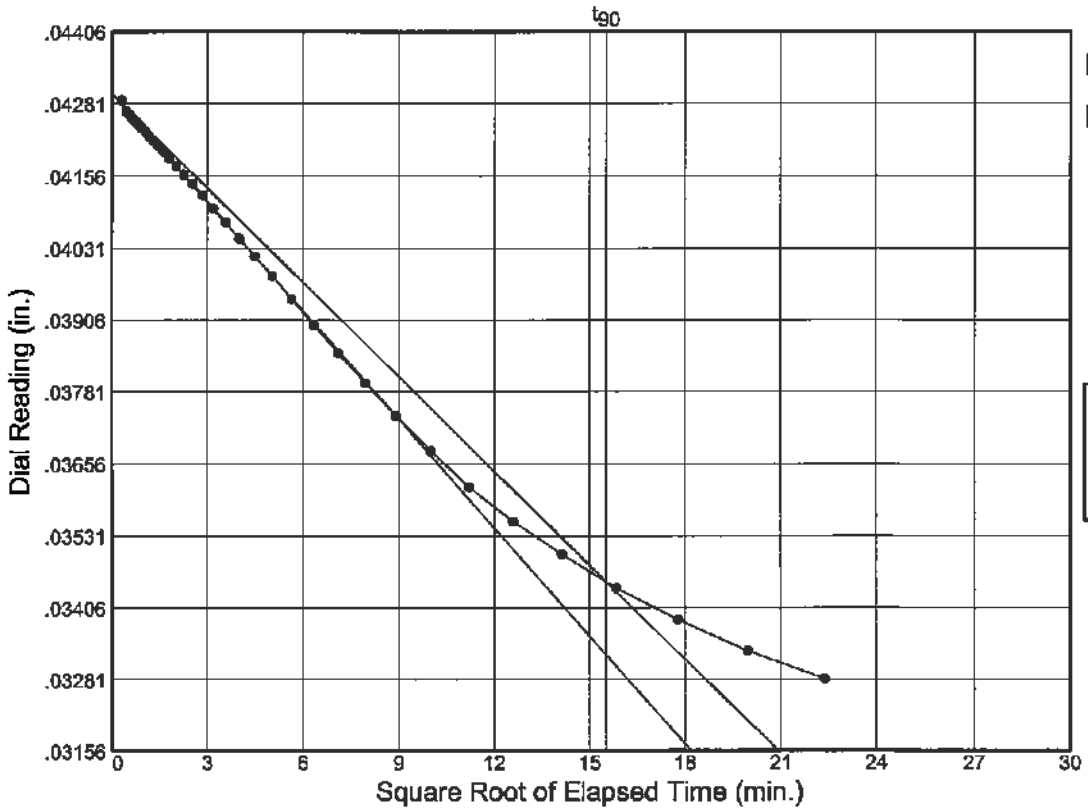
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 15
Load= 0.50 tsf
D_0 = 0.05284
D_{90} = 0.04683
D_{100} = 0.04616
T_{90} = 15.59 min.

C_v @ T_{90}
0.11 ft.^{2}/day



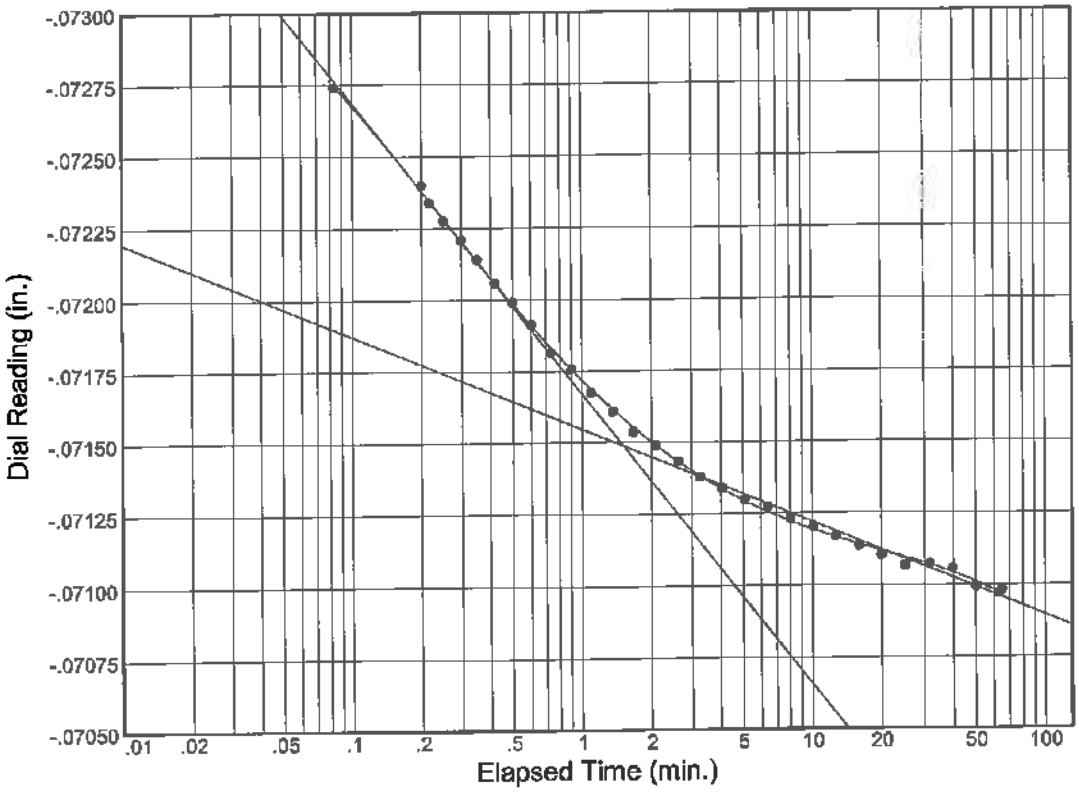
Load No.= 16
Load= 0.25 tsf
D_0 = 0.04299
D_{90} = 0.03451
D_{100} = 0.03357
T_{90} = 240.71 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

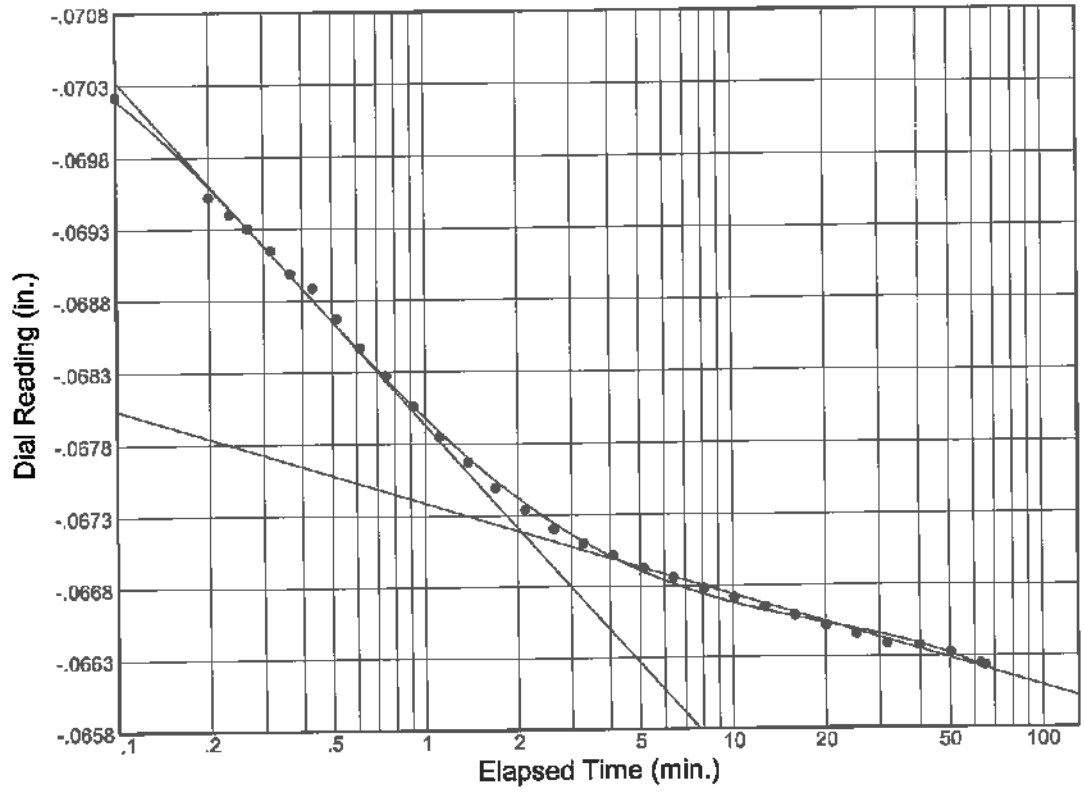
Location: WB-56 50'-52'



Load No.= 3
Load= 0.50 tsf
D_0 = -0.07398
D_{50} = -0.07273
D_{100} = -0.07149
T_{50} = 0.09 min.

C_v @ T_{50}
5.33 ft.2/day

C_α = 0.000



Load No.= 4
Load= 1.00 tsf
D_0 = -0.07224
D_{50} = -0.06971
D_{100} = -0.06718
T_{50} = 0.18 min.

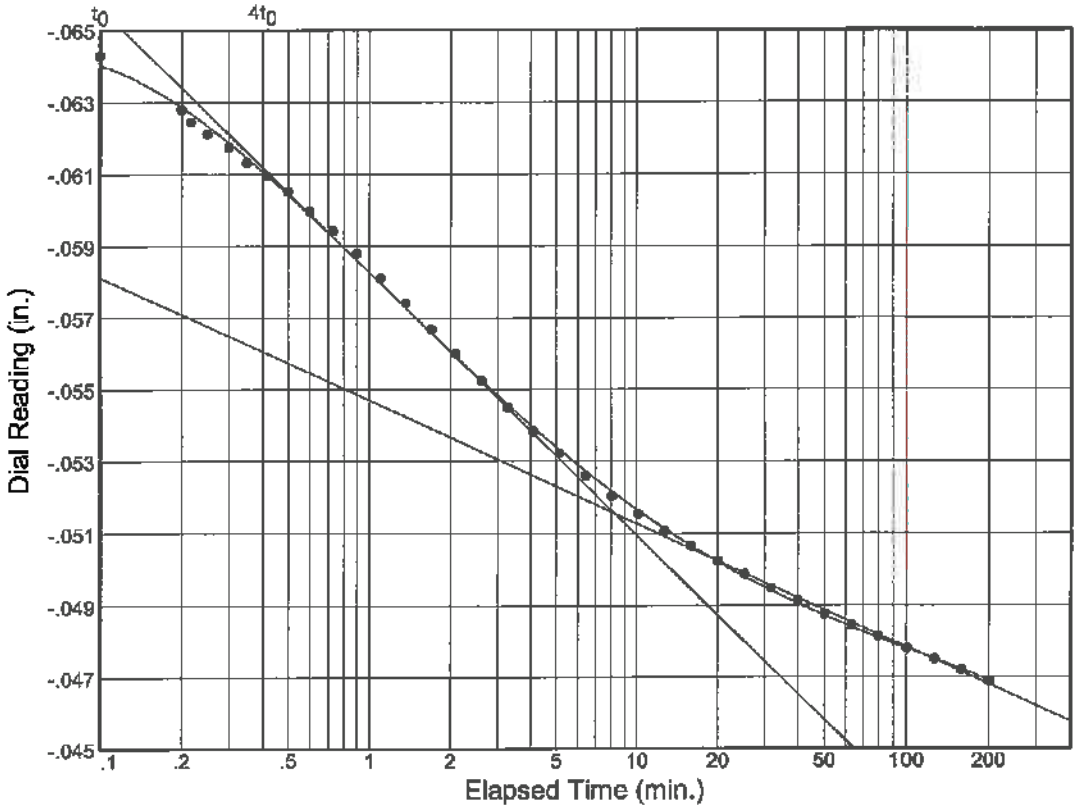
C_v @ T_{50}
2.76 ft.2/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

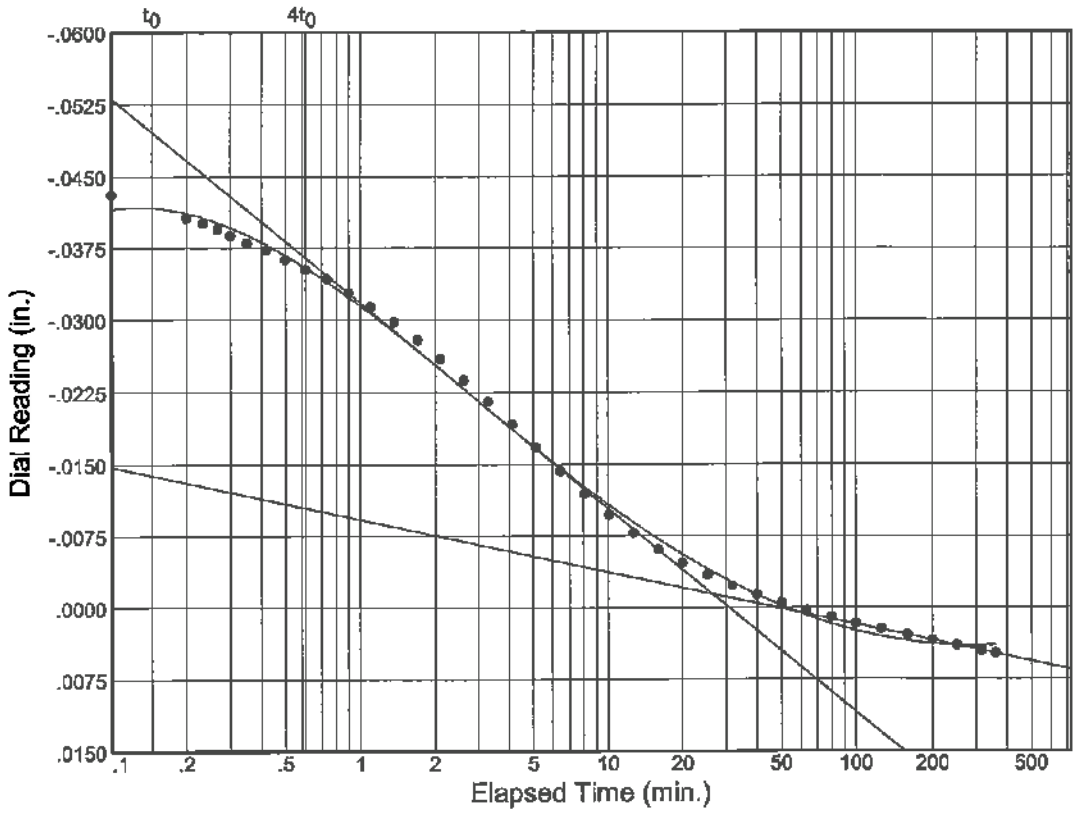
Location: WB-56 50'-52'



Load No.= 5
Load= 2.00 tsf
D_0 = -0.06698
D_{50} = -0.05927
D_{100} = -0.05156
T_{50} = 0.73 min.

C_v @ T_{50}
0.66 ft.^{2}/day

C_α = 0.003



Load No.= 6
Load= 4.00 tsf
D_0 = -0.04774
D_{50} = -0.02457
D_{100} = -0.00141
T_{50} = 2.17 min.

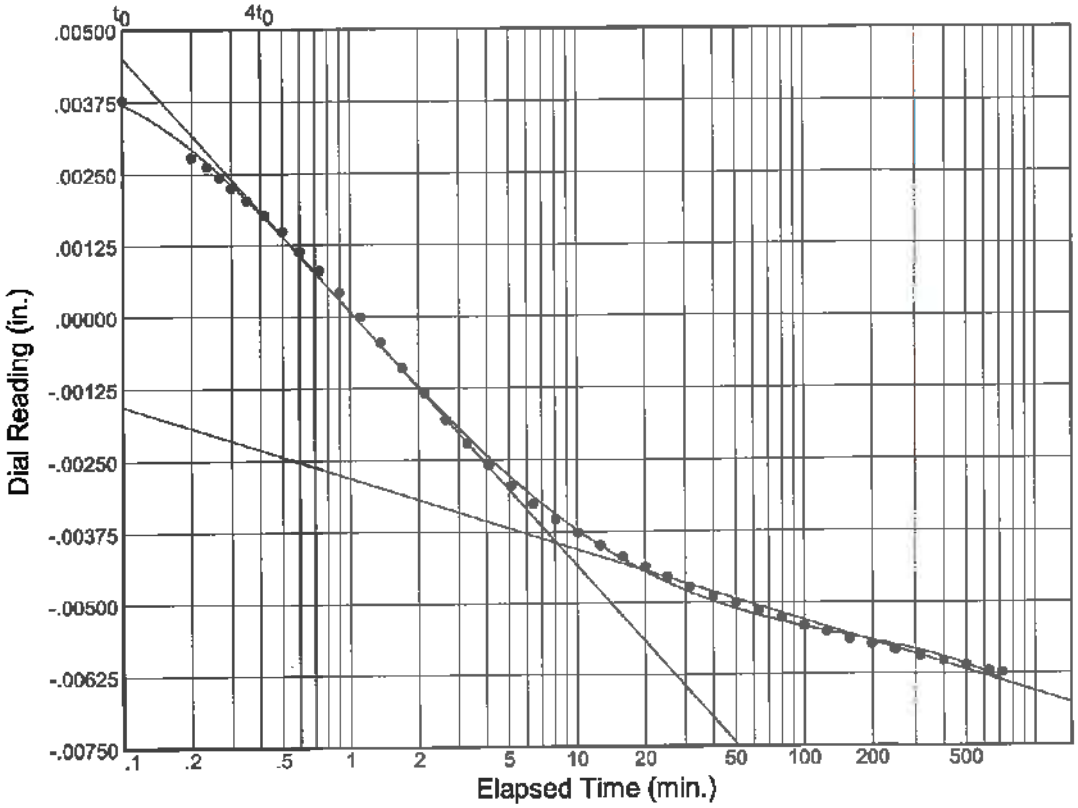
C_v @ T_{50}
0.20 ft.^{2}/day

C_α = 0.006

Dial Reading vs. Time

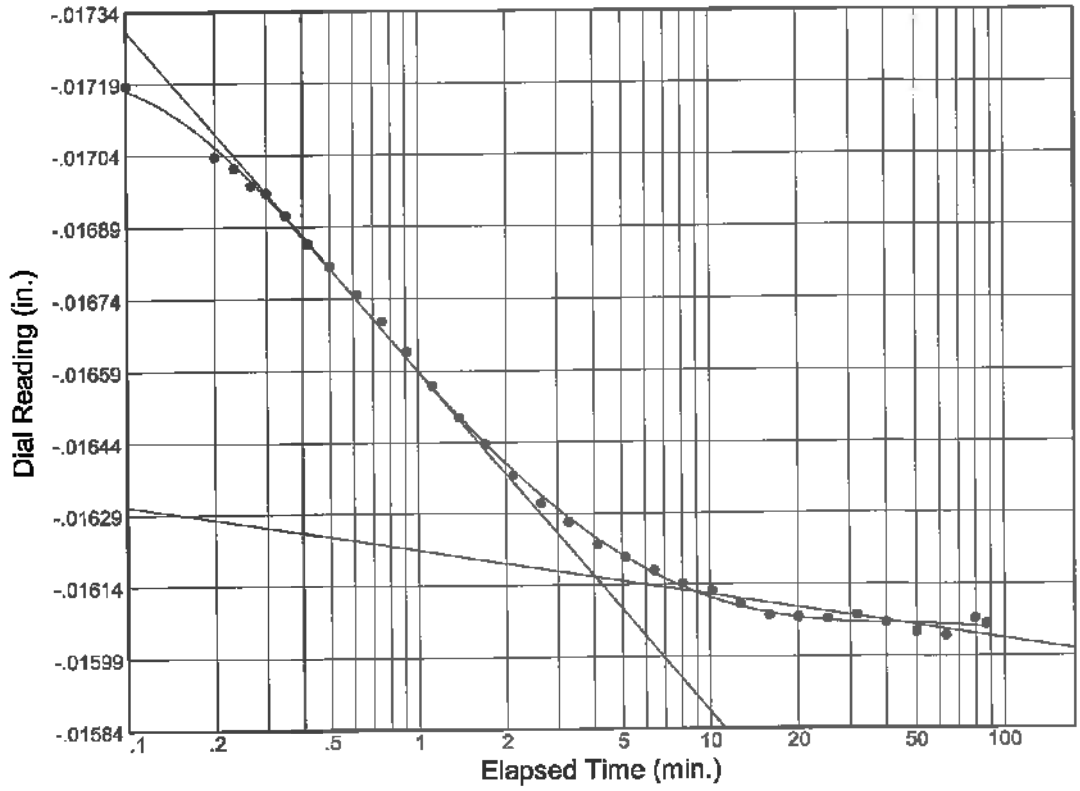
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 7
Load= 1.00 tsf
D_0 = 0.00560
D_{50} = 0.00082
D_{100} = -0.00395
T_{50} = 0.68 min.

C_v @ T_{50}
0.62 ft.^{2}/day



Load No.= 9
Load= 0.50 tsf
D_0 = -0.01773
D_{50} = -0.01694
D_{100} = -0.01616
T_{50} = 0.31 min.

C_v @ T_{50}
1.41 ft.^{2}/day

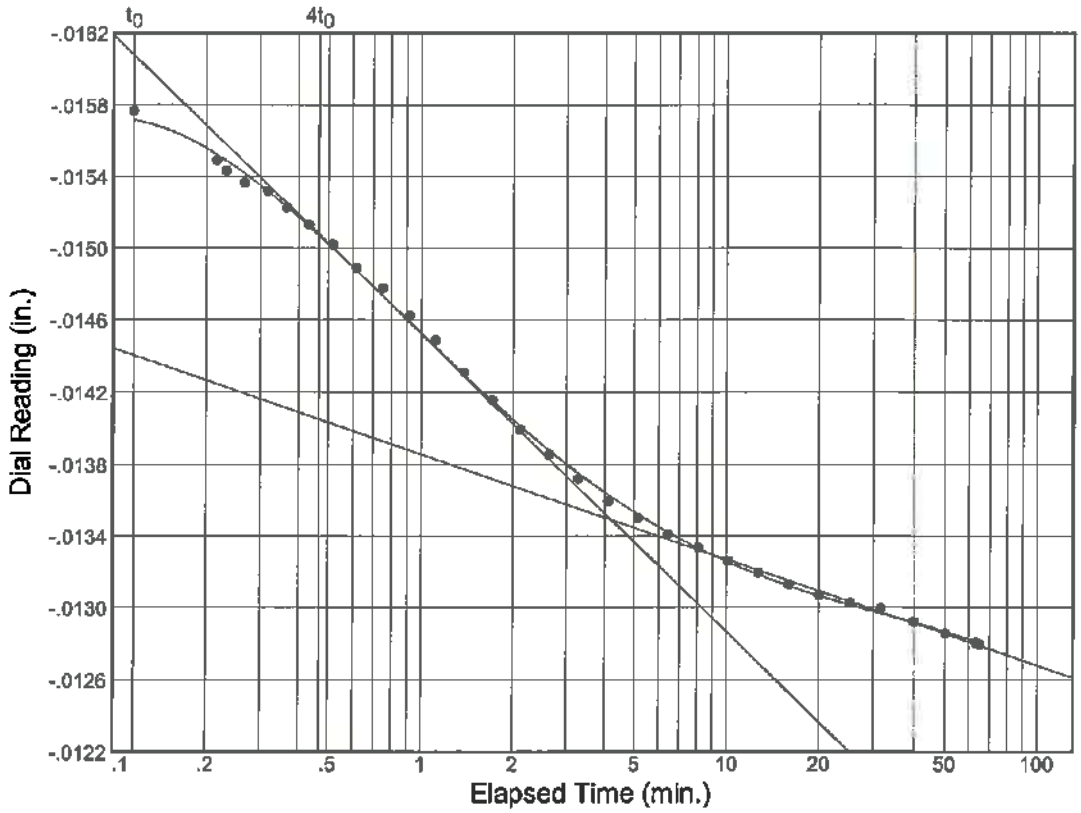
C_α = 0.000

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

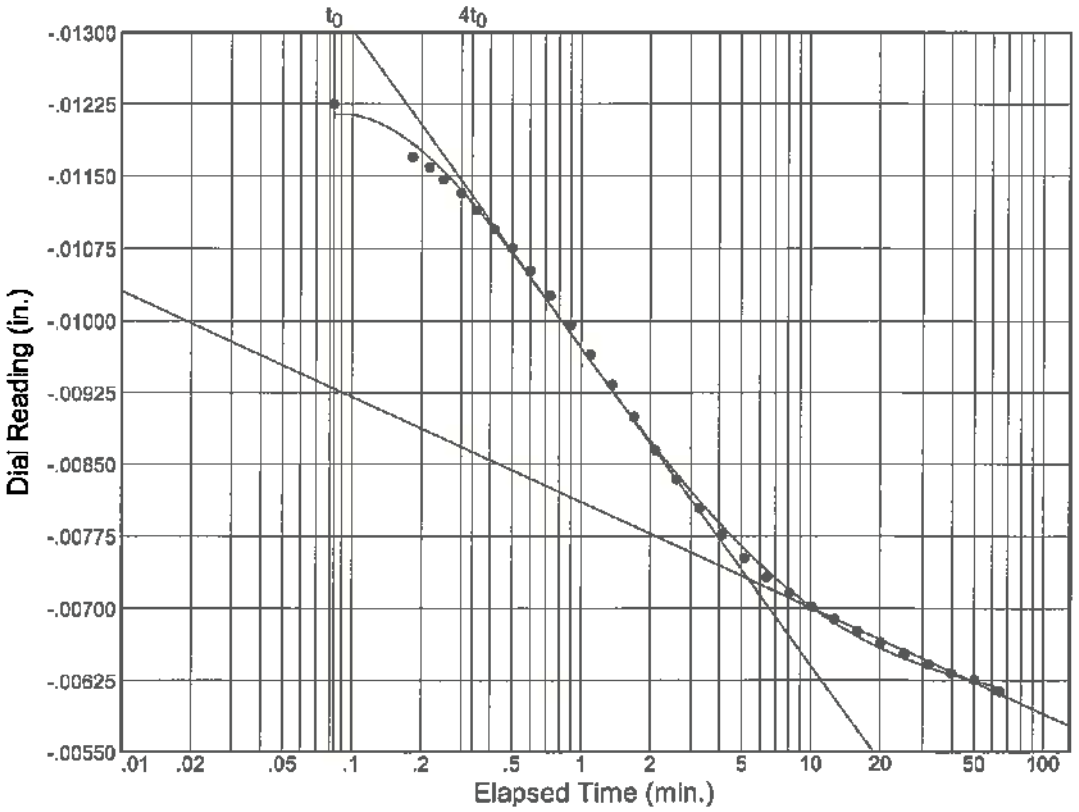
Location: WB-56 50'-52'



Load No.= 10
Load= 1.00 tsf
D_0 = -0.01637
D_{50} = -0.01493
D_{100} = -0.01349
T_{50} = 0.57 min.

C_v @ T_{50}
0.76 ft.^{2}/day

C_α = 0.001



Load No.= 11
Load= 2.00 tsf
D_0 = -0.01307
D_{50} = -0.01019
D_{100} = -0.00730
T_{50} = 0.72 min.

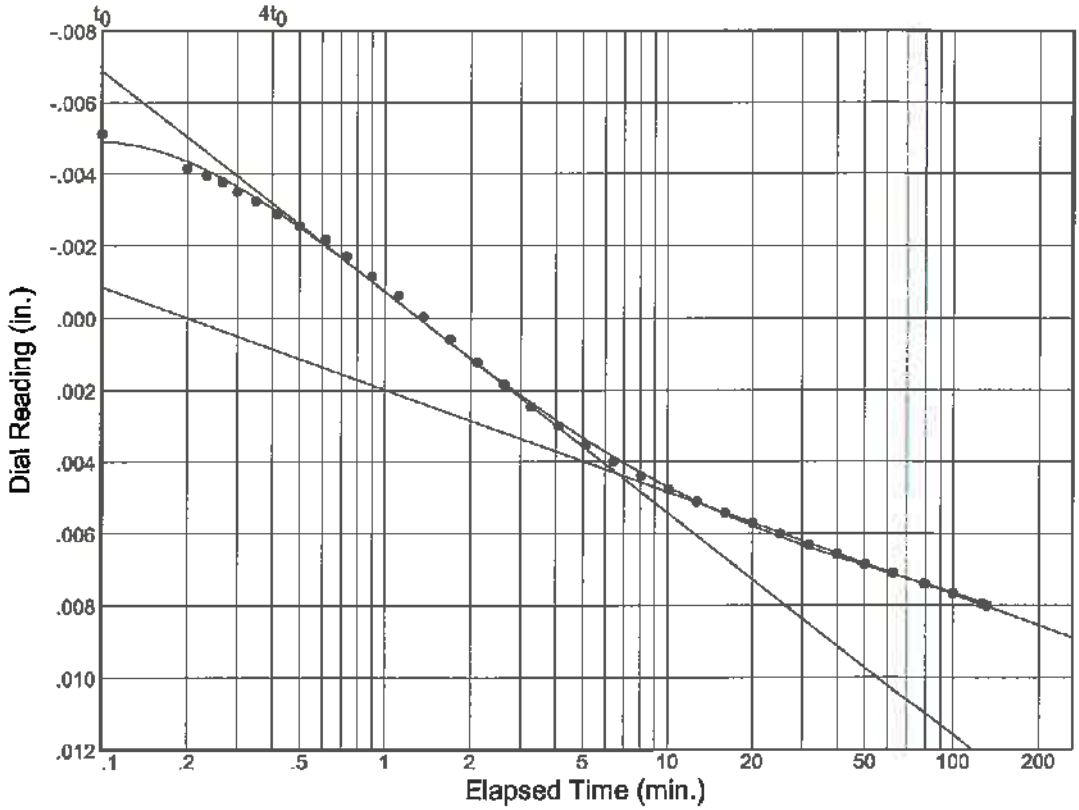
C_v @ T_{50}
0.60 ft.^{2}/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

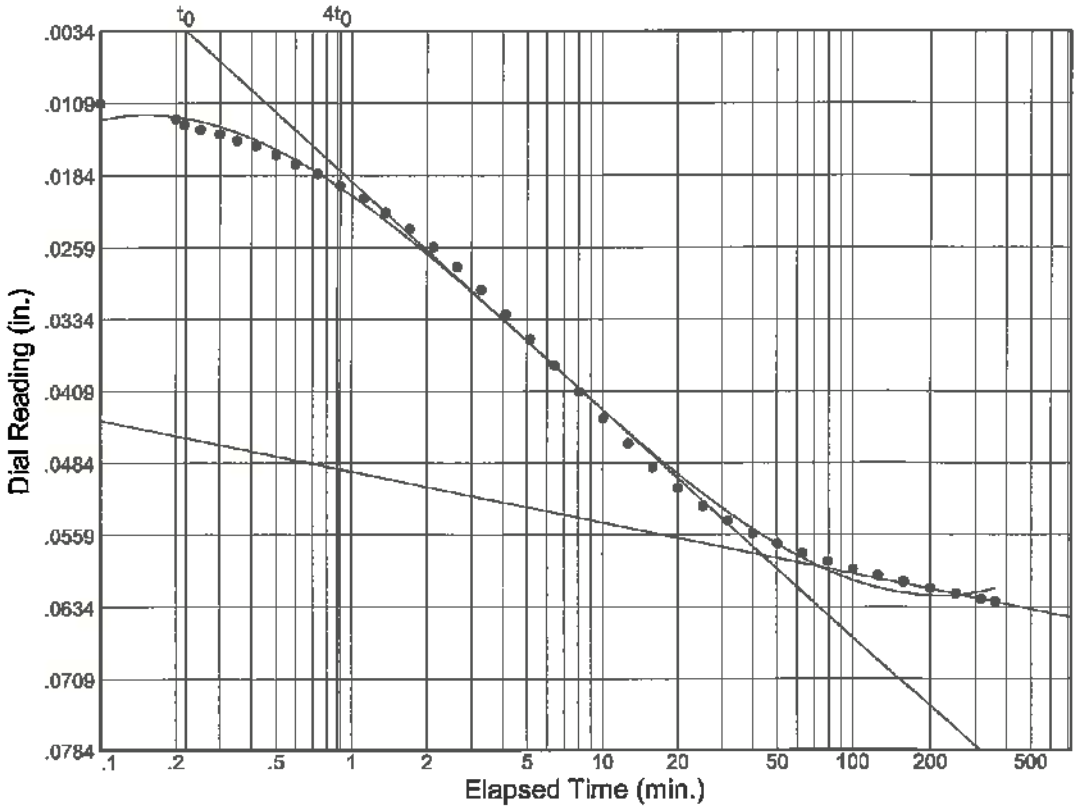
Location: WB-56 50'-52'



Load No.= 12
Load= 4.00 tsf
D_0 = -0.00676
D_{50} = -0.00121
D_{100} = 0.00433
T_{50} = 0.83 min.

C_v @ T_{50}
0.51 ft.^{2}/day

C_α = 0.003



Load No.= 13
Load= 8.00 tsf
D_0 = 0.00561
D_{50} = 0.03181
D_{100} = 0.05800
T_{50} = 3.42 min.

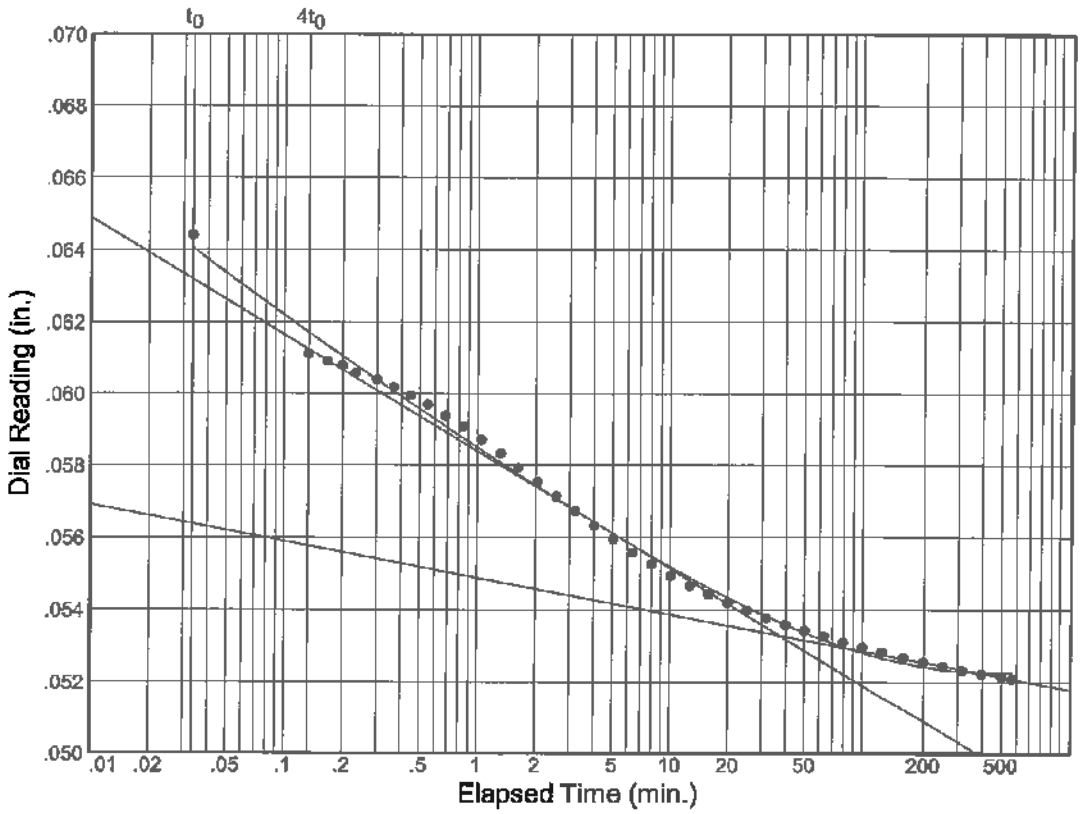
C_v @ T_{50}
0.11 ft.^{2}/day

C_α = 0.006

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-56 50'-52'



Load No.= 14

Load= 2.00 tsf

D_0 = 0.06640

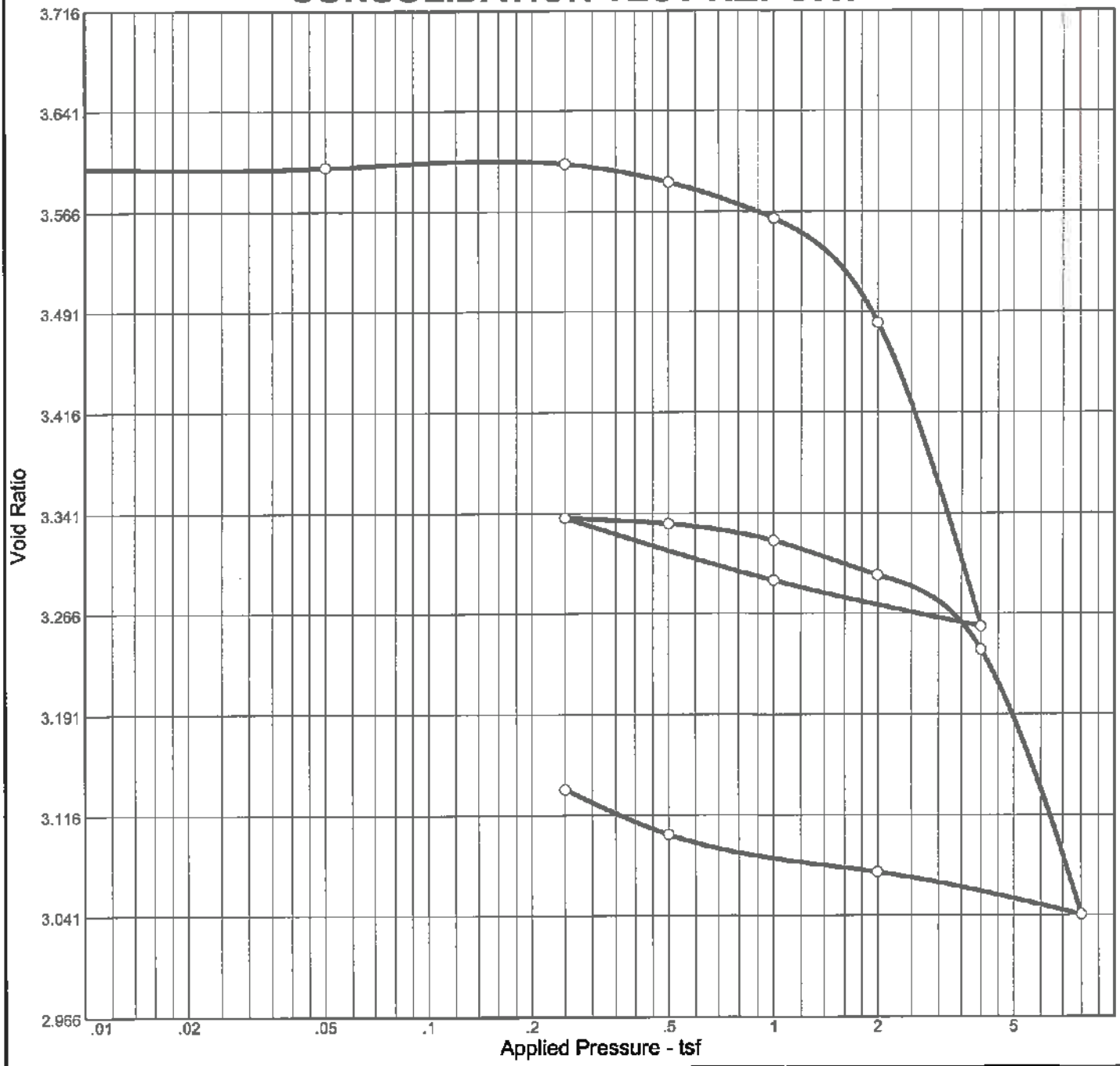
D_{50} = 0.05985

D_{100} = 0.05329

T_{50} = 0.42 min.

C_v @ T_{50}
0.88 ft.^{2}/day

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
98.2 %	215.6 %	22.3			1.64	0.95	1.86	0.75	0.08			3.599

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Muck	(PT)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: MB-14 35'-37'

Remarks:

Fines Content= 82.2%
Organic Content= 60.1%

CONSOLIDATION TEST REPORT

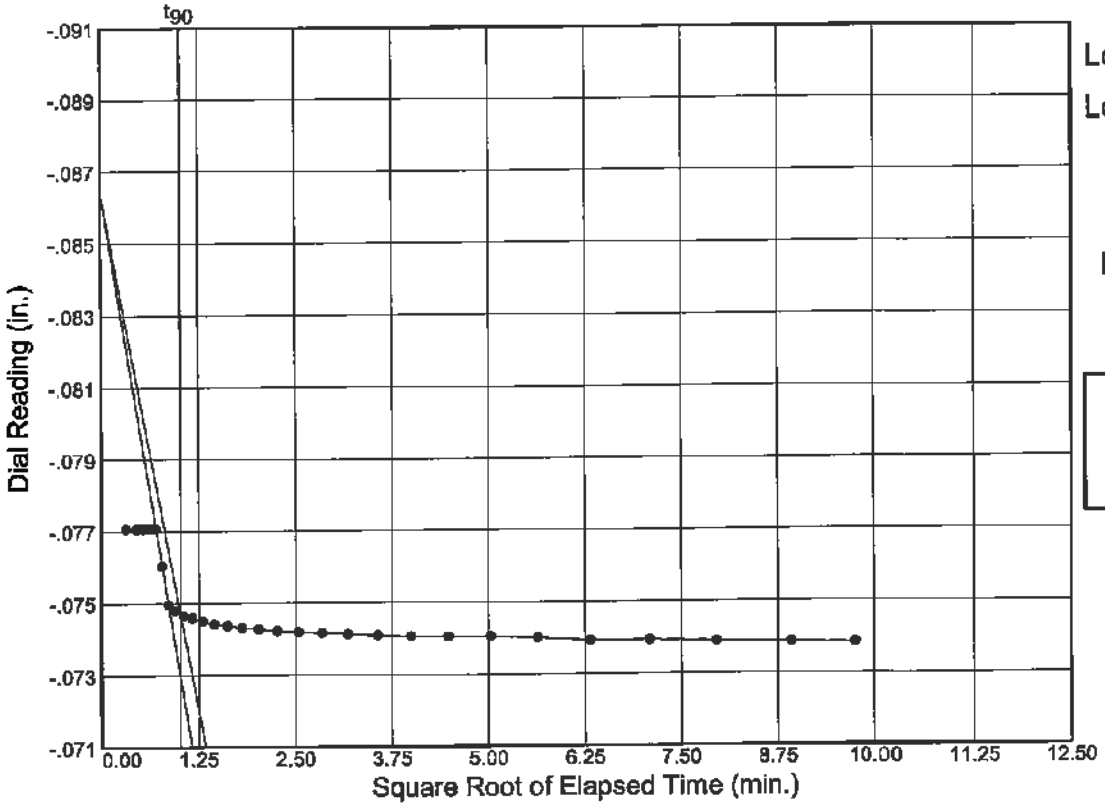
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

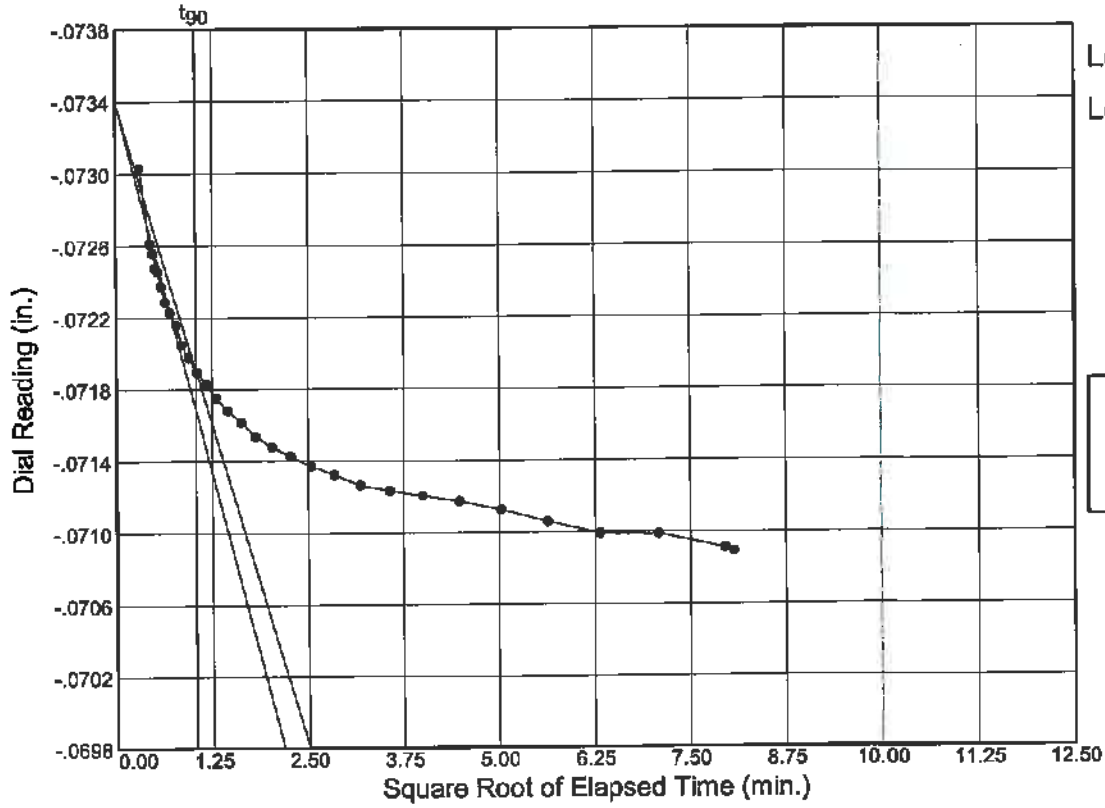
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 2
Load= 0.25 tsf
D_0 = -0.08639
D_{90} = -0.07470
D_{100} = -0.07340
T_{90} = 1.04 min.

C_v @ T_{90}
2.05 ft.^{2}/day



Load No.= 3
Load= 0.50 tsf
D_0 = -0.07340
D_{90} = -0.07191
D_{100} = -0.07174
T_{90} = 1.08 min.

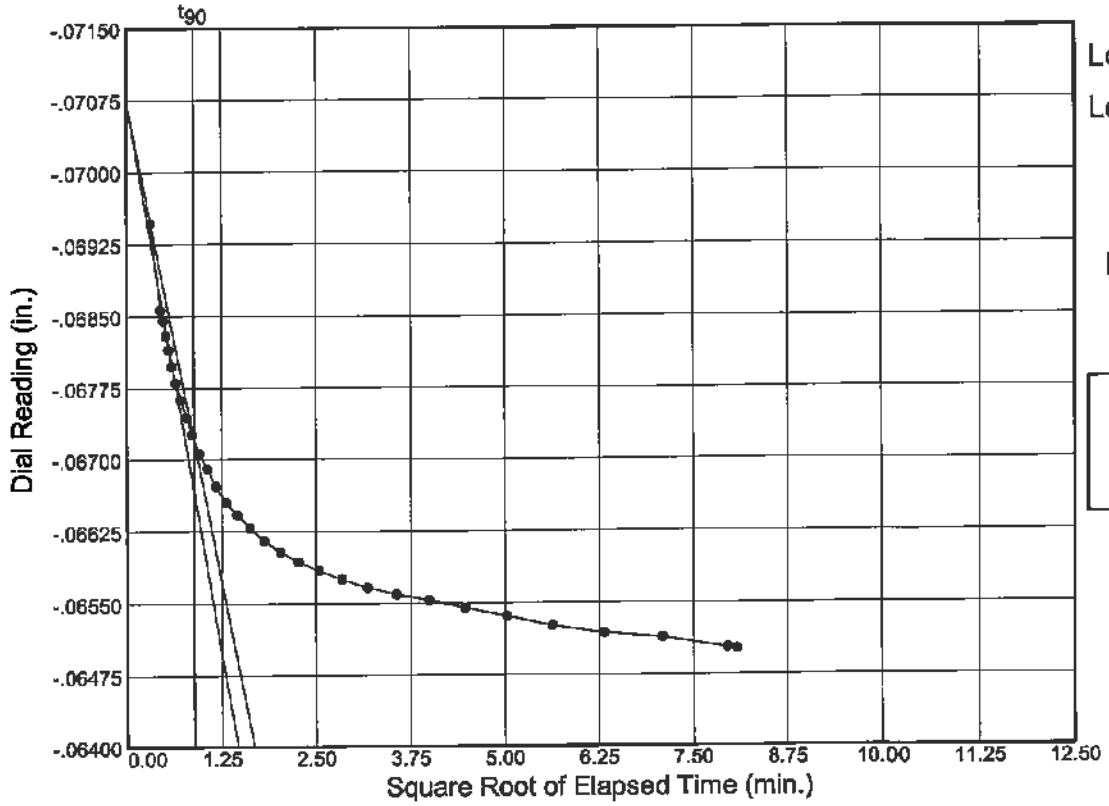
C_v @ T_{90}
1.97 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 4

Load= 1.00 tsf

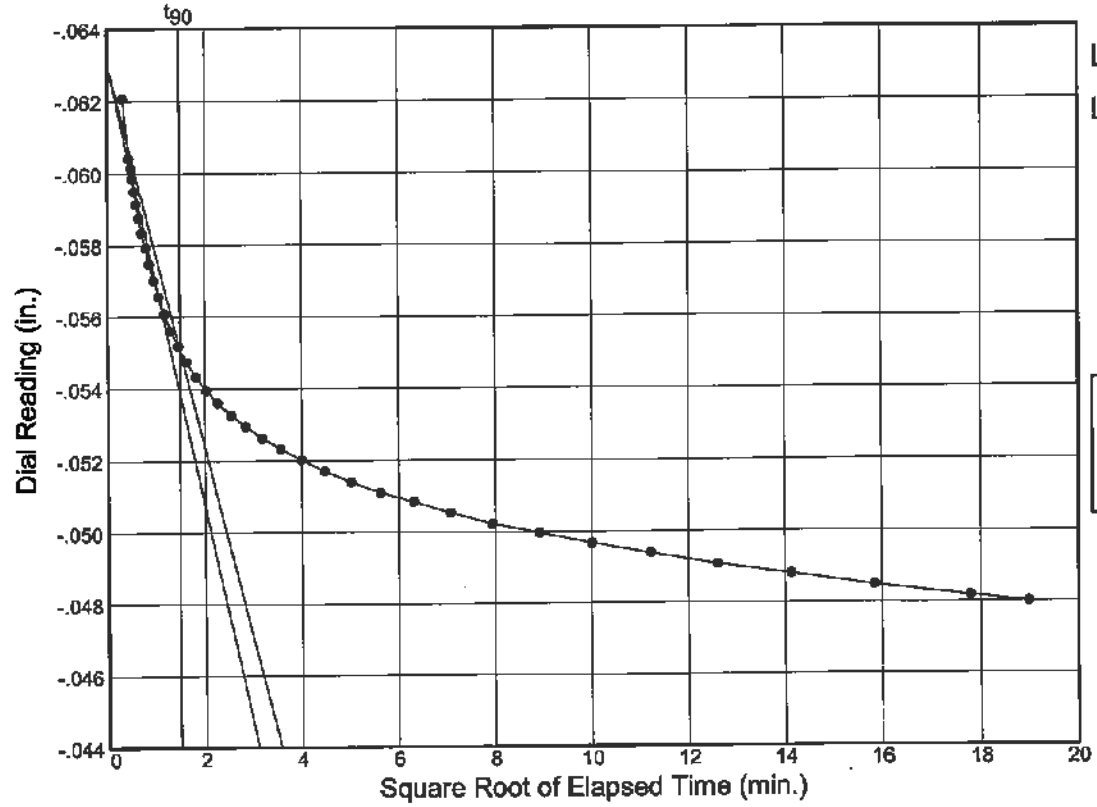
D_0 = -0.07074

D_{90} = -0.06720

D_{100} = -0.06681

T_{90} = 0.78 min.

C_v @ T_{90}
2.70 ft.^{2}/day



Load No.= 5

Load= 2.00 tsf

D_0 = -0.06305

D_{90} = -0.05509

D_{100} = -0.05420

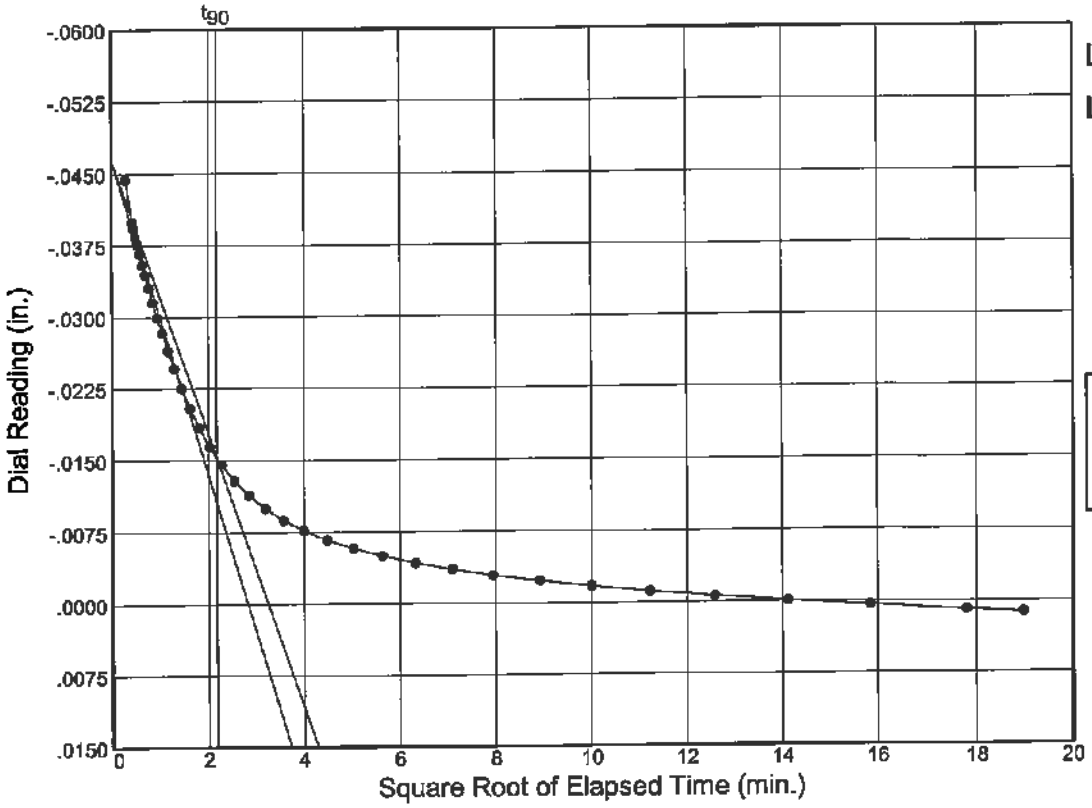
T_{90} = 2.21 min.

C_v @ T_{90}
0.93 ft.^{2}/day

Dial Reading vs. Time

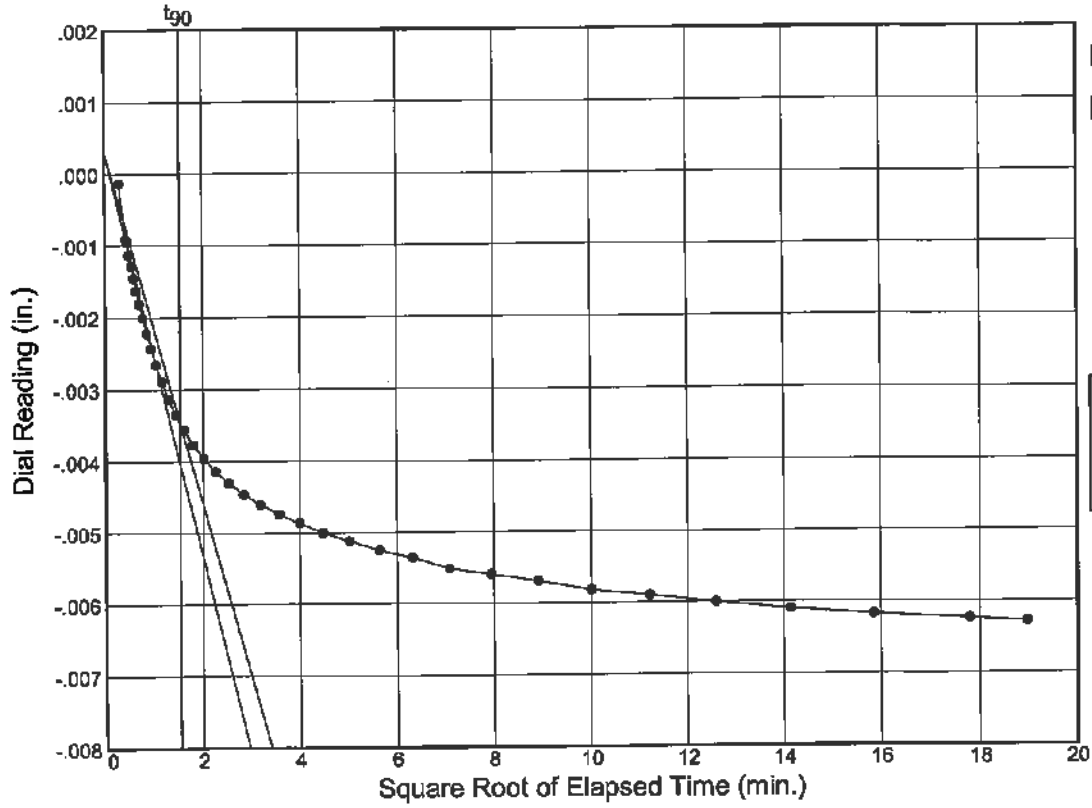
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 6
Load= 4.00 tsf
D_0 = -0.04641
D_{90} = -0.01523
D_{100} = -0.01176
T_{90} = 4.72 min.

C_v @ T_{90}
0.41 ft.^{2}/day



Load No.= 7
Load= 1.00 tsf
D_0 = 0.00030
D_{90} = -0.00347
D_{100} = -0.00388
T_{90} = 2.37 min.

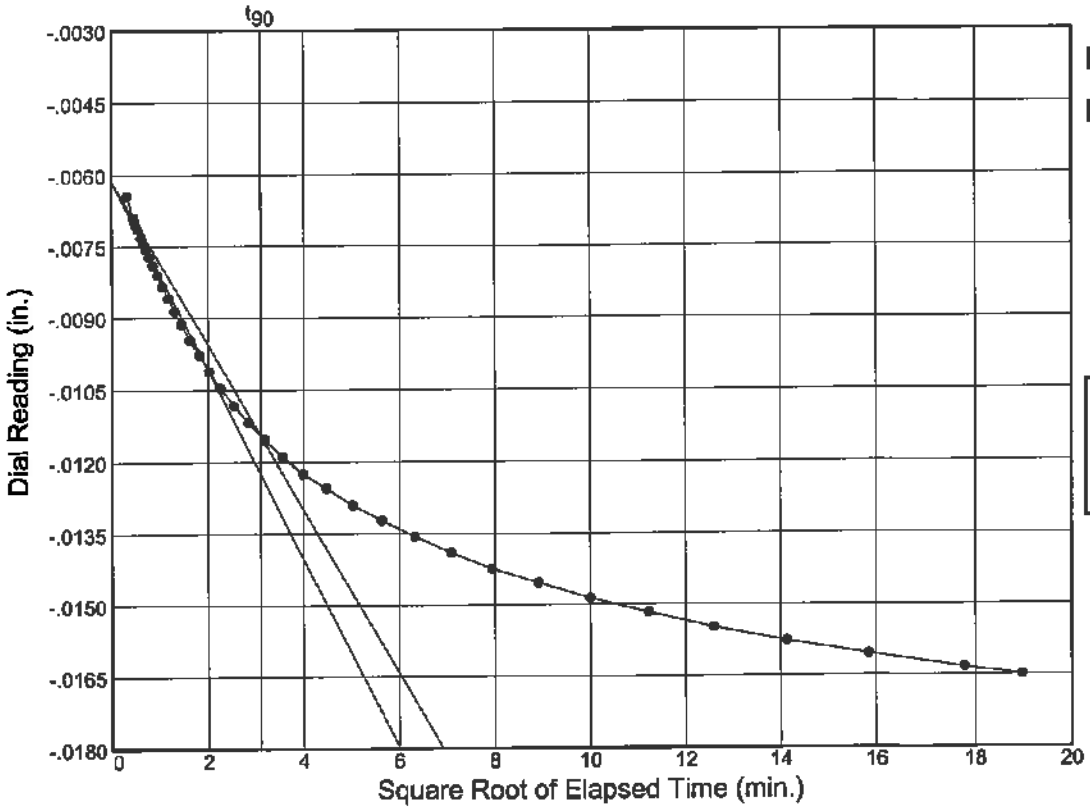
C_v @ T_{90}
0.77 ft.^{2}/day

Plate

Dial Reading vs. Time

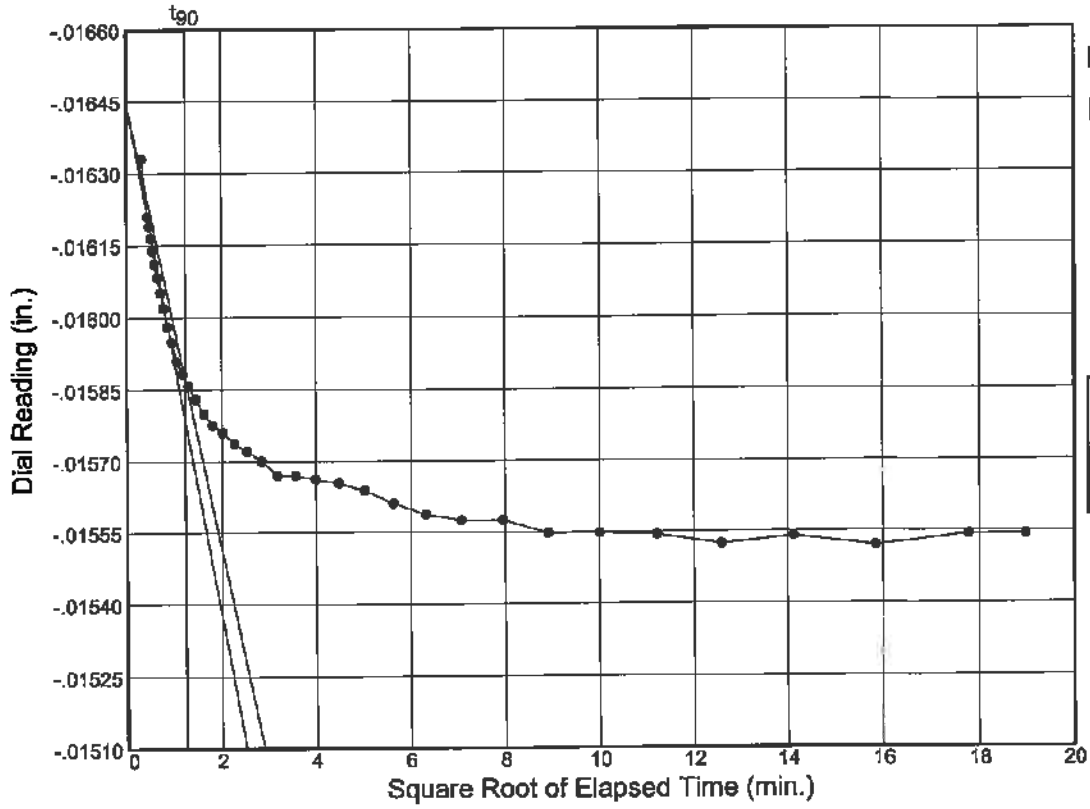
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 8
Load= 0.25 tsf
D_0 = -0.00613
D_{90} = -0.01144
D_{100} = -0.01203
T_{90} = 9.56 min.

C_v @ T_{90}
0.19 ft.^{2}/day



Load No.= 9
Load= 0.50 tsf
D_0 = -0.01645
D_{90} = -0.01587
D_{100} = -0.01581
T_{90} = 1.54 min.

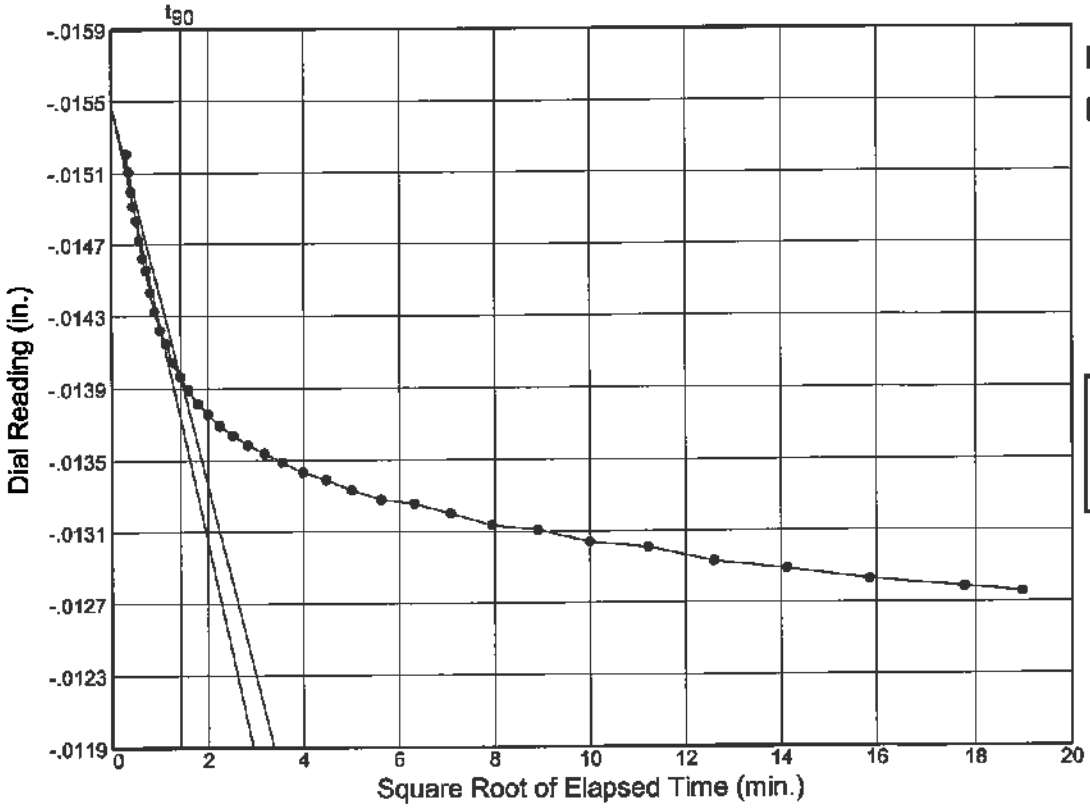
C_v @ T_{90}
1.22 ft.^{2}/day

Plate

Dial Reading vs. Time

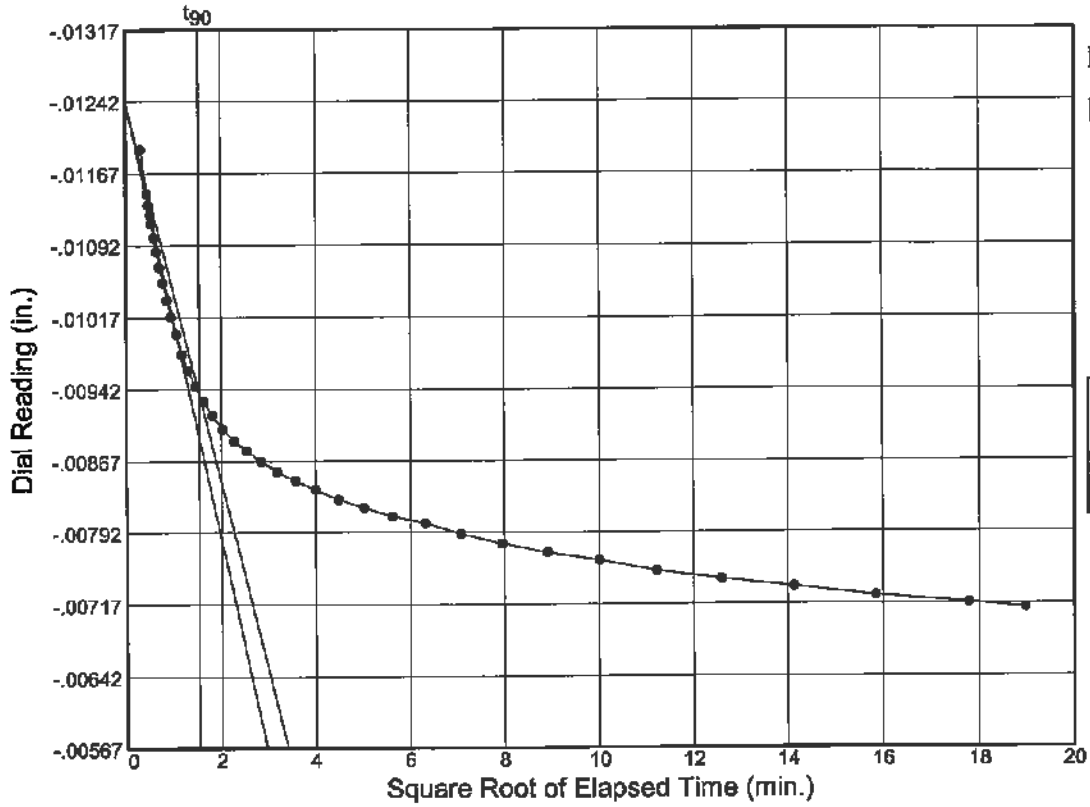
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 10
Load= 1.00 tsf
D_0 = -0.01548
D_{90} = -0.01396
D_{100} = -0.01379
T_{90} = 2.05 min.

