Final Report of Geotechnical Engineering Investigation
for Muck Surcharge
WEKIVA PARKWAY (SR 429) SECTION 7A
Lake Markham Road Bridge Surcharge Area
Station 1019+00 to 1029+00
Seminole County, Florida
FPID No. 240200-2-52-01
GEC Project No. 3520G

July 13, 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 Muck Surcharge
WEKIVA PARKWAY (SR 429) – SECTION 7A
Lake Markham Road Bridge Surcharge Area
Station 1019+00 to 1029+00
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 present this Report of Geotechnical Engineering Investigation for the above-referenced project. The purpose of this investigation was to explore soil and groundwater conditions at Lake Markham Road Bridge site within the area of deep, buried organic soils and to use the information obtained to develop recommendations for treatment of the deep organic soils through a surcharge program. This report describes our exploration procedures, exhibits the data obtained and presents our conclusions and geotechnical engineering recommendations regarding the design and construction of the proposed muck surcharge.

Our analyses and recommendations are based on project information provided by AECOM and data collected by GEC.

GEC appreciates the opportunity to be of service to AECOM and FDOT on this project. If you should have any questions concerning the contents of this report, please 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

CGB/DCS/dbj

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

Table of Contents

FIGURES CONTINUED

APPENDIX A

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 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.

This report specifically addresses the proposed improvements along the Wekiva Parkway Section 7A project alignment between Stations 1019+00 and 1029+00 where deep, buried organic soils were encountered…

This report specifically addresses the proposed improvements along the Wekiva Parkway Section 7A project alignment between Stations 1019+00 and 1029+00 where deep, buried organic soils were encountered during the geotechnical field investigation associated with the proposed Lake Markham Road bridge site. The proposed bridge site is approximately 120 feet north of the existing "T" intersection of SR 46 and Lake Markham Road. The bridge site is currently undeveloped with heavy tree cover that predominantly consists of longleaf pine at the eastbound bridge site and a combination of longleaf pine and cypress trees at the westbound bridge site. In addition, the bridge site is bordered to the north by Yankee Lake. The project site is depicted on an excerpt of the U.S. Geological Survey (USGS) Sanford SW, Florida Quadrangle Map (**Figure 1**) in the **Appendix**.

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

- The proposed SR 429 roadway typical section in this area includes a four-lane divided (expandable to six-lane divided) section. The proposed roadway profile high fill embankment ranging in height from 30 to 40 feet above existing grade.

- Two service road alignments (north and south of SR 429), referred to as the EB and WB Frontage Roads, to provide access to local traffic. A round-about intersection is proposed at the intersection of Lake Markham Road and the SR 429 Frontage Roads.
- The SR 429 over Lake Markham Road Bridge (Bridge Nos. 770103/104) located from Station 1021+21 to 1024+79. The proposed bridge site includes twin bridges with three bents/piers. The proposed pile foundation for the bridge site is 24-inch steel pipe piles due to a highly variable bearing layer encountered at the bridge site.
- One, approximately 282-ft long, 9-ft by 2-ft box culvert structure.
- An approximately 1140-ft long sheet pile wall along the northern SR 429 R/W line to mitigate settlement of the FGT gas line to the north of the proposed surcharge area.

…GEC recommends a program of special embankment construction with surcharging to facilitate roadway embankment, bridge foundation, wall, and box culvert construction in this area.

Because of the depth of the organic soil layers encountered along this section of the project alignment, 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 roadway embankment, bridge foundation, wall, and box culvert construction in this area. This report describes our exploration procedures, exhibits the data obtained and presents our conclusions and geotechnical engineering recommendations regarding the design and construction of the proposed muck surcharge. Our geotechnical recommendations and the results of the geotechnical investigations for the bridge, walls 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, historic aerials of the project site and other published sources. A summary of this information is presented in the following report sections.

2.1 NRCS Soil Survey

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 Lake Markham Road bridge site. According to the NRCS map, the soils in the vicinity of the proposed bridge site are summarized below. The NRCS Soil Survey map of the project area is shown on **Figure 1** 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)
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	
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	

At the Lake Markham Road bridge site, the NRCS soil survey map depicts Basinger, Samsula and Hontoon soils, depressional (10).

At 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.

2.2 USGS Quadrangle and Historical Aerial Maps

Based on our review of the USGS Sanford Southwest, Florida Quadrangle map and the project plans, the existing ground surface elevations at the Lake Markham Road Bridge site typically range from approximate +35 to +38 feet NAVD88.

…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. Lakes in the vicinity of the project alignment include Miranda Lake, Ross Lake, Yankee Lake, and Sylvan Lake.

…a historic drainage slough connection between Yankee Lake and Sylvan Lake may have existed…

GEC also reviewed historical aerials of the proposed Lake Markham Road Bridge site. Historical aerials indicate that a historic drainage slough connection between Yankee Lake and Sylvan Lake may have existed in the vicinity of Stations 1025+00 and 1027+00 of the project alignment prior to the construction of the existing SR 46.

The project alignment and proposed surcharge area are depicted on an excerpt of the U.S. Geological Survey (USGS) Sanford SW, Florida Quadrangle Map and an excerpt of the historical aerial map (**Figure 1**) in the **Appendix**.

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 bridge site. The approximate potentiometric surface elevation at the proposed bridge site is +21 feet

…artesian flow conditions are not anticipated at this site.

NAVD88. Since the existing ground surface elevations at the proposed bridge site are above the predicted potentiometric surface, artesian flow conditions are not anticipated at this site. Artesian conditions were not encountered in any of the boring locations performed in this area.

3.0 SUBSURFACE EXPLORATION

In addition to consulting the sources of information previously discussed for regional and site-specific soils data, GEC conducted a subsurface exploration to evaluate soil and groundwater conditions for the bridge, MSE walls and box culvert proposed between stations 1019+00 to 1029+00. Since highly compressible organic soils (muck/peat) were encountered in some of these borings, additional muck delineation borings were performed in this area. A summary table of the borings performed in this area is shown below:

Table 2
Summary of Surcharge Area Boring Plan

Boring No.	Station	Offset	Depth (ft)	Boring Type
WB-53E	1019+25	60 LT	75	SPT
WB-53D	1019+50	124 LT	100	SPT
WB-53B	1019+50	60 LT	75	SPT
WB-53G	1019+50	10 LT	50	SPT
WB-53C	1019+50	60 RT	100.1	CPT
WB-53F	1019+75	60 LT	120	SPT
WB-54	1020+55	34 LT	83.5	CPT
MB-1	1020+12	162 LT	75	SPT
WB-55	1020+40	C/L	100	SPT
MB-2	1020+81	59 LT	75	SPT
BR-19	1021+28	6 RT	120.5	SPT
BR-22	1021+37	40 LT	210.5	SPT
MB-3	1021+32	152 LT	75	SPT
MB-4	1022+30	25 LT	80	SPT
MB-5	1022+60	122 LT	75	SPT
BR-20	1023+09	32 RT	130.5	SPT
BR-23	1023+19	46 LT	225.5	SPT
MB-6	1023+68	118 LT	75	SPT
MB-7	1023+95	7 LT	80	SPT

Boring No.	Station	Offset	Depth (ft)	Boring Type
MB-8	1024+83	150 LT	75	SPT
BR-21	1024+76	20 RT	153	SPT
BR-24	1024+86	30 LT	168	SPT
MB-10	1025+45	56 LT	75	SPT
MB-9	1025+50	85 RT	85	SPT
WB-56	1025+80	C/L	100	SPT
MB-11	1026+04	149 LT	75	SPT
MB-12	1026+50	25 RT	67.9	CPT
WB-57	1026+50	80 RT	90	SPT
MB-13	1026+75	58 LT	75	SPT
BC-1	1027+25	115 LT	30	SPT
BC-2	1027+28	20 LT	30	SPT
MB-14	1027+36	63 RT	115	SPT
BC-3	1027+43	130 RT	100	SPT
WB-58	1028+07	60 LT	80	SPT
MB-15	1028+40	65 RT	75	SPT

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. All of the boring stations and offsets are referenced from the SR 429 baseline of construction. Boring locations are depicted on the **Surcharge Control Sheet Plan View** in the **Appendix**.

3.1 SPT 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.

3.2 Groundwater Measurement

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

3.3 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**.

3.4 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**.

3.5 Field Vane Shear Test

Vane shear tests were conducted at boring locations MB-1, MB-8, MB-11 and MB-14 on the organic soil layers encountered at the Lake Markham Road Bridge site. 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).

4.0 LABORATORY TESTING

Selected soil samples retrieved from the borings 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 is reviewed annually by the Construction Materials Engineering Council, Inc. (CMEC) to verify compliance with FM. Our laboratory testing program is summarized on the following table:

Table 3
Summary of Laboratory Testing Program

Type of Test	Number of Tests
Percent Fines (FM 1-T88)	123
Atterberg Limits (FM 1-T89/90)	11
Natural Moisture Content (FM 1-T265)	71
Organic Content (FM 1-T 267)	60
Unit Weight (ASTM D7263-09)	7
Specific Gravity (FM 1-T100)	7
Consolidation Test (ASTM D-2435)	7

The results of our soil classification tests are shown adjacent to the soil profiles on the SPT Boring Results in the **Appendix**.

4.1 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 4
Summary of Consolidation Test Results

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	C_v	C_α
BR-24	PT	20.5 – 22.5	2	2.57	0.49	1.06	2.16	0.38	0.04	1.4	0.005
WB-56	PT	20 – 22	2	2.01	0.41	1.17	2.85	0.32	0.01	2.4	0.004
MB-14	PT	50 – 52	2	1.90	1.2	1.35	1.13	0.34	0.04	1.1	0.004
MB-10	PT	20 – 22	W/H	6.14	0.54	0.73	1.35	1.14	0.11	0.9	0.006
WB-56	PT	50 – 52	3	4.89	0.83	1.81	2.18	1.09	0.12	0.6	0.005
MB-14	PT	35 – 37	3	3.60	0.95	1.86	1.96	0.75	0.08	0.9	0.005
BC-3	PT	30 – 32	4	3.87	0.95	1.79	1.88	0.80	0.20	1.3	0.004

5.0 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.*

5.1 Soil Strata

The borings and soundings performed between Stations 1019+00 to 1029+00 encountered highly variable subsurface conditions.

The borings and soundings performed between Stations 1019+00 to 1029+00 encountered highly variable subsurface conditions. Highly compressible organic soils (muck/peat) were encountered at or just below the ground surface in several borings. This surface muck layer is generally less than 5 feet thick and within 10 feet of the ground surface. In several borings, buried muck layers were encountered. The buried muck to the west of the Lake Markham Road Bridge extended from approximate elevations +20 to +10 and from 0 to -10 feet NAVD88. To the east of the Lake Markham Road Bridge, the buried muck extended from approximate elevation +15 to -20 and from -25 to -50 in some borings. In the area of the Lake Markham Road round-about intersection, the buried muck layers are negligible.

The muck layers 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 encountered organic soils in this project area is included in the following **Table 5**.

Table 5
Summary of Encountered Organic Soils

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	---	---
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

Boring No.	Station	Offset (ft)	Depth Range (feet)	Organic Content (%)	N-Value (blows/ft)
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"
BC-3	1027+43	130 RT	27 – 53	57 – 66	1 – 7
			57 – 98	29 - 80	1 – 4
WB-58	1028+07	50 LT	---	---	---
MB-15	1028+40	65 RT	2 – 4	---	---

For detailed subsurface profiles encountered at each of the boring/sounding locations see the Report of SPT Borings and CPT Soundings sheets in the **Appendix**.

5.2 Groundwater Levels

GEC measured groundwater levels at the boring locations 24-hours after the completion of the borings. The encountered, 24-hour stabilized groundwater levels at the SPT boring locations ranged from elevations of +26.3 to +33.1 feet NAVD88.

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 on the site can be expected to vary from those measured by GEC during this investigation.*

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

GEC estimated seasonal high groundwater levels for each boring location. We estimate seasonal high groundwater elevations will range from approximately +29.9 to +35.6 feet

NAVD88. The encountered and estimated seasonal high groundwater levels at the boring locations are presented on the Boring Results sheets in the **Appendix**.

6.0 ANALYSES AND RECOMMENDATIONS

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. If variations from the conditions described in this report do become evident during construction, or if project characteristics described in this report change, GEC should be retained so that we can reevaluate this report's conclusions and recommendations in light of such changes.

6.1 Special Roadway Construction

The subsurface exploration results from Station 1019+00 to 1029+00 encountered highly variable soils as previously discussed. Project elements in this area include embankments as high as 42 feet above existing grade, MSE walls, box culverts and the Lake Markham Road Bridge from Station 1021+21 to 1024+79. Constructing these project elements with normal subsoil preparation would result in intolerable settlements to the embankments, MSE walls and box culverts. Also, due to the highly variable subsurface conditions, significant differential settlements would likely occur and cause significant distress to the structure elements. Possible negative skin friction and downdrag loading could also occur to the bridge end bent piles installed in the embankment areas.

For all of these reasons, conventional site preparation and construction methods are not feasible at this location. Possible construction alternatives include:

1. Total removal of all the organic soils (demucking).
2. Extending the bridge past the areas of highly compressible buried organic soils.
3. Ground improvement program such as rigid inclusions.
4. Ground improvement program consisting of a surcharge.

Because of the depth of the deep, buried organic soil layers, total demucking and ground improvement techniques, such as rigid inclusions, are not practical. Extending the bridge is also

not an economically feasible alternative. Based on our discussions with the FDOT Geotechnical Department and evaluation of mitigation alternatives for the organic soil deposits at the Lake Markham Road bridge site, GEC recommends a program of special embankment construction with surcharging to facilitate embankment, bridge foundation, culvert and wall construction. The surcharge zone is composed of 3 surcharge areas, referred to as Surcharge A, B & C. The following table summarizes the approximate surcharge geometry.

Table 6
Summary of Surcharge Geometry

Surcharge ID	Approximate Stations	Approximate Offset (feet)	Surcharge Height Above Final Grades (feet)	Approx. Surcharge Height Above Existing Grades (feet)	Side Slopes	Estimated Surcharge Duration After Construction (months)
A	1019+00 to 1022+14	132 LT to 100 RT	10	50	1:2	6 to 9
B	1022+14 to 1023+91	140 LT to 100 RT	10	20	1:2	
C	1023+91 to 1028+86	132 LT to 140 RT	10	50	1:2	

Embankment construction in the surcharge area requires the implementation of special design and construction techniques and procedures. This includes temporary retaining walls on the north and south sides of the surcharges due to right-of-way limitations. Our recommendations for special embankment construction and detailed information concerning the surcharge program, monitoring instrumentation and embankment construction over soft soils are contained in the **Technical Special Provisions** included in the **Appendix**. A plan view of the surcharge area is presented on the **Surcharge Control** sheets in the **Appendix**. In addition, **Surcharge Typical Sections**, **Profile**, **Cross-Sections**, **Instrumentation**, **Wick Drain Plan View Limits** and **Geosynthetic Reinforcement Plan View** sheets are included in the **Appendix**. The surcharge should not be removed until the Engineer authorizes removal and the rate of settlement, as measured by the settlement plates, is less than 0.1 inches per month.

Our recommendations… concerning the surcharge program… are contained in the **Technical Special Provisions** included in the **Appendix**.

As described in the **Technical Special Provisions**, the shallow organic soils encountered between stations 1019+00 and 1029+00 should be removed in accordance with the project plans and Index 500 of the FDOT Design Standards. Demucking should be conducted "in-the-

dry" to enable proper visual identification of muck removal and to allow for proper compaction of backfill soils. Muck removal limits are shown on the surcharge cross-sections.

6.2 Surcharge Area Embankment Settlement Analyses

GEC conducted settlement analyses to calculate total embankment settlement due to primary consolidation of the deep organic soil layers at the Lake Markham Road Bridge site using soil consolidation parameters (summarized in **Table 4**) developed from the consolidation test results (plots are included in the **Appendix**) and the computer program WINSAF-I. The WINSAF-I program output is included in the **Appendix**.

Primary consolidation settlement is only one portion of the total anticipated settlement of organic soils. It is important to realize that construction of embankments over organic soil deposits will result in long-term embankment settlement due to secondary consolidation of the organic material. Secondary consolidation occurs due to deformation of the soil structure after primary consolidation is complete. Secondary consolidation settlement calculations are included in the **Appendix**.

Due to the variability in encountered organic soil depths and locations at the Lake Markham Road Bridge site, GEC evaluated the worst case soil conditions encountered at boring location MB-14 (1027+36, 63' RT) for settlement estimates. The following table summarizes the results of our settlement analyses for the Lake Markham Road bridge site.

Table 7
Summary of Estimated Soil Settlement
Boring Location MB-14

Settlement Type	Estimated Settlement (inches)
Short-term Primary Elastic Sand Settlement	7.3
Short-term Primary Consolidation Muck Settlement	34.7
Long-term Secondary Consolidation Muck Settlement	3.7
Total Long and Short-term Settlement	45.7

Due to the cohesionless, granular nature of the surficial sand layers in the subsurface profile, it appears that about 7 inches of settlement will occur concurrently with embankment construction. However, the time rate of consolidation of the buried organic soil will be slower than the surficial sand layers. Calculations using the coefficients of consolidation obtained from the consolidation tests indicate about 33 months are required to achieve 95 percent of primary consolidation of the organic soil layers after the embankment has been placed. To accelerate primary consolidation of the organic soil layers and reduce long-term secondary consolidation of the organic soil layers, a surcharge program is recommended prior to construction of the Lake Markham Road Bridge.

GEC analyzed a 10-foot high surcharge (10 feet above proposed final roadway grades) at the proposed Lake Markham Road bridge site. Settlement calculations were performed to evaluate the amount of time necessary to achieve about 100 percent of primary consolidation after the embankment and surcharge have been placed. Primary consolidation settlement is expected to begin during construction of the embankment and surcharge (we have assumed an embankment construction period of about 90 days), and to continue beyond fill placement into the surcharge program, at which point secondary settlement would begin to occur.

In order to reduce the time required for primary consolidation to occur, we recommend the use of vertical wick drains to shorten the soil drainage path. In order to limit the surcharge period to a realistic time frame of about 6 months (180 days), a wick drain spacing of 10 feet was calculated. The calculations for wick drain spacing and time rate settlement curves are attached in the **Appendix**.

The surcharge program also reduces the anticipated quantity of secondary consolidation settlement of the organic soils. The following table presents the results of our settlement calculations showing the quantity of estimated settlement occurring both with and without the surcharge.

Table 8
Summary of Estimated Settlements with Surcharge Program
Boring Location MB-14

Settlement Type	Settlement With No Surcharge (inches)	Settlement During 10-ft Surcharge with 10-ft Wick Drain Spacing (inches)	Settlement Post Surcharge (inches)
Short-term Primary Elastic Sand Settlement	7.3	8.0	0.0
Short-term Primary Consolidation Muck Settlement	34.7	40.8	0.0
Long-term Secondary Consolidation Muck Settlement	3.7	2.8	0.9
Total Long and Short-term Settlement	45.7	51.6	0.9

With the application of the surcharge program at the Lake Markham Road bridge site, the total long-term settlements after removal of the surcharge and construction of the roadway embankment and Lake Markham Road Bridge are estimated to be less than 1 inch. Based on this relatively minor post-construction abutment fill settlement, the pile foundation proposed for this structure can be designed and installed with acceptable foundation settlement. In addition, MSE walls at the Lake Markham Road bridge site can be constructed as single phase walls and the box culvert can be constructed on a shallow foundation. This recommendation is dependent on the application of the recommended surcharge.

During the duration of the surcharge program the adjacent SR 46 roadway embankment may settle in conjunction with the settlement of the surcharge area. We recommend the following note be included in the roadway plans regarding monitoring requirements of the existing SR 46 during the surcharge program:

> *During the duration of the surcharge program the existing SR 46 roadway embankment may settle between 1 to 6 inches. The contractor shall monitor SR 46 along the surcharge program limits for any pavement cracking and/or settlement to the existing roadway that occurs during the surcharge program. If pavement distress is observed and, in the opinion of the engineer, the distress poses an immediate danger to the traveling public then the contractor shall perform all remedial work that is required to provide temporary mitigation for the defect and restore the pavement to a safe condition. Temporary mitigation includes*

the use of traffic control systems such as barricades, drums, or other approved devices to secure the area including lane closures if necessary, and constructing temporary repairs making it safe for the roadway user.

6.3 Temporary Retaining Walls and Surcharge Slope Stability Recommendations

Due to the very weak nature of the organic soils, stability of the embankments (including surcharges) constructed over organic deposits is of critical concern. Therefore, the critical cross sections at Stations 1020+00, 1025+00 and 1027+00 were analyzed for embankment global stability. This includes FDOT Type 3 temporary wire face retaining walls on the north and south sides of the surcharges due to right-of-way limitations.

The fill to be placed behind the temporary 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 temporary 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 temporary walls, including minimum MSE wall strap lengths and factored bearing pressures, are included in the **Appendix** and are summarized in the following **Table 9**.

Table 9
MSE Wall Minimum Strap Length and Factored Bearing Pressures

Wall TW-1	Wall Height (ft.)	0 – 6	8	10	12	14	16	18	20
	[1]Reinforcement Length (ft.)	8	10	12	14	16	19	21	23
	[2]Factored Bearing Resistance (psf)	1,720	2,079	2,456	2,832	3,208	3,872	4,248	4,624
Wall TW-2	Wall Height (ft.)	0 – 6	8	10	12	14	---	---	---
	[1]Reinforcement Length (ft.)	8	10	12	14	16	---	---	---
	[2]Factored Bearing Resistance (psf)	1,720	2,079	2,456	2,832	3,208	---	---	---

1. The soil reinforcement lengths shown in this column are minimum lengths required for external stability. FDOT minimum strap length criteria of 8 feet or 0.7 times the wall height, whichever is greater, is applied. The proprietary wall companies are responsible for internal stability of the retaining walls. The reinforcement lengths used in the construction of the retaining walls shall be the longer of that required for internal or external stability.
2. Factored Bearing Resistance at base of wall corresponding to adequate capacity to demand ratios for overturning, sliding, bearing capacity and global stability.

We recommend the following soil parameters be shown in the plans for use by the temporary retaining wall vendors and the contractor:

Table 10
Recommended Soil Parameters for Surcharge Temporary Retaining Walls

	Reinforced Soil - Sand	Retained Backfill - Sand	Foundation Soil - Loose Fine Sand
Depth Below Existing Ground Line (ft)	---	---	0 – 20
Effective Unit Weight (pcf)	105	115	100
Internal Friction Angle	30°	32°	28°
Cohesion (psf)	0	0	0

The soil profiles and embankment geometry were used to analyze the global stability of the surcharge using the computer program STABL6H. This program incorporates Bishop's Modified Method of Slices and allows incorporation of reinforcing grids to enhance slope stability. In accordance with FDOT guidelines, a minimum factor of safety of 1.5 was used in our analysis.

The results of our analyses indicate that the proposed surcharges with temporary retaining walls exceed a minimum factor of safety of 1.5 for global stability with the incorporation of reinforcing grids. Refer to **Typical Section Sheets A-A'** and **C-C'**, the **Surcharge Technical Special Provisions** and FDOT Specification 985 for details regarding the installation requirements and minimum strength properties for the geosynthetic reinforcement for

Surcharges A and C. Surcharge B does not require geosynthetic reinforcement. The results of our analyses are included in the **Appendix**.

7.0 USE OF THIS REPORT

GEC has prepared this report for the exclusive use of our clients, AECOM and 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.

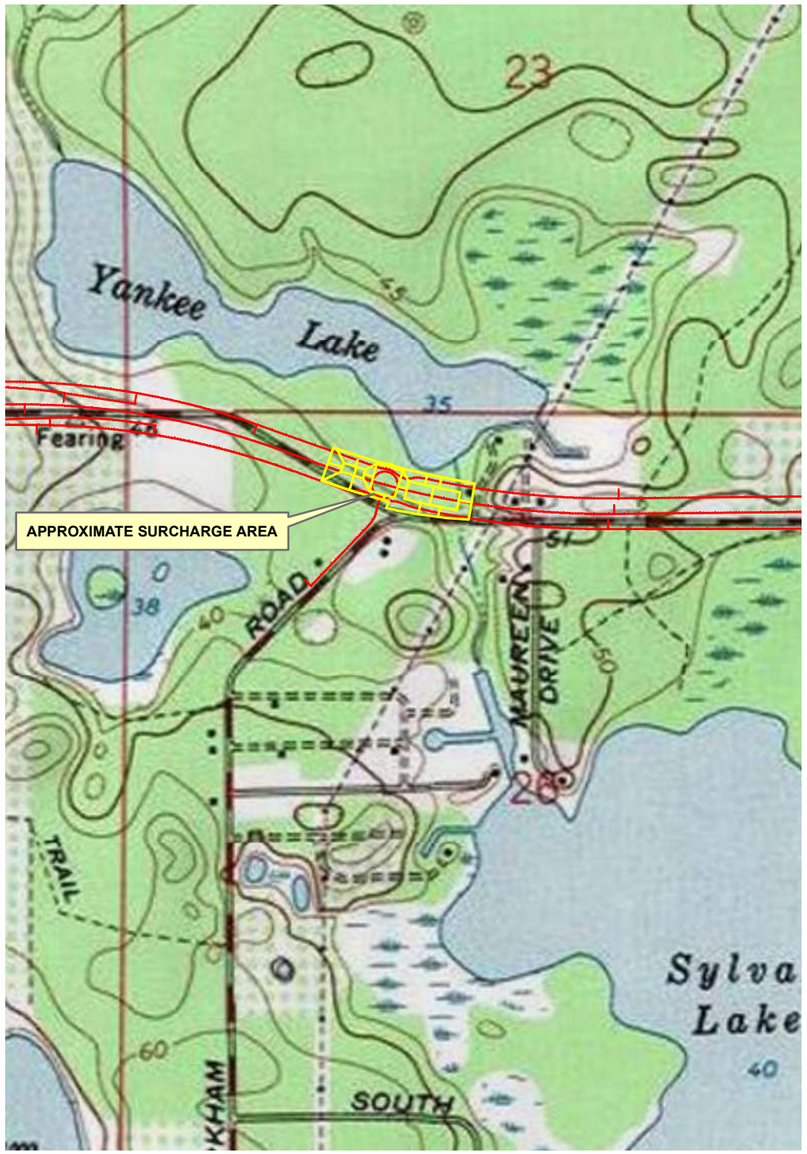
The sole purpose of the borings performed by GEC at this site was to obtain indications of subsurface conditions as part of a geotechnical exploration program. GEC has not evaluated the soil from the roadway and pond borings for the potential presence of contaminated soil or groundwater, nor have we subjected any soil samples to analysis for contaminants.

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.

The conclusions or recommendations of this report should be disregarded if the nature, design, or location of the facilities is changed. If such changes are contemplated, GEC should be retained to review the new plans to assess the applicability of this report in light of proposed changes.

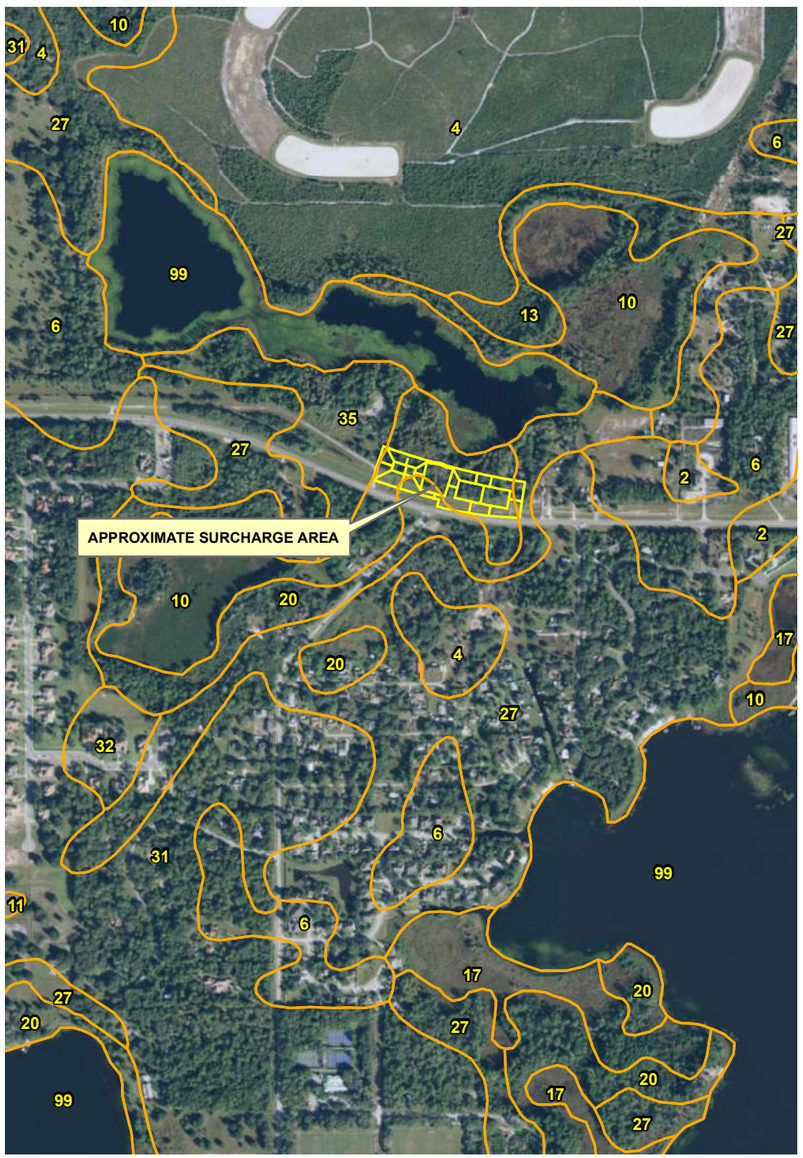
APPENDIX

USGS QUADRANGLE AND NRCS SOIL SURVEY MAP



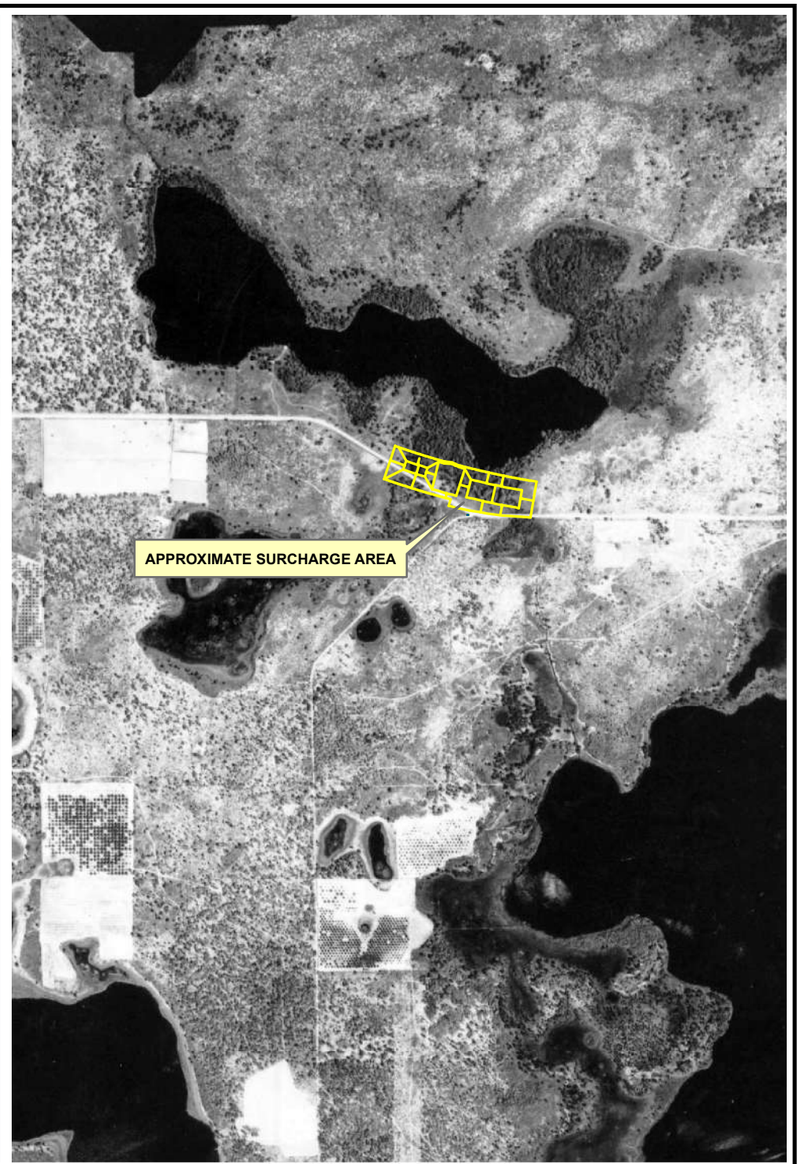
USGS Sanford SW, FL Quadrangle Map
Section: 26
Township: 19 South
Range: 29 East

0 500 1,000
Feet



NRCS Soil Survey of Seminole County, FL
Seminole County Map Unit Legend
10 - Basinger, Samsula, and Hontoon soils, depressional
20 - Myakka and EauGallie fine sands

0 500 1,000
Feet



USDA Aerial Photographs of Seminole County - Flight 2 (1940)

NOT TO SCALE

REVISIONS

DATE	BY	DISCRIPTION	DATE	BY	DISCRIPTION

Geotechnical and Environmental Consultants, Inc. (GEC)
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

STATE OF FLORIDA
DEPARTMENT OF TRANSPORATATION

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

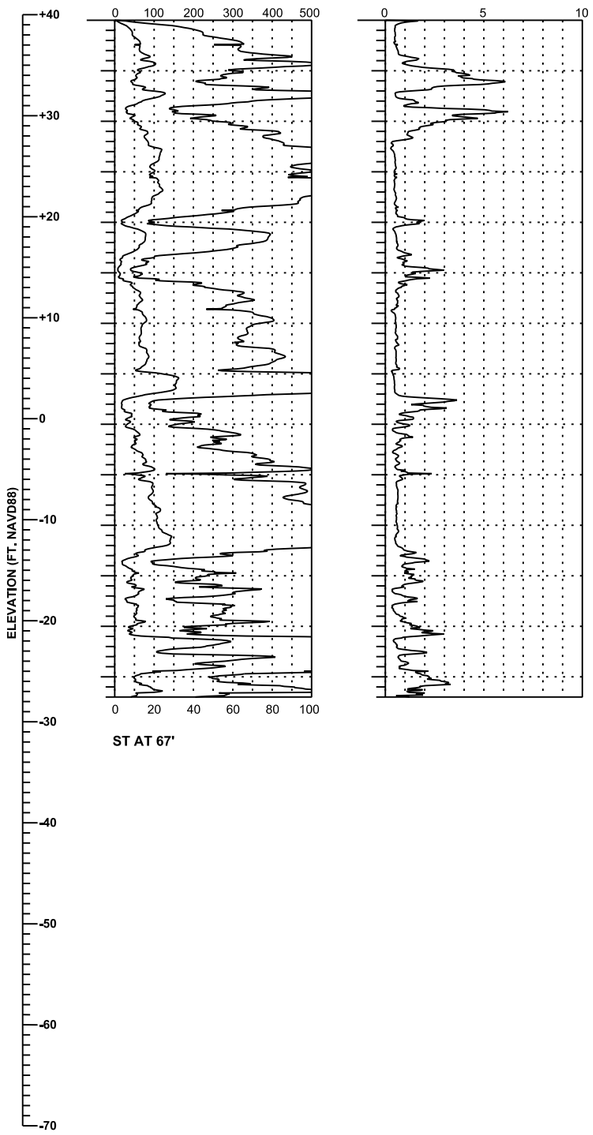
SURCHARGE AREA USGS QUADRANGLE, NRCS SOIL SURVEY AND HISTORICAL MAPS

SHEET NO.

J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\3520G 7A surchargequad.mxd 5/22/2015

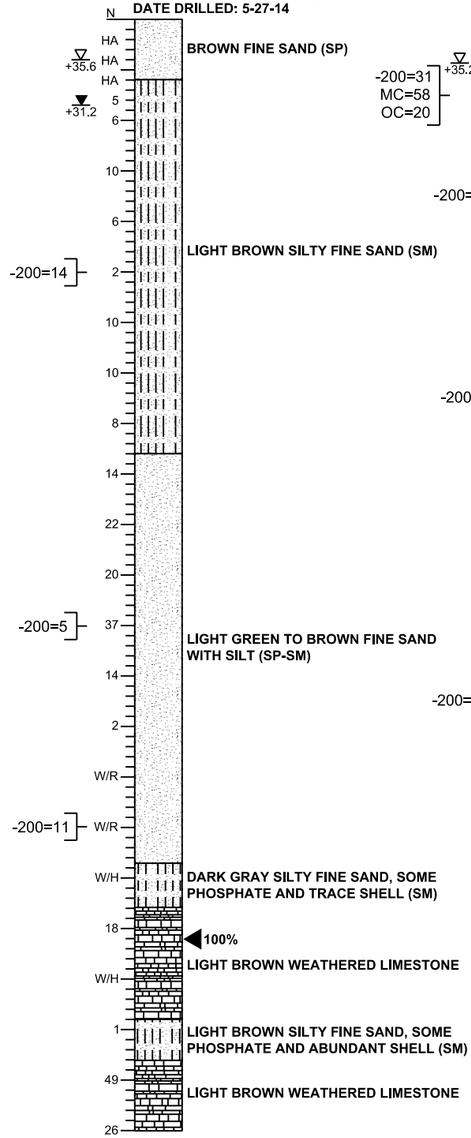
SPT BORINGS AND
CONE SOUNDINGS RESULTS

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



ST AT 67'

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



BROWN FINE SAND (SP)

LIGHT BROWN SILTY FINE SAND (SM)

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

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

100%

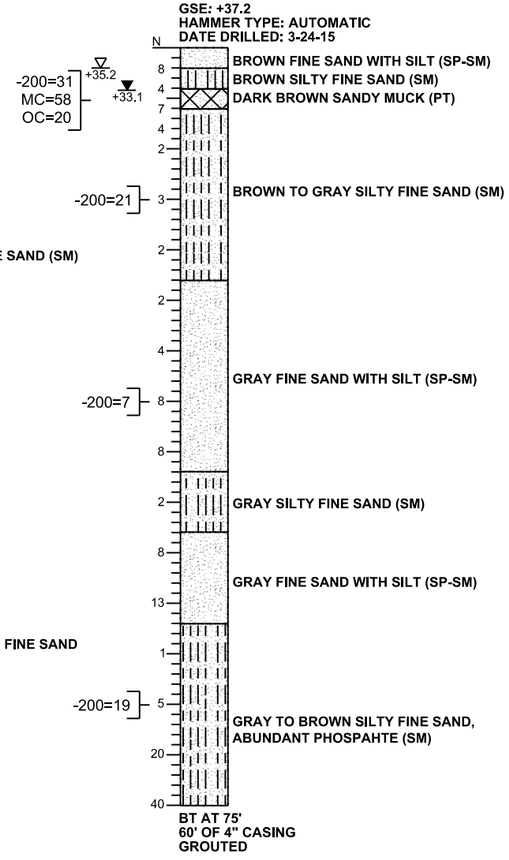
LIGHT BROWN WEATHERED LIMESTONE

LIGHT BROWN SILTY FINE SAND, SOME PHOSPHATE AND ABUNDANT SHELL (SM)

LIGHT BROWN WEATHERED LIMESTONE

BT AT 110'
100' OF 3" CASING GROUTED

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



BROWN FINE SAND WITH SILT (SP-SM)

BROWN SILTY FINE SAND (SM)

DARK BROWN SANDY MUCK (PT)

BROWN TO GRAY SILTY FINE SAND (SM)

GRAY FINE SAND WITH SILT (SP-SM)

GRAY SILTY FINE SAND (SM)

GRAY FINE SAND WITH SILT (SP-SM)

GRAY TO BROWN SILTY FINE SAND, ABUNDANT PHOSPAHTE (SM)

BT AT 75'
60' OF 4" CASING GROUTED

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	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

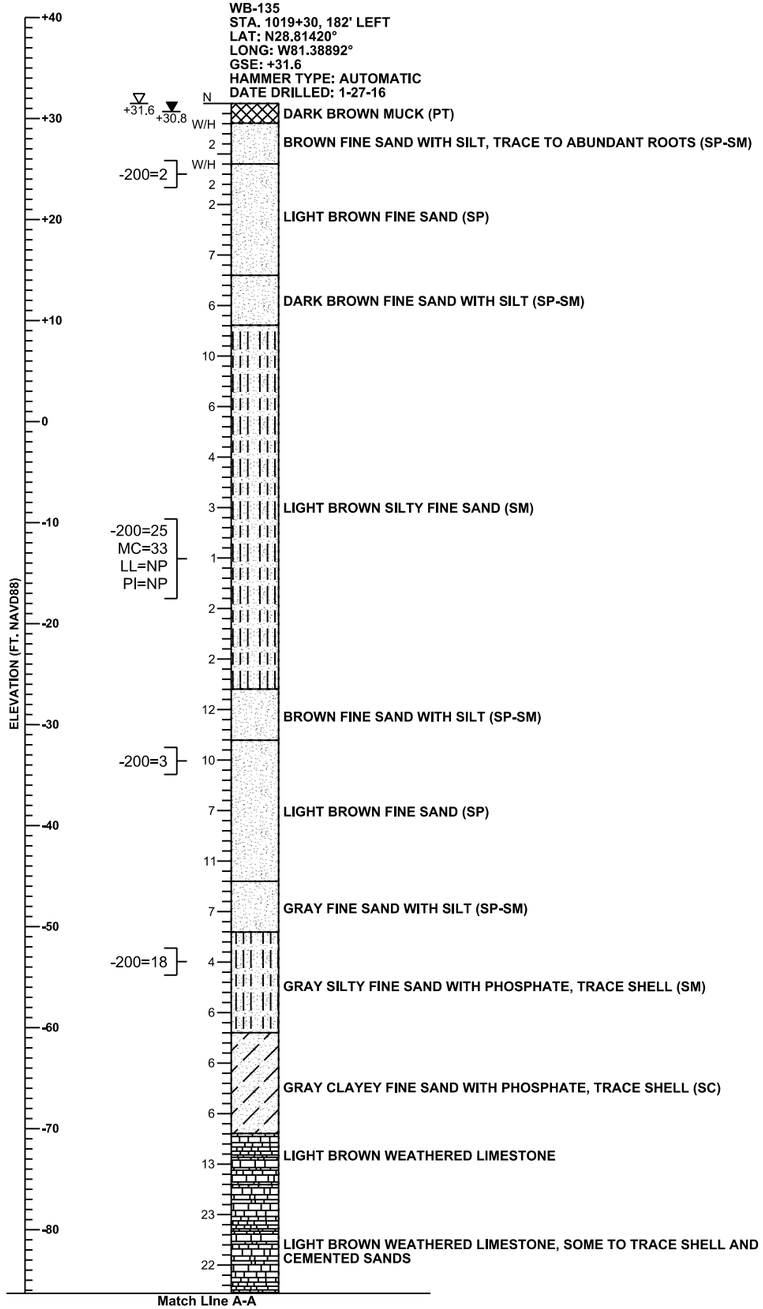
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