C_v @ T_{90}
0.92 ft.^{2}/day



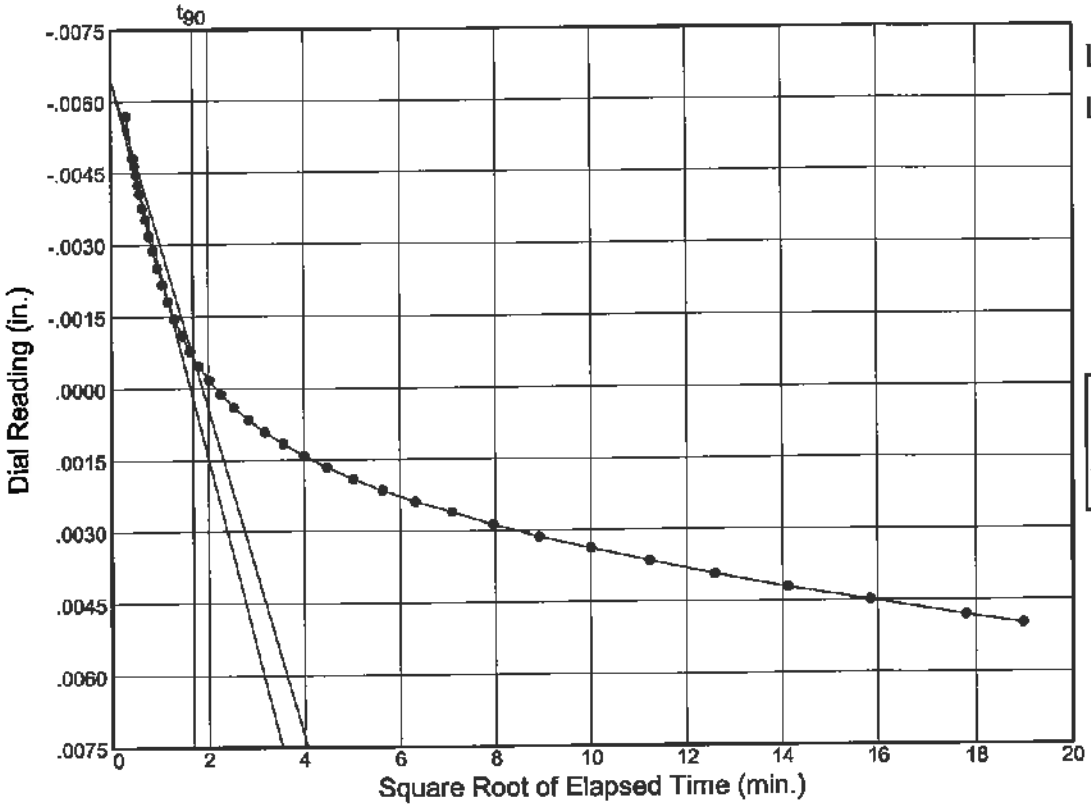
Load No.= 11
Load= 2.00 tsf
D_0 = -0.01241
D_{90} = -0.00938
D_{100} = -0.00905
T_{90} = 2.33 min.

C_v @ T_{90}
0.80 ft.^{2}/day

Dial Reading vs. Time

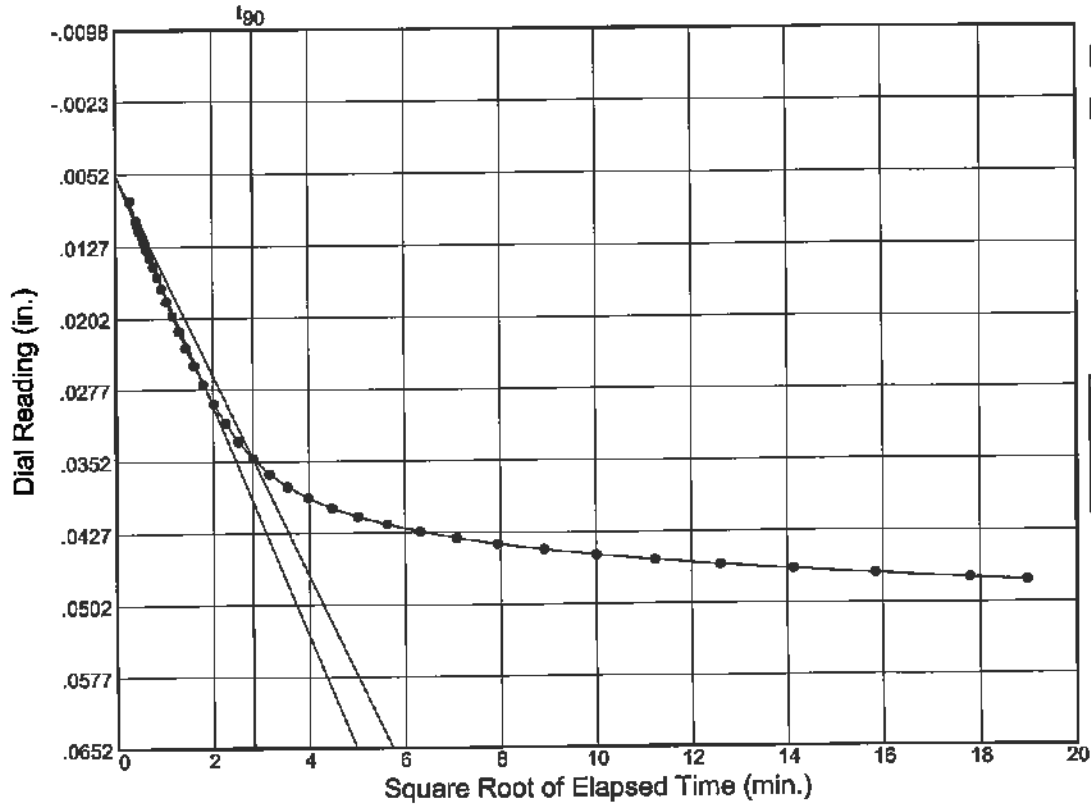
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 12
Load= 4.00 tsf
D_0 = -0.00646
D_{90} = -0.00067
D_{100} = -0.00003
T_{90} = 2.85 min.

C_v @ T_{90}
0.64 ft.^{2}/day



Load No.= 13
Load= 8.00 tsf
D_0 = 0.00530
D_{90} = 0.03491
D_{100} = 0.03820
T_{90} = 8.02 min.

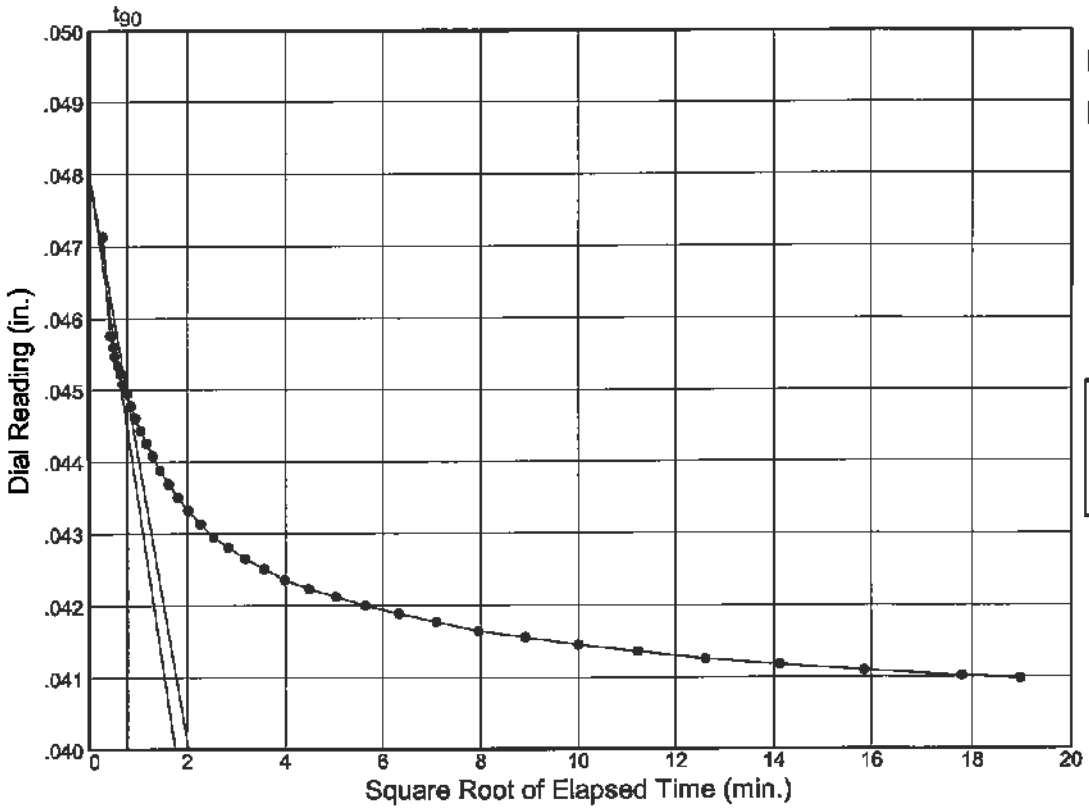
C_v @ T_{90}
0.22 ft.^{2}/day

Plate

Dial Reading vs. Time

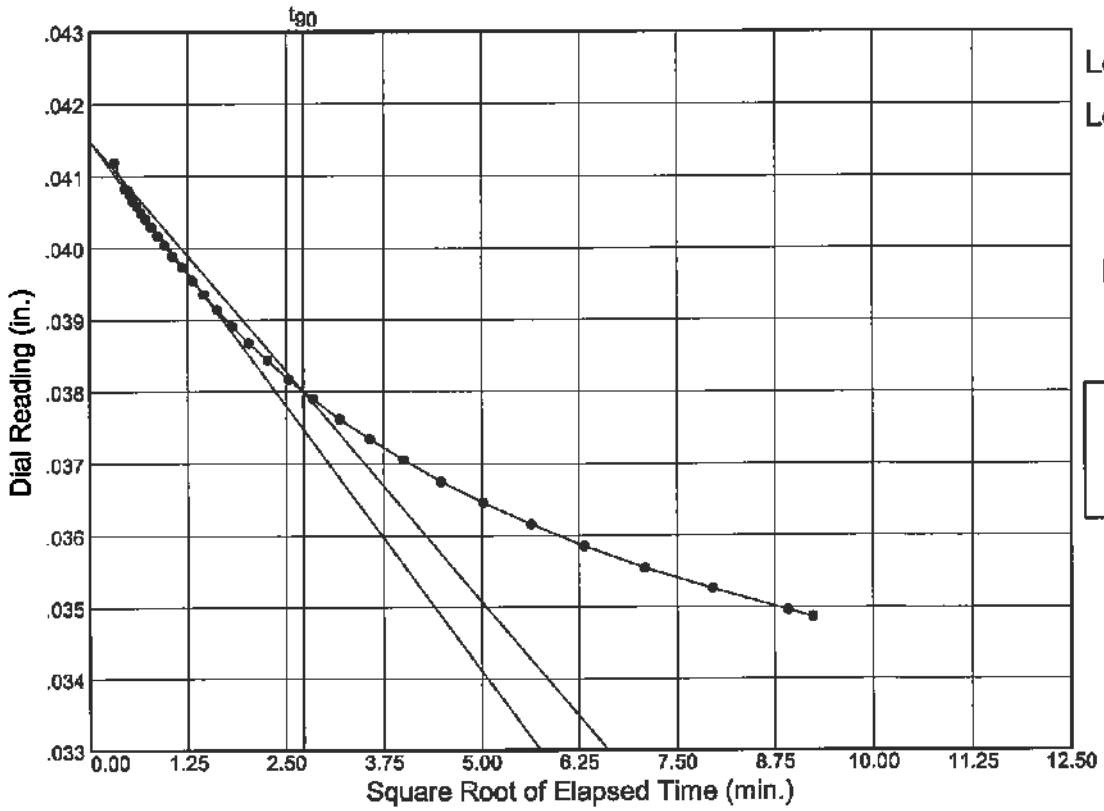
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 14
Load= 2.00 tsf
D_0 = 0.04803
D_{90} = 0.04493
D_{100} = 0.04458
T_{90} = 0.61 min.

C_v @ T_{90}
2.68 ft.^{2}/day



Load No.= 15
Load= 0.50 tsf
D_0 = 0.04150
D_{90} = 0.03800
D_{100} = 0.03762
T_{90} = 7.40 min.

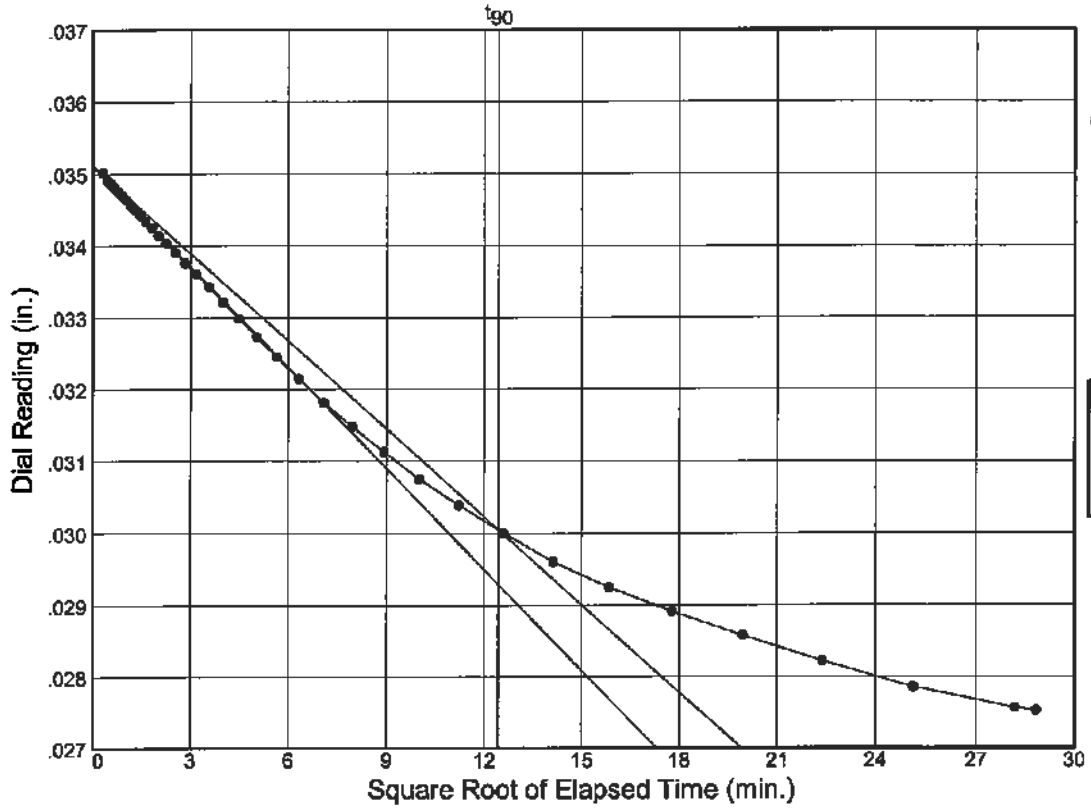
C_v @ T_{90}
0.23 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 16

Load= 0.25 tsf

D_0 = 0.03512

D_{90} = 0.03005

D_{100} = 0.02949

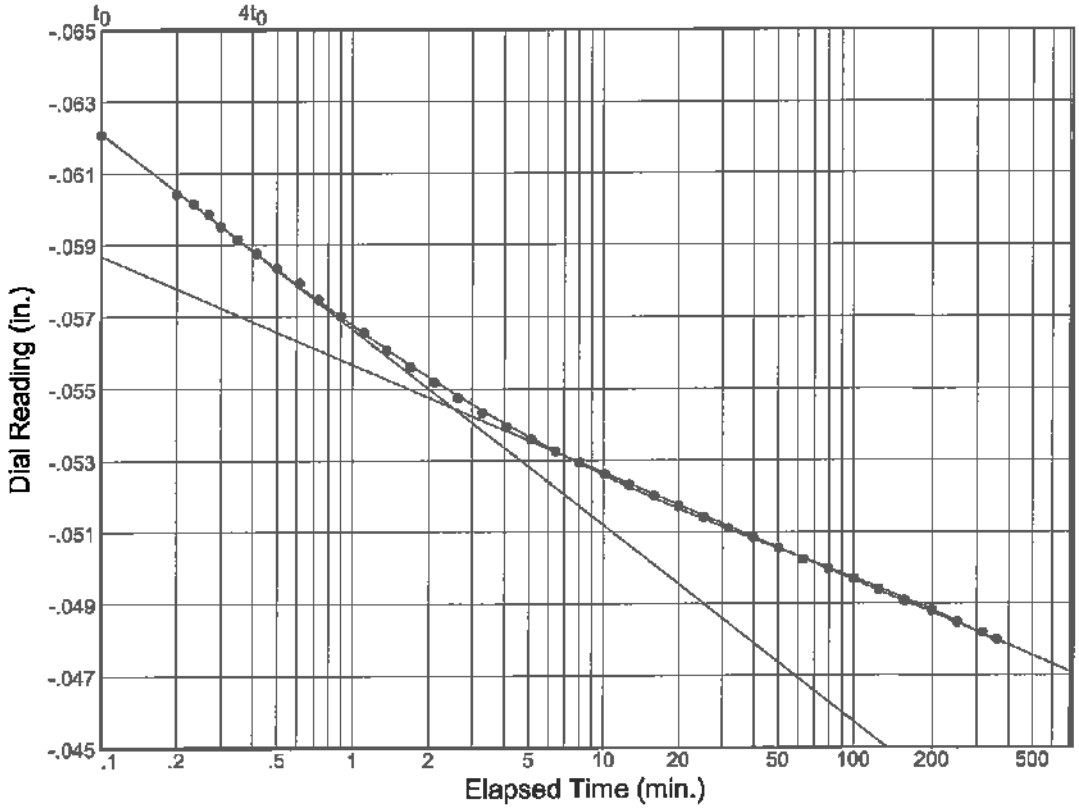
T_{90} = 154.48 min.

C_v @ T_{90}
0.01 $ft.^2/day$

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

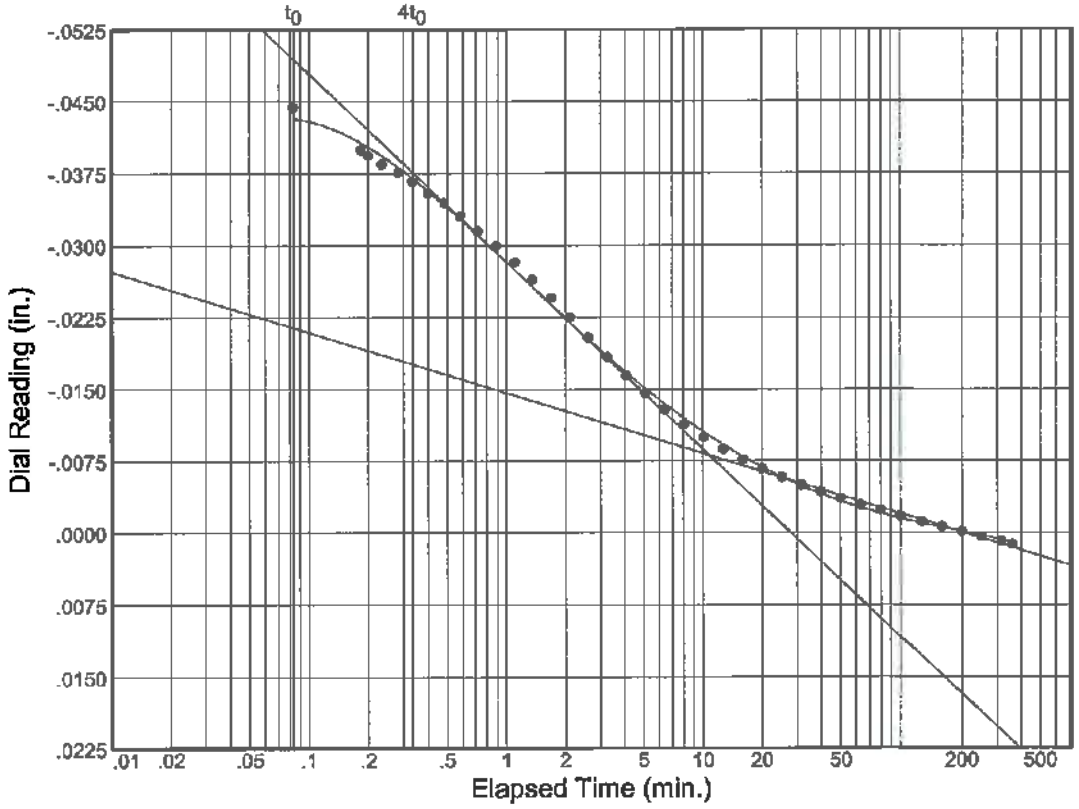
Location: MB-14 35'-37'



Load No.= 5
Load= 2.00 tsf
D_0 = -0.06536
D_{50} = -0.05991
D_{100} = -0.05447
T_{50} = 0.25 min.

C_v @ T_{50}
1.88 ft.^{2}/day

C_α = 0.003



Load No.= 6
Load= 4.00 tsf
D_0 = -0.04940
D_{50} = -0.02874
D_{100} = -0.00808
T_{50} = 0.95 min.

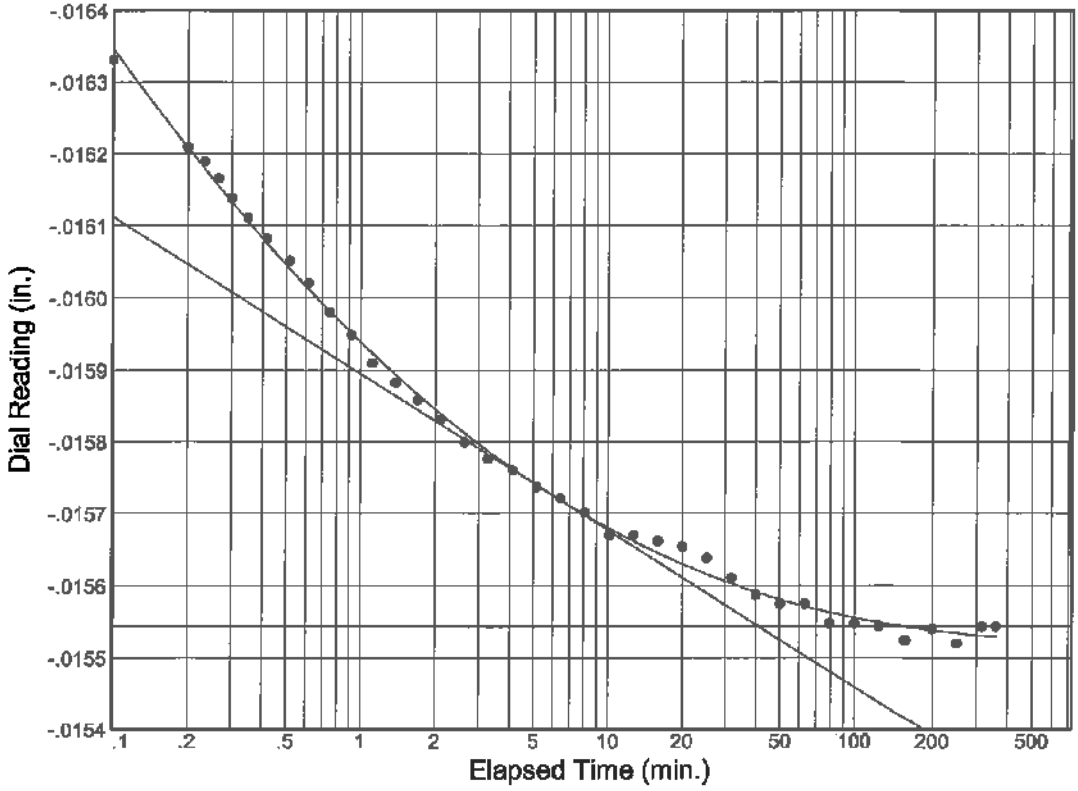
C_v @ T_{50}
0.47 ft.^{2}/day

C_α = 0.006

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

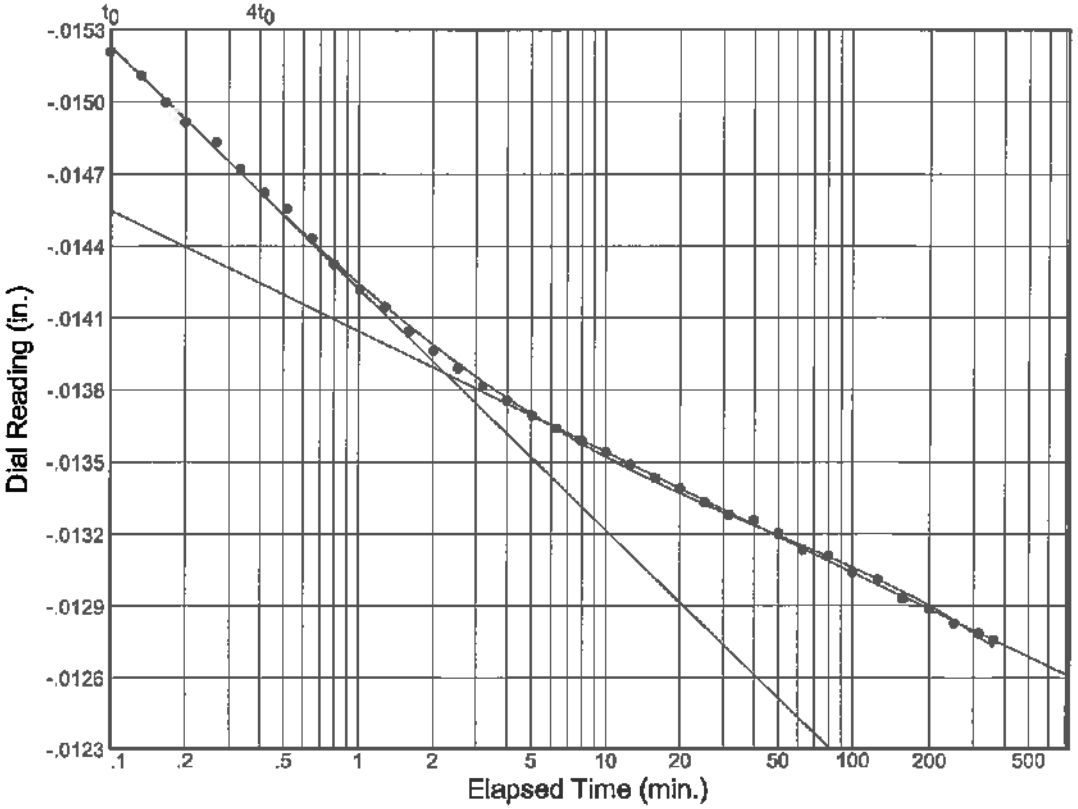
Location: MB-14 35'-37'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.01695
D_{50} = -0.01625
D_{100} = -0.01554
T_{50} = 0.16 min.

C_v @ T_{50}
2.66 ft.^{2}/day

C_α = 0.000



Load No.= 10
Load= 1.00 tsf
D_0 = -0.01582
D_{50} = -0.01485
D_{100} = -0.01387
T_{50} = 0.24 min.

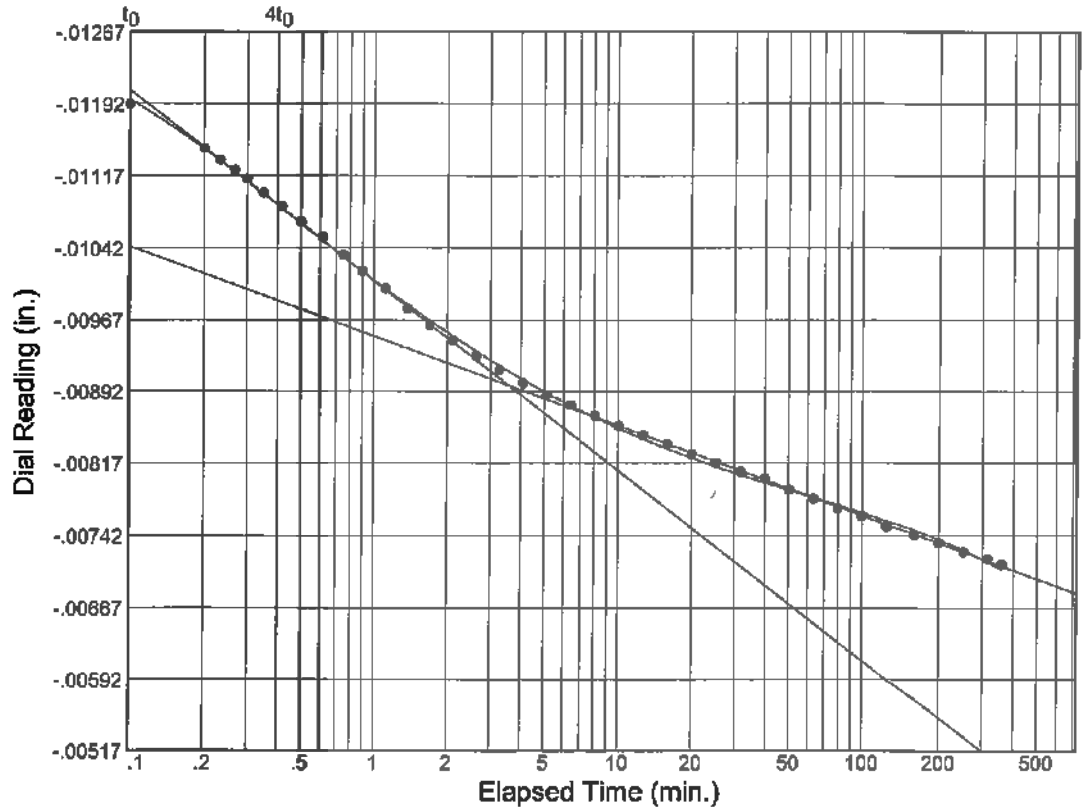
C_v @ T_{50}
1.81 ft.^{2}/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

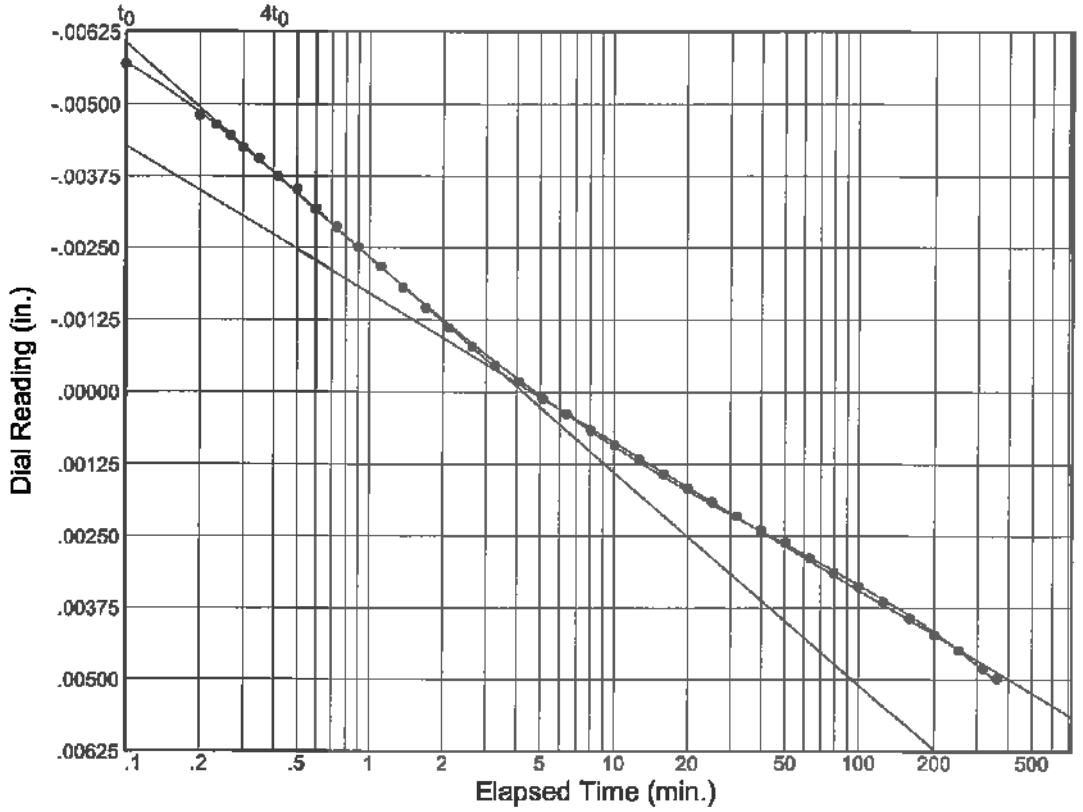
Location: MB-14 35'-37'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.01306
D_{50} = -0.01102
D_{100} = -0.00898
T_{50} = 0.33 min.

C_v @ T_{50}
1.29 ft.^{2}/day

C_α = 0.001



Load No.= 12
Load= 4.00 tsf
D_0 = -0.00762
D_{50} = -0.00396
D_{100} = -0.00030
T_{50} = 0.36 min.

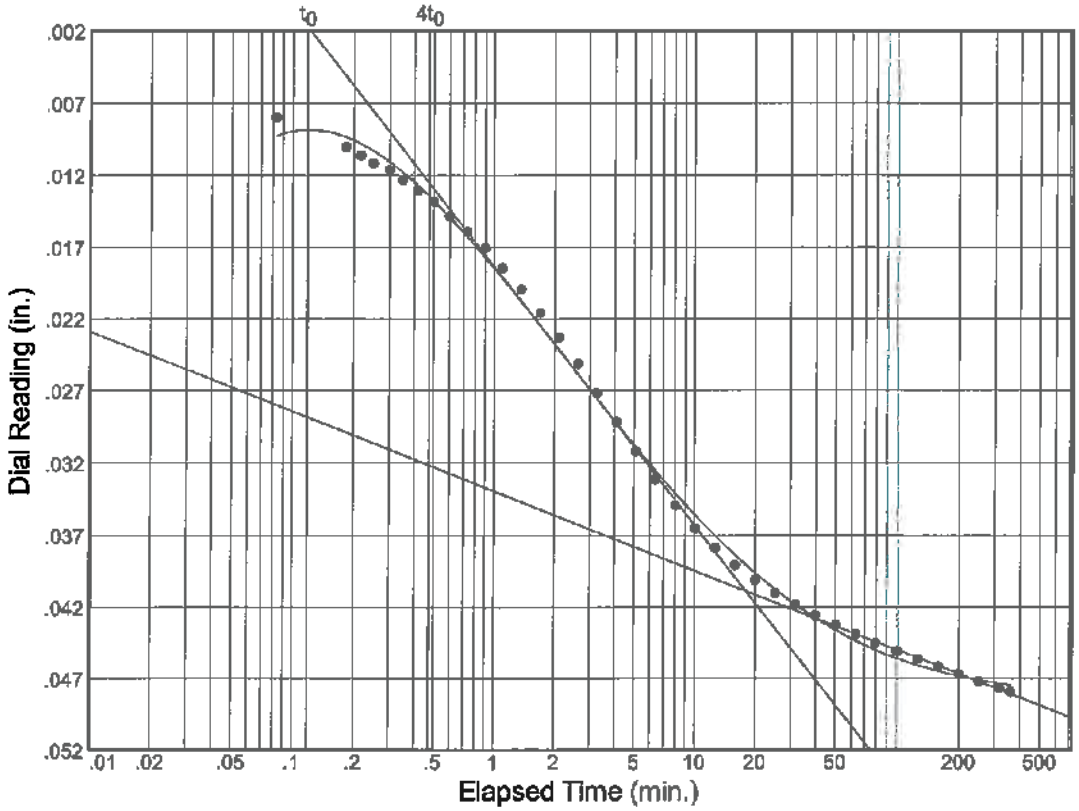
C_v @ T_{50}
1.17 ft.^{2}/day

C_α = 0.003

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 35'-37'



Load No.= 13

Load= 8.00 tsf

D_0 = 0.00419

D_{50} = 0.02253

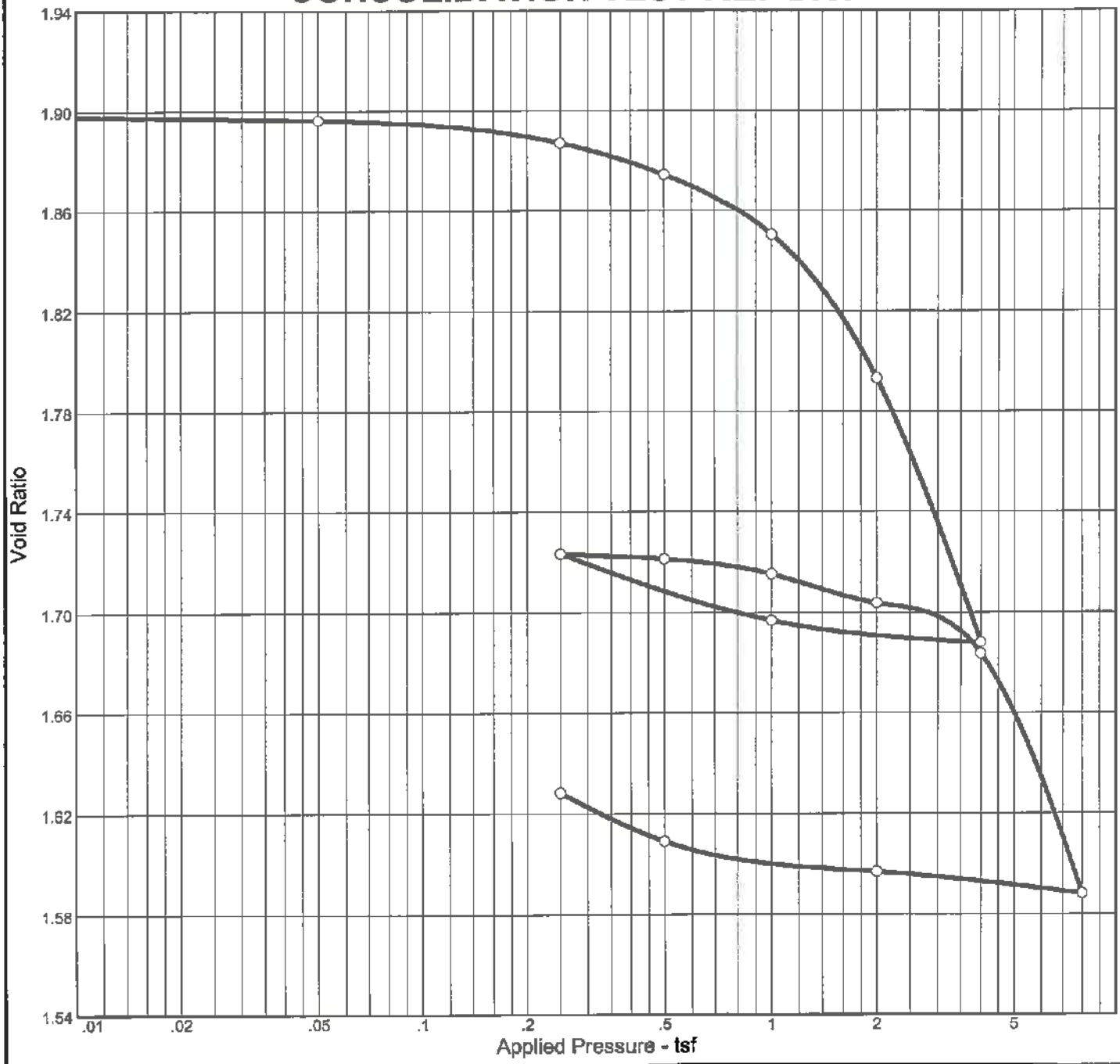
D_{100} = 0.04087

T_{50} = 1.71 min.

C_v @ T_{50}
0.23 $ft.^2$/day

C_α = 0.006

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
102.7 %	91.9 %	45.7			2.12	1.20	1.35	0.34	0.04			1.898

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Mucky Fine Sand	(PT)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: MB-14 50'-52'

Remarks:

Fines Content= 35.9%
Organic Content=20.4%

CONSOLIDATION TEST REPORT

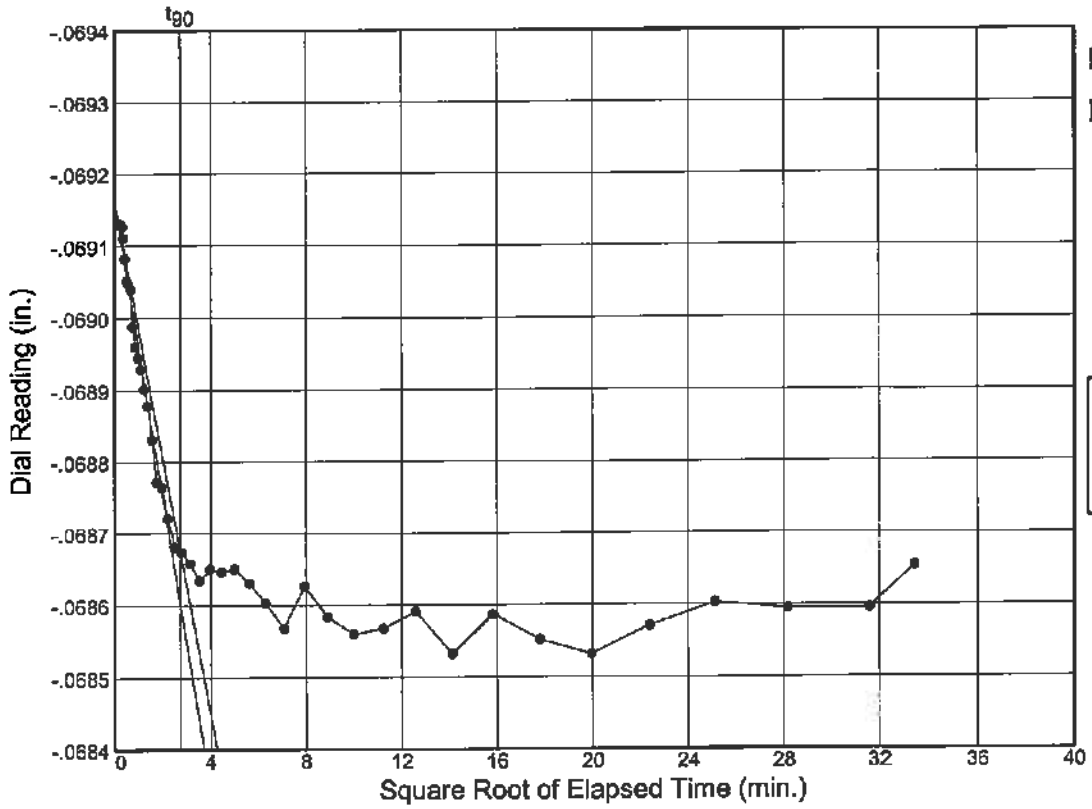
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

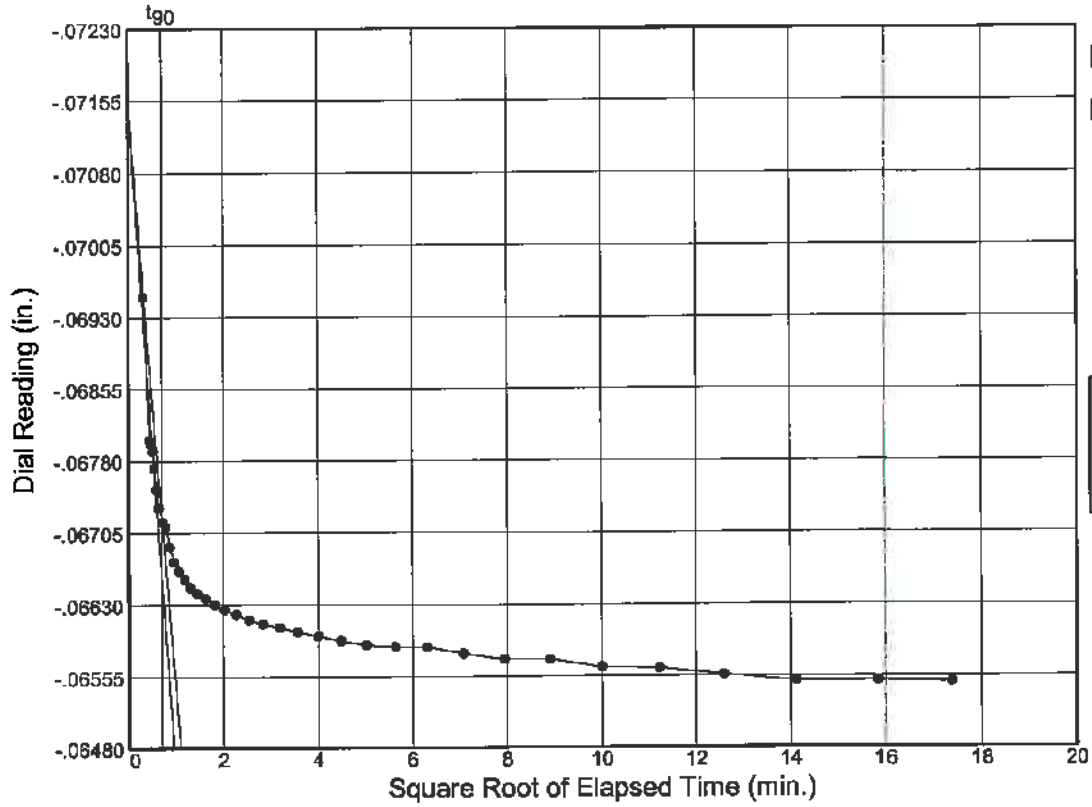
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.06916
D_{90} = -0.06868
D_{100} = -0.06862
T_{90} = 7.49 min.

C_v @ T_{90}
0.28 ft.^{2}/day



Load No.= 2
Load= 0.25 tsf
D_0 = -0.07155
D_{90} = -0.06719
D_{100} = -0.06671
T_{90} = 0.49 min.

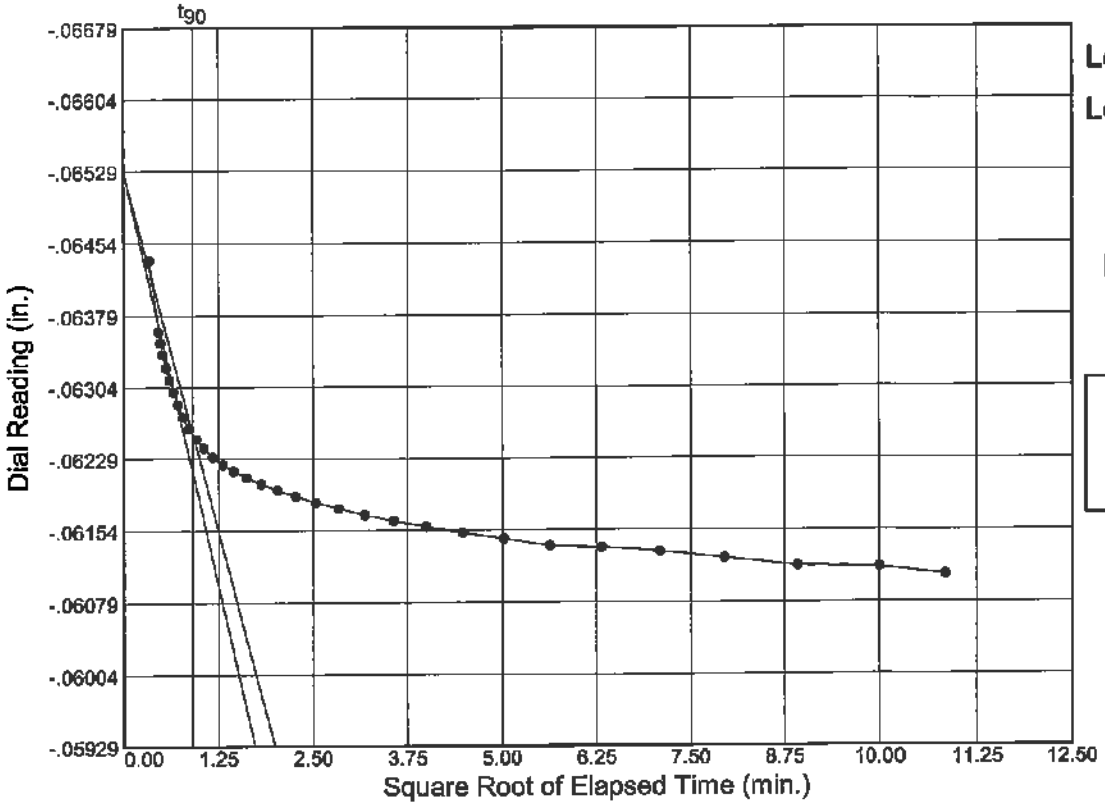
C_v @ T_{90}
4.28 ft.^{2}/day

Plate

Dial Reading vs. Time

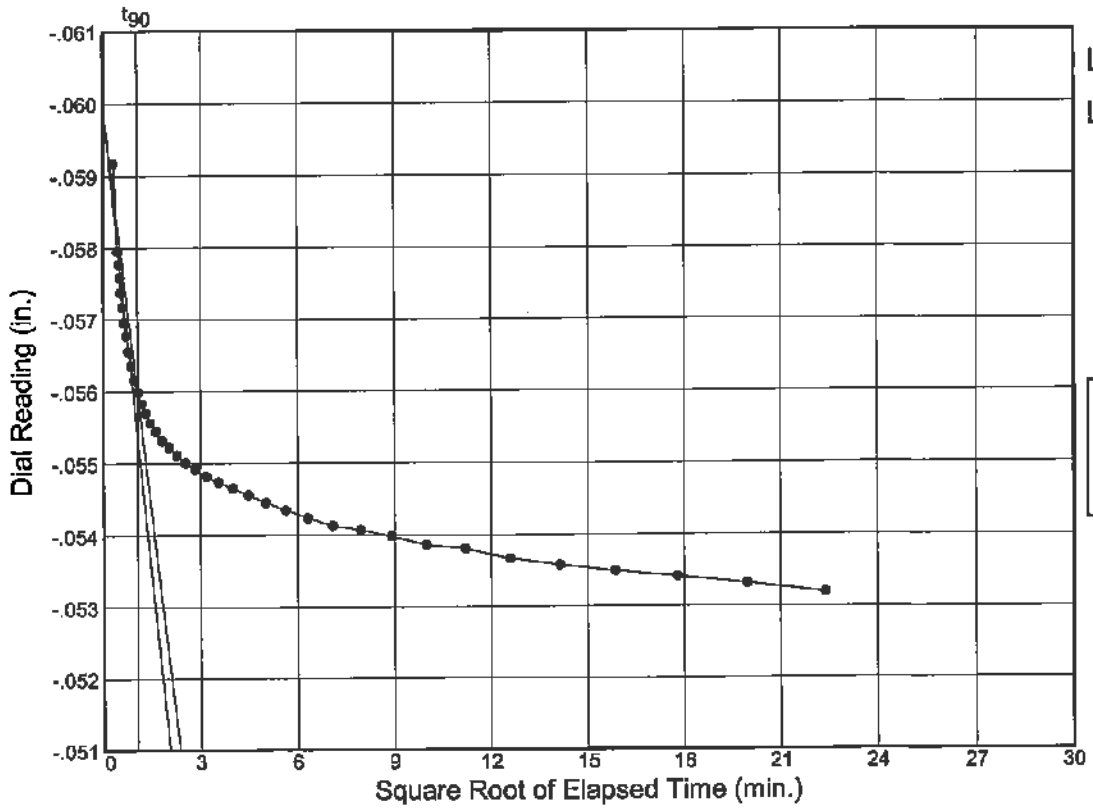
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 3
Load= 0.50 tsf
D_0 = -0.06528
D_{90} = -0.06255
D_{100} = -0.06225
T_{90} = 0.83 min.

C_v @ T_{90}
2.54 ft.^{2}/day



Load No.= 4
Load= 1.00 tsf
D_0 = -0.05998
D_{90} = -0.05600
D_{100} = -0.05556
T_{90} = 1.09 min.

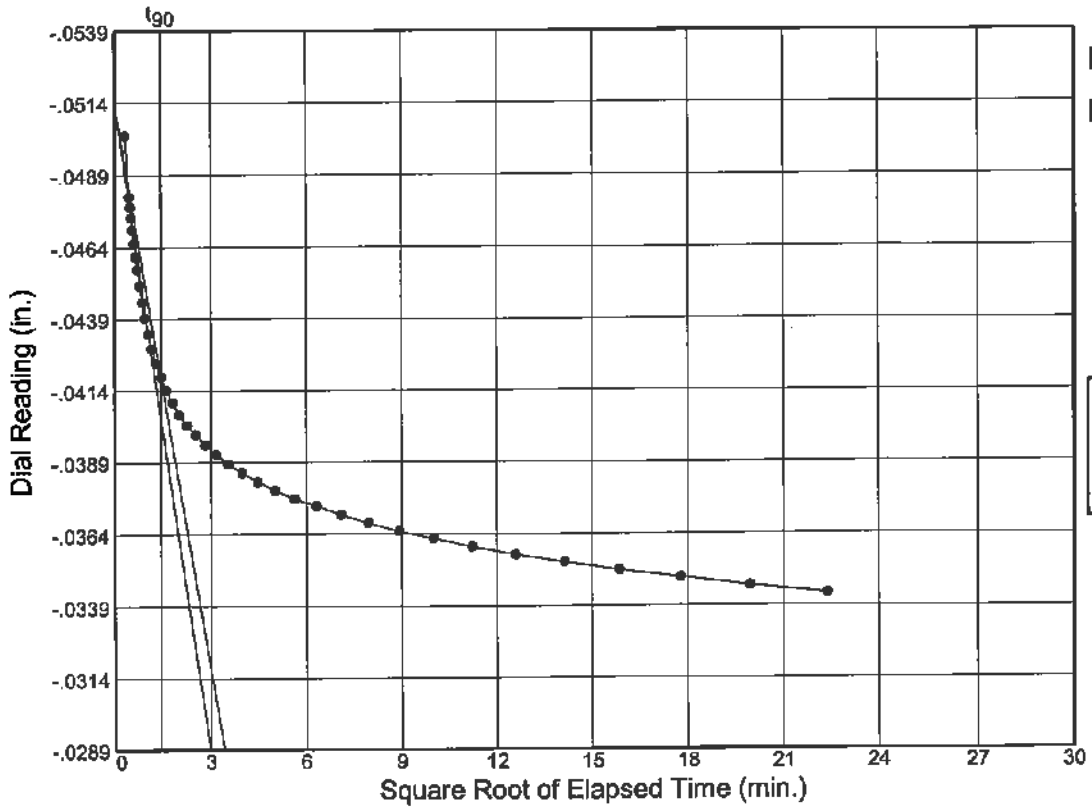
C_v @ T_{90}
1.90 ft.^{2}/day

Plate

Dial Reading vs. Time

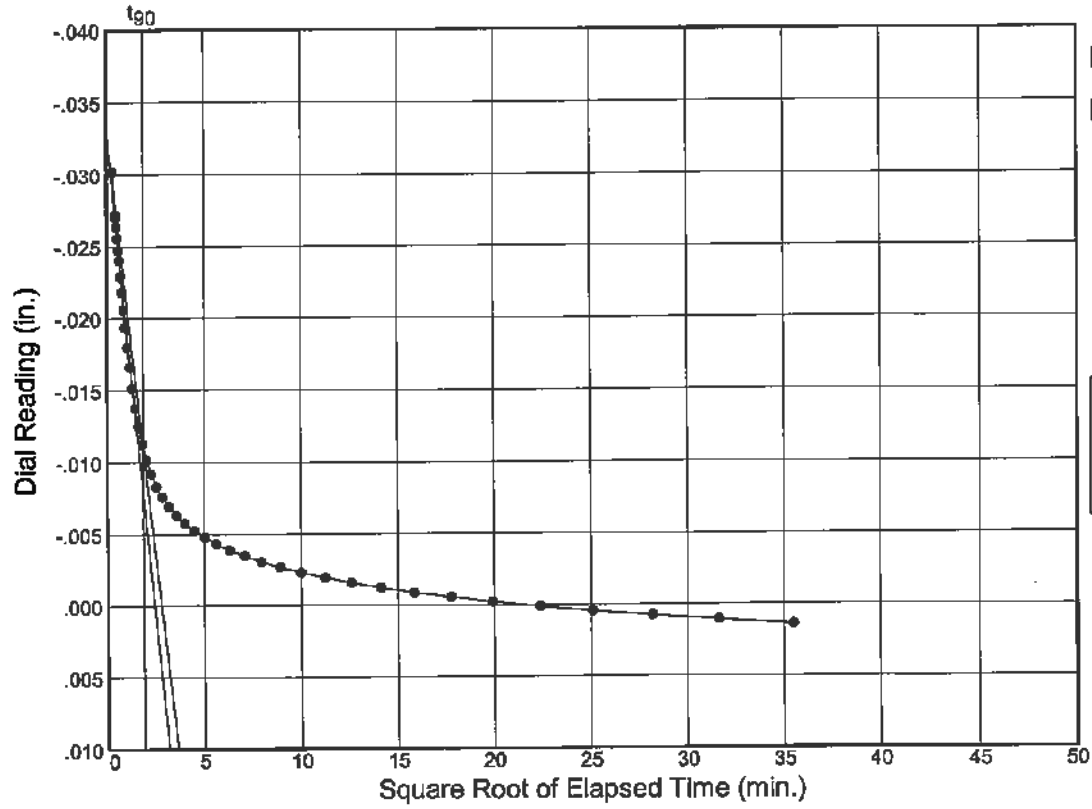
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 5
Load= 2.00 tsf
D_0 = -0.05138
D_{90} = -0.04190
D_{100} = -0.04085
T_{90} = 2.09 min.

C_v @ T_{90}
0.96 ft.^{2}/day



Load No.= 6
Load= 4.00 tsf
D_0 = -0.03298
D_{90} = -0.01101
D_{100} = -0.00857
T_{90} = 3.46 min.

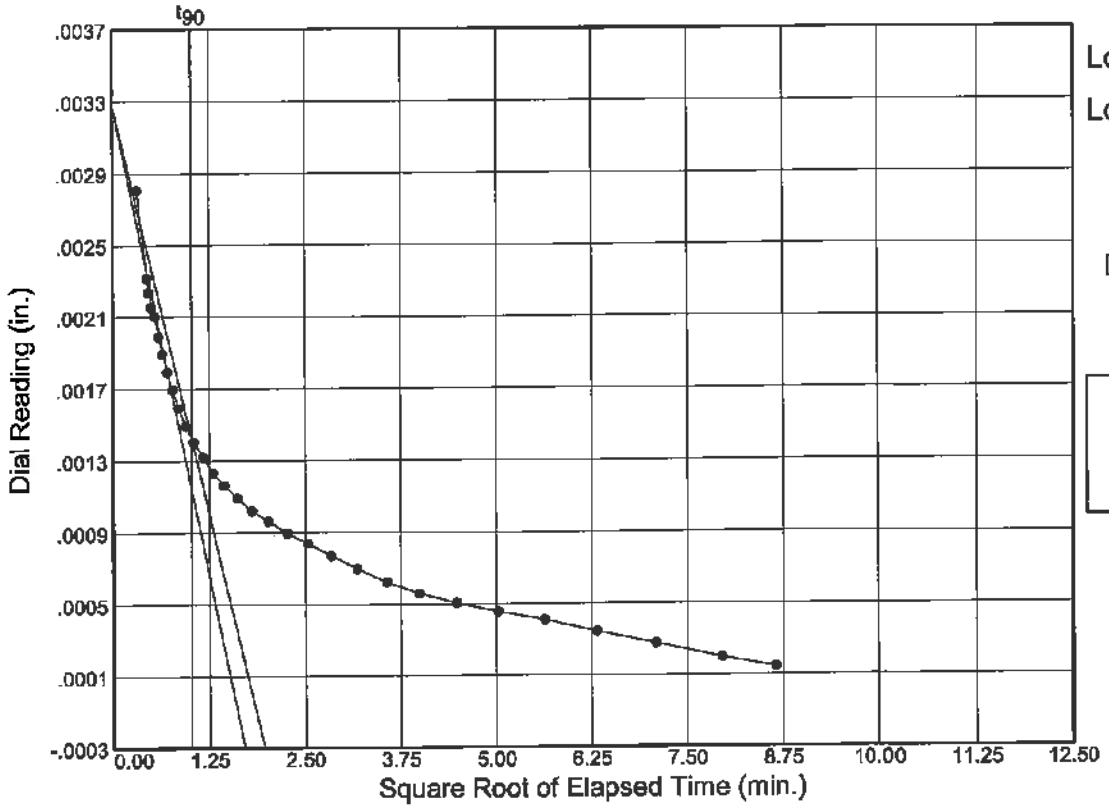
C_v @ T_{90}
0.55 ft.^{2}/day

Plate

Dial Reading vs. Time

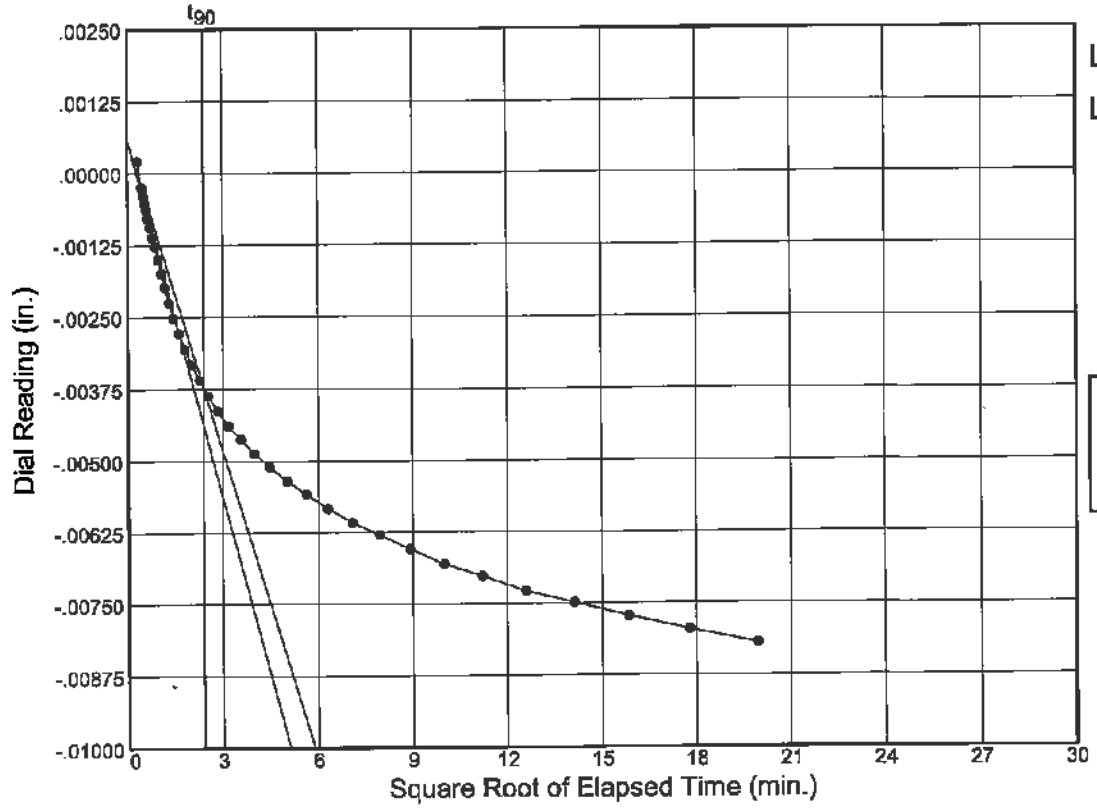
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 7
Load= 1.00 tsf
D_0 = 0.00328
D_{90} = 0.00143
D_{100} = 0.00122
T_{90} = 1.04 min.

C_v @ T_{90}
1.76 ft.^{2}/day



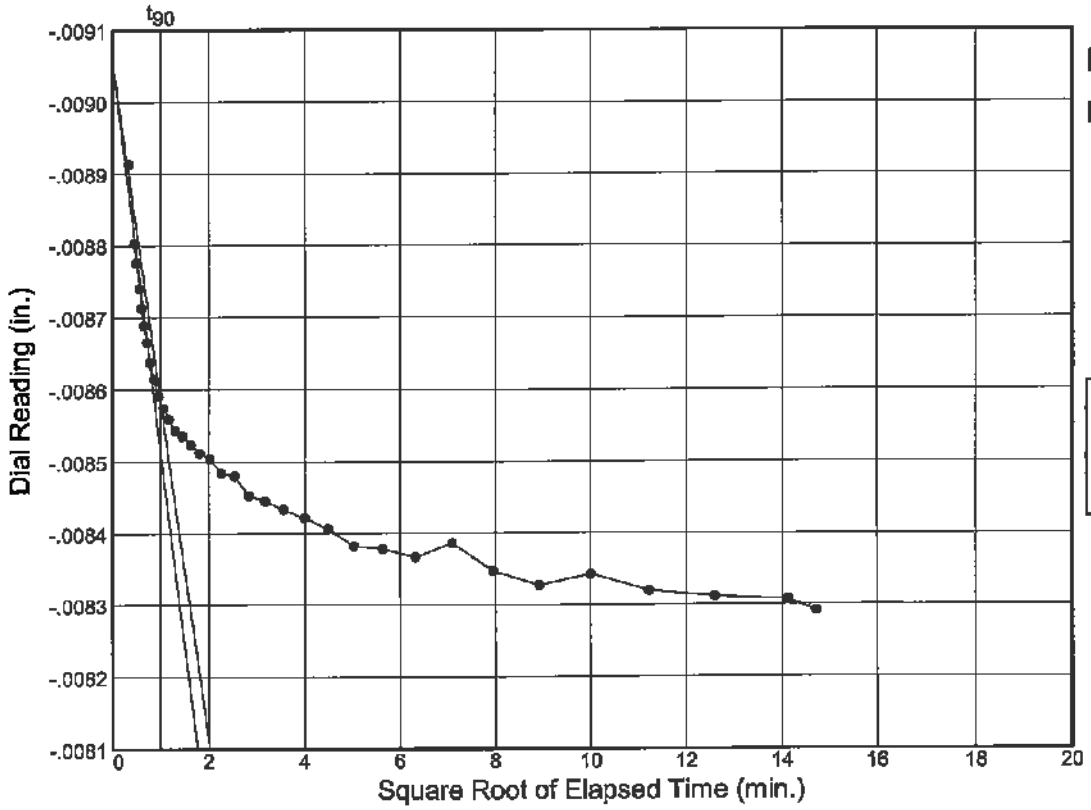
Load No.= 8
Load= 0.25 tsf
D_0 = 0.00059
D_{90} = -0.00371
D_{100} = -0.00419
T_{90} = 5.69 min.

C_v @ T_{90}
0.33 ft.^{2}/day

Dial Reading vs. Time

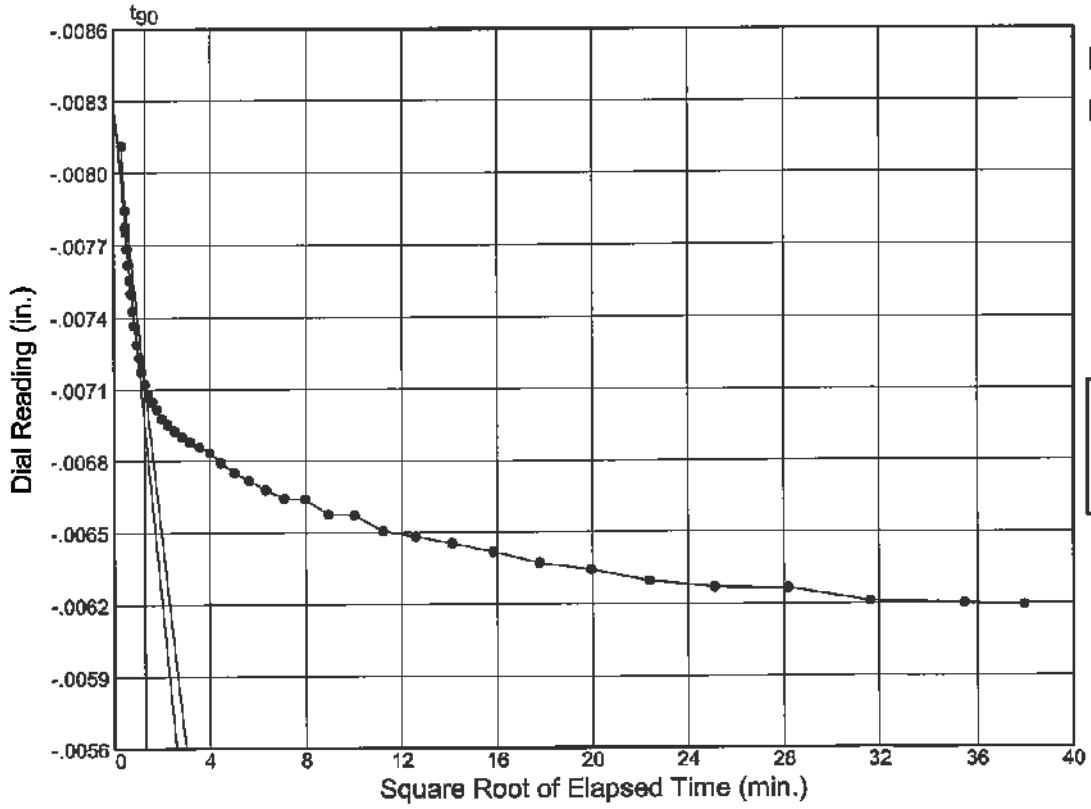
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.00906
D_{90} = -0.00858
D_{100} = -0.00853
T_{90} = 1.01 min.