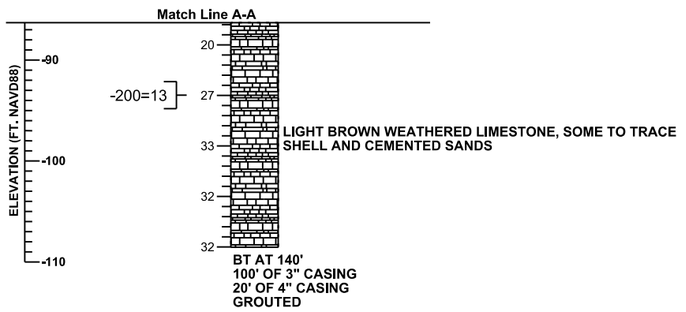
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 3:52:22 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.dgn





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	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

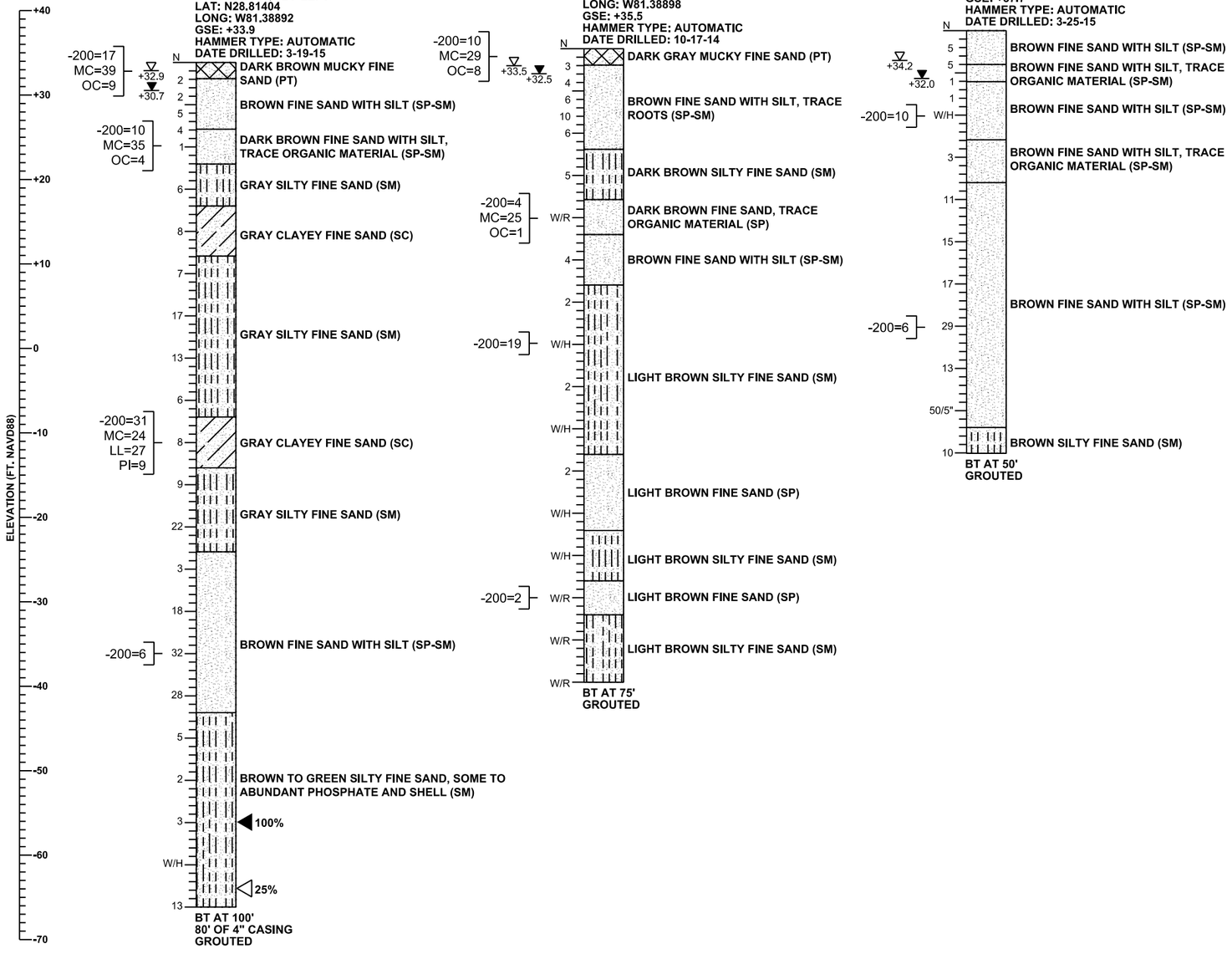
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 3:55:04 PM J:\D109\3520G Wekiva Parkway Section 7A\2-15-16\b1boring03.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	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

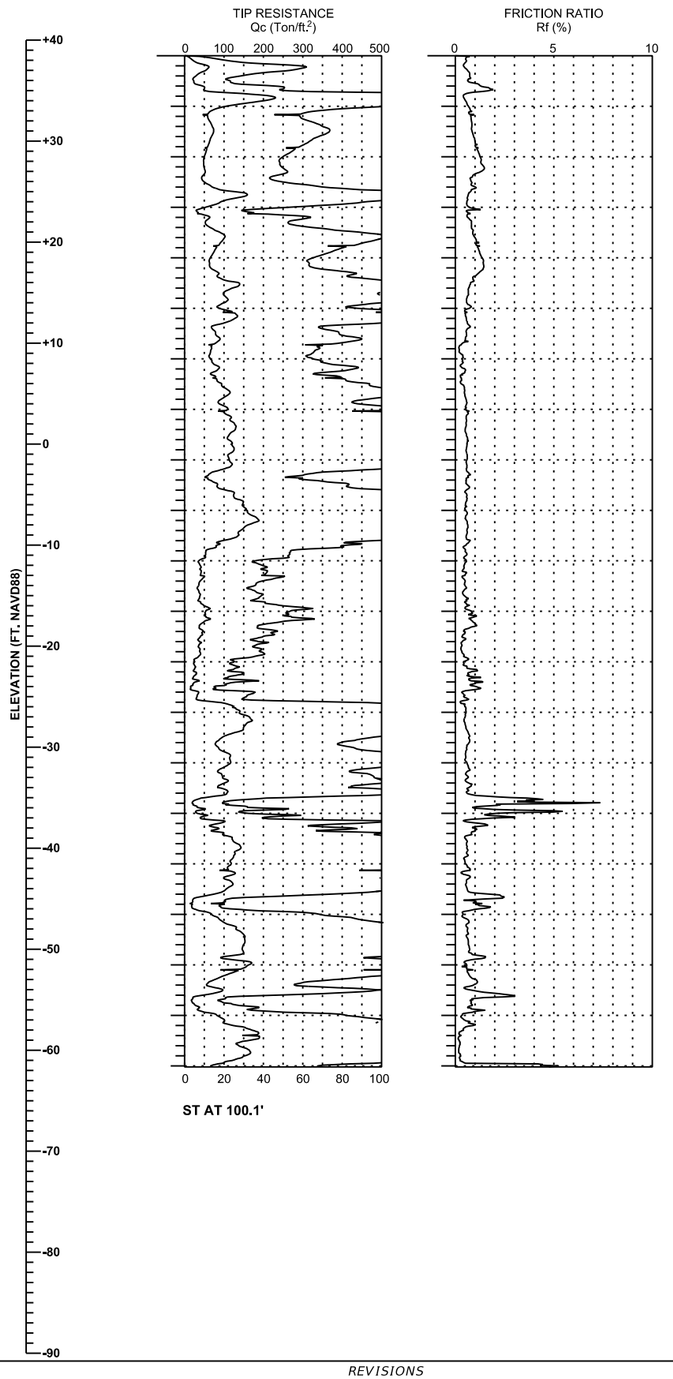
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

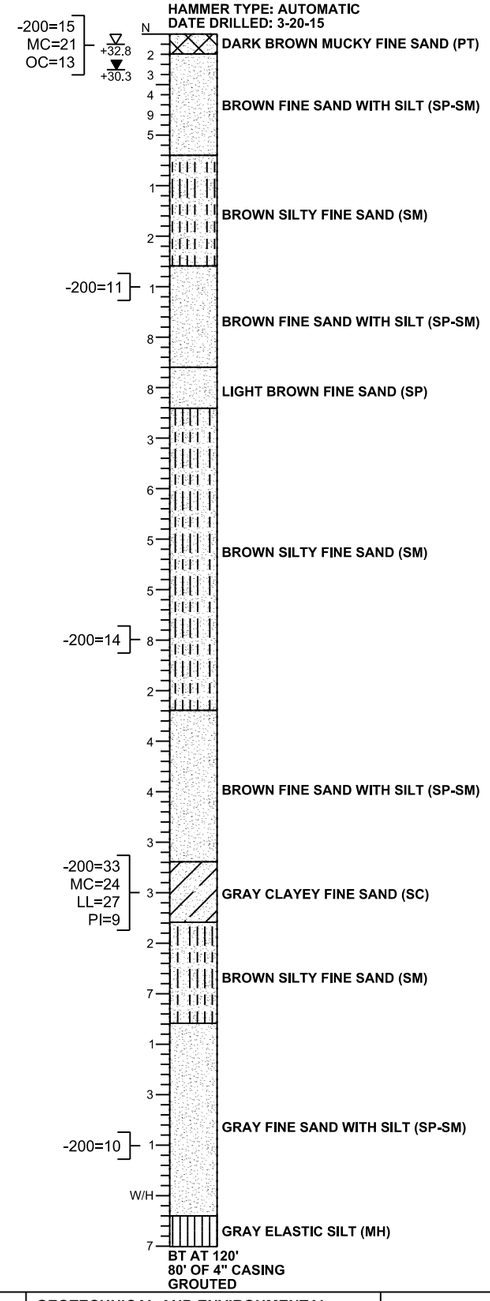
Scott 4/17/2017 3:58:47 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.dgn

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	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

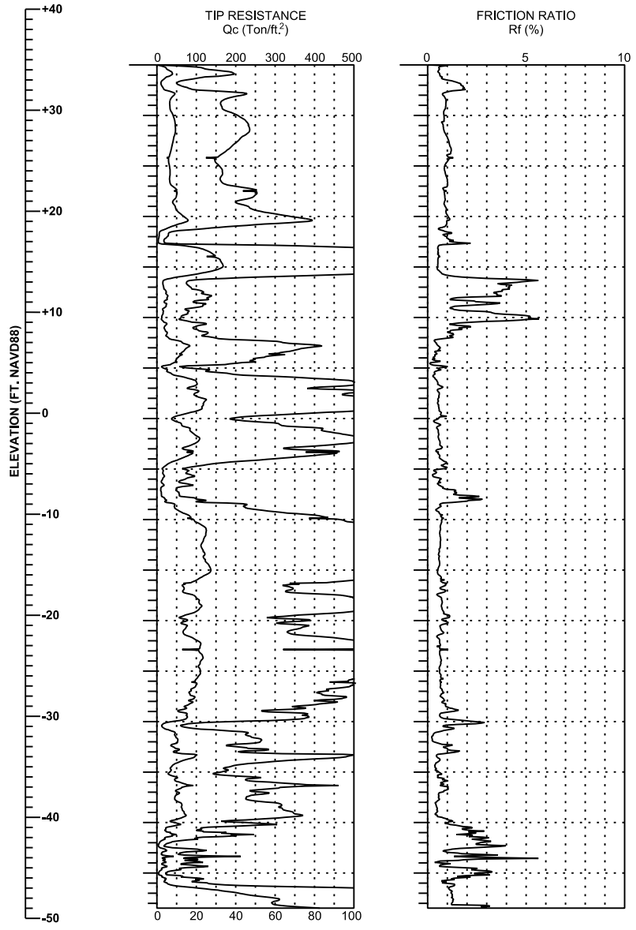
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

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

	N	
▽ +32.6 ▼ +30.9	HA	DARK BROWN MUCK (PT)
	8	BROWN FINE SAND WITH SILT, TRACE ORGANIC MATERIAL (SP-SM)
	6	
	7	LIGHT BROWN FINE SAND WITH SILT (SP-SM)
	11	
	5	
-200=30 MC=111 OC=13 S_u=342 S_R=249	1	DARK BROWN MUCKY FINE SAND (PT)
	1	
	11	
	15	BROWN FINE SAND WITH SILT (SP-SM)
-200=12 MC=31 OC=8	24	DARK BROWN MUCKY FINE SAND (PT)
-200=58 MC=166 OC=40	2	DARK BROWN SANDY MUCK, TRACE CEMENTED SAND (PT)
	14	
	14	
	13	LIGHT BROWN FINE SAND WITH SILT (SP-SM)
	16	
	9	
	15	
	7	LIGHT GRAY SILTY FINE SAND (SM)

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	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

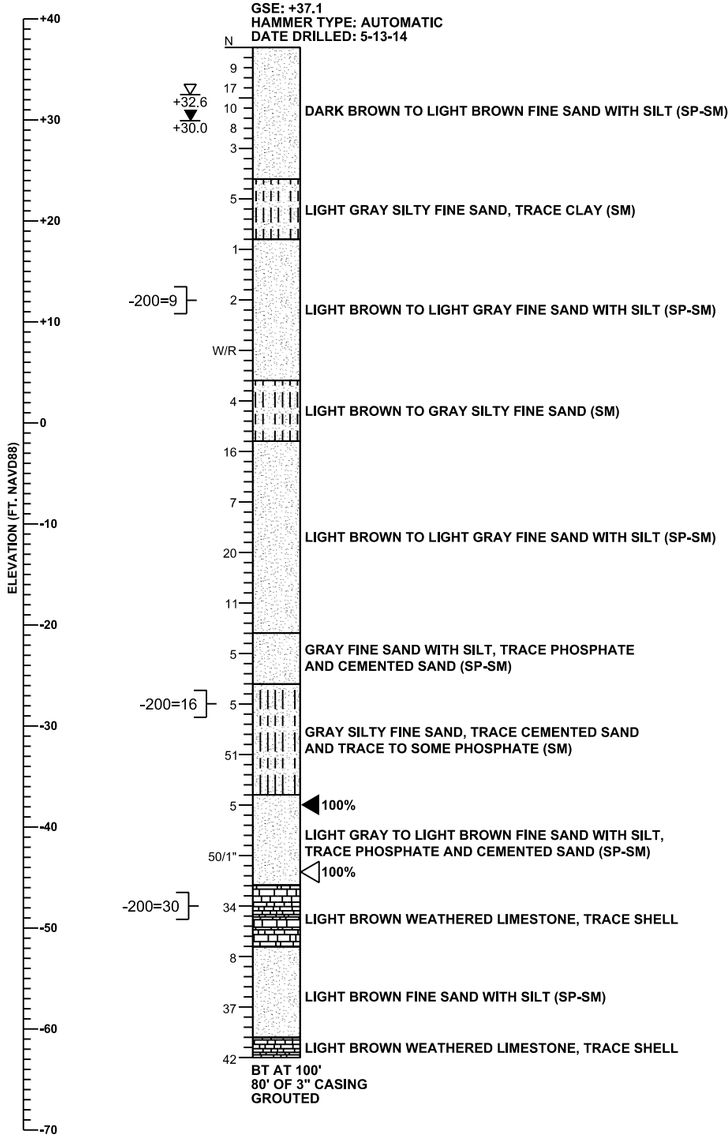
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:03:21 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.dgn



WB-55
STA. 1020+40, C/L
LAT: N28.81362
LONG: W81.38873
GSE: +37.1
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 5-13-14

N

9 17 10 8 3 — DARK BROWN TO LIGHT BROWN FINE SAND WITH SILT (SP-SM)
+32.6 / +30.0

5 — LIGHT GRAY SILTY FINE SAND, TRACE CLAY (SM)

-200=9
1 2 — LIGHT BROWN TO LIGHT GRAY FINE SAND WITH SILT (SP-SM)

W/R
4 — LIGHT BROWN TO GRAY SILTY FINE SAND (SM)

16 7 20 11 — LIGHT BROWN TO LIGHT GRAY FINE SAND WITH SILT (SP-SM)

5 — GRAY FINE SAND WITH SILT, TRACE PHOSPHATE AND CEMENTED SAND (SP-SM)

-200=16
5 — GRAY SILTY FINE SAND, TRACE CEMENTED SAND AND TRACE TO SOME PHOSPHATE (SM)

51 5 — 100%
LIGHT GRAY TO LIGHT BROWN FINE SAND WITH SILT, TRACE PHOSPHATE AND CEMENTED SAND (SP-SM)

50/1" — 100%

-200=30
34 — LIGHT BROWN WEATHERED LIMESTONE, TRACE SHELL

8 37 — LIGHT BROWN FINE SAND WITH SILT (SP-SM)

42 — LIGHT BROWN WEATHERED LIMESTONE, TRACE SHELL

BT AT 100'
80' OF 3" CASING
GROUTED

MB-2
STA. 1020+81, 59' LEFT
LAT: N28.81376
LONG: W81.38861
GSE: +36.9
HAMMER TYPE: AUTOMATIC
DATE DRILLED: 7-29-14

N

+31.9 / +29.5

7 8 9 6 7 10 — BROWN SILTY FINE SAND (SM) / DARK BROWN MUCKY FINE SAND (PT) / BROWN FINE SAND WITH SILT (SP-SM)

-200=14
MC=30
OC=6
10 12 — DARK BROWN SILTY FINE SAND, TRACE CEMENTED SAND AND ORGANIC MATERIAL (SM) / DARK BROWN MUCKY FINE SAND (PT)

18 — BROWN SILTY FINE SAND (SM)

-200=84
MC=217
OC=63
5 — DARK BROWN SLIGHTLY CEMENTED MUCK (PT)

16 25 — DARK GRAY FINE SAND WITH SILT (SP-SM)

36 — LIGHT GRAY FINE SAND (SP)

10 9 — GRAY CLAYEY FINE SAND (SC)

18 — GRAY FINE SAND WITH SILT (SP-SM)

11 31 — GRAY SILTY FINE SAND (SM)

BT AT 75'
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/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	DESCRIPTION	DATE	DESCRIPTION

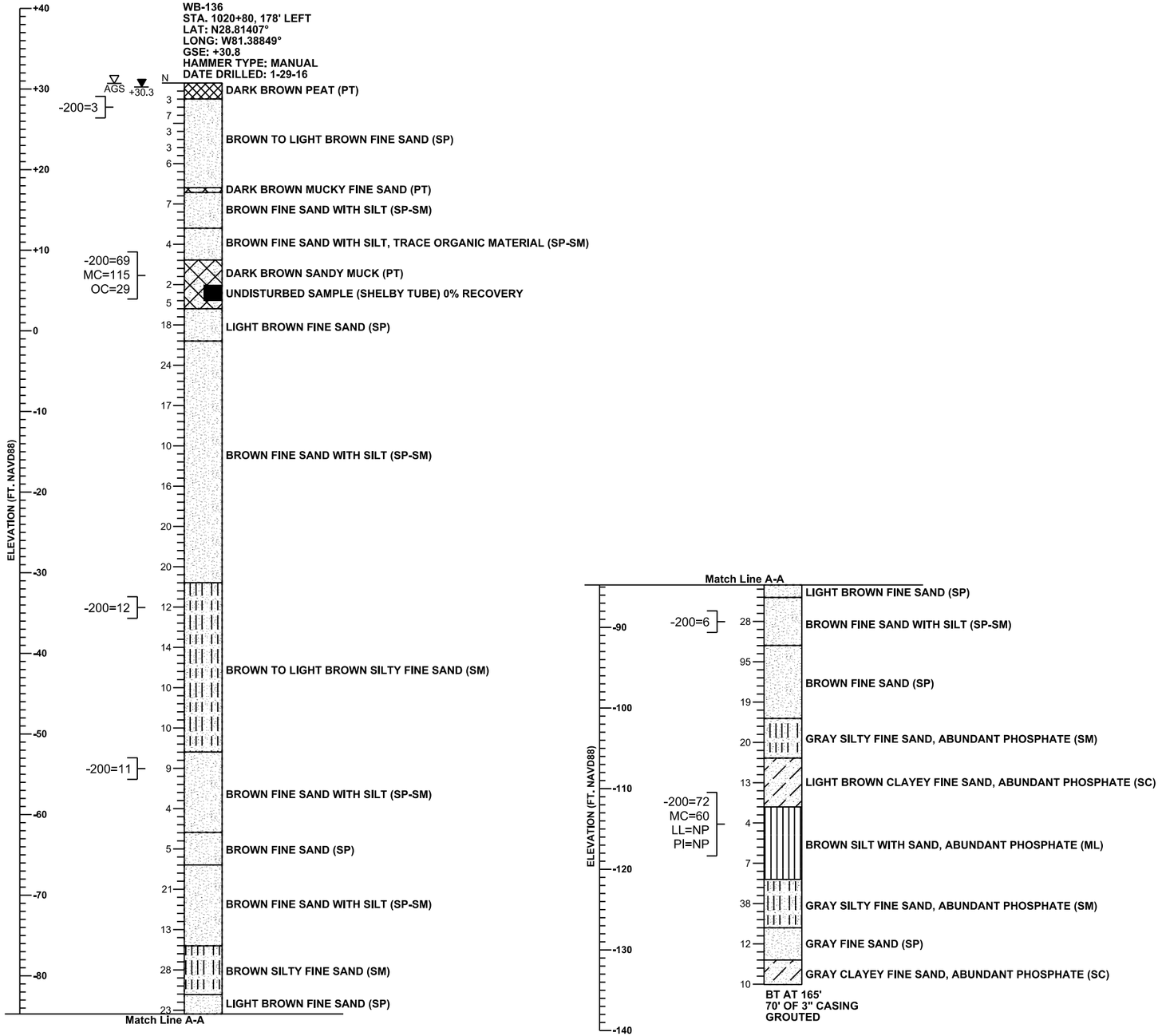
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



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	DESCRIPTION	DATE	DESCRIPTION

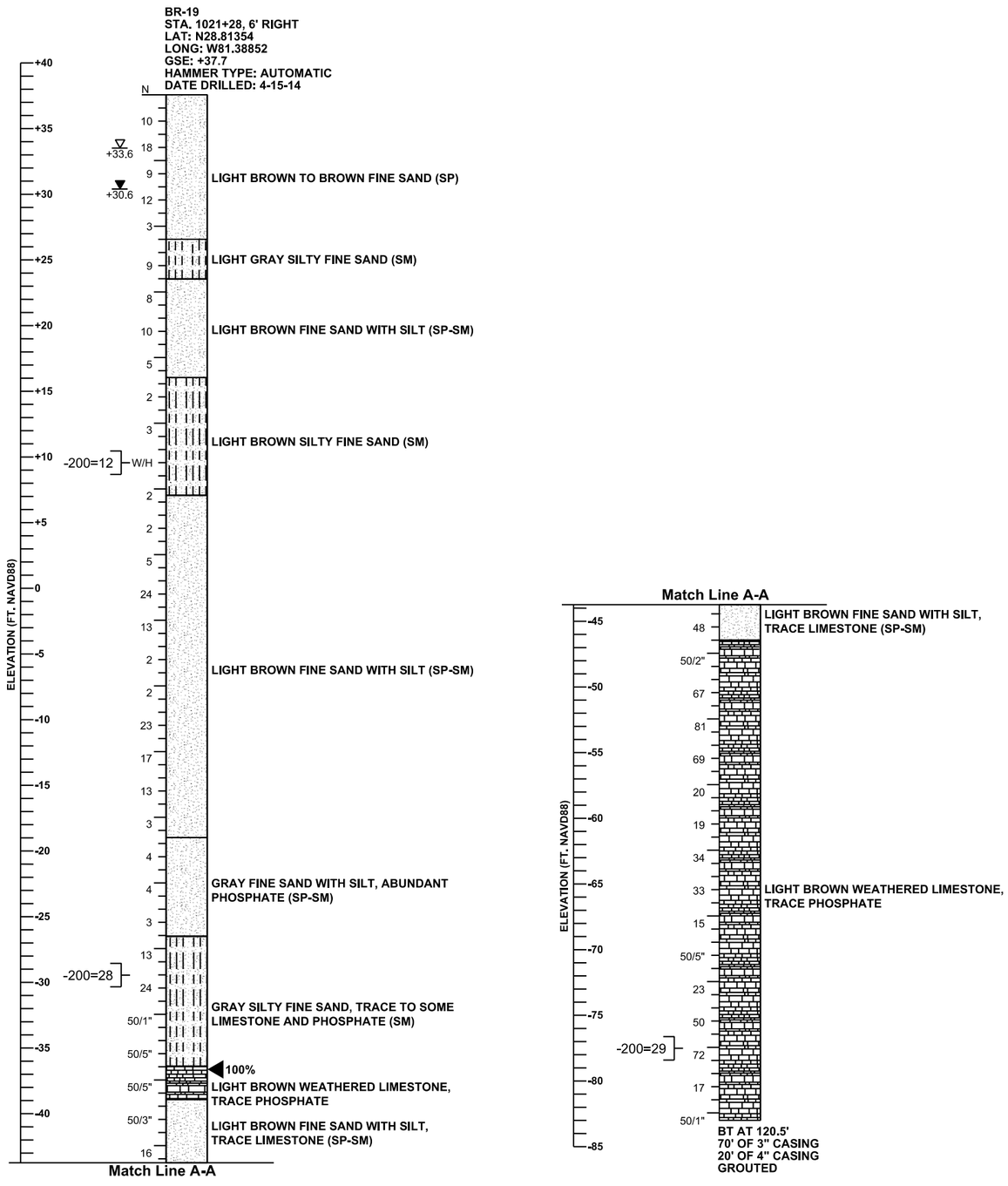
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS
RESULTS

SHEET NO.



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

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

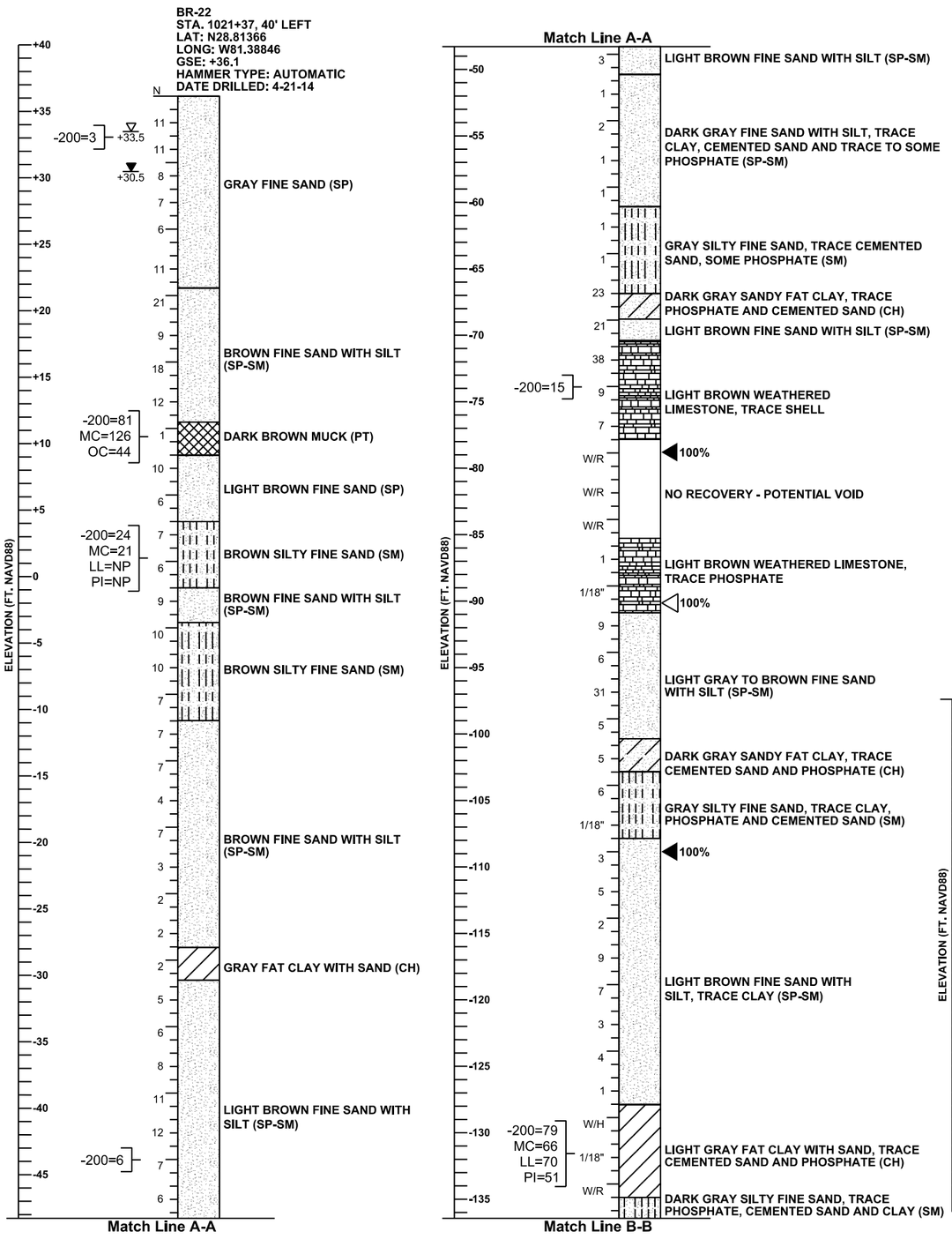
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



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

PRELIMINARY: NOT FOR CONSTRUCTION

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

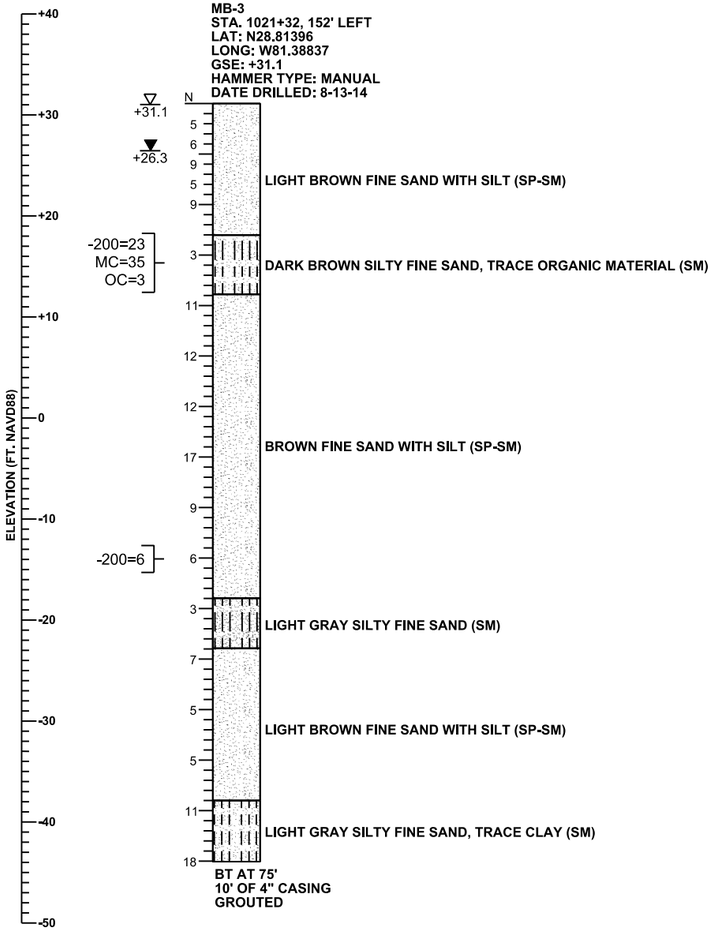
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

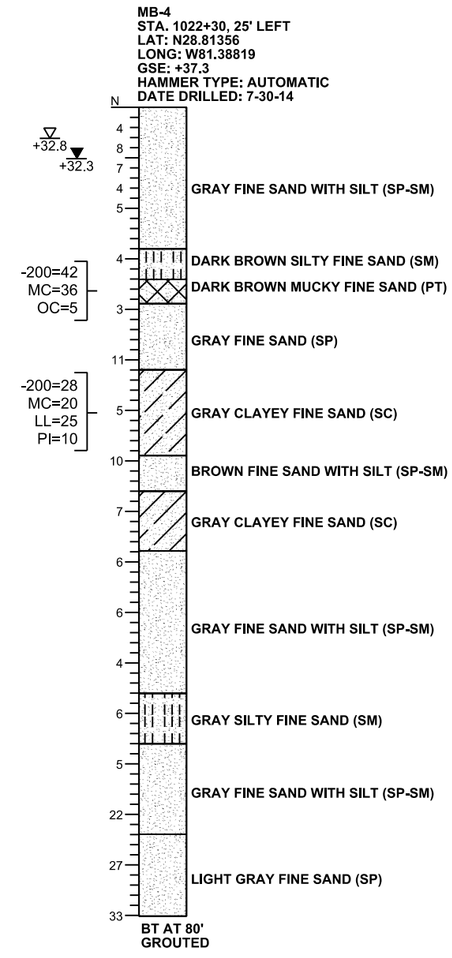
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:08:24 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring20.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	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

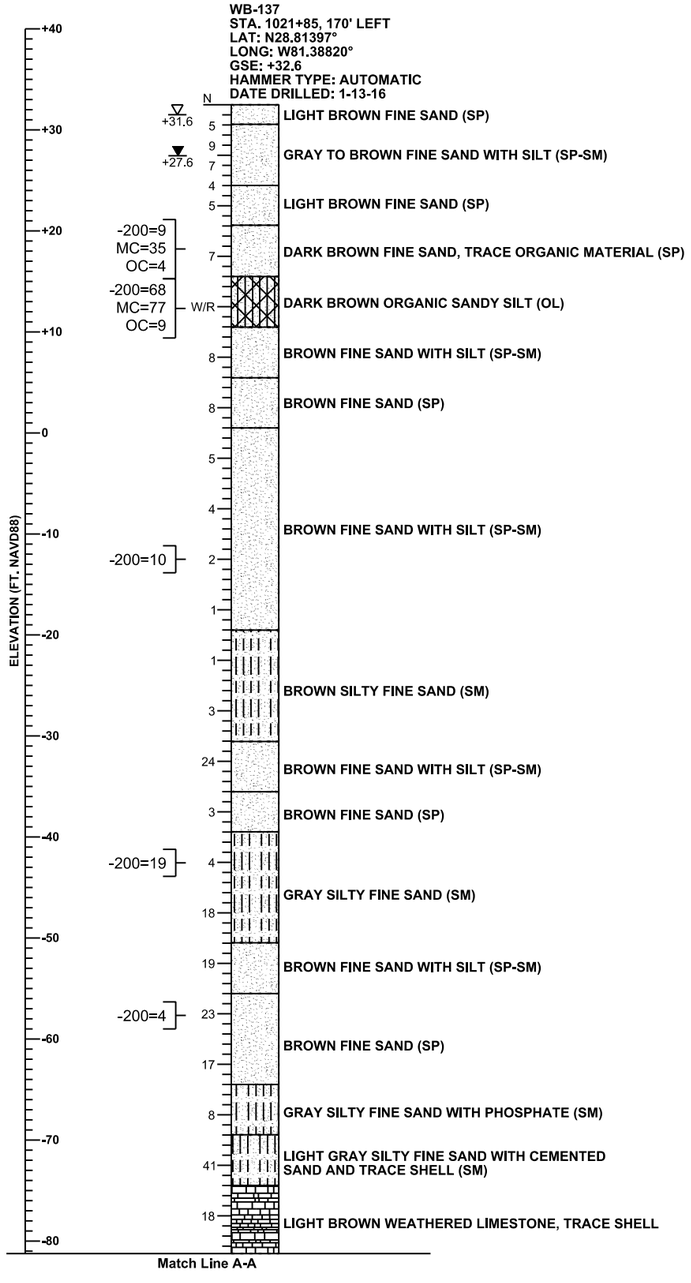
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

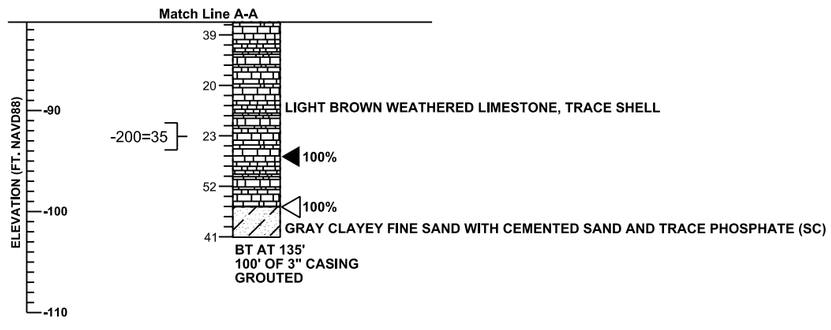
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS
RESULTS

SHEET NO.

Scott 4/17/2017 4:10:20 PM J:\D109\3520G Wekiva Parkway Section 7A\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	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

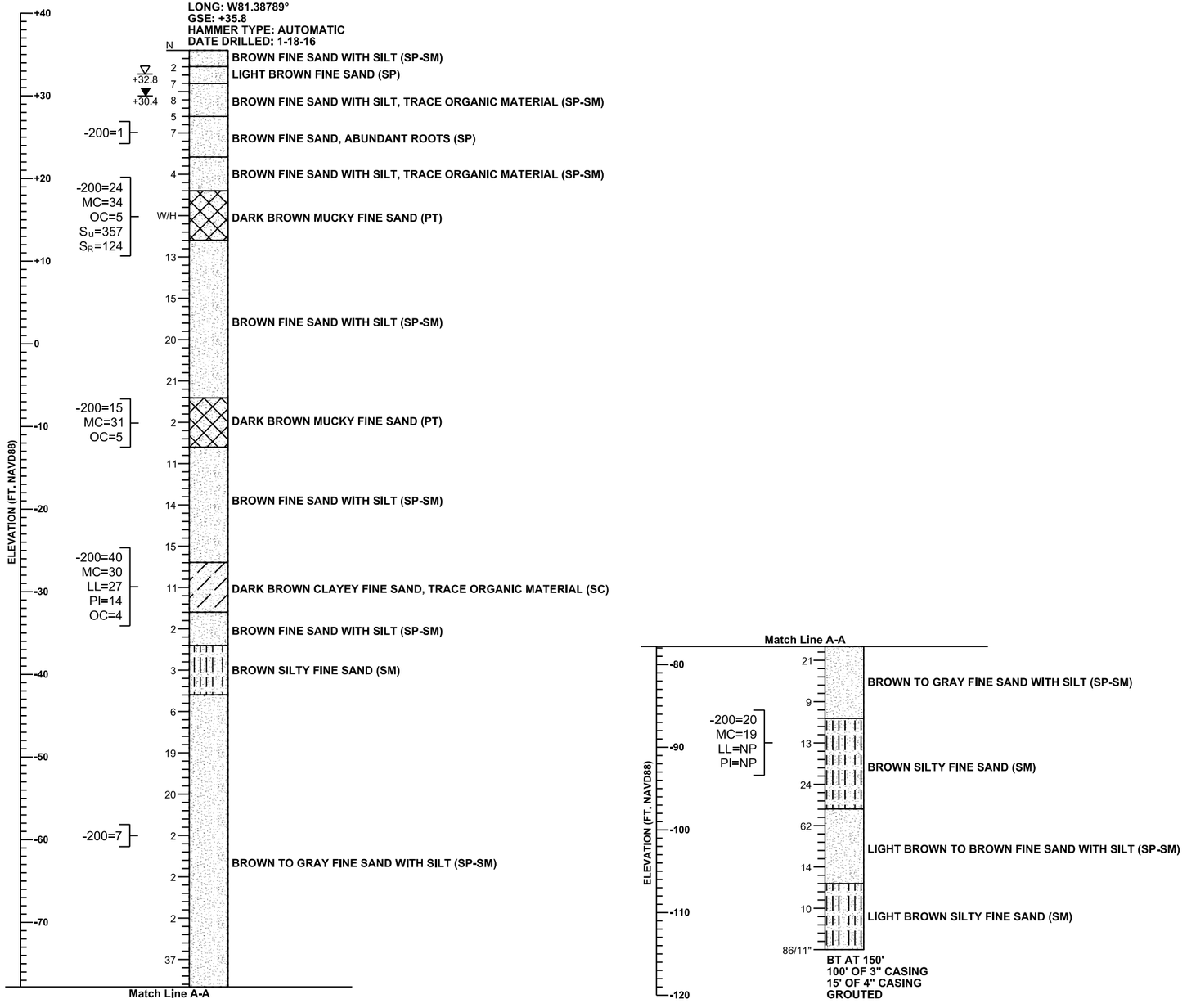
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:12:24 PM J:\D109\3520G Wekiva Parkway Section 7A\2-15-16\b1boring04.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	DESCRIPTION	DATE	DESCRIPTION

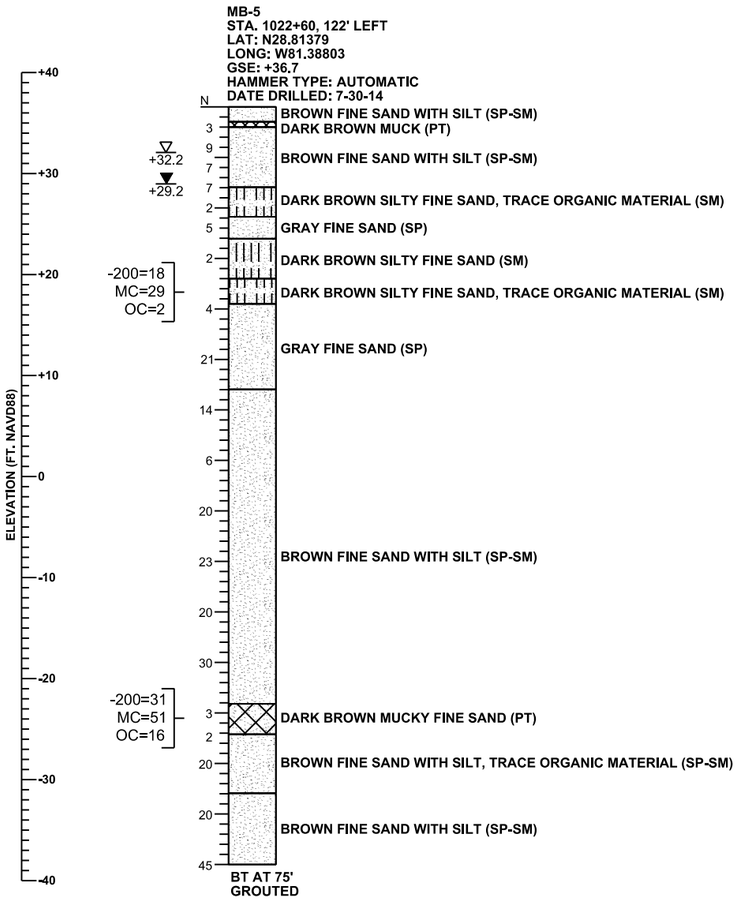
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

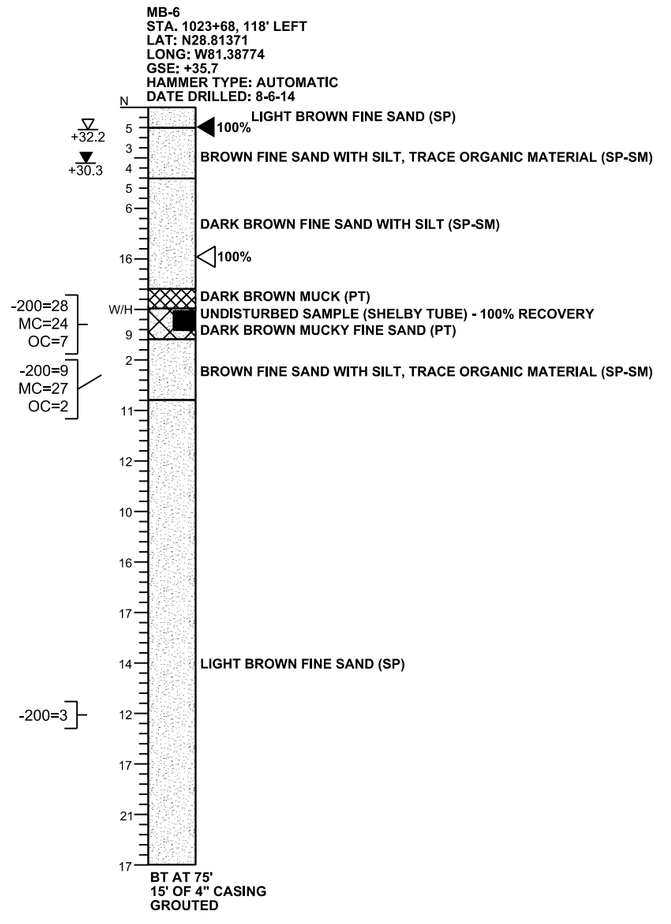
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.