C_v @ T_{90}
1.85 ft.^{2}/day



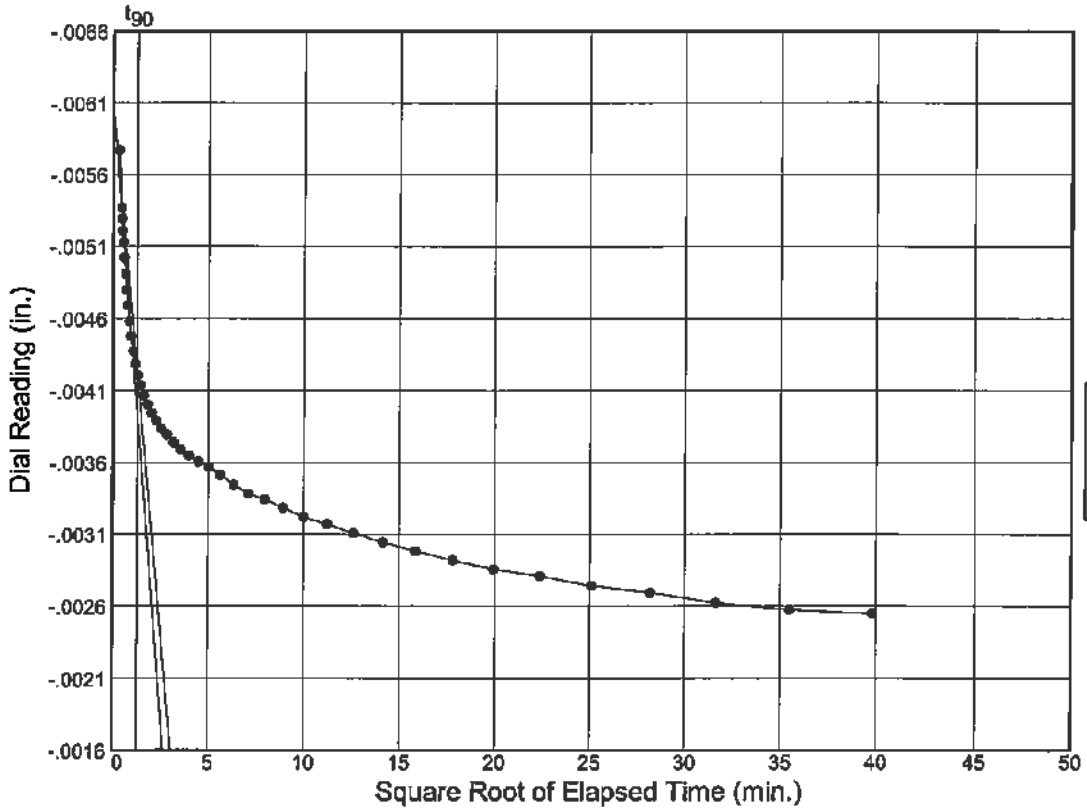
Load No.= 10
Load= 1.00 tsf
D_0 = -0.00828
D_{90} = -0.00713
D_{100} = -0.00700
T_{90} = 1.65 min.

C_v @ T_{90}
1.13 ft.^{2}/day

Dial Reading vs. Time

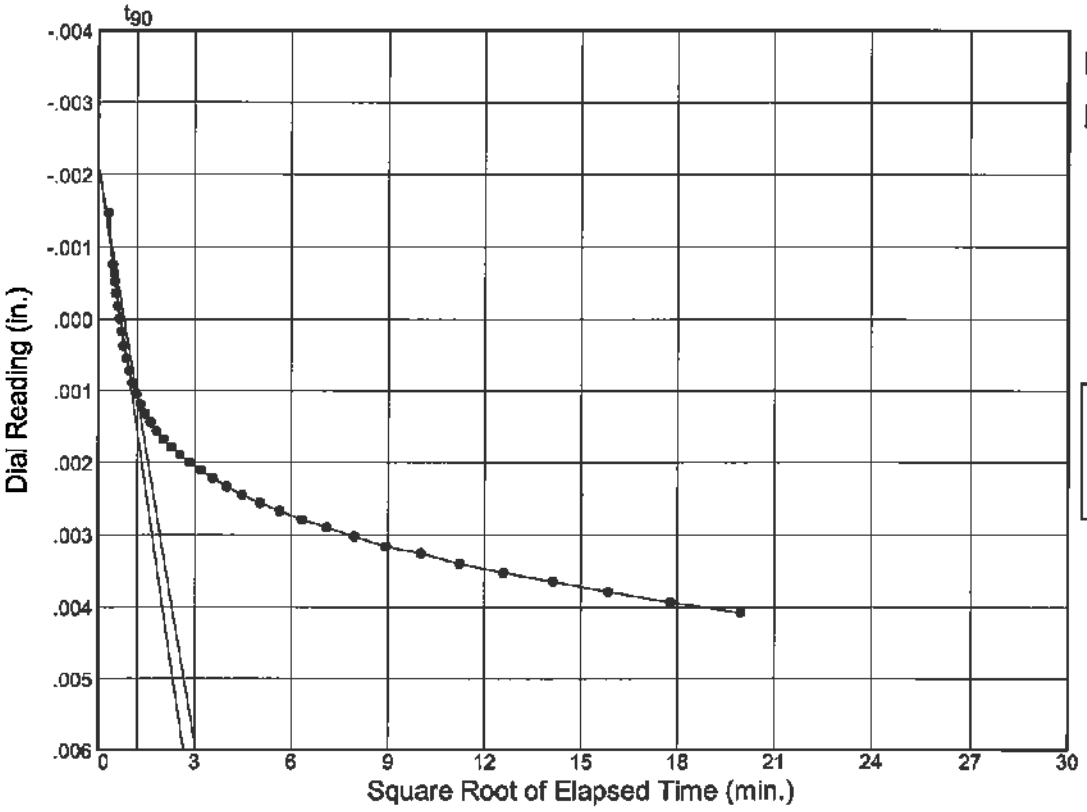
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.00607
D_{90} = -0.00422
D_{100} = -0.00402
T_{90} = 1.63 min.

C_v @ T_{90}
1.14 ft.^{2}/day



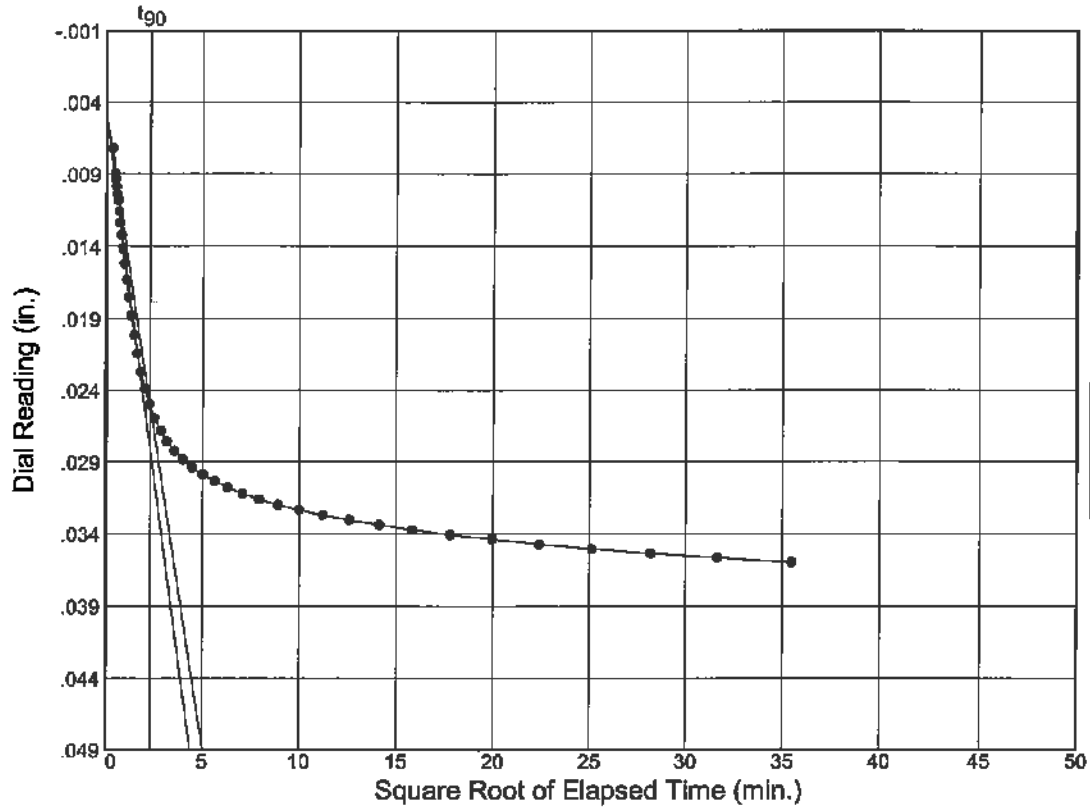
Load No.= 12
Load= 4.00 tsf
D_0 = -0.00214
D_{90} = 0.00108
D_{100} = 0.00143
T_{90} = 1.45 min.

C_v @ T_{90}
1.27 ft.^{2}/day

Dial Reading vs. Time

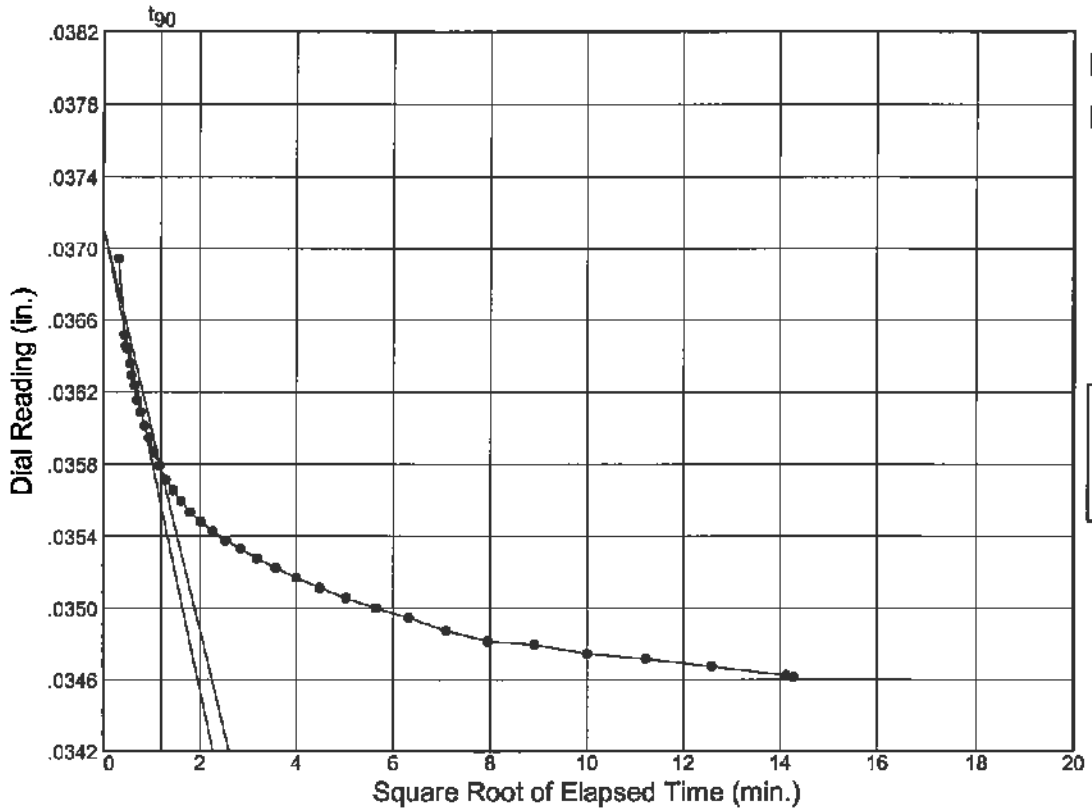
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 13
Load= 8.00 tsf
D_0 = 0.00500
D_{90} = 0.02514
D_{100} = 0.02738
T_{90} = 5.30 min.

C_v @ T_{90}
0.33 ft.^{2}/day



Load No.= 14
Load= 2.00 tsf
D_0 = 0.03712
D_{90} = 0.03577
D_{100} = 0.03562
T_{90} = 1.44 min.

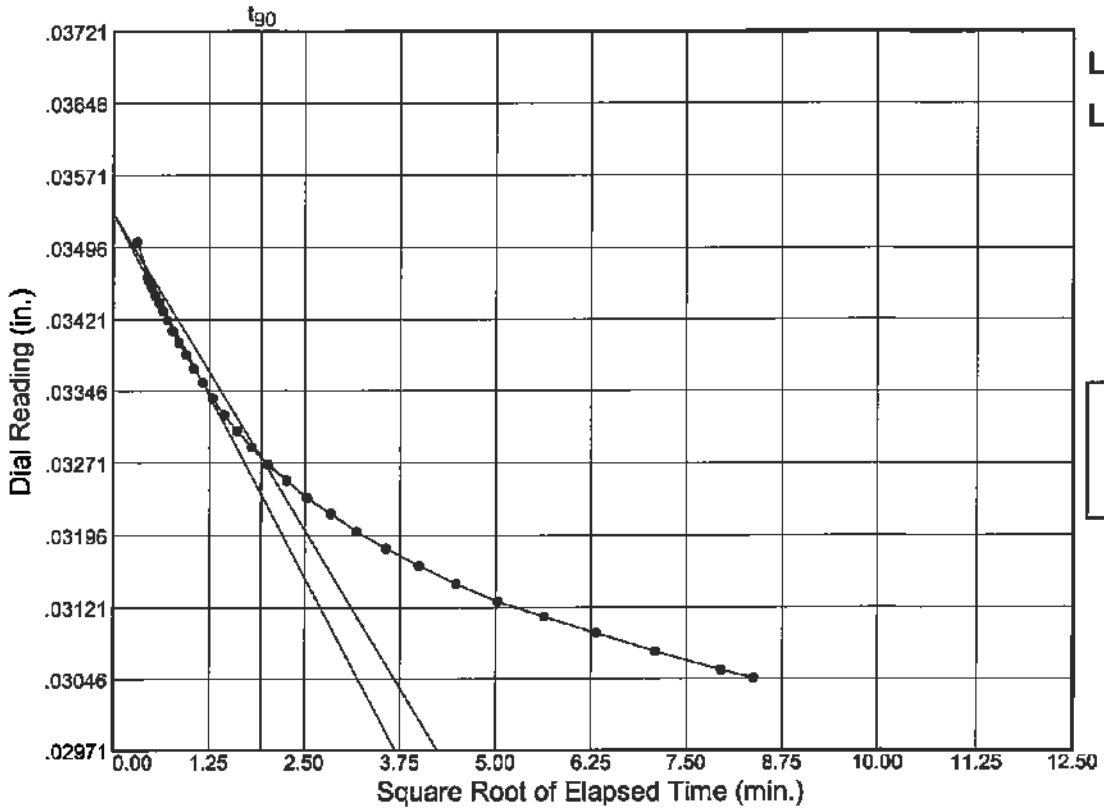
C_v @ T_{90}
1.17 ft.^{2}/day

Plate

Dial Reading vs. Time

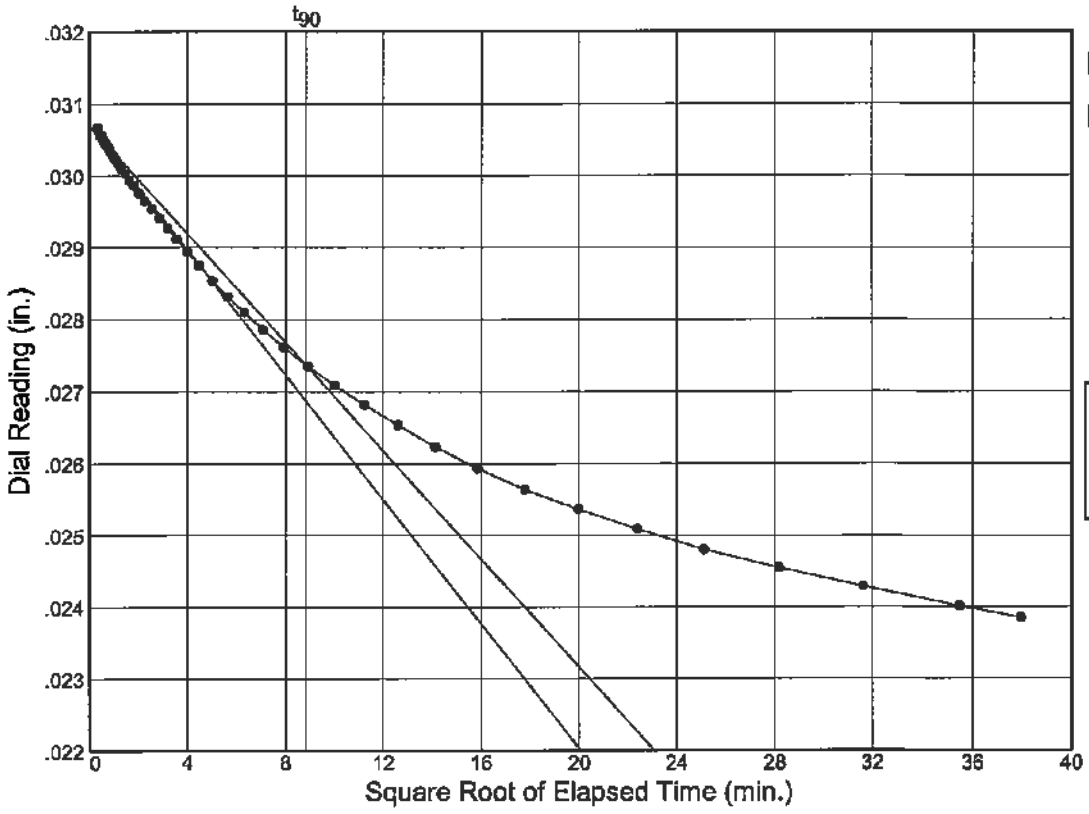
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: MB-14 50'-52'



Load No.= 15
Load= 0.50 tsf
D_0 = 0.03532
D_{90} = 0.03277
D_{100} = 0.03249
T_{90} = 3.72 min.

C_v @ T_{90}
0.46 ft.^{2}/day



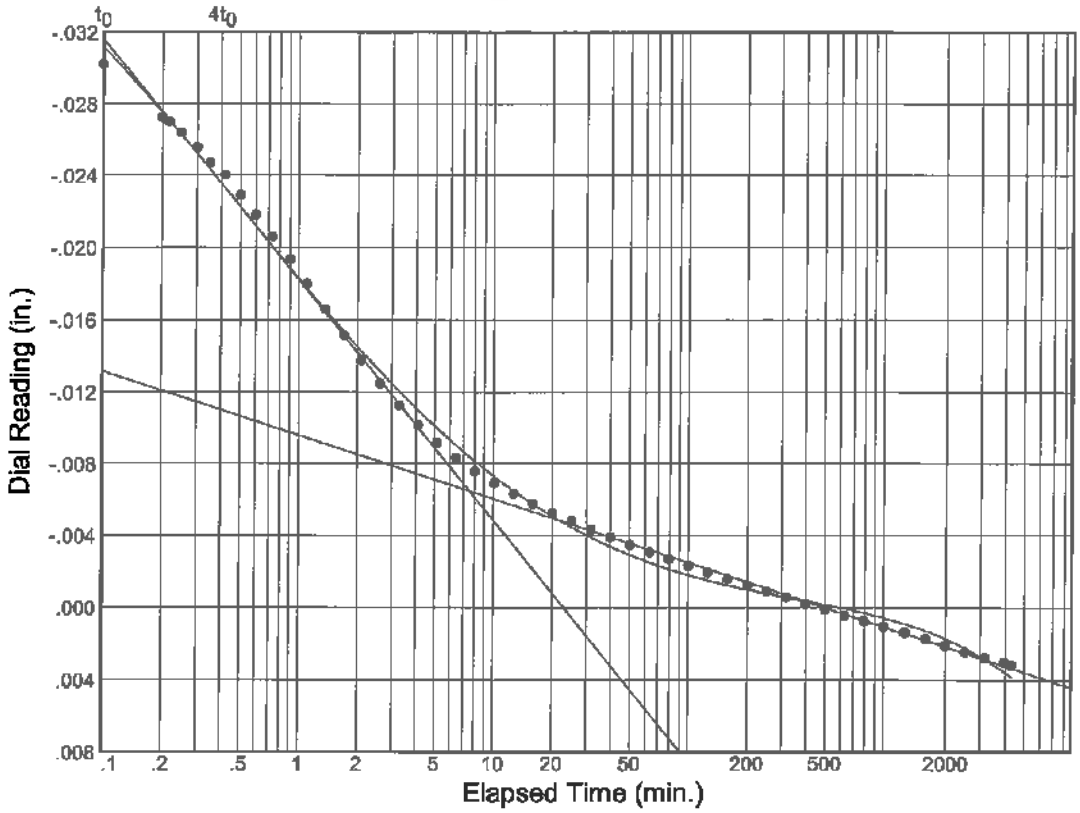
Load No.= 16
Load= 0.25 tsf
D_0 = 0.03070
D_{90} = 0.02737
D_{100} = 0.02700
T_{90} = 78.12 min.

C_v @ T_{90}
0.02 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

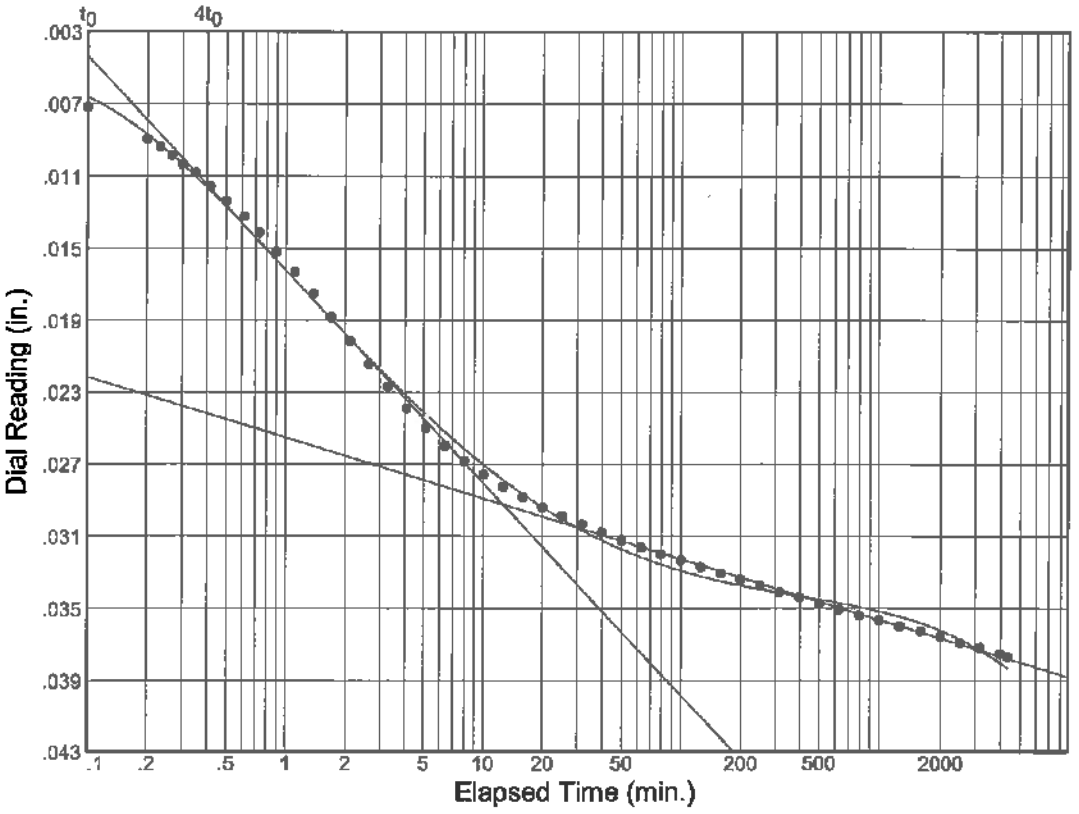
Location: MB-14 50'-52'



Load No.= 6
Load= 4.00 tsf
D_0 = -0.03878
D_{50} = -0.02262
D_{100} = -0.00646
T_{50} = 0.47 min.

C_v @ T_{50}
0.94 ft.^{2}/day

C_α = 0.004

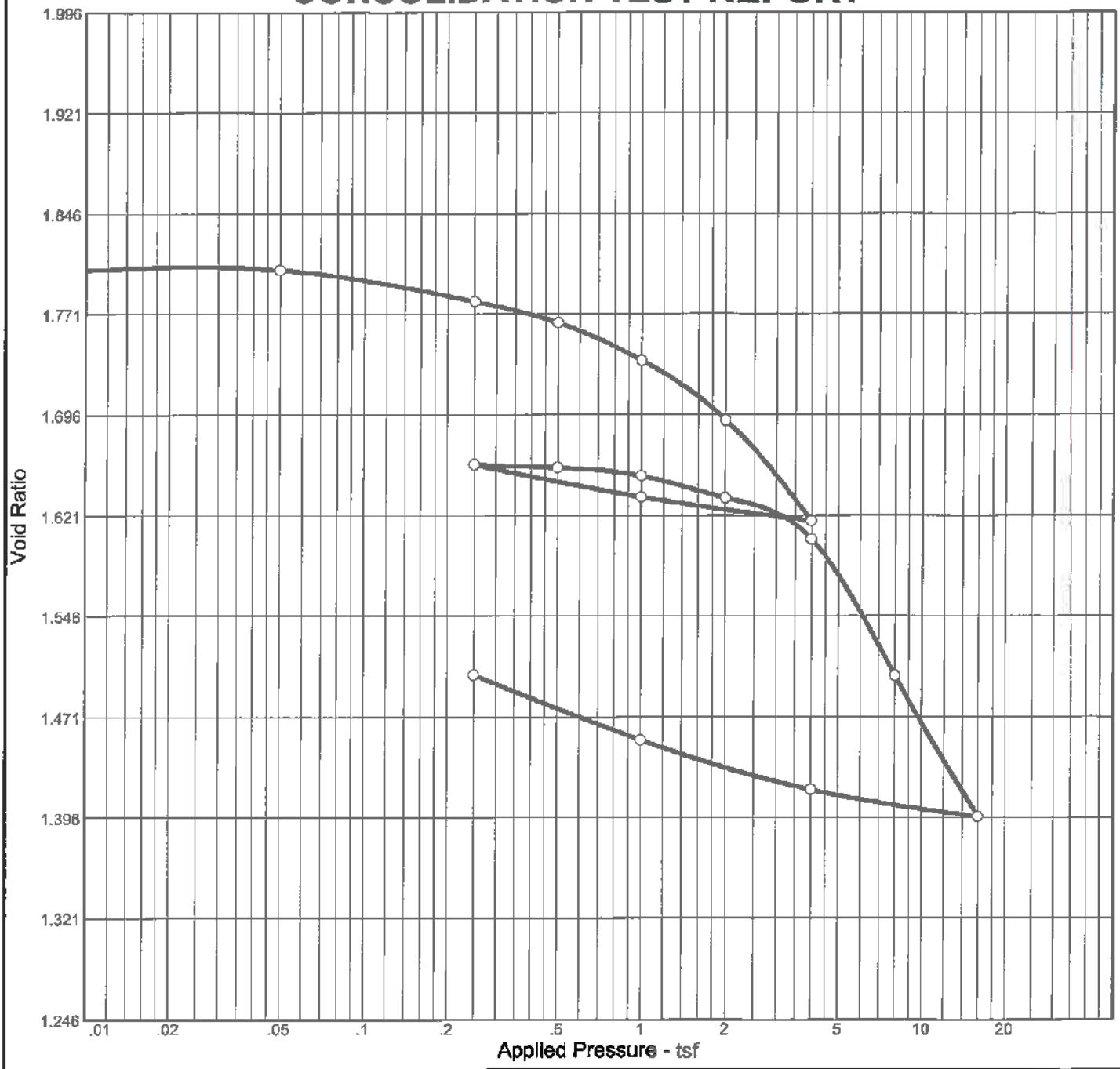


Load No.= 13
Load= 8.00 tsf
D_0 = 0.00163
D_{50} = 0.01543
D_{100} = 0.02924
T_{50} = 0.86 min.

C_v @ T_{50}
0.47 ft.^{2}/day

C_α = 0.004

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
Sat.	Moist.											
95.3 %	65.6 %	58.3	56	31	2.62	1.60	2.09	0.37	0.06			1.804

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Sandy Fat Clay	(CH)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'

Remarks:

Fines Content= 56.3%

CONSOLIDATION TEST REPORT

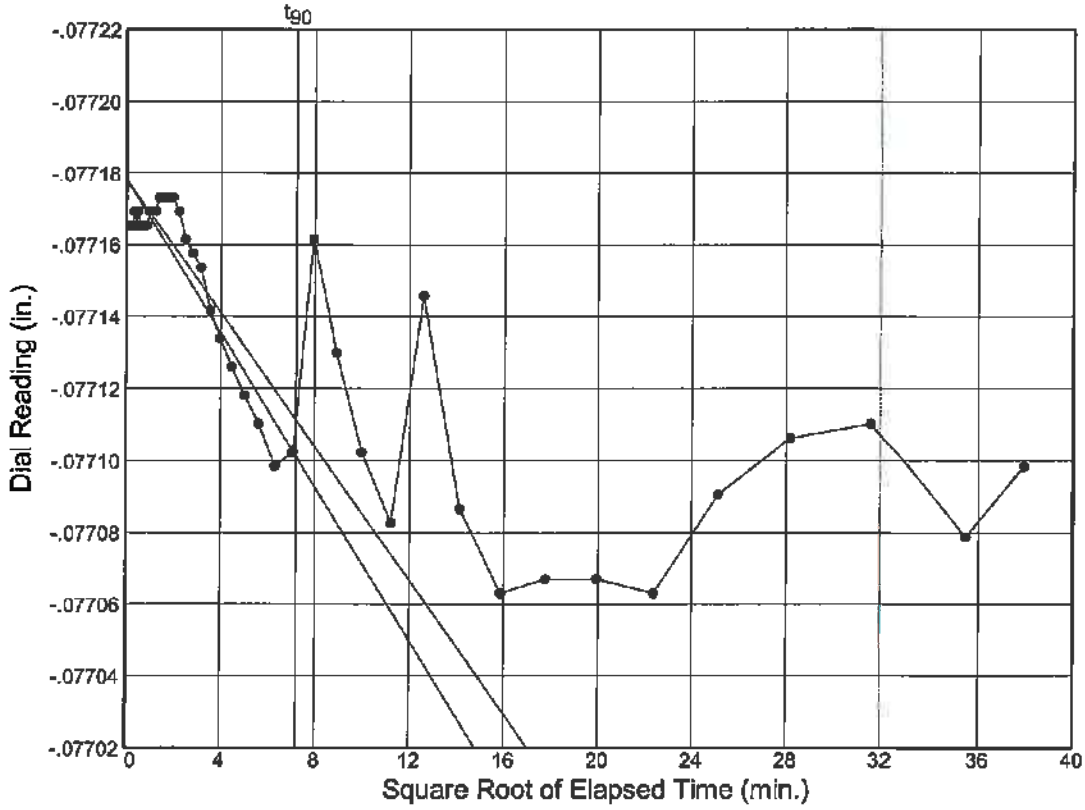
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

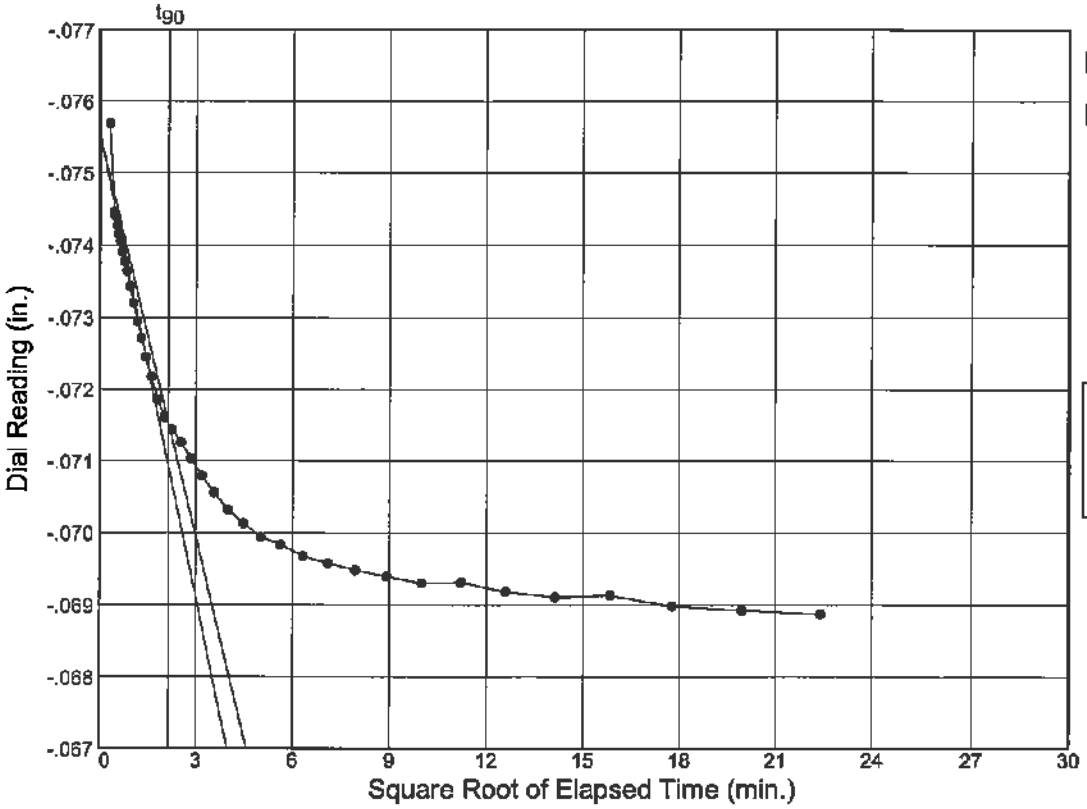
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.07718
D_{90} = -0.07711
D_{100} = -0.07710
T_{90} = 51.93 min.

C_v @ T_{90}
0.04 ft.^{2}/day



Load No.= 2
Load= 0.25 tsf
D_0 = -0.07554
D_{90} = -0.07152
D_{100} = -0.07108
T_{90} = 4.62 min.

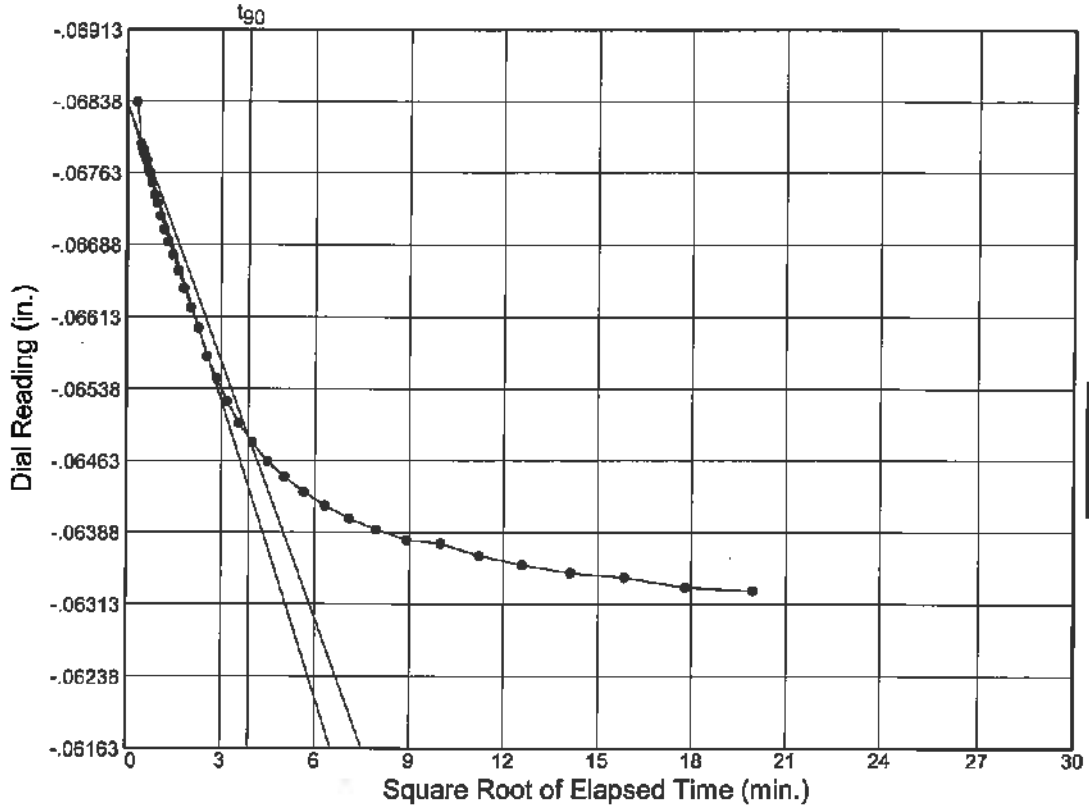
C_v @ T_{90}
0.46 ft.^{2}/day

Plate

Dial Reading vs. Time

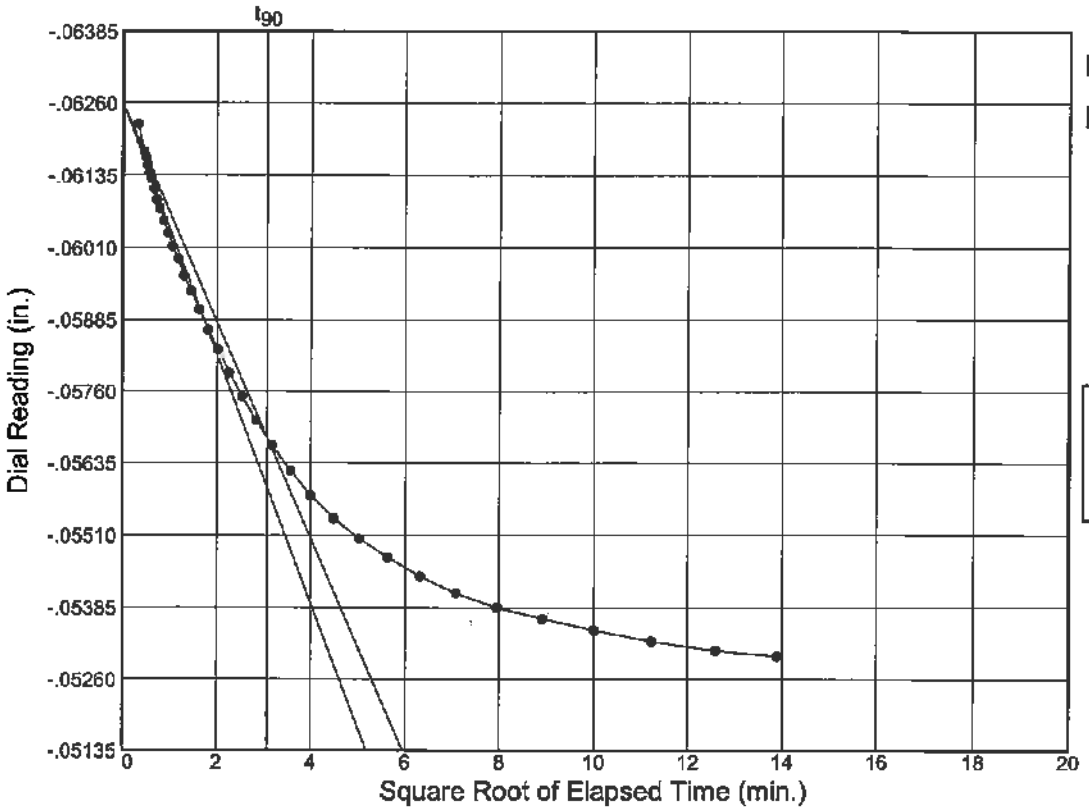
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 3
Load= 0.50 tsf
D_0 = -0.06836
D_{90} = -0.06488
D_{100} = -0.06449
T_{90} = 15.03 min.

C_v @ T_{90}
0.14 ft.^{2}/day



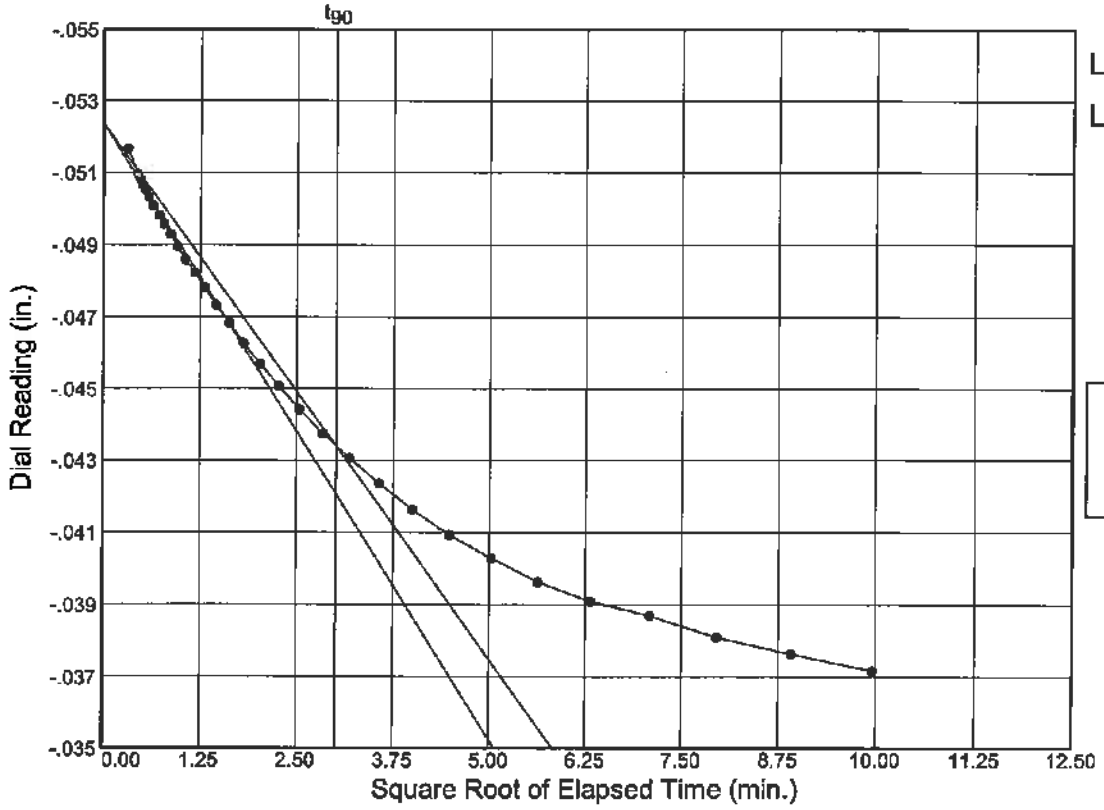
Load No.= 4
Load= 1.00 tsf
D_0 = -0.06259
D_{90} = -0.05680
D_{100} = -0.05615
T_{90} = 9.40 min.

C_v @ T_{90}
0.22 ft.^{2}/day

Dial Reading vs. Time

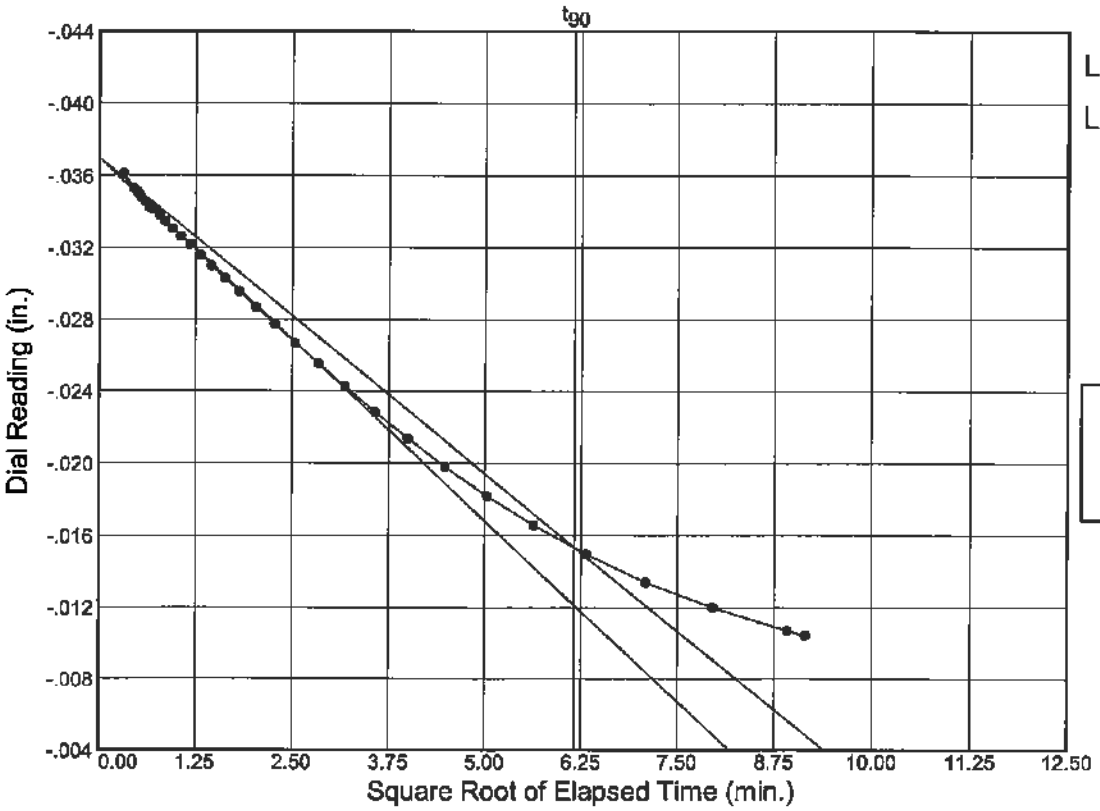
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 5
Load= 2.00 tsf
D_0 = -0.05237
D_{90} = -0.04340
D_{100} = -0.04241
T_{90} = 9.06 min.

C_v @ T_{90}
0.22 ft.^{2}/day



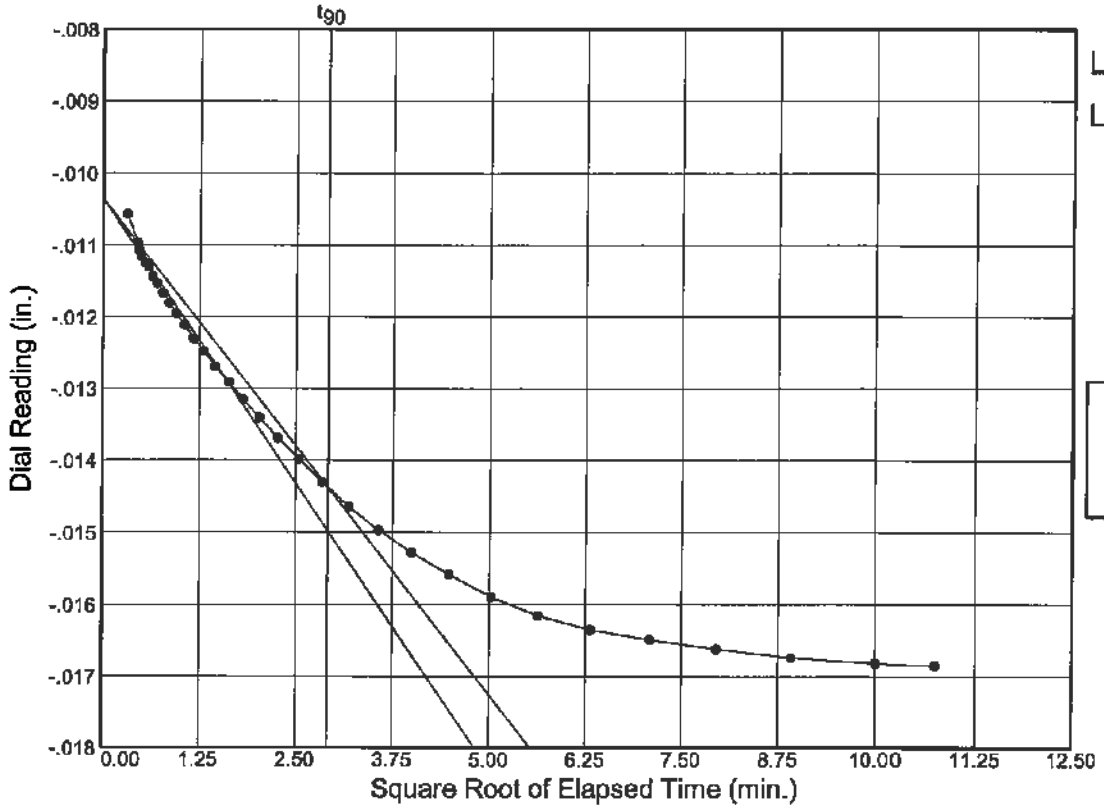
Load No.= 6
Load= 4.00 tsf
D_0 = -0.03698
D_{90} = -0.01535
D_{100} = -0.01295
T_{90} = 37.94 min.

C_v @ T_{90}
0.05 ft.^{2}/day

Dial Reading vs. Time

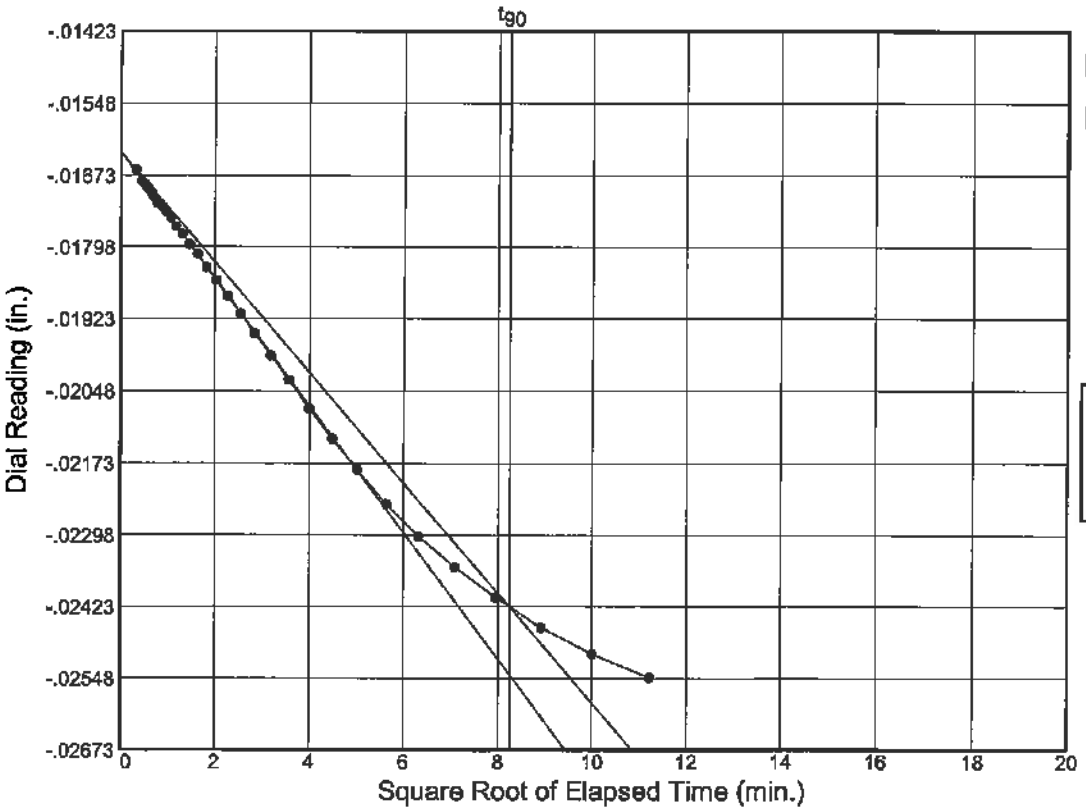
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 7
Load= 1.00 tsf
D_0 = -0.01035
D_{90} = -0.01438
D_{100} = -0.01483
T_{90} = 8.49 min.

C_v @ T_{90}
0.22 ft.^{2}/day



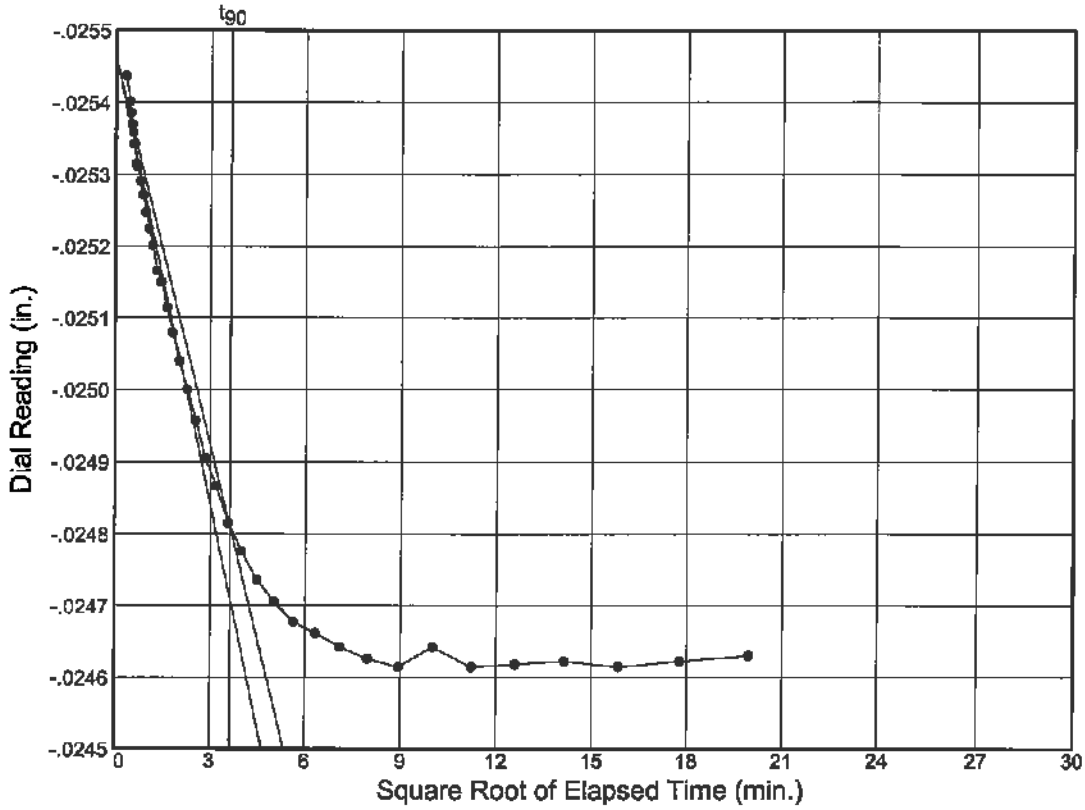
Load No.= 8
Load= 0.25 tsf
D_0 = -0.01633
D_{90} = -0.02423
D_{100} = -0.02511
T_{90} = 67.88 min.

C_v @ T_{90}
0.03 ft.^{2}/day

Dial Reading vs. Time

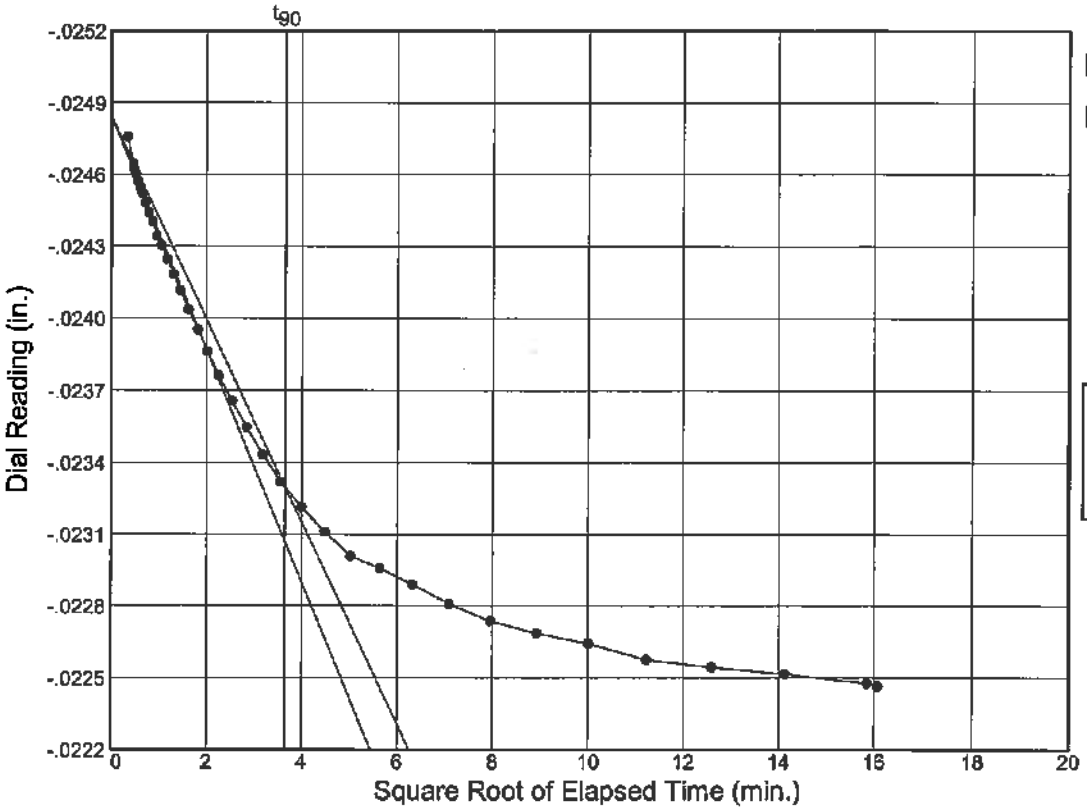
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.02546
D_{90} = -0.02481
D_{100} = -0.02474
T_{90} = 13.19 min.

C_v @ T_{90}
0.14 ft.^{2}/day



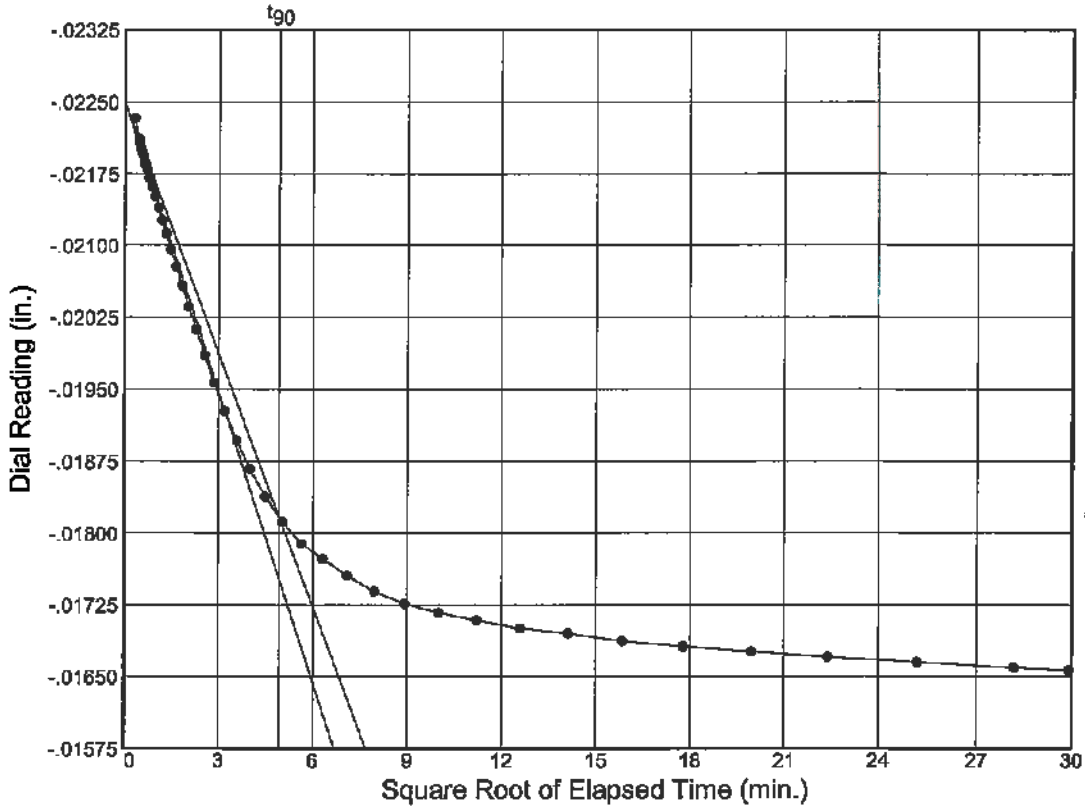
Load No.= 10
Load= 1.00 tsf
D_0 = -0.02484
D_{90} = -0.02330
D_{100} = -0.02313
T_{90} = 13.35 min.

C_v @ T_{90}
0.14 ft.^{2}/day

Dial Reading vs. Time

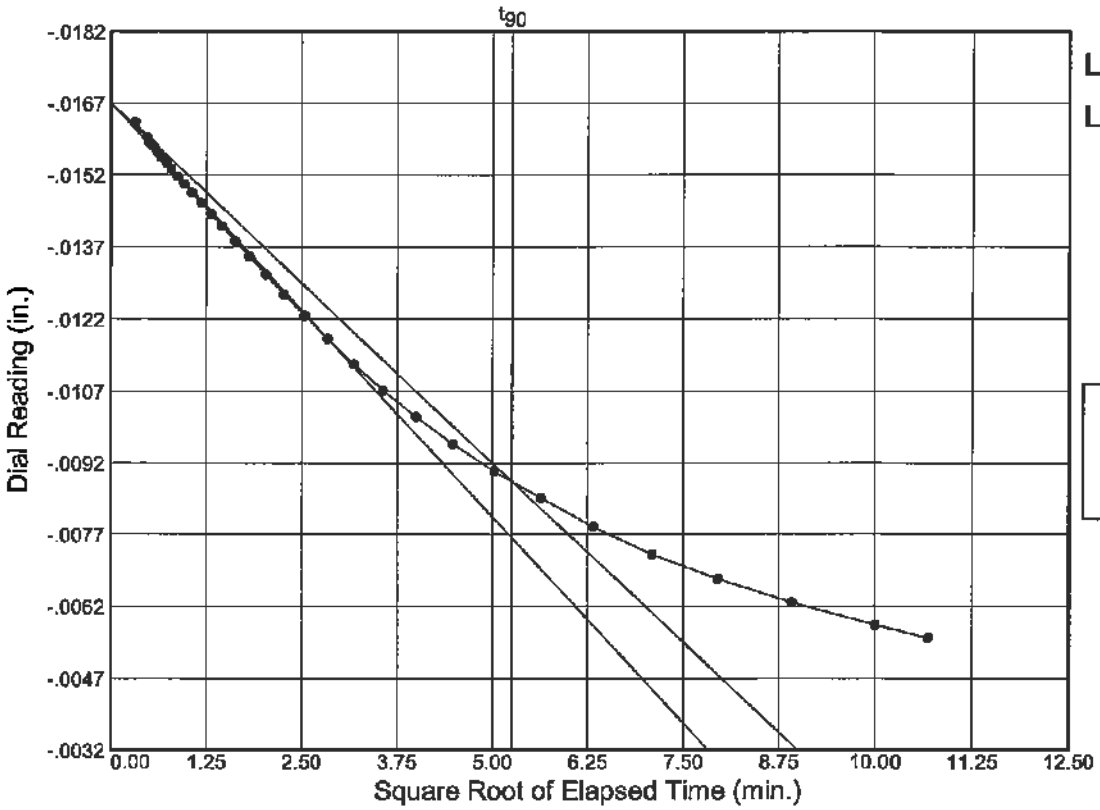
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.02249
D_{90} = -0.01817
D_{100} = -0.01769
T_{90} = 24.24 min.

C_v @ T_{90}
0.08 ft.^{2}/day



Load No.= 12
Load= 4.00 tsf
D_0 = -0.01670
D_{90} = -0.00881
D_{100} = -0.00794
T_{90} = 27.59 min.

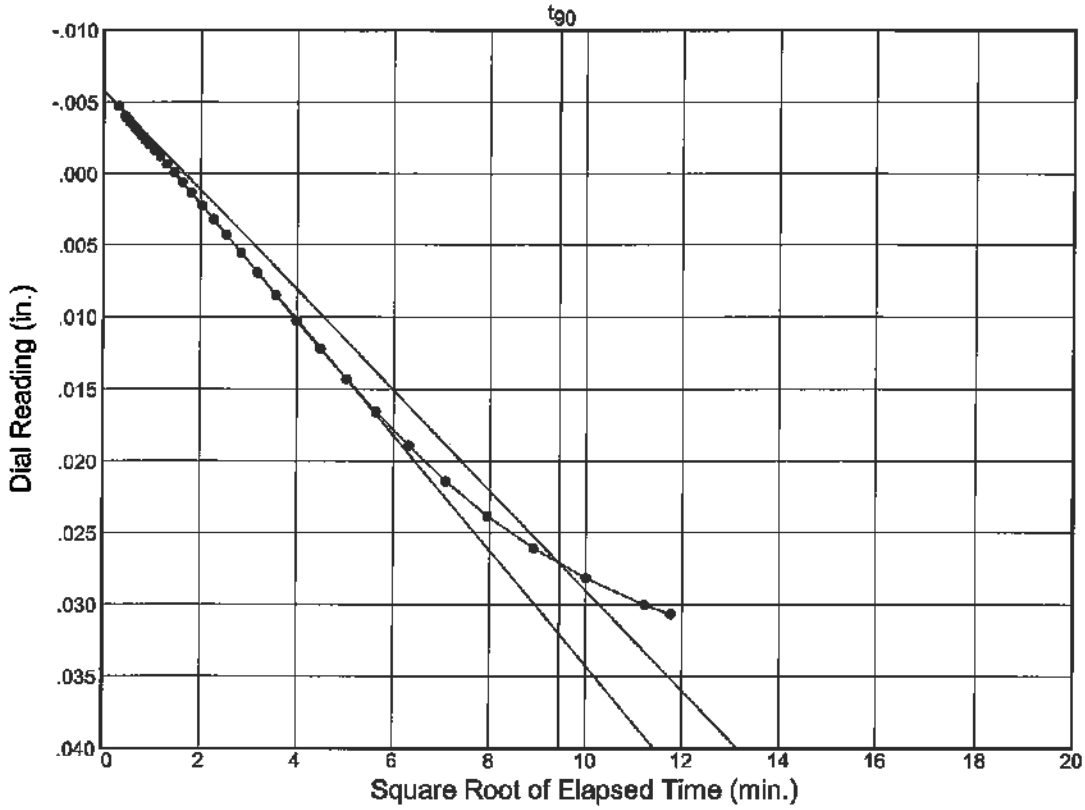
C_v @ T_{90}
0.07 ft.^{2}/day

Plate

Dial Reading vs. Time

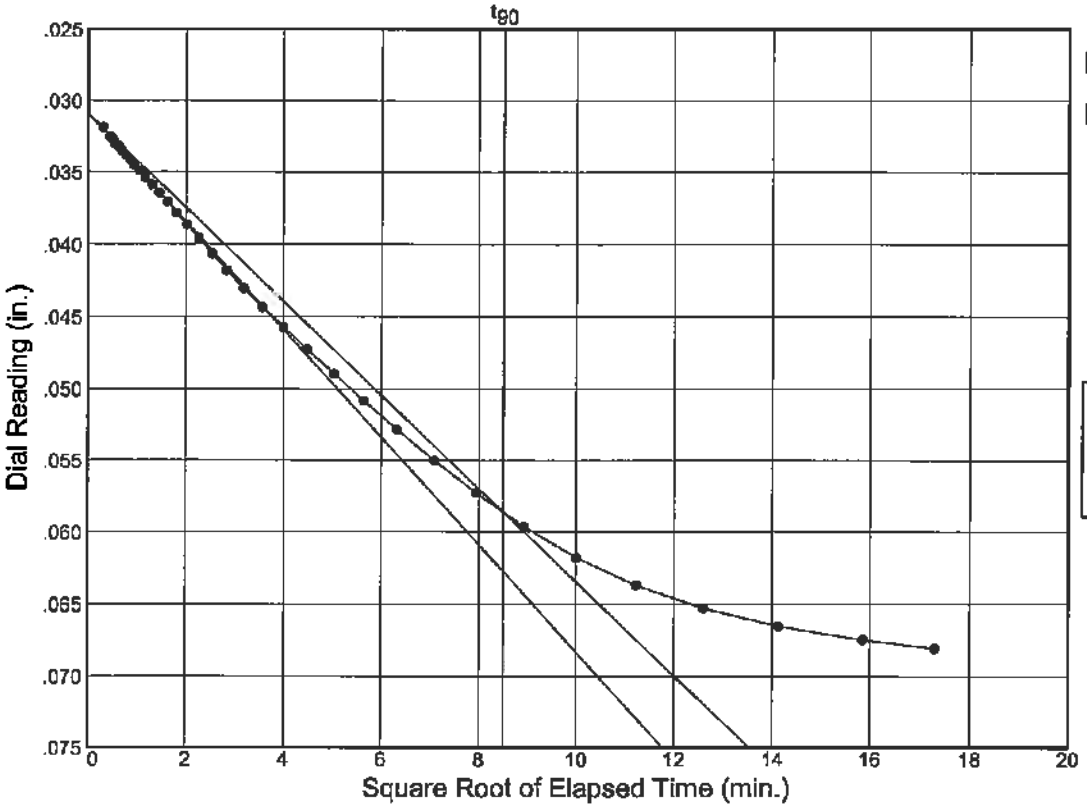
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 13
Load= 8.00 tsf
D_0 = -0.00584
D_{90} = 0.02711
D_{100} = 0.03077
T_{90} = 89.24 min.

C_v @ T_{90}
0.02 ft.^{2}/day



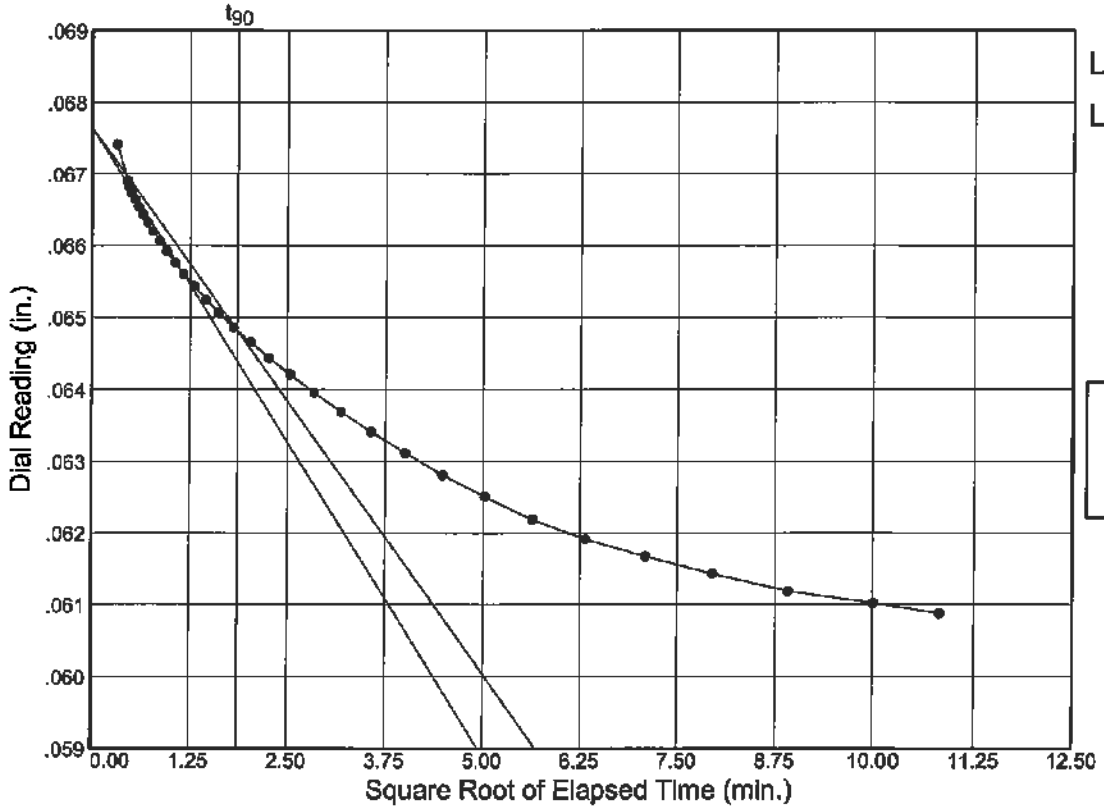
Load No.= 14
Load= 16.00 tsf
D_0 = 0.03095
D_{90} = 0.05861
D_{100} = 0.06169
T_{90} = 72.27 min.

C_v @ T_{90}
0.02 ft.^{2}/day

Dial Reading vs. Time

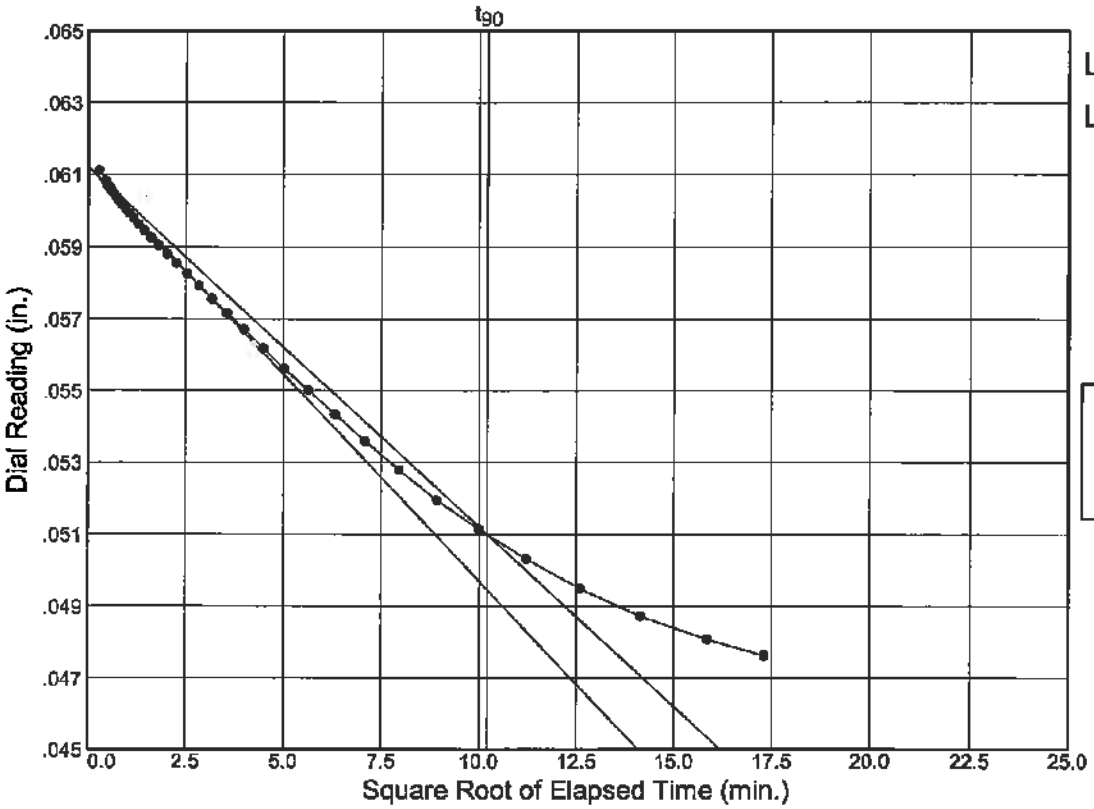
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 15
Load= 4.00 tsf
D_0 = 0.06764
D_{90} = 0.06481
D_{100} = 0.06449
T_{90} = 3.47 min.

C_v @ T_{90}
0.45 ft.^{2}/day



Load No.= 16
Load= 1.00 tsf
D_0 = 0.06121
D_{90} = 0.05099
D_{100} = 0.04985
T_{90} = 104.37 min.

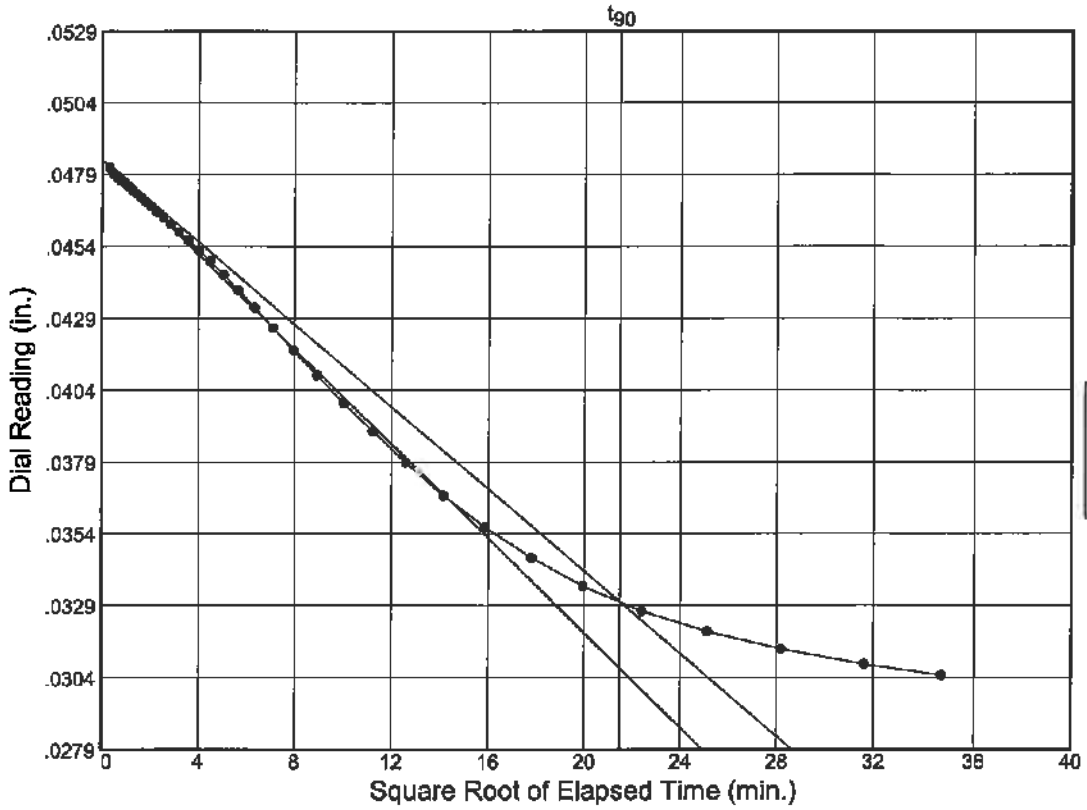
C_v @ T_{90}
0.02 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-30B 38'-40'



Load No.= 17

Load= 0.25 tsf

D_0 = 0.04840

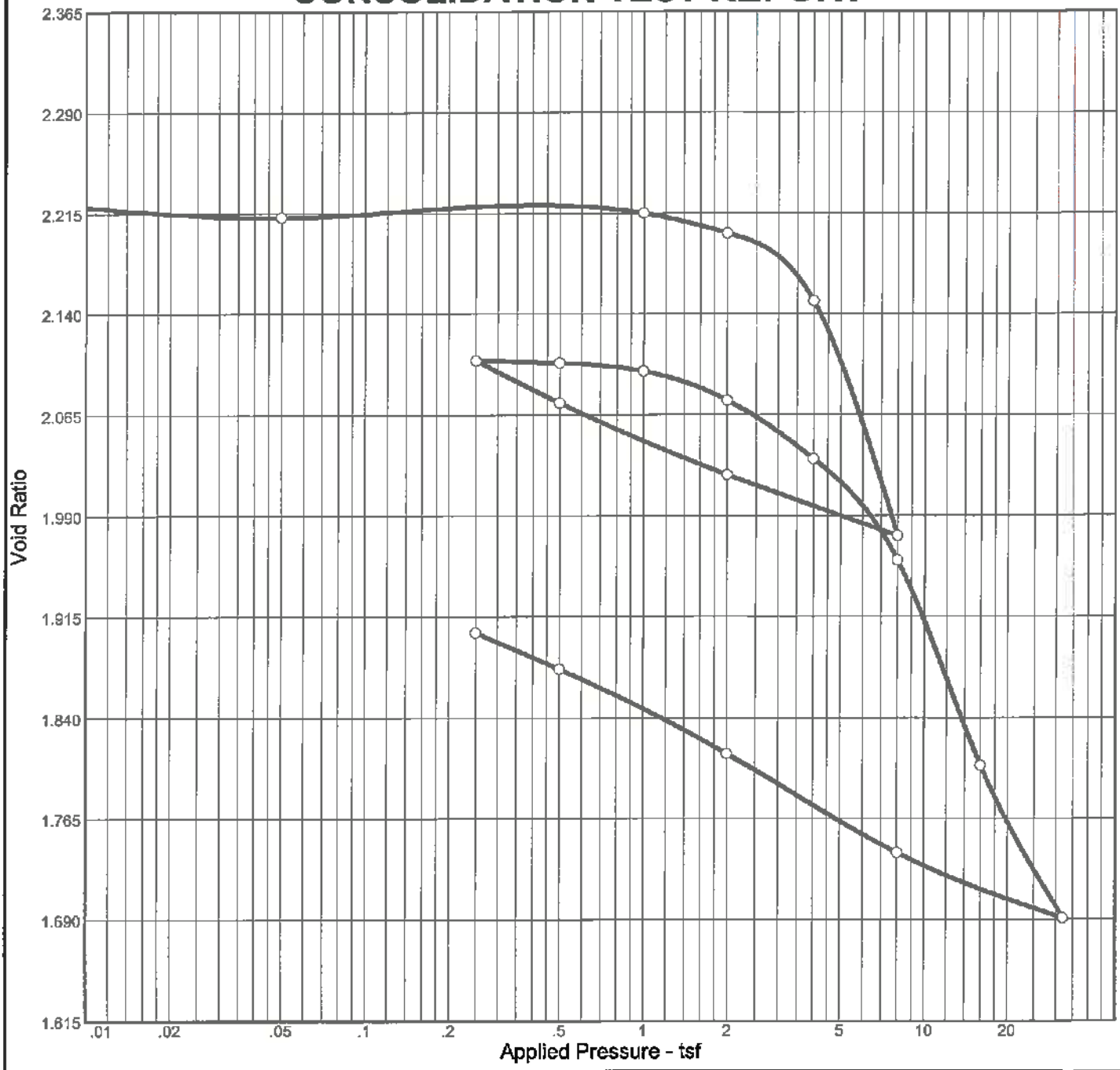
D_{90} = 0.03303

D_{100} = 0.03132

T_{90} = 461.10 min.

C_v @ T_{90}
0.00 $ft.^2/day$

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
Sat.	Moist.											
98.5 %	87.1 %	48.7	82	42	2.51	1.39	3.96	0.61	0.12			2.220

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Elastic Silt	(MH)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: WB-114 45'-47'

Remarks:

Fines Content=99.2%

CONSOLIDATION TEST REPORT

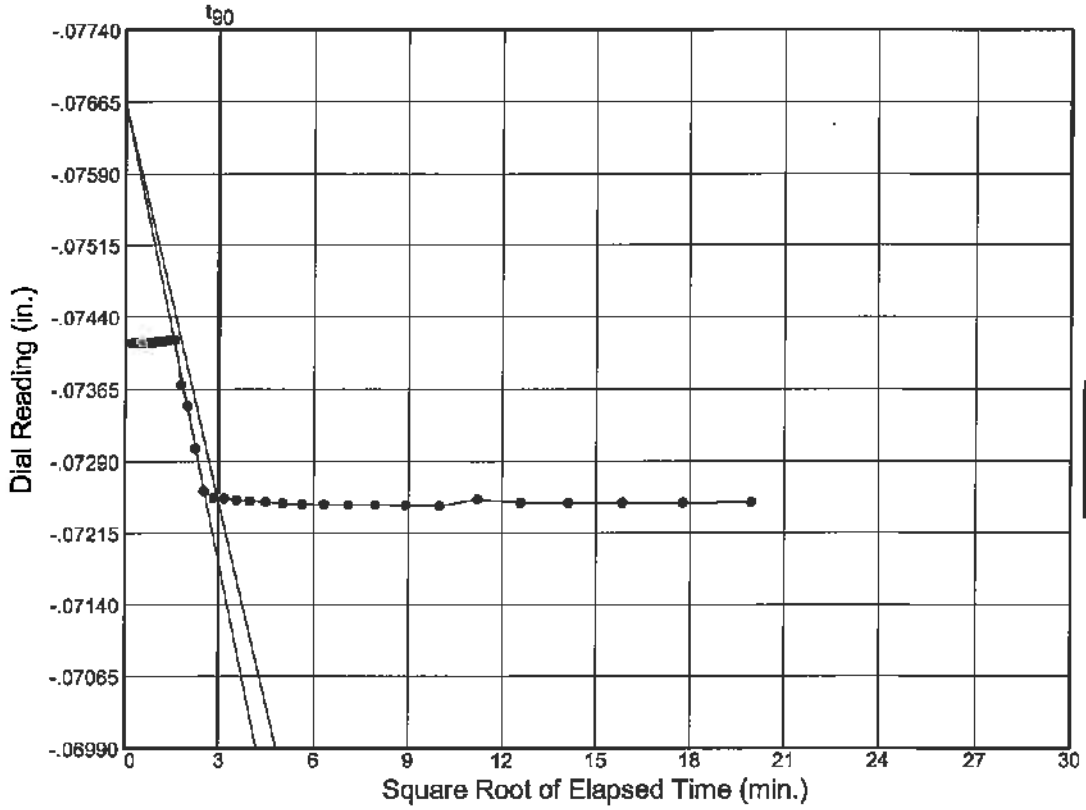
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

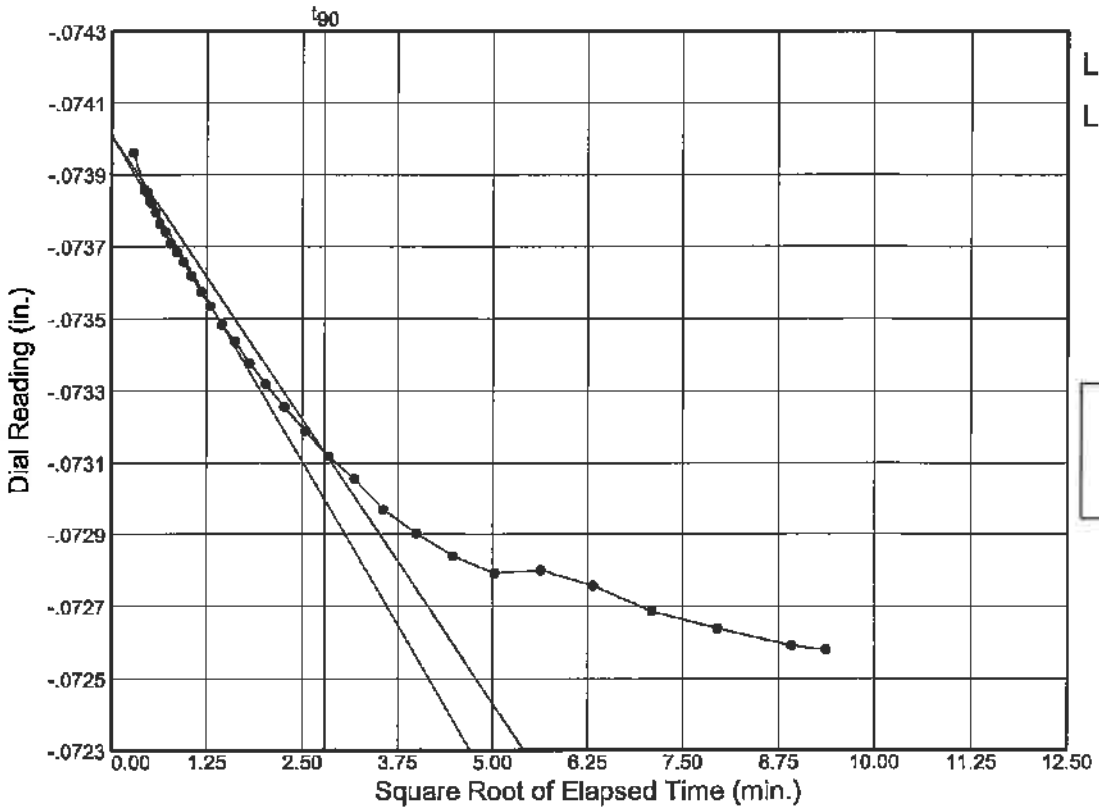
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.07664
D_{90} = -0.07251
D_{100} = -0.07205
T_{90} = 8.65 min.

C_v @ T_{90}
0.24 ft.^{2}/day



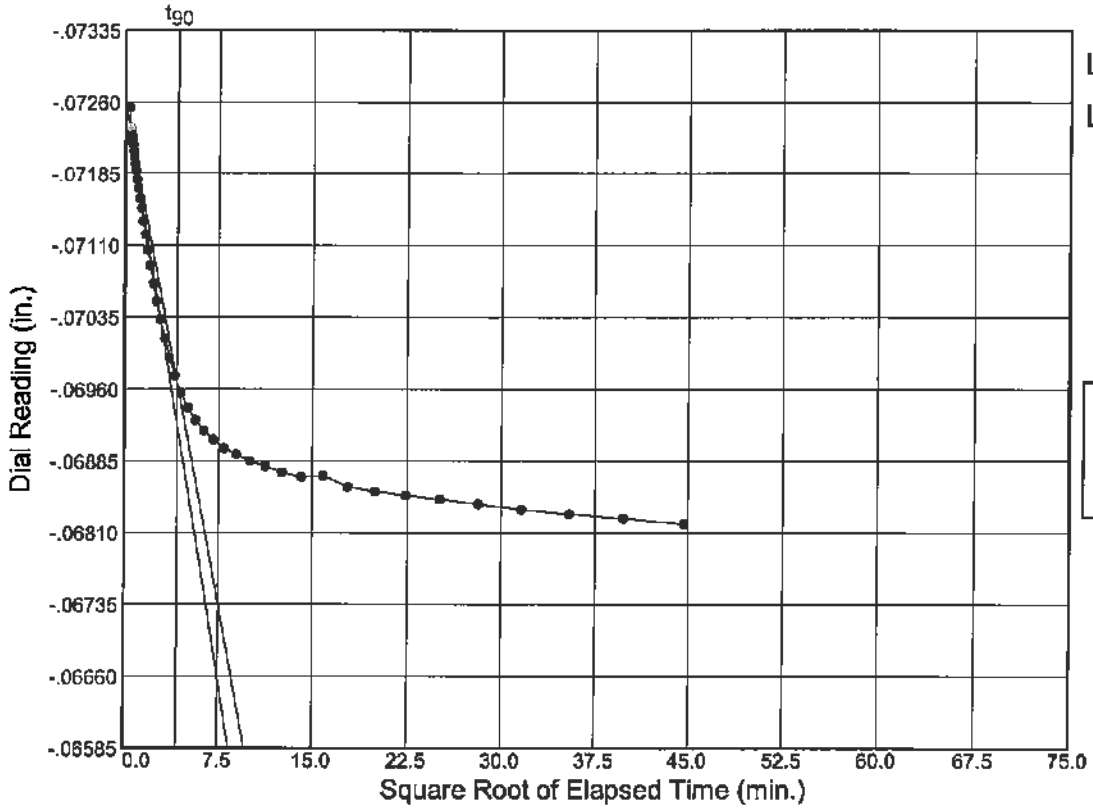
Load No.= 2
Load= 1.00 tsf
D_0 = -0.07401
D_{90} = -0.07313
D_{100} = -0.07303
T_{90} = 7.75 min.

C_v @ T_{90}
0.27 ft.^{2}/day

Dial Reading vs. Time

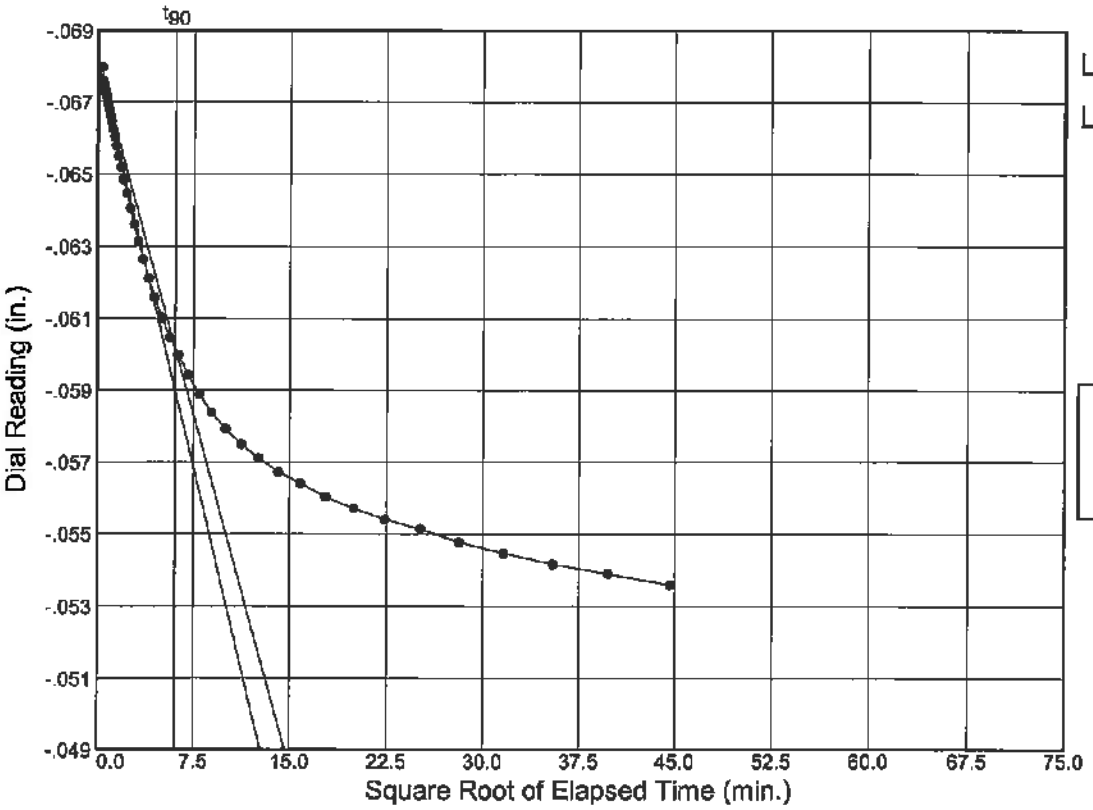
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 3
Load= 2.00 tsf
D_0 = -0.07260
D_{90} = -0.06967
D_{100} = -0.06935
T_{90} = 17.51 min.

C_v @ T_{90}
0.12 ft.^{2}/day



Load No.= 4
Load= 4.00 tsf
D_0 = -0.06808
D_{90} = -0.06015
D_{100} = -0.05927
T_{90} = 36.87 min.

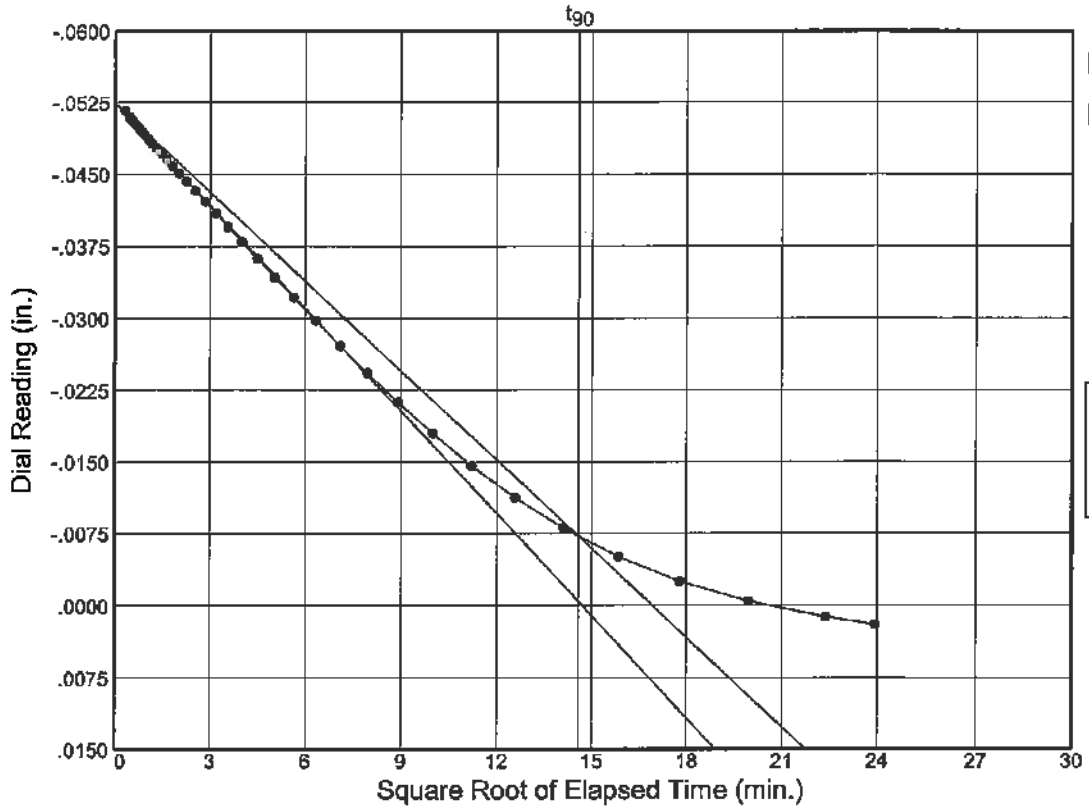
C_v @ T_{90}
0.06 ft.^{2}/day

Plate

Dial Reading vs. Time

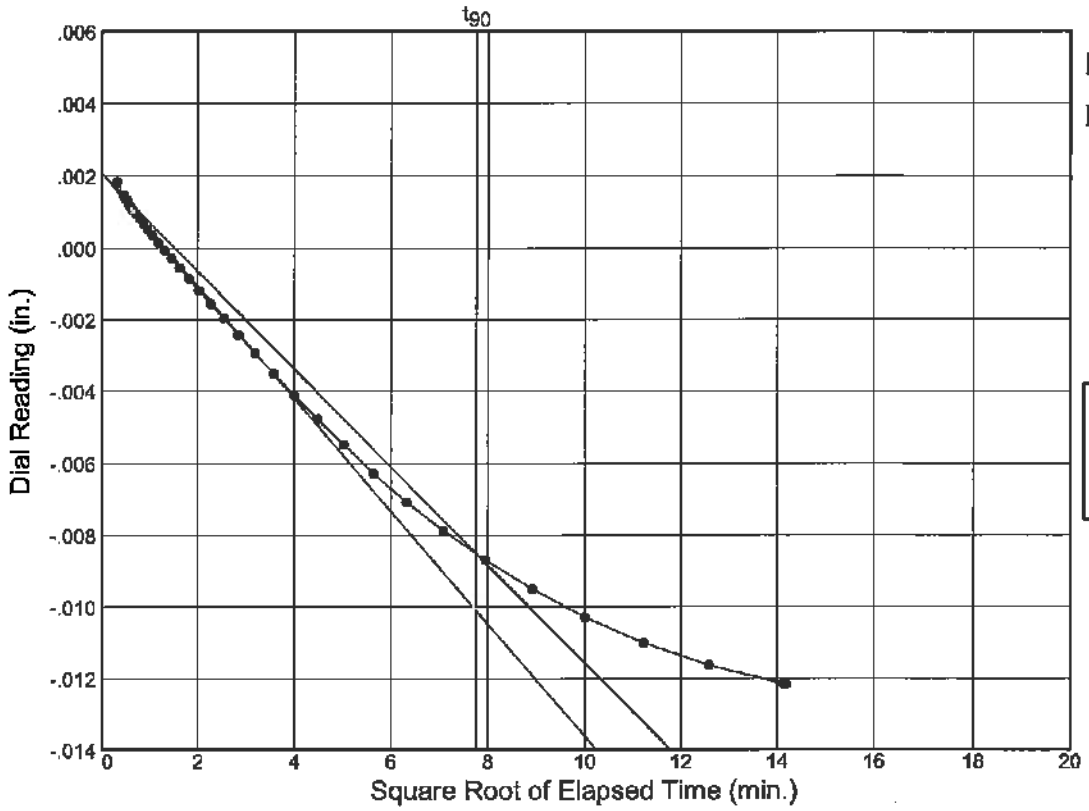
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 5
Load= 8.00 tsf
D_0 = -0.05242
D_{90} = -0.00722
D_{100} = -0.00220
T_{90} = 212.59 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 6
Load= 2.00 tsf
D_0 = 0.00207
D_{90} = -0.00852
D_{100} = -0.00969
T_{90} = 60.23 min.

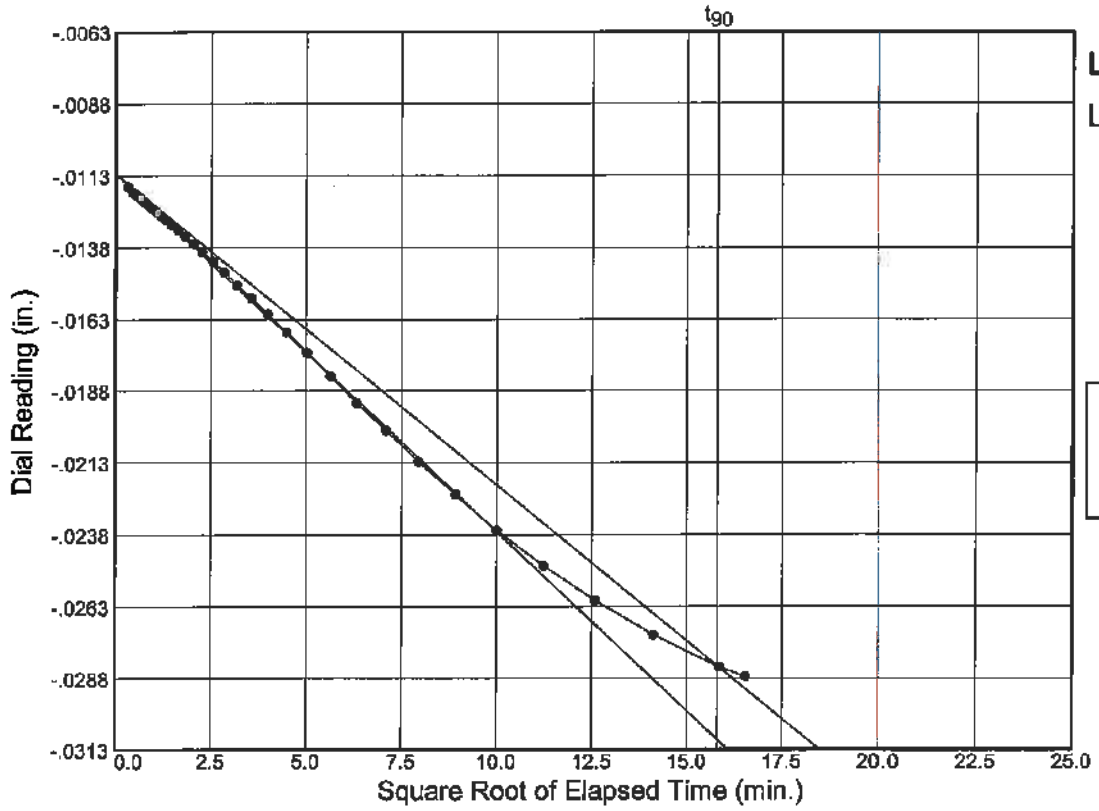
C_v @ T_{90}
0.03 ft.^{2}/day

Plate

Dial Reading vs. Time

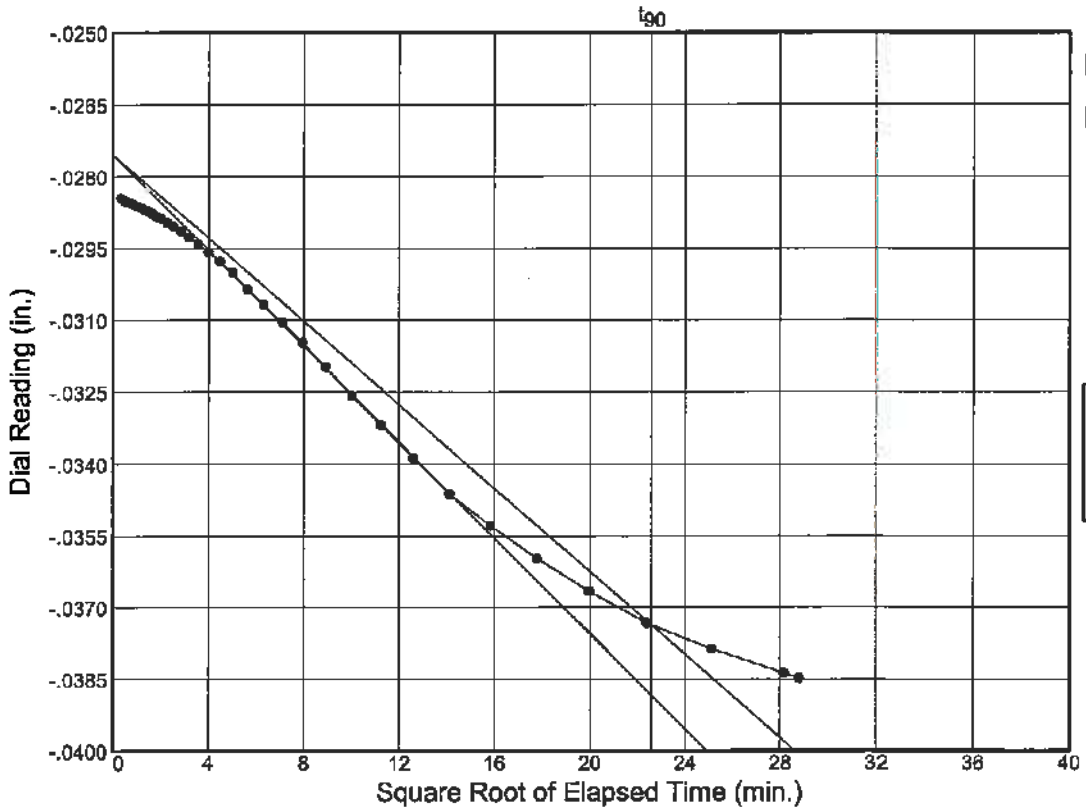
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 7
Load= 0.50 tsf
D_0 = -0.01122
D_{90} = -0.02837
D_{100} = -0.03028
T_{90} = 249.64 min.

C_v @ T_{90}
0.01 ft.^{2}/day



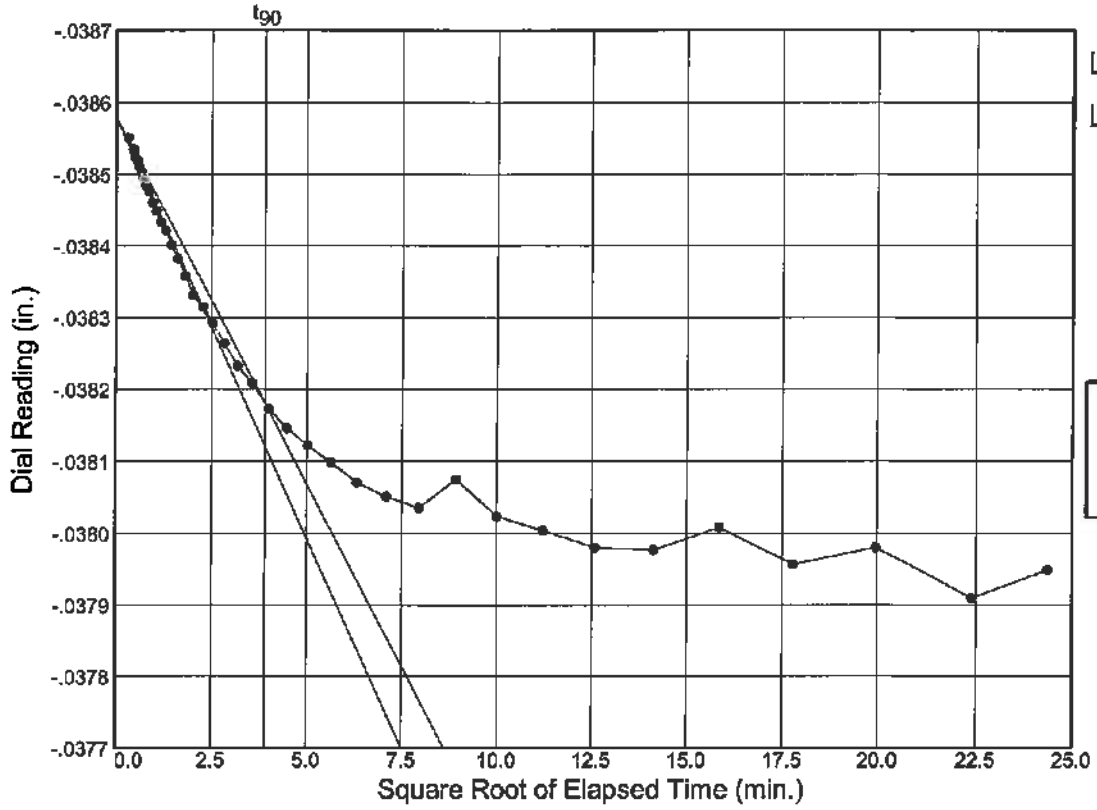
Load No.= 8
Load= 0.25 tsf
D_0 = -0.02754
D_{90} = -0.03737
D_{100} = -0.03846
T_{90} = 509.94 min.

C_v @ T_{90}
0.00 ft.^{2}/day

Dial Reading vs. Time

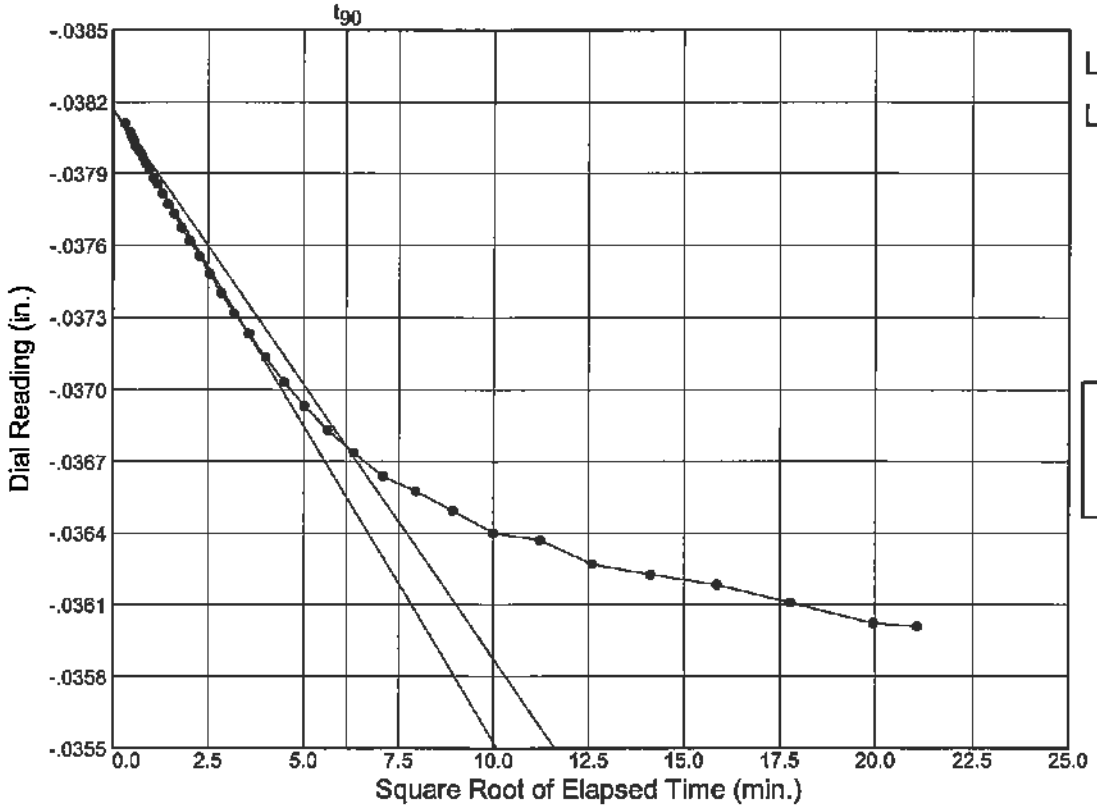
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 9
Load= 0.50 tsf
D_0 = -0.03858
D_{90} = -0.03818
D_{100} = -0.03814
T_{90} = 15.26 min.

C_v @ T_{90}
0.13 ft.^{2}/day



Load No.= 10
Load= 1.00 tsf
D_0 = -0.03817
D_{90} = -0.03676
D_{100} = -0.03661
T_{90} = 37.44 min.

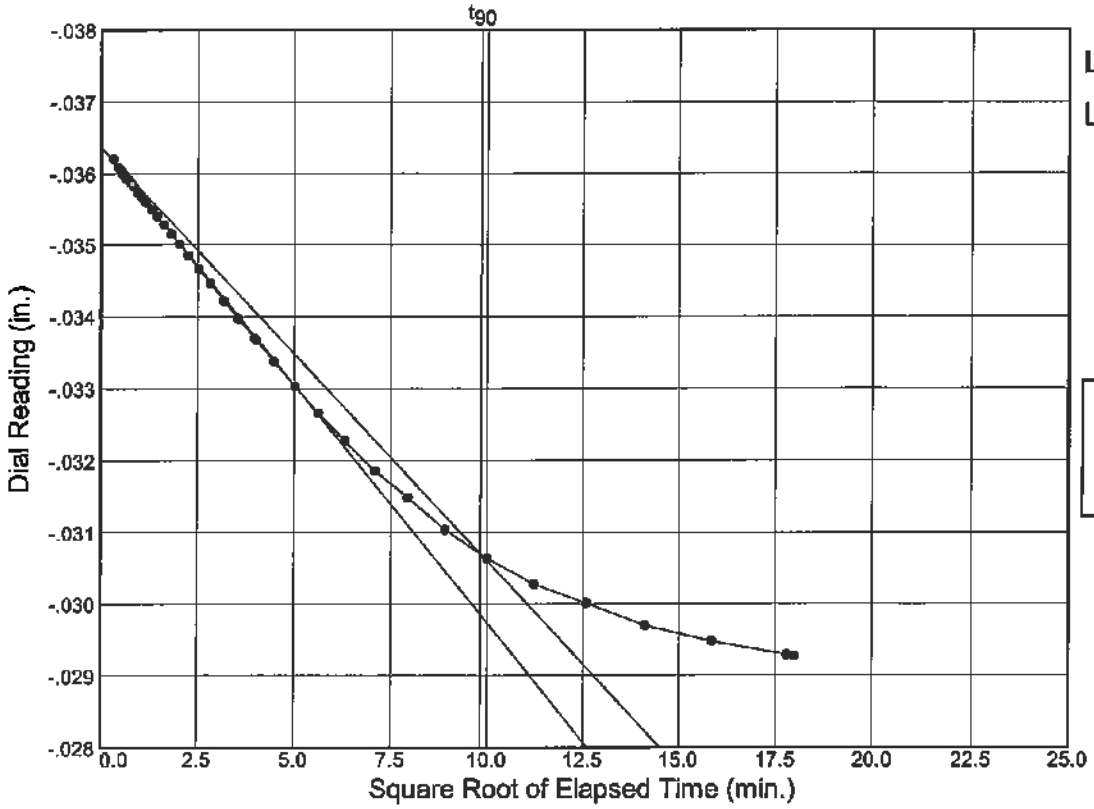
C_v @ T_{90}
0.05 ft.^{2}/day

Plate

Dial Reading vs. Time

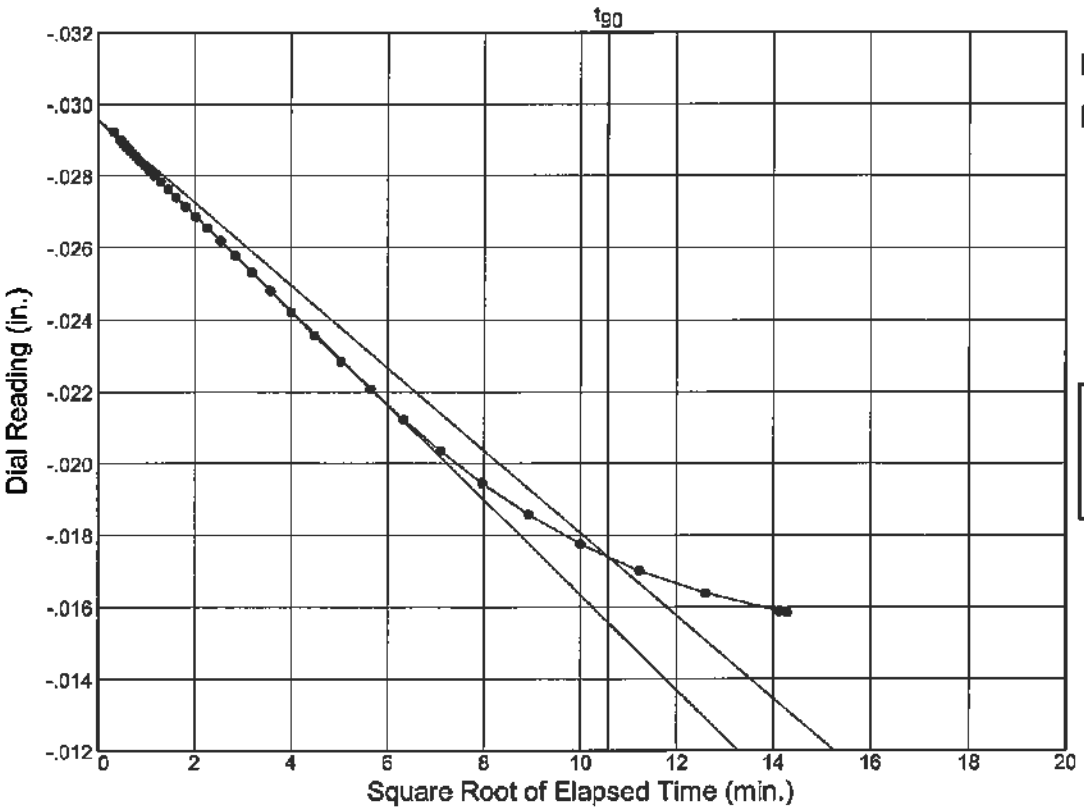
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 11
Load= 2.00 tsf
D_0 = -0.03637
D_{90} = -0.03070
D_{100} = -0.03007
T_{90} = 96.71 min.

C_v @ T_{90}
0.02 ft.^{2}/day



Load No.= 12
Load= 4.00 tsf
D_0 = -0.02955
D_{90} = -0.01740
D_{100} = -0.01605
T_{90} = 111.75 min.

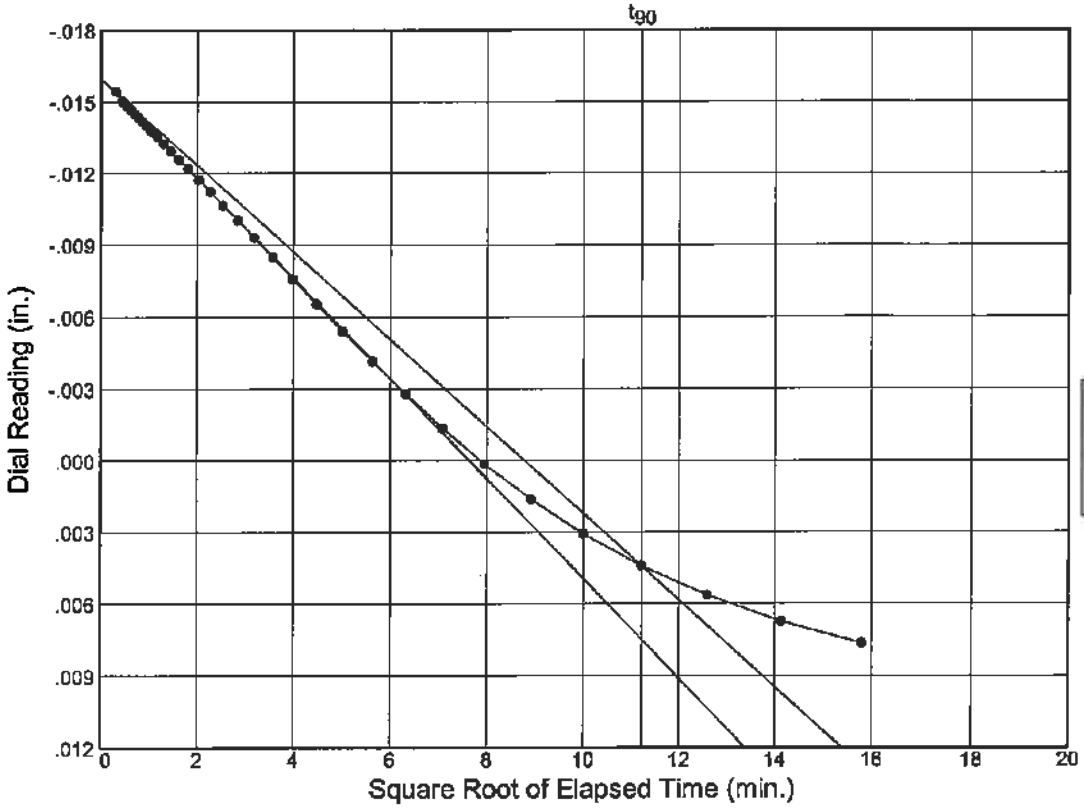
C_v @ T_{90}
0.02 ft.^{2}/day

Plate

Dial Reading vs. Time

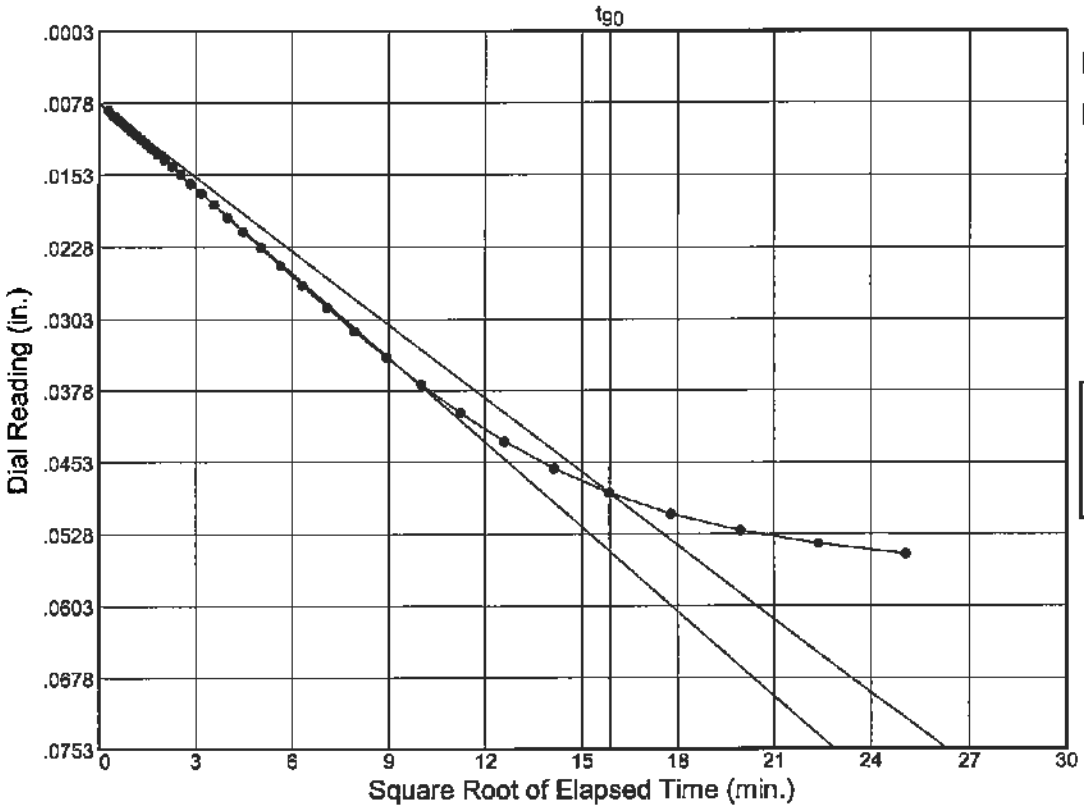
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 13
Load= 8.00 tsf
D_0 = -0.01597
D_{90} = 0.00443
D_{100} = 0.00670
T_{90} = 125.98 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 14
Load= 16.00 tsf
D_0 = 0.00784
D_{90} = 0.04852
D_{100} = 0.05304
T_{90} = 251.63 min.

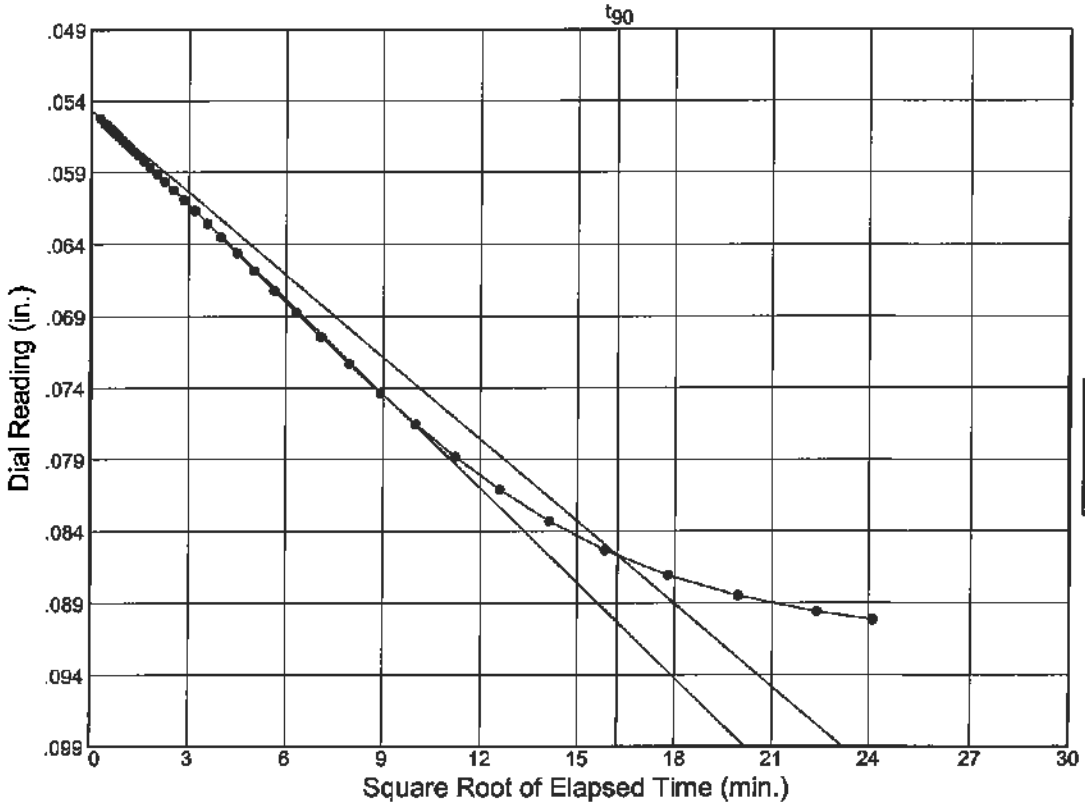
C_v @ T_{90}
0.01 ft.^{2}/day

Plate

Dial Reading vs. Time

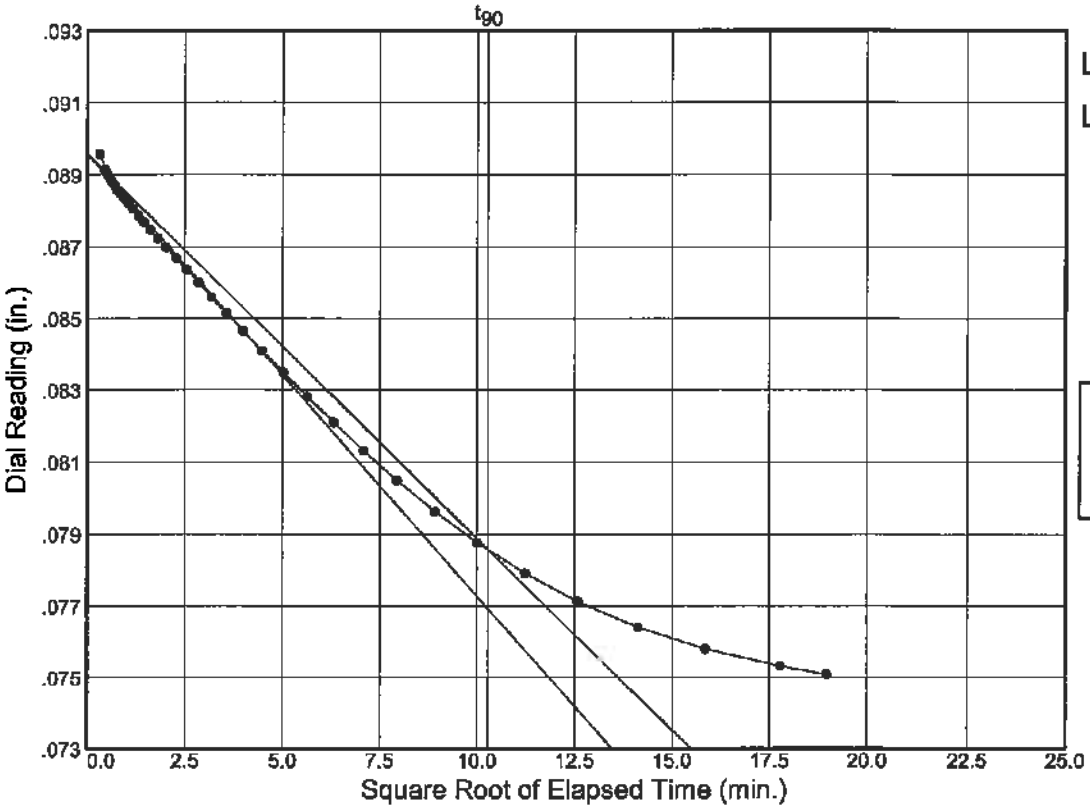
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 15
Load= 32.00 tsf
D_0 = 0.05468
D_{90} = 0.08568
D_{100} = 0.08912
T_{90} = 263.28 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 16
Load= 8.00 tsf
D_0 = 0.08957
D_{90} = 0.07857
D_{100} = 0.07735
T_{90} = 105.60 min.

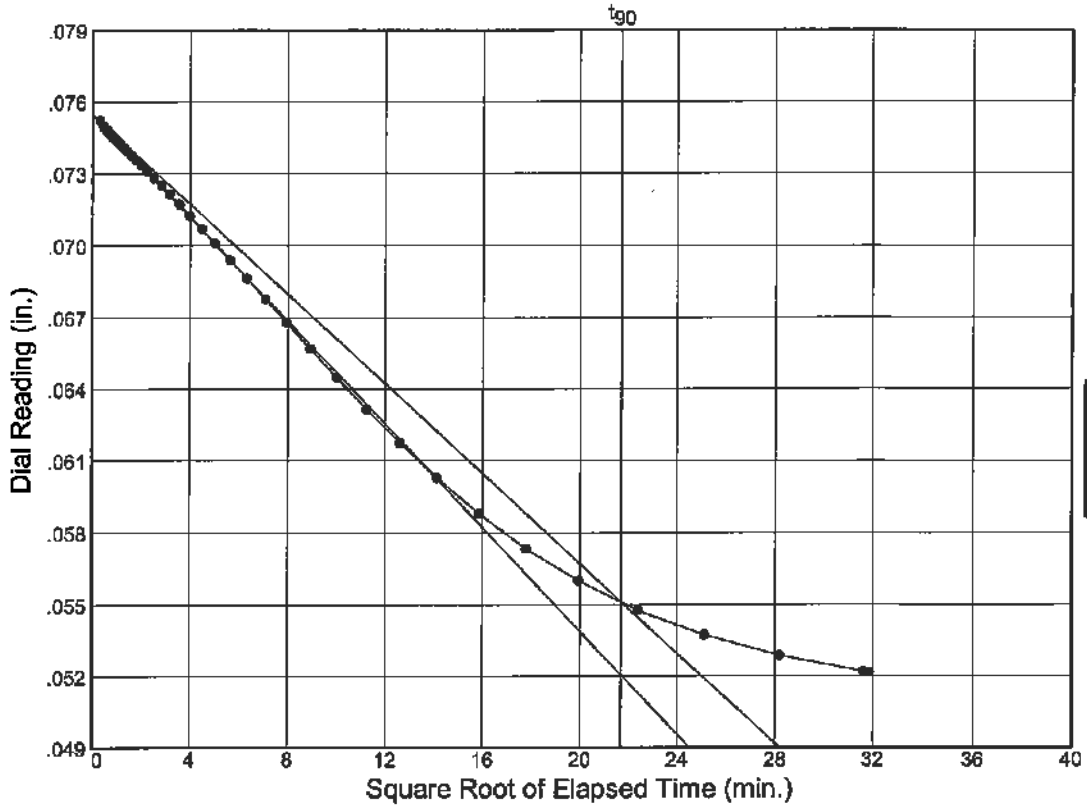
C_v @ T_{90}
0.01 ft.^{2}/day

Plate

Dial Reading vs. Time

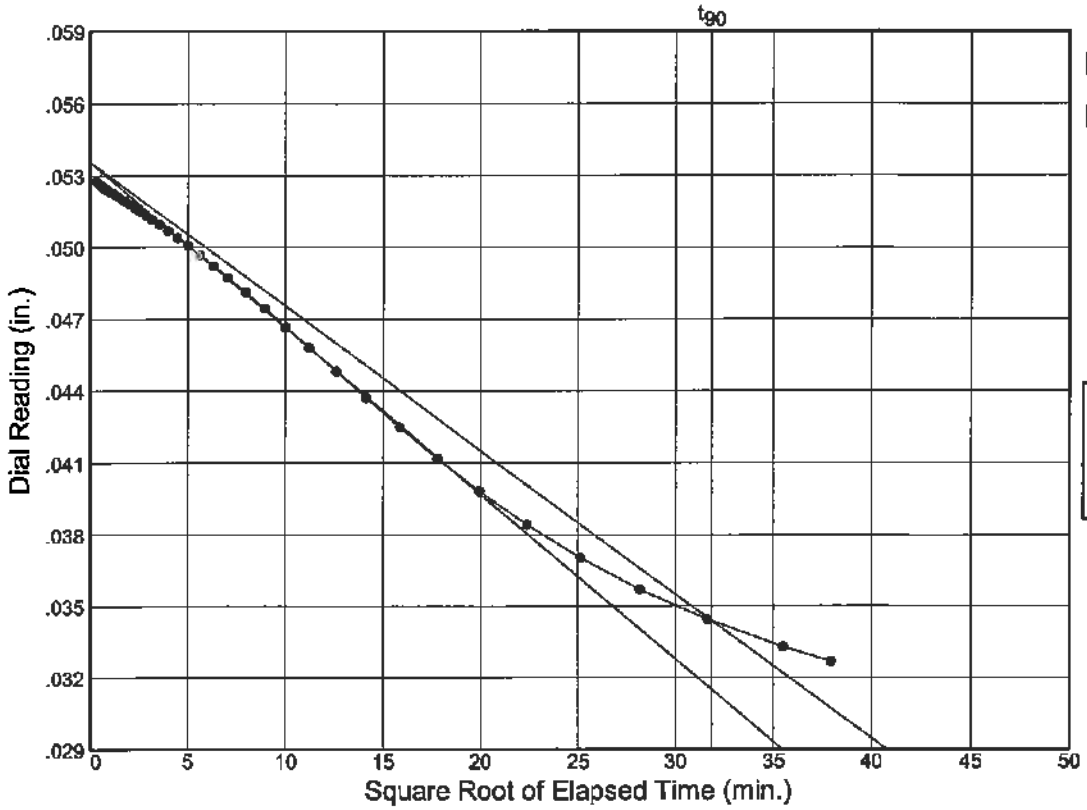
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 17
Load= 2.00 tsf
D_0 = 0.07549
D_{90} = 0.05510
D_{100} = 0.05283
T_{90} = 471.18 min.

C_v @ T_{90}
0.00 ft.^{2}/day



Load No.= 18
Load= 0.50 tsf
D_0 = 0.05357
D_{90} = 0.03437
D_{100} = 0.03224
T_{90} = 1014.06 min.