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	DESCRIPTION	DATE	DESCRIPTION

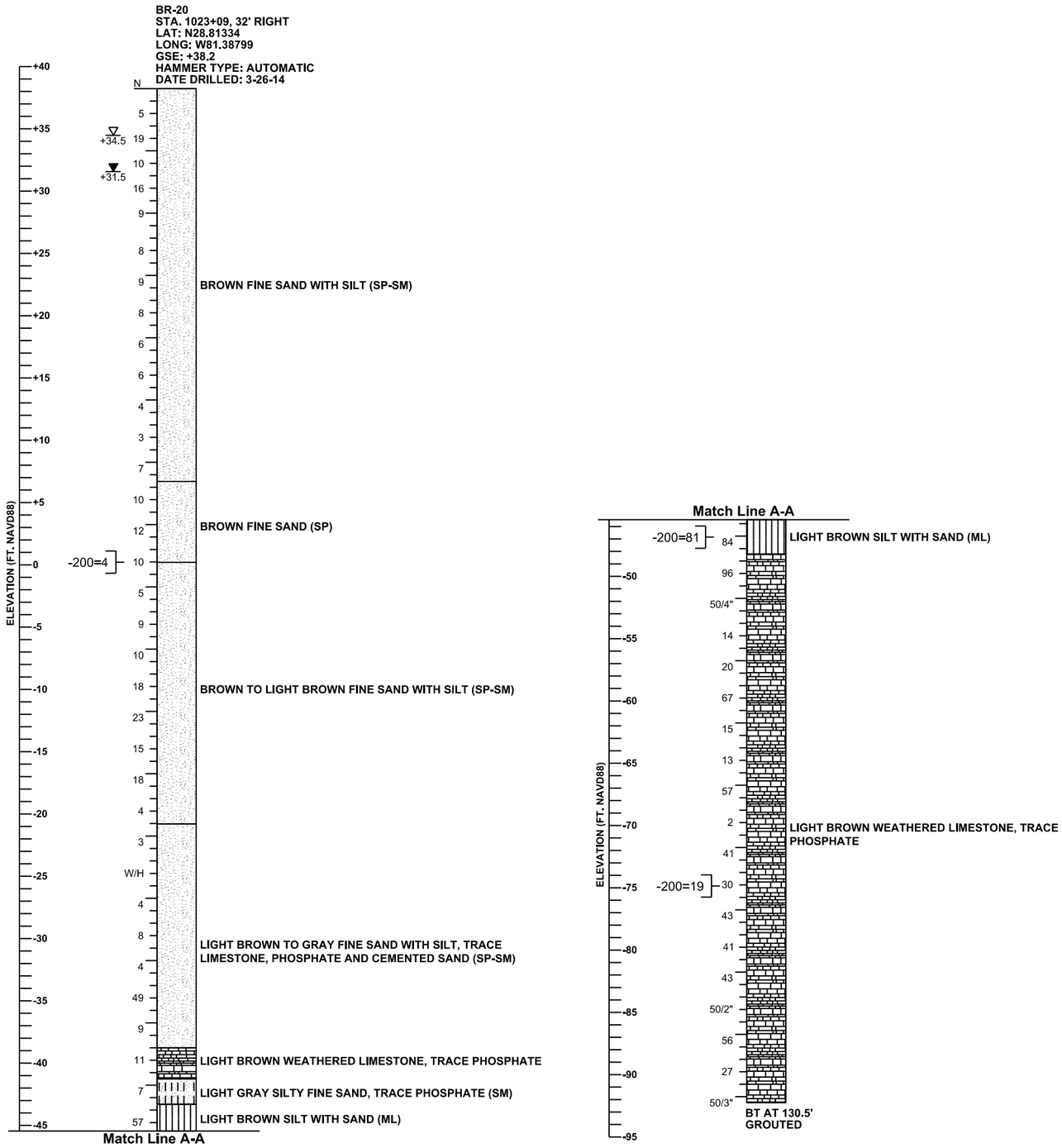
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



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

PRELIMINARY: NOT FOR CONSTRUCTION

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

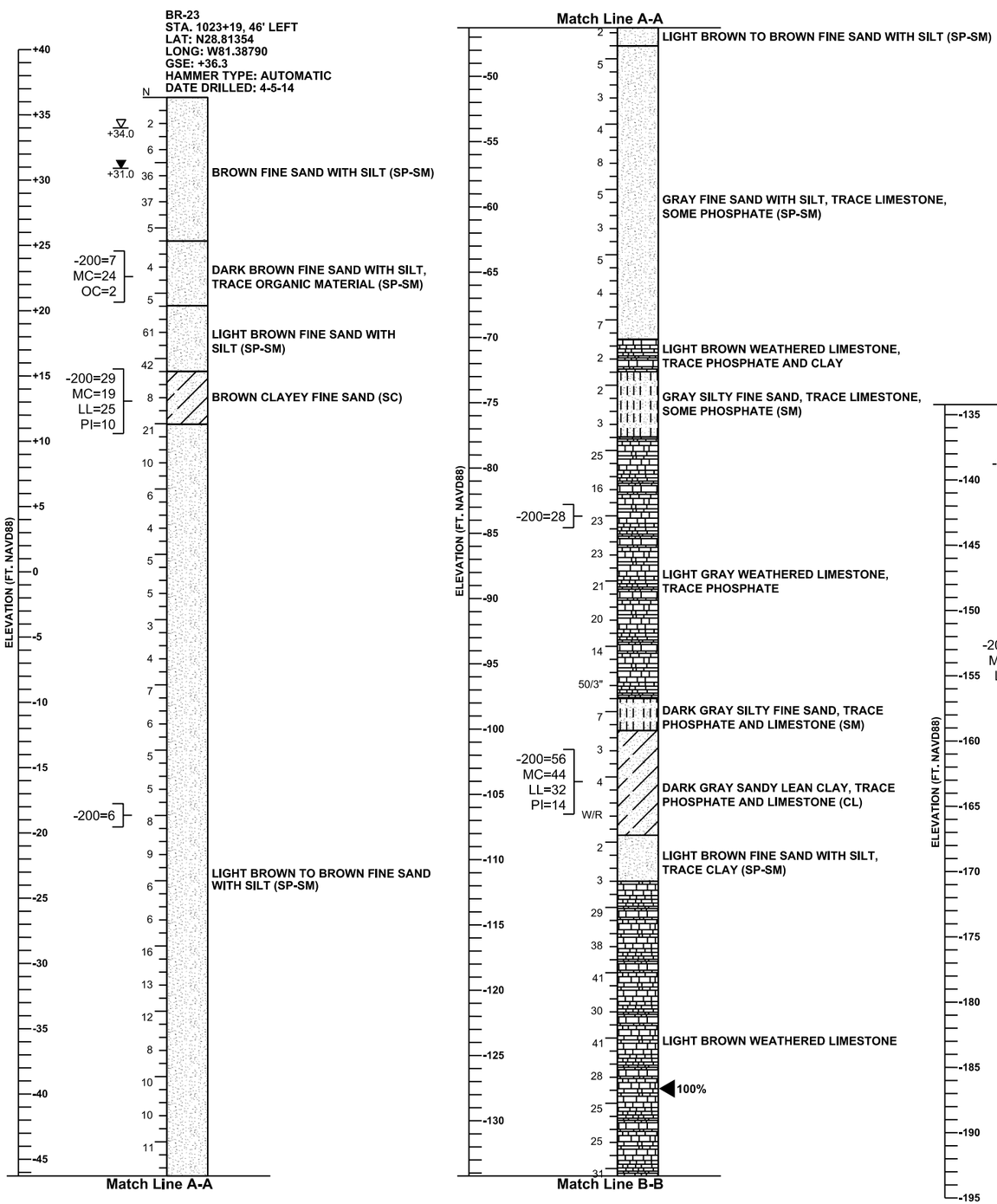
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:15:56 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring20.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

PRELIMINARY: NOT FOR CONSTRUCTION

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

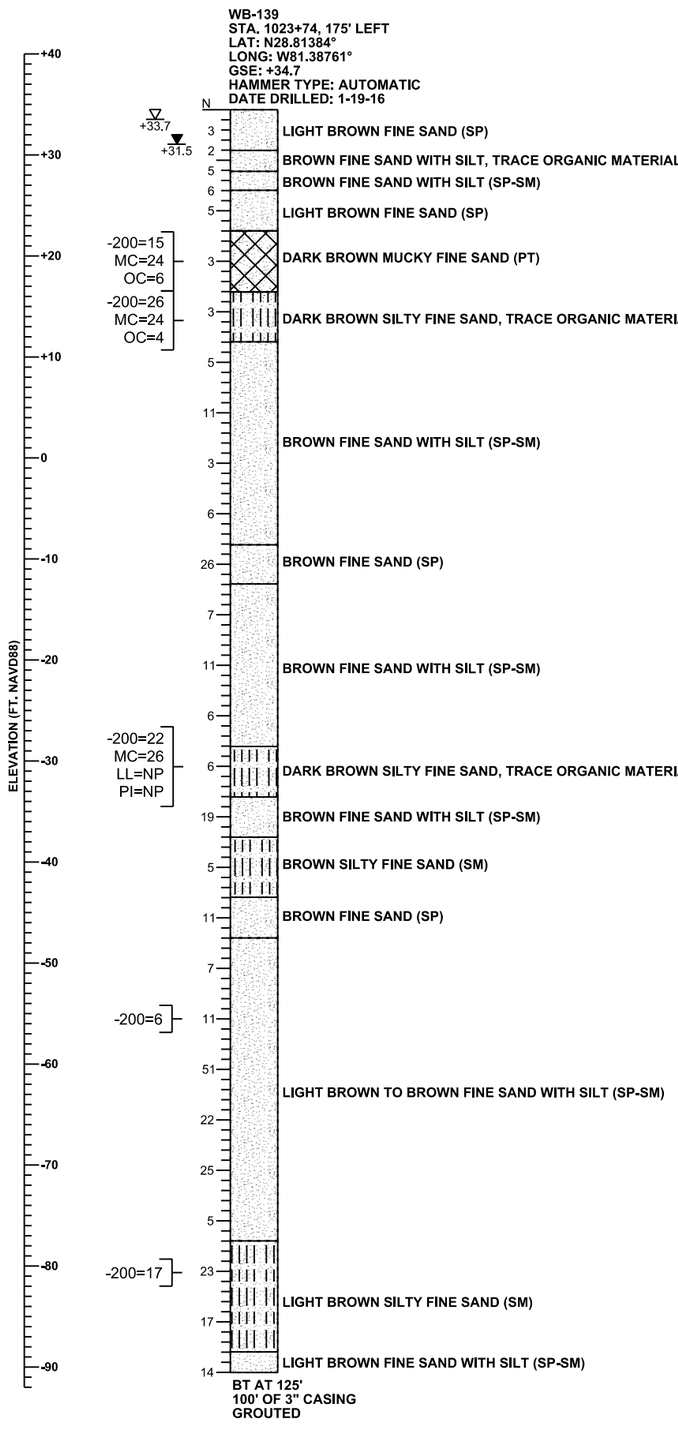
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:16:45 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring20.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	DESCRIPTION	DATE	DESCRIPTION

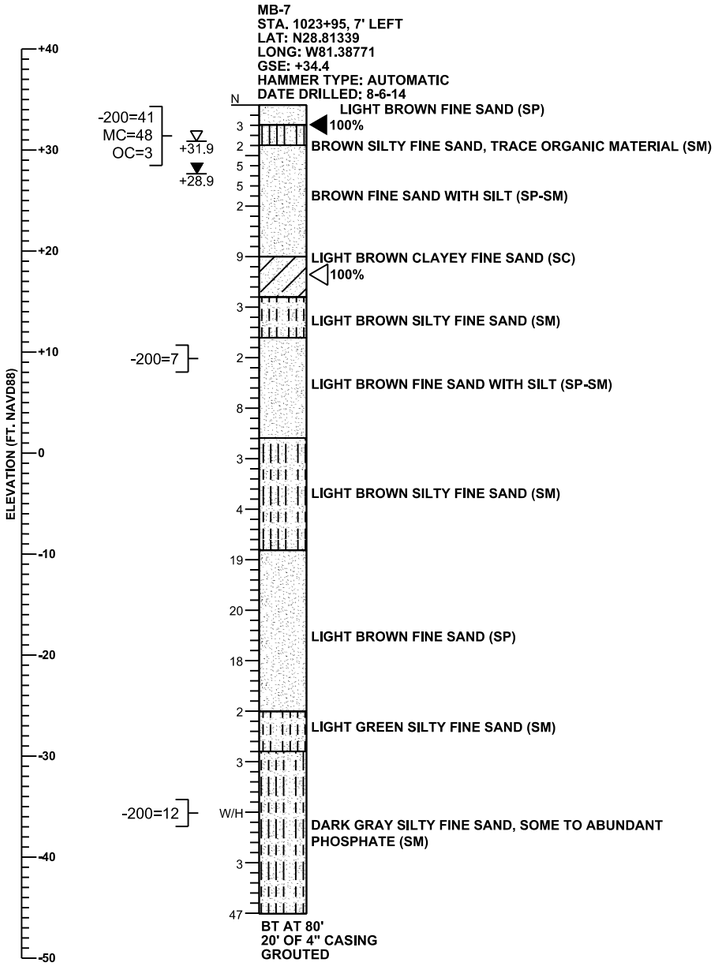
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



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	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

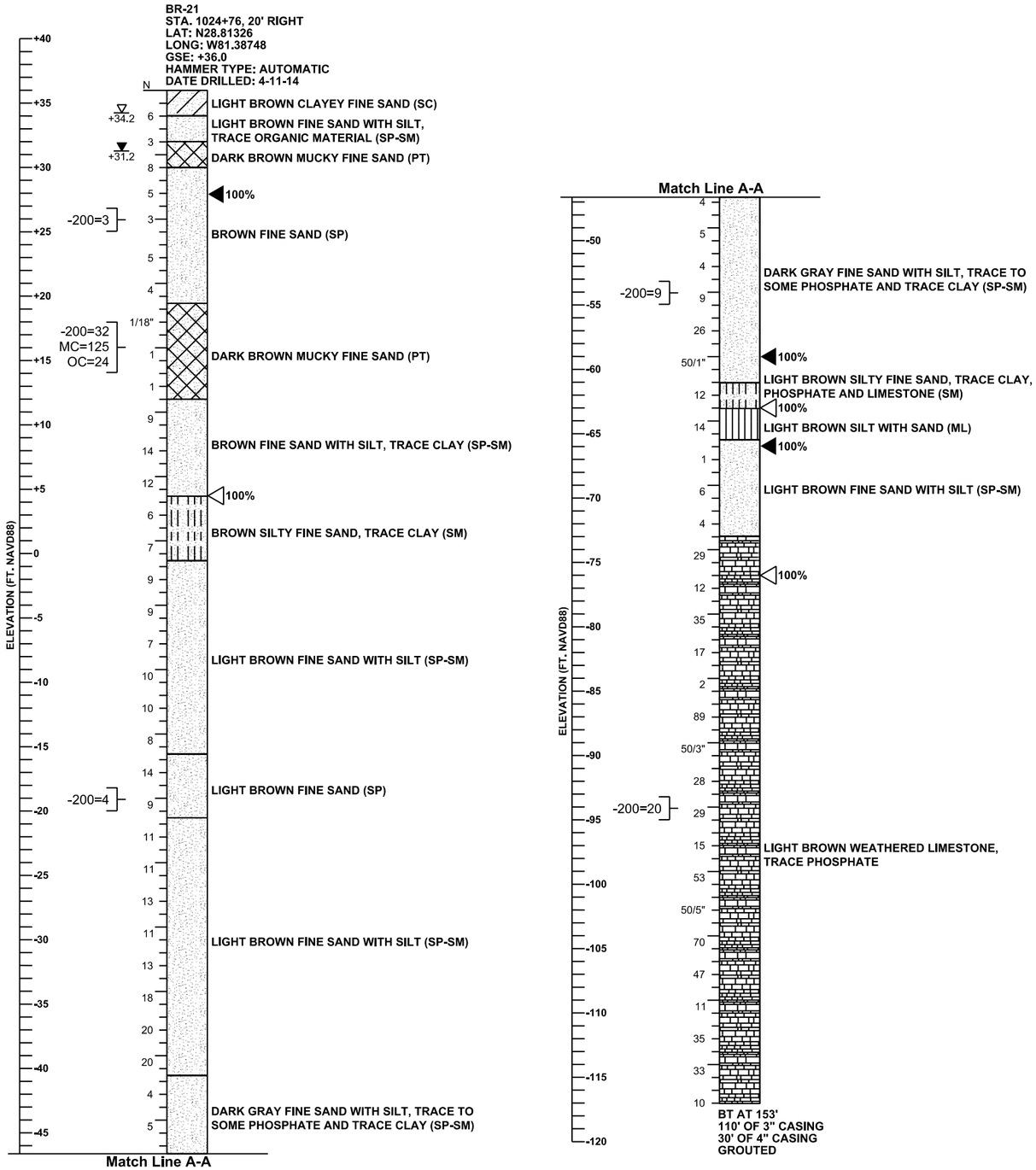
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:23:49 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.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
▽ +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

PRELIMINARY: NOT FOR CONSTRUCTION

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

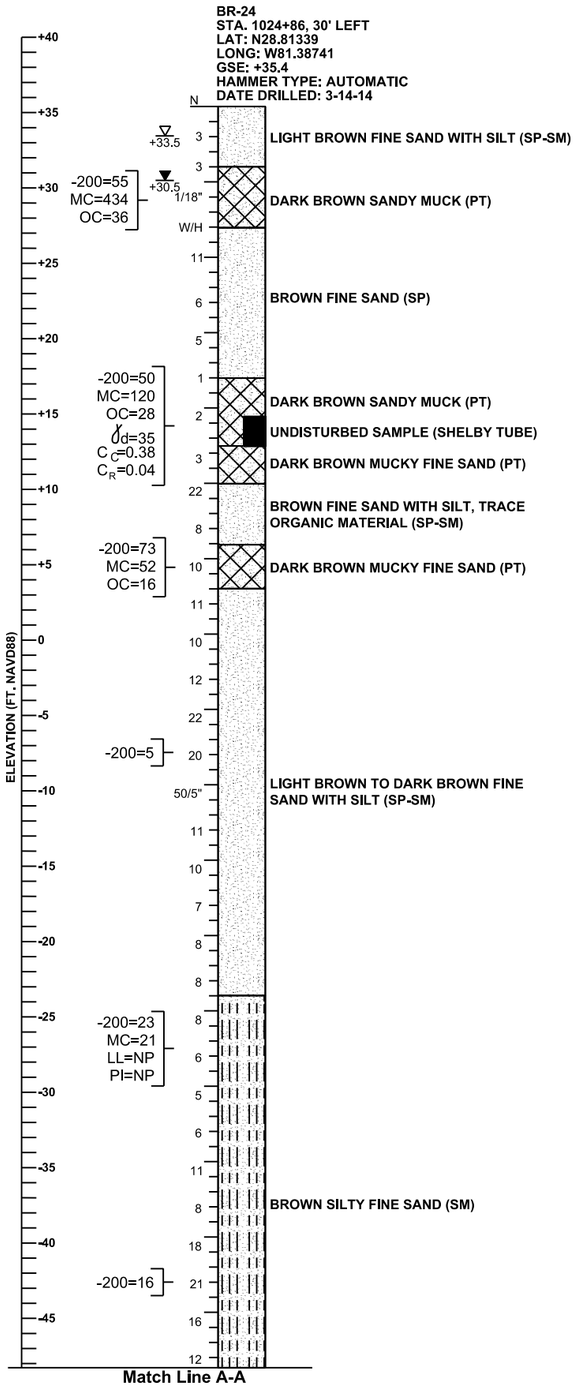
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

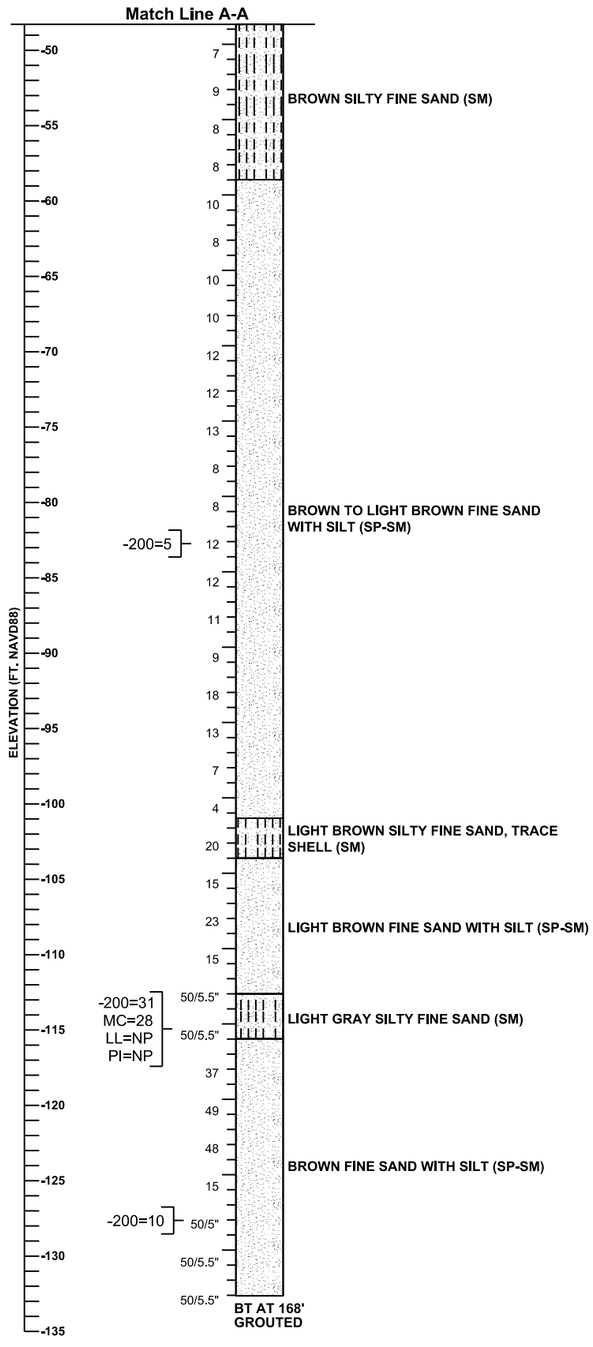
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:25:00 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring20.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

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

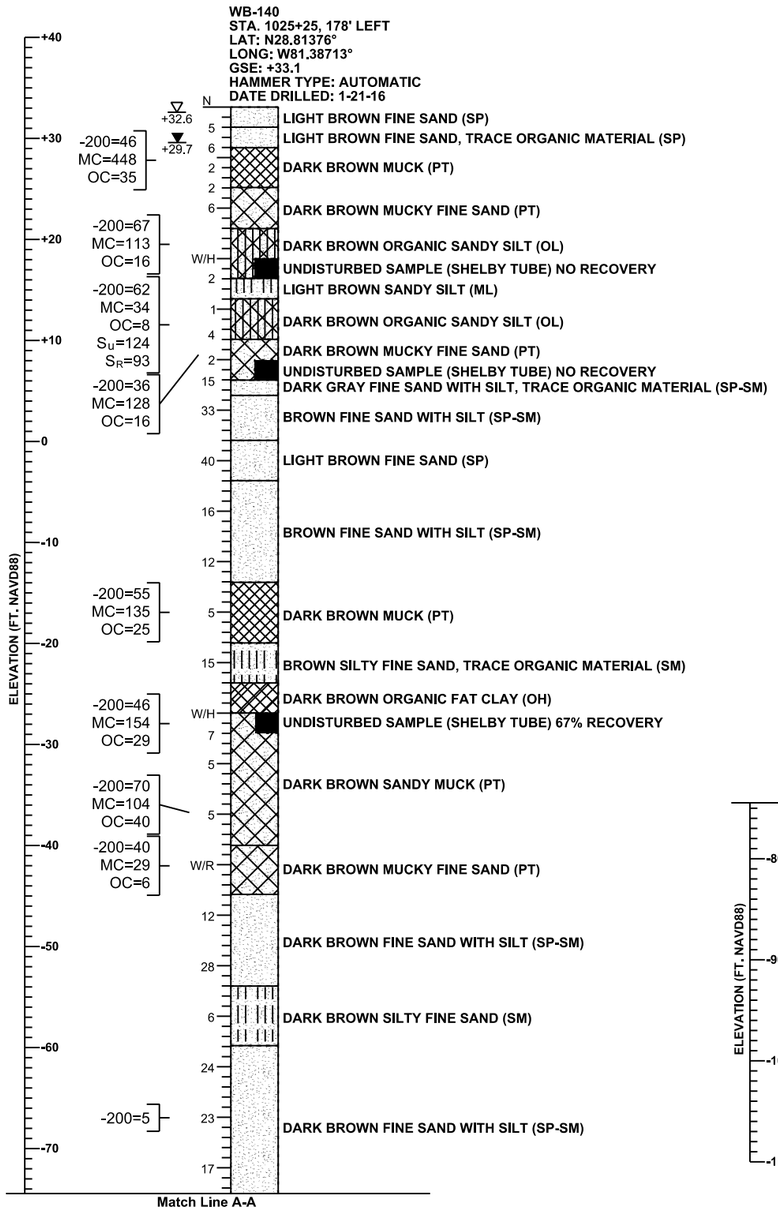
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

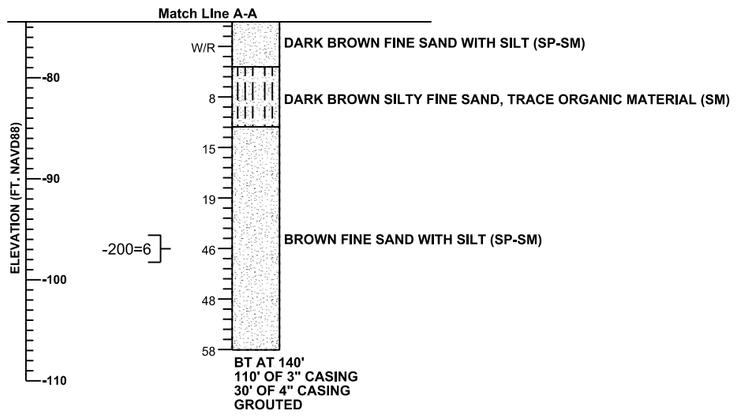
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.





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	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

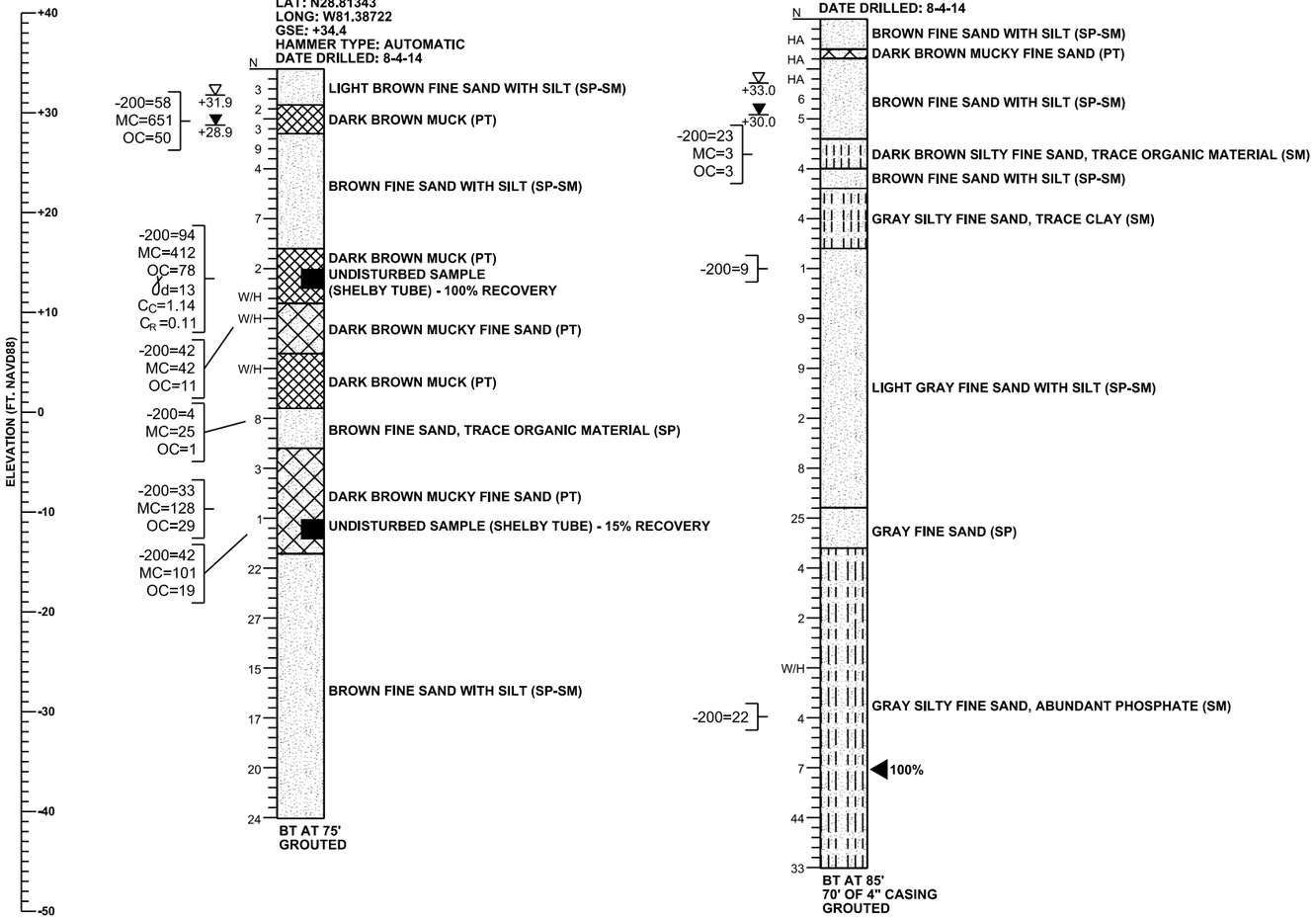
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:29:21 PM J:\D109\3520G Wekiva Parkway Section 7A\2-15-16\b1boring04.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
+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	DESCRIPTION	DATE	DESCRIPTION

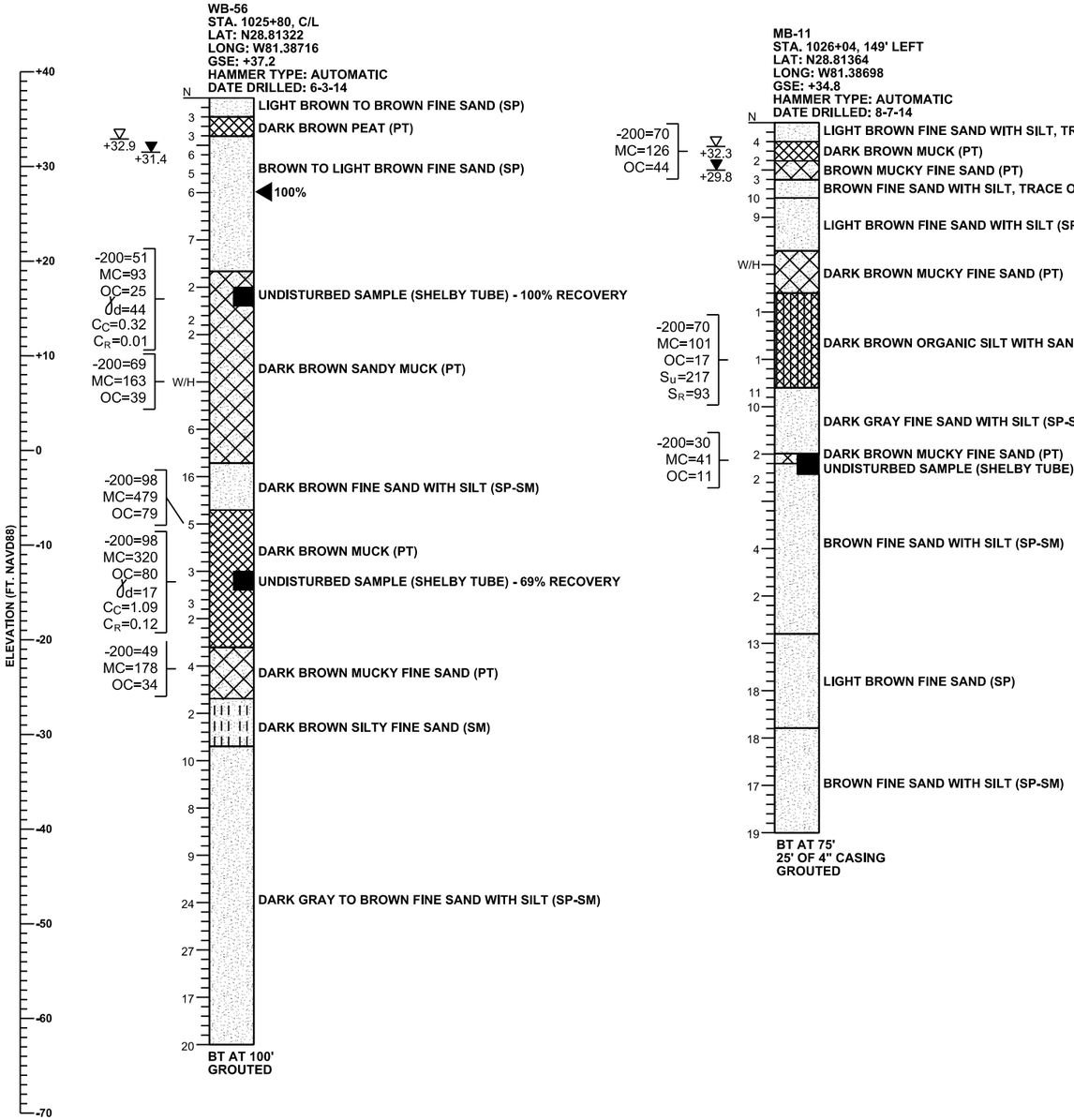
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS
RESULTS

SHEET NO.



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	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

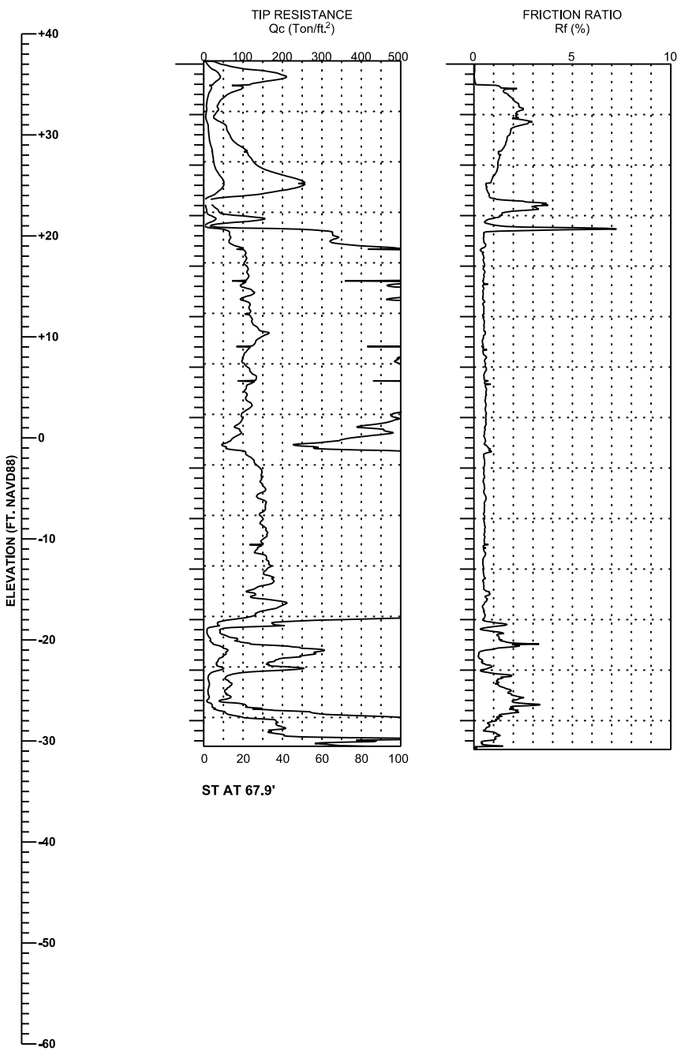
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

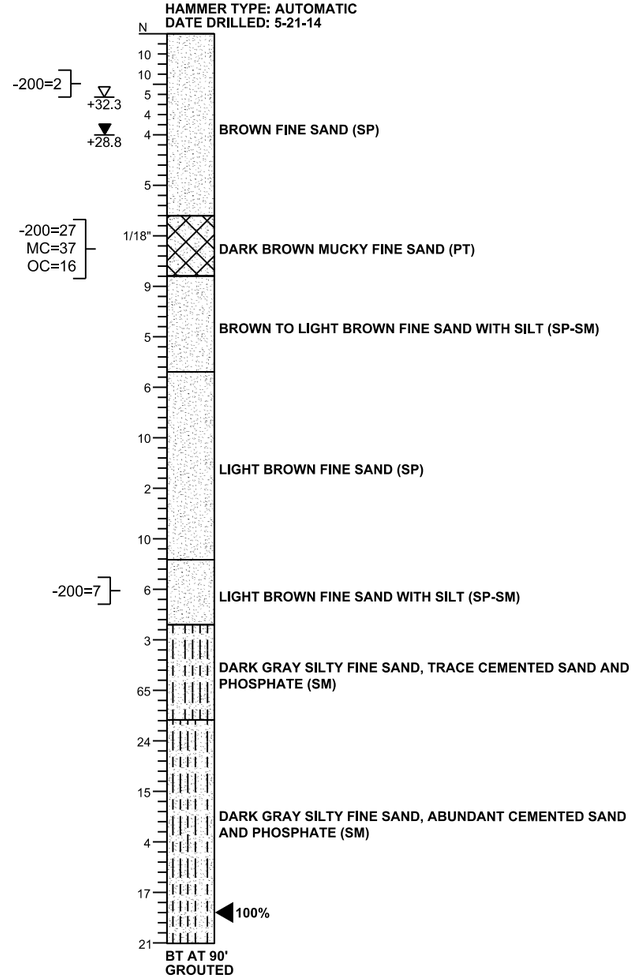
Scott 4/17/2017 4:35:24 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.dgn

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	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

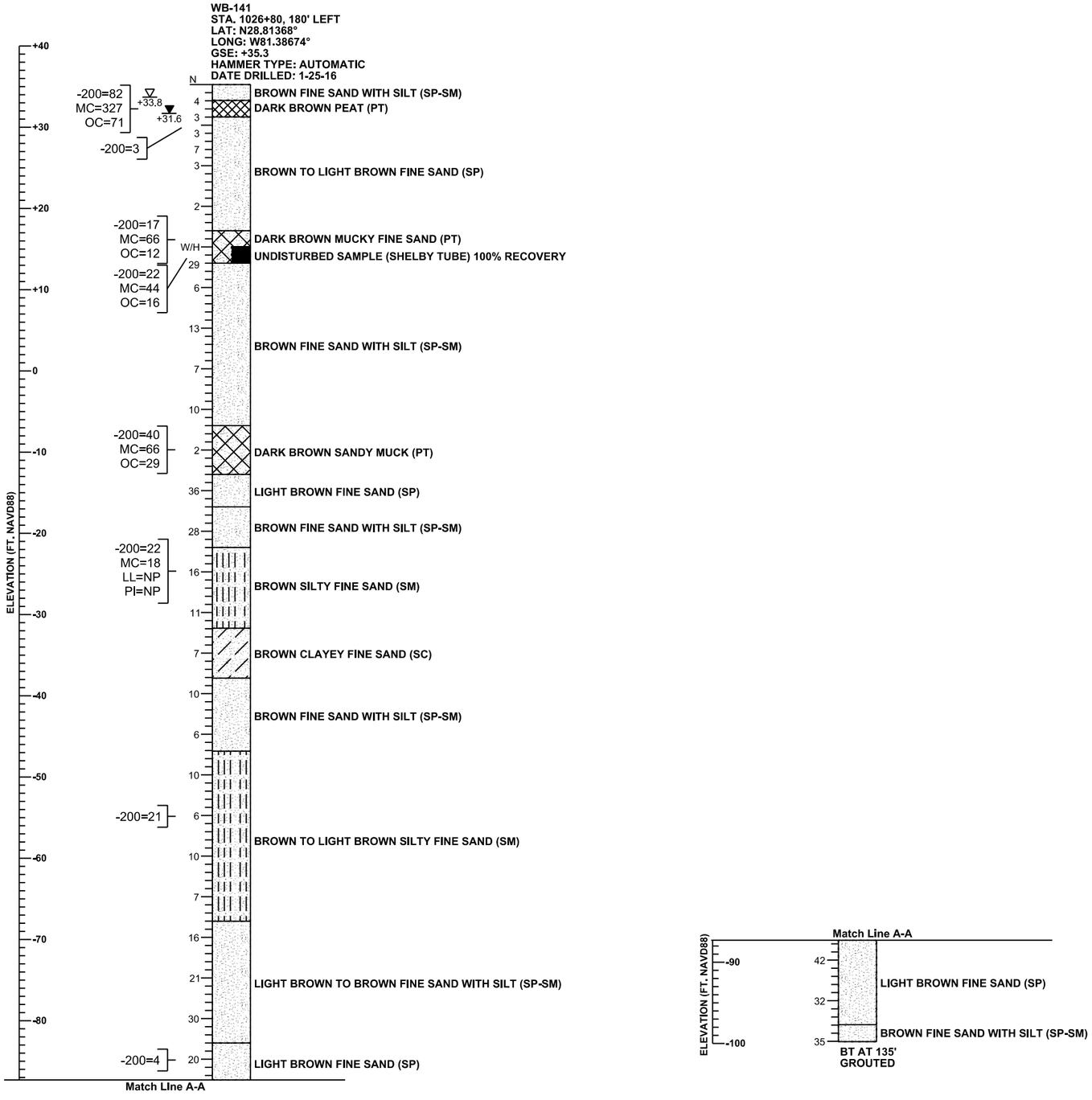
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:34:59 PM J:\D109\3520G Wekiva Parkway Section 7A\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	DESCRIPTION	DATE	DESCRIPTION

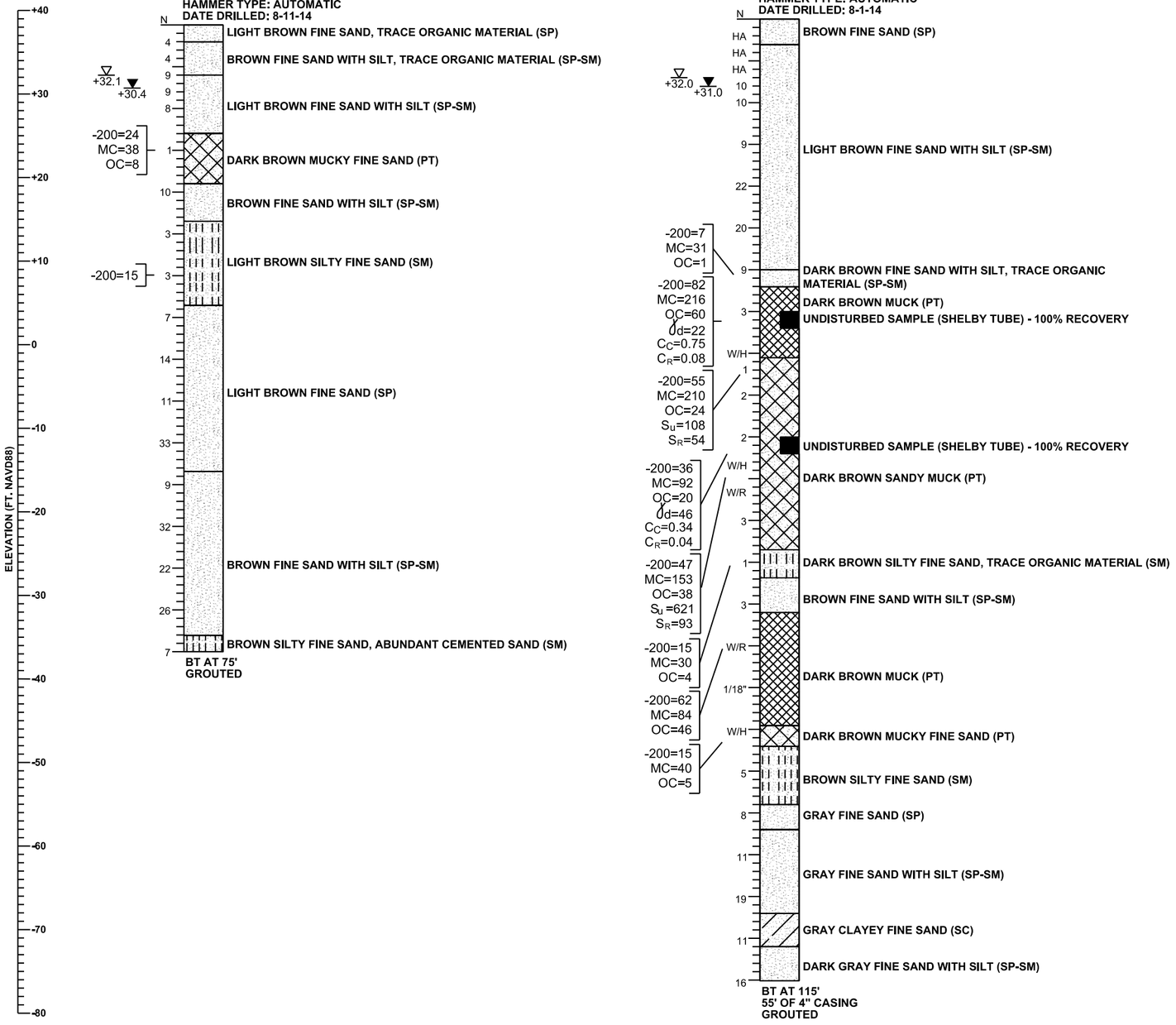
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



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	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

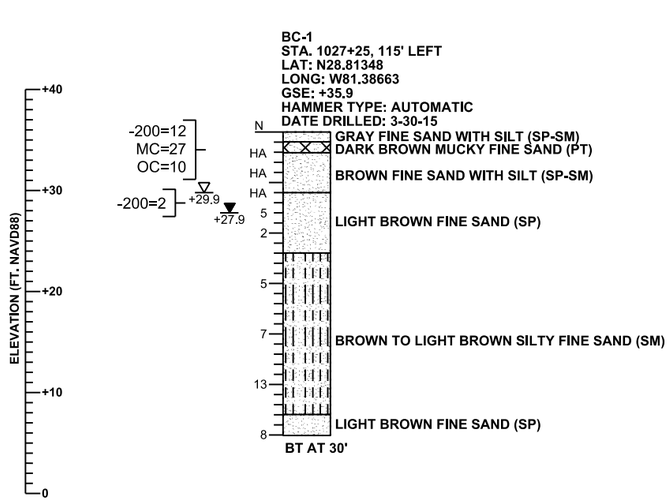
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

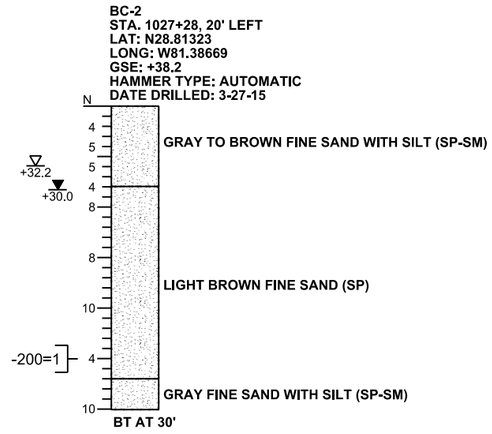
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:37:51 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.dgn





LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
HA	HAND AUGERED FOR UTILITY CLEARANCE
▽ +29.9	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +27.9	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
OC=	PERCENT ORGANIC CONTENT

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

ENVIRONMENTAL CLASSIFICATION:
SUBSTRUCTURE:
STEEL: MODERATELY AGGRESSIVE
CONCRETE: SLIGHTLY AGGRESSIVE

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	DESCRIPTION	DATE	DESCRIPTION

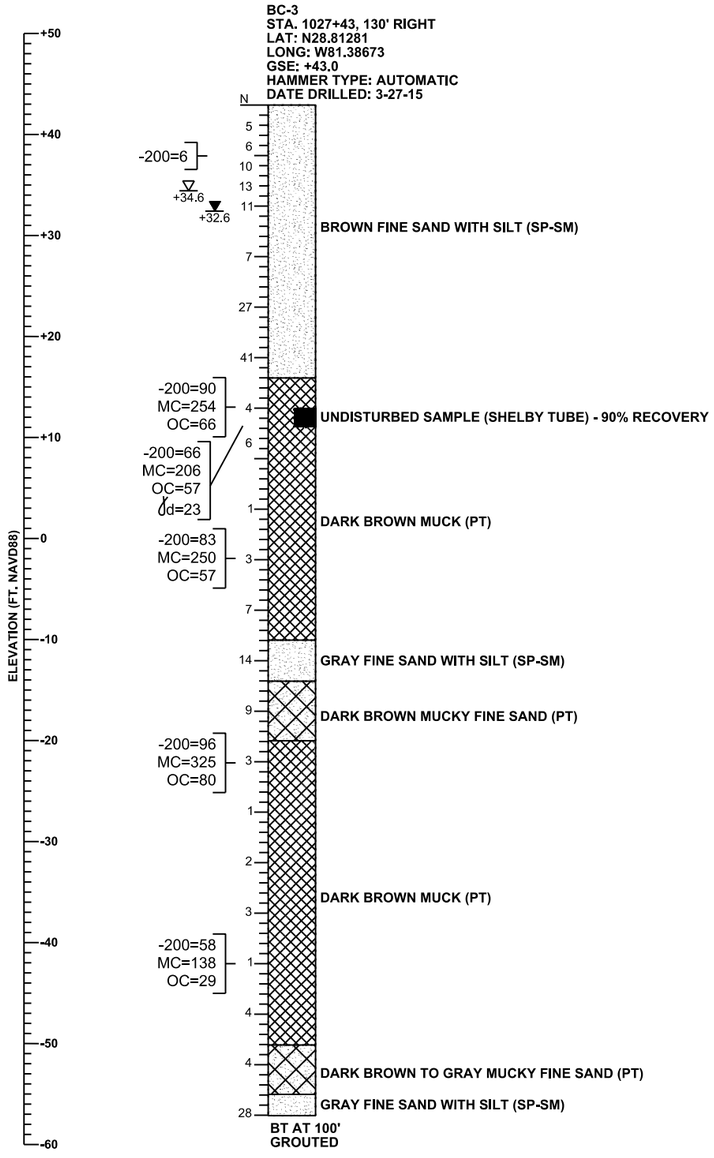
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



LEGEND

GSE	GROUND SURFACE ELEVATION (FT. NAVD88)
N	STANDARD PENETRATION RESISTANCE, BLOWS PER FOOT
▽ +34.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +32.6	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
OC=	PERCENT ORGANIC CONTENT
γd=	DRY UNIT WEIGHT (pcf)

SAND

MUCK

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

ENVIRONMENTAL CLASSIFICATION:
SUBSTRUCTURE:
STEEL: MODERATELY AGGRESSIVE
CONCRETE: SLIGHTLY AGGRESSIVE

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	DESCRIPTION	DATE	DESCRIPTION

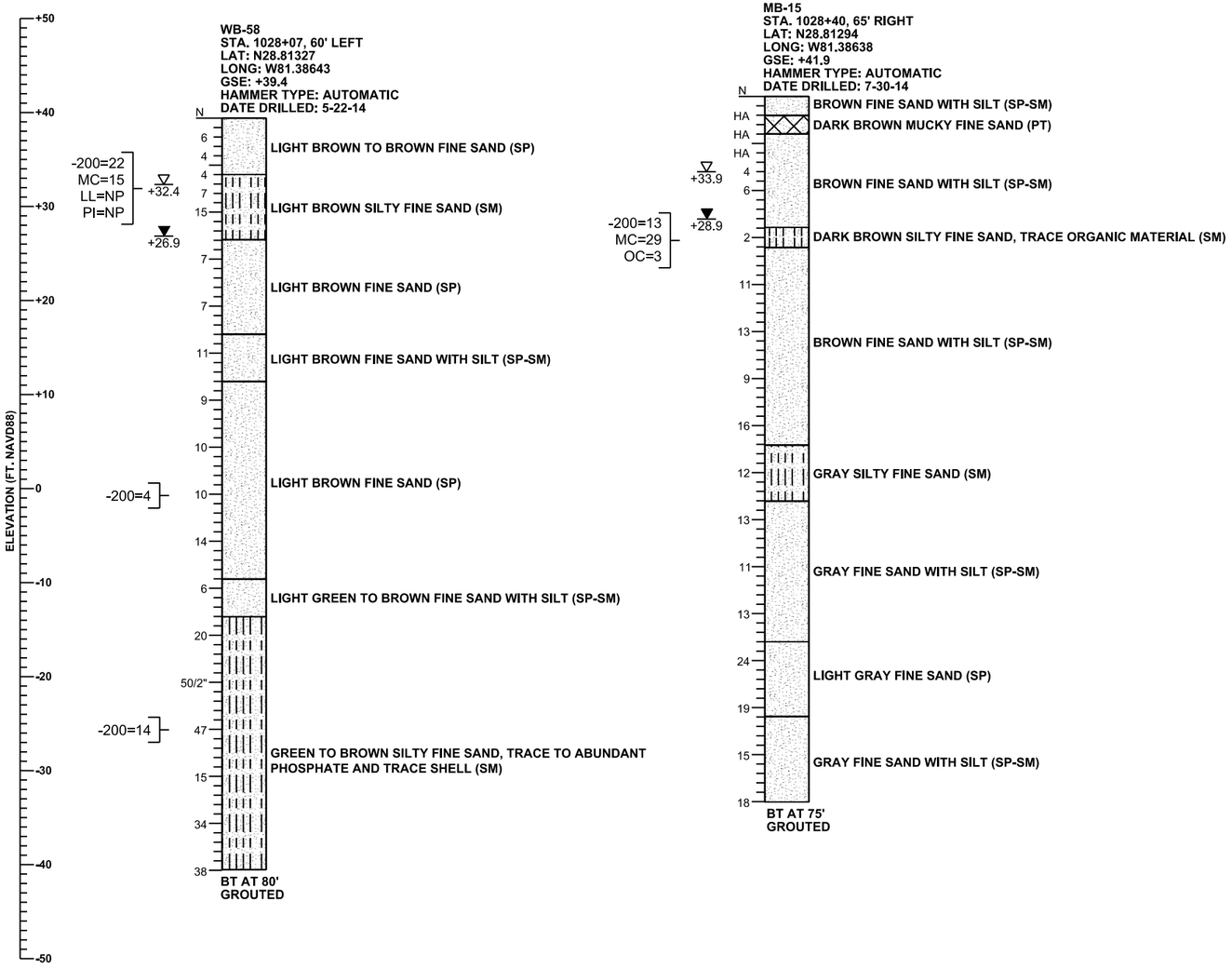
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO. 42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE AREA SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.



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	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

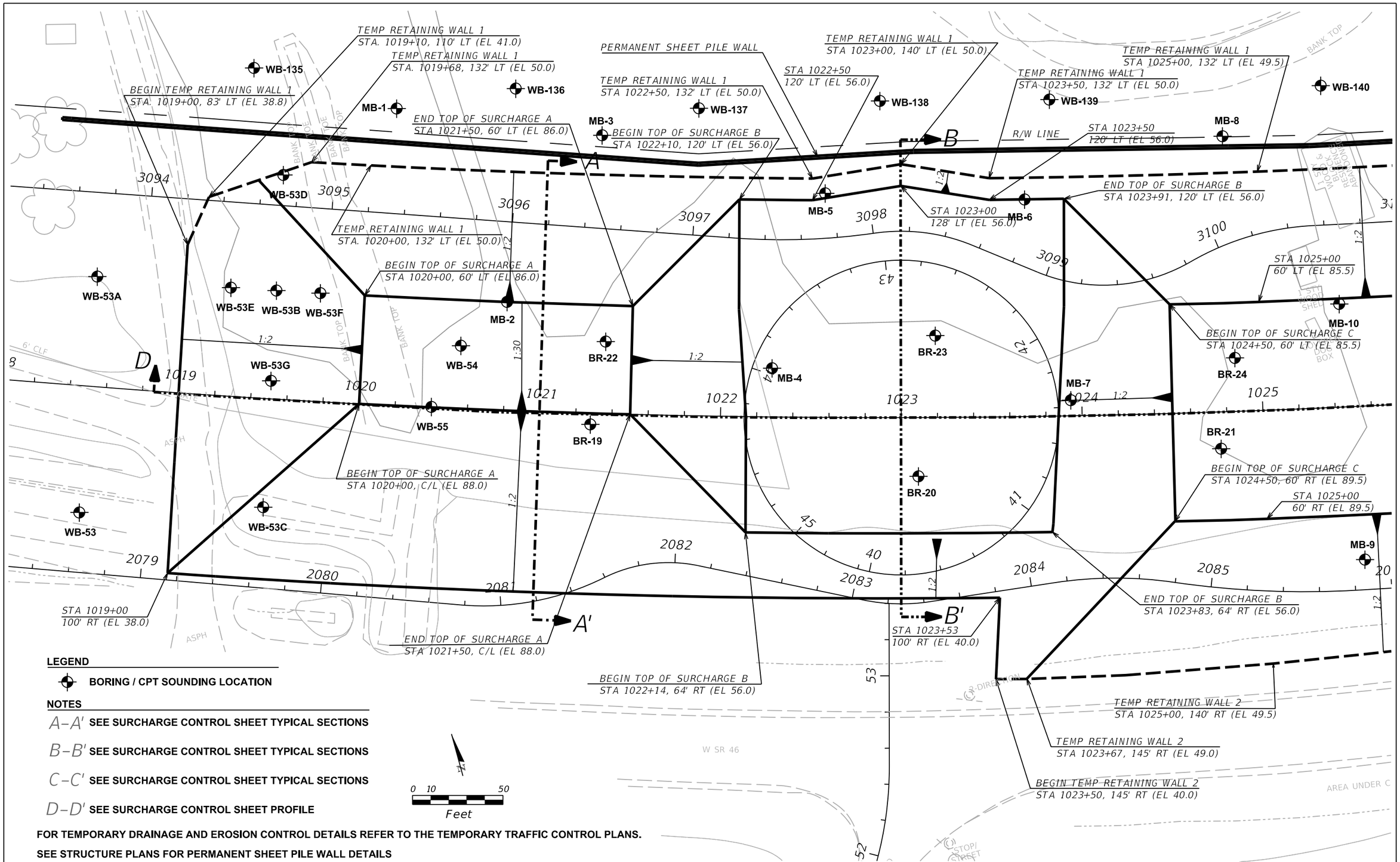
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE AREA
SPT BORINGS AND CPT SOUNDINGS RESULTS

SHEET NO.

Scott 4/17/2017 4:40:34 PM J:\D109\3520G Wekiva Parkway Section 7A\b1boring19.dgn

SURCHARGE CONTROL SHEET PLAN VIEW



LEGEND

BORING / CPT SOUNDING LOCATION

NOTES

A–A′ SEE SURCHARGE CONTROL SHEET TYPICAL SECTIONS

B–B′ SEE SURCHARGE CONTROL SHEET TYPICAL SECTIONS

C–C′ SEE SURCHARGE CONTROL SHEET TYPICAL SECTIONS

D–D′ SEE SURCHARGE CONTROL SHEET PROFILE

FOR TEMPORARY DRAINAGE AND EROSION CONTROL DETAILS REFER TO THE TEMPORARY TRAFFIC CONTROL PLANS.

SEE STRUCTURE PLANS FOR PERMANENT SHEET PILE WALL DETAILS

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

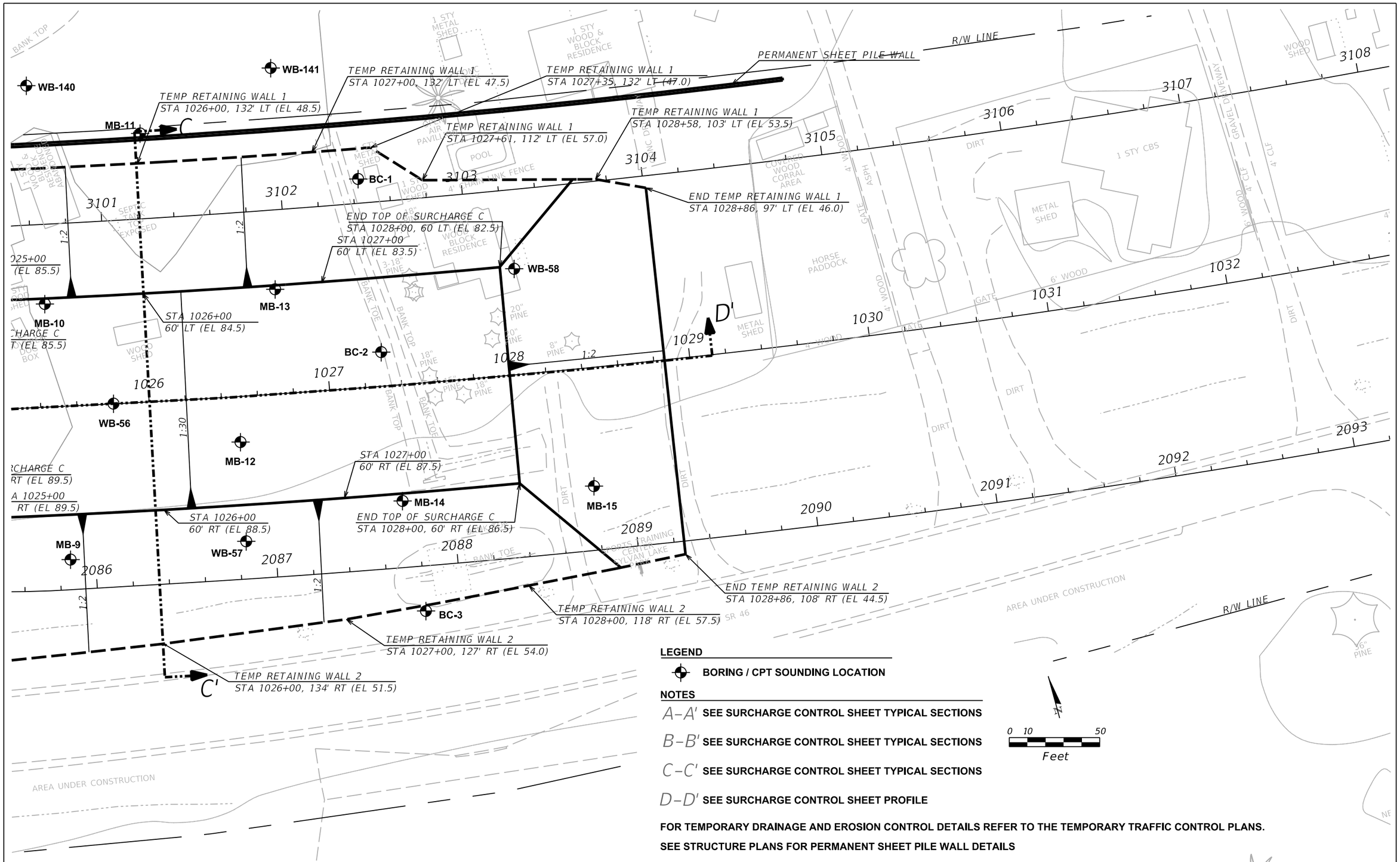
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE CONTROL SHEET PLAN VIEW

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

Scott 4/18/2017 10:16:28 AM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\b1boring01.DGN



LEGEND

BORING / CPT SOUNDING LOCATION

NOTES

A–A' **SEE SURCHARGE CONTROL SHEET TYPICAL SECTIONS**

B–B' **SEE SURCHARGE CONTROL SHEET TYPICAL SECTIONS**

C–C' **SEE SURCHARGE CONTROL SHEET TYPICAL SECTIONS**

D–D' **SEE SURCHARGE CONTROL SHEET PROFILE**

FOR TEMPORARY DRAINAGE AND EROSION CONTROL DETAILS REFER TO THE TEMPORARY TRAFFIC CONTROL PLANS.

SEE STRUCTURE PLANS FOR PERMANENT SHEET PILE WALL DETAILS

0 10 50
Feet

PRELIMINARY: NOT FOR CONSTRUCTION

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
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE CONTROL SHEET PLAN VIEW

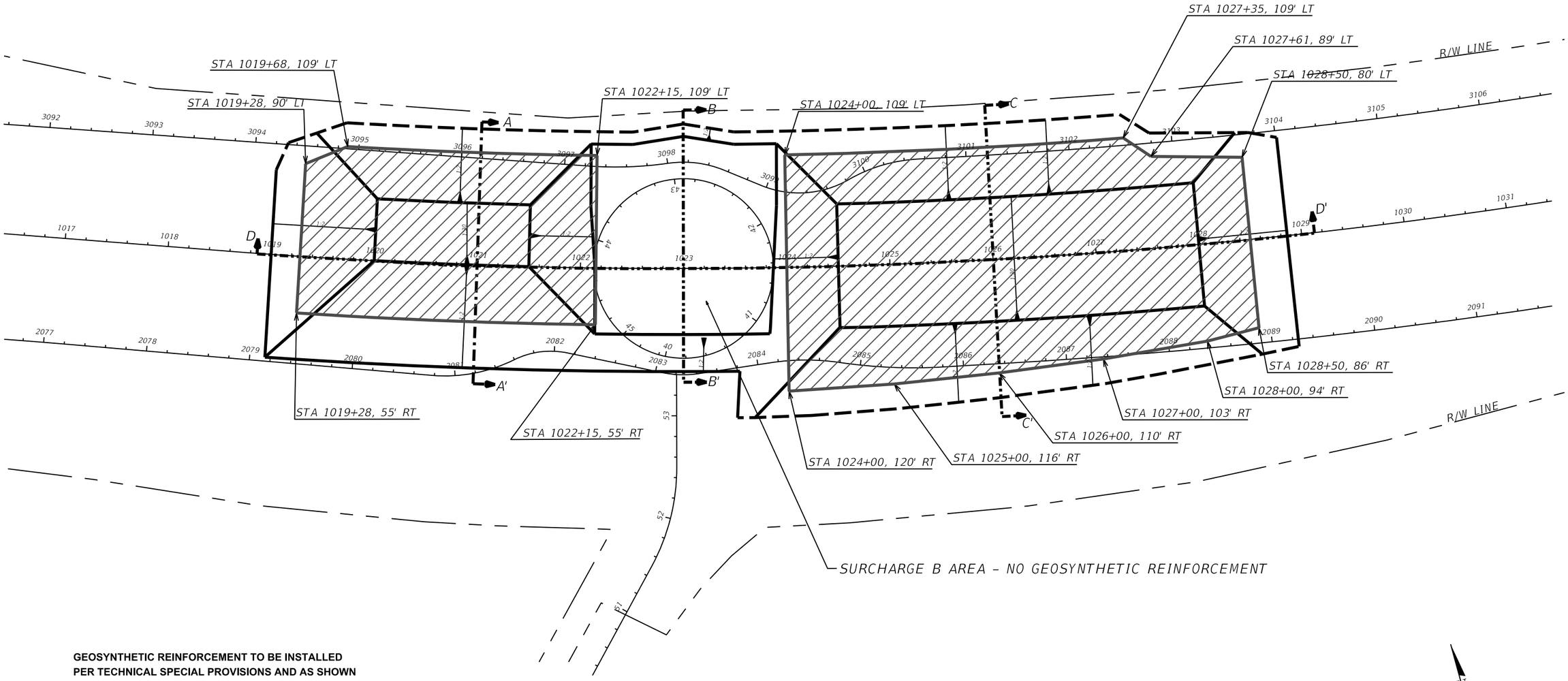
SHEET NO.

Scott 4/18/2017 10:18:36 AM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\b1boring01A.DGN

SURCHARGE CONTROL
GEOSYNTHETIC REINFORCEMENT
PLAN VIEW

SURCHARGE A – GEOSYNTHETIC REINFORCEMENT PLAN VIEW LIMITS

SURCHARGE C – GEOSYNTHETIC REINFORCEMENT PLAN VIEW LIMITS



GEOSYNTHETIC REINFORCEMENT TO BE INSTALLED PER TECHNICAL SPECIAL PROVISIONS AND AS SHOWN IN CROSS SECTIONS A-A' AND C-C'

PRELIMINARY: NOT FOR CONSTRUCTION

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

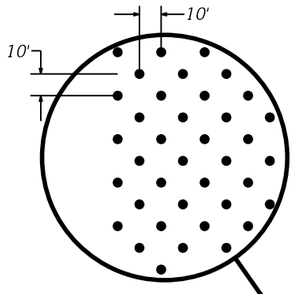
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE CONTROL SHEET GEOSYNTHETIC REINFORCEMENT PLAN VIEW

SHEET NO.

Scott 4/18/2017 10:20:28 AM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\GEOSYNTHETIC2.D

SURCHARGE CONTROL WICK DRAIN
PLAN VIEW LIMITS



TYPICAL WICK DRAIN DETAIL
N.T.S.

SURCHARGE A – WICK DRAIN PLAN VIEW LIMITS
WICK DRAINS TO BE INSTALLED TO ELEVATION –10

SURCHARGE C – WICK DRAIN PLAN VIEW LIMITS
WICK DRAINS TO BE INSTALLED TO ELEVATION –50

STA 1019+40, 97' LT
STA 1019+68, 109' LT
STA 1022+00, 109' LT
STA 1024+25, 109' LT
STA 1027+35, 109' LT
STA 1027+35, 80' LT
STA 1028+00, 80' LT
R/W LINE
STA 1019+40, 25' RT
STA 1022+00, 25' RT
STA 1024+25, 119' RT
STA 1025+00, 116' RT
STA 1026+00, 110' RT
STA 1027+00, 103' RT
STA 1028+00, 94' RT
R/W LINE
SURCHARGE AREA B – NO WICK DRAINS

WICK DRAINS TO BE INSTALLED PER
TECHNICAL SPECIAL PROVISIONS

0 20 100
Feet

PRELIMINARY: NOT FOR CONSTRUCTION

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

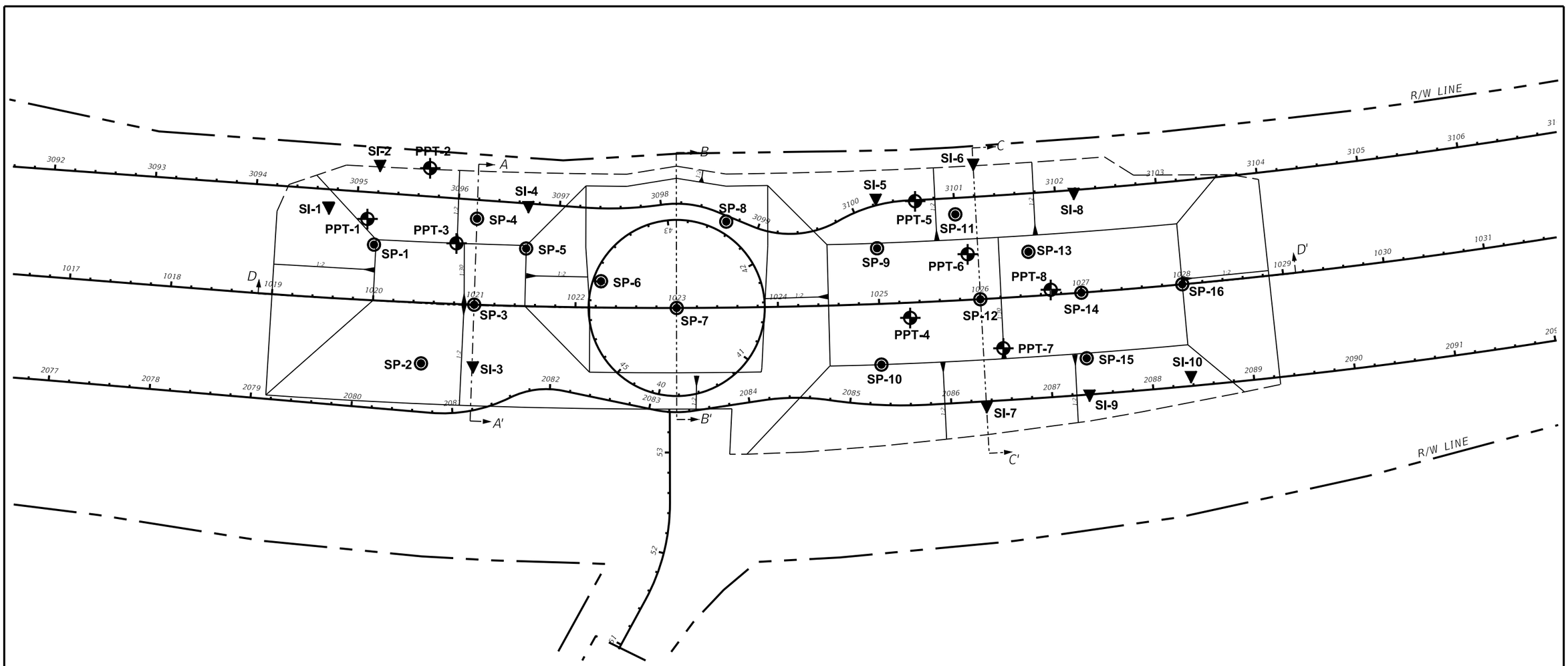
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE CONTROL SHEET
WICK DRAIN PLAN VIEW LIMITS

SHEET NO.

Scott 4/18/2017 10:24:02 AM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\WICK DRAINS2.DG

SURCHARGE INSTRUMENTATION
PLAN VIEW



SETTLEMENT PLATE LOCATION

SETTLEMENT PLATE NO.	STATION (SR 429 C/L)	OFFSET (FT.)
SP - 1	1020+00	55 LT
SP - 2	1020+50	60 RT
SP - 3	1021+00	C/L
SP - 4	1021+00	85 LT
SP - 5	1021+50	57 LT
SP - 6	1022+25	26 LT
SP - 7	1023+00	C/L
SP - 8	1023+50	85 LT
SP - 9	1025+00	55 LT
SP - 10	1025+00	60 RT
SP - 11	1025+80	85 LT
SP - 12	1026+00	C/L
SP - 13	1026+50	44 LT
SP - 14	1027+00	C/L
SP - 15	1027+00	65 RT
SP - 16	1028+00	C/L

PORE PRESSURE TRANSDUCER LOCATION

PRESSURE TRANSDUCER NO.	STATION (SR 429 C/L)	OFFSET (FT.)	APPROXIMATE TIP ELEVATION (FT. NAVD88)	TOP ELEVATION (FT. NAVD88)	TUBING LENGTH (FT.)
PPT - 1	1019+90	80 LT	15	77	62
PPT - 2	1020+50	133 LT	15	33	18
PPT - 3	1020+80	60 LT	5	88	83
PPT - 4	1025+30	15 RT	0	90	90
PPT - 5	1025+40	100 LT	5	67	62
PPT - 6	1025+90	45 LT	10	88	78
PPT - 7	1026+20	50 RT	-10	90	100
PPT - 8	1026+70	5 LT	0	89	89

INCLINOMETER CASING LOCATION

INCLINOMETER CASING NO.	STATION (SR 429 C/L)	OFFSET (FT.)	TIP ELEVATION (FT. NAVD88)	TOP ELEVATION (FT. NAVD88)	CASING LENGTH (FT.)
SI - 1	1019+50	90 LT	-5	63	68
SI - 2	1020+00	135 LT	-10	35	45
SI - 3	1021+00	60 RT	10	60	50
SI - 4	1021+50	100 LT	-5	68	73
SI - 5	1025+00	105 LT	10	66	56
SI - 6	1026+00	135 LT	0	37	37
SI - 7	1026+00	105 RT	-10	70	80
SI - 8	1027+00	100 LT	10	66	56
SI - 9	1027+00	100 RT	-10	70	80
SI - 10	1028+00	90 RT	-10	73	83

NOTE
REFER TO SURCHARGE TECHNICAL PROVISIONS FOR DETAILS REGARDING INSTALLATION OF SURCHARGE INSTRUMENTATION.

PRELIMINARY: NOT FOR CONSTRUCTION

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
SR 429	SEMINOLE	240200-2-52-01

SURCHARGE INSTRUMENTATION PLAN VIEW

SHEET NO.

Scott 4/18/2017 10:22:12 AM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\instrumentation2.d

SURCHARGE TEMPORARY RETAINING WALL
NOTES AND TABLES

SOIL REINFORCEMENT LENGTHS FOR EXTERNAL STABILITY								Table Date 1-01-11	
Wall No. TW-1	Wall Height (ft.)	0-6	8	10	12	14	16	18	20
	Reinforcement Length (ft.)	8	10	12	14	16	19	21	23
	Factored Bearing Resistance (psf)	1720	2079	2456	2832	3208	3872	4248	4624
Wall No. TW-2	Wall Height (ft.)	0-6	8	10	12	14	-	-	-
	Reinforcement Length (ft.)	8	10	12	14	16	-	-	-
	Factored Bearing Resistance (psf)	1720	2079	2456	2832	3208	-	-	-

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.

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.)	
TW-1	2.0-30.0	4.0-11.0	1.31	N/A	N/A
TW-2	2.0-21.0	4.0-8.0	1.51	N/A	N/A

NOTES:
1. Design walls for the settlements noted in the table. Long term settlement is measured from the end of surcharge embankment placement.
2. Transverse differential settlement is measured from the face of wall to the end of the soil reinforcement.

GEOTECHNICAL INFORMATION WALL NOS. TW-1 AND TW-2			Table Date 1-01-11
	Reinforced Soil - Sand	Retained Backfill - Sand	Foundation Soil - Loose Fine Sand
Depth Below Existing Ground Line (ft.)	-	-	0-20
Effective Unit Weight (pcf)	105	115	100
Cohesion (psf)	0	0	0
Internal Friction Angle	30°	32°	28°

NOTES:
1. 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.
2. Retaining walls TW-1 and TW-2 shall be FDOT Type 3 temporary MSE wall with wire basket facing.
3. Retaining walls TW-1 and TW-2 shall be constructed as part of the surcharge program.
4. For wall geometry details refer to the surcharge control sheet plan view and surcharge cross sections.

PRELIMINARY: NOT FOR CONSTRUCTION

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

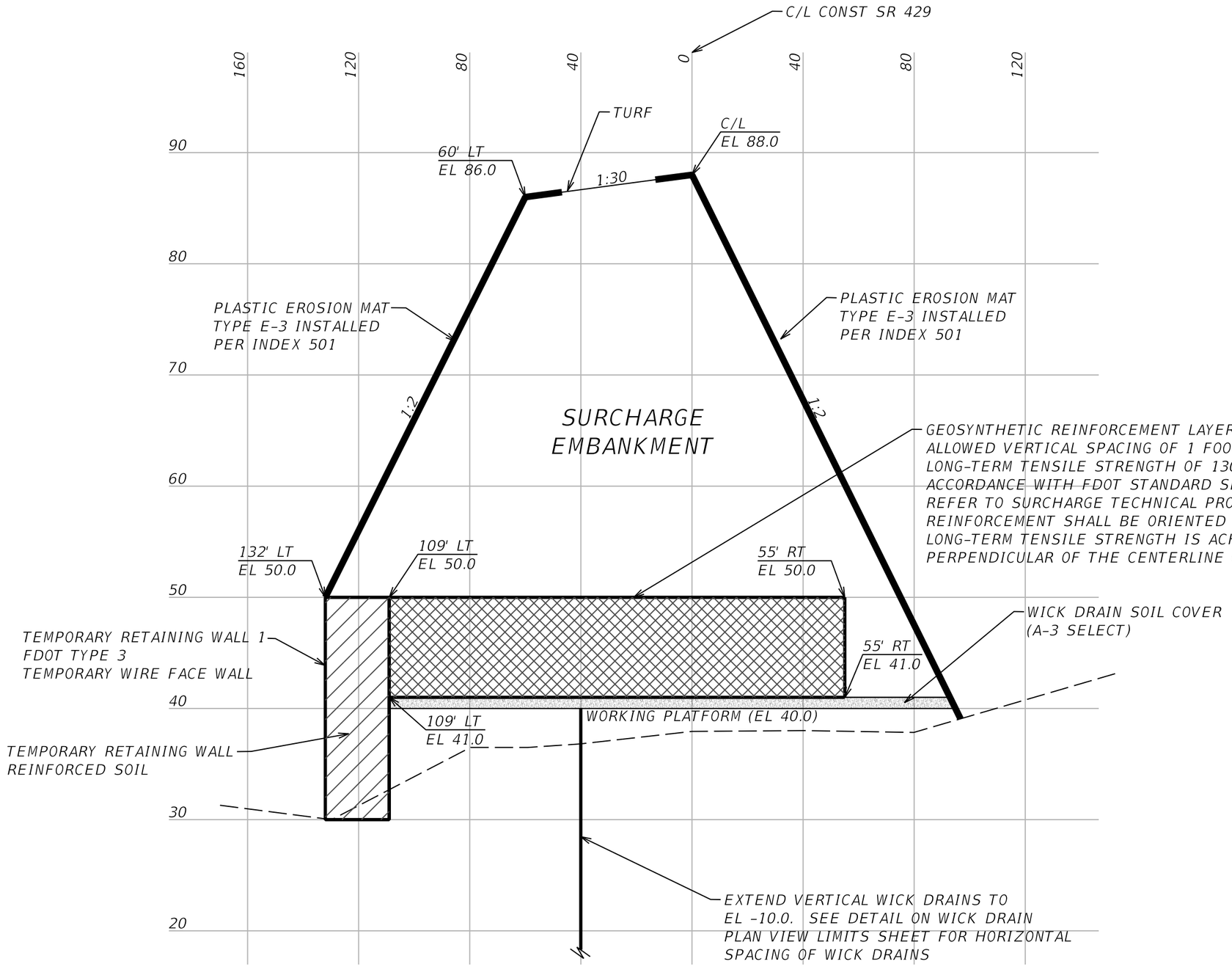
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE TEMPORARY RETAINING WALL NOTES AND TABLES

SHEET NO.

SURCHARGE TYPICAL SECTION SHEETS



GEOSYNTHETIC REINFORCEMENT LAYERS R-3 OR R-4, WITH A MAXIMUM ALLOWED VERTICAL SPACING OF 1 FOOT AND A TOTAL MINIMUM ALLOWABLE LONG-TERM TENSILE STRENGTH OF 130,000 lb/ft., INSTALLED IN ACCORDANCE WITH FDOT STANDARD SPECIFICATION 985. FOR DETAILS REFER TO SURCHARGE TECHNICAL PROVISIONS. THE GEOSYNTHETIC REINFORCEMENT SHALL BE ORIENTED SO THAT THE MINIMUM ALLOWABLE LONG-TERM TENSILE STRENGTH IS ACHIEVED IN THE DIRECTION PERPENDICULAR OF THE CENTERLINE OF THE EMBANKMENT.