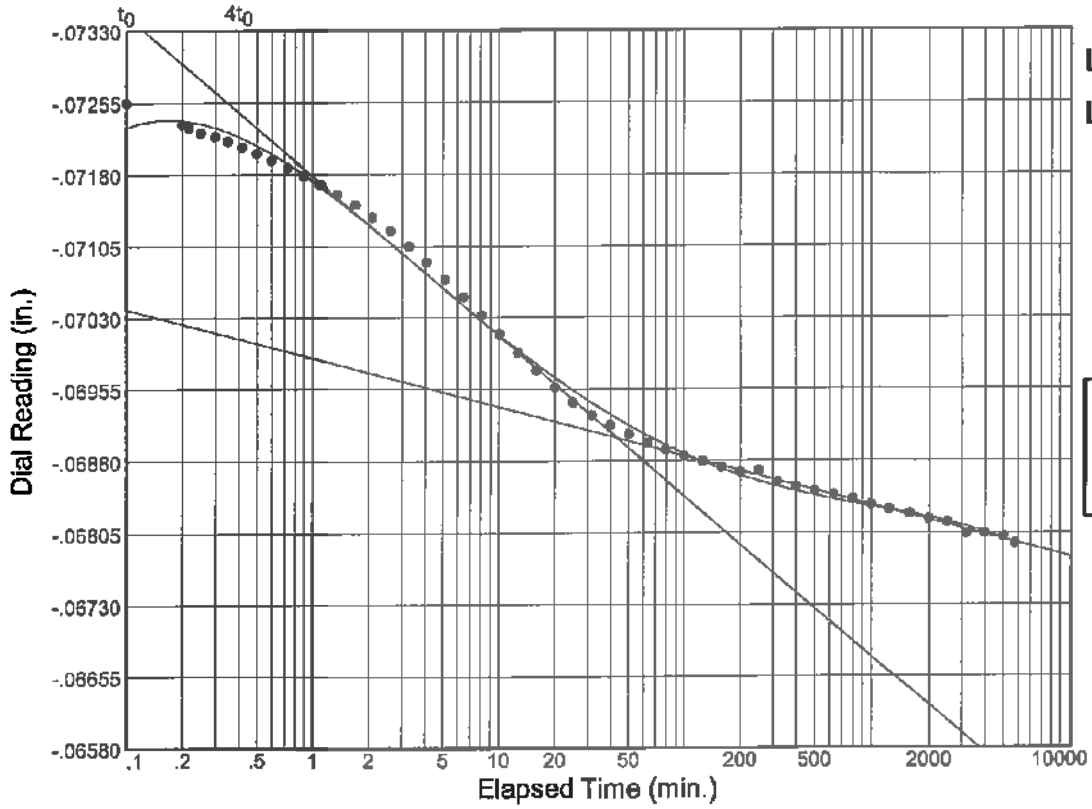
C_v @ T_{90}
0.00 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-114 45'-47'



Load No.= 3

Load= 2.00 tsf

D_0 = -0.07239

D_{50} = -0.07071

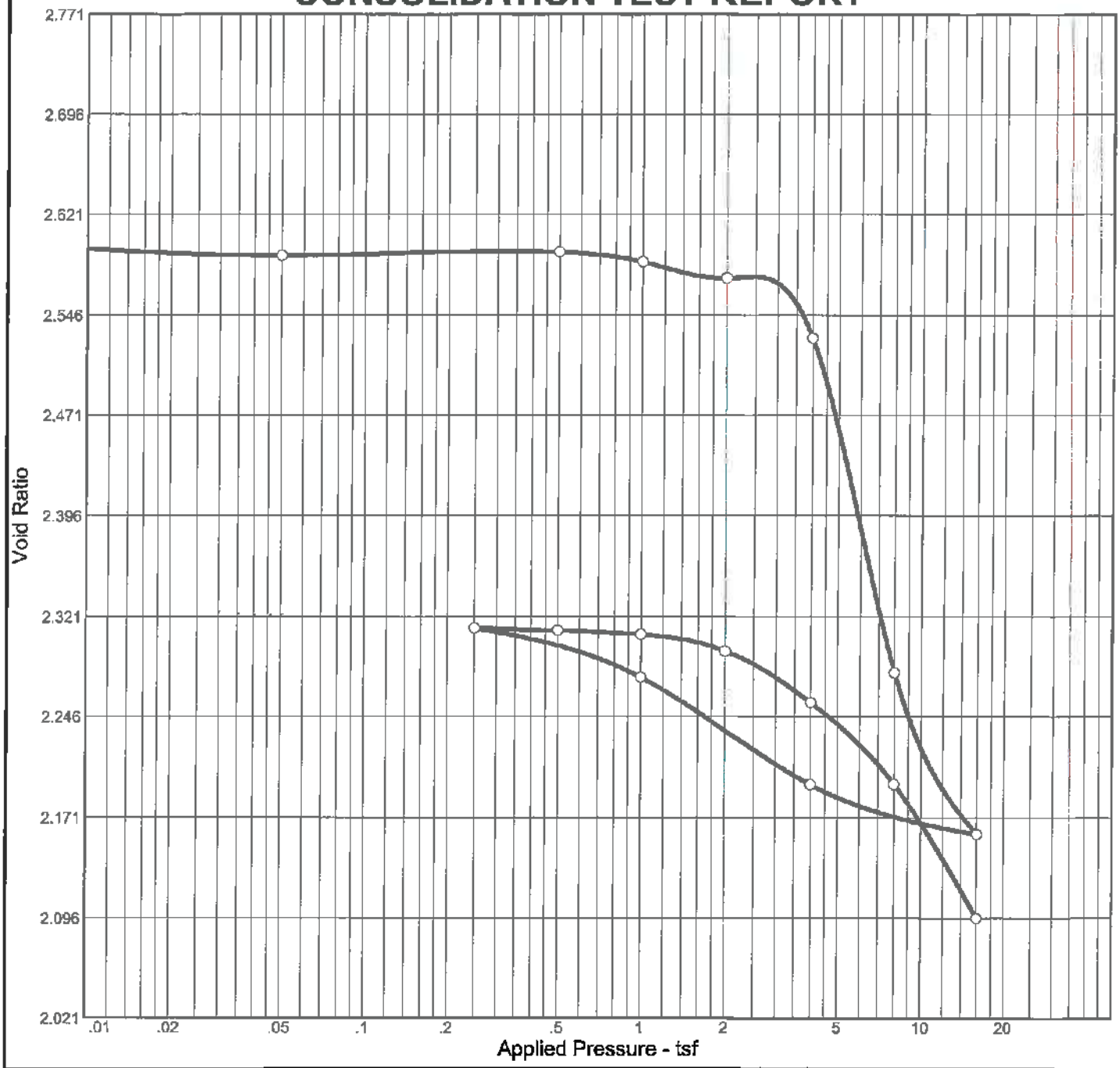
D_{100} = -0.06904

T_{50} = 4.33 min.

C_v @ T_{50}
0.11 $ft.^2$/day

C_α = 0.001

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
97.8 %	98.0 %	44.8	74	40	2.59	1.35	3.85	0.89	0.11			2.595

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Fat Clay	(CH)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: BR-32 43'-45'

Remarks:

Fines Content= 98%

CONSOLIDATION TEST REPORT

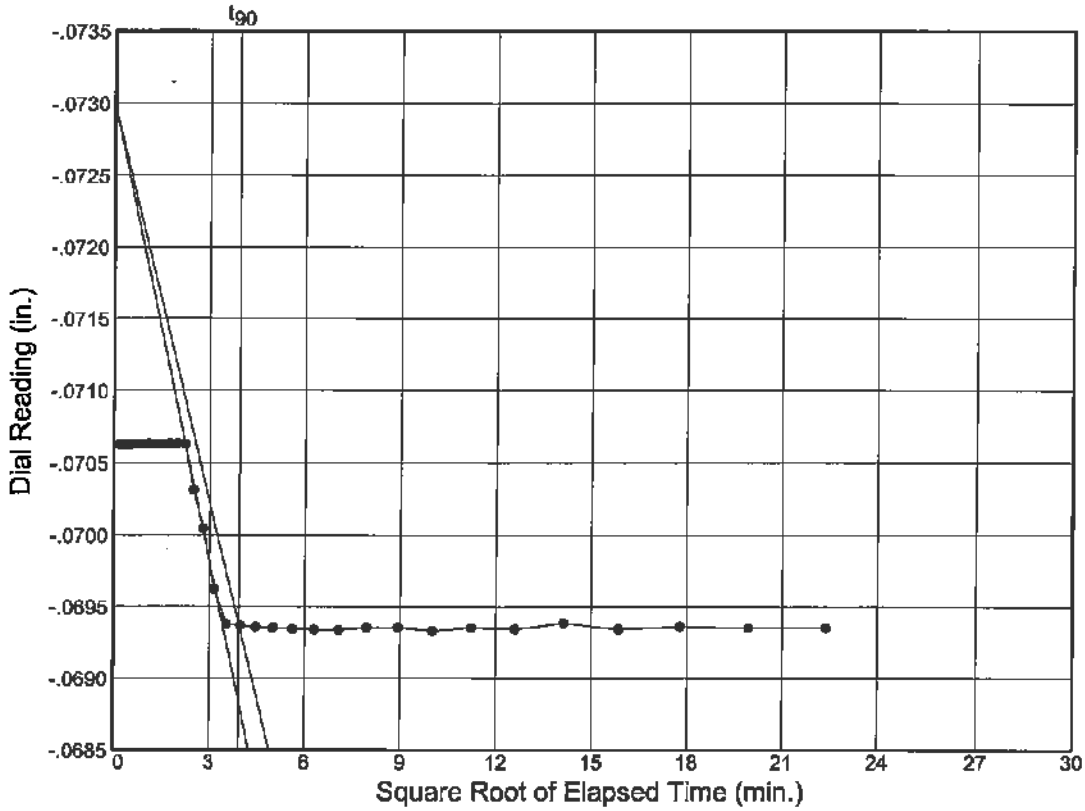
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

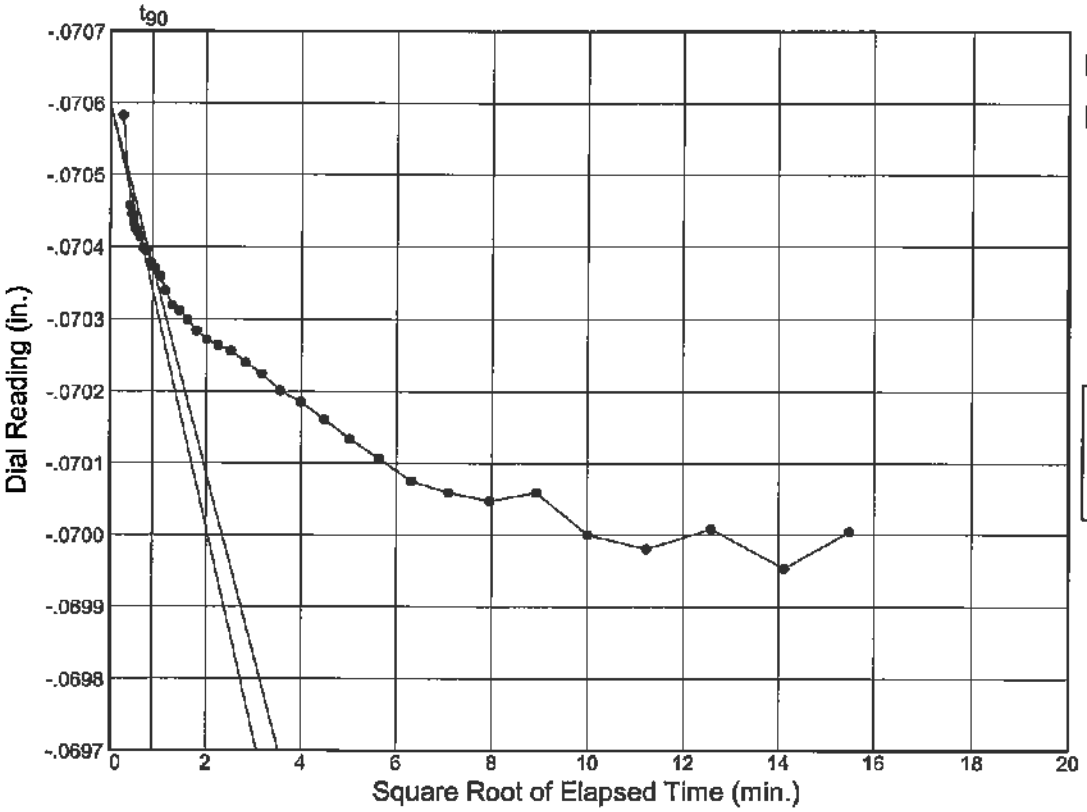
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.07298
D_{90} = -0.06937
D_{100} = -0.06897
T_{90} = 15.50 min.

C_v @ T_{90}
0.14 ft.^{2}/day



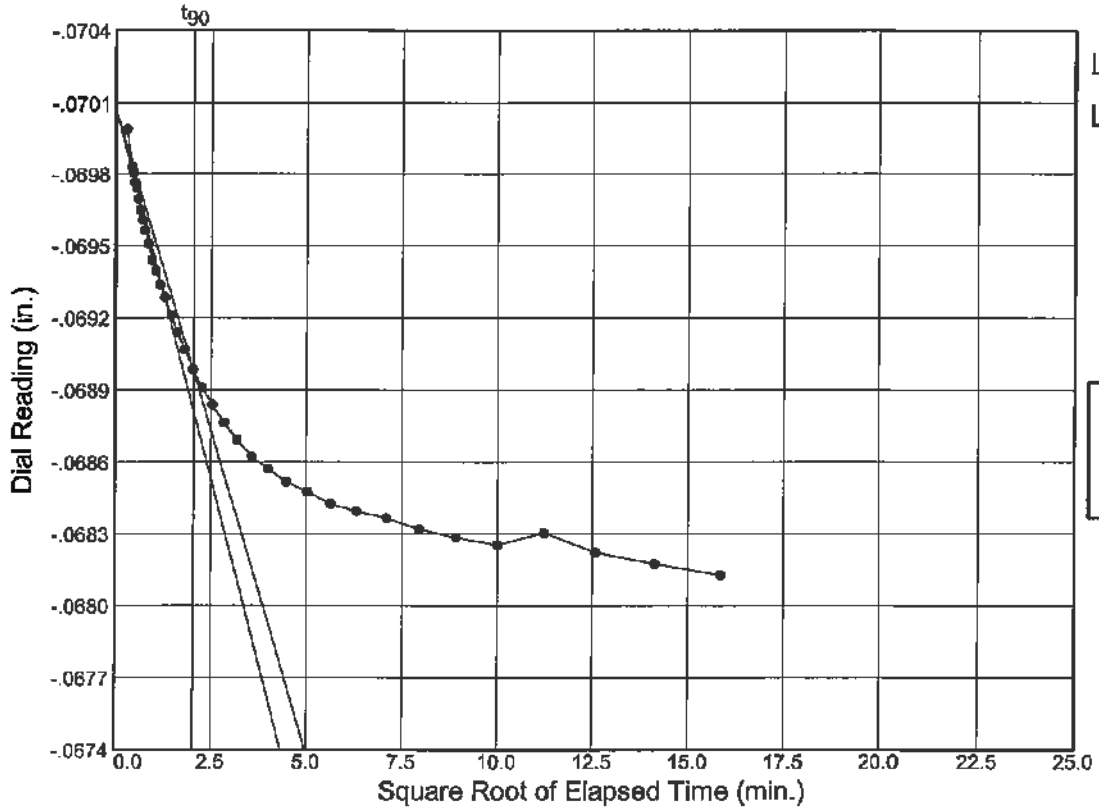
Load No.= 2
Load= 0.50 tsf
D_0 = -0.07060
D_{90} = -0.07037
D_{100} = -0.07035
T_{90} = 0.77 min.

C_v @ T_{90}
2.76 ft.^{2}/day

Dial Reading vs. Time

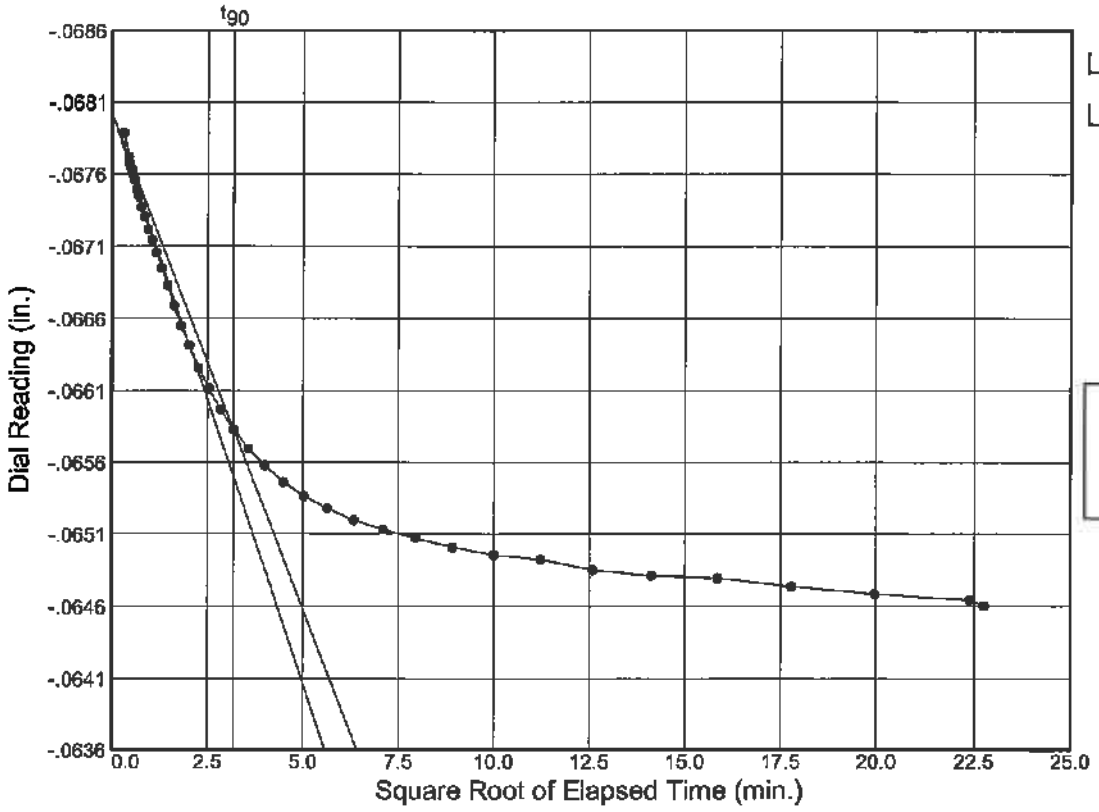
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 3
Load= 1.00 tsf
D_0 = -0.07008
D_{90} = -0.06898
D_{100} = -0.06886
T_{90} = 4.14 min.

C_v @ T_{90}
0.51 ft.^{2}/day



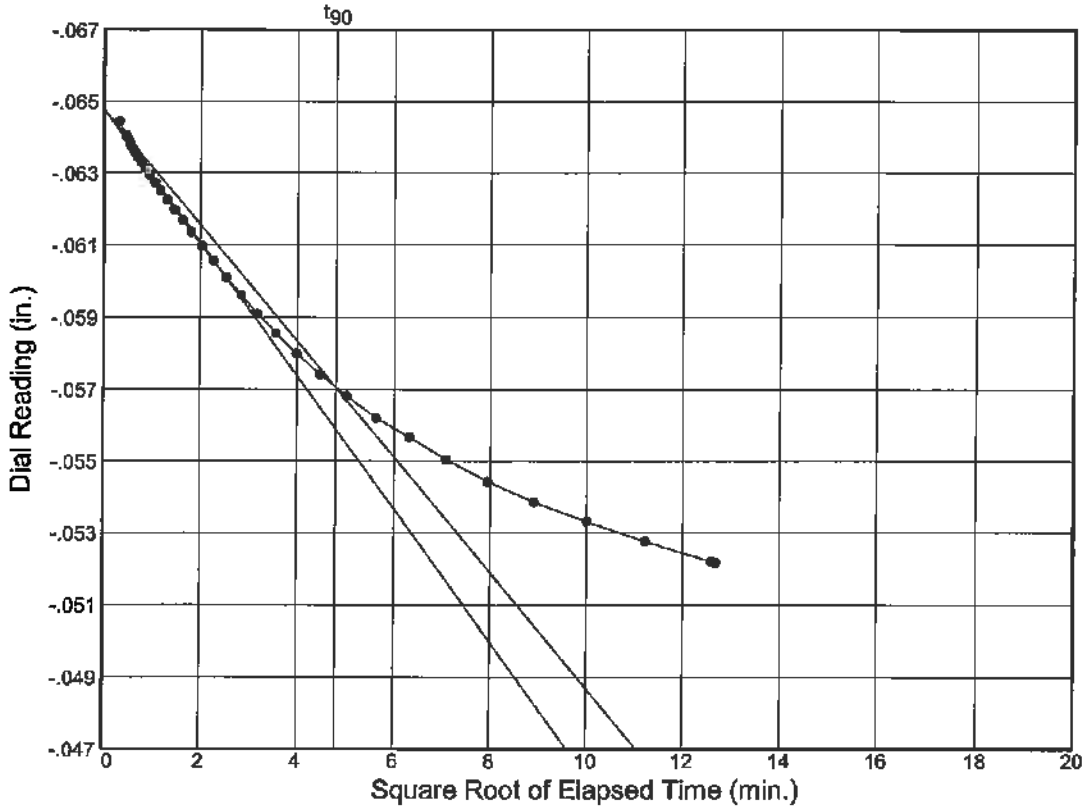
Load No.= 4
Load= 2.00 tsf
D_0 = -0.06802
D_{90} = -0.06583
D_{100} = -0.06559
T_{90} = 10.08 min.

C_v @ T_{90}
0.21 ft.^{2}/day

Dial Reading vs. Time

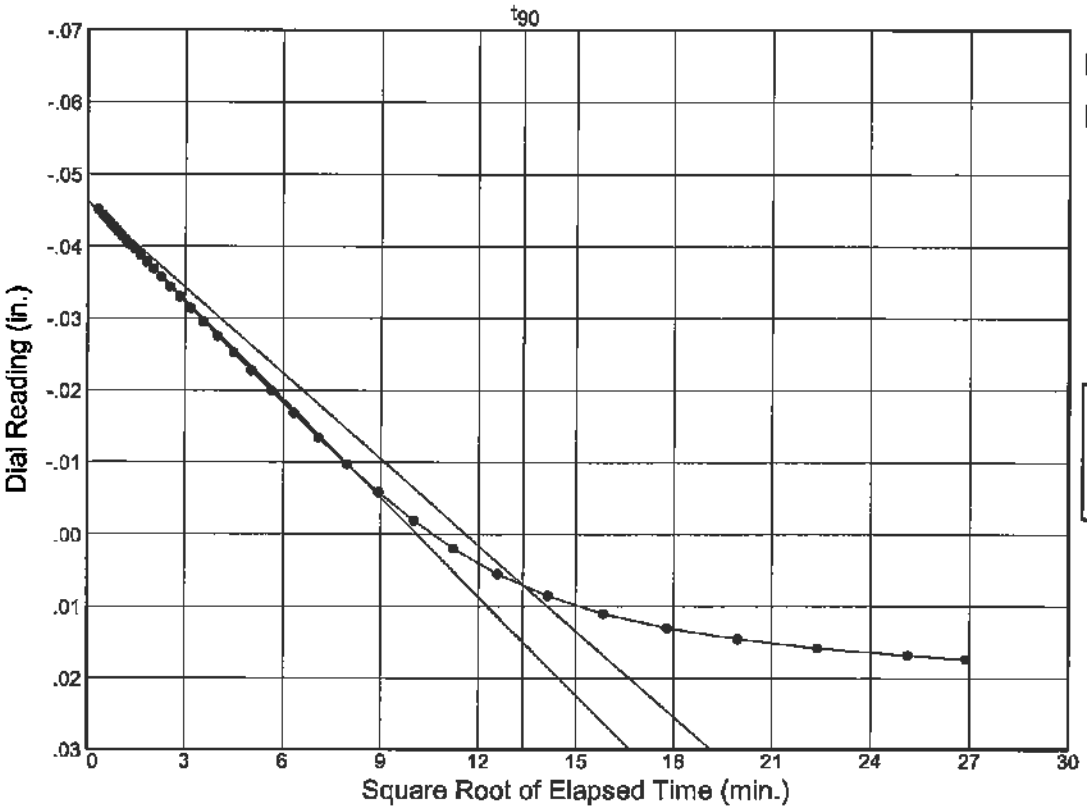
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 5
Load= 4.00 tsf
D_0 = -0.06477
D_{90} = -0.05705
D_{100} = -0.05619
T_{90} = 23.05 min.

C_v @ T_{90}
0.09 ft.^{2}/day



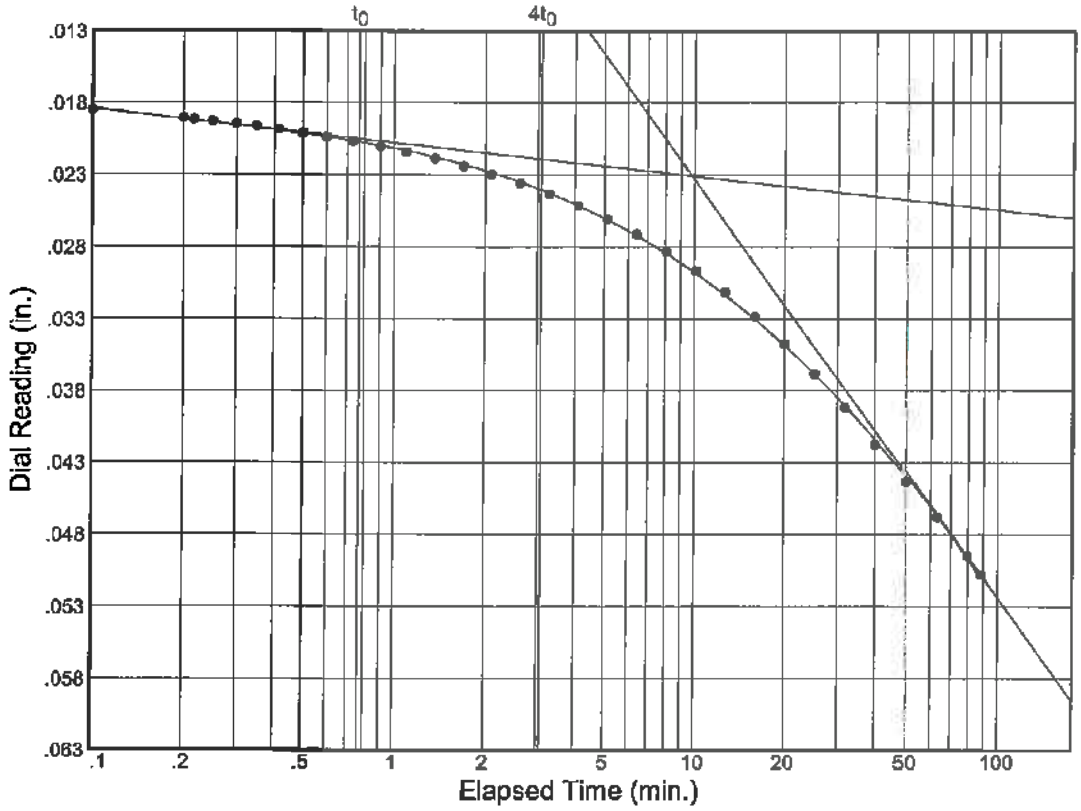
Load No.= 6
Load= 8.00 tsf
D_0 = -0.04627
D_{90} = 0.00705
D_{100} = 0.01297
T_{90} = 179.01 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

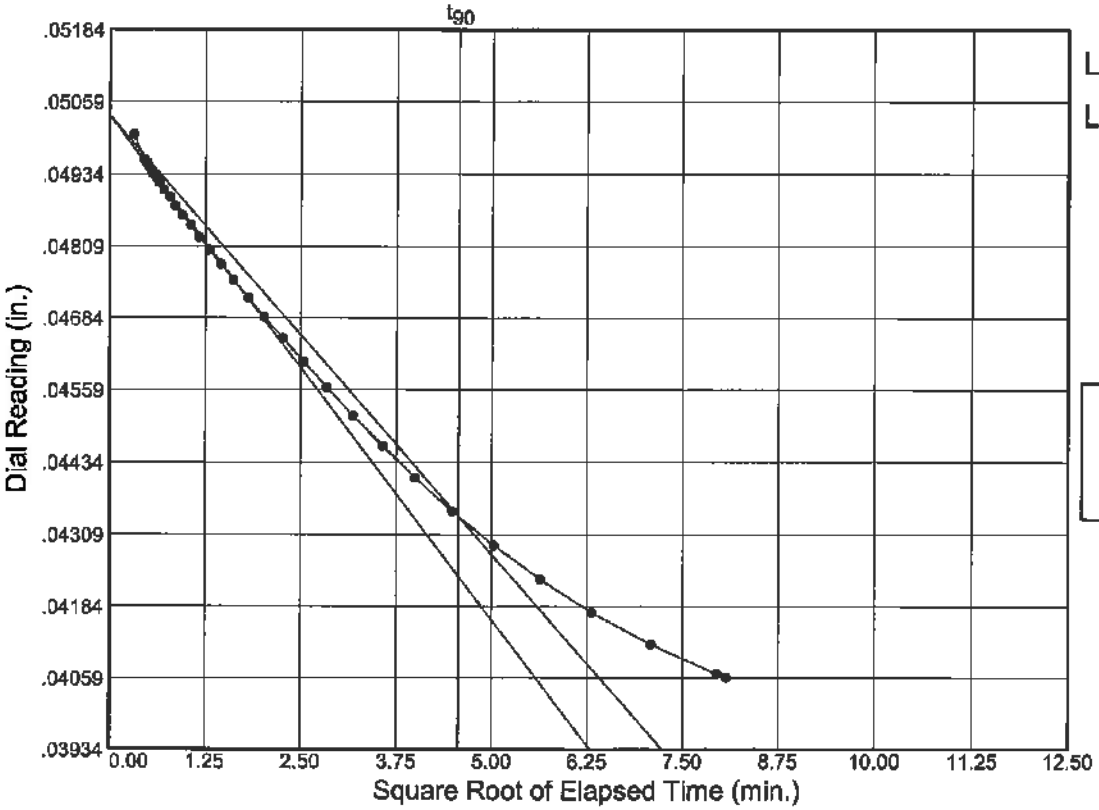
Location: BR-32 43'-45'



Load No.= 7
Load= 16.00 tsf
D_0 = 0.01737
D_{50} = 0.02024
D_{100} = 0.02311
T_{50} = 0.55 min.

C_v @ T_{50}
0.72 ft.^{2}/day

C_α = 0.032



Load No.= 8
Load= 4.00 tsf
D_0 = 0.05035
D_{90} = 0.04340
D_{100} = 0.04263
T_{90} = 20.81 min.

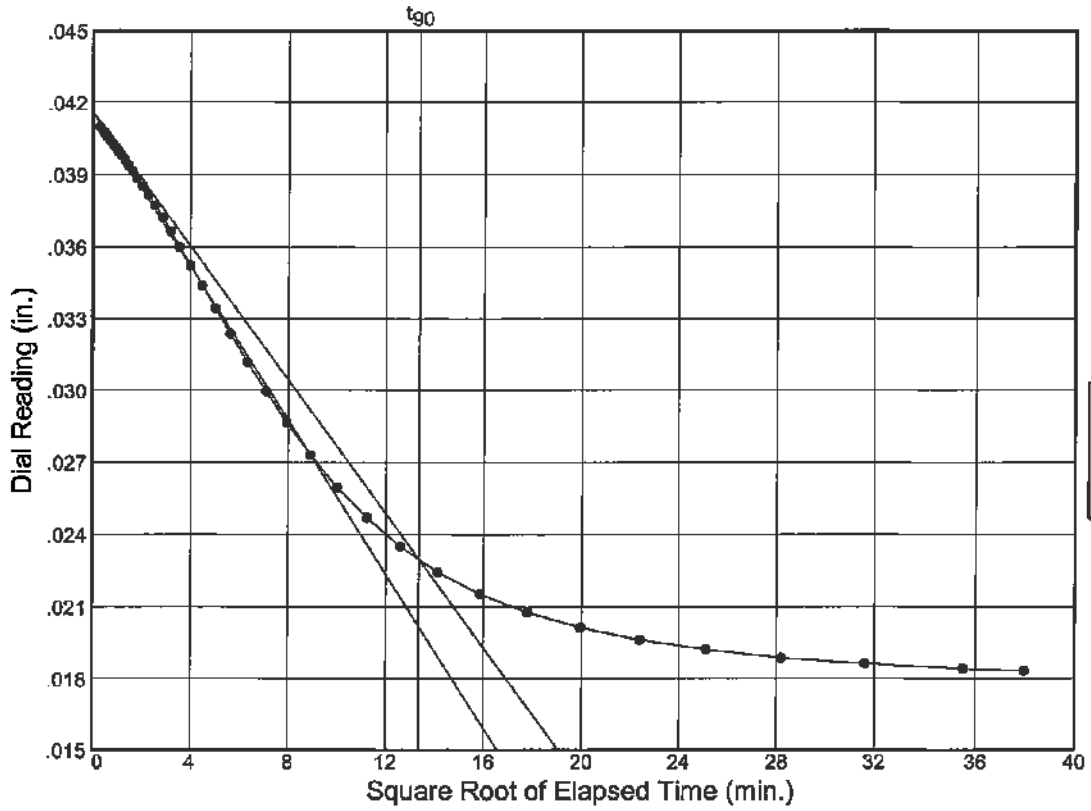
C_v @ T_{90}
0.08 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 9

Load= 1.00 tsf

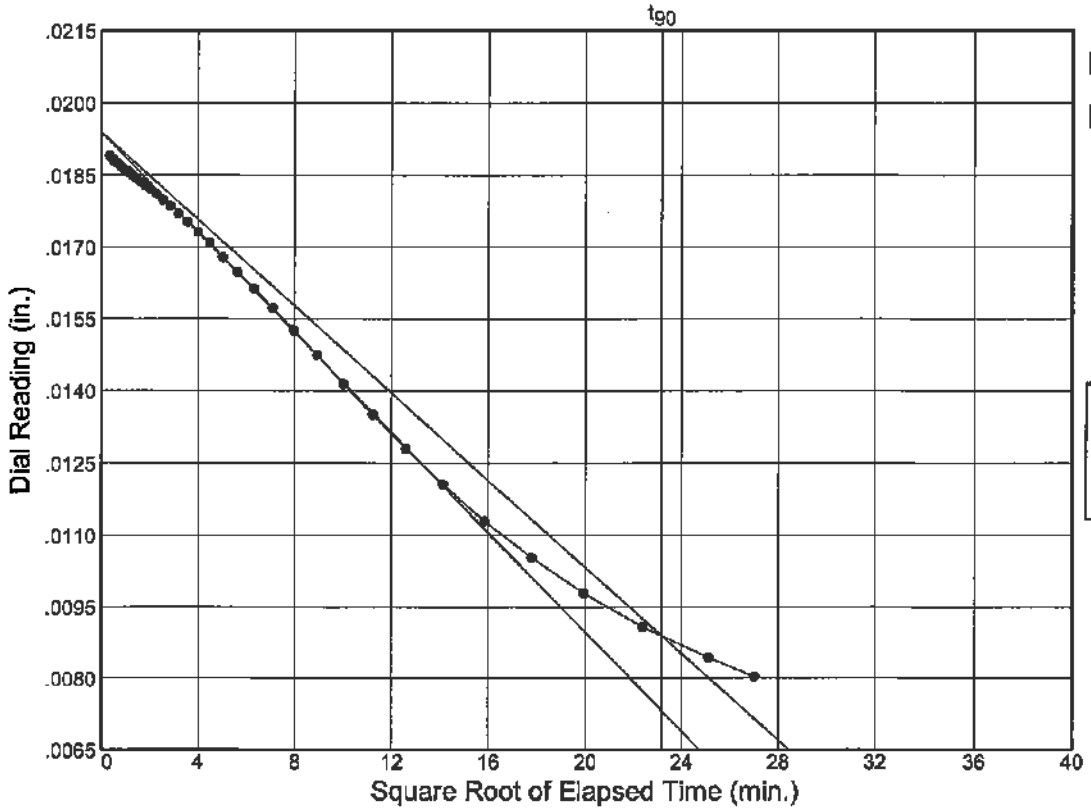
D_0 = 0.04160

D_{90} = 0.02297

D_{100} = 0.02090

T_{90} = 178.17 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 10

Load= 0.25 tsf

D_0 = 0.01939

D_{90} = 0.00889

D_{100} = 0.00773

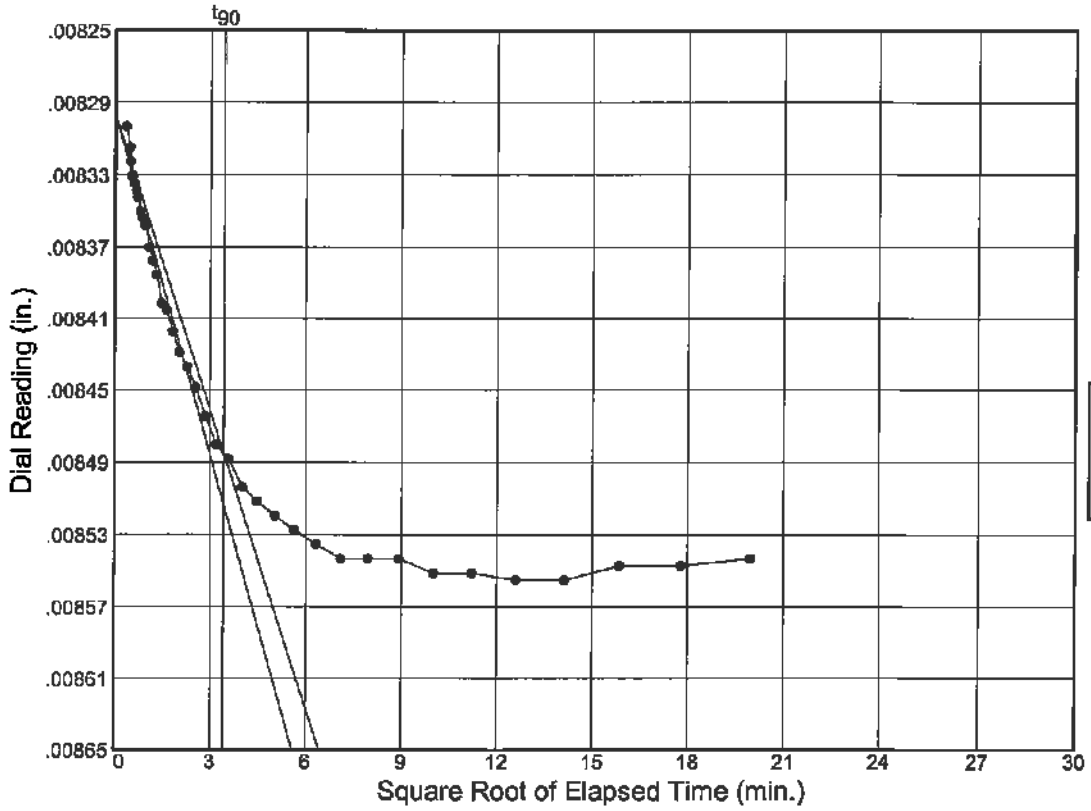
T_{90} = 536.73 min.

C_v @ T_{90}
0.00 ft.^{2}/day

Dial Reading vs. Time

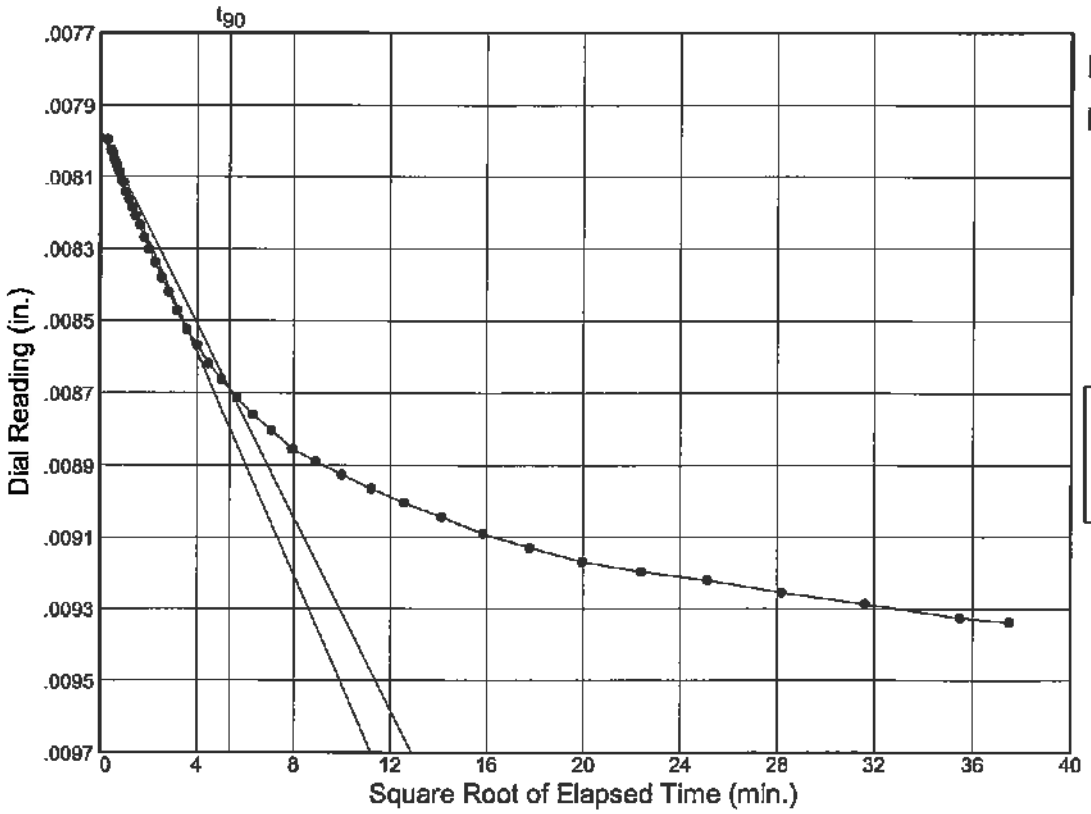
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 11
Load= 0.50 tsf
D_0 = 0.00830
D_{90} = 0.00849
D_{100} = 0.00851
T_{90} = 11.78 min.

C_v @ T_{90}
0.15 ft.^{2}/day



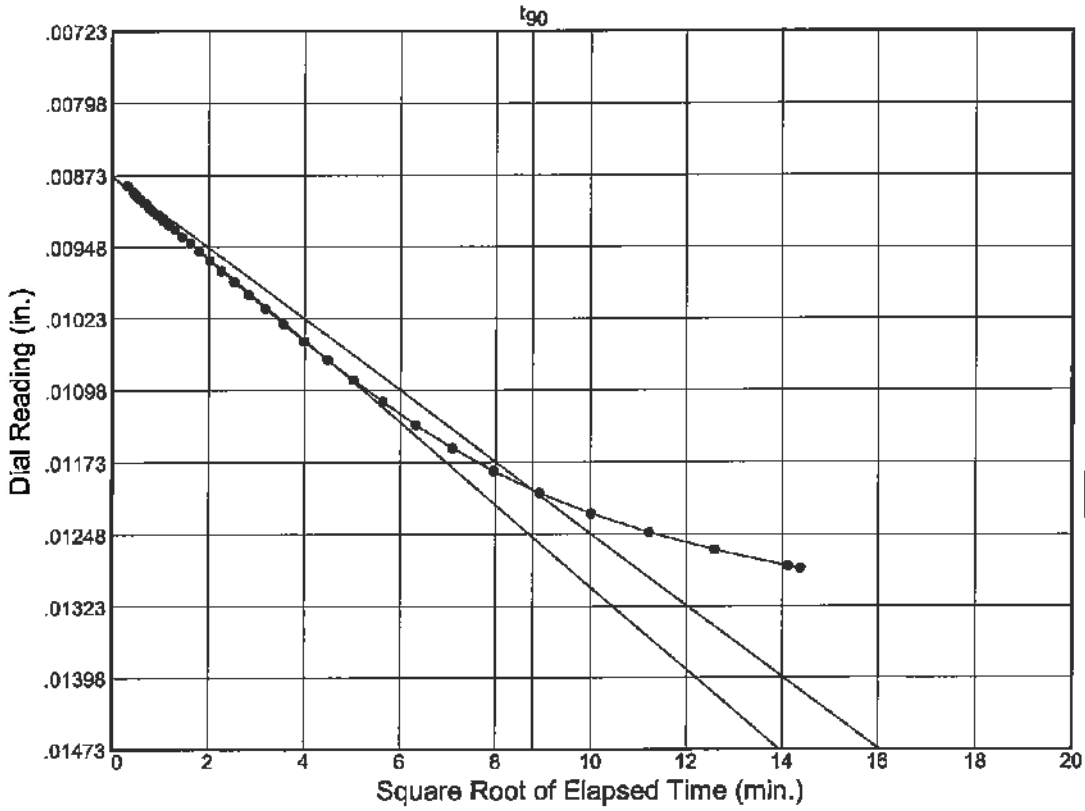
Load No.= 12
Load= 1.00 tsf
D_0 = 0.00797
D_{90} = 0.00869
D_{100} = 0.00877
T_{90} = 28.67 min.

C_v @ T_{90}
0.06 ft.^{2}/day

Dial Reading vs. Time

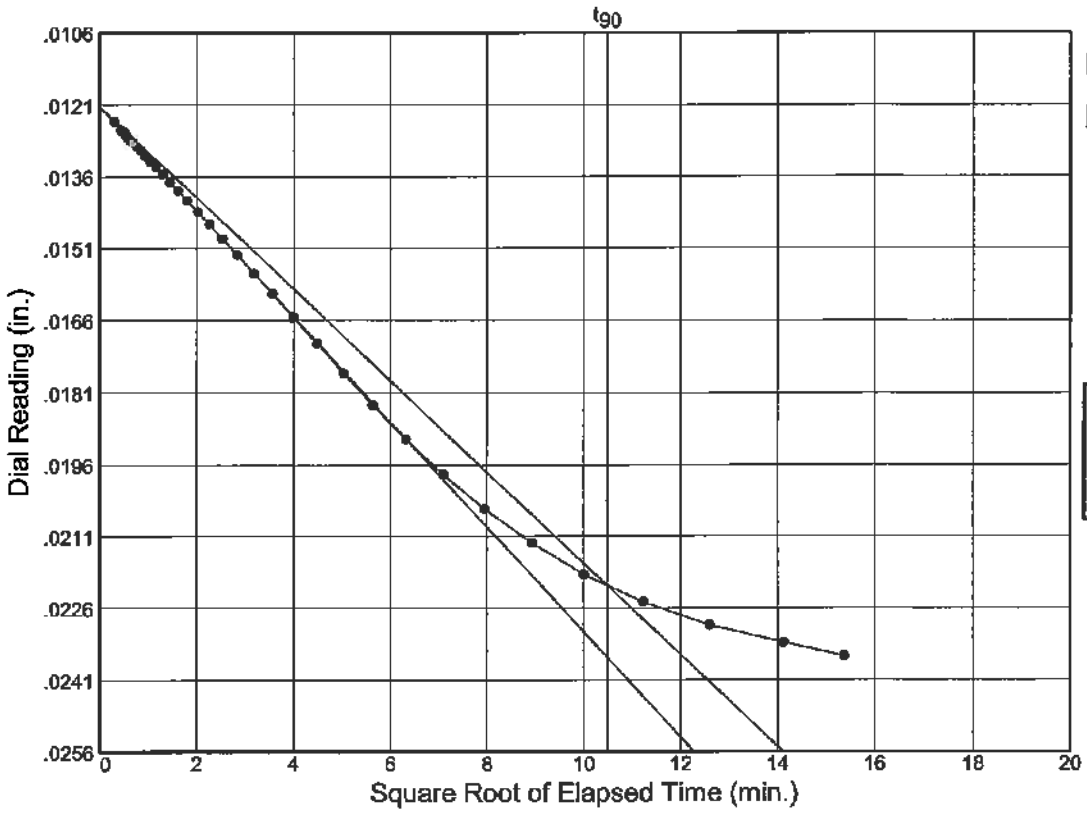
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 13
Load= 2.00 tsf
D_0 = 0.00874
D_{90} = 0.01202
D_{100} = 0.01238
T_{90} = 76.92 min.

C_v @ T_{90}
0.02 ft.^{2}/day



Load No.= 14
Load= 4.00 tsf
D_0 = 0.01212
D_{90} = 0.02214
D_{100} = 0.02325
T_{90} = 109.95 min.

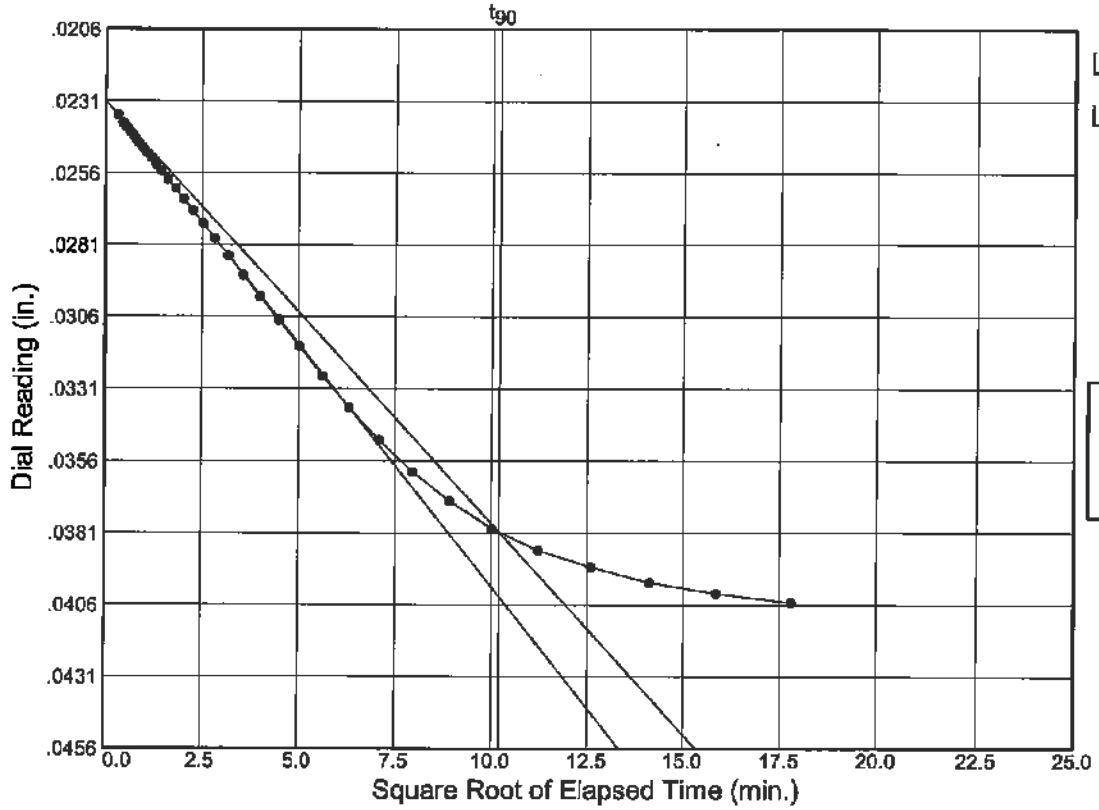
C_v @ T_{90}
0.02 ft.^{2}/day

Plate

Dial Reading vs. Time

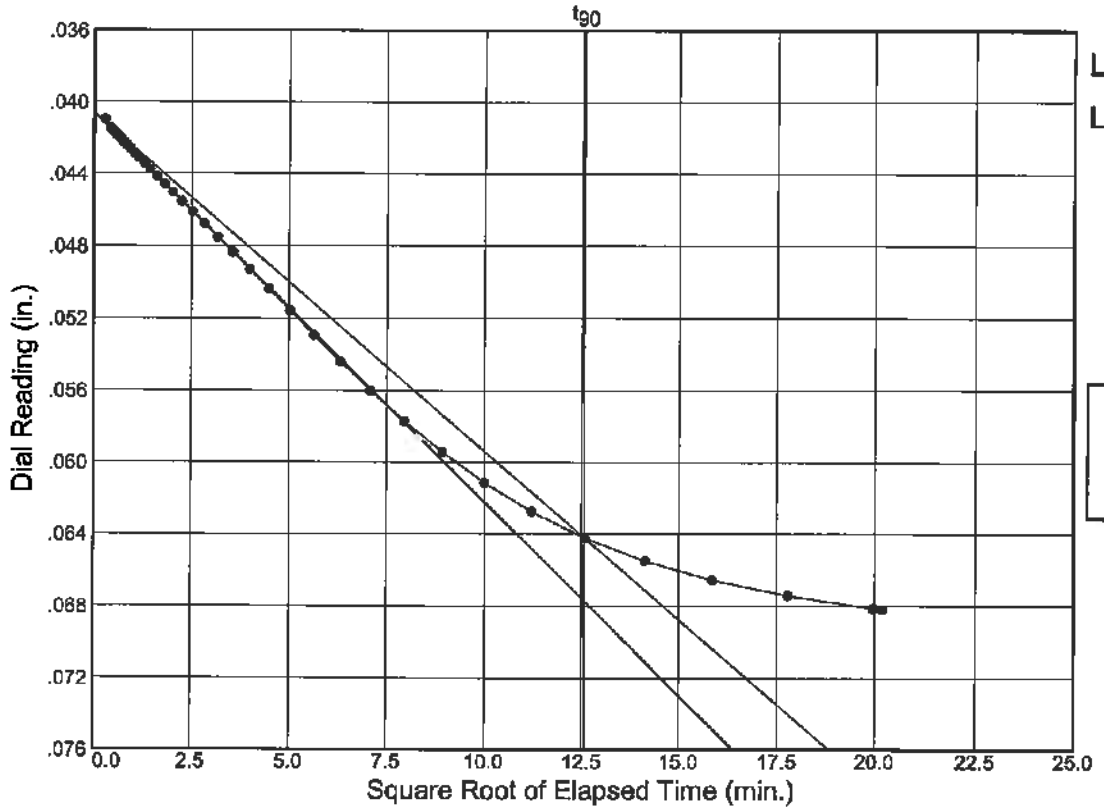
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BR-32 43'-45'



Load No.= 15
Load= 8.00 tsf
D_0 = 0.02311
D_{90} = 0.03806
D_{100} = 0.03972
T_{90} = 104.03 min.

C_v @ T_{90}
0.02 ft.^{2}/day

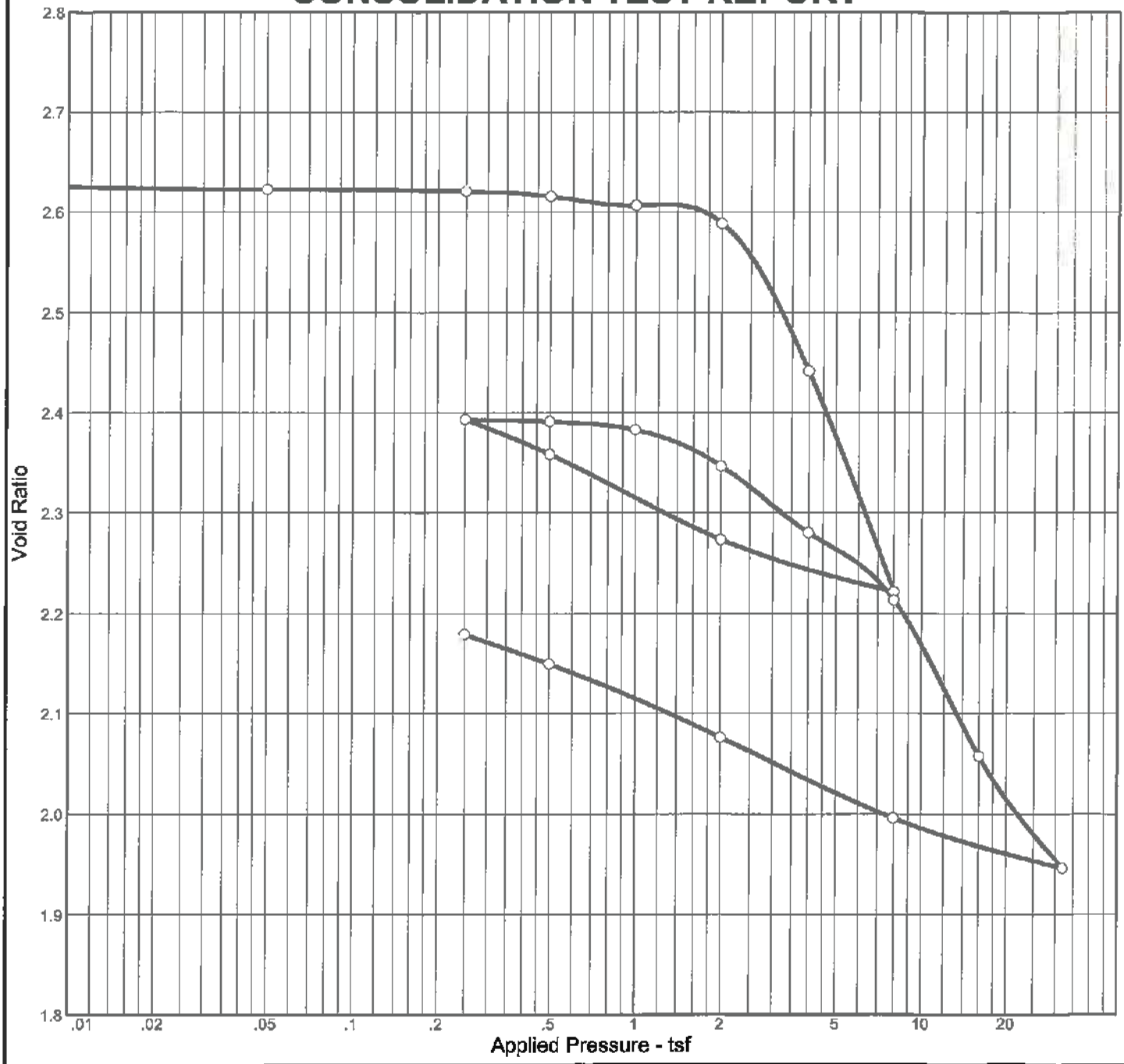


Load No.= 16
Load= 16.00 tsf
D_0 = 0.04062
D_{90} = 0.06420
D_{100} = 0.06682
T_{90} = 157.77 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Plate

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
Sat.	Moist.											
102.4 %	100.7 %	46.0	91	58	2.67	1.30	2.49	0.67	0.17			2.625

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Fat Clay	(CH)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: WB-119 40'-42'

Remarks:

Fines Content= 98.7%

CONSOLIDATION TEST REPORT

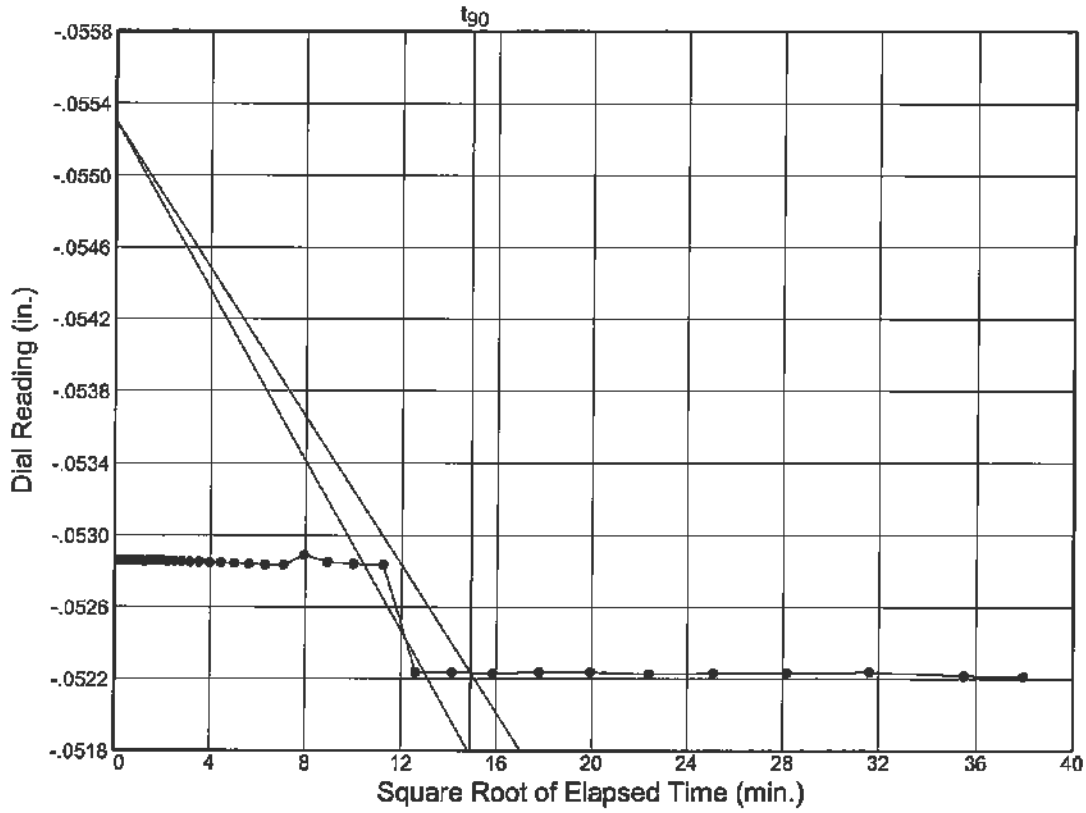
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

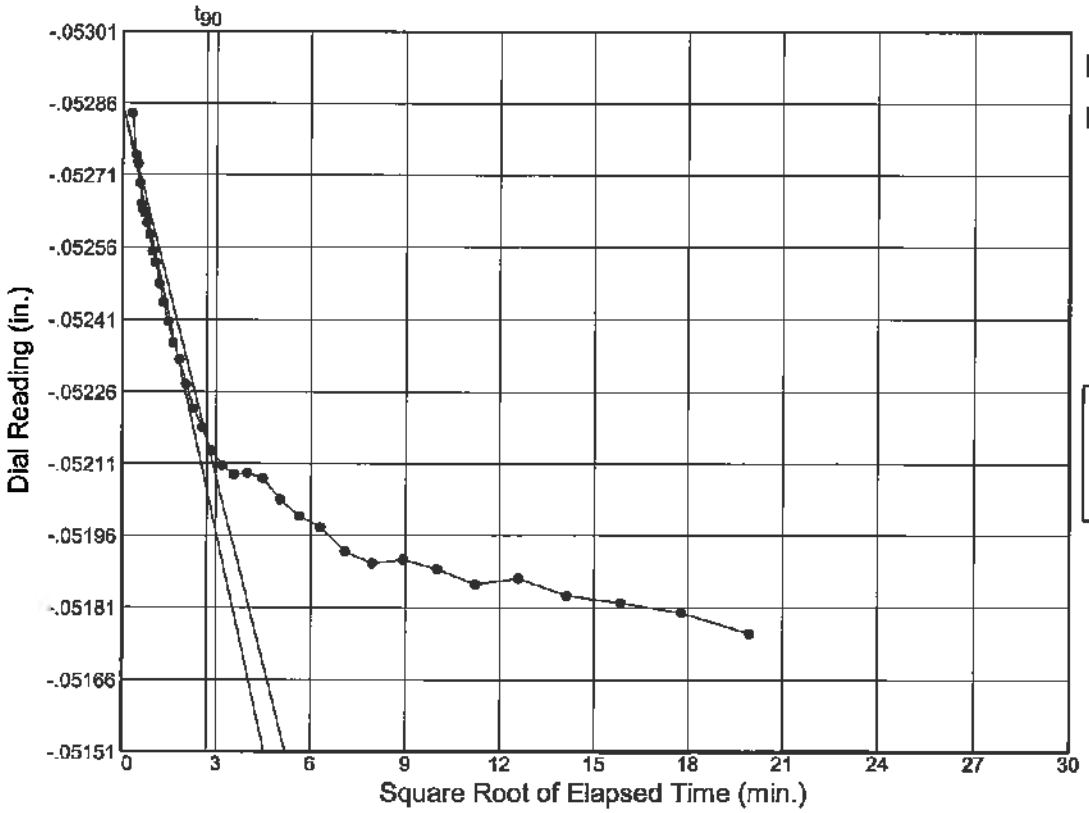
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 1
Load= 0.05 tsf
D_0 = -0.05530
D_{90} = -0.05223
D_{100} = -0.05189
T_{90} = 222.38 min.

C_v @ T_{90}
0.01 ft.^{2}/day



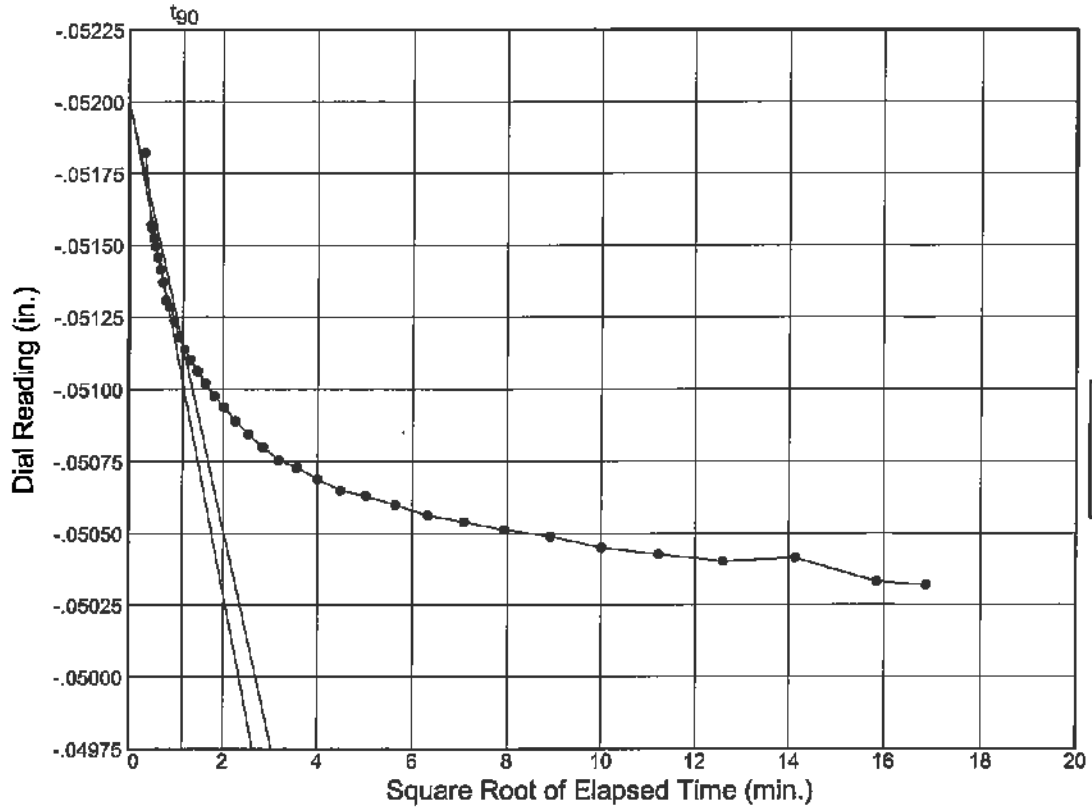
Load No.= 2
Load= 0.25 tsf
D_0 = -0.05286
D_{90} = -0.05216
D_{100} = -0.05209
T_{90} = 7.17 min.

C_v @ T_{90}
0.30 ft.^{2}/day

Dial Reading vs. Time

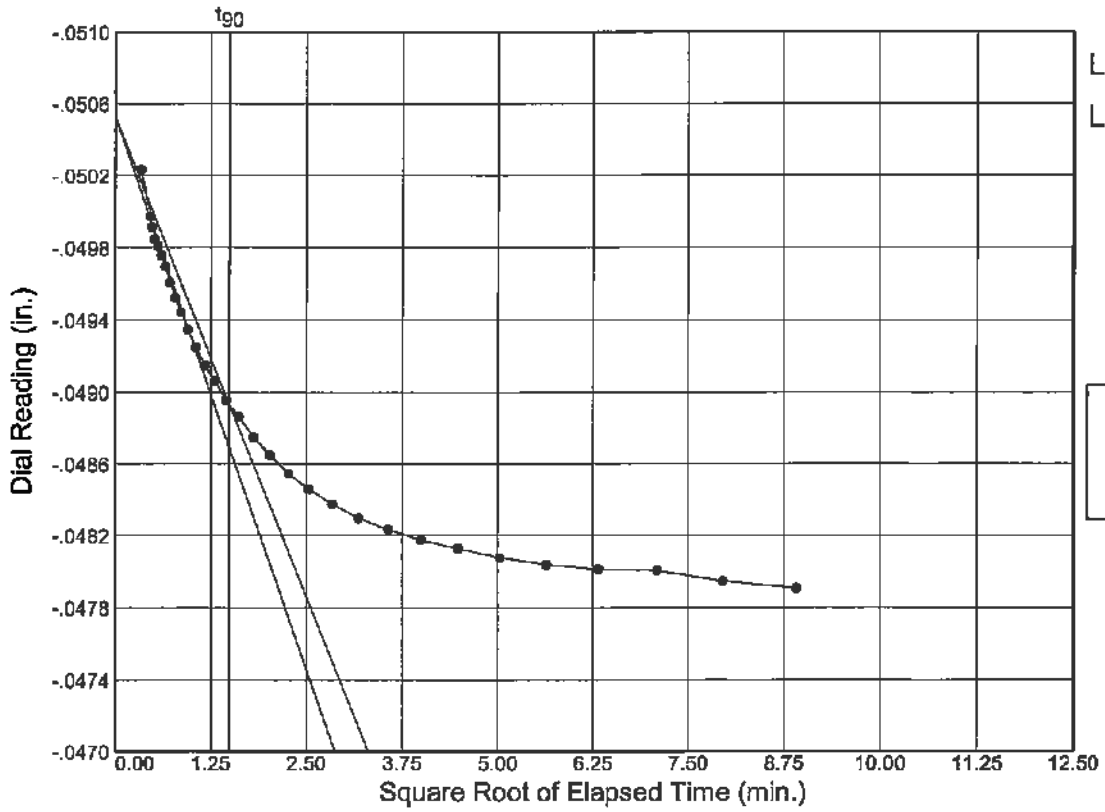
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 3
Load= 0.50 tsf
D_0 = -0.05200
D_{90} = -0.05115
D_{100} = -0.05106
T_{90} = 1.31 min.

C_v @ T_{90}
1.62 ft.^{2}/day



Load No.= 4
Load= 1.00 tsf
D_0 = -0.05052
D_{90} = -0.04893
D_{100} = -0.04876
T_{90} = 2.23 min.