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=10'

A-A' TYPICAL SECTION - SURCHARGE A

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

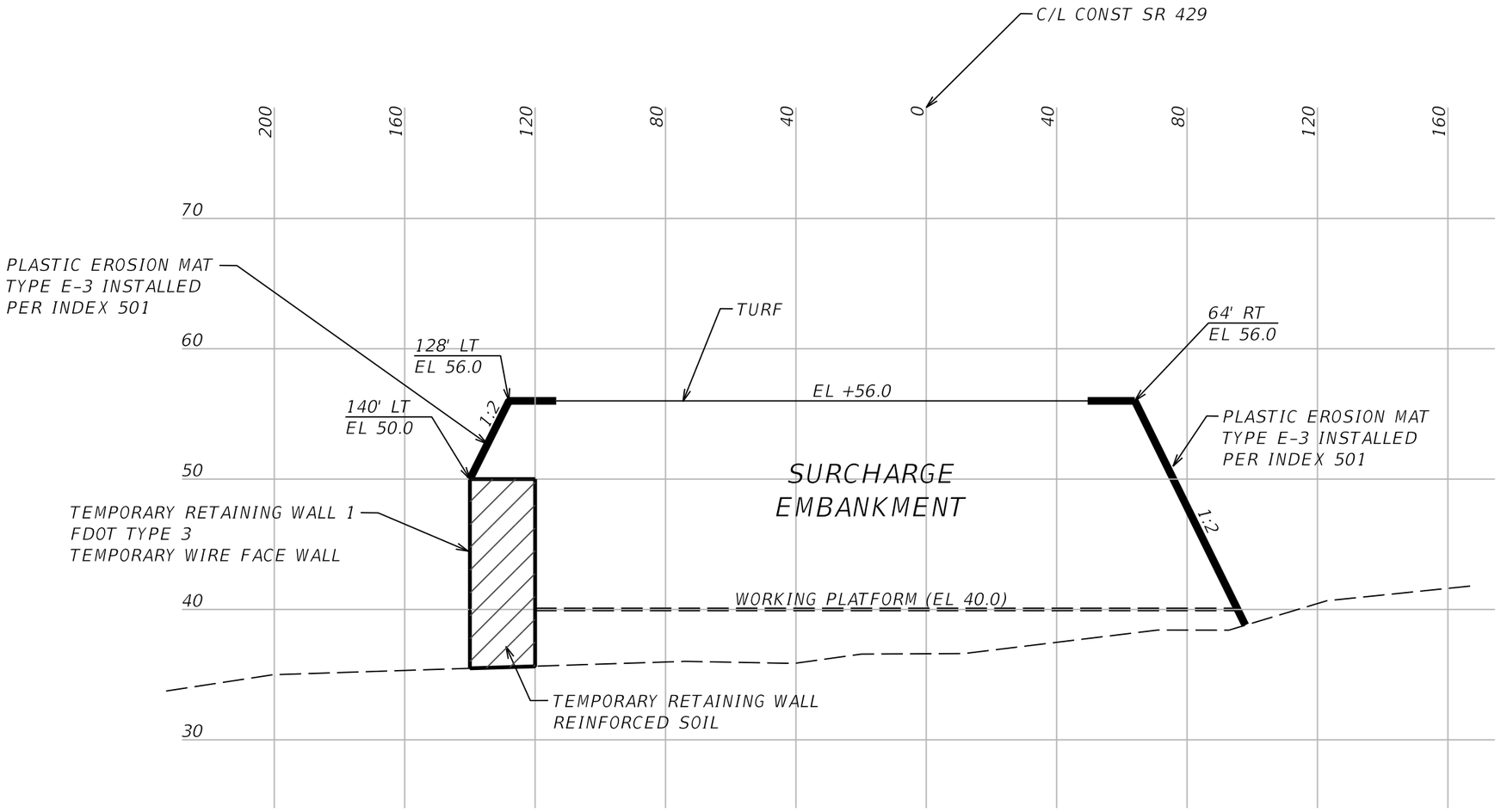
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

TYPICAL SECTION A-A'
SURCHARGE A

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



B-B' TYPICAL SECTION - SURCHARGE B

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=10'

PRELIMINARY: NOT FOR CONSTRUCTION

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

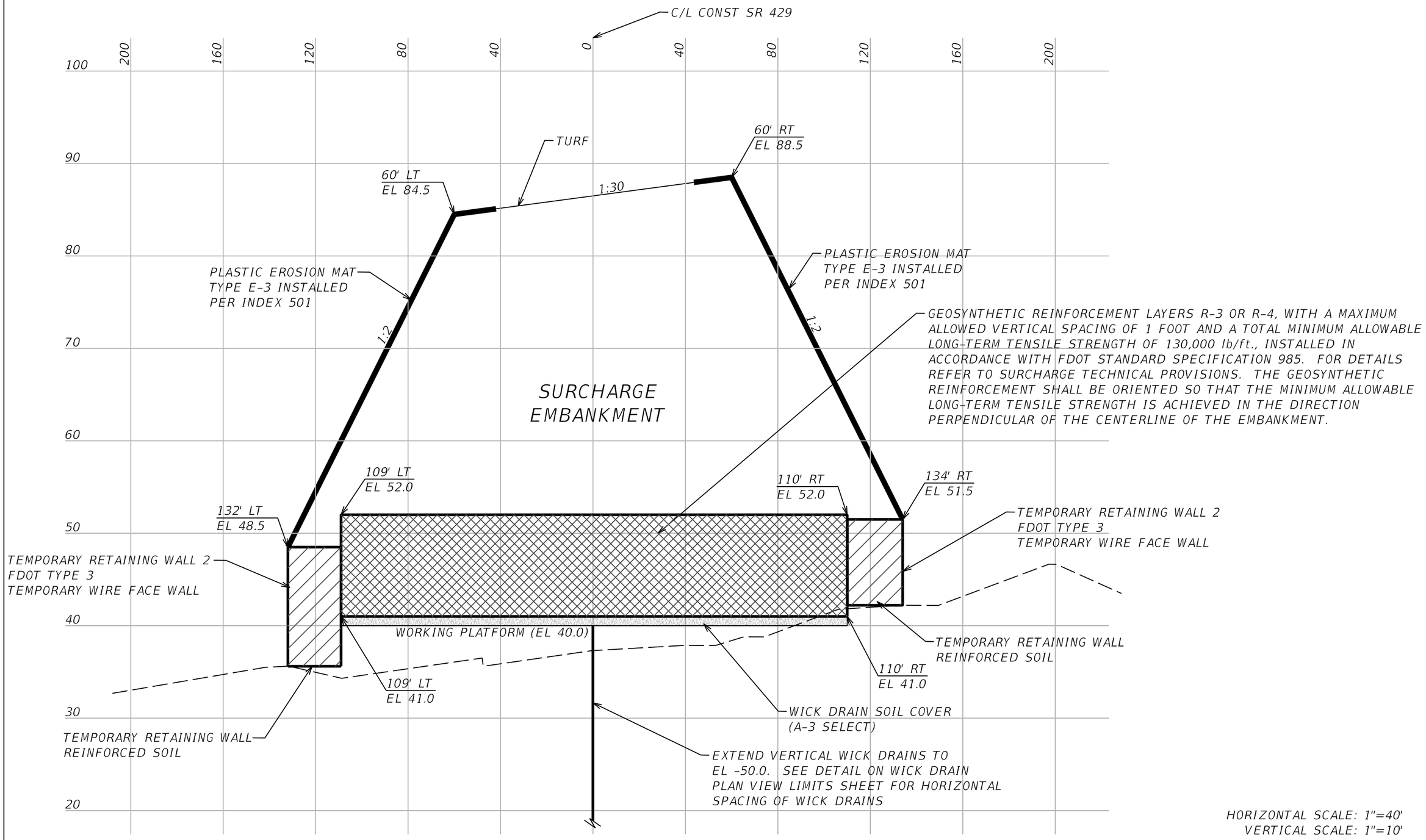
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

TYPICAL SECTION B-B'
SURCHARGE B

SHEET NO.

Scott 4/17/2017 3:26:25 PM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\CROSS SECTIONS..



HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=10'

C-C' TYPICAL SECTION - SURCHARGE C

PRELIMINARY: NOT FOR CONSTRUCTION

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

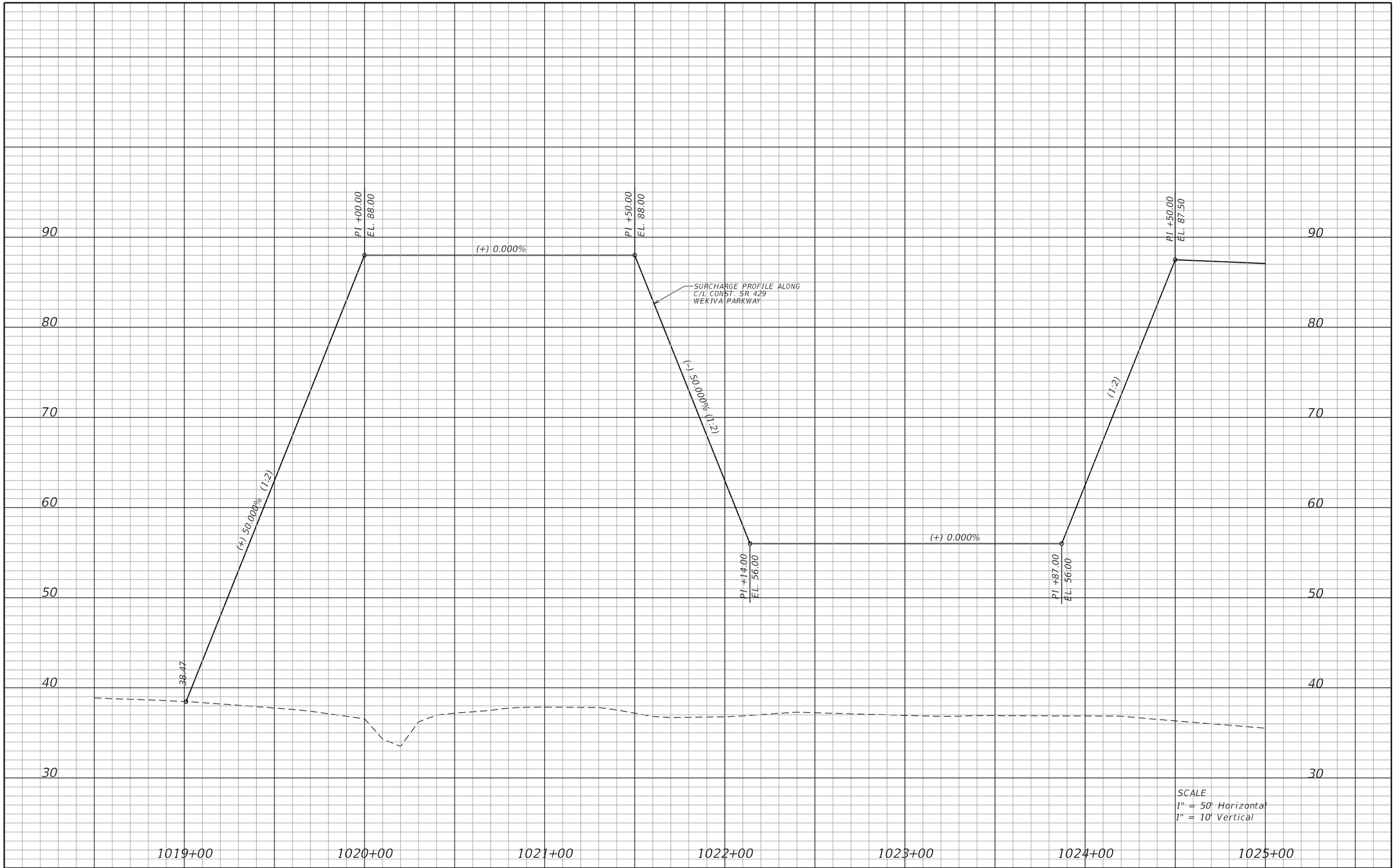
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

TYPICAL SECTION C-C'
SURCHARGE C

SHEET NO.

SURCHARGE PROFILE SHEET



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

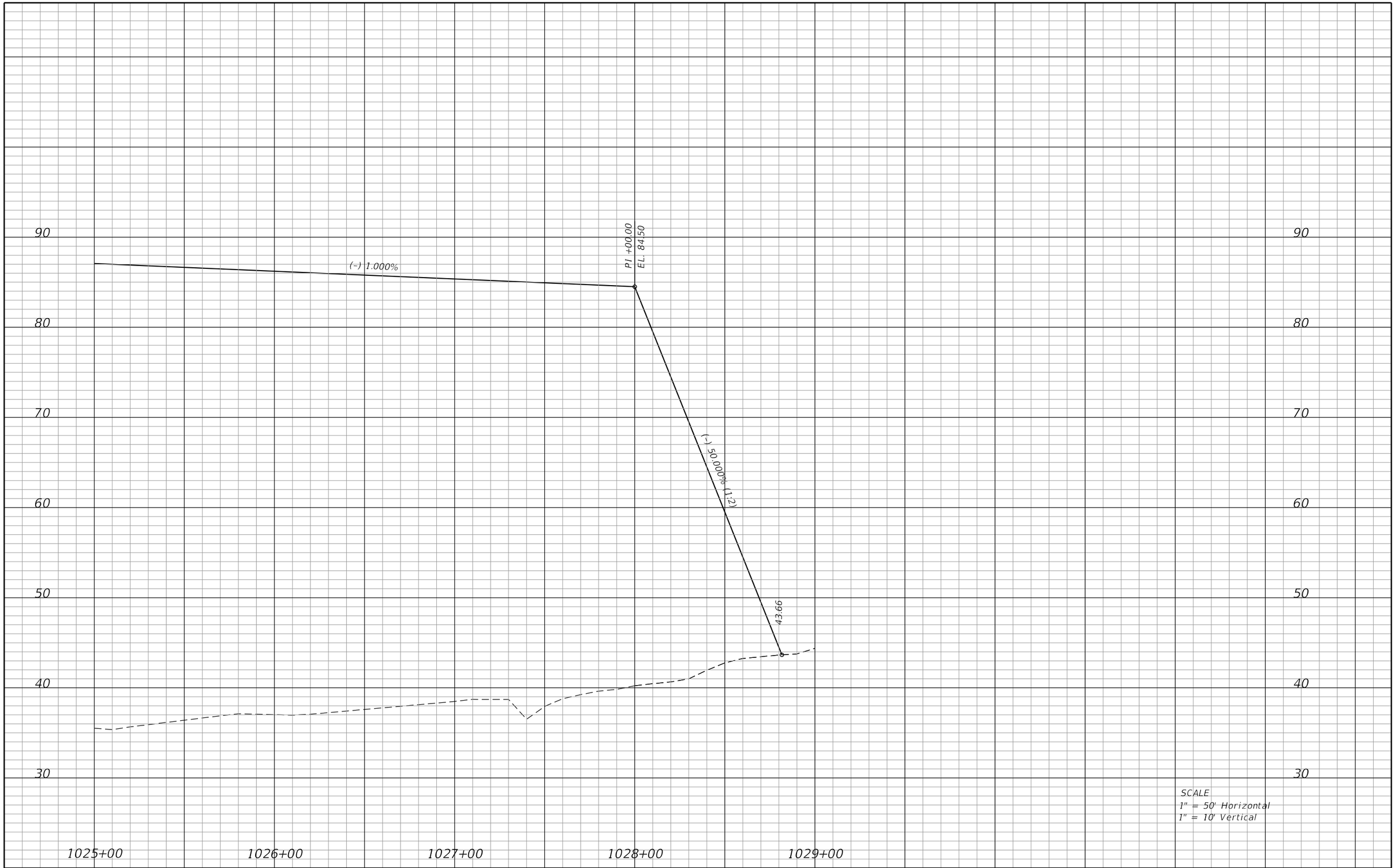
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO.42763

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SURCHARGE PROFILE D-D'

SHEET NO.



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

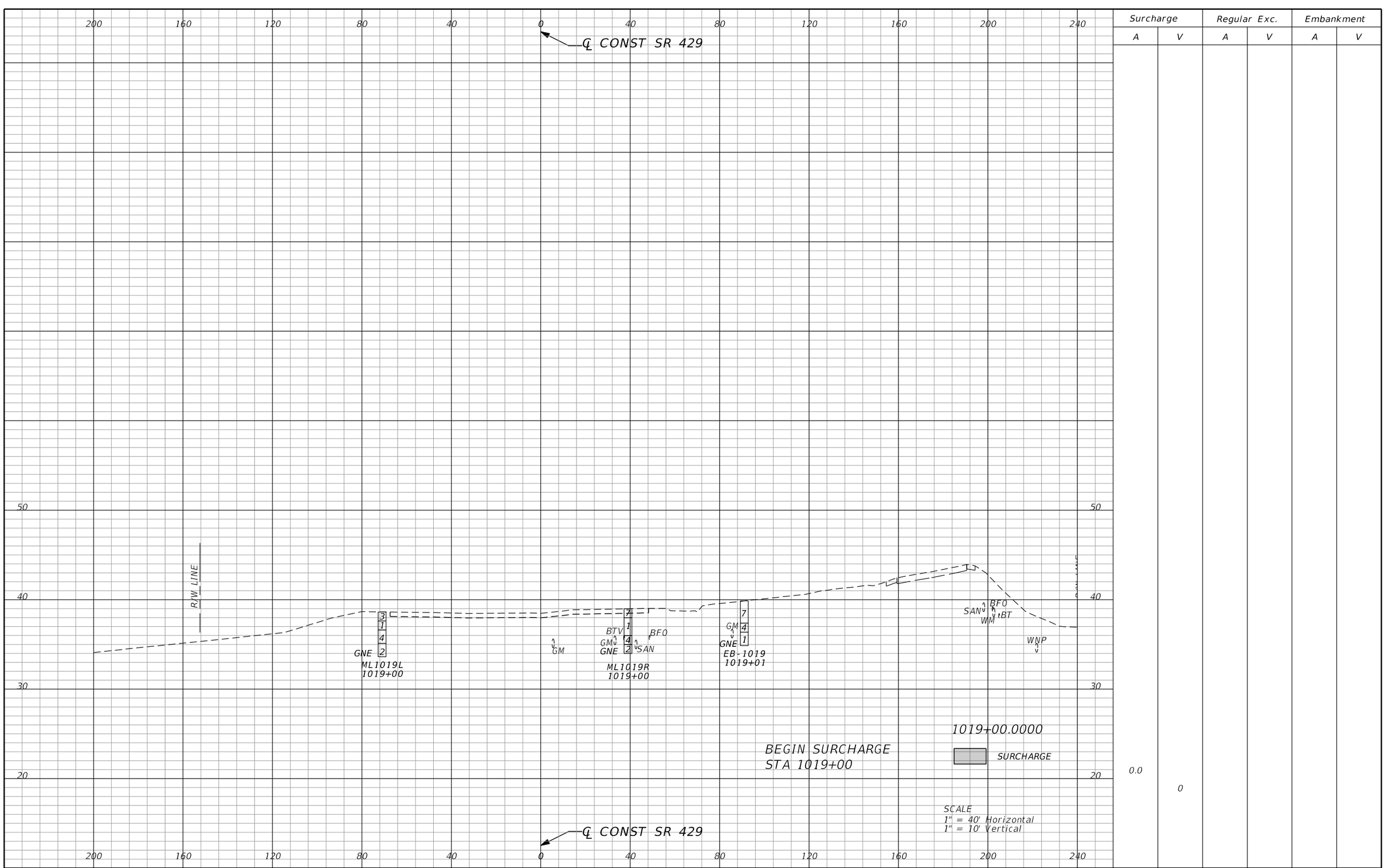
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SURCHARGE PROFILE D-D'

SHEET NO.

robert_martini 9/3/2015 3:04:25 PM 0:\Projects\CADD\24020025201 _USER\USER\geotech\DSPFRD01_surcharge_4-26-15.DGN

SURCHARGE CROSS SECTION SHEETS



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	0.0		0		

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

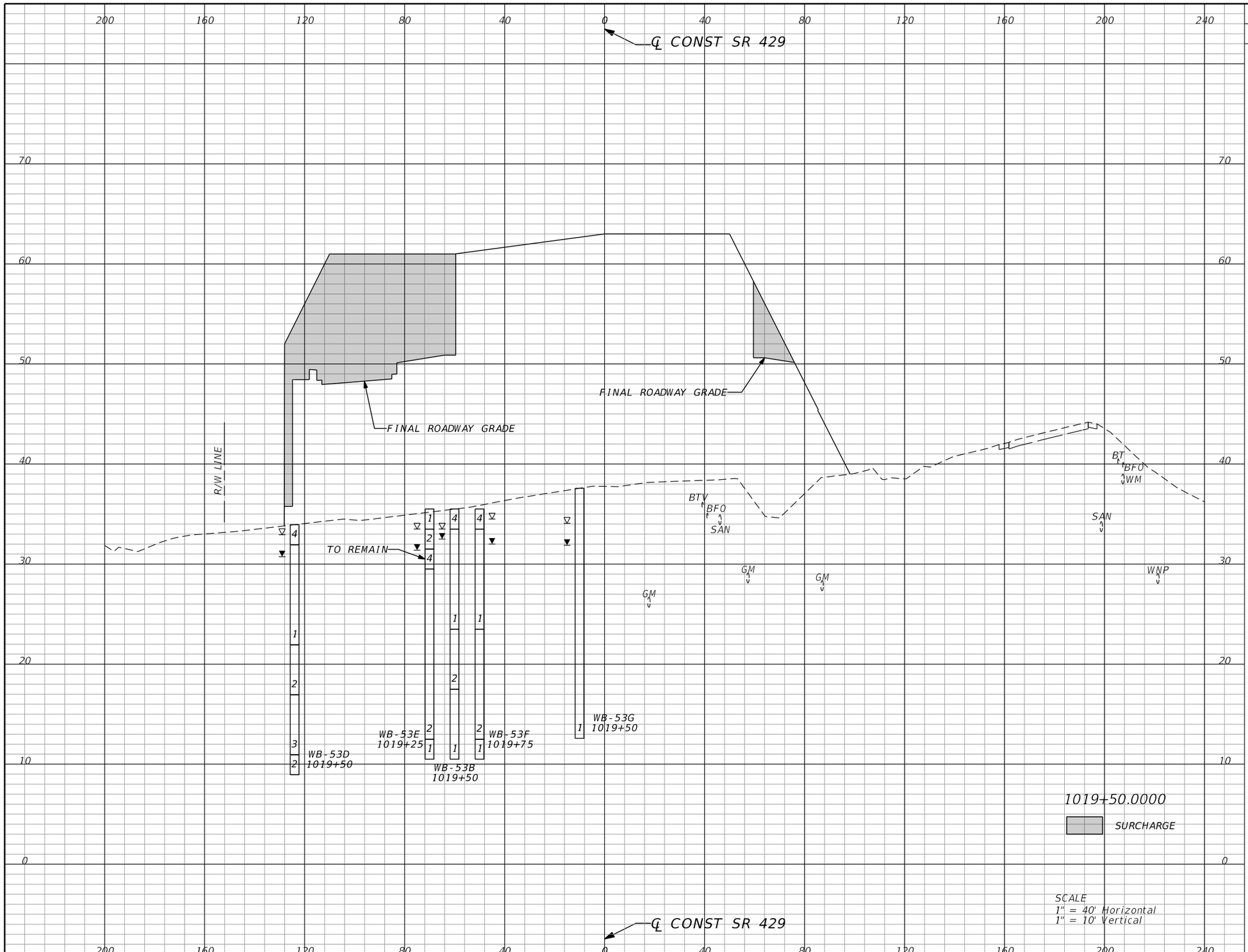
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO.42763

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.



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	834.1		766		

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

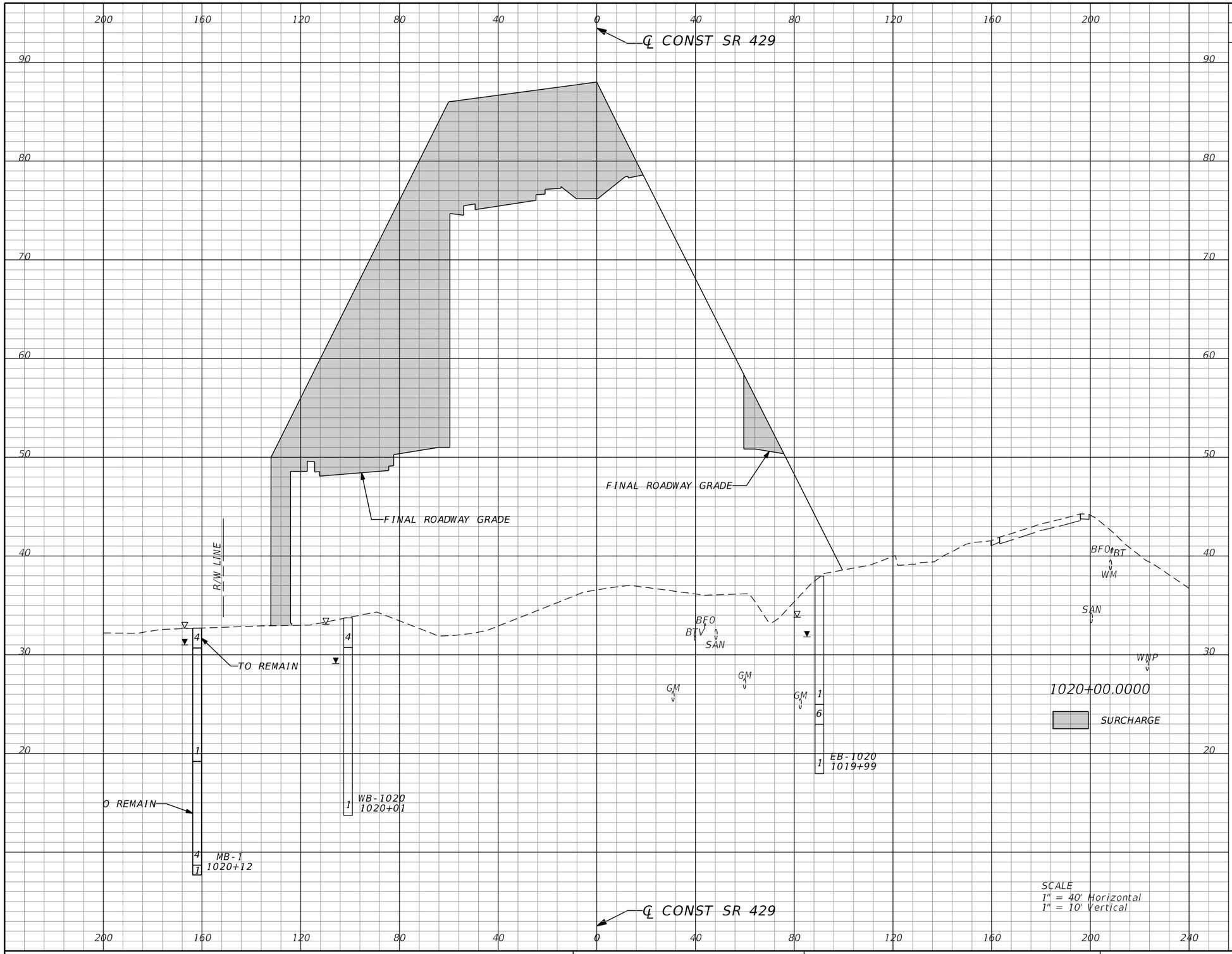
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

glen_dvorovy 10/15/2015 8:36:47 AM 0:\Projects\CADD\24020025201 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
2318.3	2881				

SCALE
1" = 40' Horizontal
1" = 10' Vertical

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

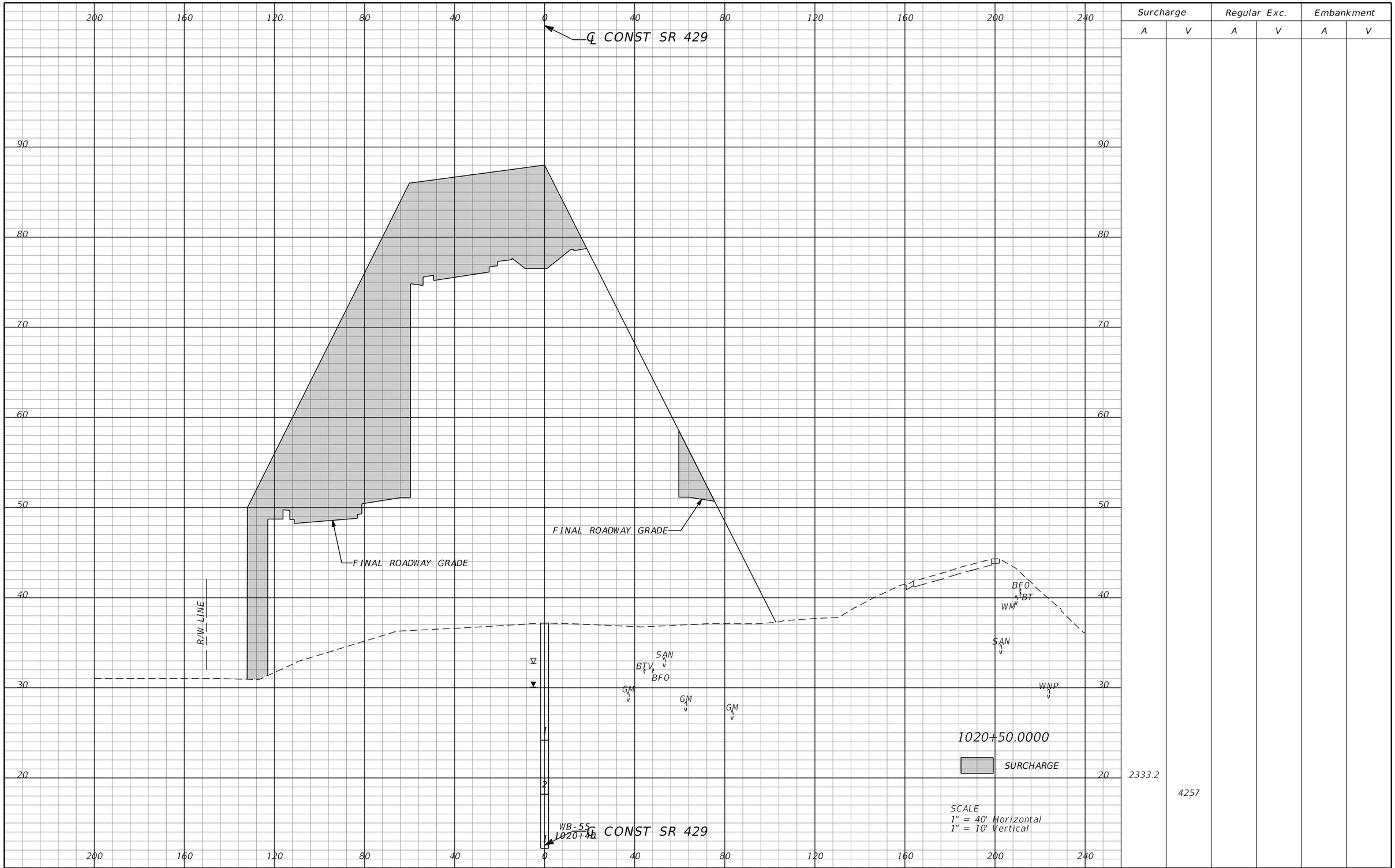
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY; NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	2333.2		4257		

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

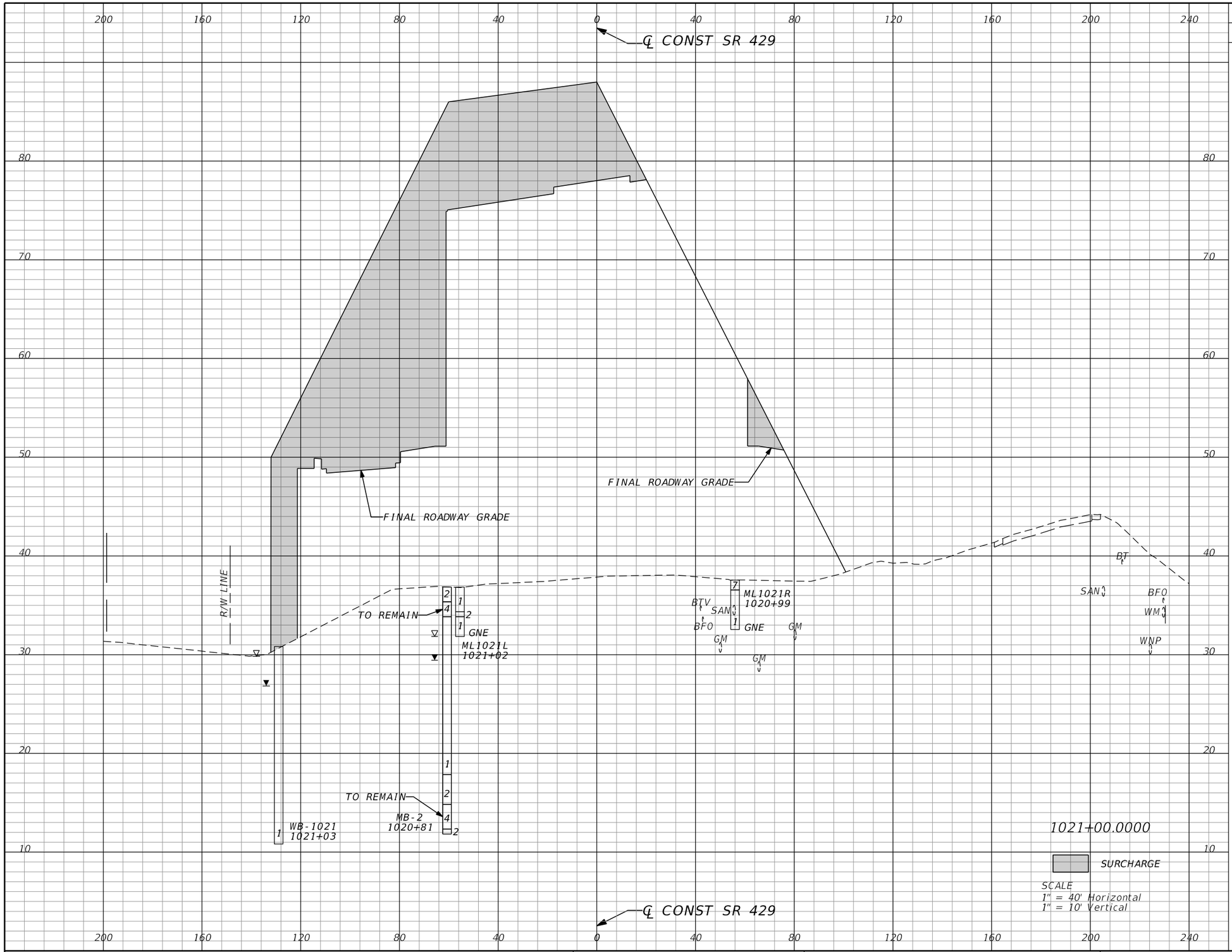
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	2289.1		4229		

PRELIMINARY: NOT FOR CONSTRUCTION

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

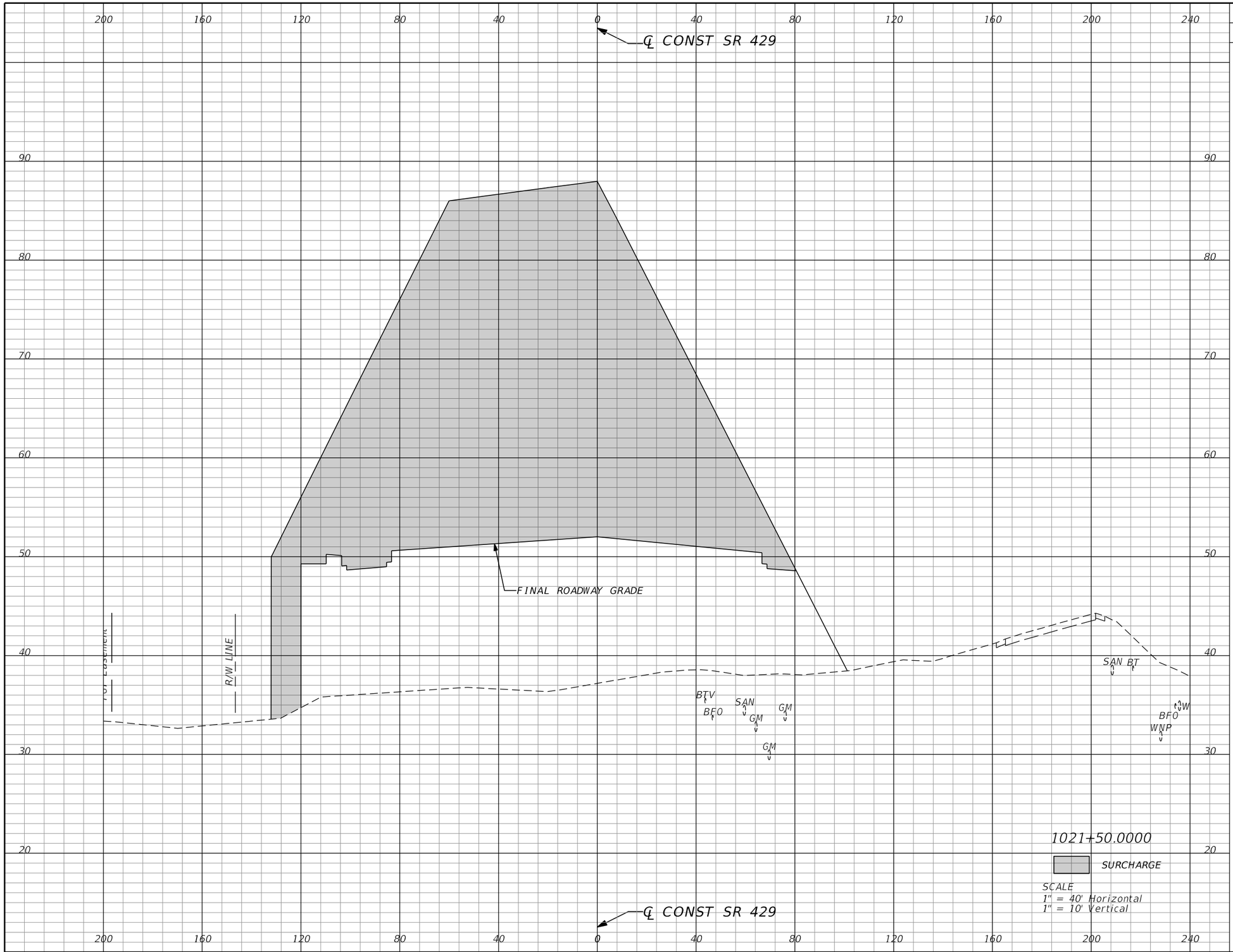
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

glen_dvorovy 10/15/2015 8:37:00 AM O:\Projects\CADD\24020025201 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	5042.3		6728		

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

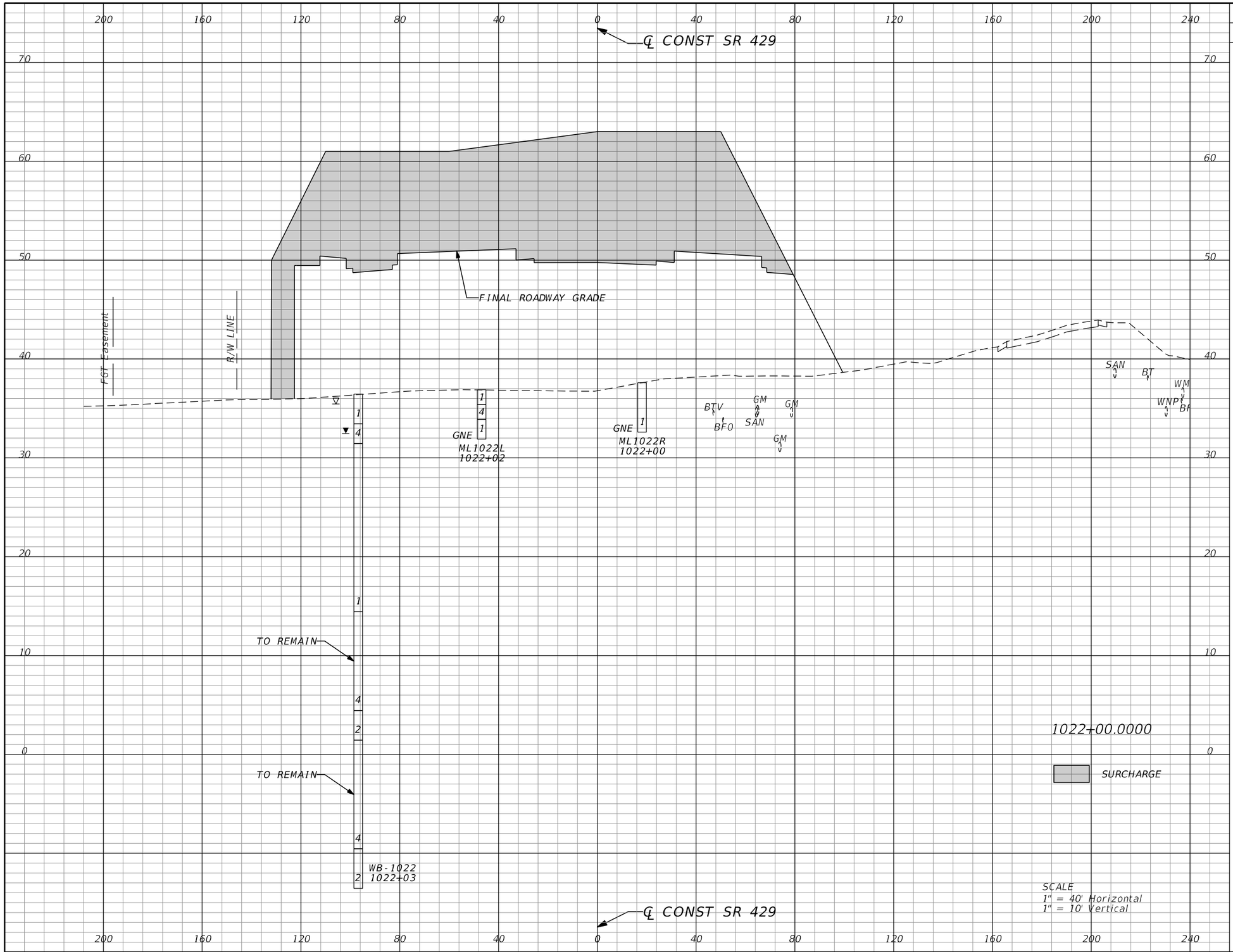
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
2330.9	6788				

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

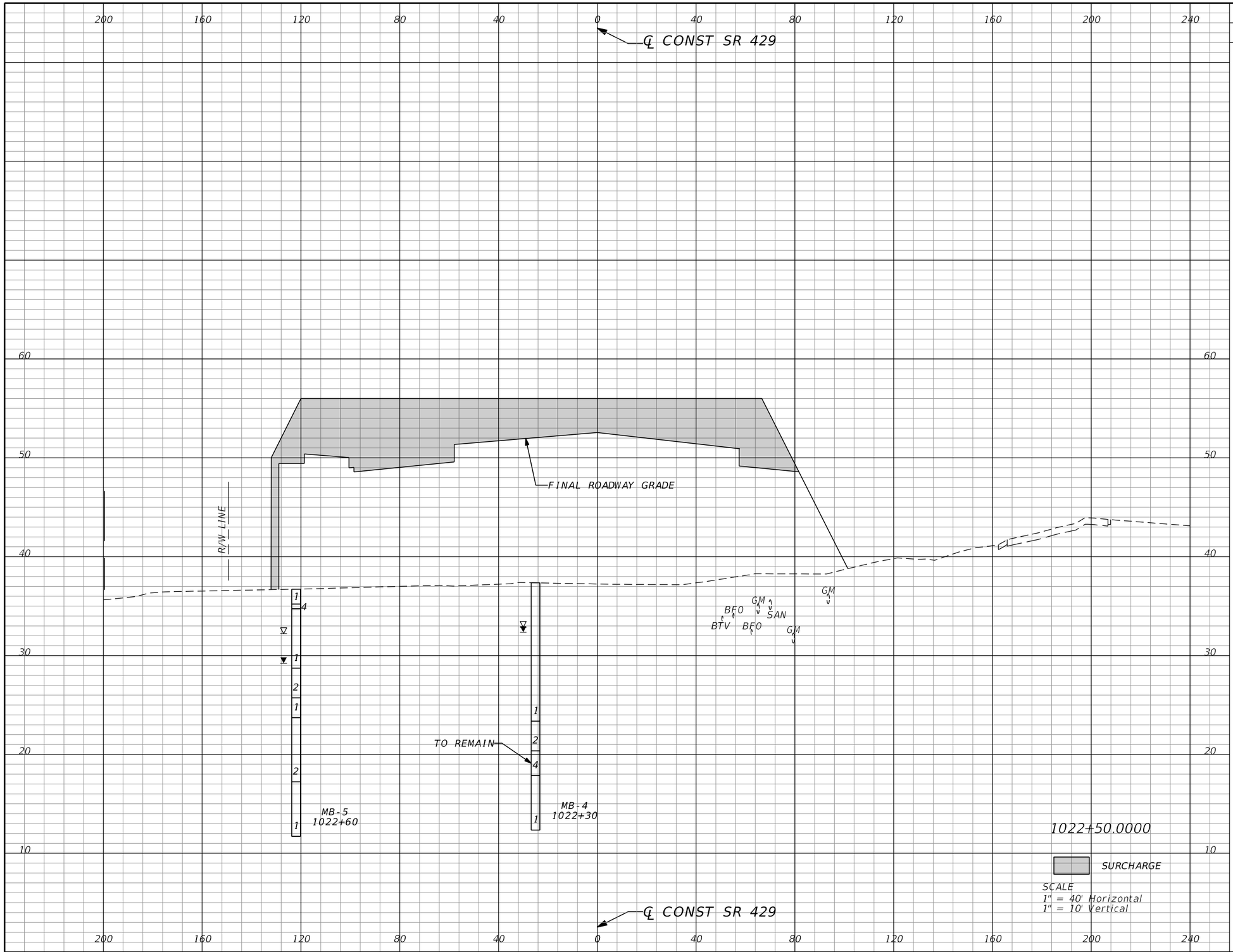
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

glen_dvorovy 10/15/2015 8:37:10 AM 0:\Projects\CADD\24020025201 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	1086.5				3145

PRELIMINARY: NOT FOR CONSTRUCTION

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

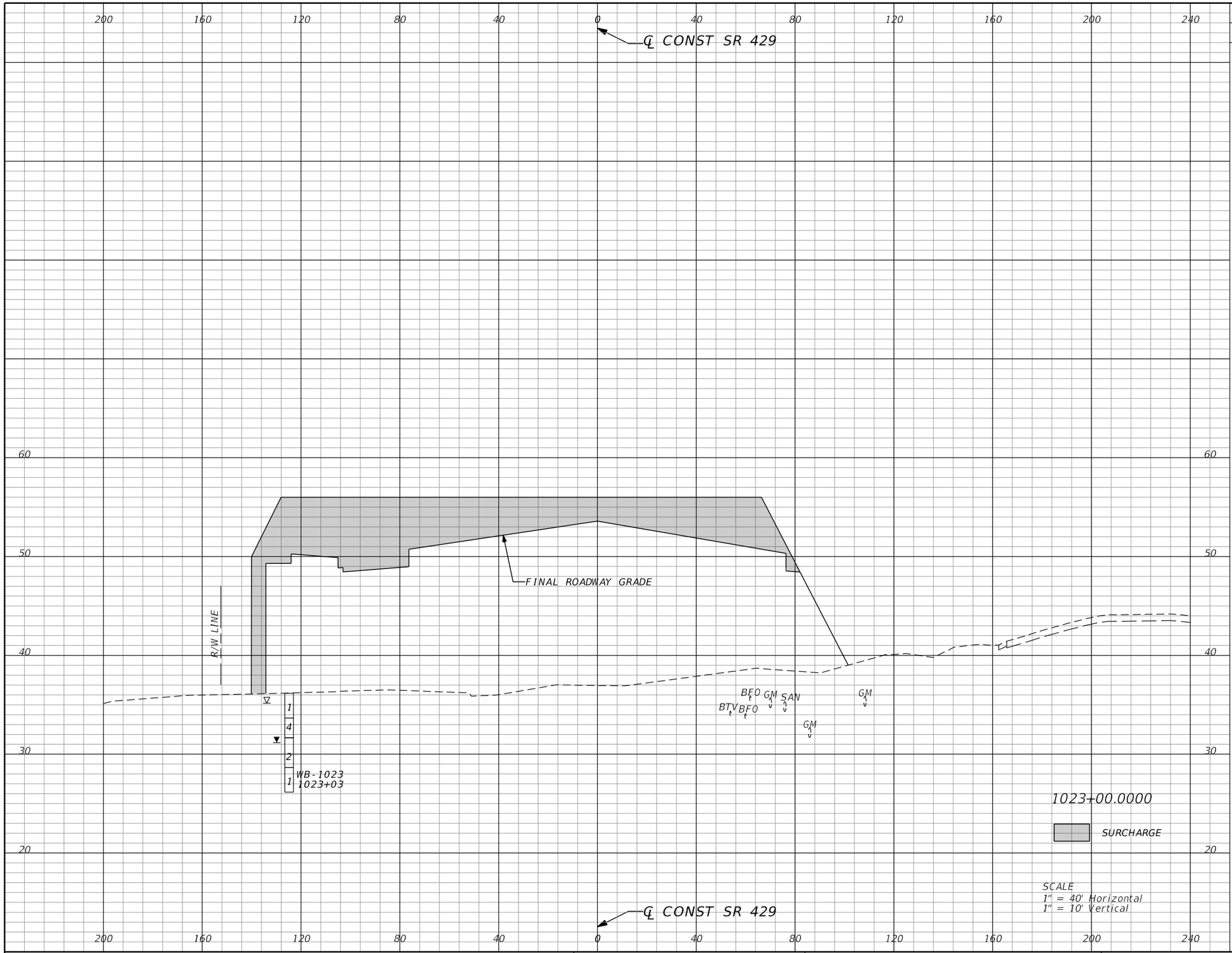
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

glen_dvorovy 10/15/2015 8:37:14 AM O:\Projects\CADD\24020025201 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dgn



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	1055.0		1968		

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

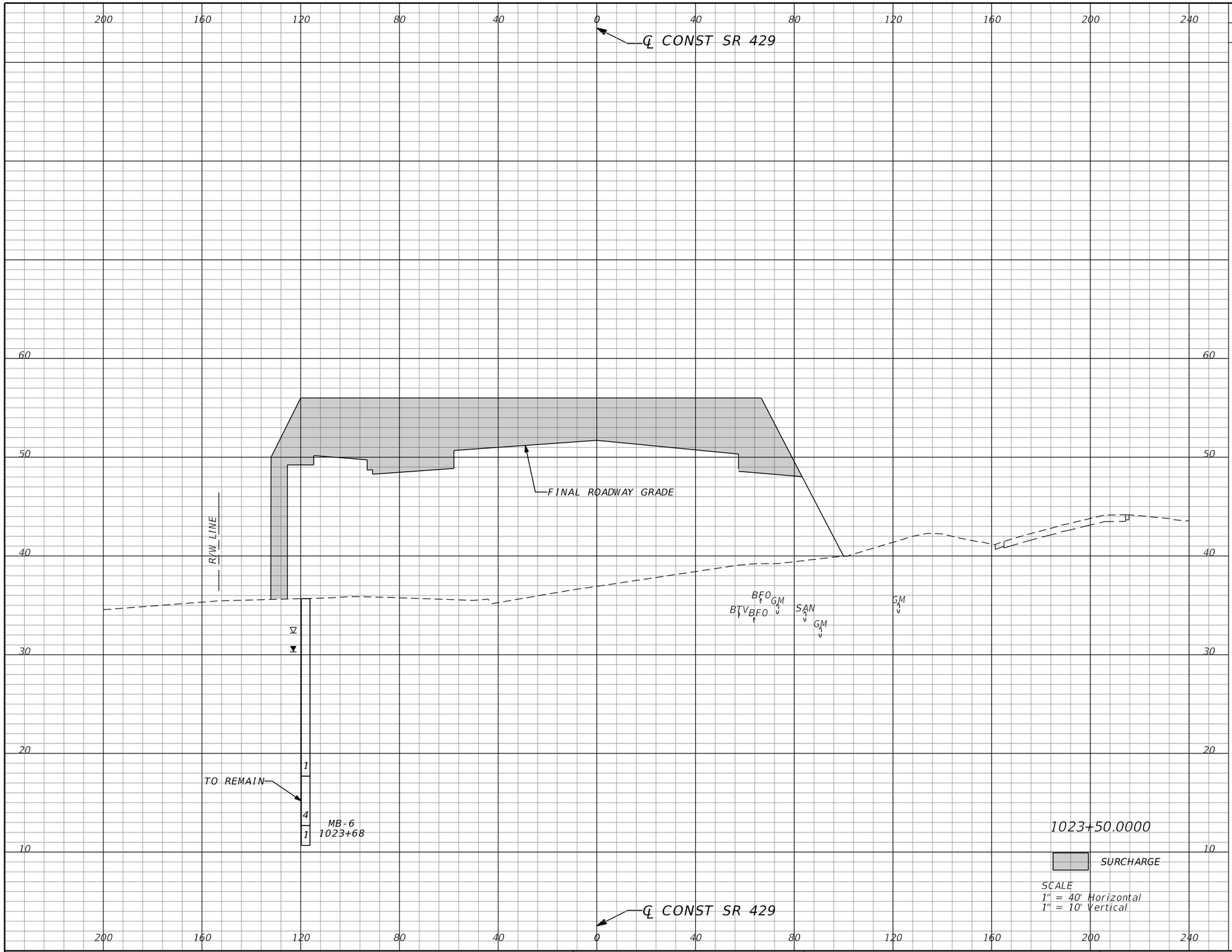
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	1260.3		2127		

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

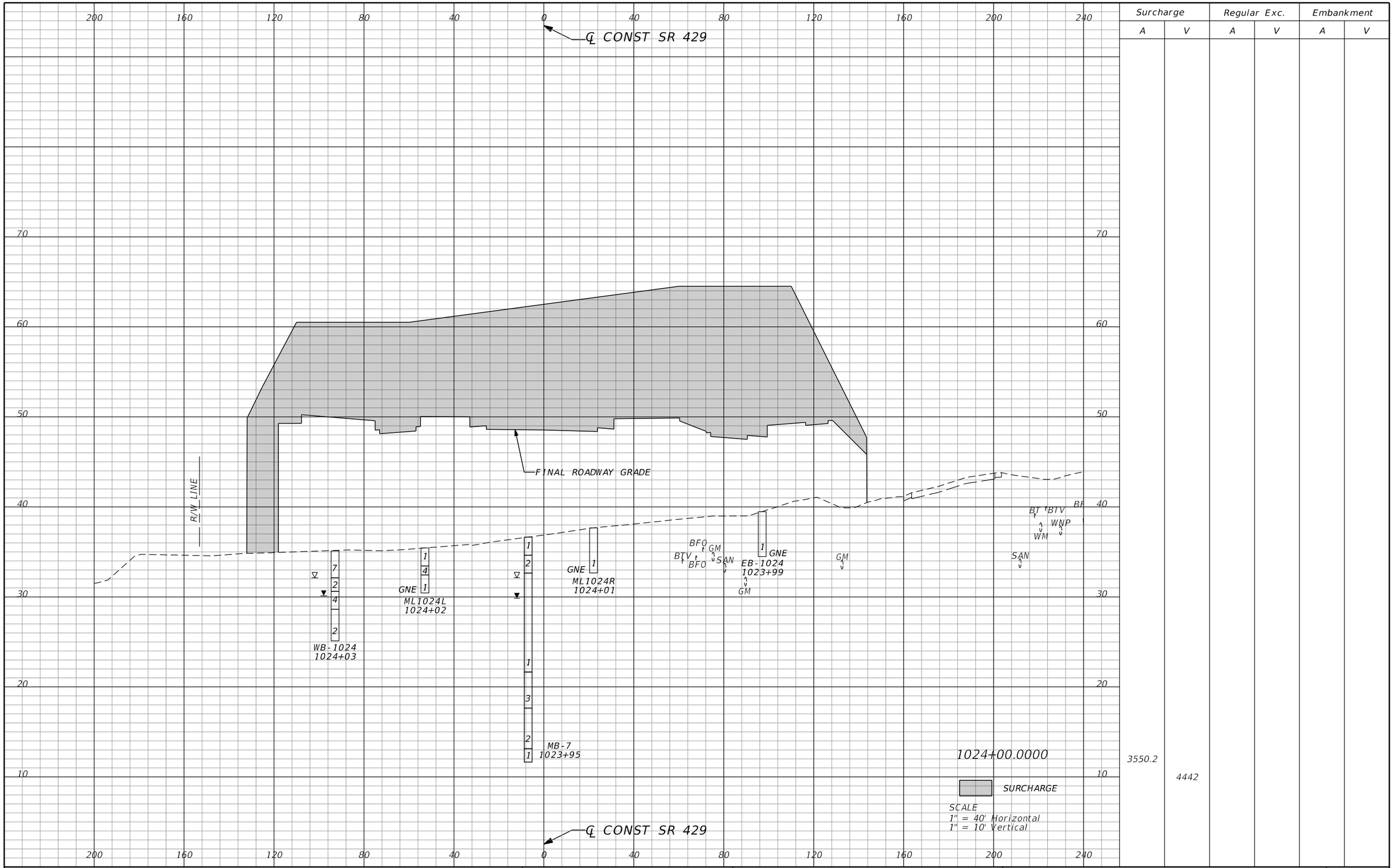
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V



3550.2

4442

PRELIMINARY: NOT FOR CONSTRUCTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

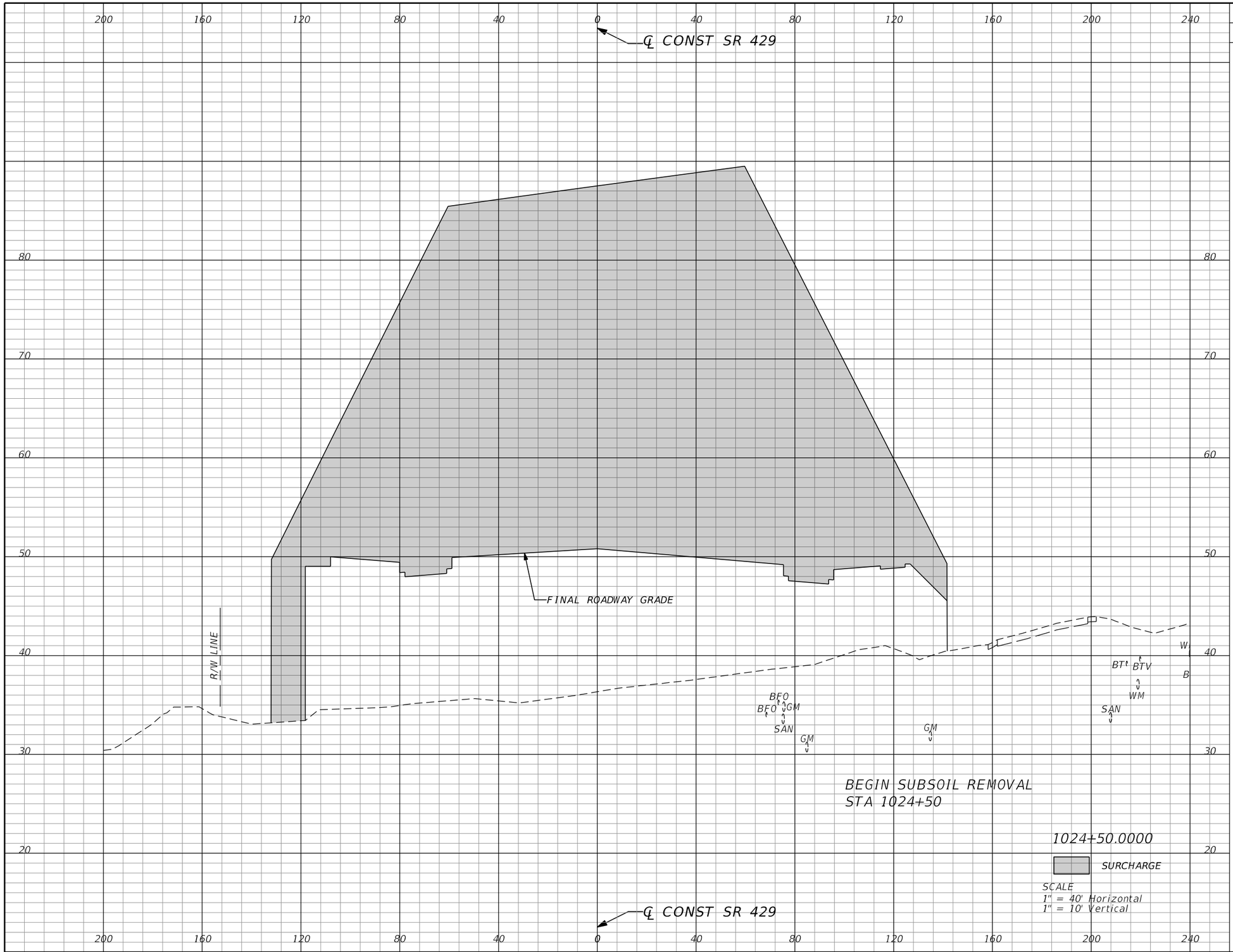
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 Lake Baldwin Lane
Orlando, FL 32814
T 407-898-1818 F 407-898-1837
Certificate of Authorization No. 5882
DANIEL C. STANFILL PE NO.42763

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.



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
7739.6	10460				

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

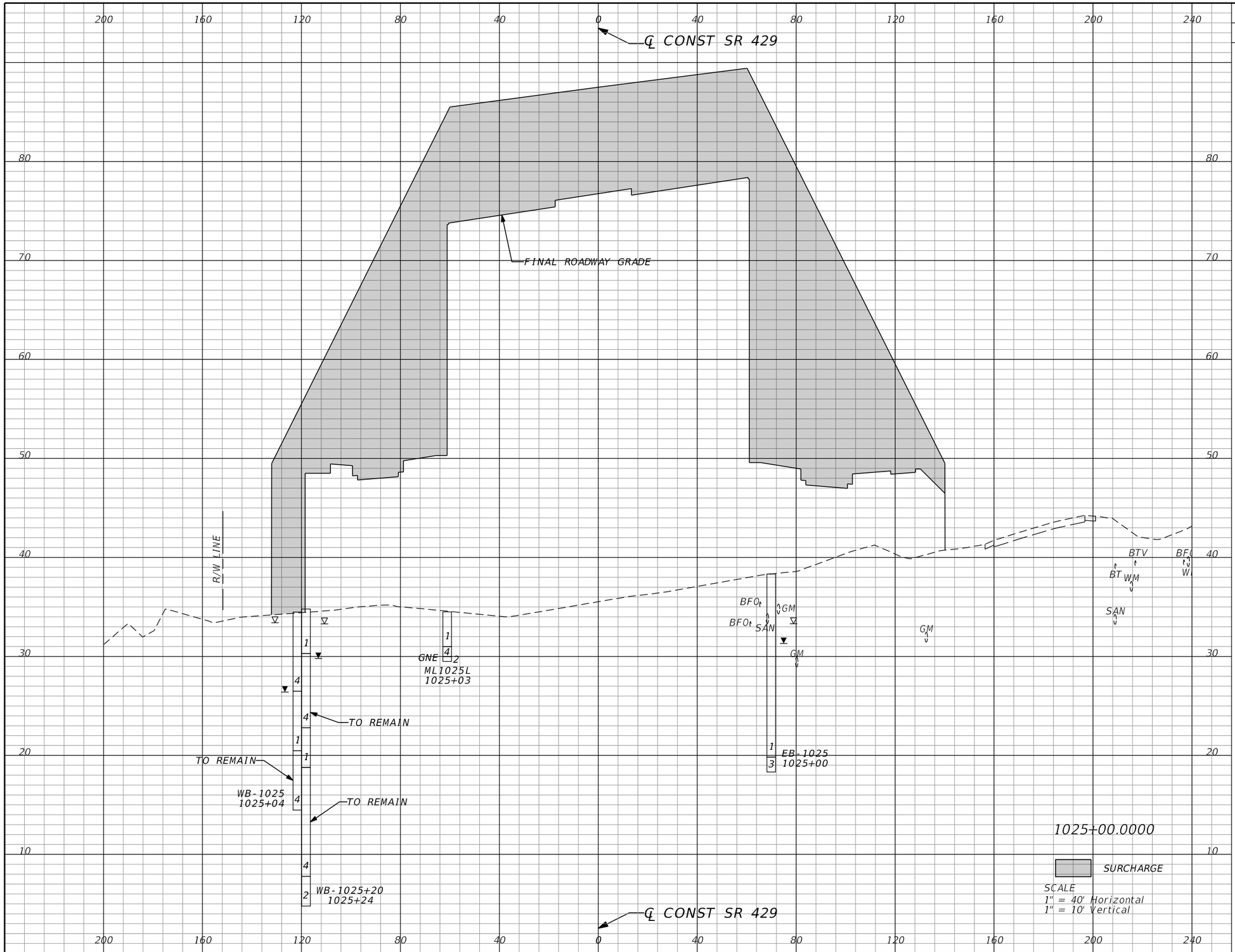
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
4519.3	11355				

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

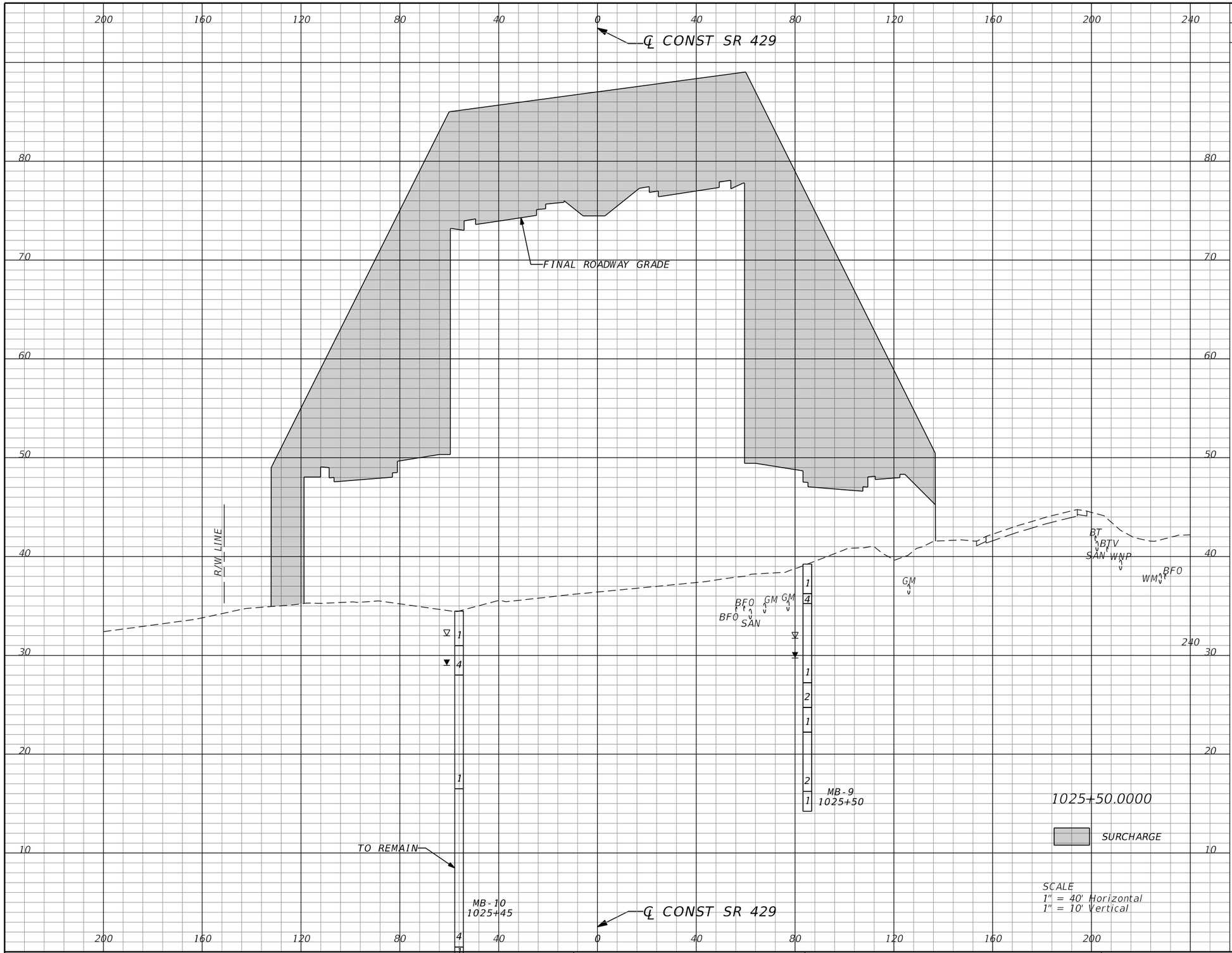
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY; NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
4581.9	8431				

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

Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V

℄ CONST SR 429

FINAL ROADWAY GRADE

R/W LINE

TO REMAIN

TO REMAIN

TO REMAIN

WB-1026
1026+03

ML1026L
1026+23

MB-11
1026+04

WB-56
1025+80

℄ CONST SR 429

BFO
BFO
GM
SAN
GM

GNE
EB-1026
1026+00
GM

BT
BTV
SAN
WNP
WM
BFO

1026+00.0000

SURCHARGE

SCALE
1" = 40' Horizontal
1" = 10' Vertical

4536.8	8448

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

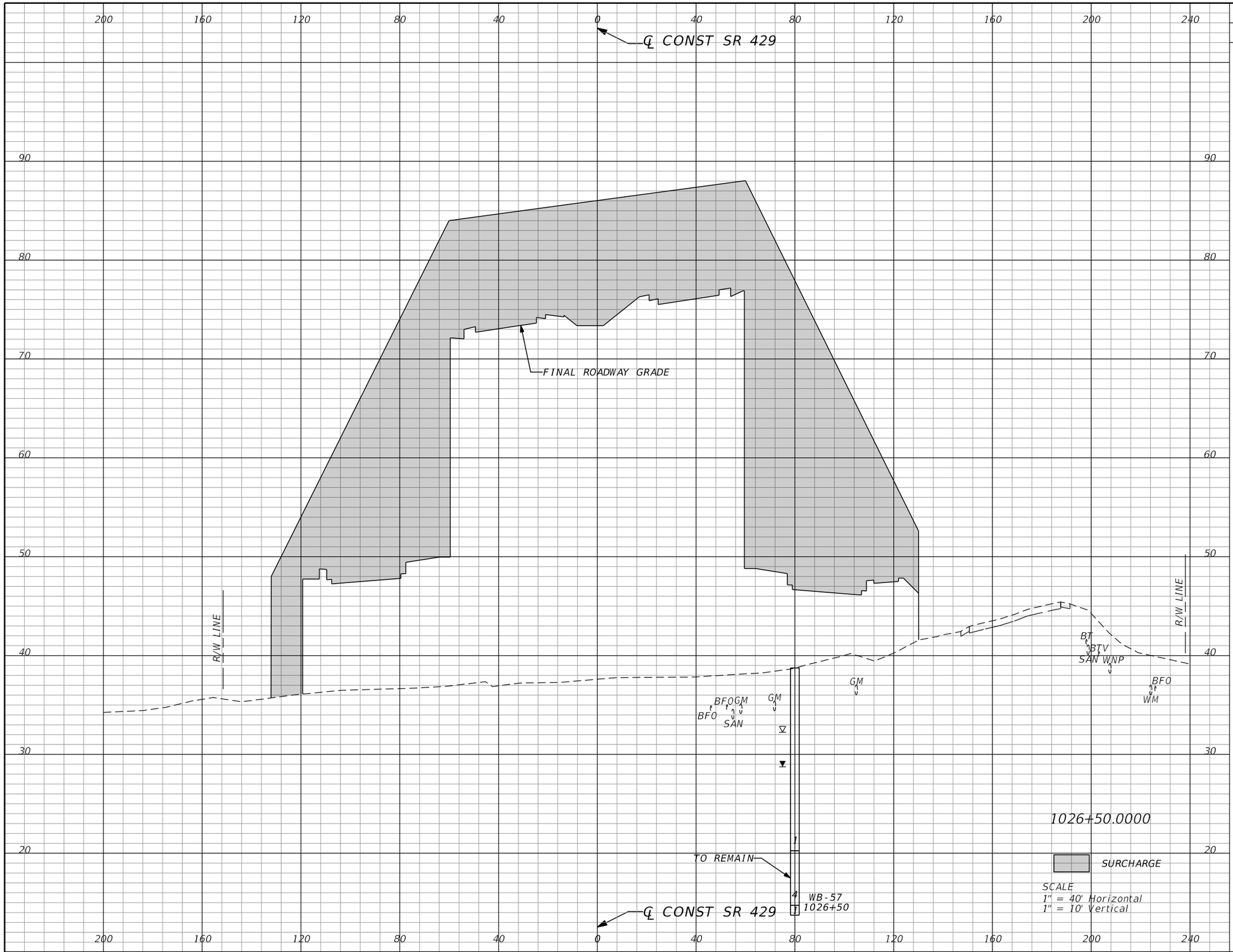
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

glen_dvorovy 10/15/2015 8:37:45 AM 0:\Projects\CADD\24020025201 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	4447.4		8323		

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

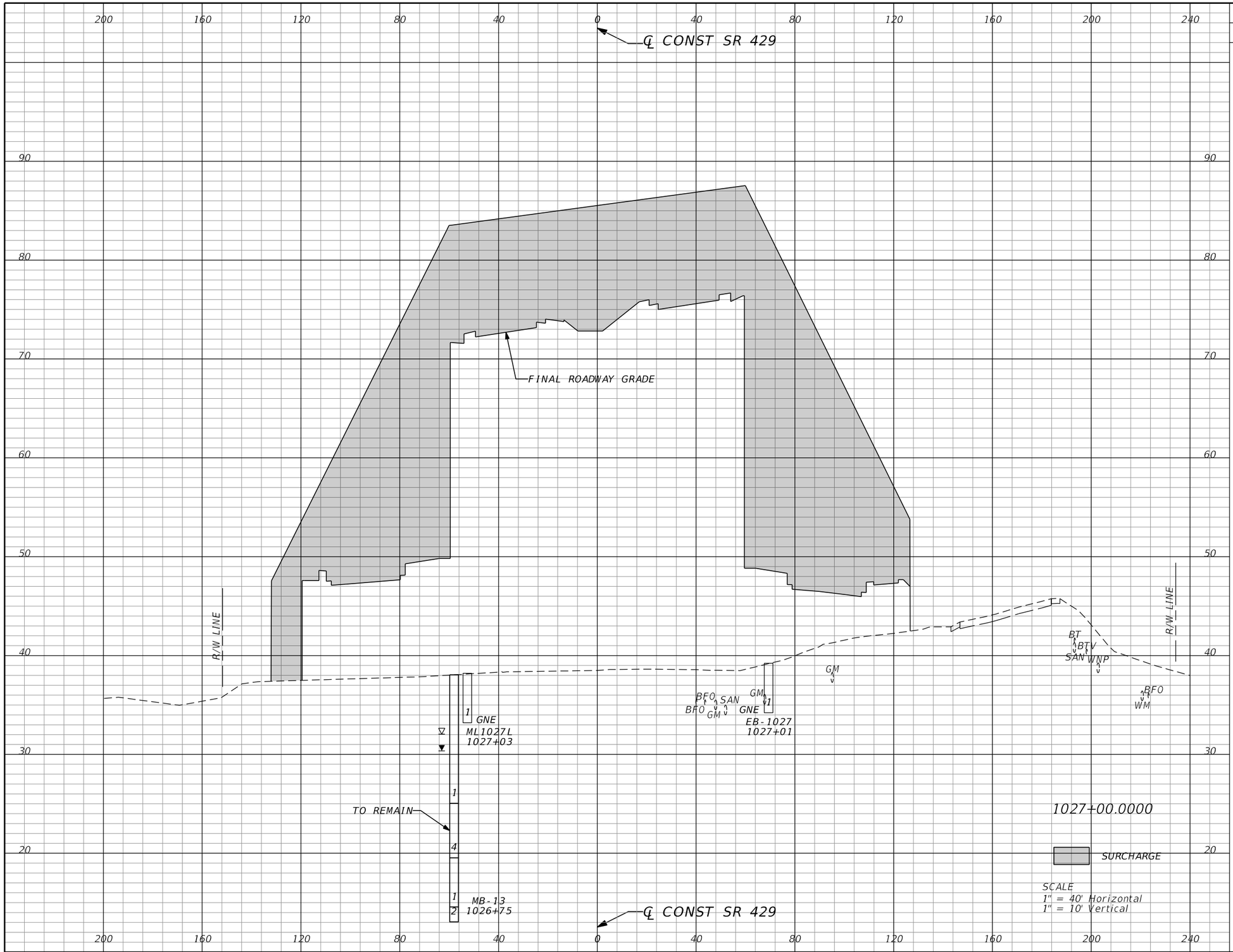
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	4339.6		8140		

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

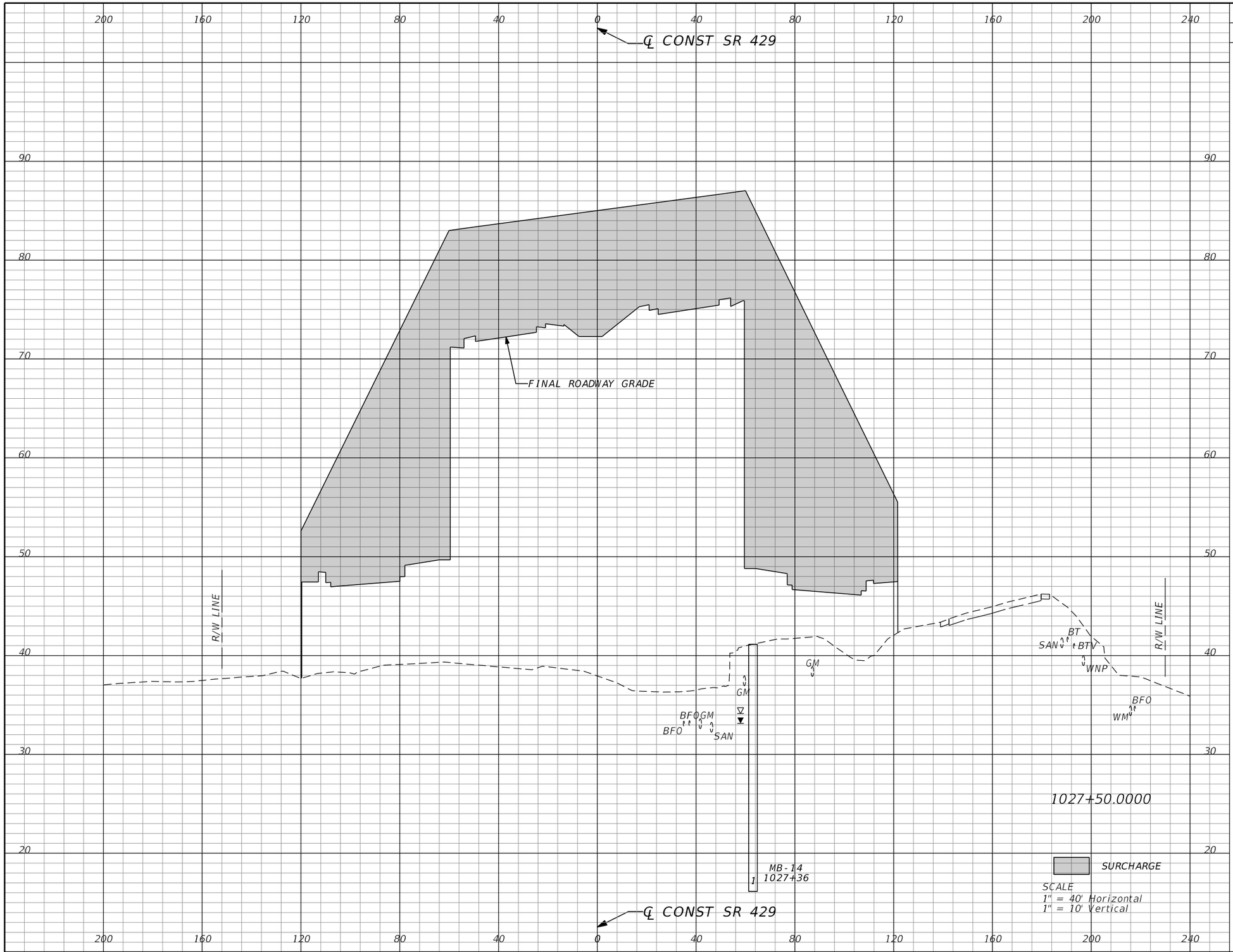
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
4062.7	7786				

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

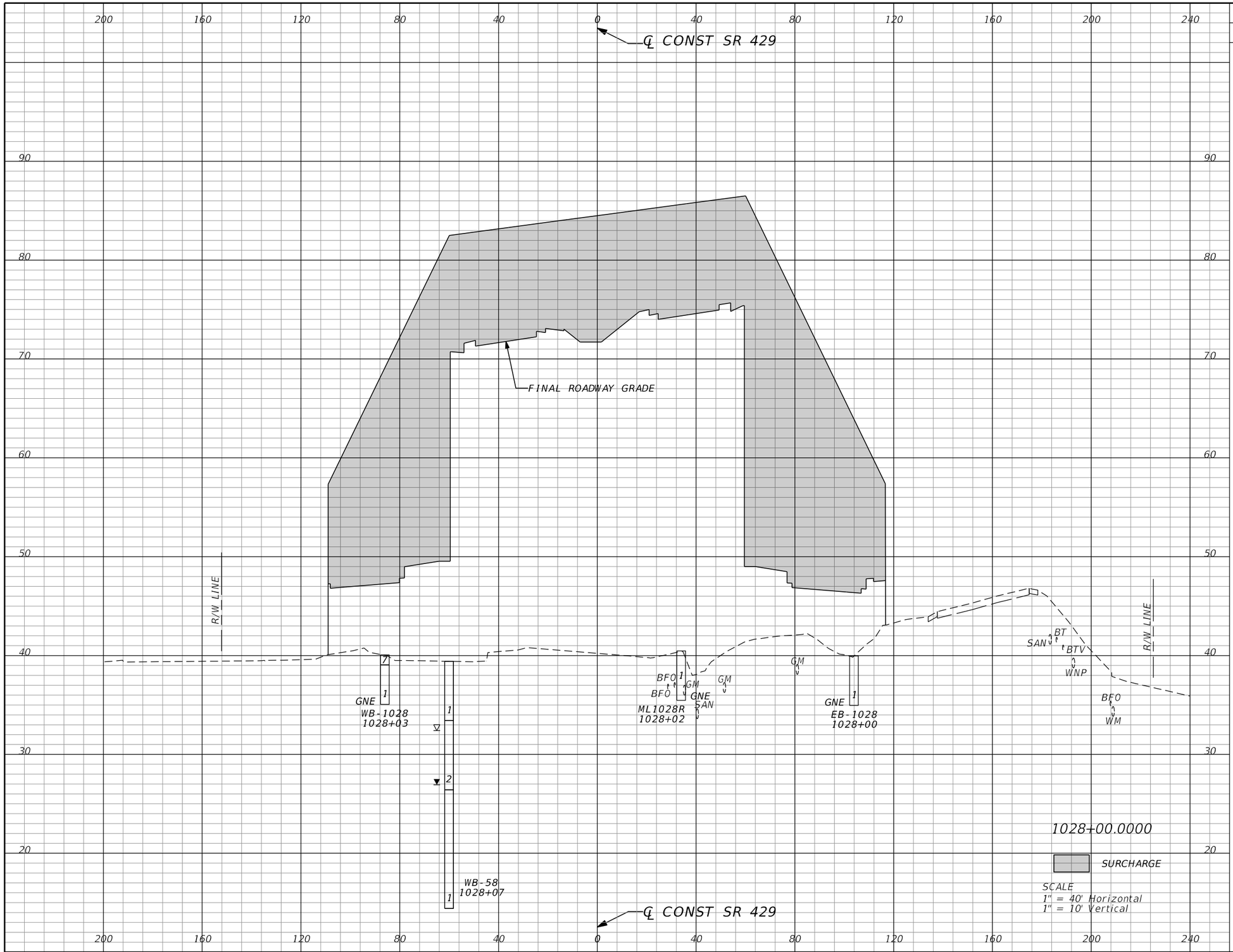
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
3854.5	7340				

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

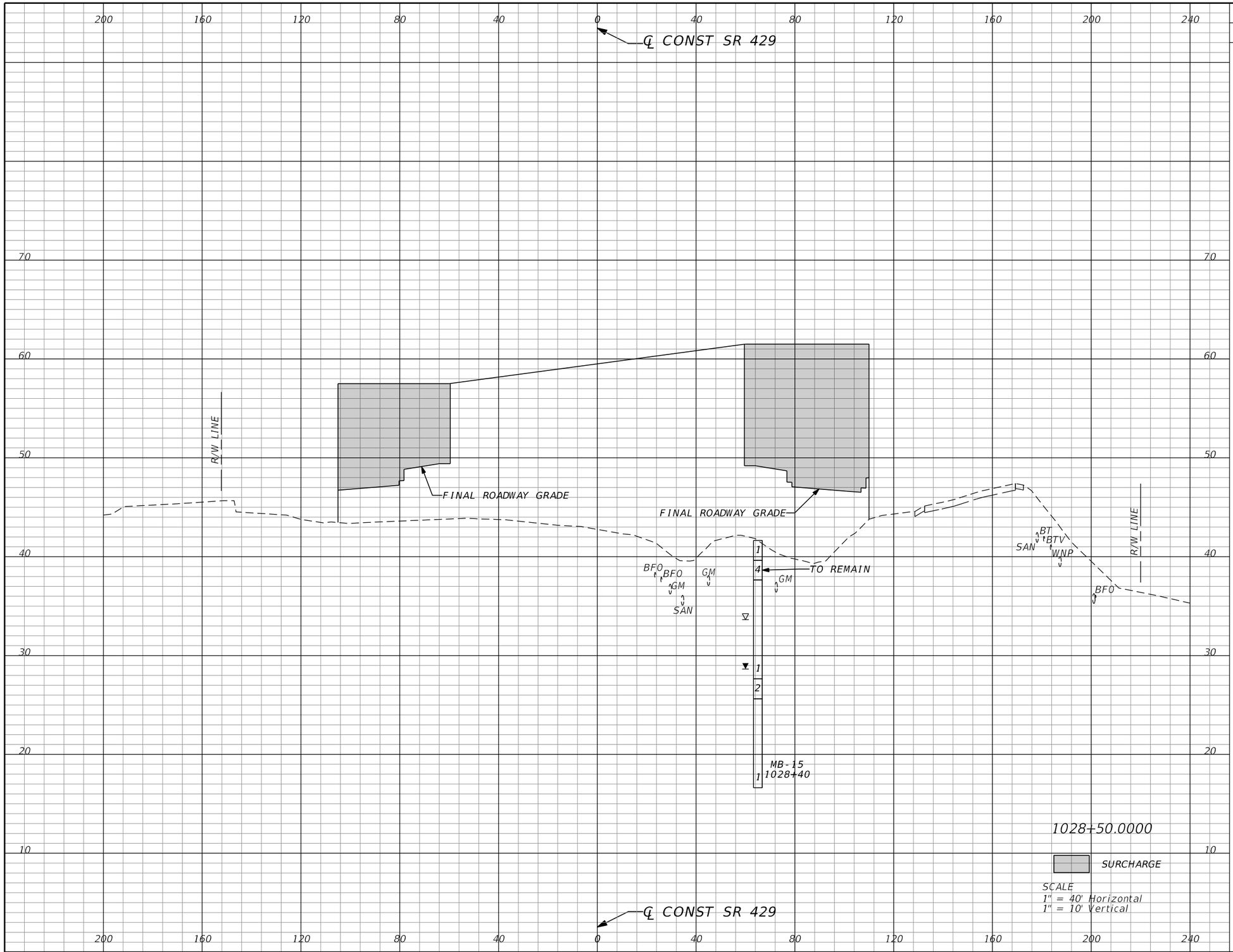
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION



Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
	1136.4		4633		

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

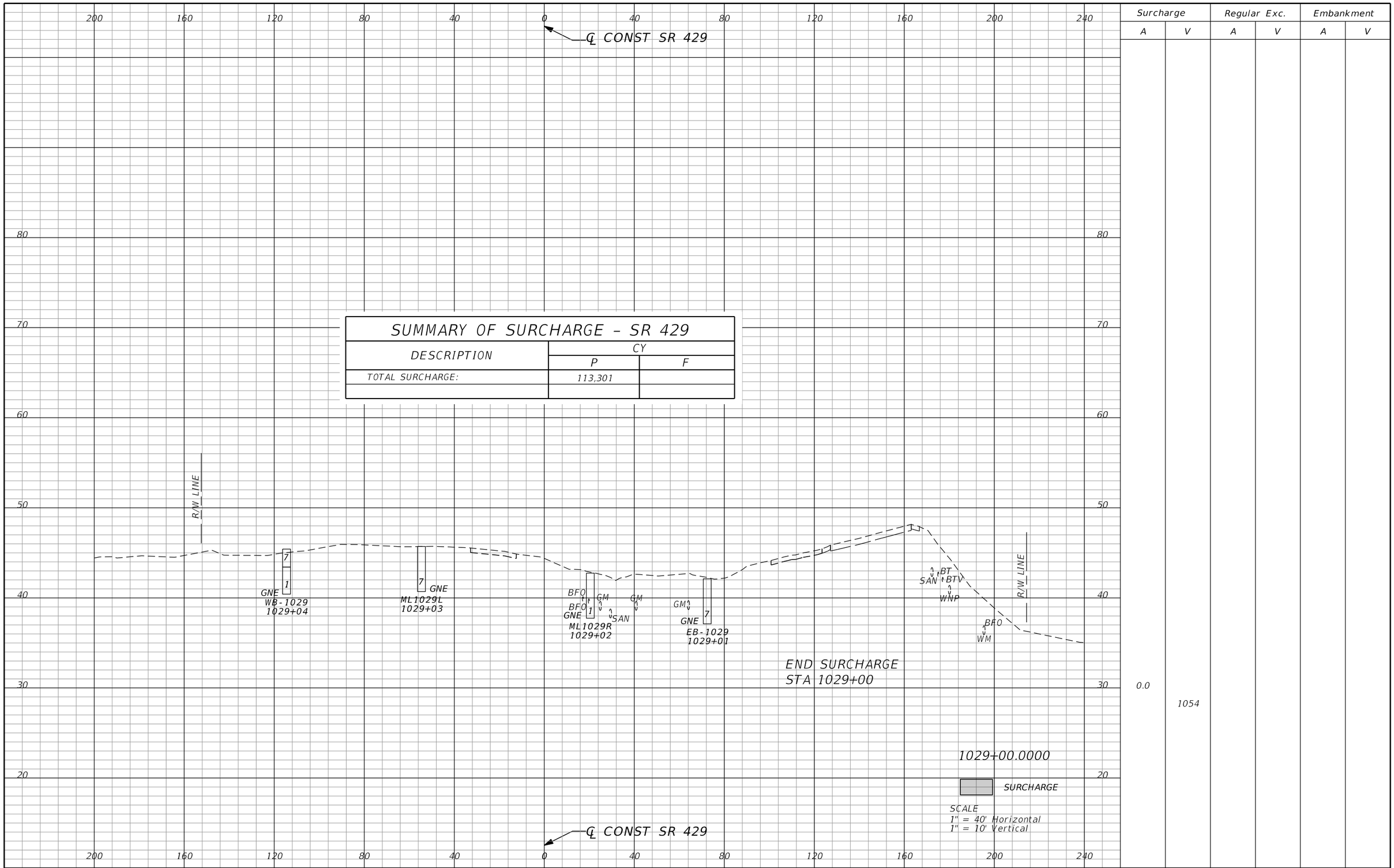
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

glen_dvorovy 10/15/2015 8:38:07 AM O:\Projects\CADD\24020025201 _USER\USER\geotech\RDXSRD01_surcharge_earthwork.dg



SUMMARY OF SURCHARGE - SR 429

DESCRIPTION	CY	
	P	F
TOTAL SURCHARGE:	113,301	

Surcharge		Regular Exc.		Embankment	
A	V	A	V	A	V
0.0	1054				

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.