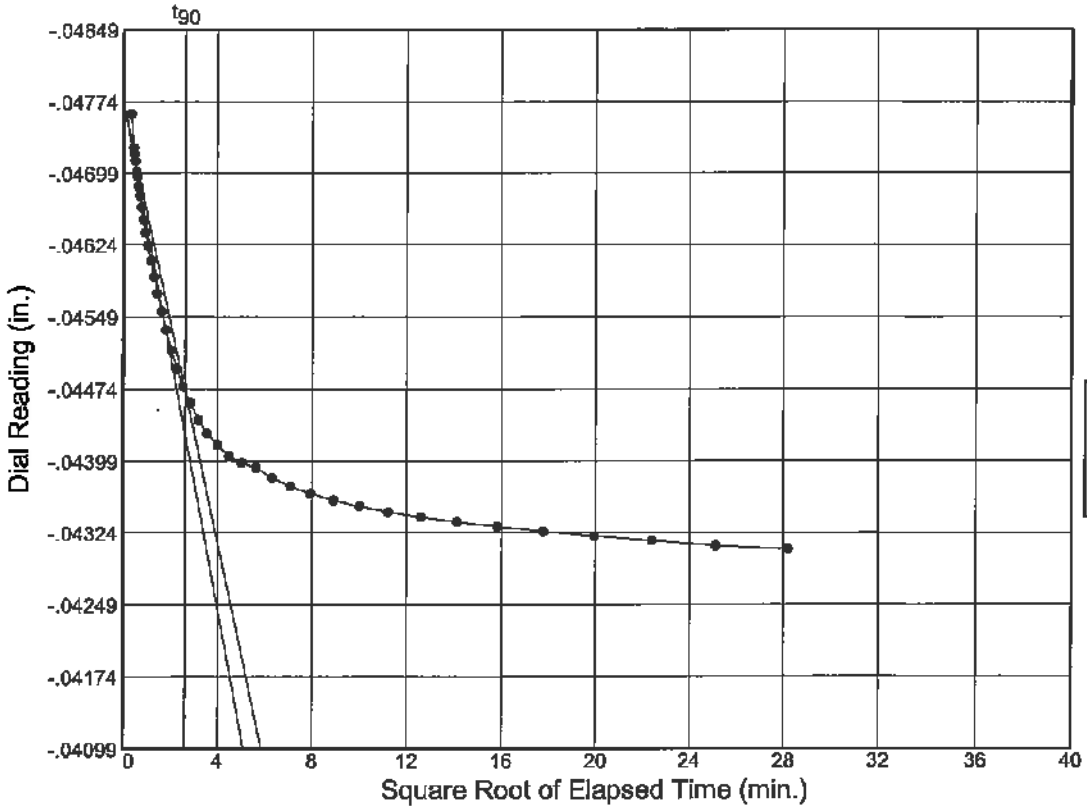
C_v @ T_{90}
0.95 ft.^{2}/day

Plate

Dial Reading vs. Time

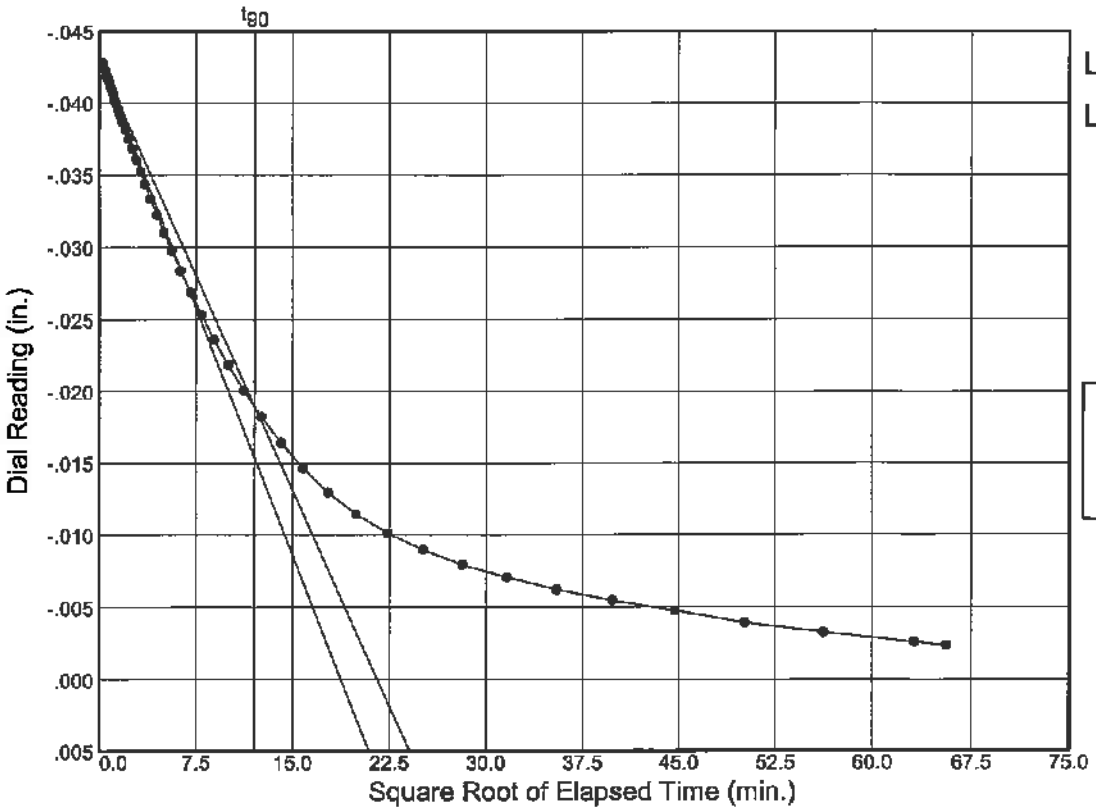
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 5
Load= 2.00 tsf
D_0 = -0.04773
D_{90} = -0.04472
D_{100} = -0.04438
T_{90} = 6.86 min.

C_v @ T_{90}
0.30 ft.^{2}/day



Load No.= 6
Load= 4.00 tsf
D_0 = -0.04299
D_{90} = -0.01896
D_{100} = -0.01629
T_{90} = 145.37 min.

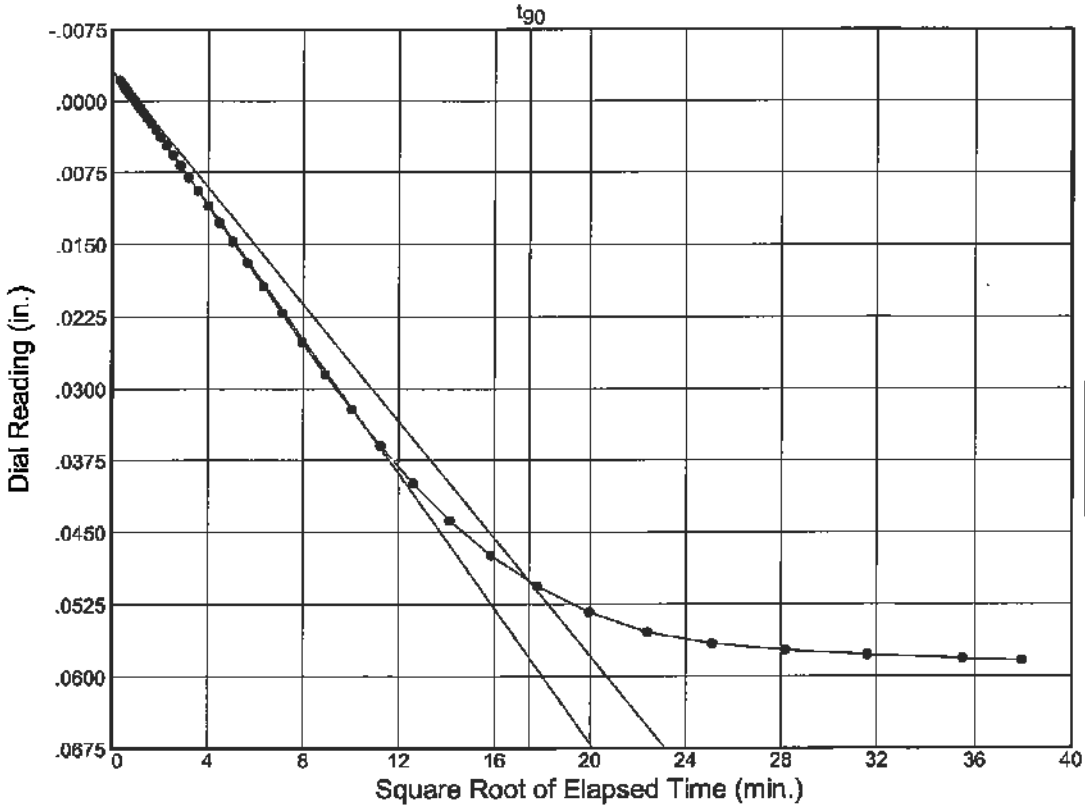
C_v @ T_{90}
0.01 ft.^{2}/day

Plate

Dial Reading vs. Time

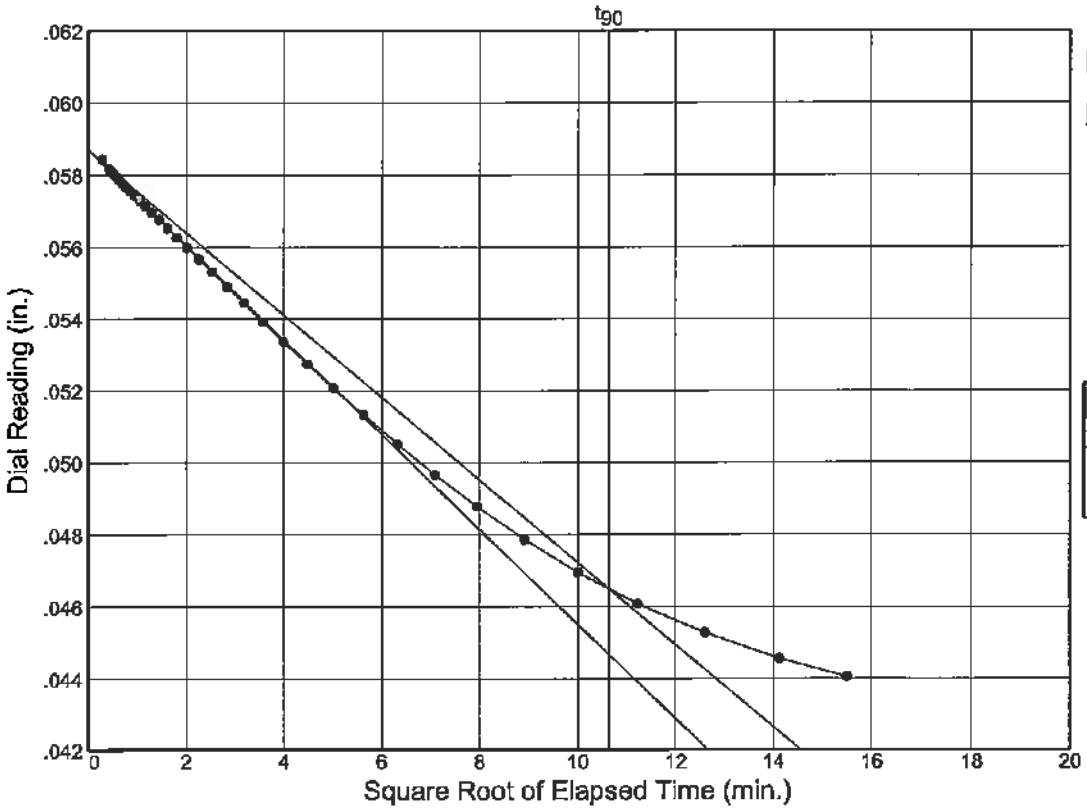
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 7
Load= 8.00 tsf
D_0 = -0.00319
D_{90} = 0.05012
D_{100} = 0.05604
T_{90} = 304.75 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 8
Load= 2.00 tsf
D_0 = 0.05869
D_{90} = 0.04651
D_{100} = 0.04515
T_{90} = 112.96 min.

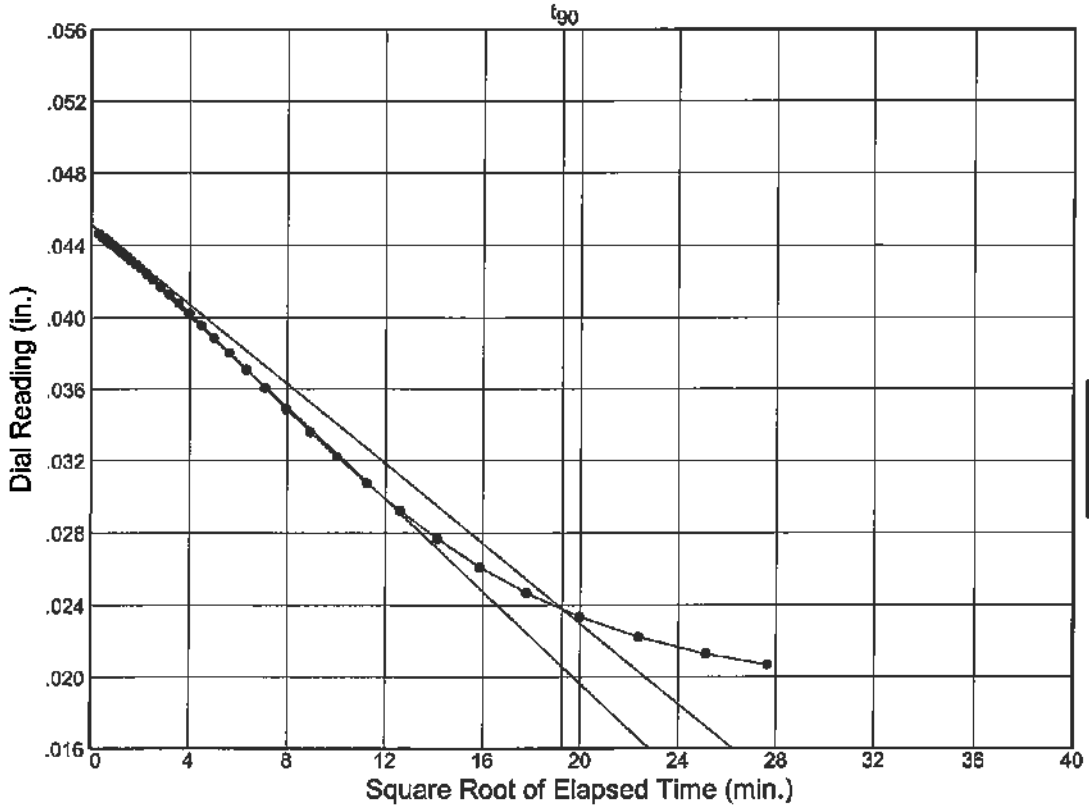
C_v @ T_{90}
0.02 ft.^{2}/day

Plate

Dial Reading vs. Time

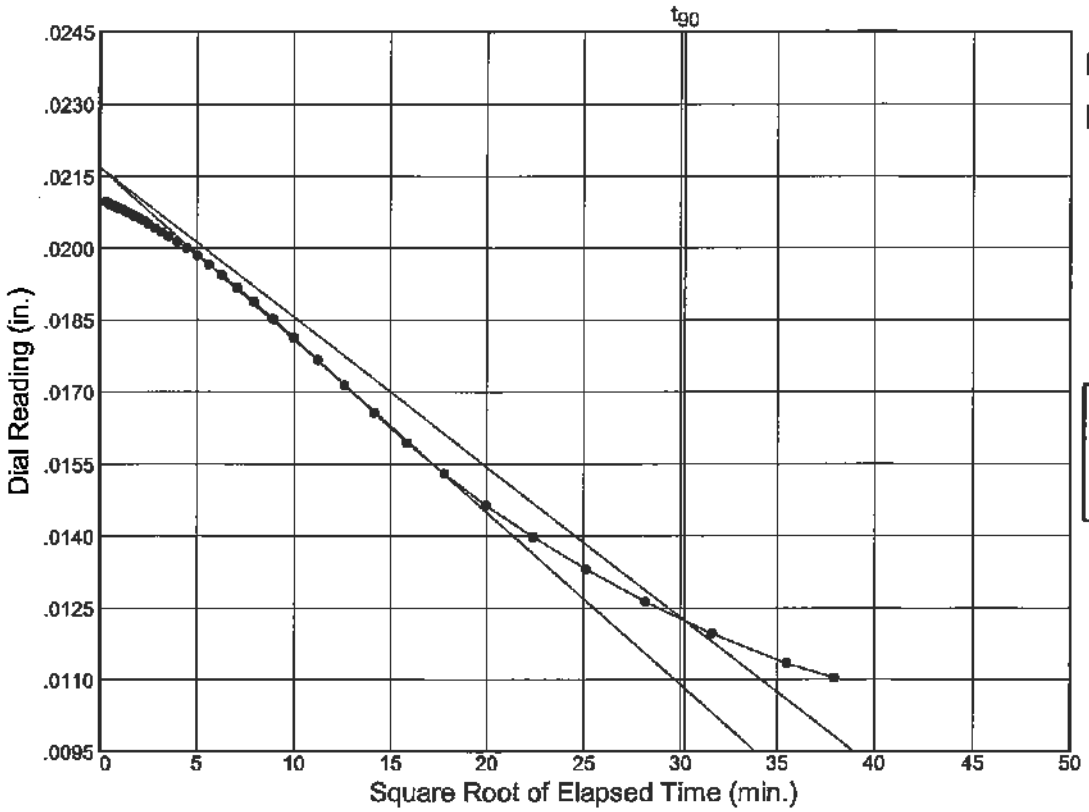
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 9
Load= 0.50 tsf
D_0 = 0.04517
D_{90} = 0.02377
D_{100} = 0.02140
T_{90} = 370.55 min.

C_v @ T_{90}
0.00 ft.^{2}/day



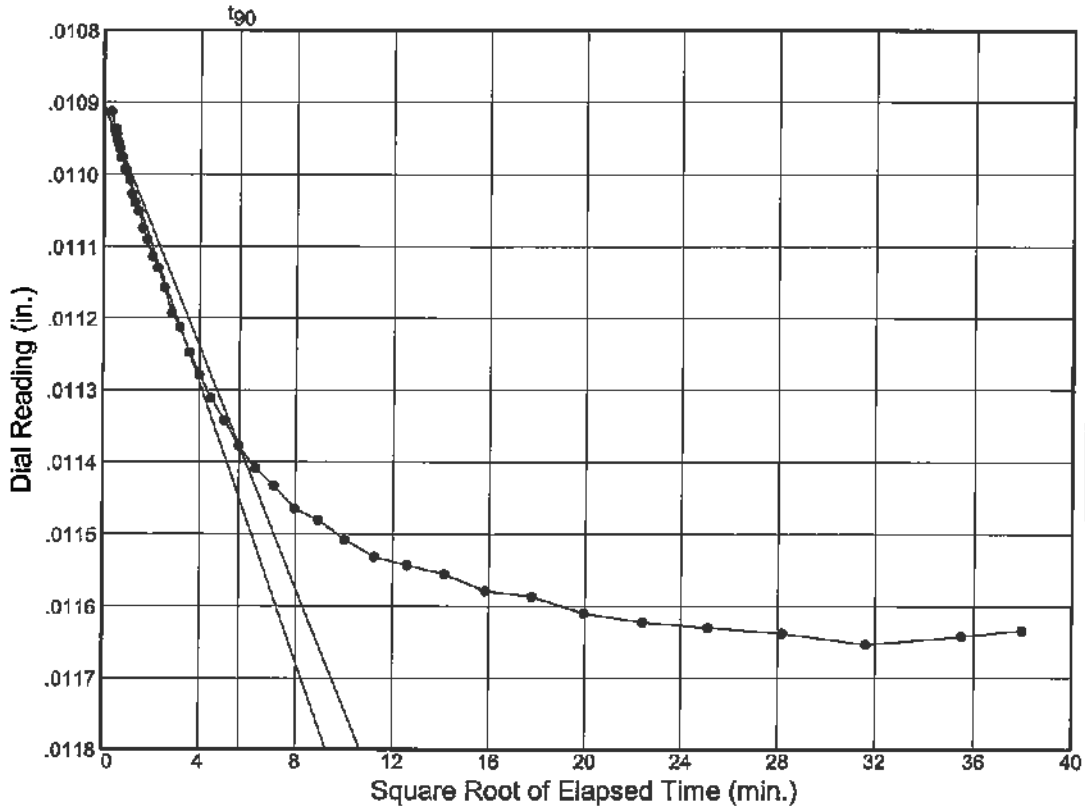
Load No.= 10
Load= 0.25 tsf
D_0 = 0.02169
D_{90} = 0.01223
D_{100} = 0.01118
T_{90} = 912.61 min.

C_v @ T_{90}
0.00 ft.^{2}/day

Dial Reading vs. Time

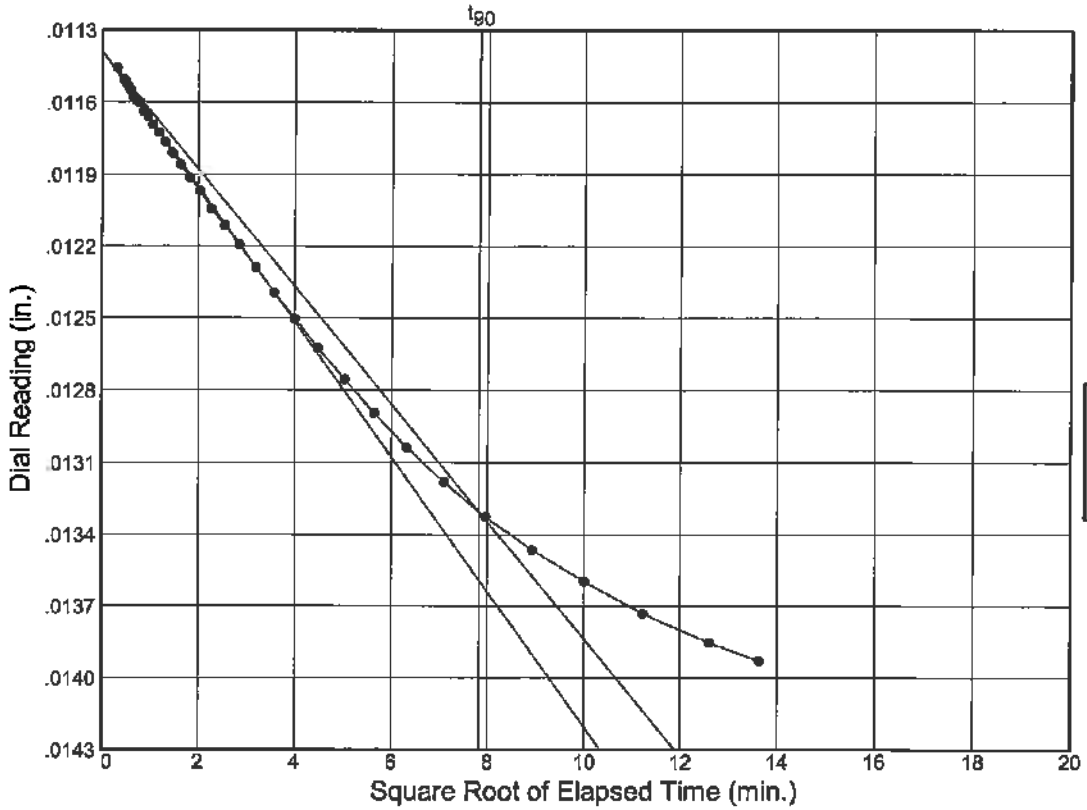
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 11
Load= 0.50 tsf
D_0 = 0.01090
D_{90} = 0.01138
D_{100} = 0.01143
T_{90} = 31.87 min.

C_v @ T_{90}
0.06 ft.^{2}/day



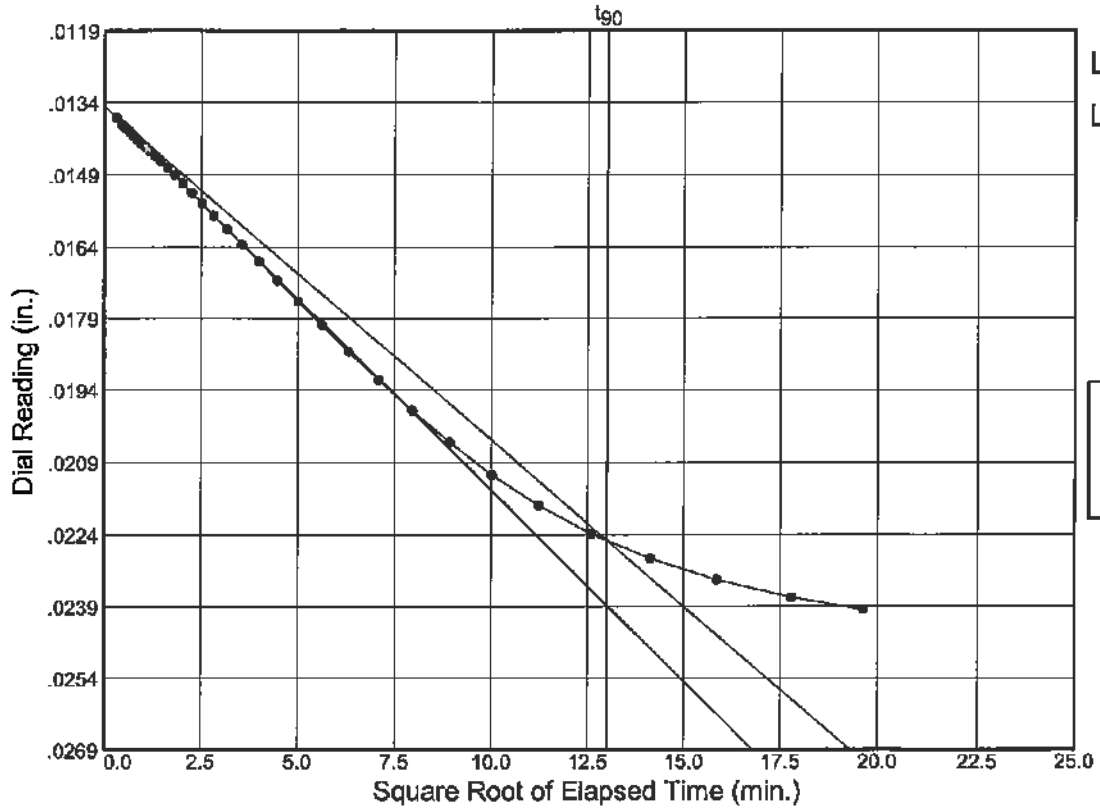
Load No.= 12
Load= 1.00 tsf
D_0 = 0.01139
D_{90} = 0.01330
D_{100} = 0.01352
T_{90} = 61.19 min.

C_v @ T_{90}
0.03 ft.^{2}/day

Dial Reading vs. Time

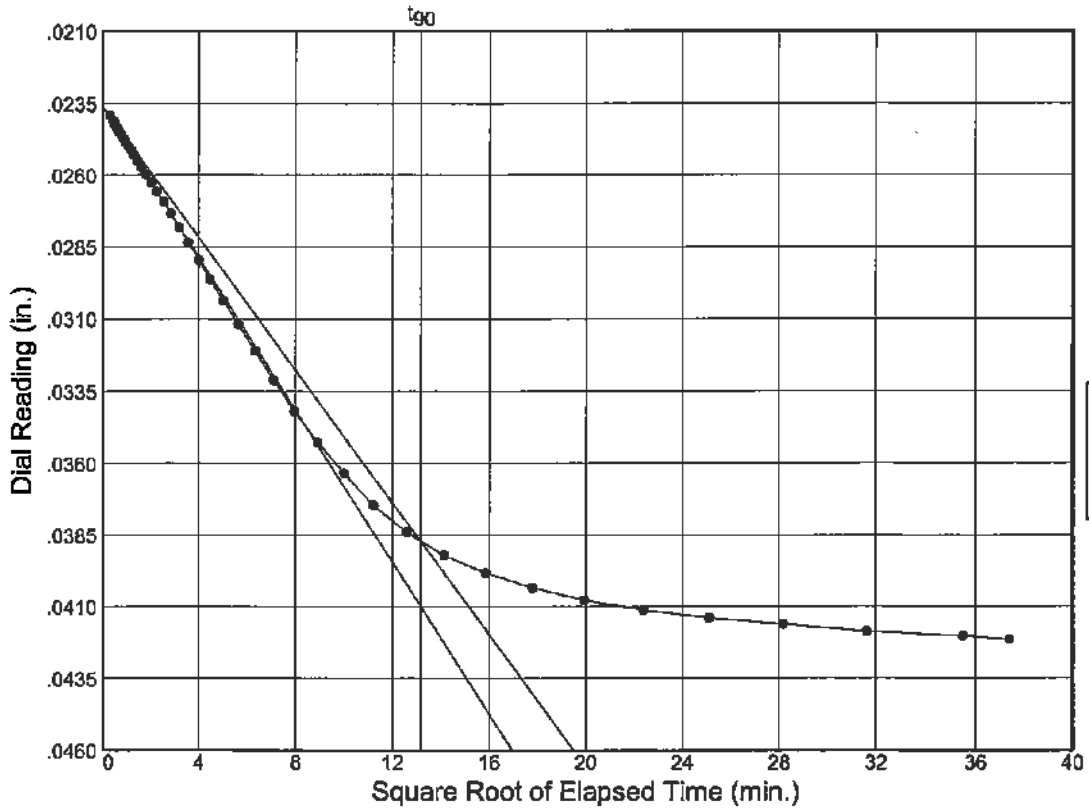
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 13
Load= 2.00 tsf
D_0 = 0.01348
D_{90} = 0.02253
D_{100} = 0.02353
T_{90} = 169.03 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 14
Load= 4.00 tsf
D_0 = 0.02358
D_{90} = 0.03871
D_{100} = 0.04039
T_{90} = 173.20 min.

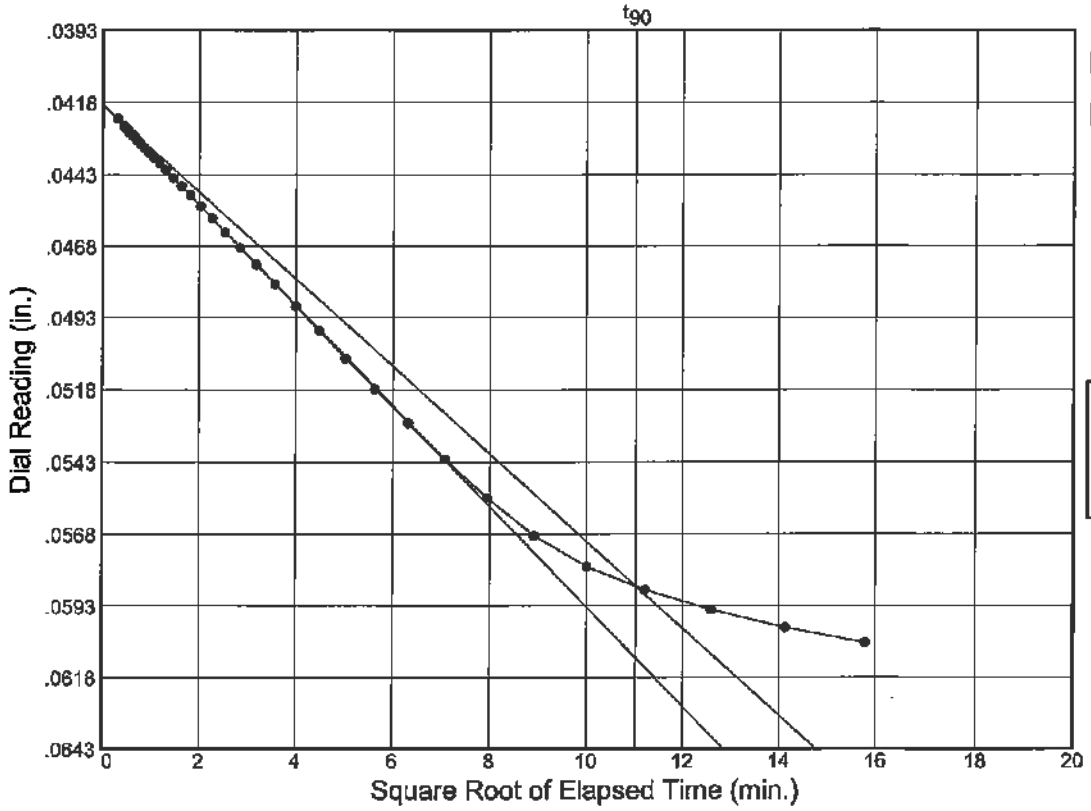
C_v @ T_{90}
0.01 ft.^{2}/day

Plate

Dial Reading vs. Time

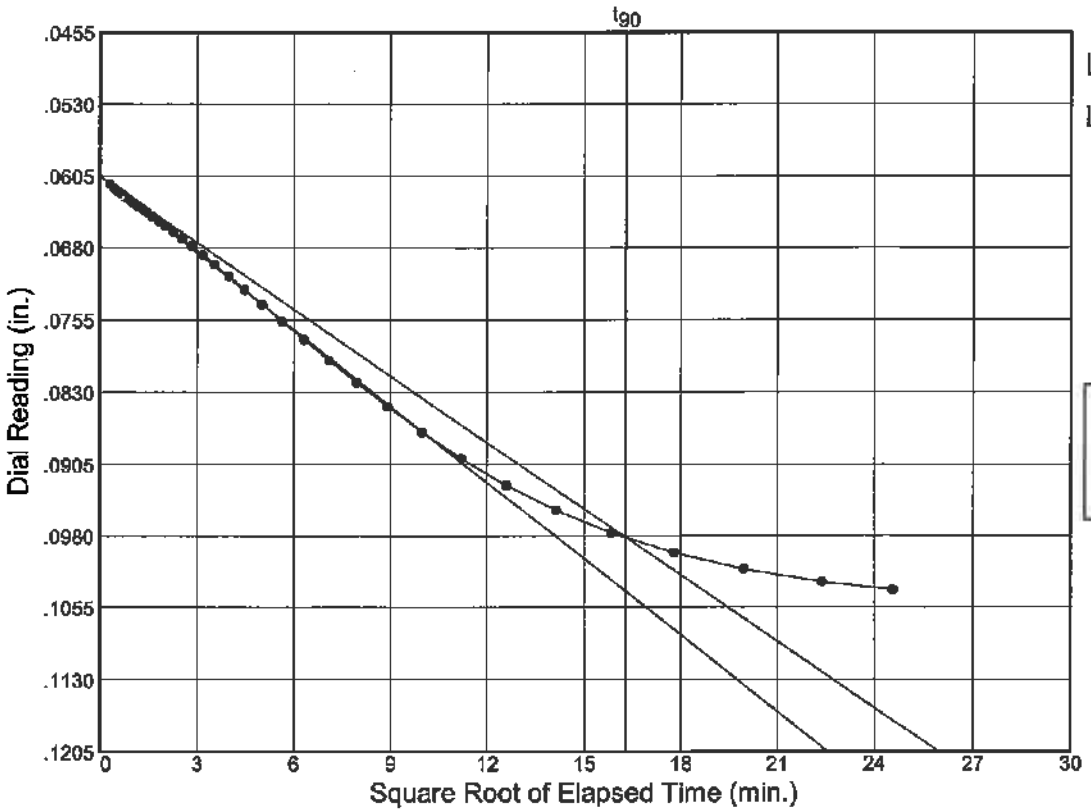
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 15
Load= 8.00 tsf
D_0 = 0.04187
D_{90} = 0.05861
D_{100} = 0.06046
T_{90} = 121.50 min.

C_v @ T_{90}
0.01 ft.^{2}/day



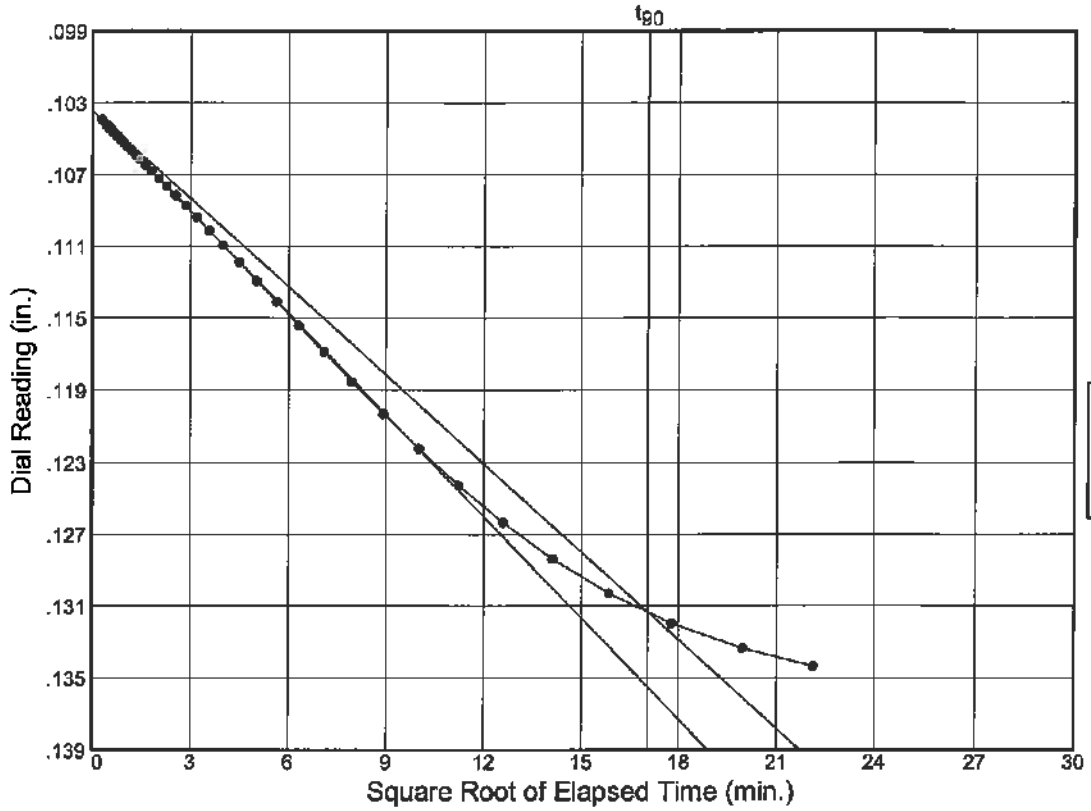
Load No.= 16
Load= 16.00 tsf
D_0 = 0.06052
D_{90} = 0.09819
D_{100} = 0.10237
T_{90} = 265.51 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

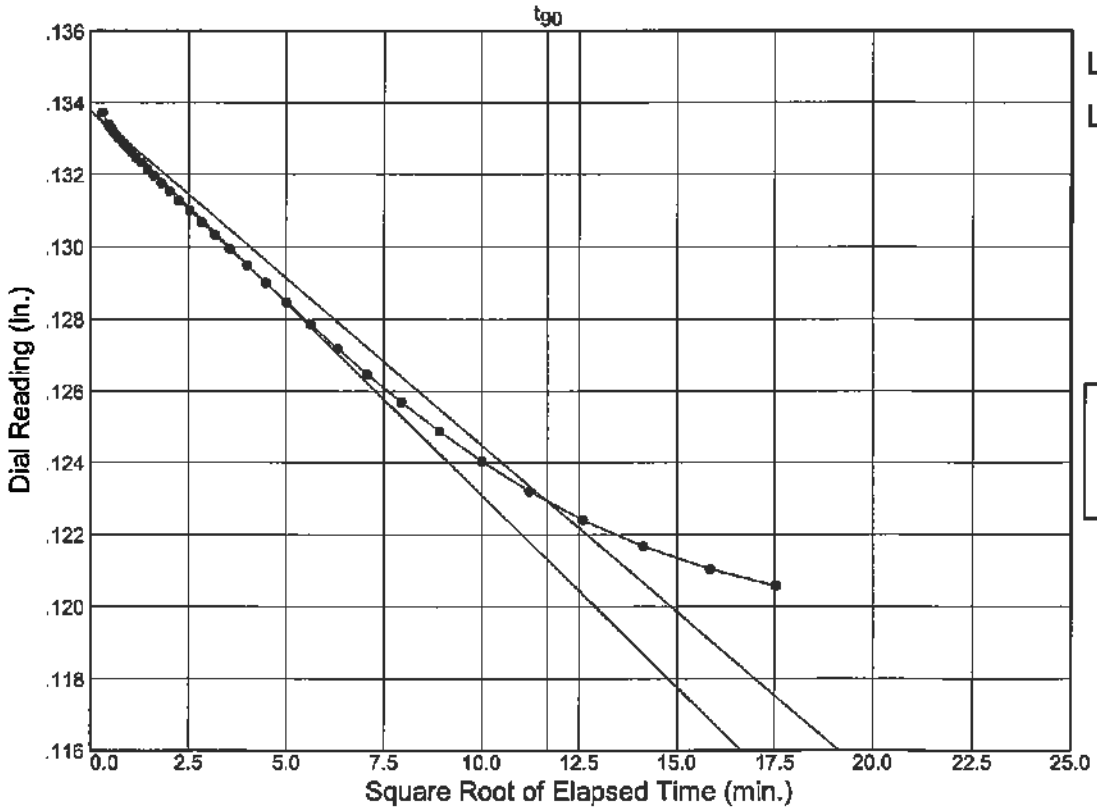
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 17
Load= 32.00 tsf
D_0 = 0.10343
D_{90} = 0.13133
D_{100} = 0.13443
T_{90} = 290.45 min.

C_v @ T_{90}
0.01 ft.^{2}/day



Load No.= 18
Load= 8.00 tsf
D_0 = 0.13378
D_{90} = 0.12293
D_{100} = 0.12172
T_{90} = 136.61 min.

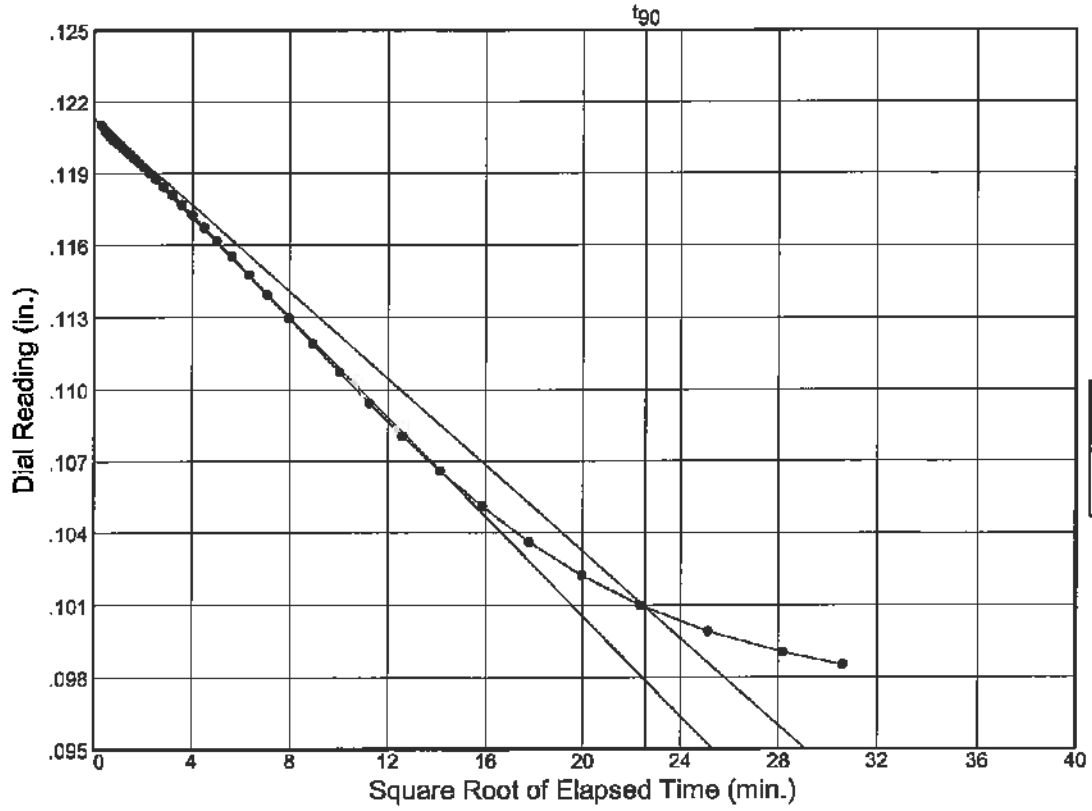
C_v @ T_{90}
0.01 ft.^{2}/day

Plate

Dial Reading vs. Time

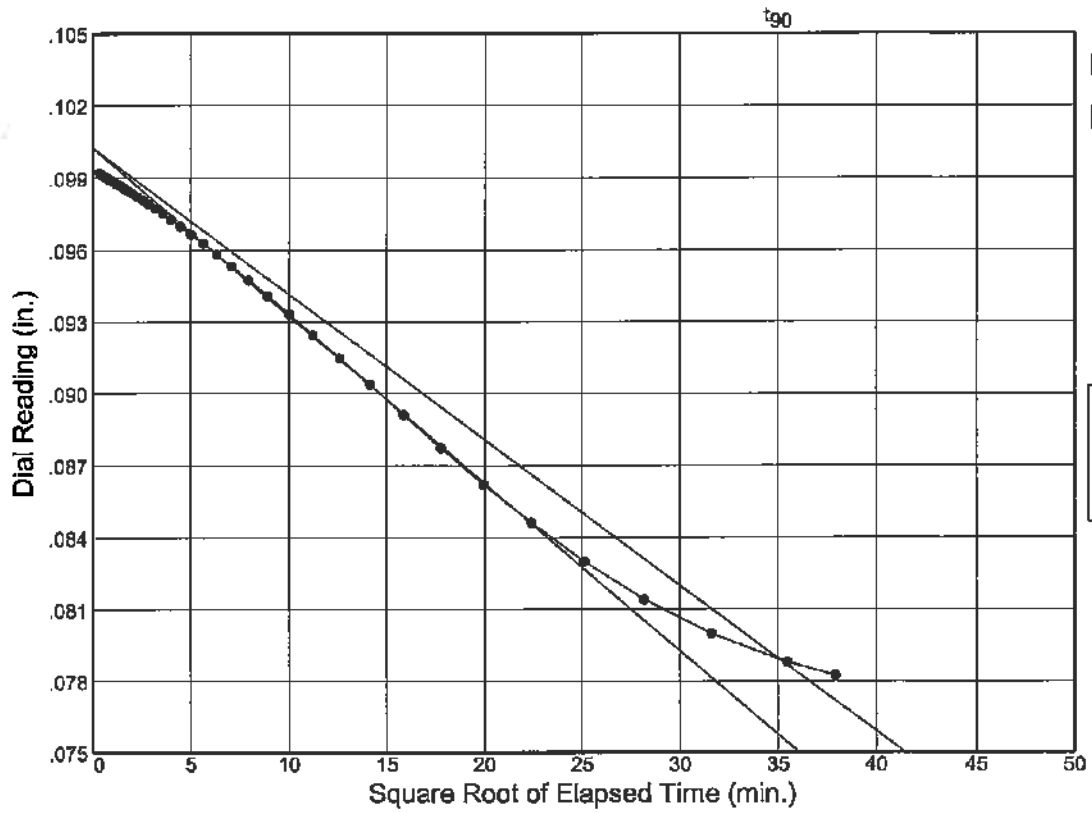
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: WB-119 40'-42'



Load No.= 19
Load= 2.00 tsf
D_0 = 0.12130
D_{90} = 0.10091
D_{100} = 0.09864
T_{90} = 508.74 min.

C_v @ T_{90}
0.00 ft.^{2}/day



Load No.= 20
Load= 0.50 tsf
D_0 = 0.10025
D_{90} = 0.07894
D_{100} = 0.07657
T_{90} = 1225.87 min.

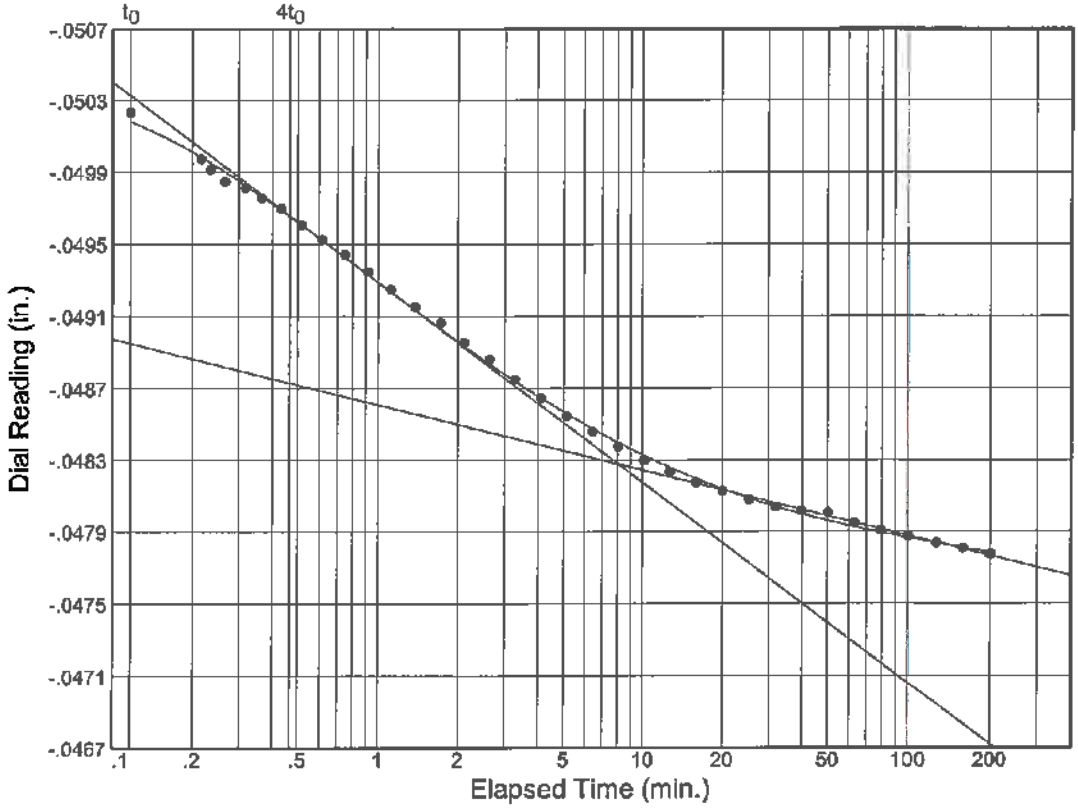
C_v @ T_{90}
0.00 ft.^{2}/day

Plate

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

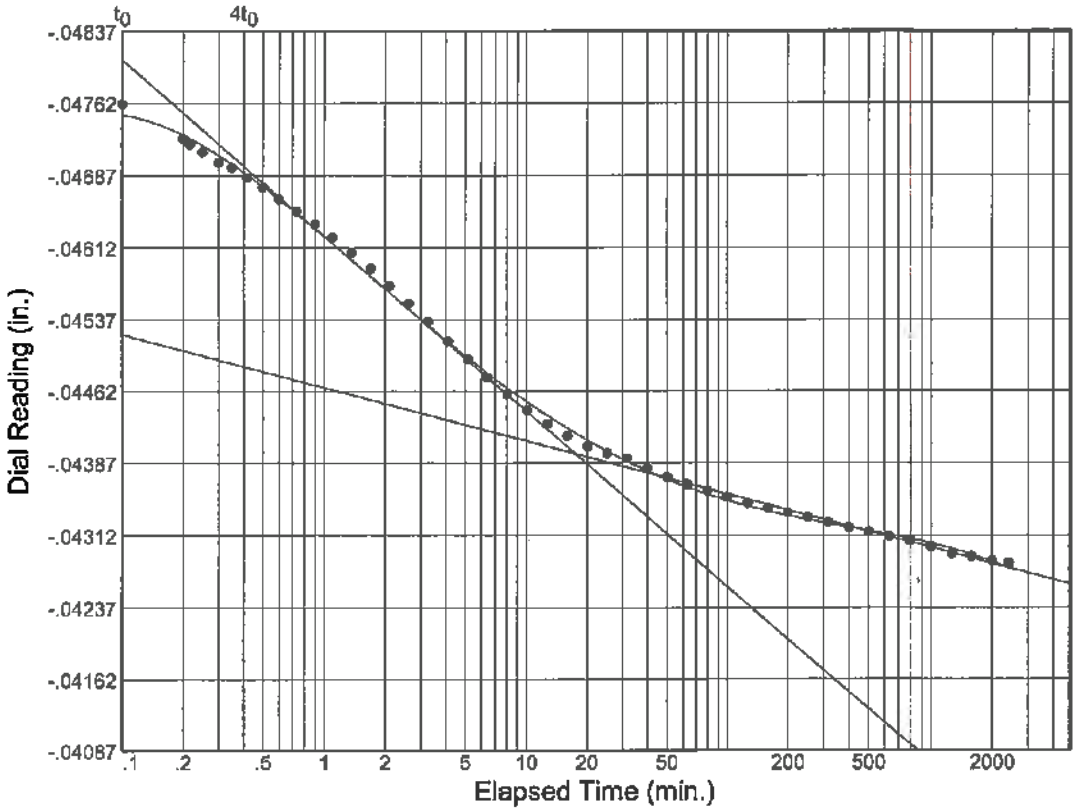
Location: WB-119 40'-42'



Load No.= 4
Load= 1.00 tsf
D_0 = -0.05071
D_{50} = -0.04949
D_{100} = -0.04828
T_{50} = 0.66 min.

C_v @ T_{50}
0.75 ft.^{2}/day

C_α = 0.000



Load No.= 5
Load= 2.00 tsf
D_0 = -0.04809
D_{50} = -0.04603
D_{100} = -0.04397
T_{50} = 1.31 min.

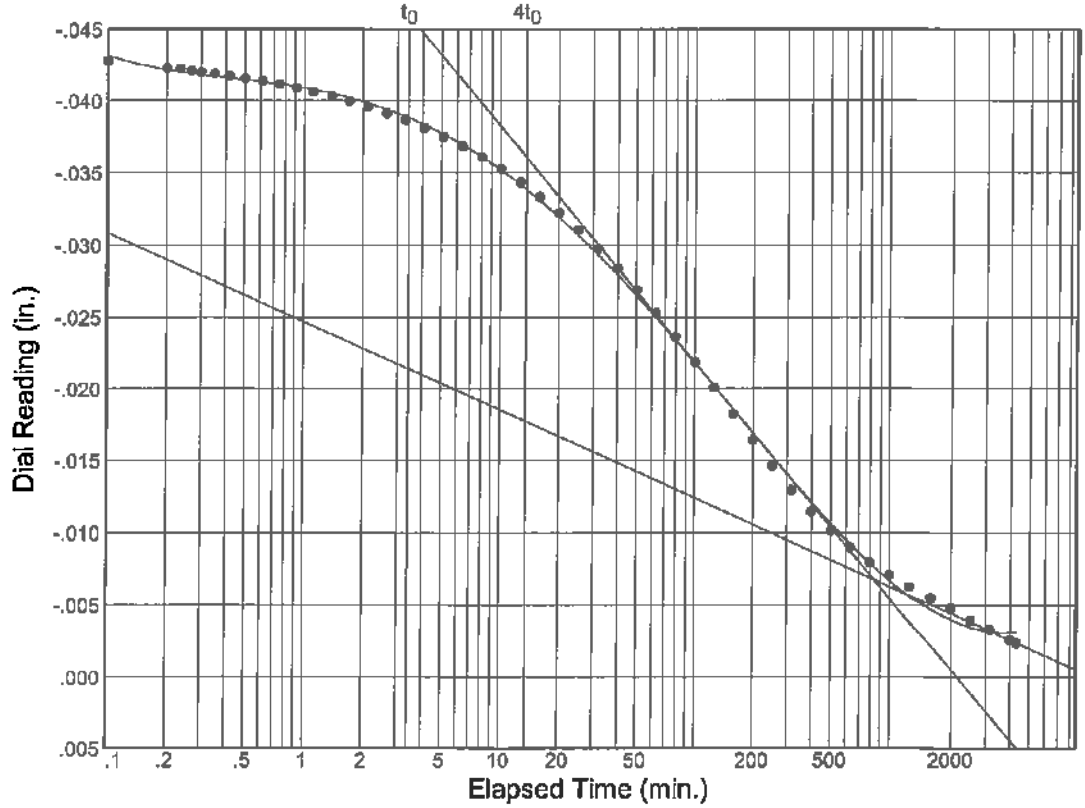
C_v @ T_{50}
0.37 ft.^{2}/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

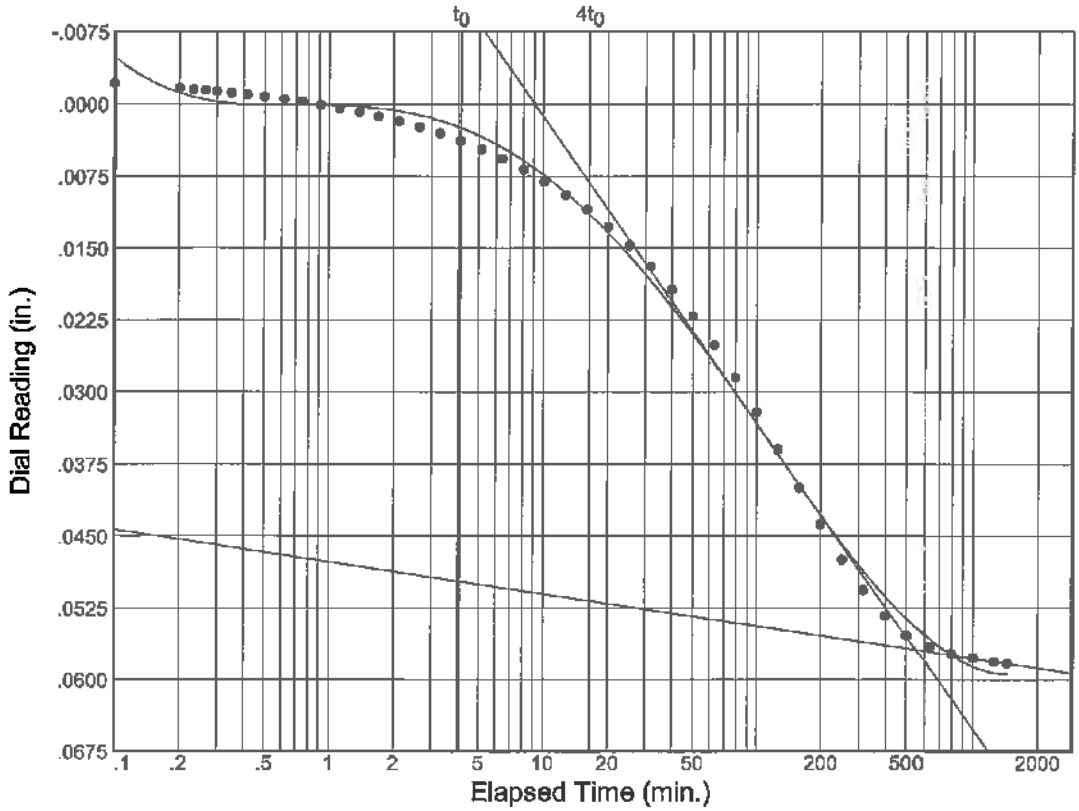
Location: WB-119 40'-42'



Load No.= 6
Load= 4.00 tsf
D_0 = -0.04378
D_{50} = -0.02526
D_{100} = -0.00675
T_{50} = 60.42 min.

C_v @ T_{50}
0.01 ft.^{2}/day

C_α = 0.006



Load No.= 7
Load= 8.00 tsf
D_0 = -0.00653
D_{50} = 0.02519
D_{100} = 0.05692
T_{50} = 54.98 min.

C_v @ T_{50}
0.01 ft.^{2}/day

C_α = 0.004

CPT SOUNDING LOGS

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

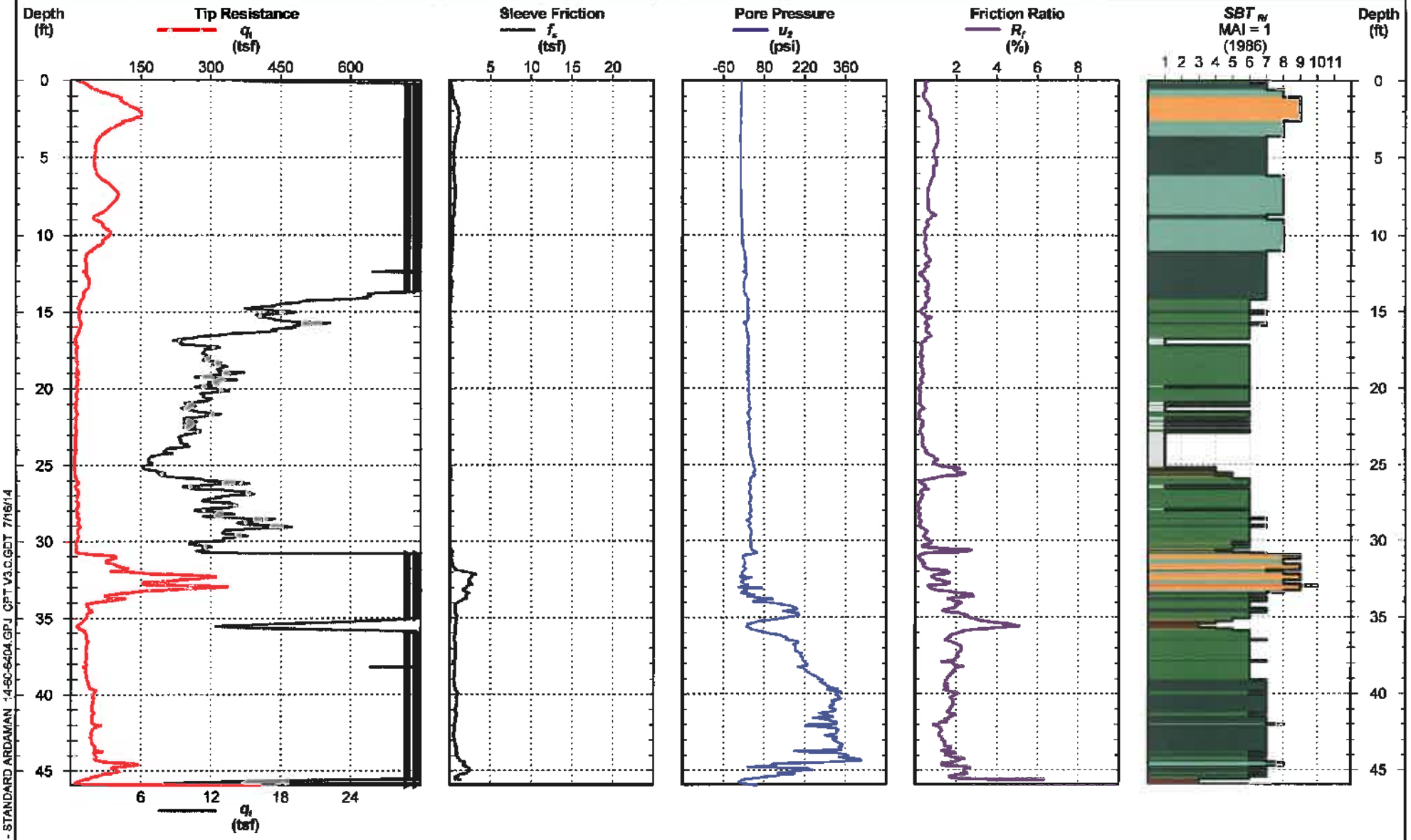
Cone Penetration Test

CPT WB-1

Project #: 14-60-6404
Date: Jul. 15, 2014

Latitude:
Longitude:

Elevation:
Total Depth: 45.9 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

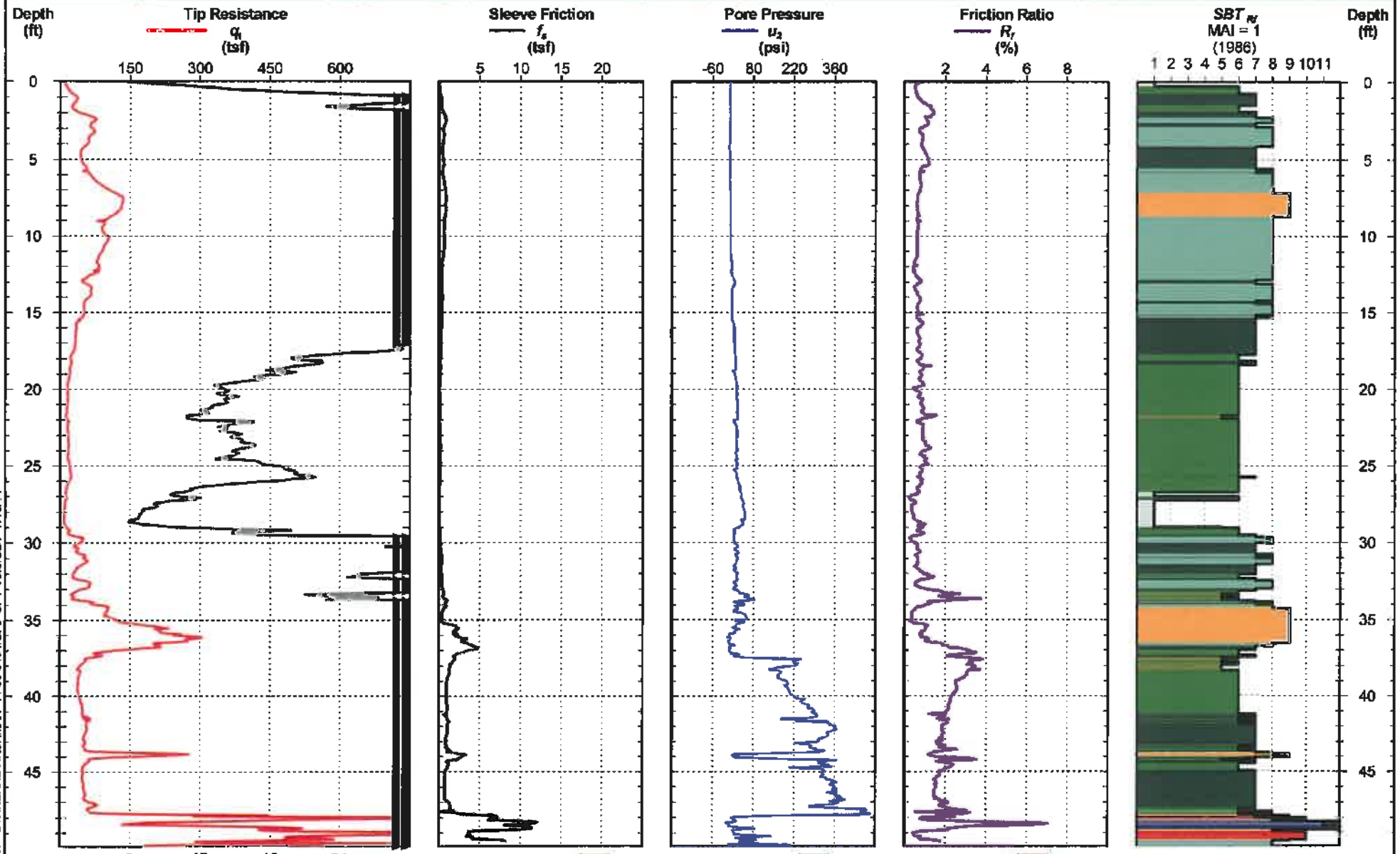
CPT WB-1

Ardaman & Associates, Inc.

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test — CPT WB-4

Project #: 14-60-6404
Date: Jul. 8, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 49.9 ft



CPT WB-4

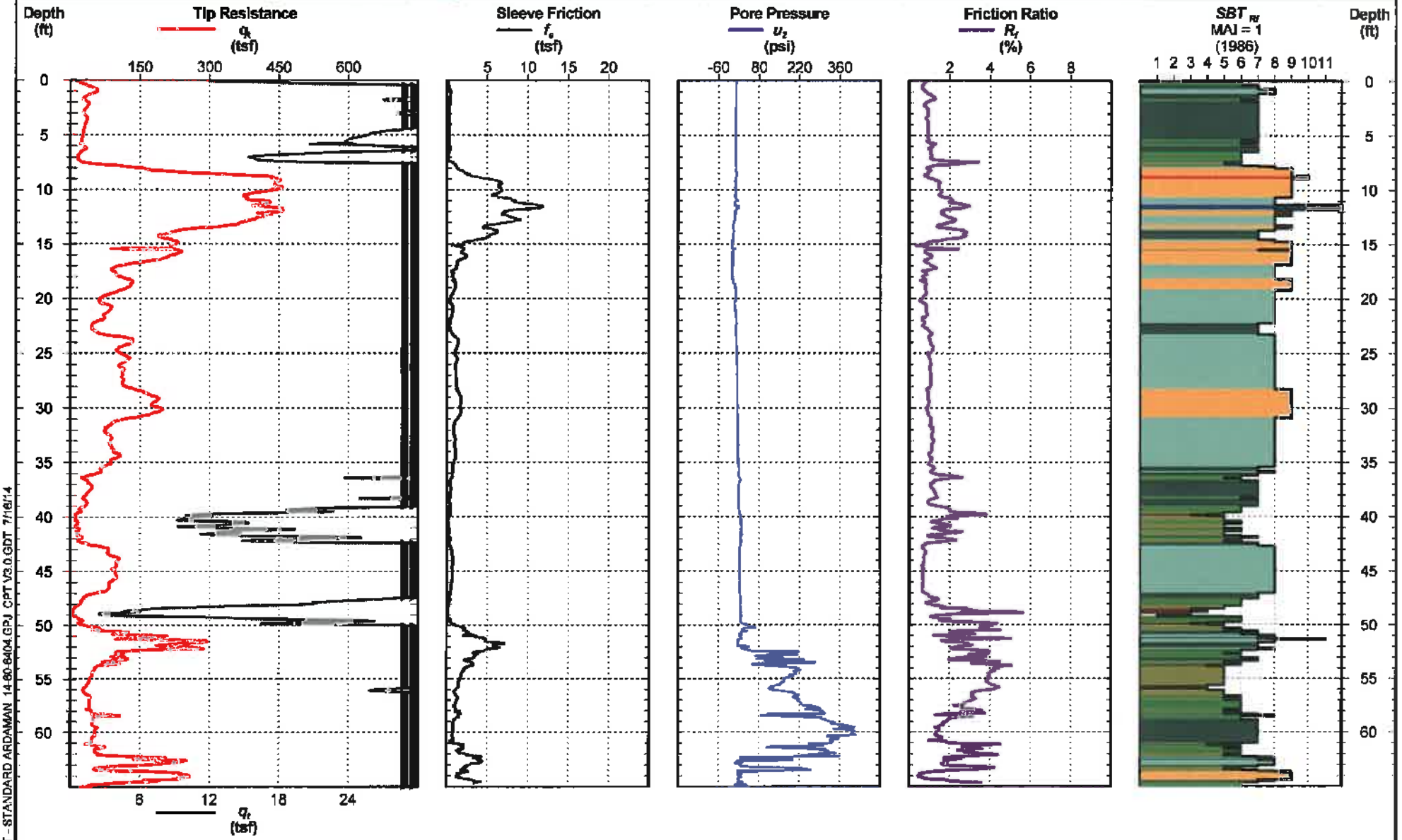
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test

CPT WB-9

Project #: 14-60-6404
Date: Jul. 8, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 65.0 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-9

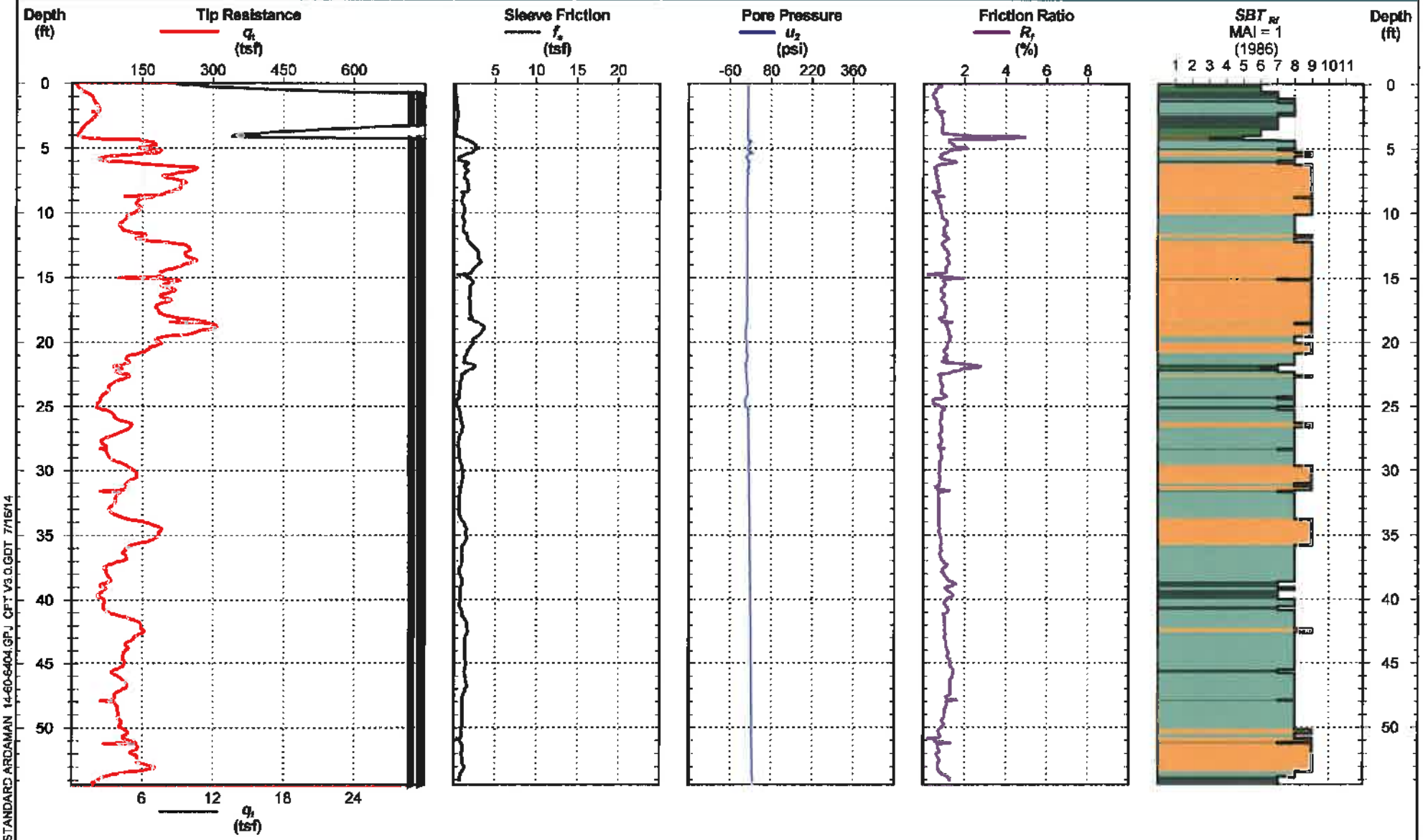
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

Ardaman & Associates, Inc.

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-12

Project #: 14-60-6404
Date: Jul. 8, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 54.4 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-12

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

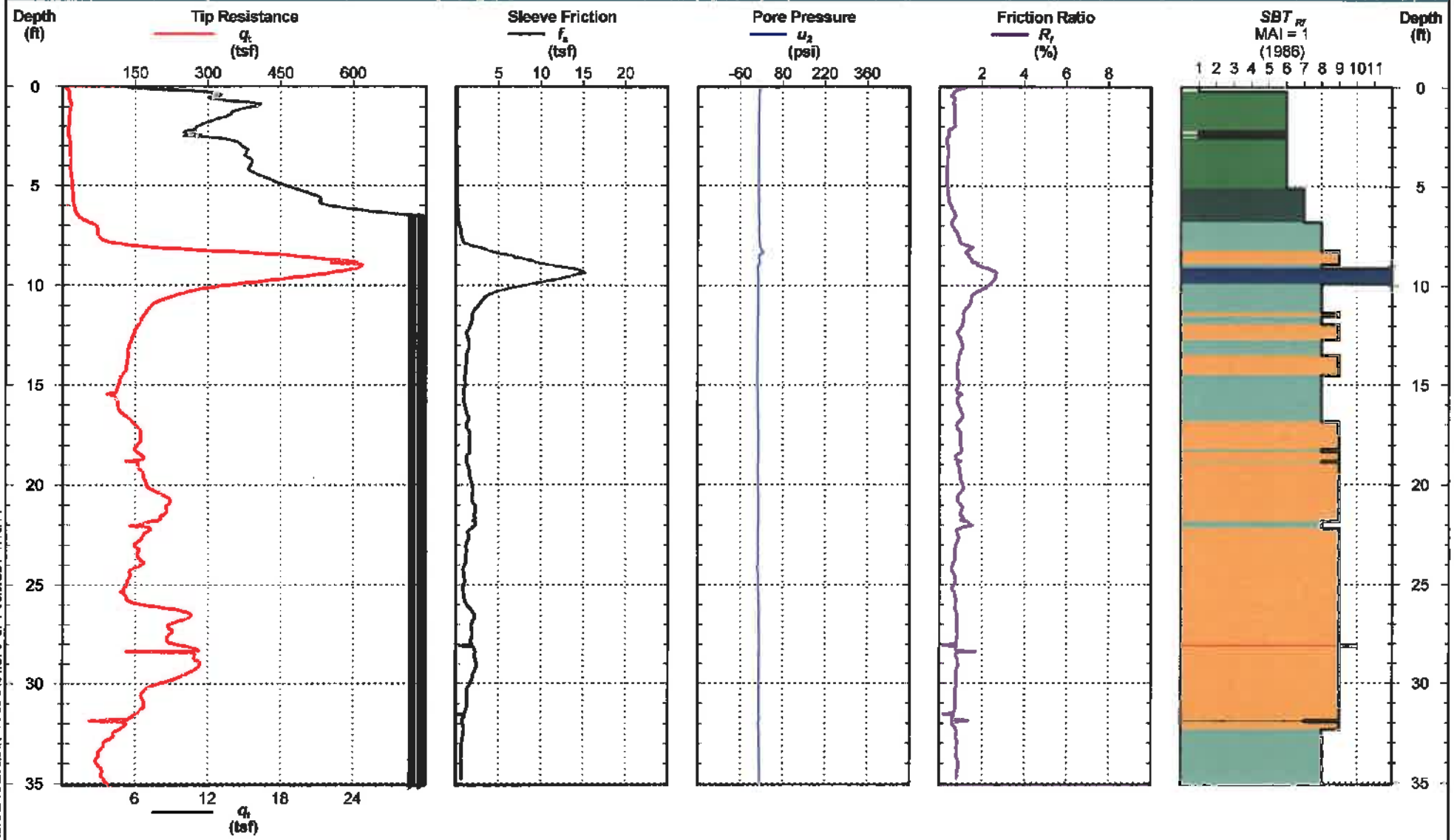
SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-15

Project #: 14-60-6404
Date: Jul. 8, 2014

Latitude:
Longitude:

Elevation:
Total Depth: 35.1 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-15

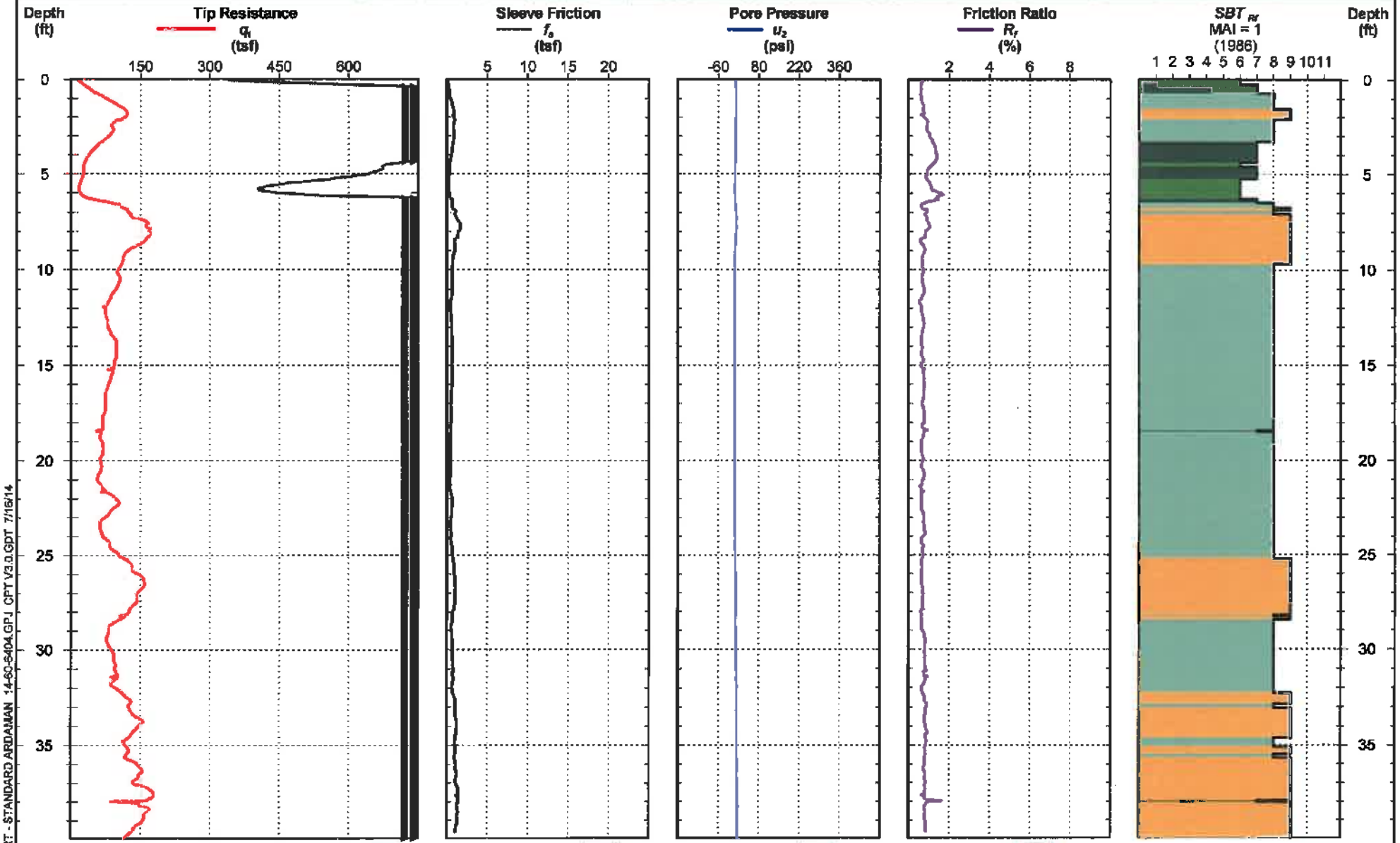
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

Ardaman & Associates, Inc.

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-18

Project #: 14-60-6404
Date: Jul. 14, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 40.0 ft



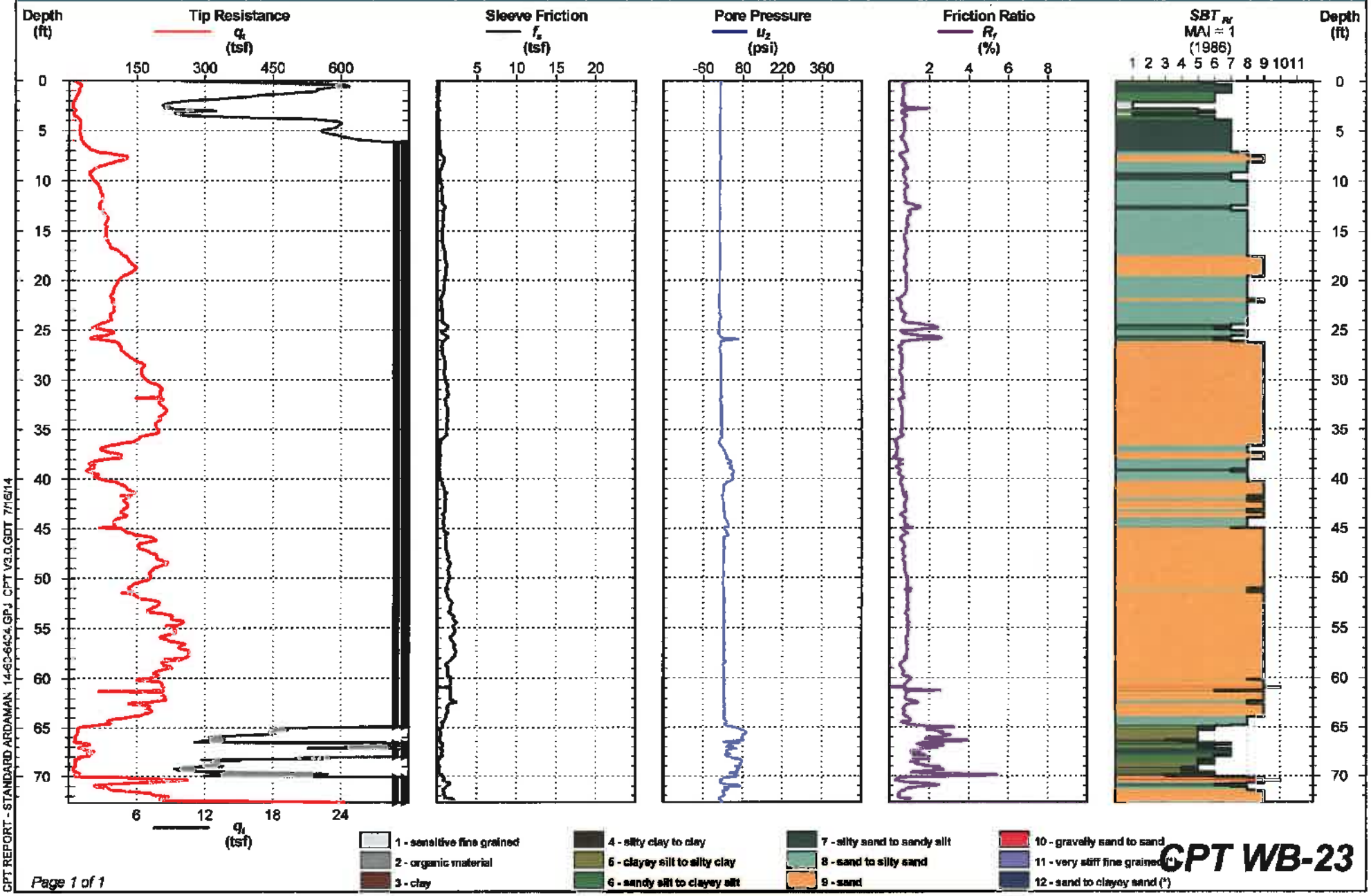
CPT WB-18

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-23

Project #: 14-60-6404
Date: Jul. 9, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 72.7 ft



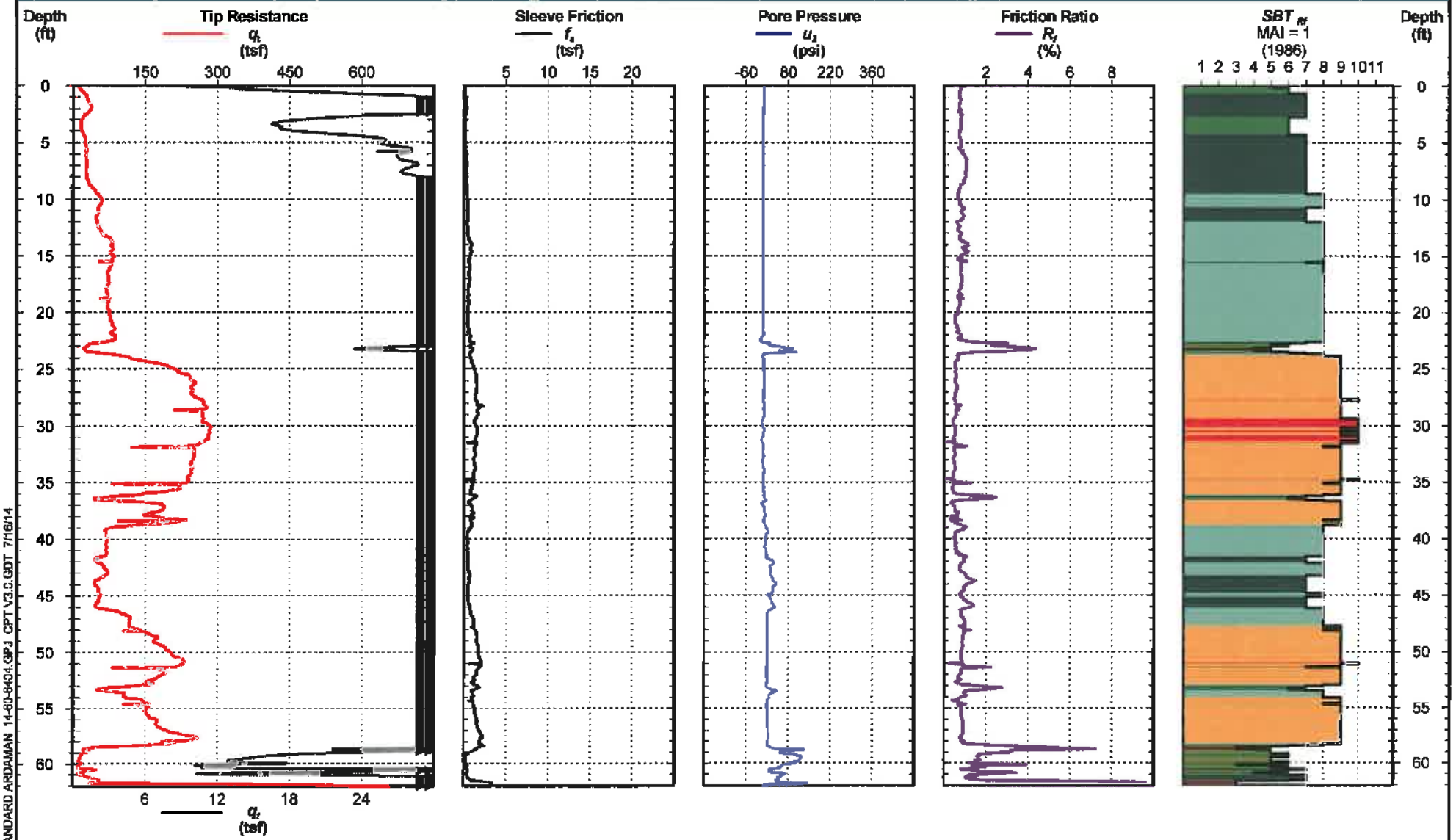
CPT WB-23

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-26

Project #: 14-60-6404
Date: Jul. 9, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 62.1 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-26

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

Ardaman & Associates, Inc.

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

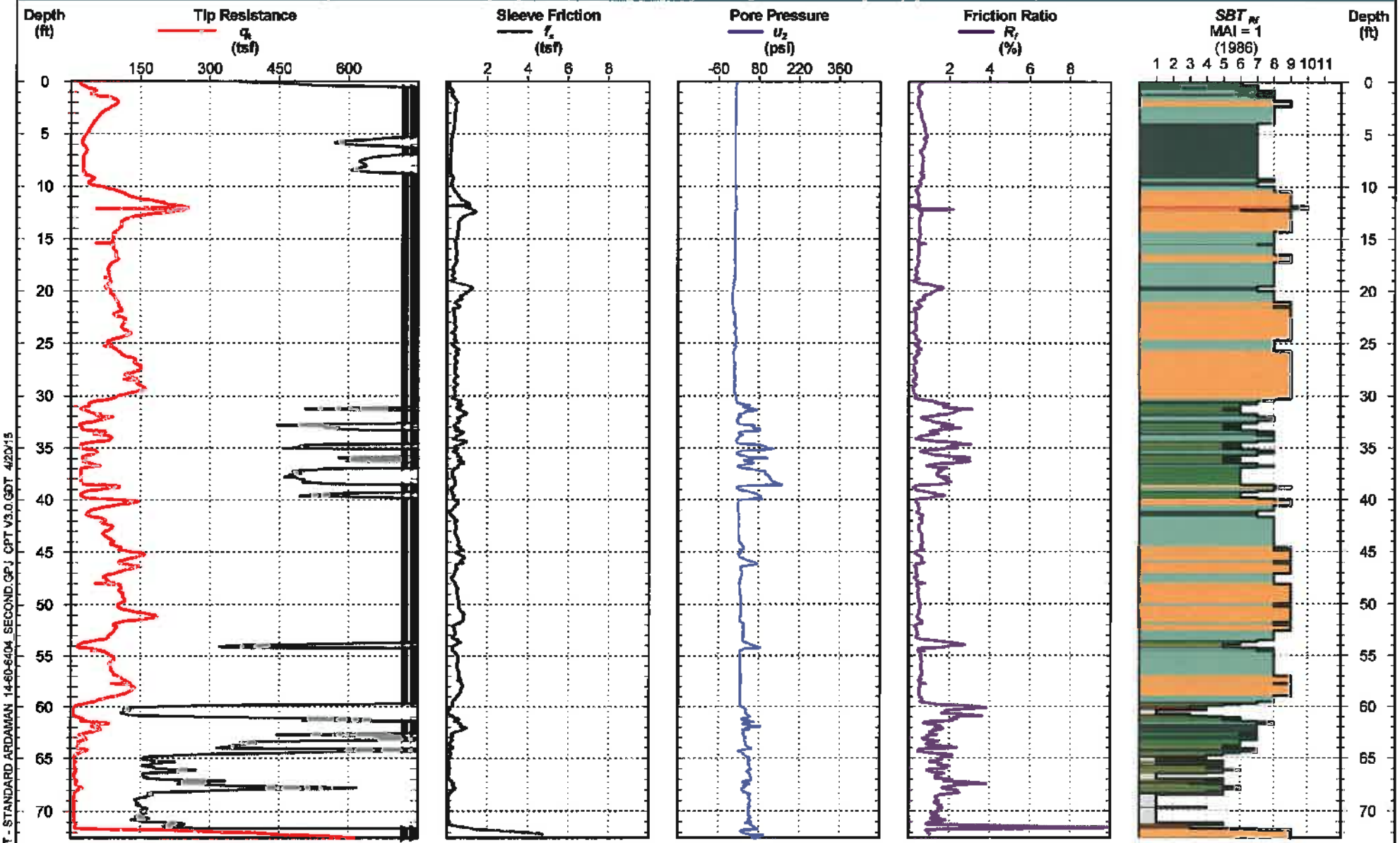
Cone Penetration Test

WB-30B

Project #: 14-60-6404
Date: Oct. 2, 2014

Latitude:
Longitude:

Elevation:
Total Depth: 72.5 ft



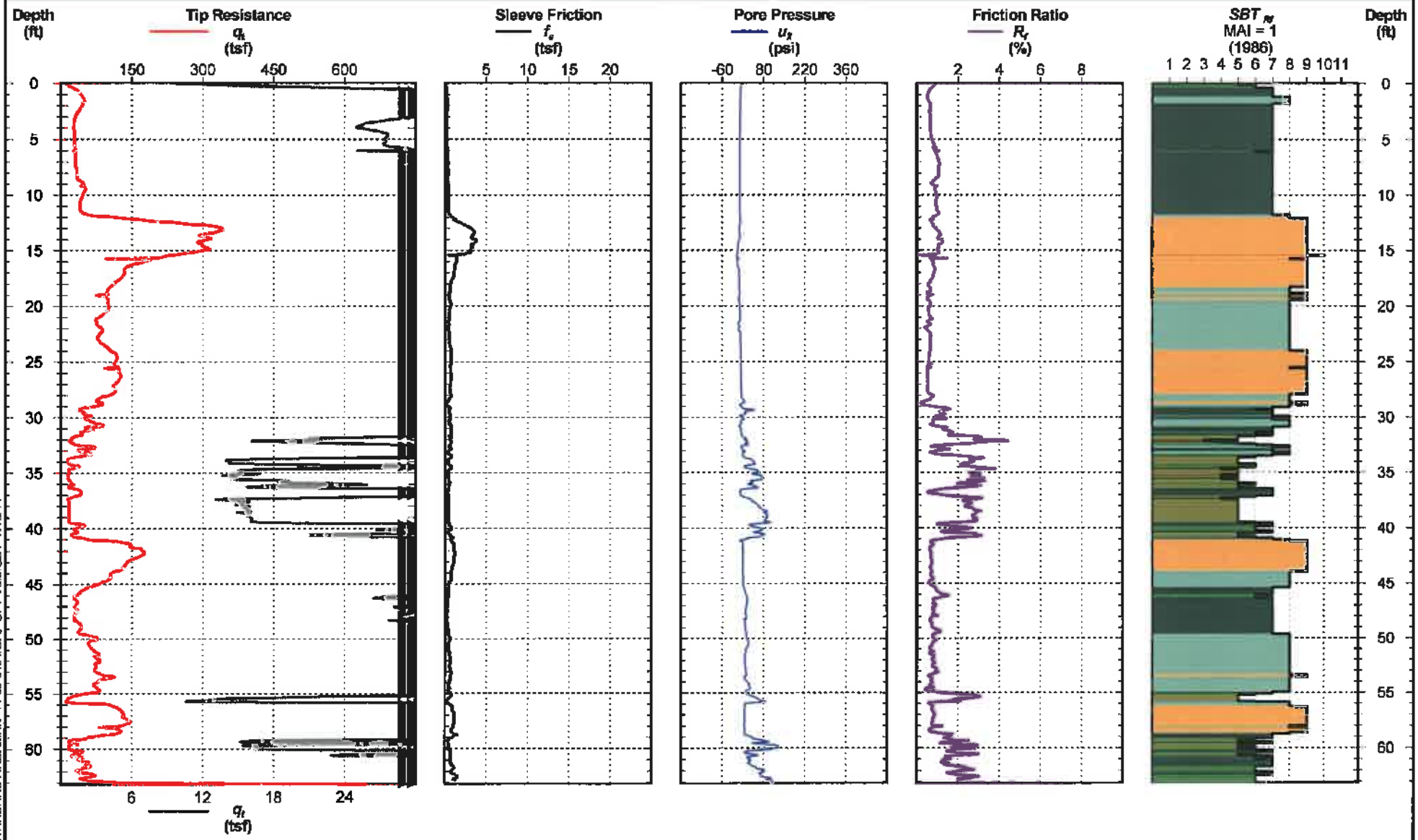
WB-30B

CPT REPORT - STANDARD ARDAMAN 14-60-6404_SECOND.GPJ CPT V3.0.GDT 4/20/15

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-31

Project #: 14-60-6404
Date: Jul. 9, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 63.1 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-31

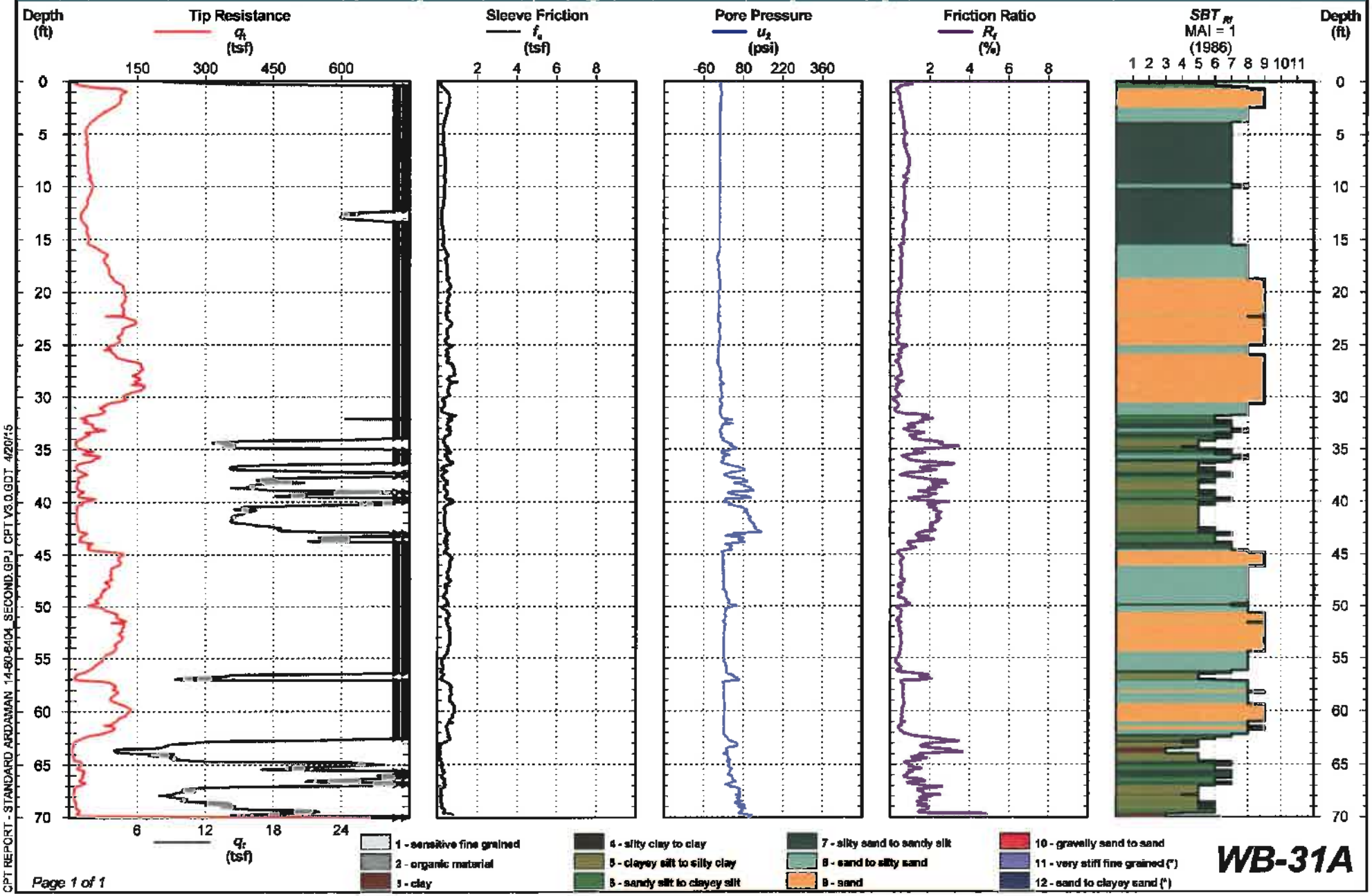
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test

WB-31A

Project #: 14-60-6404
Date: Oct. 3, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 70.1 ft



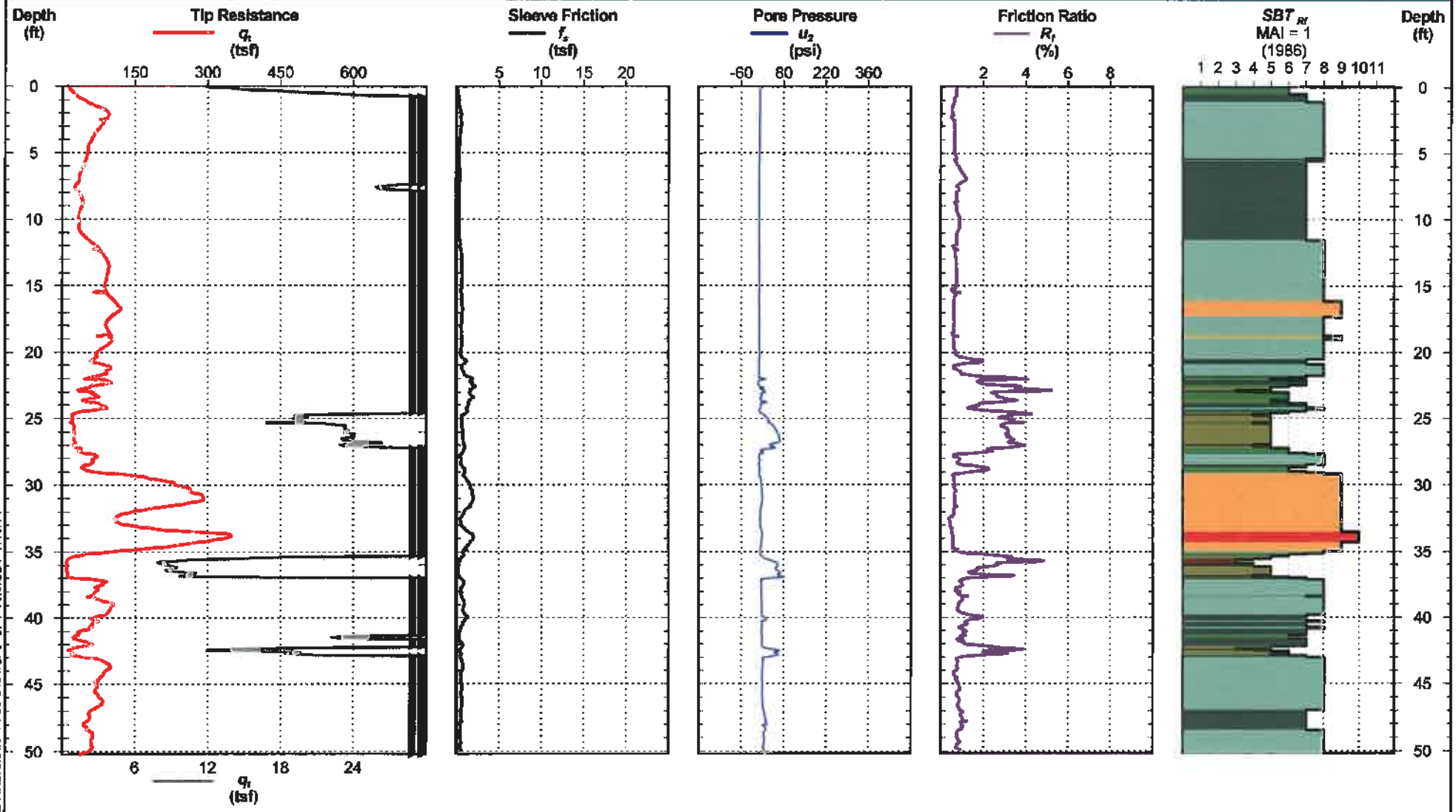
WB-31A

CPT REPORT - STANDARD ARDAMAN 14-60-6404_SECOND.GPJ CPT V3.0.GDT 4/20/15

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-34

Project #: 14-60-6404
Date: Jul. 10, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 50.2 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-34

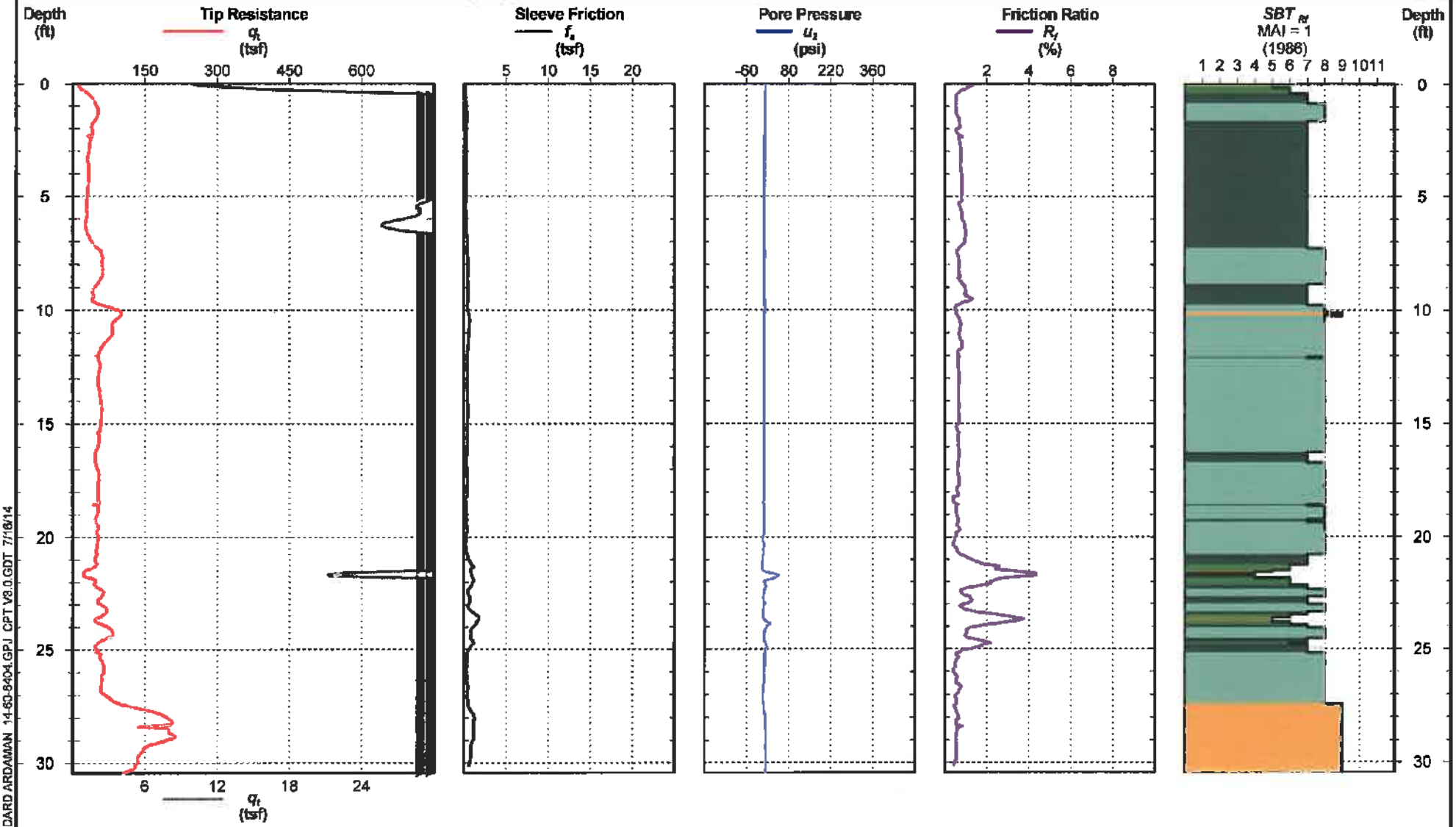
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

Ardaman & Associates, Inc.

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-37

Project #: 14-60-6404
Date: Jul. 10, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 30.5 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-37

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V8.0.GDT 7/16/14

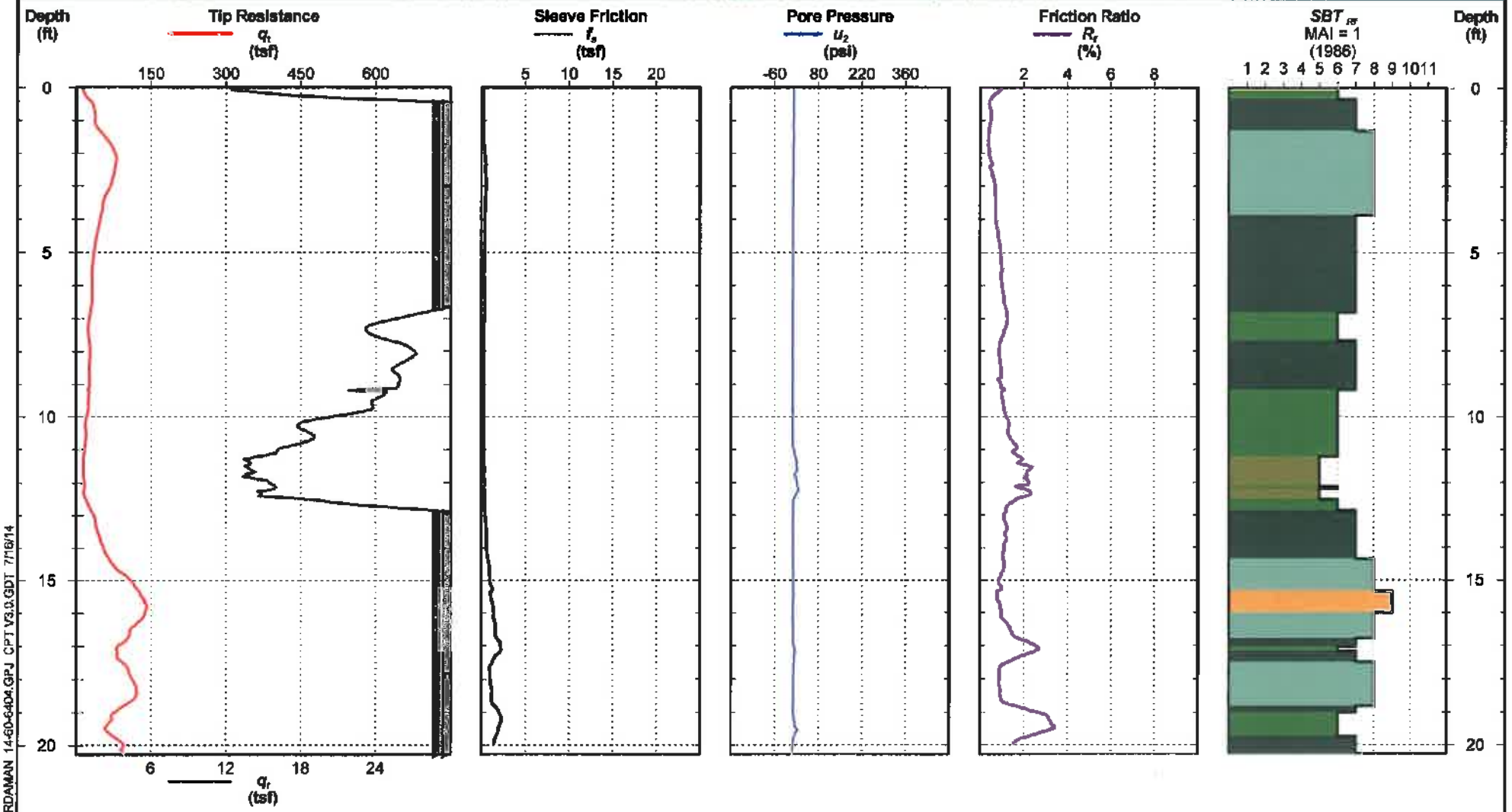
SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-40

Project #: 14-60-6404
Date: Jul. 10, 2014

Latitude:
Longitude:

Elevation:
Total Depth: 20.3 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-40

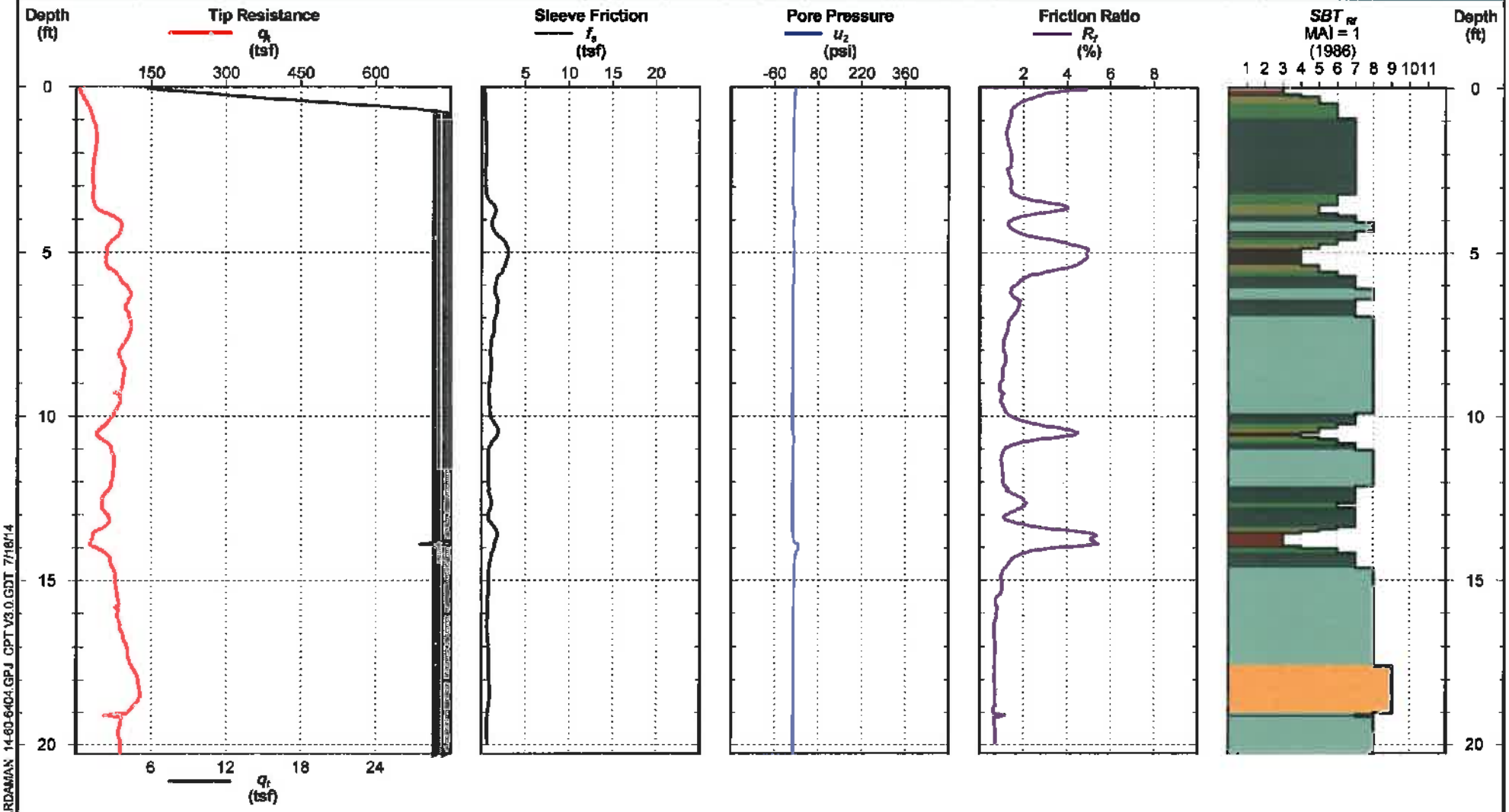
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

Ardaman & Associates, Inc.

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-42

Project #: 14-60-6404
Date: Jul. 10, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 20.3 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-42

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPTV3.0.GDT 7/16/14

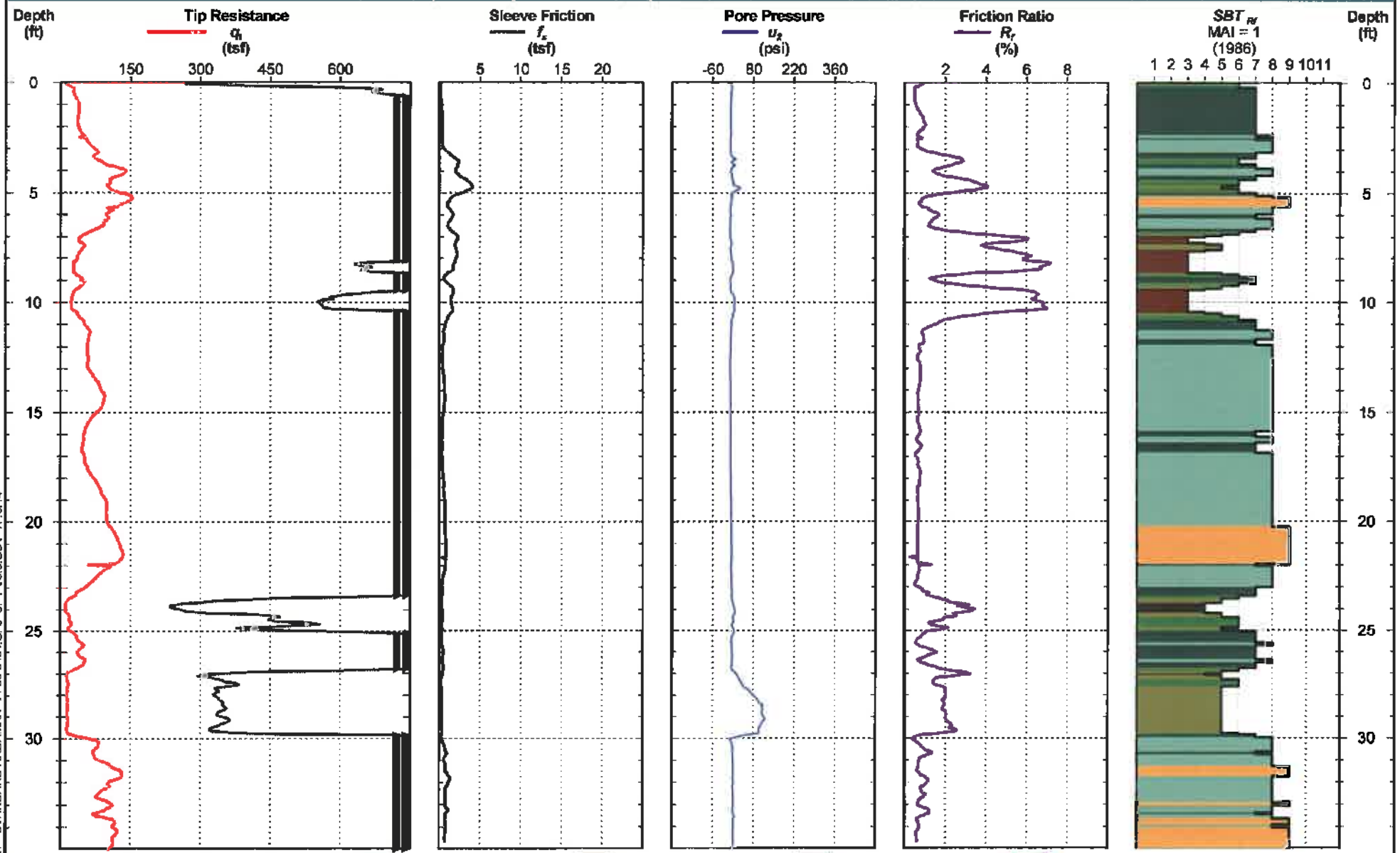
SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-45

Project #: 14-60-6404
Date: Jul. 10, 2014

Latitude:
Longitude:

Elevation:
Total Depth: 35.0 ft



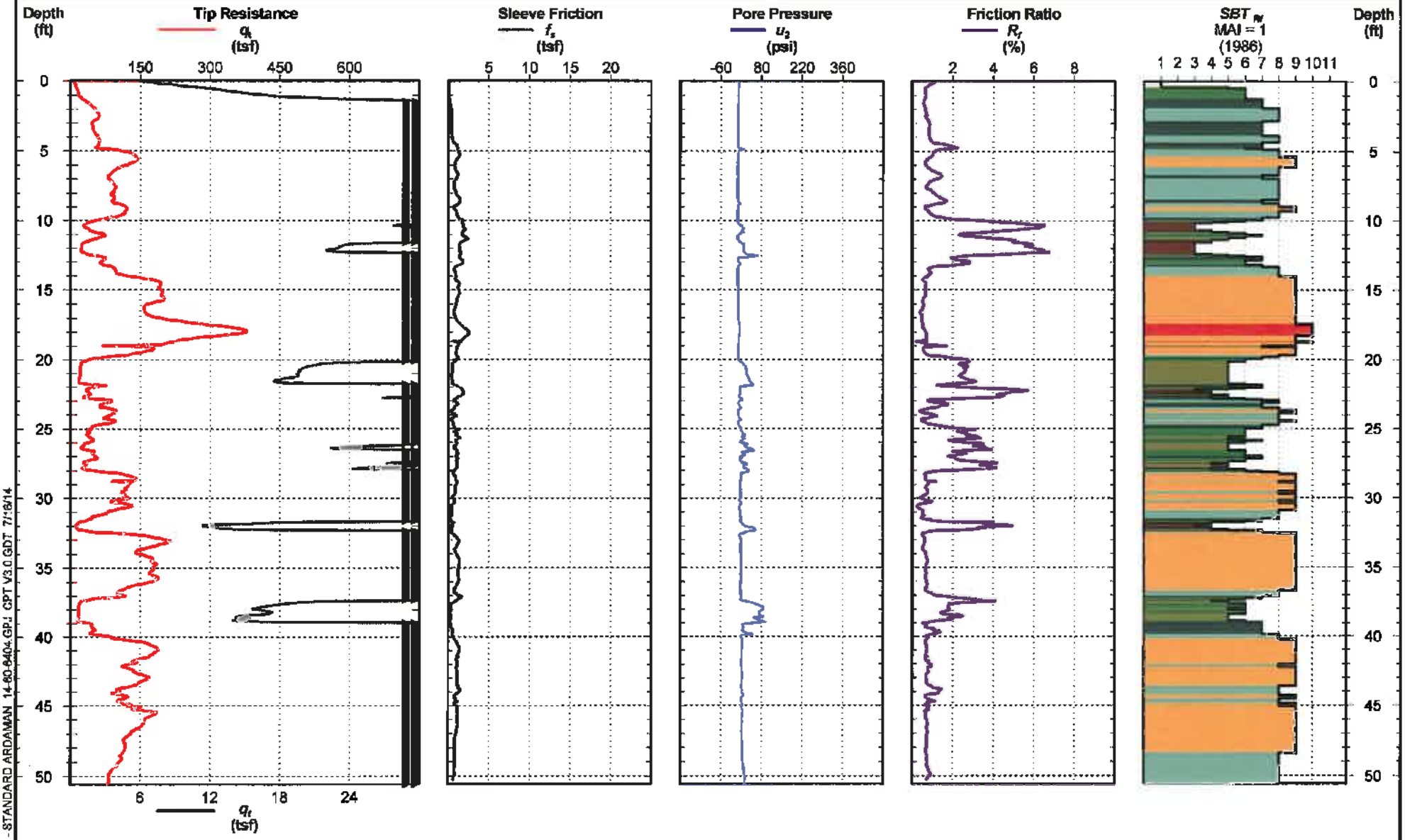
CPT WB-45

CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test CPT WB-48

Project #: 14-60-6404
Date: Jul. 14, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 50.6 ft



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

CPT WB-48

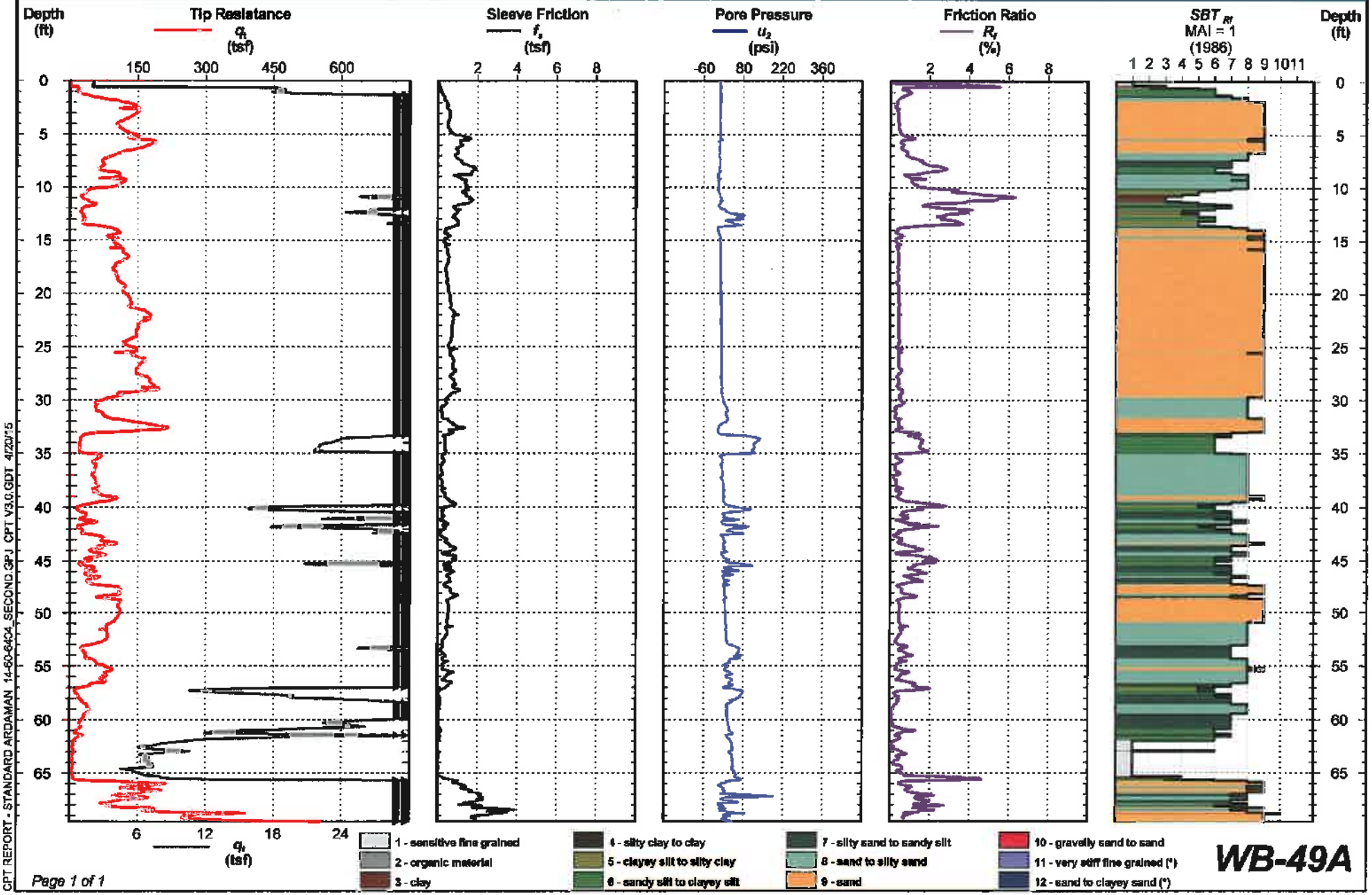
CPT REPORT - STANDARD ARDAMAN 14-60-6404.GPJ CPT V3.0.GDT 7/16/14

SR 429 from River Oaks Circle to Orange Blvd (Wekiva 7A)

Cone Penetration Test

WB-49A

Project #: 14-60-6404
Date: Oct. 1, 2014
Latitude:
Longitude:
Elevation:
Total Depth: 69.6 ft



WB-49A

CPT REPORT - STANDARD ARDAMAN 14-60-6404_SECOND.GPJ CPT V3.0.GDT 4/29/15

SHEET PILE WALL SETTLEMENT ANALYSES

Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
1		1			
0		1			
		50	55	67	
4536.8		8448			

℄ CONST SR 429

(48') 72 5280

192 (50') 5500

FINAL ROADWAY GRADE

(13') 0.1 1430

265 (9') 990

215.1 ℄

GAS EASEMENT

R/W LINE

TO REMAIN

0.0

7' (1020+50 to 1025+00)

12' (1018+25 to 1020+50)

WB-1026 1026+03

ML 1026L 1026+23

BFO GM BFO SAN

GM

GNE EB-1026 1026+00

BT BT/V SAN WNP

GM

WM BFO

TO REMAIN

TO REMAIN

MB-1.1 1026+04

WB-56 1025+80

℄ CONST SR 429

1026+00.0000

SURCHARGE

SCALE
1" = 40' Horizontal
1" = 10' Vertical

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
949 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO.42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

glco_dvorovy 10/15/2015 8:37:45 AM D:\Projects\CADD\24020025201_USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg

STRIP LOADING VARIABLE SHAPE

Project Name: WPKY 7: MB-1 (1021+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 2/25/2016 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	67.00	0.00
5	67.10	1430.00
6	139.00	5280.00
7	259.00	5500.00
8	332.00	990.00
9	332.10	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 33.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	COMP.	1.0	0.131	0.013	0.013	67.00	0.00
2	COMP.	12.0	0.015	0.001	0.001	107.00	0.00
3	COMP.	11.0	0.129	0.013	0.013	77.00	0.00
4	COMP.	15.0	0.014	0.001	0.001	117.00	0.00
5	COMP.	5.0	0.350	0.040	0.040	77.00	0.00
6	COMP.	14.0	0.018	0.002	0.002	112.00	0.00
7	COMP.	18.0	0.020	0.002	0.002	112.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	1.00	32.50	33.50	33.50
2	6.00	29.00	200.80	200.80
3	6.00	23.00	468.40	468.40
4	5.50	17.25	642.35	642.35
5	5.50	11.75	722.65	722.65
6	5.00	6.50	899.30	899.30
7	5.00	1.50	1172.30	1172.30
8	5.00	-3.50	1445.30	1445.30
9	5.00	-8.50	1618.30	1618.30
10	4.67	-13.33	1770.53	1770.53
11	4.67	-18.00	2002.00	2002.00

12	4.67	-22.67	2233.47	2233.47
13	6.00	-28.00	2498.00	2498.00
14	6.00	-34.00	2795.60	2795.60
15	6.00	-40.00	3093.20	3093.20

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 5.00 Stress (psf)	Sett. (in.)	X = 10.00 Stress (psf)	Sett. (in.)	X = 15.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.12	0.00	0.15	0.00	0.19	0.00	0.24	0.00
3	1.90	0.00	2.33	0.00	2.91	0.00	3.70	0.00
4	7.18	0.04	8.77	0.05	10.88	0.06	13.73	0.08
5	16.90	0.09	20.53	0.10	25.26	0.13	31.55	0.16
6	31.20	0.01	37.61	0.01	45.87	0.02	56.68	0.02
7	49.60	0.02	59.36	0.02	71.75	0.02	87.67	0.03
8	72.61	0.02	86.21	0.02	103.23	0.03	124.73	0.03
9	99.89	0.18	117.66	0.21	139.59	0.25	166.82	0.30
10	129.88	0.03	151.83	0.04	178.54	0.04	211.20	0.05
11	161.74	0.03	187.72	0.04	218.94	0.05	256.58	0.05
12	195.94	0.04	225.85	0.04	261.36	0.05	303.63	0.06
13	237.29	0.06	271.44	0.06	311.50	0.07	358.53	0.08
14	285.85	0.06	324.41	0.07	369.04	0.08	420.72	0.09
15	335.75	0.06	378.23	0.07	426.83	0.08	482.41	0.09
		0.64		0.75		0.88		1.04

Layer	X = 20.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 30.00 Stress (psf)	Sett. (in.)	X = 35.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.32	0.00	0.43	0.00	0.61	0.00	0.89	0.00
3	4.81	0.00	6.44	0.01	8.92	0.01	12.88	0.01
4	17.68	0.10	23.31	0.13	31.63	0.18	44.40	0.25
5	40.10	0.20	51.98	0.26	68.91	0.34	93.72	0.45
6	71.04	0.03	90.46	0.03	117.21	0.04	154.69	0.06
7	108.39	0.03	135.70	0.04	172.13	0.05	221.22	0.06
8	152.14	0.04	187.39	0.04	233.04	0.05	292.46	0.07
9	200.85	0.36	243.63	0.43	297.58	0.51	365.72	0.62
10	251.31	0.06	300.71	0.07	361.63	0.08	436.65	0.10
11	302.09	0.06	357.16	0.07	423.77	0.08	504.11	0.10
12	353.98	0.06	413.97	0.07	485.31	0.09	569.82	0.10
13	413.73	0.10	478.44	0.11	554.10	0.13	642.18	0.14
14	480.48	0.10	549.44	0.11	628.78	0.13	719.59	0.14
15	545.84	0.10	618.07	0.11	699.99	0.13	792.48	0.14
		1.24		1.49		1.82		2.24

Layer	X = 40.00 Stress (psf)	Sett. (in.)	X = 45.00 Stress (psf)	Sett. (in.)	X = 50.00 Stress (psf)	Sett. (in.)	X = 55.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.00

2	1.40	0.00	2.43	0.01	4.83	0.01	12.06	0.03
3	19.67	0.02	32.28	0.03	58.25	0.05	118.76	0.11
4	64.91	0.36	99.57	0.53	161.13	0.83	274.34	1.32
5	131.10	0.62	188.88	0.86	279.70	1.21	421.86	1.70
6	208.03	0.08	284.69	0.10	394.78	0.13	550.03	0.17
7	287.83	0.08	378.27	0.10	500.00	0.13	660.28	0.16
8	369.89	0.08	470.33	0.10	599.03	0.13	760.40	0.15
9	451.57	0.75	558.94	0.90	691.46	1.08	851.77	1.29
10	528.64	0.11	640.47	0.14	774.67	0.16	932.80	0.19
11	600.47	0.11	715.04	0.13	849.56	0.15	1004.96	0.18
12	669.32	0.11	785.45	0.13	919.41	0.15	1071.72	0.17
13	744.05	0.16	860.87	0.19	993.43	0.21	1141.95	0.24
14	822.90	0.16	939.49	0.18	1069.81	0.20	1213.86	0.23
15	896.24	0.16	1011.80	0.18	1139.39	0.20	1278.89	0.22
		2.81		3.58		4.65		6.14

STRIP LOADING VARIABLE SHAPE

Project Name: MB-1 (1021+00) W/ WALL Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 2/25/2016 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	67.00	0.00
5	67.10	1430.00
6	139.00	5280.00
7	259.00	5500.00
8	332.00	990.00
9	332.10	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 33.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	INCOMP.	1.0				67.00	0.00
2	INCOMP.	12.0				107.00	0.00
3	INCOMP.	11.0				77.00	0.00
4	INCOMP.	15.0				117.00	0.00
5	INCOMP.	5.0				77.00	0.00
6	INCOMP.	14.0				112.00	0.00
7	COMP.	18.0	0.020	0.002	0.002	112.00	0.00
					Total Settlement =		0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	INCOMP.			
2	INCOMP.			
3	INCOMP.			
4	INCOMP.			
5	INCOMP.			
6	INCOMP.			
7	INCOMP.			
8	INCOMP.			
9	INCOMP.			
10	INCOMP.			
11	INCOMP.			