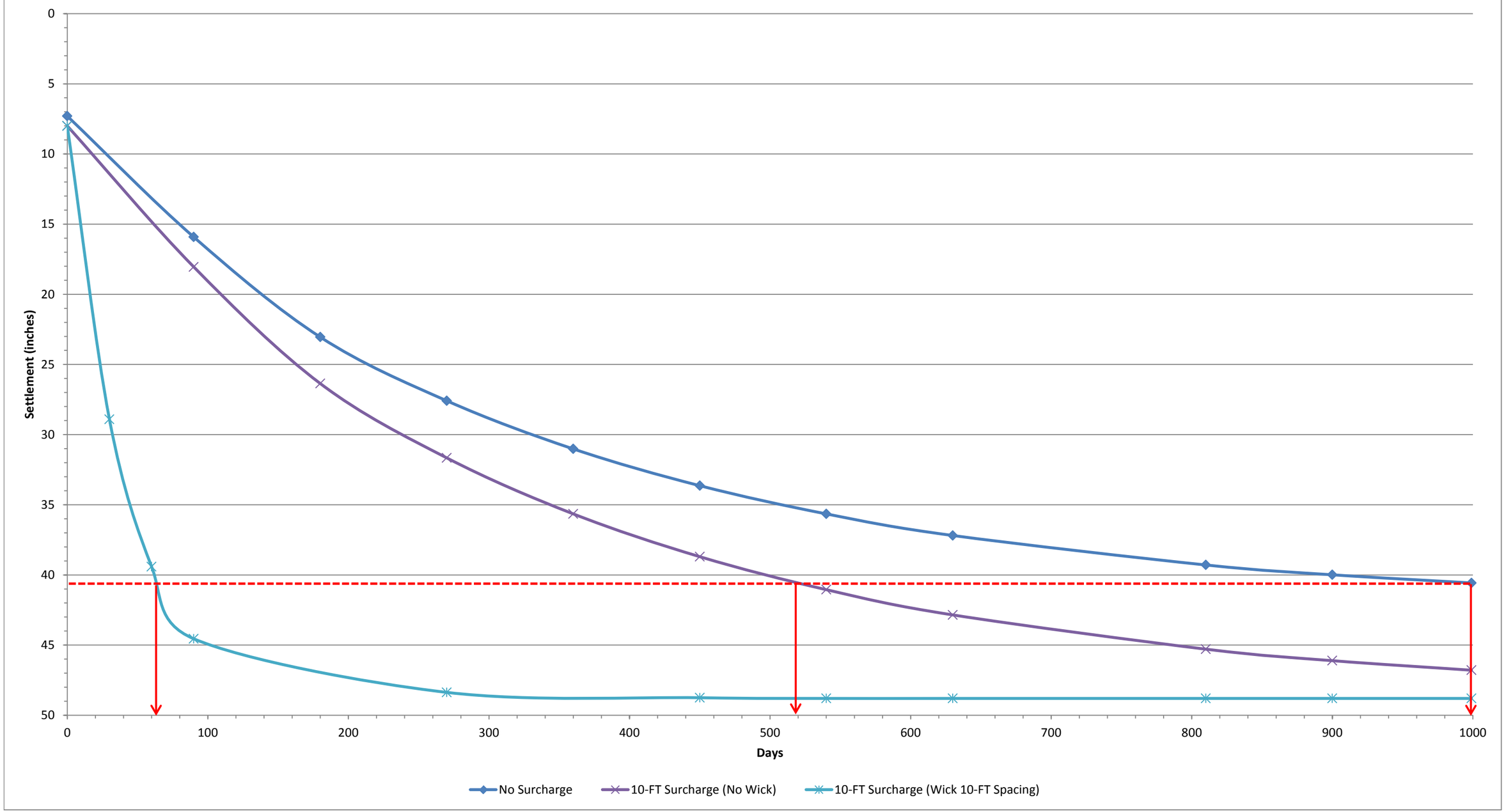
PRELIMINARY: NOT FOR CONSTRUCTION

SURCHARGE SETTLEMENT ANALYSES

Time Rate Settlement Curves

Wekiva Parkway (SR 429) Section 7A

Lake Markham Road Bridge Site



STRIP LOADING VARIABLE SHAPE

No Surcharge
42 inches
(34.7 Muck)
(7.3 muck)

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/16/2014 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	46.00	1515.00
3	102.00	4455.00
4	225.00	4455.00
5	285.00	1515.00
6	305.00	0.00

Foundation Elev. = 39.00 (ft) Ground Surface Elev.= 39.00 (ft)
Water table Elev. = 31.00 (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.	8.0	0.012	0.001	0.001	105.00	0.00
2	COMP.	10.0	0.017	0.002	0.002	110.00	0.00
3	COMP.	14.0	0.014	0.001	0.001	115.00	0.00
4	COMP.	9.0	0.750	0.080	0.080	75.00	0.00
5	COMP.	23.0	0.340	0.040	0.040	92.00	0.00
6	COMP.	7.0	0.029	0.003	0.003	100.00	0.00
7	COMP.	16.0	1.090	0.120	0.120	75.00	0.00
8	COMP.	28.0	0.021	0.002	0.000	110.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	8.00	35.00	420.00	420.00
2	10.00	26.00	1078.00	1078.00
3	14.00	14.00	1684.20	1684.20
4	4.50	4.75	2080.75	2080.75
5	4.50	0.25	2137.45	2137.45
6	4.60	-4.30	2233.88	2233.88
7	4.60	-8.90	2370.04	2370.04
8	4.60	-13.50	2506.20	2506.20
9	4.60	-18.10	2642.36	2642.36
10	4.60	-22.70	2778.52	2778.52
11	7.00	-28.50	2978.20	2978.20
12	5.33	-34.67	3143.40	3143.40
13	5.33	-40.00	3210.60	3210.60

14	5.33	-45.33	3277.80	3277.80
15	28.00	-62.00	3977.80	3977.80

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 50.00 Stress (psf)	Sett. (in.)	X = 75.00 Stress (psf)	Sett. (in.)
1	41.96	0.05	823.95	0.54	1730.30	0.82	3037.20	1.05
2	137.07	0.11	840.26	0.51	1772.64	0.86	3028.60	1.18
3	266.30	0.15	906.36	0.44	1834.72	0.75	2990.86	1.04
4	366.83	0.62	979.26	1.47	1876.29	2.46	2945.89	3.37
5	415.40	0.68	1017.40	1.49	1893.91	2.43	2921.14	3.29
6	463.94	0.53	1056.29	1.09	1909.92	1.74	2895.00	2.34
7	512.16	0.55	1095.18	1.07	1924.29	1.67	2867.87	2.23
8	559.30	0.57	1133.05	1.05	1936.86	1.61	2840.35	2.13
9	605.16	0.58	1169.50	1.03	1947.69	1.55	2812.68	2.04
10	649.57	0.59	1204.27	1.01	1956.86	1.50	2785.01	1.95
11	703.29	0.22	1245.42	0.37	1966.18	0.54	2750.26	0.69
12	757.42	1.11	1285.72	1.76	1973.50	2.50	2713.62	3.20
13	801.66	1.14	1317.63	1.77	1977.82	2.46	2682.23	3.12
14	843.44	1.18	1346.84	1.77	1980.40	2.43	2651.12	3.04
15	958.25	0.66	1421.55	0.94	1978.50	1.24	2555.67	1.52
		8.73		16.30		24.55		32.20

Layer	X = 100.00 Stress (psf)	Sett. (in.)	X = 125.00 Stress (psf)	Sett. (in.)	X = 150.00 Stress (psf)	Sett. (in.)	X = 175.00 Stress (psf)	Sett. (in.)
1	4320.21	1.21	4454.35	1.23	4454.82	1.23	4454.83	1.23
2	4181.93	1.40	4435.86	1.45	4449.06	1.45	4449.40	1.45
3	3993.80	1.24	4357.71	1.30	4416.89	1.31	4418.76	1.32
4	3856.03	4.01	4265.62	4.26	4367.02	4.32	4370.70	4.33
5	3791.77	3.90	4214.60	4.16	4334.84	4.24	4339.45	4.24
6	3728.66	2.76	4160.24	2.96	4297.46	3.02	4302.95	3.02
7	3666.72	2.63	4103.20	2.82	4255.18	2.89	4261.48	2.89
8	3606.58	2.51	4044.68	2.70	4208.89	2.77	4215.88	2.77
9	3548.15	2.39	3985.14	2.58	4159.12	2.66	4166.67	2.66
10	3491.33	2.29	3924.97	2.48	4106.42	2.55	4114.39	2.55
11	3421.86	0.81	3848.66	0.88	4036.54	0.91	4044.85	0.91
12	3350.44	3.73	3767.48	4.05	3959.04	4.19	3967.49	4.19
13	3290.54	3.62	3697.56	3.93	3890.10	4.08	3898.51	4.08
14	3232.27	3.52	3628.16	3.83	3819.98	3.97	3828.24	3.97
15	3059.51	1.75	3416.49	1.90	3598.33	1.97	3605.61	1.98
		37.77		40.53		41.54		41.58

Layer	X = 200.00 Stress (psf)	Sett. (in.)	X = 225.00 Stress (psf)	Sett. (in.)
1	4454.47	1.23	4392.63	1.22
2	4439.07	1.45	4252.76	1.42

3	4370.48	1.31	4068.90	1.25
4	4285.71	4.28	3930.85	4.06
5	4237.56	4.18	3865.25	3.95
6	4185.52	2.97	3800.13	2.79
7	4130.23	2.84	3735.60	2.66
8	4072.91	2.71	3672.46	2.54
9	4014.06	2.60	3610.75	2.42
10	3954.13	2.49	3550.48	2.31
11	3877.58	0.88	3476.53	0.82
12	3795.62	4.07	3400.38	3.77
13	3724.70	3.95	3336.51	3.66
14	3654.08	3.85	3274.41	3.56
15	3437.86	1.91	3091.06	1.76
		40.69		38.18

One Layer Soil System/Rectangular

No Surcharge

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/17/2014 Computed by : CGB

Stratum thickness = 55.00 (ft)
Coeff. of consolidation = 0.900 (ft*ft/days)
Number of sublayers = 20
Drainage Conditions = Drainage at top/bottom

Load #	Init. Pore Pressure (psf)	Load Type	Placement Time (days)	Ramp Time (days)	Ultimate Settlement (in.)
1	4455.00	RAMP	0.00	90.00	35.00

Pore Pressure Distribution
for Time (days) = 90.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	1339.83	1339.83
5.50	2334.79	2334.79
8.25	3052.26	3052.26
11.00	3553.95	3553.95
13.75	3893.49	3893.49
16.50	4115.25	4115.25
19.25	4254.18	4254.18
22.00	4336.08	4336.08
24.75	4378.52	4378.52
27.50	4391.58	4391.58
30.25	4378.52	4378.52
33.00	4336.08	4336.08
35.75	4254.18	4254.18
38.50	4115.25	4115.25
41.25	3893.49	3893.49
44.00	3553.95	3553.95
46.75	3052.26	3052.26
49.50	2334.79	2334.79
52.25	1339.83	1339.83
55.00	0.00	0.00

T	=	0.11	
U (%)	=	24.62	24.62
Settlement	=	8.62	8.62

Pore Pressure Distribution
for Time (days) = 180.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	629.19	629.19
5.50	1236.93	1236.93
8.25	1803.62	1803.62
11.00	2313.04	2313.04
13.75	2753.21	2753.21
16.50	3116.55	3116.55
19.25	3399.27	3399.27
22.00	3600.41	3600.41
24.75	3720.49	3720.49
27.50	3760.39	3760.39
30.25	3720.49	3720.49
33.00	3600.41	3600.41
35.75	3399.27	3399.27
38.50	3116.55	3116.55
41.25	2753.21	2753.21
44.00	2313.04	2313.04
46.75	1803.62	1803.62
49.50	1236.93	1236.93
52.25	629.19	629.19
55.00	0.00	0.00

T	=	0.21	
U (%)	=	44.99	44.99
Settlement	=	15.75	15.75

Pore Pressure Distribution
for Time (days) = 270.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	462.45	462.45
5.50	912.98	912.98
8.25	1340.05	1340.05
11.00	1732.94	1732.94
13.75	2082.02	2082.02
16.50	2378.99	2378.99
19.25	2617.01	2617.01
22.00	2790.78	2790.78
24.75	2896.53	2896.53
27.50	2932.03	2932.03
30.25	2896.53	2896.53
33.00	2790.78	2790.78
35.75	2617.01	2617.01
38.50	2378.99	2378.99
41.25	2082.02	2082.02
44.00	1732.94	1732.94
46.75	1340.05	1340.05
49.50	912.98	912.98

52.25	462.45	462.45
55.00	0.00	0.00

T	=	0.32	
U (%)	=	57.98	57.98
Settlement	=	20.29	20.29

Pore Pressure Distribution
for Time (days) = 360.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	353.15	353.15
5.50	697.56	697.56
8.25	1024.71	1024.71
11.00	1326.51	1326.51
13.75	1595.54	1595.54
16.50	1825.20	1825.20
19.25	2009.89	2009.89
22.00	2145.11	2145.11
24.75	2227.57	2227.57
27.50	2255.28	2255.28
30.25	2227.57	2227.57
33.00	2145.11	2145.11
35.75	2009.89	2009.89
38.50	1825.20	1825.20
41.25	1595.54	1595.54
44.00	1326.51	1326.51
46.75	1024.71	1024.71
49.50	697.56	697.56
52.25	353.15	353.15
55.00	0.00	0.00

T	=	0.43	
U (%)	=	67.76	67.76
Settlement	=	23.72	23.72

Pore Pressure Distribution
for Time (days) = 450.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	270.96	270.96
5.50	535.25	535.25
8.25	786.35	786.35
11.00	1018.07	1018.07
13.75	1224.72	1224.72
16.50	1401.20	1401.20
19.25	1543.18	1543.18

22.00	1647.16	1647.16
24.75	1710.59	1710.59
27.50	1731.91	1731.91
30.25	1710.59	1710.59
33.00	1647.16	1647.16
35.75	1543.18	1543.18
38.50	1401.20	1401.20
41.25	1224.72	1224.72
44.00	1018.07	1018.07
46.75	786.35	786.35
49.50	535.25	535.25
52.25	270.96	270.96
55.00	0.00	0.00

T	=	0.54	
U (%)	=	75.25	75.25
Settlement	=	26.34	26.34

One Layer Soil System/Rectangular

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/17/2014 Computed by : CGB

Stratum thickness = 55.00 (ft)
Coeff. of consolidation = 0.900 (ft*ft/days)
Number of sublayers = 20
Drainage Conditions = Drainage at top/bottom

Load #	Init. Pore Pressure (psf)	Load Type	Placement Time (days)	Ramp Time (days)	Ultimate Settlement (in.)
1	4455.00	RAMP	0.00	90.00	35.00

Pore Pressure Distribution
for Time (days) = 540.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	208.02	208.02
5.50	410.91	410.91
8.25	603.69	603.69
11.00	781.60	781.60
13.75	940.27	940.27
16.50	1075.78	1075.78
19.25	1184.80	1184.80
22.00	1264.65	1264.65
24.75	1313.36	1313.36
27.50	1329.73	1329.73
30.25	1313.36	1313.36
33.00	1264.65	1264.65
35.75	1184.80	1184.80
38.50	1075.78	1075.78
41.25	940.27	940.27
44.00	781.60	781.60
46.75	603.69	603.69
49.50	410.91	410.91
52.25	208.02	208.02
55.00	0.00	0.00

T	=	0.64	
U (%)	=	81.00	81.00
Settlement	=	28.35	28.35

Pore Pressure Distribution
for Time (days) = 630.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	159.71	159.71
5.50	315.48	315.48
8.25	463.49	463.49
11.00	600.08	600.08
13.75	721.90	721.90
16.50	825.94	825.94
19.25	909.64	909.64
22.00	970.95	970.95
24.75	1008.35	1008.35
27.50	1020.91	1020.91
30.25	1008.35	1008.35
33.00	970.95	970.95
35.75	909.64	909.64
38.50	825.94	825.94
41.25	721.90	721.90
44.00	600.08	600.08
46.75	463.49	463.49
49.50	315.48	315.48
52.25	159.71	159.71
55.00	0.00	0.00

T	=	0.75	
U (%)	=	85.41	85.41
Settlement	=	29.89	29.89

Pore Pressure Distribution
for Time (days) = 810.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	94.14	94.14
5.50	185.96	185.96
8.25	273.20	273.20
11.00	353.72	353.72
13.75	425.53	425.53
16.50	486.85	486.85
19.25	536.19	536.19
22.00	572.33	572.33
24.75	594.38	594.38
27.50	601.79	601.79
30.25	594.38	594.38
33.00	572.33	572.33
35.75	536.19	536.19
38.50	486.85	486.85
41.25	425.53	425.53
44.00	353.72	353.72
46.75	273.20	273.20
49.50	185.96	185.96

52.25	94.14	94.14
55.00	0.00	0.00

T	= 0.96	
U (%)	= 91.40	91.40
Settlement	= 31.99	31.99

Pore Pressure Distribution
for Time (days) = 900.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	72.28	72.28
5.50	142.77	142.77
8.25	209.76	209.76
11.00	271.57	271.57
13.75	326.70	326.70
16.50	373.79	373.79
19.25	411.67	411.67
22.00	439.41	439.41
24.75	456.34	456.34
27.50	462.03	462.03
30.25	456.34	456.34
33.00	439.41	439.41
35.75	411.67	411.67
38.50	373.79	373.79
41.25	326.70	326.70
44.00	271.57	271.57
46.75	209.76	209.76
49.50	142.77	142.77
52.25	72.28	72.28
55.00	0.00	0.00

T	= 1.07	
U (%)	= 93.40	93.40
Settlement	= 32.69	32.69

Pore Pressure Distribution
for Time (days) = 999.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	54.04	54.04
5.50	106.76	106.76
8.25	156.84	156.84
11.00	203.06	203.06
13.75	244.29	244.29
16.50	279.49	279.49
19.25	307.82	307.82

22.00	328.57	328.57
24.75	341.22	341.22
27.50	345.47	345.47
30.25	341.22	341.22
33.00	328.57	328.57
35.75	307.82	307.82
38.50	279.49	279.49
41.25	244.29	244.29
44.00	203.06	203.06
46.75	156.84	156.84
49.50	106.76	106.76
52.25	54.04	54.04
55.00	0.00	0.00

T	=	1.19	
U (%)	=	95.06	95.06
Settlement	=	33.27	33.27

STRIP LOADING VARIABLE SHAPE

10-FT Surcharge
Total: 48.8
Mud: 40.8
Elev: 8

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/16/2014 Computed by : CGB

Increment of stresses obtained using : Boussinesq

Settlement for X-Direction

Point #	X(ft)	Load (psf)
1	0.00	0.00
2	0.00	2760.00
3	55.00	5750.00
4	180.00	5750.00
5	250.00	1150.00
6	250.00	0.00

Foundation Elev. = 39.00 (ft) Ground Surface Elev.= 39.00 (ft)
Water table Elev. = 31.00 (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.	8.0	0.012	0.001	0.001	105.00	0.00
2	COMP.	10.0	0.017	0.002	0.002	110.00	0.00
3	COMP.	14.0	0.014	0.001	0.001	115.00	0.00
4	COMP.	9.0	0.750	0.080	0.080	75.00	0.00
5	COMP.	23.0	0.340	0.040	0.040	92.00	0.00
6	COMP.	7.0	0.029	0.003	0.003	100.00	0.00
7	COMP.	16.0	1.090	0.120	0.120	75.00	0.00
8	COMP.	28.0	0.021	0.002	0.000	110.00	0.00

Total Settlement = 0.00

N°.	Sublayer Thick. (ft)	Elev. (ft)	Soil Stresses Initial (psf)	Max.Past Press. (psf)
1	8.00	35.00	420.00	420.00
2	10.00	26.00	1078.00	1078.00
3	14.00	14.00	1684.20	1684.20
4	4.50	4.75	2080.75	2080.75
5	4.50	0.25	2137.45	2137.45
6	4.60	-4.30	2233.88	2233.88
7	4.60	-8.90	2370.04	2370.04
8	4.60	-13.50	2506.20	2506.20
9	4.60	-18.10	2642.36	2642.36
10	4.60	-22.70	2778.52	2778.52
11	7.00	-28.50	2978.20	2978.20
12	5.33	-34.67	3143.40	3143.40
13	5.33	-40.00	3210.60	3210.60

14	5.33	-45.33	3277.80	3277.80
15	28.00	-62.00	3977.80	3977.80

Layer	X = 0.00 Stress (psf)	Sett. (in.)	X = 25.00 Stress (psf)	Sett. (in.)	X = 50.00 Stress (psf)	Sett. (in.)	X = 75.00 Stress (psf)	Sett. (in.)
1	1449.09	0.75	4116.93	1.19	5467.18	1.32	5749.05	1.34
2	1600.64	0.81	4061.87	1.38	5352.14	1.58	5722.81	1.63
3	1784.21	0.74	3886.59	1.22	5135.86	1.43	5616.69	1.50
4	1905.44	2.49	3739.94	3.93	4953.65	4.66	5493.66	4.94
5	1957.48	2.49	3674.84	3.83	4864.10	4.54	5425.43	4.83
6	2005.54	1.80	3614.17	2.70	4774.36	3.21	5352.50	3.44
7	2049.59	1.75	3557.91	2.58	4685.22	3.07	5275.73	3.29
8	2089.31	1.70	3506.29	2.46	4598.25	2.93	5196.73	3.16
9	2124.93	1.66	3458.71	2.35	4513.78	2.80	5116.19	3.03
10	2156.69	1.61	3414.59	2.25	4432.02	2.68	5034.70	2.91
11	2191.65	0.58	3363.06	0.80	4332.88	0.95	4931.34	1.03
12	2223.08	2.75	3312.29	3.70	4232.23	4.38	4821.52	4.77
13	2245.92	2.72	3271.02	3.61	4148.95	4.26	4727.17	4.65
14	2265.09	2.70	3231.66	3.52	4068.94	4.14	4633.79	4.52
15	2304.43	1.40	3117.09	1.77	3837.45	2.07	4351.09	2.26
		25.94		37.30		44.02		47.31

Layer	X = 100.00 Stress (psf)	Sett. (in.)	X = 125.00 Stress (psf)	Sett. (in.)	X = 150.00 Stress (psf)	Sett. (in.)	X = 175.00 Stress (psf)	Sett. (in.)
1	5749.76	1.34	5749.80	1.34	5749.50	1.34	5736.92	1.34
2	5742.20	1.63	5743.42	1.63	5734.46	1.63	5604.71	1.62
3	5700.03	1.51	5706.89	1.51	5661.71	1.50	5376.05	1.46
4	5634.84	5.01	5648.57	5.02	5565.08	4.98	5196.43	4.79
5	5592.79	4.92	5610.18	4.92	5508.15	4.87	5110.12	4.67
6	5543.93	3.51	5565.01	3.51	5445.43	3.47	5023.99	3.31
7	5488.62	3.37	5513.27	3.38	5377.73	3.33	4938.31	3.17
8	5428.01	3.24	5456.00	3.25	5306.58	3.20	4854.17	3.03
9	5362.80	3.12	5393.80	3.13	5232.72	3.07	4771.66	2.90
10	5293.65	3.00	5327.32	3.01	5156.78	2.95	4690.85	2.78
11	5201.86	1.07	5238.39	1.07	5058.92	1.05	4591.42	0.99
12	5099.94	4.95	5138.86	4.97	4953.25	4.86	4488.72	4.56
13	5009.19	4.83	5049.69	4.85	4861.19	4.73	4402.36	4.43
14	4916.84	4.71	4958.48	4.73	4769.04	4.61	4318.23	4.32
15	4624.84	2.36	4667.69	2.38	4484.60	2.31	4069.07	2.16
		48.56		48.72		47.91		45.51

Layer	X = 200.00 Stress (psf)	Sett. (in.)	X = 225.00 Stress (psf)	Sett. (in.)	X = 250.00 Stress (psf)	Sett. (in.)
1	4434.67	1.22	2792.36	1.02	658.57	0.47
2	4406.40	1.44	2780.82	1.13	843.65	0.51

3	4299.26	1.29	2752.89	0.99	1075.77	0.50
4	4186.61	4.22	2738.34	3.21	1237.49	1.78
5	4128.68	4.11	2734.08	3.15	1309.84	1.83
6	4069.89	2.92	2731.04	2.24	1378.59	1.35
7	4011.08	2.78	2728.76	2.15	1443.57	1.34
8	3953.46	2.66	2726.81	2.07	1504.05	1.32
9	3897.35	2.55	2724.83	1.99	1560.12	1.30
10	3842.90	2.44	2722.55	1.92	1611.93	1.29
11	3776.66	0.87	2718.92	0.69	1671.43	0.47
12	3709.09	4.00	2713.87	3.20	1727.96	2.25
13	3652.86	3.90	2708.35	3.14	1771.62	2.26
14	3598.48	3.80	2701.69	3.09	1810.74	2.26
15	3438.60	1.91	2673.34	1.58	1907.02	1.20
		40.12		31.56		20.14

One Layer Soil System/Rectangular

10-FT Surcharge

No wick

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/17/2014 Computed by : CGB

Stratum thickness = 55.00 (ft)
Coeff. of consolidation = 0.900 (ft*ft/days)
Number of sublayers = 20
Drainage Conditions = Drainage at top/bottom

Load #	Init. Pore Pressure (psf)	Load Type	Placement Time (days)	Ramp Time (days)	Ultimate Settlement (in.)
1	5750.00	RAMP	0.00	90.00	40.80

Pore Pressure Distribution
for Time (days) = 90.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	1729.29	1729.29
5.50	3013.48	3013.48
8.25	3939.50	3939.50
11.00	4587.03	4587.03
13.75	5025.26	5025.26
16.50	5311.49	5311.49
19.25	5490.80	5490.80
22.00	5596.51	5596.51
24.75	5651.29	5651.29
27.50	5668.14	5668.14
30.25	5651.29	5651.29
33.00	5596.51	5596.51
35.75	5490.80	5490.80
38.50	5311.49	5311.49
41.25	5025.26	5025.26
44.00	4587.03	4587.03
46.75	3939.50	3939.50
49.50	3013.48	3013.48
52.25	1729.29	1729.29
55.00	0.00	0.00

T	=	0.11	
U (%)	=	24.62	24.62
Settlement	=	10.05	10.05

Pore Pressure Distribution
for Time (days) = 180.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	812.09	812.09
5.50	1596.49	1596.49
8.25	2327.91	2327.91
11.00	2985.41	2985.41
13.75	3553.53	3553.53
16.50	4022.48	4022.48
19.25	4387.39	4387.39
22.00	4646.99	4646.99
24.75	4801.98	4801.98
27.50	4853.48	4853.48
30.25	4801.98	4801.98
33.00	4646.99	4646.99
35.75	4387.39	4387.39
38.50	4022.48	4022.48
41.25	3553.53	3553.53
44.00	2985.41	2985.41
46.75	2327.91	2327.91
49.50	1596.49	1596.49
52.25	812.09	812.09
55.00	0.00	0.00

T	=	0.21	
U (%)	=	44.99	44.99
Settlement	=	18.36	18.36

Pore Pressure Distribution
for Time (days) = 270.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	596.88	596.88
5.50	1178.36	1178.36
8.25	1729.58	1729.58
11.00	2236.68	2236.68
13.75	2687.24	2687.24
16.50	3070.53	3070.53
19.25	3377.74	3377.74
22.00	3602.02	3602.02
24.75	3738.51	3738.51
27.50	3784.33	3784.33
30.25	3738.51	3738.51
33.00	3602.02	3602.02
35.75	3377.74	3377.74
38.50	3070.53	3070.53
41.25	2687.24	2687.24
44.00	2236.68	2236.68
46.75	1729.58	1729.58
49.50	1178.36	1178.36

52.25	596.88	596.88
55.00	0.00	0.00

T	=	0.32	
U (%)	=	57.98	57.98
Settlement	=	23.66	23.66

Pore Pressure Distribution
for Time (days) = 360.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	455.81	455.81
5.50	900.33	900.33
8.25	1322.57	1322.57
11.00	1712.10	1712.10
13.75	2059.34	2059.34
16.50	2355.76	2355.76
19.25	2594.14	2594.14
22.00	2768.66	2768.66
24.75	2875.09	2875.09
27.50	2910.86	2910.86
30.25	2875.09	2875.09
33.00	2768.66	2768.66
35.75	2594.14	2594.14
38.50	2355.76	2355.76
41.25	2059.34	2059.34
44.00	1712.10	1712.10
46.75	1322.57	1322.57
49.50	900.33	900.33
52.25	455.81	455.81
55.00	0.00	0.00

T	=	0.43	
U (%)	=	67.76	67.76
Settlement	=	27.65	27.65

Pore Pressure Distribution
for Time (days) = 450.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	349.73	349.73
5.50	690.84	690.84
8.25	1014.92	1014.92
11.00	1314.01	1314.01
13.75	1580.72	1580.72
16.50	1808.51	1808.51
19.25	1991.76	1991.76

22.00	2125.96	2125.96
24.75	2207.83	2207.83
27.50	2235.34	2235.34
30.25	2207.83	2207.83
33.00	2125.96	2125.96
35.75	1991.76	1991.76
38.50	1808.51	1808.51
41.25	1580.72	1580.72
44.00	1314.01	1314.01
46.75	1014.92	1014.92
49.50	690.84	690.84
52.25	349.73	349.73
55.00	0.00	0.00

T	=	0.54	
U (%)	=	75.25	75.25
Settlement	=	30.70	30.70

One Layer Soil System/Rectangular

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/17/2014 Computed by : CGB

Stratum thickness = 55.00 (ft)
Coeff. of consolidation = 0.900 (ft*ft/days)
Number of sublayers = 20
Drainage Conditions = Drainage at top/bottom

Load #	Init. Pore Pressure (psf)	Load Type	Placement Time (days)	Ramp Time (days)	Ultimate Settlement (in.)
1	5750.00	RAMP	0.00	90.00	40.80

Pore Pressure Distribution
for Time (days) = 540.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	268.49	268.49
5.50	530.36	530.36
8.25	779.17	779.17
11.00	1008.80	1008.80
13.75	1213.59	1213.59
16.50	1388.49	1388.49
19.25	1529.20	1529.20
22.00	1632.26	1632.26
24.75	1695.13	1695.13
27.50	1716.26	1716.26
30.25	1695.13	1695.13
33.00	1632.26	1632.26
35.75	1529.20	1529.20
38.50	1388.49	1388.49
41.25	1213.59	1213.59
44.00	1008.80	1008.80
46.75	779.17	779.17
49.50	530.36	530.36
52.25	268.49	268.49
55.00	0.00	0.00
T =	0.64	
U (%) =	81.00	81.00
Settlement =	33.05	33.05

Pore Pressure Distribution
for Time (days) = 630.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	206.13	206.13
5.50	407.19	407.19
8.25	598.21	598.21
11.00	774.51	774.51
13.75	931.74	931.74
16.50	1066.03	1066.03
19.25	1174.06	1174.06
22.00	1253.19	1253.19
24.75	1301.46	1301.46
27.50	1317.68	1317.68
30.25	1301.46	1301.46
33.00	1253.19	1253.19
35.75	1174.06	1174.06
38.50	1066.03	1066.03
41.25	931.74	931.74
44.00	774.51	774.51
46.75	598.21	598.21
49.50	407.19	407.19
52.25	206.13	206.13
55.00	0.00	0.00

T	=	0.75	
U (%)	=	85.41	85.41
Settlement	=	34.85	34.85

Pore Pressure Distribution
for Time (days) = 810.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	121.50	121.50
5.50	240.02	240.02
8.25	352.62	352.62
11.00	456.54	456.54
13.75	549.22	549.22
16.50	628.38	628.38
19.25	692.06	692.06
22.00	738.70	738.70
24.75	767.15	767.15
27.50	776.71	776.71
30.25	767.15	767.15
33.00	738.70	738.70
35.75	692.06	692.06
38.50	628.38	628.38
41.25	549.22	549.22
44.00	456.54	456.54
46.75	352.62	352.62
49.50	240.02	240.02

52.25	121.50	121.50
55.00	0.00	0.00

T	= 0.96	
U (%)	= 91.40	91.40
Settlement	= 37.29	37.29

Pore Pressure Distribution
for Time (days) = 900.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	93.29	93.29
5.50	184.28	184.28
8.25	270.73	270.73
11.00	350.51	350.51
13.75	421.67	421.67
16.50	482.44	482.44
19.25	531.34	531.34
22.00	567.14	567.14
24.75	588.99	588.99
27.50	596.33	596.33
30.25	588.99	588.99
33.00	567.14	567.14
35.75	531.34	531.34
38.50	482.44	482.44
41.25	421.67	421.67
44.00	350.51	350.51
46.75	270.73	270.73
49.50	184.28	184.28
52.25	93.29	93.29
55.00	0.00	0.00

T	= 1.07	
U (%)	= 93.40	93.40
Settlement	= 38.11	38.11

Pore Pressure Distribution
for Time (days) = 999.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	69.75	69.75
5.50	137.79	137.79
8.25	202.43	202.43
11.00	262.09	262.09
13.75	315.30	315.30
16.50	360.74	360.74
19.25	397.30	397.30

22.00	424.07	424.07
24.75	440.41	440.41
27.50	445.90	445.90
30.25	440.41	440.41
33.00	424.07	424.07
35.75	397.30	397.30
38.50	360.74	360.74
41.25	315.30	315.30
44.00	262.09	262.09
46.75	202.43	202.43
49.50	137.79	137.79
52.25	69.75	69.75
55.00	0.00	0.00

T	=	1.19	
U (%)	=	95.06	95.06
Settlement	=	38.79	38.79

One Layer Soil System/Combined vertical/radial consolidation 10-FT

w/ Wick Drains 10-FT

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/17/2014 Computed by : CGB

Number of loads	=	1
Stratum Thickness	=	55.00 (ft)
Vert. Coeff. of Consolidation	=	0.90 (ft*ft/days)
Radial Coeff. of Consolidation	=	0.90 (ft*ft/days)
Number of sublayers	=	20
Drainage Conditions	=	Drainage at top/bottom
Drain Diameter	=	0.22 (ft)
Effective Diameter	=	10.25 (ft)

Load #	Init. Pore Pressure (psf)	Load Type	Placement Time (days)	Ramp Time (days)	Ultimate Settlement (in.)
1	5750.00	RAMP	0.00	90.00	40.80

Pore Pressure Distribution
for Time (days) = 30.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	461.92	461.92
5.50	728.41	728.41
8.25	868.69	868.69
11.00	935.61	935.61
13.75	964.35	964.35
16.50	975.41	975.41
19.25	979.21	979.21
22.00	980.37	980.37
24.75	980.67	980.67
27.50	980.73	980.73
30.25	980.67	980.67
33.00	980.37	980.37
35.75	979.21	979.21
38.50	975.41	975.41
41.25	964.35	964.35
44.00	935.61	935.61
46.75	868.69	868.69
49.50	728.41	728.41
52.25	461.92	461.92
55.00	0.00	0.00
U (%) =	51.25	
Settlement =	20.91	20.91

Pore Pressure Distribution
for Time (days) = 60.00

Depth	Load 1	Total

(ft)	(psf)	(psf)
0.00	0.00	0.00
2.75	363.93	363.93
5.50	614.83	614.83
8.25	780.25	780.25
11.00	884.30	884.30
13.75	946.59	946.59
16.50	981.98	981.98
19.25	1001.00	1001.00
22.00	1010.57	1010.57
24.75	1014.89	1014.89
27.50	1016.10	1016.10
30.25	1014.89	1014.89
33.00	1010.57	1010.57
35.75	1001.00	1001.00
38.50	981.98	981.98
41.25	946.59	946.59
44.00	884.30	884.30
46.75	780.25	780.25
49.50	614.83	614.83
52.25	363.93	363.93
55.00	0.00	0.00
U (%) =	76.98	
Settlement =	31.41	31.41

Pore Pressure Distribution
for Time (days) = 90.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	238.84	238.84
5.50	416.20	416.20
8.25	544.10	544.10
11.00	633.53	633.53
13.75	694.06	694.06
16.50	733.59	733.59
19.25	758.35	758.35
22.00	772.95	772.95
24.75	780.52	780.52
27.50	782.84	782.84
30.25	780.52	780.52
33.00	772.95	772.95
35.75	758.35	758.35
38.50	733.59	733.59
41.25	694.06	694.06
44.00	633.53	633.53
46.75	544.10	544.10
49.50	416.20	416.20
52.25	238.84	238.84
55.00	0.00	0.00
U (%) =	89.59	
Settlement =	36.55	36.55

Pore Pressure Distribution
for Time (days) = 180.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	15.73	15.73
5.50	30.92	30.92
8.25	45.08	45.08
11.00	57.82	57.82
13.75	68.82	68.82
16.50	77.90	77.90
19.25	84.97	84.97
22.00	90.00	90.00
24.75	93.00	93.00
27.50	94.00	94.00
30.25	93.00	93.00
33.00	90.00	90.00
35.75	84.97	84.97
38.50	77.90	77.90
41.25	68.82	68.82
44.00	57.82	57.82
46.75	45.08	45.08
49.50	30.92	30.92
52.25	15.73	15.73
55.00	0.00	0.00
U (%) =	98.93	
Settlement =	40.37	40.37

Pore Pressure Distribution
for Time (days) = 270.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	1.62	1.62
5.50	3.20	3.20
8.25	4.70	4.70
11.00	6.07	6.07
13.75	7.30	7.30
16.50	8.34	8.34
19.25	9.17	9.17
22.00	9.78	9.78
24.75	10.15	10.15
27.50	10.28	10.28
30.25	10.15	10.15
33.00	9.78	9.78
35.75	9.17	9.17
38.50	8.34	8.34
41.25	7.30	7.30
44.00	6.07	6.07
46.75	4.70	4.70
49.50	3.20	3.20

52.25	1.62	1.62
55.00	0.00	0.00
U (%) =	99.89	
Settlement =	40.75	40.75

One Layer Soil System/Combined vertical/radial consolidation

Project Name: WPKY 7: MB-14 (1027+00) Project Number : 3520G
Client : FDOT Project Manager: CGB
Date : 9/17/2014 Computed by : CGB