12	INCOMP.			
13	6.00	-28.00	2498.00	2498.00
14	6.00	-34.00	2795.60	2795.60
15	6.00	-40.00	3093.20	3093.20

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 5.00 Stress (psf)	Sett. (in.)	X = 10.00 Stress (psf)	Sett. (in.)	X = 15.00 Stress (psf)	Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
12	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
13	237.29	0.06	271.44	0.06	311.50	0.07	358.53	0.08
14	285.85	0.06	324.41	0.07	369.04	0.08	420.72	0.09
15	335.75	0.06	378.23	0.07	426.83	0.08	482.41	0.09
		0.18		0.21		0.23		0.26

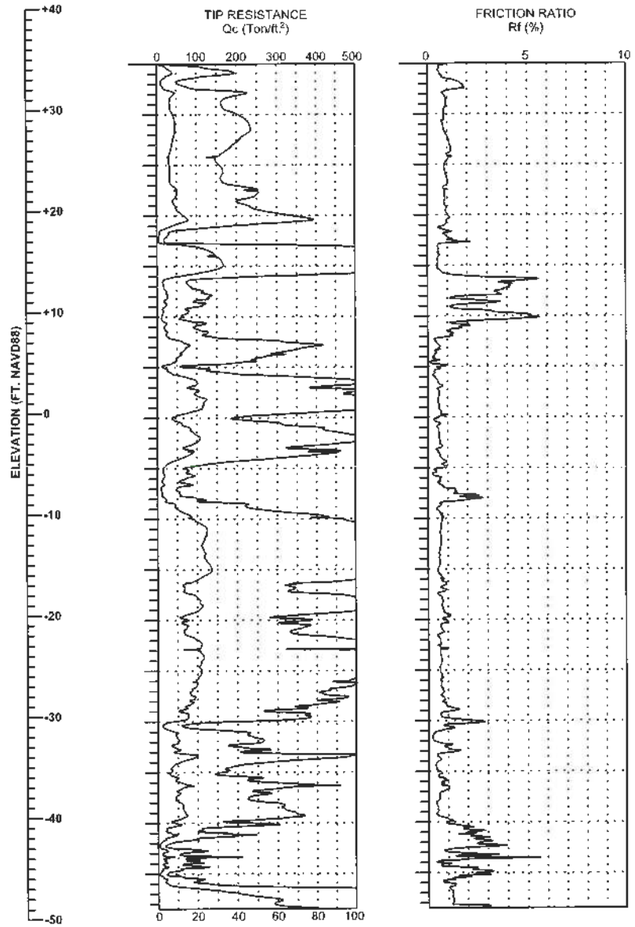
Layer	X = 20.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 30.00 Stress (psf)	Sett. (in.)	X = 35.00 Stress (psf)	Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
12	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
13	413.73	0.10	478.44	0.11	554.10	0.13	642.18	0.14
14	480.48	0.10	549.44	0.11	628.78	0.13	719.59	0.14
15	545.84	0.10	618.07	0.11	699.99	0.13	792.48	0.14
		0.30		0.34		0.38		0.43

Layer	X = 40.00 Stress (psf)	Sett. (in.)	X = 45.00 Stress (psf)	Sett. (in.)	X = 50.00 Stress (psf)	Sett. (in.)	X = 55.00 Stress (psf)	Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	

2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
12	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
13	744.05	0.16	860.87	0.19	993.43	0.21	1141.95	0.24
14	822.90	0.16	939.49	0.18	1069.81	0.20	1213.86	0.23
15	896.24	0.16	1011.80	0.18	1139.39	0.20	1278.89	0.22
		0.48		0.54		0.61		0.68

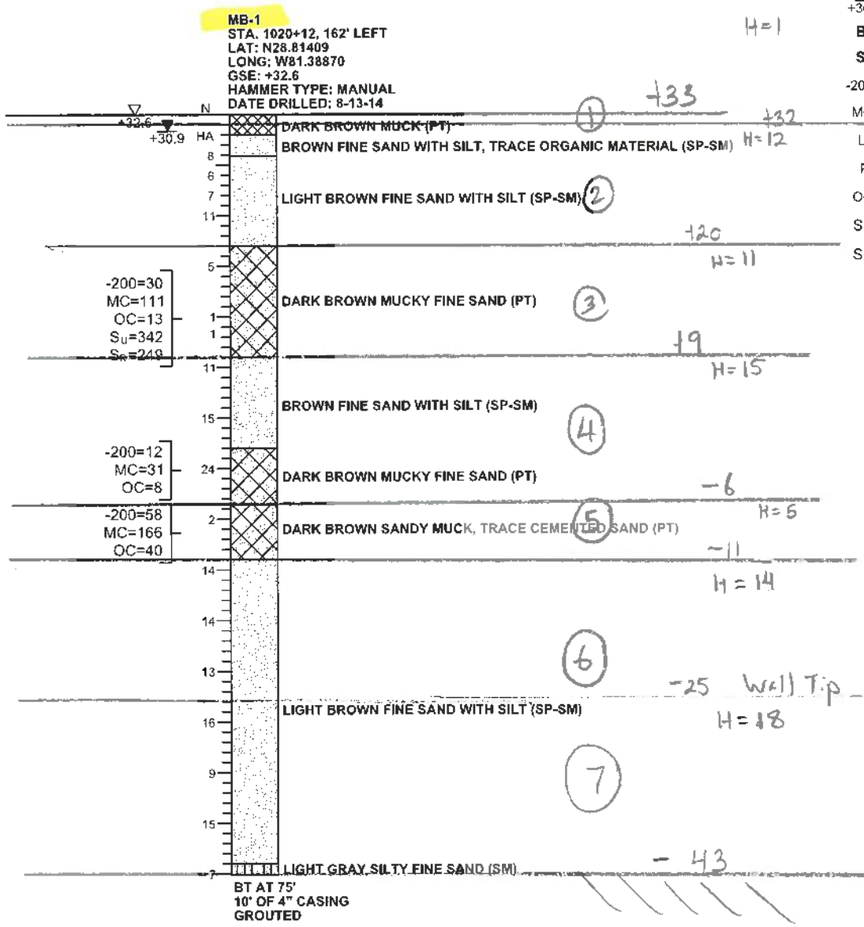
* Wall Deflection & Settlement (1018+25 to 1020+50)

WB-54
STA. 1020+55, 34' LEFT
LAT: N28.81378
LONG: W81.38882
GSE: +34.3
DATE DRILLED: 7-11-14



ST AT 83.5'

MB-1
STA. 1020+12, 162' LEFT
LAT: N28.81409
LONG; W81.38870
GSE: +32.6
HAMMER TYPE: MANUAL
DATE DRILLED: 8-13-14



BT AT 75'
10' OF 4" CASING
GROUTED

LEGEND

GSE	GROUND SURFACE ELEVATION (FT, NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +32.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +30.9	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
ST	SOUNDING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
LL=	LIQUID LIMIT
PI=	PLASTICITY INDEX
OC=	PERCENT ORGANIC CONTENT
S_U=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND — SAND AND MUCK
SAND AND SILT — MUCK

GENERAL NOTES

ELECTRONIC CONE PENETRATION TEST SOUNDINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-3441-79.

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING AND SOUNDING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING AND SOUNDING LOCATIONS WERE NOT SURVEYED. BORING AND SOUNDING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING AND SOUNDING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

STRIP LOADING VARIABLE SHAPE

Project Name: WB-137 (1021+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 2/25/2016 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	62.00	0.00
5	62.10	1430.00
6	134.00	5280.00
7	254.00	5500.00
8	327.00	990.00
9	327.10	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 33.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	COMP.	1.0	0.014	0.001	0.001	101.00	0.00
2	COMP.	17.0	0.017	0.002	0.002	107.00	0.00
3	COMP.	5.0	0.136	0.014	0.014	107.00	0.00
4	COMP.	20.0	0.023	0.002	0.002	107.00	0.00
5	COMP.	20.0	0.032	0.003	0.003	97.00	0.00
6	COMP.	5.0	0.012	0.001	0.001	122.00	0.00
7	COMP.	35.0	0.018	0.002	0.002	117.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	1.00	32.50	50.50	50.50
2	5.67	29.17	227.37	227.37
3	5.67	23.50	480.10	480.10
4	5.67	17.83	732.83	732.83
5	5.00	12.50	970.70	970.70
6	10.00	5.00	1305.20	1305.20
7	10.00	-5.00	1751.20	1751.20
8	10.00	-15.00	2147.20	2147.20
9	10.00	-25.00	2493.20	2493.20
10	5.00	-32.50	2815.20	2815.20
11	7.00	-38.50	3155.30	3155.30

12	7.00	-45.50	3537.50	3537.50
13	7.00	-52.50	3919.70	3919.70
14	7.00	-59.50	4301.90	4301.90
15	7.00	-66.50	4684.10	4684.10

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 5.00 Stress (psf)	Sett. (in.)	X = 10.00 Stress (psf)	Sett. (in.)	X = 15.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.13	0.00	0.17	0.00	0.21	0.00	0.28	0.00
3	2.00	0.00	2.50	0.00	3.18	0.00	4.14	0.00
4	7.87	0.01	9.77	0.01	12.33	0.01	15.90	0.01
5	18.56	0.07	22.87	0.08	28.61	0.10	36.43	0.13
6	43.58	0.04	53.01	0.05	65.28	0.06	81.49	0.07
7	95.19	0.06	113.66	0.08	136.88	0.09	166.30	0.11
8	164.36	0.12	192.69	0.14	227.17	0.17	269.27	0.20
9	245.57	0.16	283.13	0.18	327.55	0.21	380.11	0.24
10	311.05	0.03	354.60	0.04	405.18	0.04	463.89	0.05
11	364.74	0.07	412.41	0.08	467.07	0.09	529.67	0.10
12	427.64	0.07	479.35	0.08	537.87	0.09	603.98	0.10
13	489.83	0.08	544.79	0.09	606.28	0.09	674.92	0.10
14	550.51	0.08	608.00	0.09	671.67	0.10	742.02	0.10
15	609.09	0.08	668.46	0.09	733.64	0.10	805.00	0.10
		0.87		1.00		1.15		1.33

Layer	X = 20.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 30.00 Stress (psf)	Sett. (in.)	X = 35.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.38	0.00	0.53	0.00	0.79	0.00	1.24	0.00
3	5.55	0.01	7.70	0.01	11.14	0.01	17.07	0.02
4	21.01	0.01	28.56	0.02	40.22	0.03	59.09	0.04
5	47.34	0.17	62.97	0.22	86.01	0.30	121.03	0.42
6	103.24	0.09	132.90	0.12	173.96	0.15	231.52	0.20
7	203.86	0.13	252.12	0.16	314.33	0.20	394.52	0.24
8	320.78	0.23	383.84	0.27	460.90	0.32	554.61	0.38
9	442.29	0.27	515.65	0.31	601.86	0.36	702.54	0.41
10	531.89	0.05	610.41	0.06	700.66	0.07	803.71	0.08
11	601.17	0.11	682.53	0.13	774.69	0.14	878.42	0.16
12	678.42	0.12	761.94	0.13	855.19	0.14	958.71	0.16
13	751.30	0.12	835.96	0.13	929.37	0.14	1031.86	0.15
14	819.50	0.11	904.50	0.13	997.34	0.14	1098.23	0.15
15	882.90	0.11	967.61	0.12	1059.35	0.13	1158.22	0.15
		1.54		1.81		2.14		2.56

Layer	X = 40.00 Stress (psf)	Sett. (in.)	X = 45.00 Stress (psf)	Sett. (in.)	X = 50.00 Stress (psf)	Sett. (in.)	X = 55.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.01	0.00	0.03	0.00	0.12	0.00

2	2.14	0.00	4.27	0.01	10.71	0.02	41.04	0.08
3	28.16	0.03	51.32	0.05	106.50	0.10	255.25	0.21
4	91.27	0.06	149.26	0.09	258.17	0.15	461.03	0.25
5	175.79	0.59	263.16	0.85	402.48	1.23	615.84	1.74
6	312.75	0.26	426.93	0.34	584.26	0.44	792.20	0.57
7	497.33	0.30	627.45	0.37	788.67	0.45	982.42	0.53
8	667.58	0.45	802.01	0.53	959.22	0.62	1139.16	0.71
9	819.10	0.47	952.53	0.54	1103.21	0.61	1270.70	0.69
10	920.44	0.09	1051.37	0.10	1196.55	0.11	1355.48	0.12
11	994.29	0.18	1122.60	0.20	1263.25	0.22	1415.72	0.24
12	1072.81	0.17	1197.62	0.19	1332.94	0.21	1478.26	0.23
13	1143.62	0.17	1264.63	0.18	1394.65	0.20	1533.19	0.22
14	1207.25	0.16	1324.29	0.18	1449.09	0.19	1581.20	0.21
15	1264.22	0.16	1377.22	0.17	1496.92	0.18	1622.90	0.20
		3.09		3.80		4.73		6.00

STRIP LOADING VARIABLE SHAPE

Project Name: WB-137 (1021+00) W/ WALL Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 2/25/2016 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	62.00	0.00
5	62.10	1430.00
6	134.00	5280.00
7	254.00	5500.00
8	327.00	990.00
9	327.10	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 33.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	INCOMP.	1.0				101.00	0.00
2	INCOMP.	17.0				107.00	0.00
3	INCOMP.	5.0				107.00	0.00
4	INCOMP.	20.0				107.00	0.00
5	INCOMP.	20.0				97.00	0.00
6	INCOMP.	5.0				122.00	0.00
7	COMP.	35.0	0.018	0.002	0.002	117.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	INCOMP.			
2	INCOMP.			
3	INCOMP.			
4	INCOMP.			
5	INCOMP.			
6	INCOMP.			
7	INCOMP.			
8	INCOMP.			
9	INCOMP.			
10	INCOMP.			
11	7.00	-38.50	3155.30	3155.30

12	7.00	-45.50	3537.50	3537.50
13	7.00	-52.50	3919.70	3919.70
14	7.00	-59.50	4301.90	4301.90
15	7.00	-66.50	4684.10	4684.10

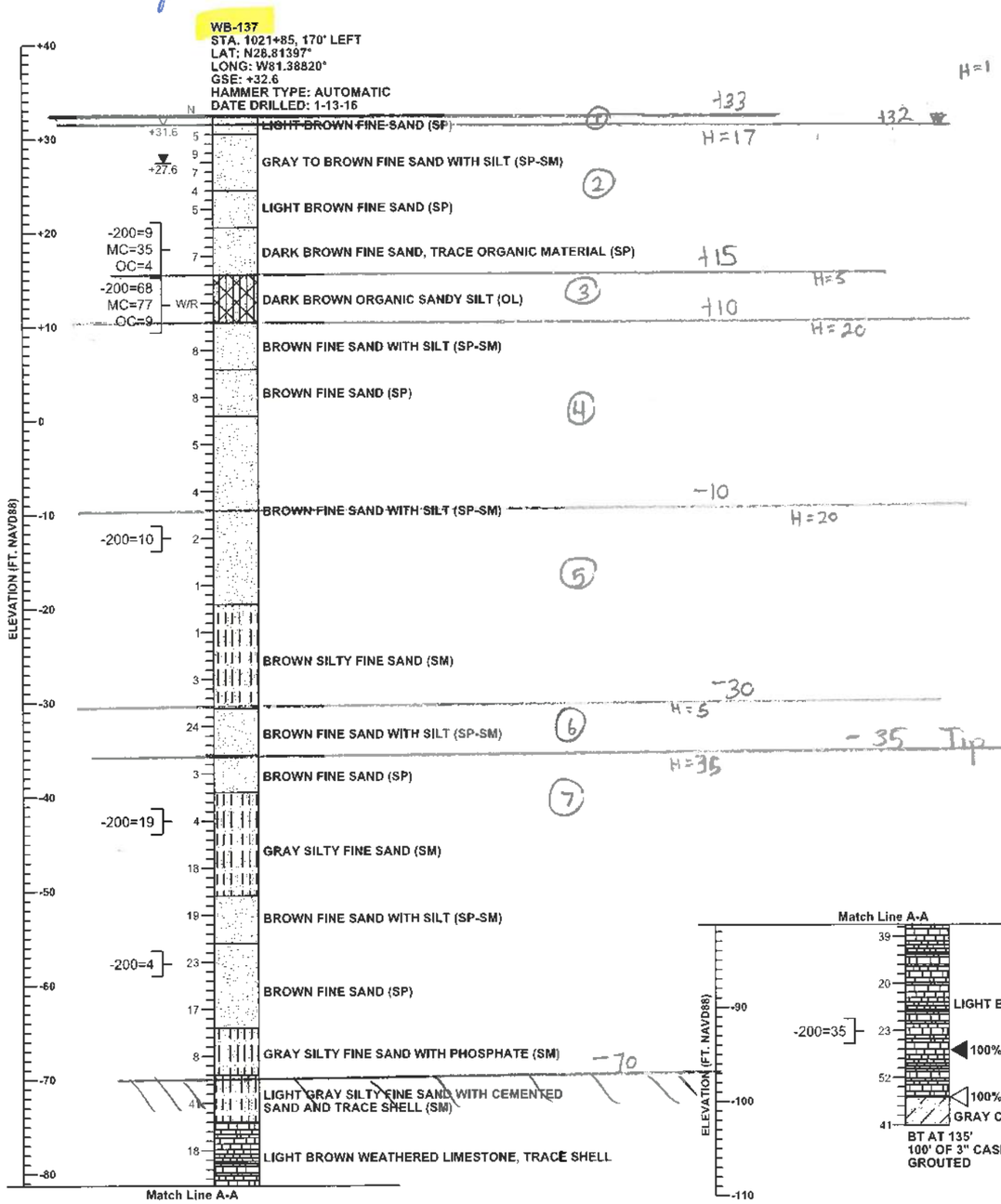
Layer	X = Stress (psf)	0.00 Sett. (in.)	X = Stress (psf)	5.00 Sett. (in.)	X = Stress (psf)	10.00 Sett. (in.)	X = Stress (psf)	15.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	364.74	0.07	412.41	0.08	467.07	0.09	529.67	0.10
12	427.64	0.07	479.35	0.08	537.87	0.09	603.98	0.10
13	489.83	0.08	544.79	0.09	606.28	0.09	674.92	0.10
14	550.51	0.08	608.00	0.09	671.67	0.10	742.02	0.10
15	609.09	0.08	668.46	0.09	733.64	0.10	805.00	0.10
		0.38		0.42		0.47		0.52

Layer	X = Stress (psf)	20.00 Sett. (in.)	X = Stress (psf)	25.00 Sett. (in.)	X = Stress (psf)	30.00 Sett. (in.)	X = Stress (psf)	35.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	601.17	0.11	682.53	0.13	774.69	0.14	878.42	0.16
12	678.42	0.12	761.94	0.13	855.19	0.14	958.71	0.16
13	751.30	0.12	835.96	0.13	929.37	0.14	1031.86	0.15
14	819.50	0.11	904.50	0.13	997.34	0.14	1098.23	0.15
15	882.90	0.11	967.61	0.12	1059.35	0.13	1158.22	0.15
		0.57		0.63		0.70		0.77

Layer	X = Stress (psf)	40.00 Sett. (in.)	X = Stress (psf)	45.00 Sett. (in.)	X = Stress (psf)	50.00 Sett. (in.)	X = Stress (psf)	55.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	

2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	994.29	0.18	1122.60	0.20	1263.25	0.22	1415.72	0.24
12	1072.81	0.17	1197.62	0.19	1332.94	0.21	1478.26	0.23
13	1143.62	0.17	1264.63	0.18	1394.65	0.20	1533.19	0.22
14	1207.25	0.16	1324.29	0.18	1449.09	0.19	1581.20	0.21
15	1264.22	0.16	1377.22	0.17	1496.92	0.18	1622.90	0.20
		0.84		0.92		1.00		1.09

* Settlement / Deflection: 1020+50 to 1025+00



LEGEND

GSE	GROUND SURFACE ELEVATION (FT, NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
+31.6 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+27.6 ▼	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
◁	PERCENT RETURN OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT

SAND · SAND AND CLAY · ORGANIC SANDY SILT · SAND AND SILT · LIMESTONE

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
2289.1	4229				

(44') 72, 5390

(50') ℄ CONST SR 429

131, 5500

(20') 0.1, 2200

FINAL ROADWAY GRADE

FINAL ROADWAY GRADE

2315.0

GAS EASEMENT

R/W LINE

950

TO REMAIN

GNE ML-1021L 1021+02

13' (1025+00 to 1029+75)

TO REMAIN

MB-2 1020+81

WB-1021 1021+03

ML-1021R 1020+99

BTV SAN BFO GNE GM GM GM

SAN BFO WM WNP

BT

1021+00.0000

SURCHARGE

SCALE
1" = 40' Horizontal
1" = 10' Vertical

℄ CONST SR 429

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO.42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY; NOT FOR CONSTRUCTION

glen_dvorovy 10/15/2015 8:37:00 AM D:\Projects\CADD\240200252O1 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg

STRIP LOADING VARIABLE SHAPE

Project Name: WB-140 (1025+00)
Client : FDOT
Date : 2/25/2016

Project Number : 3520G
Project Manager: CGB
Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	68.00	0.00
5	68.10	2200.00
6	140.00	5390.00
7	199.00	5500.00
8	299.00	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 33.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	COMP.	1.0	0.014	0.001	0.001	102.00	0.00
2	COMP.	3.0	0.015	0.001	0.001	107.00	0.00
3	COMP.	23.0	0.350	0.040	0.040	77.00	0.00
4	COMP.	20.0	0.009	0.001	0.001	127.00	0.00
5	COMP.	6.0	0.350	0.040	0.040	82.00	0.00
6	COMP.	4.0	0.018	0.002	0.002	122.00	0.00
7	COMP.	21.0	0.350	0.040	0.040	82.00	0.00
8	COMP.	50.0	0.017	0.002	0.002	117.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	1.00	32.50	51.00	51.00
2	3.00	30.50	168.90	168.90
3	5.75	26.13	277.78	277.78
4	5.75	20.38	361.73	361.73
5	5.75	14.63	445.68	445.68
6	5.75	8.88	529.63	529.63
7	5.00	3.50	733.10	733.10
8	5.00	-1.50	1056.10	1056.10
9	5.00	-6.50	1379.10	1379.10
10	5.00	-11.50	1702.10	1702.10
11	6.00	-17.00	1922.40	1922.40

12	4.00	-22.00	2100.40	2100.40
13	5.25	-26.63	2271.05	2271.05
14	5.25	-31.88	2373.95	2373.95
15	5.25	-37.13	2476.85	2476.85
16	5.25	-42.38	2579.75	2579.75
17	10.00	-50.00	2904.20	2904.20
18	10.00	-60.00	3450.20	3450.20
19	10.00	-70.00	3996.20	3996.20
20	10.00	-80.00	4542.20	4542.20
21	10.00	-90.00	5088.20	5088.20

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 5.00 Stress (psf)	Sett. (in.)	X = 10.00 Stress (psf)	Sett. (in.)	X = 15.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.00	0.04	0.00	0.05	0.00	0.07	0.00
3	0.70	0.01	0.87	0.01	1.09	0.01	1.41	0.02
4	4.23	0.04	5.22	0.05	6.54	0.06	8.35	0.08
5	12.53	0.10	15.37	0.12	19.12	0.15	24.18	0.18
6	26.92	0.17	32.77	0.21	40.39	0.26	50.48	0.32
7	46.42	0.01	56.05	0.02	68.40	0.02	84.46	0.03
8	69.79	0.02	83.59	0.02	101.03	0.02	123.32	0.03
9	97.86	0.02	116.25	0.02	139.15	0.02	167.90	0.03
10	130.10	0.02	153.27	0.02	181.70	0.02	216.81	0.03
11	169.57	0.31	197.99	0.36	232.34	0.42	274.02	0.49
12	208.32	0.04	241.34	0.04	280.73	0.05	327.82	0.05
13	245.96	0.33	282.98	0.37	326.64	0.43	378.17	0.49
14	290.11	0.37	331.29	0.42	379.27	0.47	435.18	0.54
15	335.09	0.41	379.98	0.46	431.71	0.51	491.28	0.58
16	380.32	0.44	428.44	0.49	483.35	0.55	545.89	0.61
17	445.39	0.13	497.39	0.14	555.93	0.16	621.69	0.17
18	527.87	0.13	583.54	0.14	645.29	0.15	713.61	0.17
19	605.40	0.12	663.35	0.14	726.83	0.15	796.17	0.16
20	676.84	0.12	735.93	0.13	799.97	0.14	869.17	0.16
21	741.63	0.12	800.95	0.13	864.63	0.14	932.83	0.15
		2.89		3.28		3.73		4.27

Layer	X = 20.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 30.00 Stress (psf)	Sett. (in.)	X = 35.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.09	0.00	0.12	0.00	0.17	0.00	0.26	0.00
3	1.85	0.02	2.51	0.03	3.52	0.04	5.18	0.06
4	10.90	0.10	14.59	0.14	20.16	0.19	28.95	0.27
5	31.16	0.24	41.04	0.31	55.45	0.41	77.18	0.56
6	64.08	0.40	82.80	0.51	109.10	0.65	146.86	0.86
7	105.64	0.03	133.97	0.04	172.39	0.05	225.19	0.06
8	152.09	0.03	189.60	0.04	238.94	0.05	304.26	0.06
9	204.25	0.03	250.52	0.04	309.69	0.05	385.51	0.06
10	260.35	0.03	314.55	0.04	382.12	0.05	466.30	0.06
11	324.70	0.57	386.41	0.67	461.50	0.78	552.59	0.92

12	384.16	0.06	451.54	0.07	531.97	0.08	627.55	0.10
13	439.00	0.56	510.69	0.65	594.92	0.74	693.40	0.85
14	500.24	0.61	575.80	0.69	663.20	0.79	763.76	0.89
15	559.73	0.65	638.19	0.73	727.72	0.82	829.34	0.92
16	616.96	0.68	697.48	0.76	788.29	0.85	890.14	0.95
17	695.38	0.19	777.65	0.21	869.10	0.23	970.18	0.26
18	788.97	0.18	871.79	0.20	962.42	0.22	1061.09	0.24
19	871.68	0.17	953.62	0.19	1042.15	0.21	1137.37	0.22
20	943.73	0.17	1023.77	0.18	1109.37	0.19	1200.50	0.21
21	1005.65	0.16	1083.12	0.17	1165.26	0.18	1251.97	0.19
		4.91		5.67		6.59		7.73

Layer	X = 40.00 Stress (psf)	Sett. (in.)	X = 45.00 Stress (psf)	Sett. (in.)	X = 50.00 Stress (psf)	Sett. (in.)	X = 55.00 Stress (psf)	Sett. (in.)
1	0.00	0.00	0.01	0.00	0.01	0.00	0.03	0.00
2	0.41	0.00	0.71	0.00	1.42	0.00	3.55	0.00
3	8.08	0.10	13.69	0.17	25.98	0.31	58.19	0.66
4	43.60	0.40	69.66	0.62	119.67	1.00	223.25	1.68
5	111.13	0.78	166.22	1.11	258.52	1.60	415.48	2.30
6	202.18	1.13	284.57	1.50	408.05	2.00	590.83	2.62
7	298.44	0.08	400.45	0.10	541.62	0.13	732.83	0.16
8	391.00	0.07	505.81	0.09	655.98	0.11	847.85	0.14
9	482.51	0.07	605.74	0.09	760.08	0.10	949.08	0.12
10	570.69	0.07	698.99	0.08	854.39	0.10	1038.73	0.11
11	662.40	1.08	793.48	1.26	947.77	1.46	1126.04	1.68
12	740.35	0.11	872.15	0.13	1024.14	0.15	1196.54	0.17
13	807.69	0.97	939.08	1.10	1088.25	1.25	1255.13	1.40
14	878.62	1.01	1008.62	1.13	1154.08	1.26	1314.74	1.41
15	943.84	1.03	1071.76	1.15	1213.19	1.27	1367.74	1.40
16	1003.60	1.05	1128.95	1.16	1266.15	1.27	1414.74	1.40
17	1081.21	0.28	1202.28	0.31	1333.18	0.33	1473.42	0.36
18	1167.89	0.26	1282.73	0.28	1405.34	0.30	1535.24	0.33
19	1239.22	0.24	1347.56	0.26	1462.06	0.28	1582.26	0.30
20	1297.07	0.22	1398.86	0.24	1505.55	0.25	1616.72	0.27
21	1343.12	0.21	1438.48	0.22	1537.74	0.23	1640.50	0.25
		9.16		10.99		13.43		16.77

STRIP LOADING VARIABLE SHAPE

Project Name: WB-140 (1025+00) W/ WALL Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 2/25/2016 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	68.00	0.00
5	68.10	2200.00
6	140.00	5390.00
7	199.00	5500.00
8	299.00	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 33.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	INCOMP.	1.0				102.00	0.00
2	INCOMP.	3.0				107.00	0.00
3	INCOMP.	23.0				77.00	0.00
4	INCOMP.	20.0				127.00	0.00
5	INCOMP.	6.0				82.00	0.00
6	INCOMP.	4.0				122.00	0.00
7	INCOMP.	21.0				82.00	0.00
8	COMP.	50.0	0.017	0.002	0.002	117.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	INCOMP.			
2	INCOMP.			
3	INCOMP.			
4	INCOMP.			
5	INCOMP.			
6	INCOMP.			
7	INCOMP.			
8	INCOMP.			
9	INCOMP.			
10	INCOMP.			
11	INCOMP.			

12	INCOMP.			
13	INCOMP.			
14	INCOMP.			
15	INCOMP.			
16	INCOMP.			
17	10.00	-50.00	2904.20	2904.20
18	10.00	-60.00	3450.20	3450.20
19	10.00	-70.00	3996.20	3996.20
20	10.00	-80.00	4542.20	4542.20
21	10.00	-90.00	5088.20	5088.20

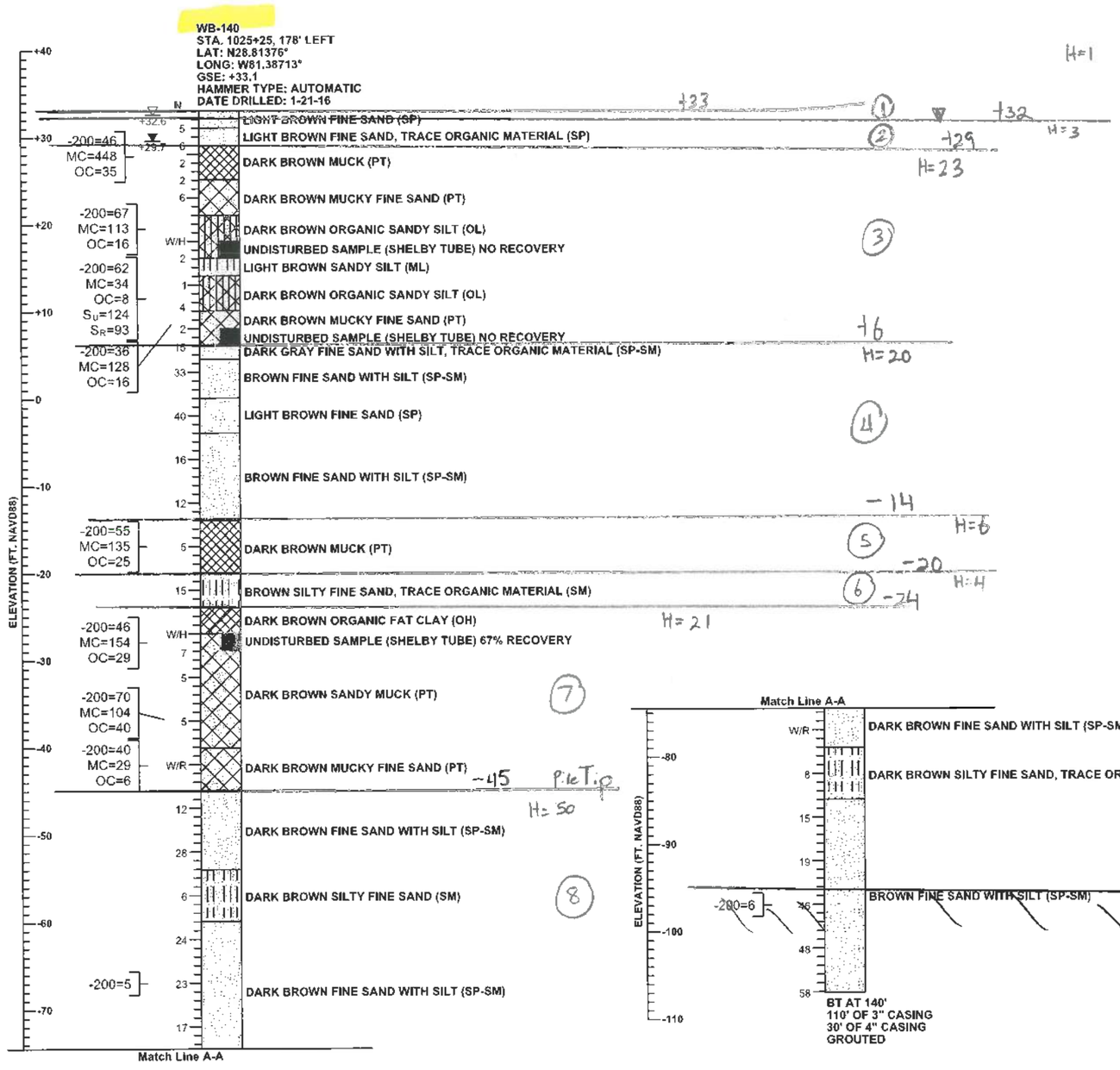
Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 5.00 Stress (psf)	Sett. (in.)	X = 10.00 Stress (psf)	Sett. (in.)	X = 15.00 Stress (psf)	Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
12	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
13	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
14	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
15	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
16	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
17	445.39	0.13	497.39	0.14	555.93	0.16	621.69	0.17
18	527.87	0.13	583.54	0.14	645.29	0.15	713.61	0.17
19	605.40	0.12	663.35	0.14	726.83	0.15	796.17	0.16
20	676.84	0.12	735.93	0.13	799.97	0.14	869.17	0.16
21	741.63	0.12	800.95	0.13	864.63	0.14	932.83	0.15
		0.62		0.68		0.74		0.80

Layer	X = 20.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 30.00 Stress (psf)	Sett. (in.)	X = 35.00 Stress (psf)	Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	INCOMP.		INCOMP.		INCOMP.		INCOMP.	

12	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
13	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
14	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
15	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
16	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
17	695.38	0.19	777.65	0.21	869.10	0.23	970.18	0.26
18	788.97	0.18	871.79	0.20	962.42	0.22	1061.09	0.24
19	871.68	0.17	953.62	0.19	1042.15	0.21	1137.37	0.22
20	943.73	0.17	1023.77	0.18	1109.37	0.19	1200.50	0.21
21	1005.65	0.16	1083.12	0.17	1165.26	0.18	1251.97	0.19
		0.87		0.95		1.03		1.12

Layer	X = Stress (psf)	40.00 Sett. (in.)	X = Stress (psf)	45.00 Sett. (in.)	X = Stress (psf)	50.00 Sett. (in.)	X = Stress (psf)	55.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
12	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
13	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
14	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
15	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
16	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
17	1081.21	0.28	1202.28	0.31	1333.18	0.33	1473.42	0.36
18	1167.89	0.26	1282.73	0.28	1405.34	0.30	1535.24	0.33
19	1239.22	0.24	1347.56	0.26	1462.06	0.28	1582.26	0.30
20	1297.07	0.22	1398.86	0.24	1505.55	0.25	1616.72	0.27
21	1343.12	0.21	1438.48	0.22	1537.74	0.23	1640.50	0.25
		1.21		1.30		1.40		1.50

* Wall Settlement / Deflection: 1025+00 to 1026+00



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/R	WEIGHT OF ROD
W/H	WEIGHT OF HAMMER
+32.6 ▽	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
+29.7 ▽	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
S_U=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND | SAND AND MUCK | MUCK
SAND AND SILT | ORGANIC CLAY | ORGANIC SANDY SILT

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: AUTOMATIC

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-3	VERY LOOSE
	3-8	LOOSE
	8-24	MEDIUM DENSE
	24-40	DENSE
	OVER 40	VERY DENSE

NON-GRANULAR SOILS	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-1	VERY SOFT
	1-3	SOFT
	3-6	FIRM
	6-12	STIFF
	12-24	VERY STIFF
	OVER 24	HARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

STRIP LOADING VARIABLE SHAPE

Project Name: MB-11 (1025+00)
Client : FDOT
Date : 2/25/2016

Project Number : 3520G
Project Manager: CGB
Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	68.00	0.00
5	68.10	2200.00
6	140.00	5390.00
7	199.00	5500.00
8	299.00	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 35.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	COMP.	3.0	0.017	0.002	0.002	102.00	0.00
2	COMP.	4.0	0.750	0.080	0.080	77.00	0.00
3	COMP.	6.5	0.013	0.001	0.001	112.00	0.00
4	COMP.	14.5	0.136	0.014	0.014	107.00	0.00
5	COMP.	5.0	0.016	0.002	0.002	112.00	0.00
6	COMP.	21.0	0.030	0.003	0.003	102.00	0.00
7	COMP.	6.0	0.016	0.002	0.002	117.00	0.00
8	COMP.	15.0	0.015	0.001	0.001	122.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	1.00	32.50	255.00	255.00
2	4.00	30.00	335.20	335.20
3	6.50	24.75	525.60	525.60
4	4.83	19.08	794.58	794.58
5	4.83	14.25	1010.15	1010.15
6	4.83	9.42	1225.72	1225.72
7	5.00	4.50	1457.50	1457.50
8	10.50	-3.25	1789.40	1789.40
9	10.50	-13.75	2205.20	2205.20
10	6.00	-22.00	2576.90	2576.90
11	7.50	-28.75	2964.20	2964.20

12	7.50	-36.25	3411.20	3411.20

Layer	X = Stress (psf)	0.00 Sett. (in.)	X = Stress (psf)	5.00 Sett. (in.)	X = Stress (psf)	10.00 Sett. (in.)	X = Stress (psf)	15.00 Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.06	0.00	0.07	0.00	0.09	0.00	0.12	0.00
3	1.20	0.00	1.49	0.00	1.88	0.00	2.41	0.00
4	5.62	0.02	6.93	0.03	8.67	0.04	11.05	0.05
5	13.28	0.04	16.27	0.05	20.23	0.07	25.57	0.09
6	25.29	0.07	30.80	0.09	38.00	0.10	47.54	0.13
7	42.35	0.01	51.21	0.01	62.61	0.02	77.49	0.02
8	79.10	0.07	94.47	0.08	113.80	0.10	138.34	0.12
9	145.79	0.11	171.12	0.12	202.01	0.14	239.87	0.17
10	208.32	0.04	241.34	0.04	280.73	0.05	327.82	0.06
11	263.69	0.05	302.44	0.06	347.92	0.07	401.31	0.07
12	327.57	0.05	371.87	0.06	423.01	0.07	482.02	0.08
		0.47		0.56		0.66		0.79

Layer	X = Stress (psf)	20.00 Sett. (in.)	X = Stress (psf)	25.00 Sett. (in.)	X = Stress (psf)	30.00 Sett. (in.)	X = Stress (psf)	35.00 Sett. (in.)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.16	0.00	0.21	0.00	0.30	0.00	0.45	0.00
3	3.17	0.00	4.28	0.00	5.99	0.00	8.77	0.01
4	14.38	0.06	19.19	0.08	26.39	0.11	37.65	0.16
5	32.92	0.11	43.31	0.14	58.42	0.19	81.14	0.26
6	60.45	0.16	78.25	0.21	103.36	0.28	139.56	0.37
7	97.19	0.03	123.68	0.03	159.85	0.04	209.94	0.06
8	169.79	0.15	210.44	0.18	263.36	0.23	332.61	0.28
9	286.45	0.20	343.88	0.24	414.74	0.28	502.02	0.34
10	384.16	0.07	451.54	0.08	531.97	0.09	627.55	0.11
11	463.96	0.09	537.34	0.10	622.99	0.11	722.45	0.13
12	549.96	0.09	628.00	0.10	717.24	0.11	818.74	0.13
		0.96		1.18		1.46		1.84

Layer	X = Stress (psf)	40.00 Sett. (in.)	X = Stress (psf)	45.00 Sett. (in.)	X = Stress (psf)	50.00 Sett. (in.)	X = Stress (psf)	55.00 Sett. (in.)
1	0.00	0.00	0.01	0.00	0.01	0.00	0.03	0.00
2	0.71	0.01	1.23	0.01	2.44	0.02	6.03	0.06
3	13.60	0.01	22.75	0.02	42.24	0.03	90.56	0.07
4	56.15	0.23	88.41	0.36	148.36	0.59	266.55	0.99
5	116.48	0.37	173.48	0.54	268.23	0.81	427.62	1.21
6	192.92	0.50	272.99	0.69	394.11	0.96	575.35	1.32
7	280.10	0.07	378.94	0.10	517.54	0.13	707.94	0.17
8	423.30	0.35	541.50	0.43	693.57	0.54	884.72	0.66
9	608.93	0.40	738.67	0.47	893.84	0.56	1075.78	0.65

10	740.35	0.13	872.15	0.15	1024.14	0.17	1196.54	0.19
11	837.10	0.15	968.02	0.17	1115.75	0.19	1280.10	0.21
12	933.36	0.14	1061.66	0.16	1203.78	0.18	1359.34	0.20
		2.36		3.10		4.16		5.72

STRIP LOADING VARIABLE SHAPE

Project Name: MB-11 (1025+00) W/ WALL Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 2/25/2016 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	50.00	0.00
3	55.00	0.00
4	68.00	0.00
5	68.10	2200.00
6	140.00	5390.00
7	199.00	5500.00
8	299.00	0.00

Foundation Elev. = 33.00 (ft) Ground Surface Elev.= 35.00 (ft)
Water table Elev. = 32.00 (ft) Unit weight of Wat. = 62.40 (pcf)

N°.	Layer Type	Thick. (ft)	Coefficient Comp.	Recomp.	Swell.	Unit Weight (pcf)	Secondary Settlement (in.)
1	INCOMP.	3.0				102.00	0.00
2	INCOMP.	4.0				77.00	0.00
3	INCOMP.	6.5				112.00	0.00
4	INCOMP.	14.5				107.00	0.00
5	INCOMP.	5.0				112.00	0.00
6	INCOMP.	21.0				102.00	0.00
7	INCOMP.	6.0				117.00	0.00
8	COMP.	15.0	0.015	0.001	0.001	122.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	INCOMP.			
2	INCOMP.			
3	INCOMP.			
4	INCOMP.			
5	INCOMP.			
6	INCOMP.			
7	INCOMP.			
8	INCOMP.			
9	INCOMP.			
10	INCOMP.			
11	7.50	-28.75	2964.20	2964.20

12	7.50	-36.25	3411.20	3411.20

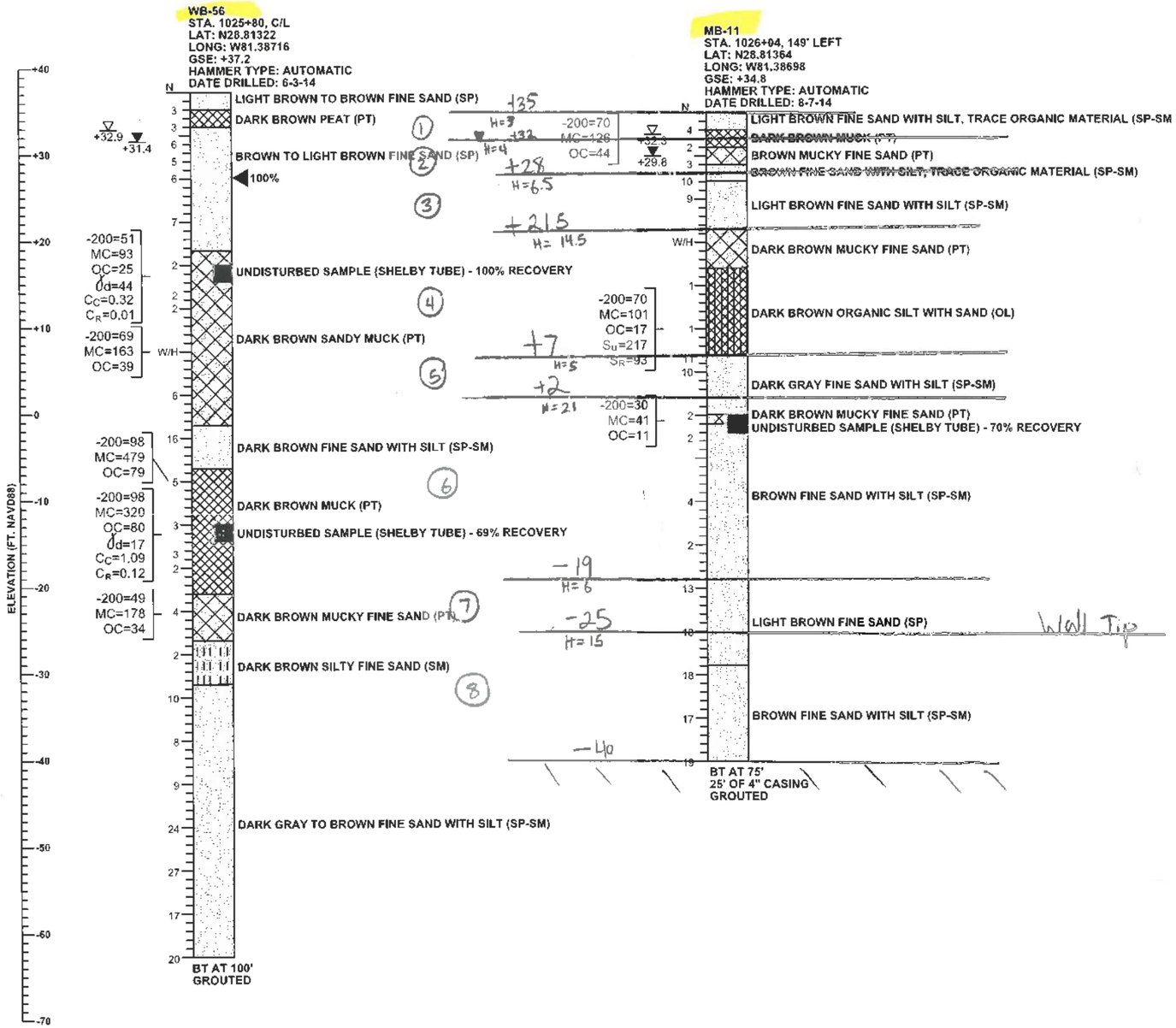
Layer	X = Stress (psf)	0.00 Sett. (in.)	X = Stress (psf)	5.00 Sett. (in.)	X = Stress (psf)	10.00 Sett. (in.)	X = Stress (psf)	15.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	263.69	0.05	302.44	0.06	347.92	0.07	401.31	0.07
12	327.57	0.05	371.87	0.06	423.01	0.07	482.02	0.08
		0.10		0.12		0.13		0.15

Layer	X = Stress (psf)	20.00 Sett. (in.)	X = Stress (psf)	25.00 Sett. (in.)	X = Stress (psf)	30.00 Sett. (in.)	X = Stress (psf)	35.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	463.96	0.09	537.34	0.10	622.99	0.11	722.45	0.13
12	549.96	0.09	628.00	0.10	717.24	0.11	818.74	0.13
		0.17		0.20		0.22		0.25

Layer	X = Stress (psf)	40.00 Sett. (in.)	X = Stress (psf)	45.00 Sett. (in.)	X = Stress (psf)	50.00 Sett. (in.)	X = Stress (psf)	55.00 Sett. (in.)
1	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
2	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
3	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
4	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
5	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
6	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
7	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
8	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
9	INCOMP.		INCOMP.		INCOMP.		INCOMP.	

10	INCOMP.		INCOMP.		INCOMP.		INCOMP.	
11	837.10	0.15	968.02	0.17	1115.75	0.19	1280.10	0.21
12	933.36	0.14	1061.66	0.16	1203.78	0.18	1359.34	0.20
		0.29		0.32		0.36		0.41

* Wall Settlement/Deflection: 1026+00



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
W/H	WEIGHT OF HAMMER
▽ +32.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +31.4	ENCOUNTERED GROUNDWATER ELEVATION (FT. NAVD88) 24 HRS. AFTER DATE DRILLED
◀	PERCENT LOSS OF DRILLING FLUID CIRCULATION
BT	BORING TERMINATED AT DEPTH INDICATED
-200=	PERCENT PASSING NO. 200 U.S. STANDARD SIEVE
MC=	PERCENT NATURAL MOISTURE CONTENT
OC=	PERCENT ORGANIC CONTENT
γd=	DRY UNIT WEIGHT (pcf)
C_C=	COMPRESSION INDEX
C_R=	RECOMPRESSION INDEX
S_U=	UNDRAINED SHEAR STRENGTH (psf)
S_R=	REMOLDED SHEAR STRENGTH (psf)

SAND | SAND AND MUCK | ORGANIC SILT | SAND AND SILT | MUCK

GENERAL NOTES

STANDARD PENETRATION TEST BORINGS WERE PERFORMED IN ACCORDANCE WITH ASTM D-1586. STANDARD PENETRATION RESISTANCES ARE SHOWN ON THE BORINGS AT THE TEST DEPTHS IN IN BLOWS PER FOOT UNLESS OTHERWISE NOTED.

SUBSURFACE CONDITIONS SHOWN REPRESENT THE CONDITIONS ENCOUNTERED AT THE BORING LOCATIONS. ACTUAL CONDITIONS BETWEEN THE BORINGS AND SOUNDINGS MAY VARY FROM THOSE SHOWN. UNIFIED SOIL CLASSIFICATIONS SHOWN ON THE BORINGS ARE BASED ON VISUAL EXAMINATION AND THE LABORATORY TESTING SHOWN.

THE BORING LOCATIONS WERE NOT SURVEYED. BORING LOCATIONS WERE ESTABLISHED IN THE FIELD USING A SUB-METER ACCURACY GPS UNIT (TRIMBLE GEO XT AND XH) FOR HORIZONTAL CONTROL. GROUND SURFACE ELEVATIONS ESTIMATED FROM PROJECT CROSS SECTIONS. BORING LOCATIONS REFERENCE THE SR 429 CENTERLINE.

SPLIT SPOON SAMPLER:
INSIDE DIAMETER: 1.375 IN.
OUTSIDE DIAMETER: 2.0 IN.
AVERAGE HAMMER DROP: 30 IN.
HAMMER WEIGHT: 140 LBS.
HAMMER TYPE: SEE BORING

SECTION: 26
TOWNSHIP: 19 SOUTH
RANGE: 29 EAST

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY OF SOIL

GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	RELATIVE DENSITY
SANDS	0-4	0-3	VERY LOOSE
	4-10	3-8	LOOSE
	10-30	8-24	MEDIUM DENSE
	30-50	24-40	DENSE
	OVER 50	OVER 40	VERY DENSE

NON-GRANULAR SOILS	MANUAL HAMMER N VALUE (blows per foot)	AUTOMATIC HAMMER N VALUE (blows per foot)	CONSISTENCY
SILTS, CLAYS, MUCK, PEAT	0-2	0-1	VERY SOFT
	2-4	1-3	SOFT
	4-8	3-6	FIRM
	8-15	6-12	STIFF
	15-30	12-24	VERY STIFF
	OVER 30	OVER 24	HARD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scale

5/22/2015 7:36:35 AM J:\D109\35200 Wekiva Parkway Section 7A\Boring19.dgn

WB-137 (Critical Offset 7-ft from Surcharge)					
Layer Elevation (ft NAVD88)	Layer Depth (ft)	[1]Initial Vertical Soil Stress (psf)	[1]Vertical Soil Stress Increase Due to Surcharge @ Wall (psf)	Total Vertical Soil Stress @ Wall (psf)	Total At Rest Horizontal Soil Stress @ Wall (psf)
32.5	2.5	50.5	0.1	50.6	25.3
29.2	5.8	227.4	41.0	268.4	134.2
23.5	11.5	480.1	255.3	735.4	367.7
17.8	17.2	732.8	461.0	1193.9	596.9
12.5	22.5	970.7	615.8	1586.5	793.3
5.0	30.0	1305.2	792.2	2097.4	1048.7
-5.0	40.0	1751.2	982.4	2733.6	1366.8
-15.0	50.0	2147.2	1139.2	3286.4	1643.2
-25.0	60.0	2493.2	1270.7	3763.9	1882.0
-32.5	67.5	2815.2	1355.5	4170.7	2085.3
-35.0	70.0	2985.3	1385.6	4370.9	2185.4
-38.5	73.5	3155.3	1415.7	4571.0	2285.5
-45.5	80.5	3537.5	1478.3	5015.8	2507.9
-52.5	87.5	3919.7	1533.2	5452.9	2726.4
-59.5	94.5	4301.9	1571.2	5873.1	2936.6
-66.5	101.5	4684.1	1622.9	6307.0	3153.5

Notes

1. From WinSAFI output.

WB-140 (Critical Offset 13-ft from Surcharge)					
Layer Elevation (ft NAVD88)	Layer Depth (ft)	[1]Initial Vertical Soil Stress (psf)	[1]Vertical Soil Stress Increase Due to Surcharge @ Wall (psf)	Total Vertical Soil Stress @ Wall (psf)	Total At Rest Horizontal Soil Stress @ Wall (psf)
32.5	2.5	51.0	0.0	51.0	25.5
30.5	4.5	168.9	3.6	172.5	86.2
26.1	8.9	277.8	58.2	336.0	168.0
20.4	14.6	361.7	223.3	585.0	292.5
14.6	20.4	445.7	415.5	861.2	430.6
8.9	26.1	529.6	590.8	1120.5	560.2
3.5	31.5	733.1	732.8	1465.9	733.0
-1.5	36.5	1056.1	847.9	1904.0	952.0
-6.5	41.5	1379.1	949.1	2328.2	1164.1
-11.5	46.5	1702.1	1038.7	2740.8	1370.4
-17.0	52.0	1922.4	1126.0	3048.4	1524.2
-22.0	57.0	2100.4	1196.5	3296.9	1648.5
-26.6	61.6	2271.1	1255.1	3526.2	1763.1
-31.9	66.9	2374.0	1314.7	3688.7	1844.3
-37.1	72.1	2476.9	1367.7	3844.6	1922.3
-42.4	77.4	2579.8	1414.7	3994.5	1997.2
-45.0	80.0	2742.0	1444.1	4186.1	2093.0
-50.0	85.0	2904.2	1473.4	4377.6	2188.8
-60.0	95.0	3450.2	1535.2	4985.4	2492.7
-70.0	105.0	3996.2	1582.3	5578.5	2789.2
-80.0	115.0	4542.2	1616.7	6158.9	3079.5
-90.0	125.0	5088.2	1640.5	6728.7	3364.4

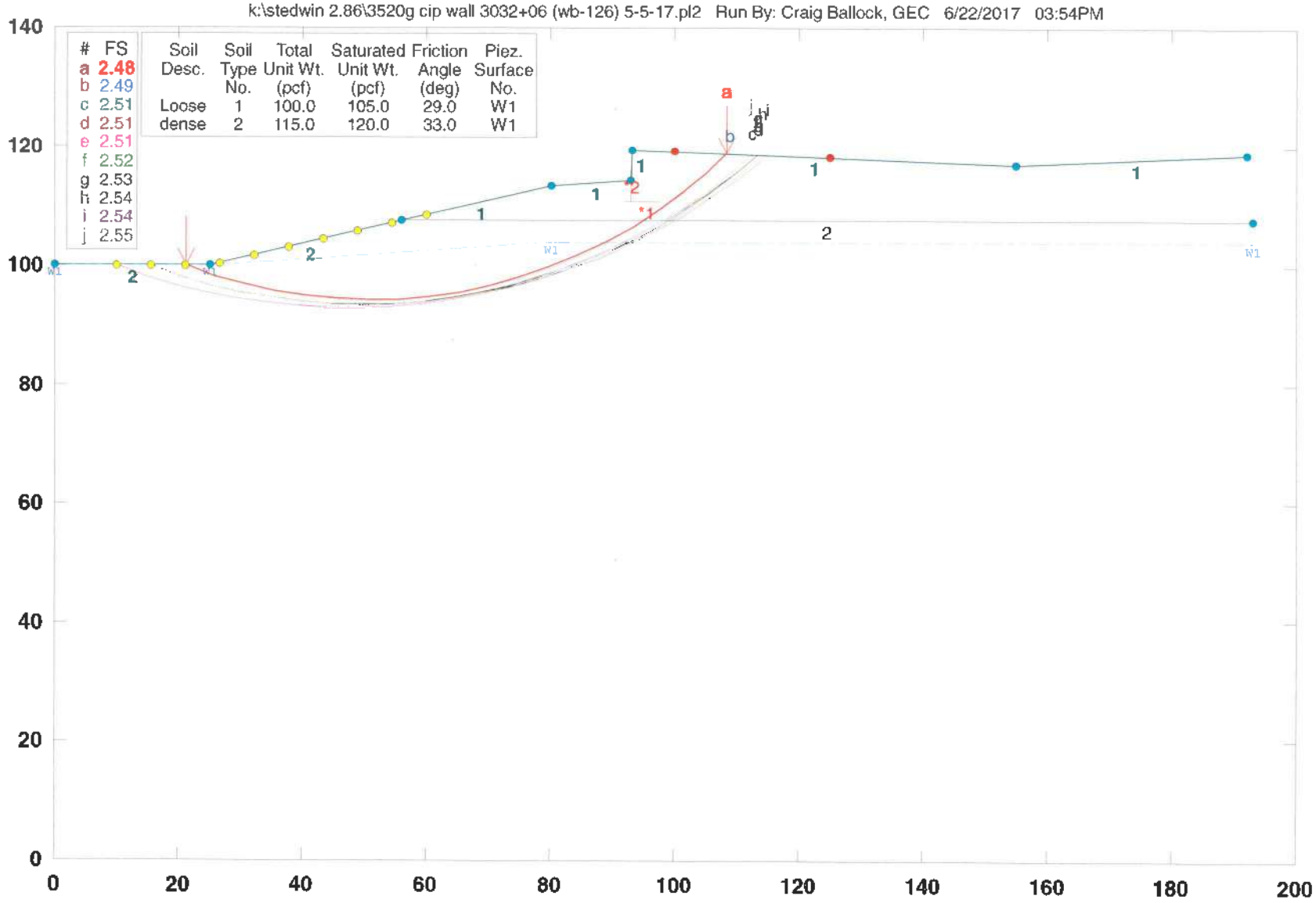
Notes

1. From WinSAFI output.

CIP CANTILEVER RETAINING WALL
GLOBAL STABILITY ANALYSIS

Wekiva 7A CIP Wall 3032+06

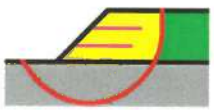
k:\stedwin 2.86\3520g cip wall 3032+06 (wb-126) 5-5-17.pl2 Run By: Craig Ballock, GEC 6/22/2017 03:54PM



STABL6H FSmin=2.48

Safety Factors Are Calculated By The Modified Bishop Method

STED



** STABL6H **
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 6/22/2017
Time of Run: 03:54PM
Run By: Craig Ballock, GEC
Input Data Filename: K:3520g cip wall 3032+06 (wb-126) 5-5-17.in
Output Filename: K:3520g cip wall 3032+06 (wb-126) 5-5-17.OUT
Plotted Output Filename: K:3520g cip wall 3032+06 (wb-126) 5-5-17.PLT
PROBLEM DESCRIPTION Wekiva 7A
CIP Wall 3032+06

BOUNDARY COORDINATES
7 Top Boundaries
8 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	100.00	25.00	100.00	2
2	25.00	100.00	56.00	107.50	2
3	56.00	107.50	80.00	113.50	1
4	80.00	113.50	93.00	114.30	1
5	93.00	114.30	93.01	119.50	1
6	93.01	119.50	155.00	117.00	1
7	155.00	117.00	192.00	118.80	1

8	56.00	107.50	193.00	107.50	2

ISOTROPIC SOIL PARAMETERS
2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	100.0	105.0	0.0	29.0	0.00	0.0	1
2	115.0	120.0	0.0	33.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
Unit Weight of Water = 62.40
Piezometric Surface No. 1 Specified by 4 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	100.00
2	25.00	100.00
3	80.00	104.00
4	193.00	104.00

Searching Routine Will Be Limited To An Area Defined By 2 Boundaries
Of Which The First 1 Boundaries Will Deflect Surfaces Upward

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)
1	92.00	110.80	99.00	110.80
2	93.00	110.80	93.01	119.50

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
100 Trial Surfaces Have Been Generated.
10 Surfaces Initiate From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 10.00 ft.
and X = 60.00 ft.
Each Surface Terminates Between X = 100.00 ft.
and X = 125.00 ft.
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00 ft.
5.00 ft. Line Segments Define Each Trial Failure Surface.
Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -20.0
And -20.0 deg.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	21.11	100.00
2	25.81	98.29
3	30.61	96.88
4	35.48	95.77
5	40.42	94.97
6	45.39	94.48
7	50.39	94.30
8	55.39	94.44
9	60.37	94.89
10	65.31	95.65
11	70.19	96.72
12	75.00	98.09
13	79.71	99.76
14	84.31	101.73
15	88.78	103.98
16	93.09	106.50
17	97.24	109.29
18	101.21	112.34
19	104.98	115.62
20	108.27	118.88

Circle Center At X = 50.7 ; Y = 174.0 and Radius, 79.7
*** 2.482 ***
Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	21.11	100.00
2	25.81	98.29
3	30.61	96.88
4	35.48	95.77
5	40.42	94.96
6	45.39	94.47
7	50.39	94.28
8	55.39	94.41
9	60.37	94.84
10	65.31	95.59
11	70.20	96.64
12	75.01	97.99
13	79.73	99.64
14	84.34	101.58
15	88.82	103.81
16	93.15	106.30
17	97.32	109.07
18	101.31	112.08
19	105.10	115.34
20	108.68	118.83
21	108.71	118.87

Circle Center At X = 50.9 ; Y = 174.6 and Radius, 80.3

*** 2.488 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	15.56	100.00
2	20.25	98.29
3	25.04	96.83
4	29.89	95.64
5	34.81	94.72
6	39.76	94.06
7	44.75	93.68
8	49.75	93.56
9	54.75	93.72
10	59.73	94.16
11	64.68	94.86
12	69.58	95.83
13	74.43	97.07
14	79.19	98.57
15	83.88	100.33
16	88.45	102.34
17	92.91	104.60
18	97.25	107.10
19	101.44	109.83
20	105.47	112.78
21	109.34	115.95
22	112.36	118.72

Circle Center At X = 49.3 ; Y = 185.2 and Radius, 91.7

*** 2.509 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	10.00	100.00
2	14.70	98.29
3	19.47	96.81
4	24.32	95.57
5	29.22	94.58
6	34.16	93.83
7	39.14	93.34
8	44.13	93.09
9	49.13	93.10
10	54.13	93.35
11	59.10	93.85
12	64.04	94.61

13	68.94	95.61
14	73.79	96.85
15	78.56	98.34
16	83.25	100.06
17	87.86	102.01
18	92.35	104.20
19	96.74	106.60
20	100.99	109.22
21	105.11	112.06
22	109.09	115.09
23	112.90	118.32
24	113.29	118.68

Circle Center At X = 46.6 ; Y = 192.8 and Radius, 99.8

*** 2.512 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	10.00	100.00
2	14.70	98.29
3	19.48	96.82
4	24.32	95.58
5	29.22	94.60
6	34.17	93.85
7	39.14	93.36
8	44.14	93.12
9	49.14	93.12
10	54.13	93.38
11	59.11	93.88
12	64.05	94.64
13	68.95	95.63
14	73.79	96.88
15	78.57	98.36
16	83.26	100.08
17	87.86	102.04
18	92.36	104.22
19	96.75	106.62
20	101.01	109.24
21	105.13	112.07
22	109.10	115.10
23	112.92	118.33
24	113.30	118.68

Circle Center At X = 46.5 ; Y = 193.0 and Radius, 100.0

*** 2.512 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	15.56	100.00
2	20.25	98.29
3	25.04	96.83
4	29.89	95.63
5	34.80	94.70
6	39.76	94.03
7	44.74	93.63
8	49.74	93.51
9	54.74	93.65
10	59.72	94.06
11	64.68	94.74
12	69.58	95.69
13	74.44	96.90
14	79.21	98.37
15	83.91	100.10
16	88.50	102.07
17	92.98	104.30
18	97.33	106.76
19	101.54	109.45
20	105.60	112.37
21	109.50	115.50

22	113.06	118.69

Circle Center At X = 49.6 ; Y = 186.0 and Radius, 92.5

*** 2.521 ***

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	15.56	100.00
2	20.25	98.29
3	25.04	96.83
4	29.89	95.64
5	34.81	94.71
6	39.76	94.04
7	44.74	93.64
8	49.74	93.50
9	54.74	93.64
10	59.72	94.05
11	64.68	94.72
12	69.59	95.66
13	74.44	96.86
14	79.23	98.32
15	83.92	100.03
16	88.52	101.99
17	93.01	104.20
18	97.37	106.65
19	101.59	109.33
20	105.66	112.23
21	109.57	115.34
22	113.31	118.66
23	113.33	118.68

Circle Center At X = 49.7 ; Y = 186.5 and Radius, 93.0

*** 2.526 ***

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	15.56	100.00
2	20.26	98.29
3	25.04	96.84
4	29.89	95.64
5	34.80	94.70
6	39.76	94.02
7	44.74	93.61
8	49.74	93.46
9	54.74	93.58
10	59.72	93.97
11	64.68	94.62
12	69.60	95.53
13	74.46	96.70
14	79.25	98.13
15	83.96	99.81
16	88.57	101.74
17	93.07	103.91
18	97.46	106.32
19	101.70	108.96
20	105.81	111.82
21	109.75	114.89
22	113.52	118.17
23	114.03	118.65

Circle Center At X = 50.0 ; Y = 187.5 and Radius, 94.0

*** 2.541 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	10.00	100.00
2	14.70	98.29
3	19.47	96.81
4	24.32	95.56
5	29.21	94.56

6	34.16	93.79
7	39.13	93.27
8	44.12	93.00
9	49.12	92.97
10	54.12	93.18
11	59.10	93.64
12	64.05	94.35
13	68.96	95.29
14	73.81	96.48
15	78.61	97.90
16	83.32	99.56
17	87.96	101.44
18	92.49	103.55
19	96.91	105.88
20	101.22	108.43
21	105.39	111.18
22	109.43	114.13
23	113.31	117.28
24	114.81	118.62

Circle Center At X = 47.2 ; Y = 194.8 and Radius, 101.9

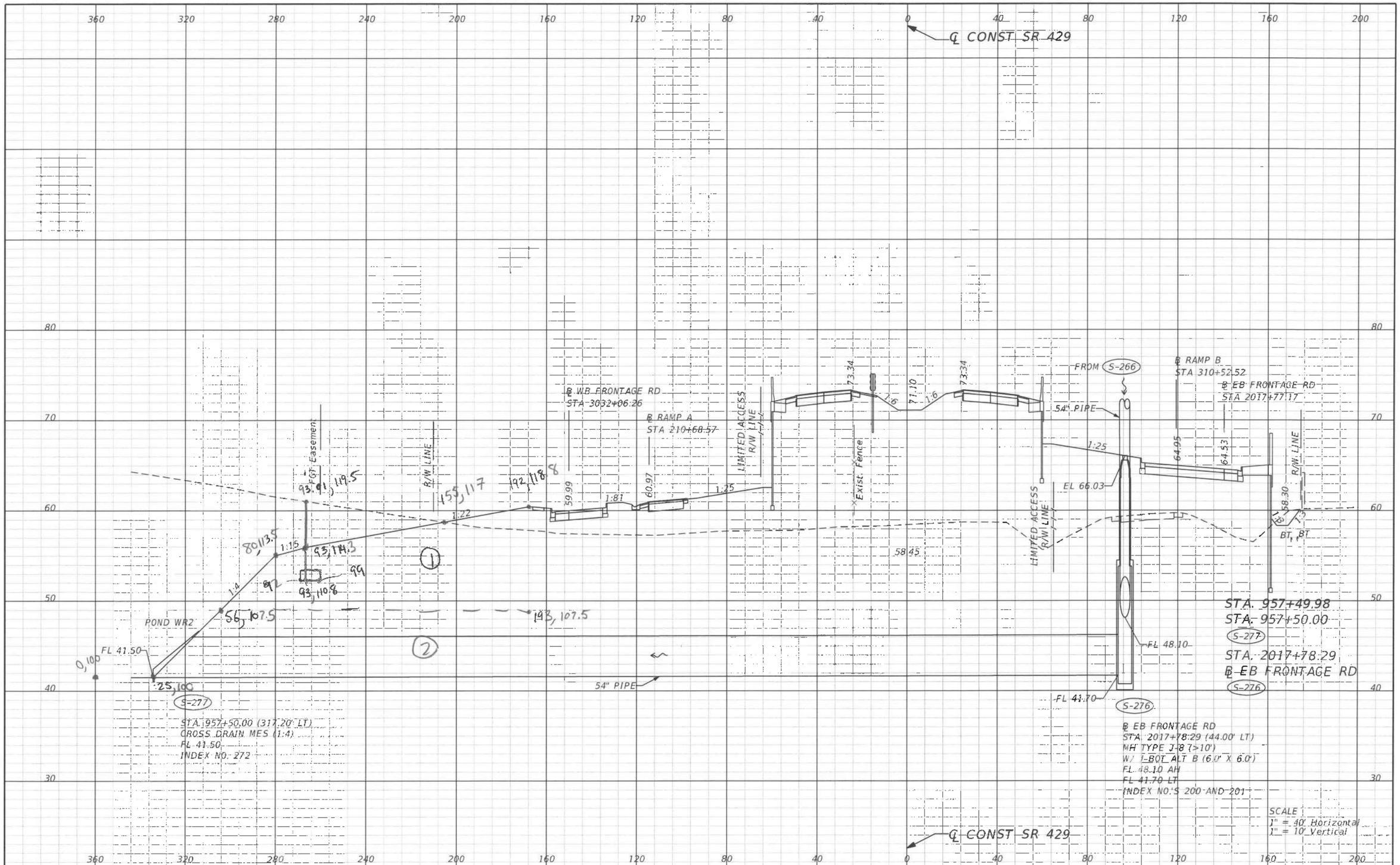
*** 2.541 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	21.11	100.00
2	25.81	98.29
3	30.60	96.86
4	35.47	95.72
5	40.40	94.87
6	45.37	94.31
7	50.36	94.04
8	55.36	94.07
9	60.35	94.39
10	65.31	95.01
11	70.23	95.92
12	75.08	97.11
13	79.86	98.59
14	84.54	100.36
15	89.10	102.39
16	93.54	104.69
17	97.84	107.25
18	101.98	110.05
19	105.94	113.10
20	109.72	116.37
21	112.14	118.73

Circle Center At X = 52.4 ; Y = 178.7 and Radius, 84.7

*** 2.550 ***



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DUSTIN E. PERKINS
P.E. LICENSE NO. 69225
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

DRAINAGE STRUCTURES

SHEET NO. 357

scott_harris 5/2/2015 9:03:17 PM O:\Projects\CADD\24020025201\drainage\Xsect\DRXSRD01_WR2.DGN