Number of loads	=	1
Stratum Thickness	=	55.00 (ft)
Vert. Coeff. of Consolidation	=	0.90 (ft*ft/days)
Radial Coeff. of Consolidation	=	0.90 (ft*ft/days)
Number of sublayers	=	20
Drainage Conditions	=	Drainage at top/bottom
Drain Diameter	=	0.22 (ft)
Effective Diameter	=	10.25 (ft)

Load #	Init. Pore Pressure (psf)	Load Type	Placement Time (days)	Ramp Time (days)	Ultimate Settlement (in.)
1	5750.00	RAMP	0.00	90.00	40.80

Pore Pressure Distribution
for Time (days) = 540.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	0.00	0.00
5.50	0.00	0.00
8.25	0.01	0.01
11.00	0.01	0.01
13.75	0.01	0.01
16.50	0.01	0.01
19.25	0.01	0.01
22.00	0.01	0.01
24.75	0.01	0.01
27.50	0.01	0.01
30.25	0.01	0.01
33.00	0.01	0.01
35.75	0.01	0.01
38.50	0.01	0.01
41.25	0.01	0.01
44.00	0.01	0.01
46.75	0.01	0.01
49.50	0.00	0.00
52.25	0.00	0.00
55.00	0.00	0.00
U (%) =	100.00	
Settlement =	40.80	40.80

Pore Pressure Distribution
for Time (days) = 630.00

Depth	Load 1	Total

(ft)	(psf)	(psf)
0.00	0.00	0.00
2.75	0.00	0.00
5.50	0.00	0.00
8.25	0.00	0.00
11.00	0.00	0.00
13.75	0.00	0.00
16.50	0.00	0.00
19.25	0.00	0.00
22.00	0.00	0.00
24.75	0.00	0.00
27.50	0.00	0.00
30.25	0.00	0.00
33.00	0.00	0.00
35.75	0.00	0.00
38.50	0.00	0.00
41.25	0.00	0.00
44.00	0.00	0.00
46.75	0.00	0.00
49.50	0.00	0.00
52.25	0.00	0.00
55.00	0.00	0.00
U (%) =	100.00	
Settlement =	40.80	40.80

Pore Pressure Distribution
for Time (days) = 810.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	0.00	0.00
5.50	0.00	0.00
8.25	0.00	0.00
11.00	0.00	0.00
13.75	0.00	0.00
16.50	0.00	0.00
19.25	0.00	0.00
22.00	0.00	0.00
24.75	0.00	0.00
27.50	0.00	0.00
30.25	0.00	0.00
33.00	0.00	0.00
35.75	0.00	0.00
38.50	0.00	0.00
41.25	0.00	0.00
44.00	0.00	0.00
46.75	0.00	0.00
49.50	0.00	0.00
52.25	0.00	0.00
55.00	0.00	0.00
U (%) =	100.00	
Settlement =	40.80	40.80

Pore Pressure Distribution
for Time (days) = 900.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	0.00	0.00
5.50	0.00	0.00
8.25	0.00	0.00
11.00	0.00	0.00
13.75	0.00	0.00
16.50	0.00	0.00
19.25	0.00	0.00
22.00	0.00	0.00
24.75	0.00	0.00
27.50	0.00	0.00
30.25	0.00	0.00
33.00	0.00	0.00
35.75	0.00	0.00
38.50	0.00	0.00
41.25	0.00	0.00
44.00	0.00	0.00
46.75	0.00	0.00
49.50	0.00	0.00
52.25	0.00	0.00
55.00	0.00	0.00
U (%) =	100.00	
Settlement =	40.80	40.80

Pore Pressure Distribution
for Time (days) = 999.00

Depth (ft)	Load 1 (psf)	Total (psf)
0.00	0.00	0.00
2.75	0.00	0.00
5.50	0.00	0.00
8.25	0.00	0.00
11.00	0.00	0.00
13.75	0.00	0.00
16.50	0.00	0.00
19.25	0.00	0.00
22.00	0.00	0.00
24.75	0.00	0.00
27.50	0.00	0.00
30.25	0.00	0.00
33.00	0.00	0.00
35.75	0.00	0.00
38.50	0.00	0.00
41.25	0.00	0.00
44.00	0.00	0.00
46.75	0.00	0.00
49.50	0.00	0.00

52.25	0.00	0.00
55.00	0.00	0.00

U (%)	= 100.00	
Settlement	= 40.80	40.80

Secondary Muck Consolidation Settlement Calculations
Wekiva Parkwy - Section 7A
10-Foot Surcharge - Boring MB-14 (1027+00)
GEC Project No. 3520G

Input Parameters

σ'_{vs} =	5750	psf	Maximum Effective Stress of Surcharge (40 ft roadway + 10 ft surcharge)
σ'_{vf} =	4455	psf	Final Effective Stress (After Surcharge Removal)
t =	5745	days	Elapsed Time From Application of Load (15 years + surcharge time)
t_p =	270	days	Duration of Primary Consolidation (duration of surcharge)
T_v =	1.129		Time Factor (For 95% Rebound)

Soil Layer	Layer Description	Compression Index C_c	Coefficient of Consolidation C_V (ft^2/day)	Secondary Compression Index C_α	e_o	Layer Thickness H (ft)	Length of Drainage Path H_{dr} (ft)
1	Muck	0.34	0.90	0.020	4.89	9.0	4.5
2	Sandy Muck	1.00	1.10	0.020	2.15	23.0	11.5
3	Muck	0.34	0.90	0.020	4.89	16.0	8.0

Secondary Settlement Without Surcharge Calculations

Soil Layer	ΔH_{sec} (inches)
1	0.49
2	2.33
3	0.87
Total	**3.68**

in. = Secondary Settlement Without Surcharge

$$\Delta H_{sec} = \frac{C_c}{1+e_o}\frac{C_\alpha}{C_c} H \log\frac{t}{t_p}$$

$$\Delta H'_{sec} = \frac{C_c}{1+e_o}\frac{C_\alpha}{C_c}\frac{C''_\alpha}{C_\alpha} H \log\frac{t}{t_p}$$

Secondary Settlement Post Surcharge Calculations

Soil Layer	Time for Primary Rebound t_{pr} (days)	Effective Surcharge Ratio R'_s	t_l/t_{pr}	Time for Secondary Settlement to Occur Post Surcharge t_l (days)	t/t_l	* C''_α/C_α	$\log(t/t_l)$	Secondary Settlement Post Surcharge $\Delta H'_{sec}$ (inches)
1	25	0.291	2.91	74	78	0.40	1.89	0.28
2	136	0.291	2.91	395	15	0.21	1.16	0.43
3	80	0.291	2.91	233	25	0.25	1.39	0.23
							Total	**0.93**

Secondary Settlement With Surcharge = 0.93 in.

** Reference: Figure 13, "Secondary Compression of Peat with or without Surcharging" Journal of Geotechnical and Geoenvironmental Engineering, May 1997.*

Wekiva Parkway Section 7A
MB-14 (1027+00)

***VERTICAL WICK DRAIN**
SPACING CALCULATIONS

Computed By: CGB
Checked By: DCS

U =	100%	Required degree of primary consolidation
U_V =	57.98%	Degree of consolidation provided by vertical drainge
		(57.98% at 9 months from SAF-TR results)
U_r =	100%	Degree of consolidation required by radial drainage (through the wick drains)
		$U_r = \frac{U - U_V}{1 - U_V}$
t (days) =	270	Time allowed for presettling including embankment construction
c_V (ft^2/day) =	0.9	Vertical Coefficient of Consolidation (from consolidation test curves)
c_h (ft^2/day) =	1.8	Horizontal Coefficient of Consolidation $(c_h = 2 \times c_v)$
d_w (in) =	2.6	Equivalent drain diameter (as specified)
T'_{r1} =	0.6	From Fig. 4, page 757 of reference (using U_r of 10%)
T'_r =	10353	$T'_r = c_h \frac{t}{{d_w}^2}$
α' =	17254	$\alpha' = \frac{T'_r}{T'_{r1}}$
n =	70	From Fig. 5, page 758 of reference (neglecting the effects of smearing)
d_e (ft) =	15.2	$d_e = n \times d_w$
H (ft) =	14.4	$H = \frac{d_e}{1.05}$
H_F (ft) =	11.1	Applying a Factor of Safety of 1.3

** Reference: "Design Curves for Prefabricated Vertical Drains" Journal of Geotechnical and Geoenvironmental Engineering , August 1997.*

MSE WALL
EXTERNAL STABILITY ANALYSES

MSE WALL - LRFD External Stability Analysis

version 2.5.1

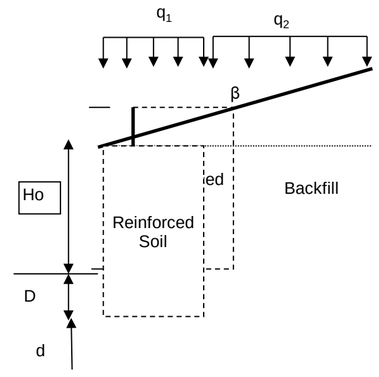
	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**6.0**	6.0	0.0	**8.0**	**OK**	**3.64**	**0.15**	**1.37**	**1.25**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
2	**8.0**	8.0	0.0	**10.0**	**OK**	**3.42**	**0.19**	**1.34**	**1.14**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
3	**10.0**	10.0	0.0	**12.0**	**OK**	**3.29**	**0.22**	**1.32**	**1.07**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
4	**12.0**	12.0	0.0	**14.0**	**OK**	**3.20**	**0.24**	**1.31**	**1.03**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
5	**14.0**	14.0	0.0	**16.0**	**OK**	**3.14**	**0.26**	**1.30**	**1.00**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
6	**16.0**	16.0	0.0	**19.0**	**OK**	**3.26**	**0.23**	**1.32**	**1.06**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
7	**18.0**	18.0	0.0	**21.0**	**OK**	**3.20**	**0.24**	**1.31**	**1.03**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
8	**20.0**	20.0	0.0	**23.0**	**OK**	**3.16**	**0.25**	**1.30**	**1.01**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
9	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
10	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
11	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
12	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#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]
1415	**1702**	10.01	5040	1683	0	0	26.6	2670	0	3581	4917	8516	10869	43479	53675	11943	11943	0.30	0.16	7.68	25.80	14.72	16.72	0.000	0.464	0.000
1902	**2079**	13.01	8400	2629	0	0	26.6	4512	0	6051	8117	14059	17919	89829	110663	26237	26237	0.48	0.29	9.42	25.80	14.72	16.72	0.000	0.464	0.000
2392	**2456**	16.01	12600	3786	0	0	26.6	6834	0	9166	12110	20976	26711	160967	198027	48914	48914	0.66	0.42	11.16	25.80	14.72	16.72	0.000	0.464	0.000
2886	**2832**	19.01	17640	5153	0	0	26.6	9637	0	12925	16896	29265	37243	262189	322240	81907	81907	0.84	0.55	12.91	25.80	14.72	16.72	0.000	0.464	0.000
3381	**3208**	22.01	23520	6730	0	0	26.6	12920	0	17329	22475	38928	49516	398794	489776	127151	127151	1.02	0.68	14.65	25.80	14.72	16.72	0.000	0.464	0.000
3835	**3872**	25.51	31920	9491	0	0	26.6	17359	0	23282	30640	53070	67563	644973	793183	198011	198011	1.08	0.69	17.62	25.80	14.72	16.72	0.000	0.464	0.000
4328	**4248**	28.52	39690	11594	0	0	26.6	21683	0	29082	38017	65847	83797	884888	1087559	276436	276436	1.26	0.82	19.36	25.80	14.72	16.72	0.000	0.464	0.000
4823	**4624**	31.52	48300	13907	0	0	26.6	26488	0	35527	46187	79998	101770	1177877	1446921	373237	373237	1.44	0.95	21.10	25.80	14.72	16.72	0.000	0.464	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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

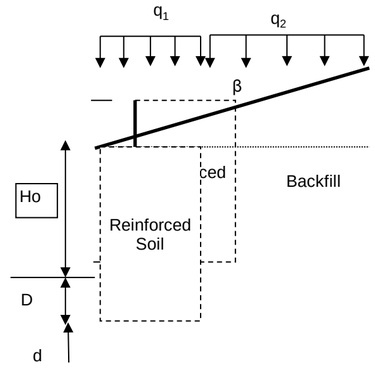
	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* f [bf] (deg)	* γ[fs] (pcf)	* f [fs] (deg)	* c[fs] (psf)	* f u (deg)	* q1 (psf)	* q2 (psf)	CW
1	**6.0**	6.0	0.0	**8.0**	**OK**	**3.64**	**0.15**	**1.37**	**1.25**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
2	**8.0**	8.0	0.0	**10.0**	**OK**	**3.42**	**0.19**	**1.34**	**1.14**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
3	**10.0**	10.0	0.0	**12.0**	**OK**	**3.29**	**0.22**	**1.32**	**1.07**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
4	**12.0**	12.0	0.0	**14.0**	**OK**	**3.20**	**0.24**	**1.31**	**1.03**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
5	**14.0**	14.0	0.0	**16.0**	**OK**	**3.14**	**0.26**	**1.30**	**1.00**	26.6	70.0	0.0	105.0	115.0	32.0	100.0	28.0	0.0	30.0	0.0	0.0	0.50
6	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
7	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
8	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
9	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
10	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
11	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
12	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
13	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
14	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
15	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
16	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
17	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
18	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
19	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!
20	**0.0**	0.0	0.0	**0.0**	**OK**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#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]
1415	**1702**	10.01	5040	1683	0	0	26.6	2670	0	3581	4917	8516	10869	43479	53675	11943	11943	0.30	0.16	7.68	25.80	14.72	16.72	0.000	0.464	0.000
1902	**2079**	13.01	8400	2629	0	0	26.6	4512	0	6051	8117	14059	17919	89829	110663	26237	26237	0.48	0.29	9.42	25.80	14.72	16.72	0.000	0.464	0.000
2392	**2456**	16.01	12600	3786	0	0	26.6	6834	0	9166	12110	20976	26711	160967	198027	48914	48914	0.66	0.42	11.16	25.80	14.72	16.72	0.000	0.464	0.000
2886	**2832**	19.01	17640	5153	0	0	26.6	9637	0	12925	16896	29265	37243	262189	322240	81907	81907	0.84	0.55	12.91	25.80	14.72	16.72	0.000	0.464	0.000
3381	**3208**	22.01	23520	6730	0	0	26.6	12920	0	17329	22475	38928	49516	398794	489776	127151	127151	1.02	0.68	14.65	25.80	14.72	16.72	0.000	0.464	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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!	5.14	1.00	0.00	1.000	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

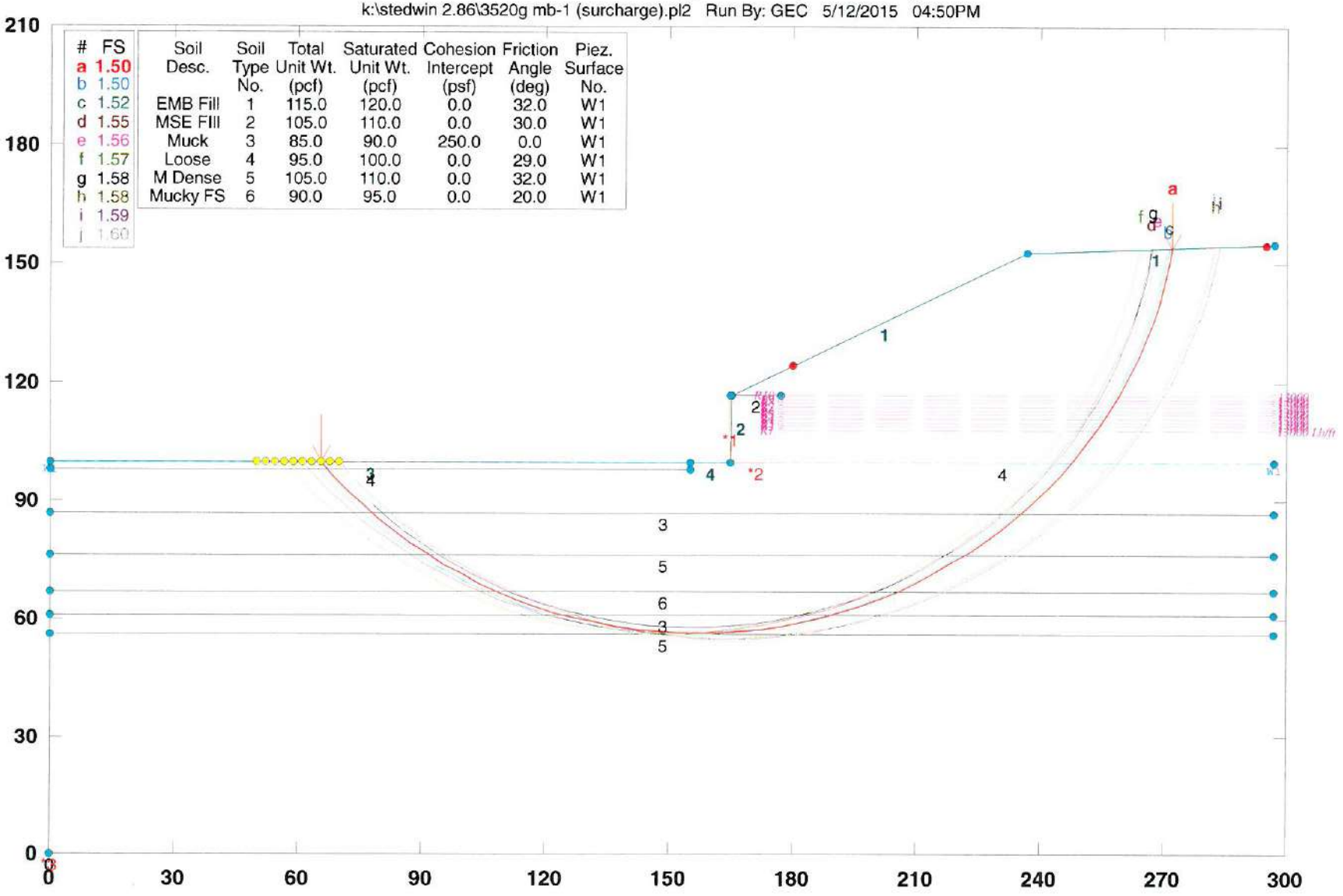
GLOBAL STABILITY ANALYSES

Wekiva 7A - Surcharge MB-1 (1020+12)

k:\stedwin 2.86\3520g mb-1 (surcharge).pl2 Run By: GEC 5/12/2015 04:50PM

#	FS
a	1.50
b	1.50
c	1.52
d	1.55
e	1.56
f	1.57
g	1.58
h	1.58
i	1.59
j	1.60

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
Muck	3	85.0	90.0	250.0	0.0	W1
Loose	4	95.0	100.0	0.0	29.0	W1
M Dense	5	105.0	110.0	0.0	32.0	W1
Mucky FS	6	90.0	95.0	0.0	20.0	W1



STABL6H FSmin=1.50

Safety Factors Are Calculated By The Modified Bishop Method

STED

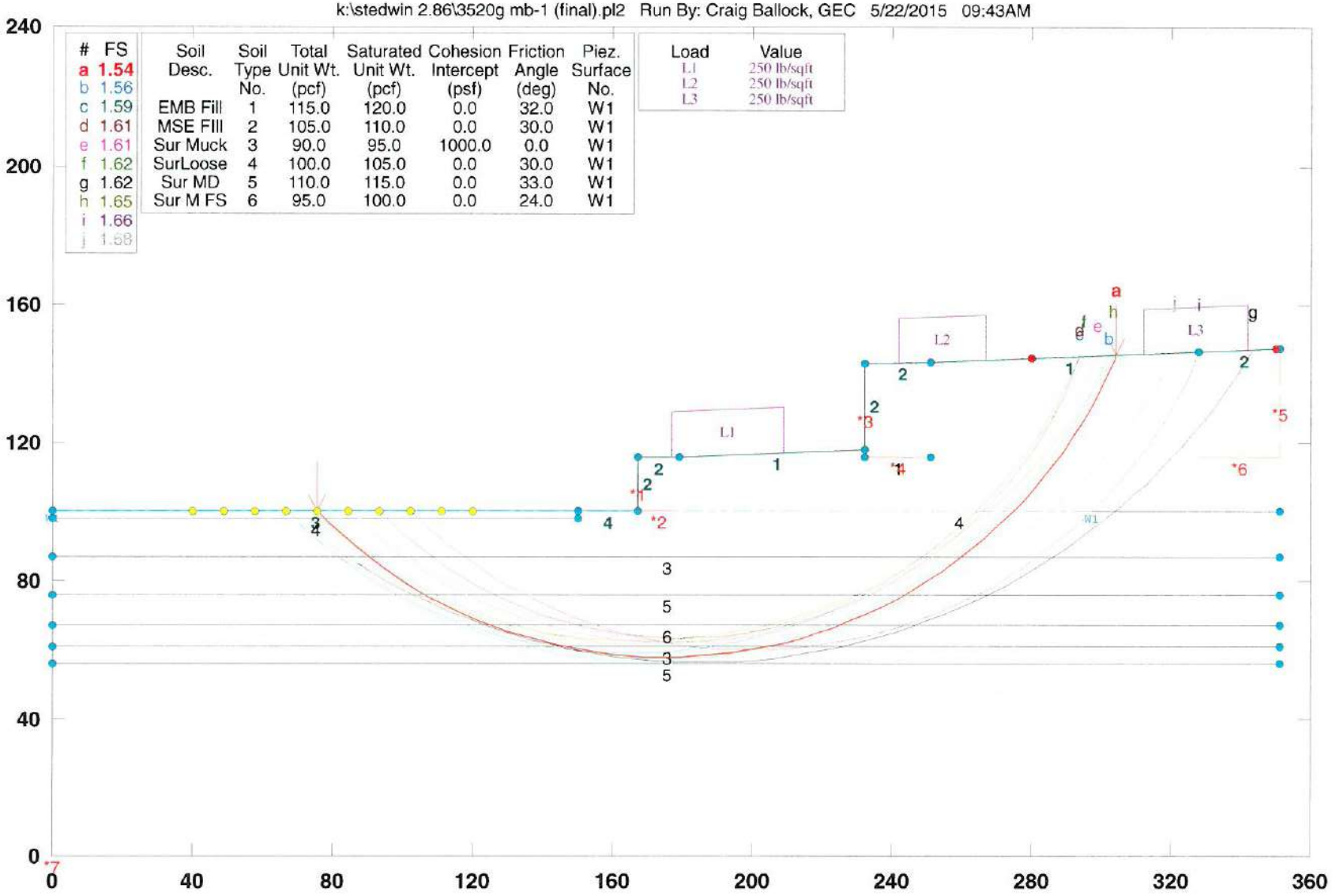
Wekiva 7A - Surcharge MB-1 (1020+12)

k:\stedwin 2.86\3520g mb-1 (final).pl2 Run By: Craig Ballock, GEC 5/22/2015 09:43AM

#	FS
a	1.54
b	1.56
c	1.59
d	1.61
e	1.61
f	1.62
g	1.62
h	1.65
i	1.66
j	1.58

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
Sur Muck	3	90.0	95.0	1000.0	0.0	W1
SurLoose	4	100.0	105.0	0.0	30.0	W1
Sur MD	5	110.0	115.0	0.0	33.0	W1
Sur M FS	6	95.0	100.0	0.0	24.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft



STABL6H FSmin=1.54

Safety Factors Are Calculated By The Modified Bishop Method

STED

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

℄ CONST SR 429

(131, 153)

(297, 155)

(165.1, 117)

(177, 117)

Geo Reinforcement

FGT Easement

R/W LINE

(0, 100)

(155, 100)

(297, 100)

(0, 98)

(155, 98)

(0, 87)

(297, 87)

EB-1020
1019+99

(0, 76)

(297, 76)

WB-1020
1020+01

(0, 67)

(297, 67)

(0, 61)

(297, 61)

MB-1
1020+15

(0, 56)

(297, 56)

℄ CONST SR 429

SCALE 1020+00.0000
1" = 40' Horizontal
1" = 10' Vertical

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

scott 5/1/2015 2:40:46 PM J:\D109\3520G Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\CLIENT\RDXSADD

℄ CONST SR 429

(232.1, 143) (251, 143.5) (328, 146.5) (351, 147.5)

77.24 76.17 79.14 1.5 1.5 8.57'

℄ CONST WB FRONTAGE RD STA 3095+20.47

℄ CONST EB FRONTAGE RD STA 2080+15.86

LIMITED ACCESS R/W LINE

(167.1, 116) (179, 116) (232, 118) (251, 116) (232, 116)

49.29 49.14 1:25 1:25

Exist. Fence

FGT Easement

R/W LINE

(150, 100) (167, 100) (351, 100)

(0, 100) (0, 98) (0, 87) (0, 76) (0, 67) (0, 61) (0, 56)

(150, 98)

36.56

GM BTV BFO SAN GM WM BT SAN BFO WM BT WNP

33.20 43.36'

1:4

SUBSOIL EXCAVATION

(351, 87) (351, 76) (351, 67) (351, 61) (351, 56)

END SUBSOIL EXCAVATION
STA 1020+50

EB-1020
1019+99

WB-1020
1020+01

MB-1
1020+12

1020+00.00

SCALE
1" = 40' Horizontal
1" = 10' Vertical

℄ CONST SR 429

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
340.6	612	515.3	901	7372.9	13238

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

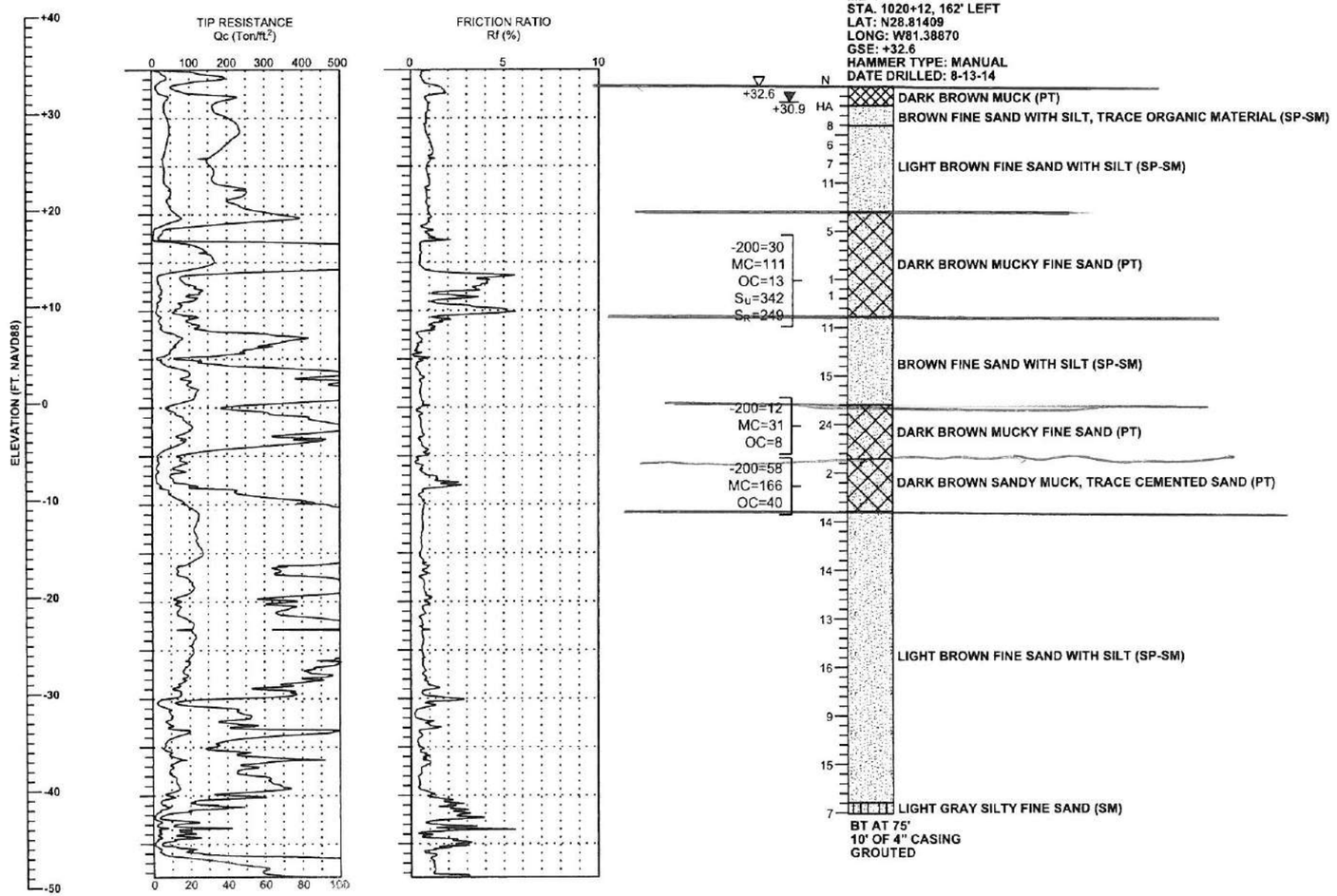
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO. 816

PRELIMINARY: NOT FOR CONSTRUCTION

robert_martini 5/2/2015 1:36:24 PM D:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD02_429.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
- 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

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.

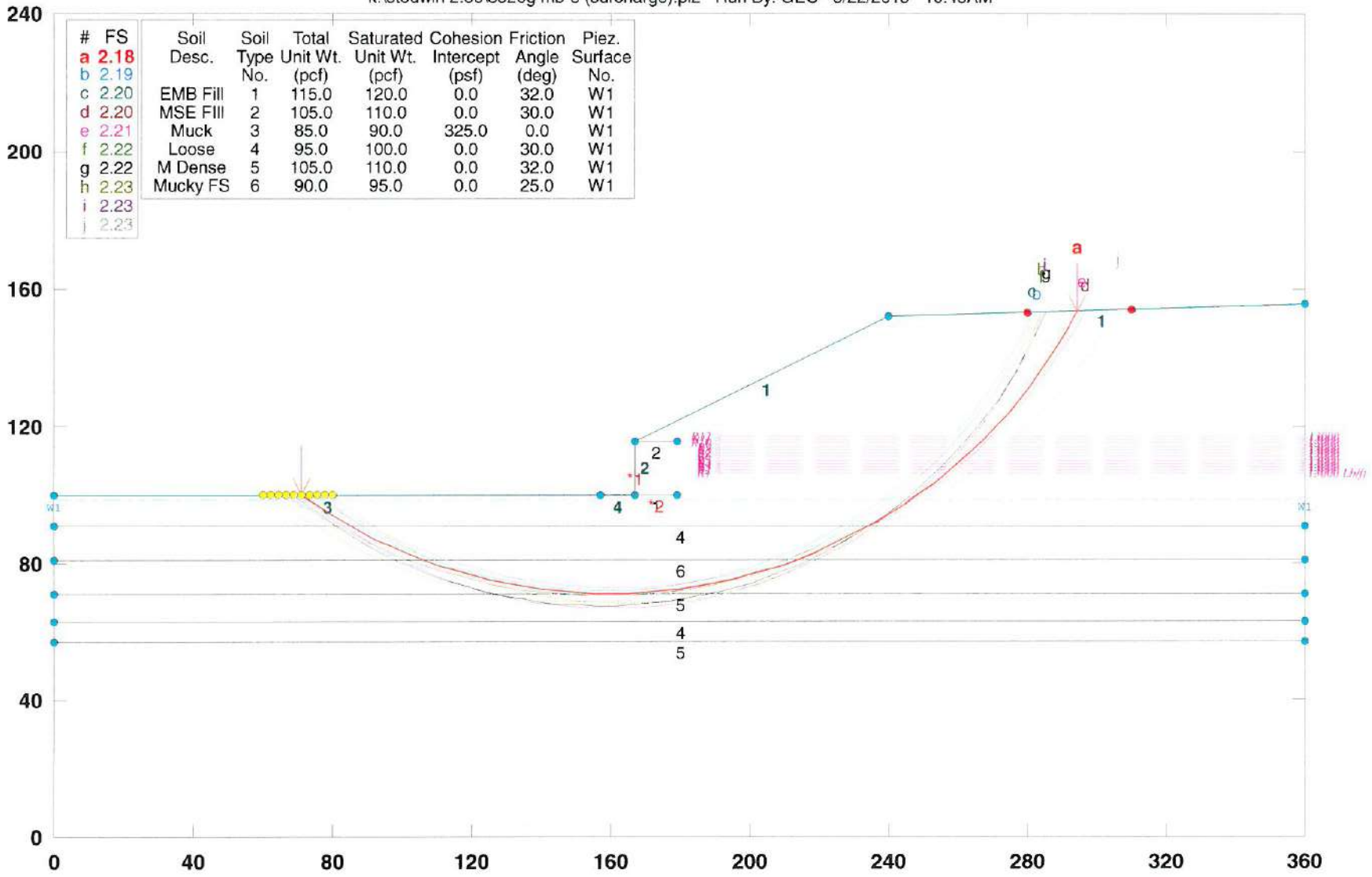
scott 4/23/2015 9:50:31 AM J:\D109\3520G Wekiva Parkway Section 7A\b1boring16.dgn

Wekiva 7A MB-8 (1024+83)

k:\stedwin 2.86\3520g mb-8 (surcharge).pl2 Run By: GEC 5/22/2015 10:48AM

#	FS
a	2.18
b	2.19
c	2.20
d	2.20
e	2.21
f	2.22
g	2.22
h	2.23
i	2.23
j	2.23

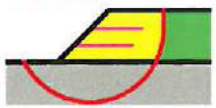
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
EMB Fill	1	115.0	120.0	0.0	32.0	W1
MSE FIll	2	105.0	110.0	0.0	30.0	W1
Muck	3	85.0	90.0	325.0	0.0	W1
Loose	4	95.0	100.0	0.0	30.0	W1
M Dense	5	105.0	110.0	0.0	32.0	W1
Mucky FS	6	90.0	95.0	0.0	25.0	W1



STABL6H FSmin=2.18

Safety Factors Are Calculated By The Modified Bishop Method

STED



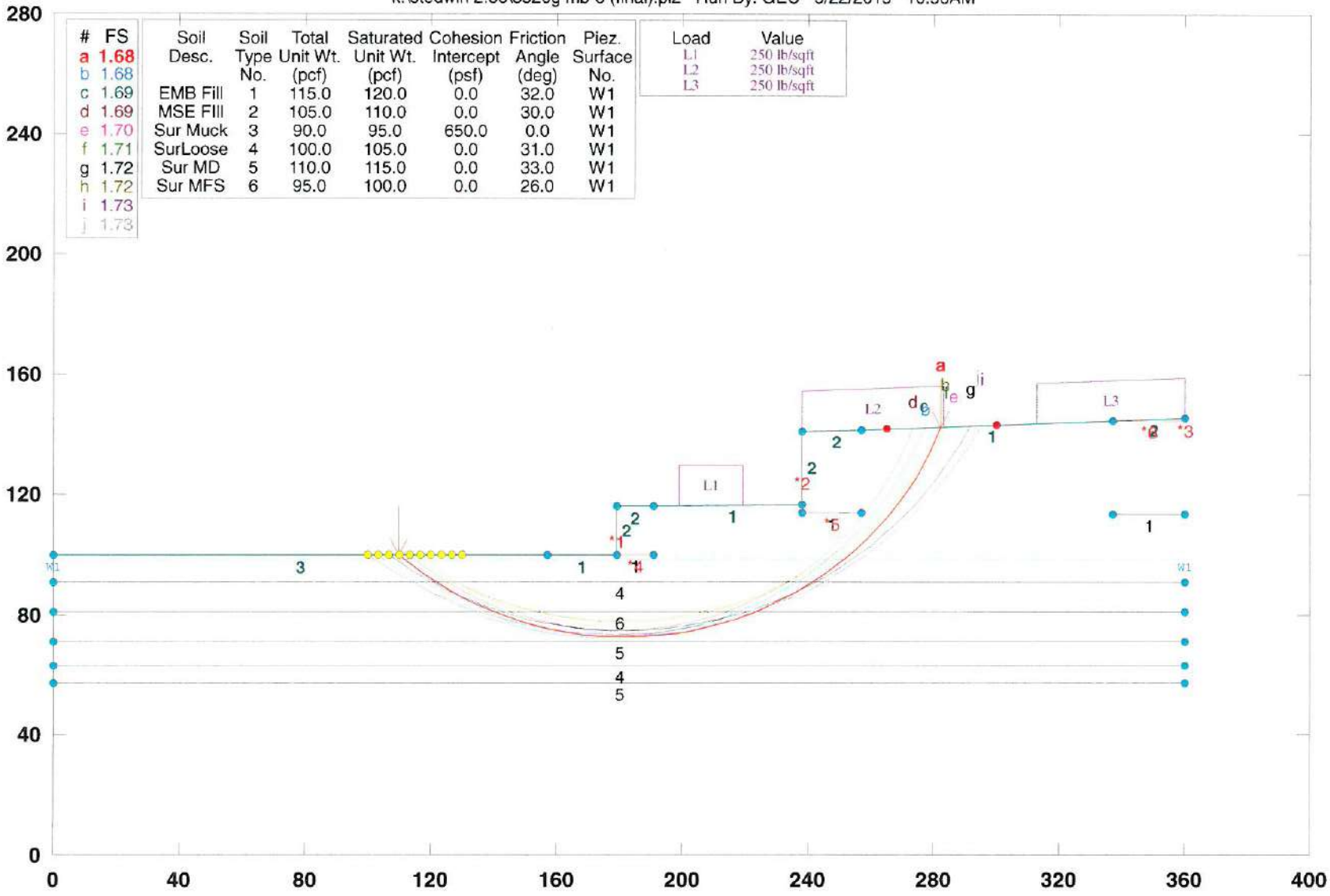
Wekiva 7A MB-8 (1024+83)

k:\stedwin 2.86\3520g mb-8 (final).pl2 Run By: GEC 5/22/2015 10:56AM

#	FS
a	1.68
b	1.68
c	1.69
d	1.69
e	1.70
f	1.71
g	1.72
h	1.72
i	1.73
j	1.73

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
Sur Muck	3	90.0	95.0	650.0	0.0	W1
SurLoose	4	100.0	105.0	0.0	31.0	W1
Sur MD	5	110.0	115.0	0.0	33.0	W1
Sur MFS	6	95.0	100.0	0.0	26.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft



STABL6H FSmin=1.68

Safety Factors Are Calculated By The Modified Bishop Method

STED

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V

(240,152)
(360,155.5)
(167,115.5)
(179,115.5)
(191,117)
(191,106)
(157,100)
(167,100)
(179,100)
(0,100)
(0,91)
(0,81)
(0,71)
(0,63)
(0,57)
(360,91)
(360,81)
(360,71)
(360,63)
(360,57)

Q CONST SR 429

FGT Easement
R/W LINE
SAN
WM
WNP
ONE-1025L
ML 1025L
1025+03
EB-1025
1025+00
WB-1025
1025+04
WB-1025+20
1025+24
1025+00.0000

SCALE
1" = 40' Horizontal
1" = 10' Vertical

PRELIMINARY: NOT FOR CONSTRUCTION

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

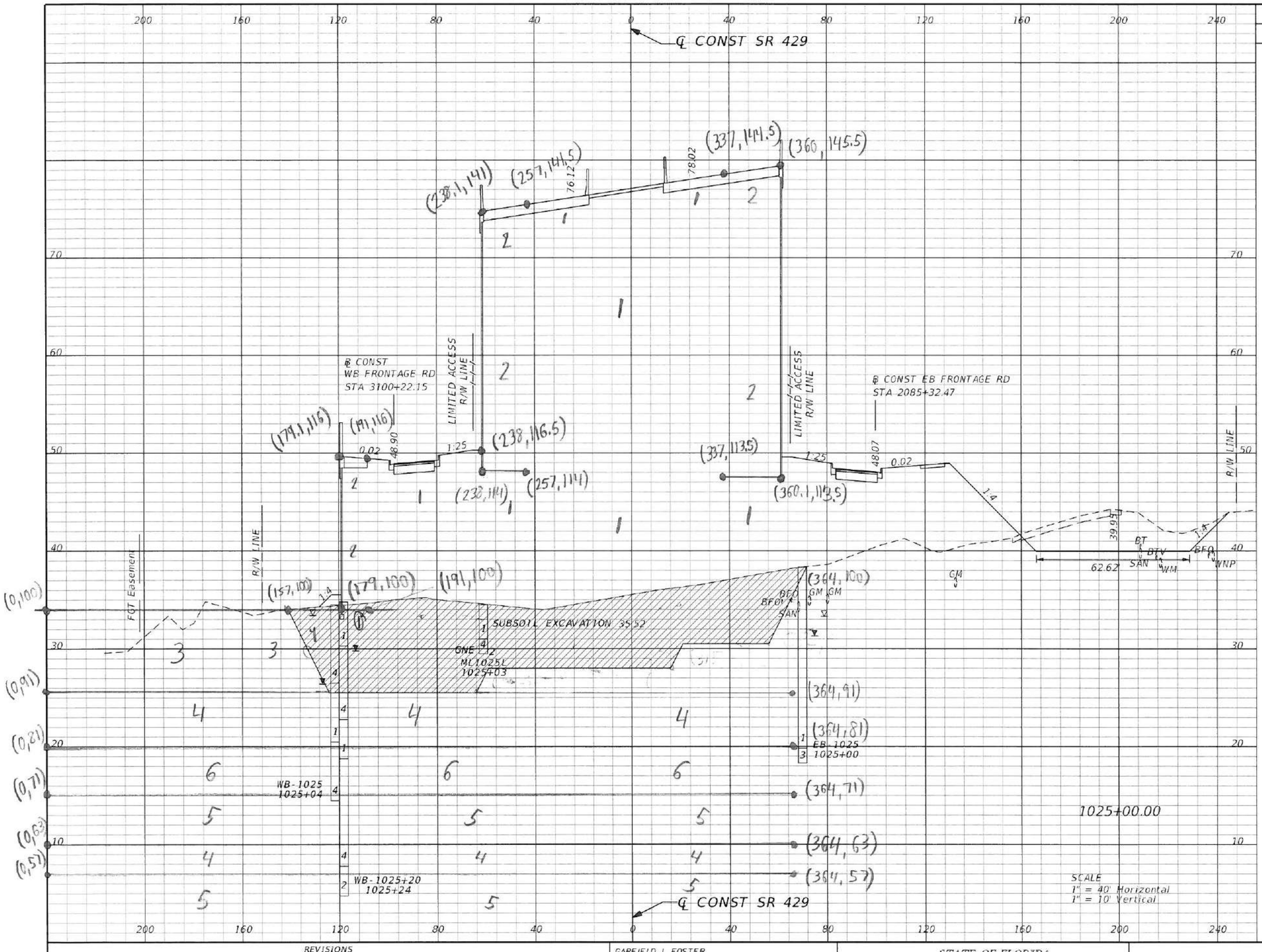
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

scott 5/1/2015 2:43:48 PM J:\D109\35200 Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\CLIENT\RDXSRD0.



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
1506.8	586	197.9	145	8019.9	5636

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

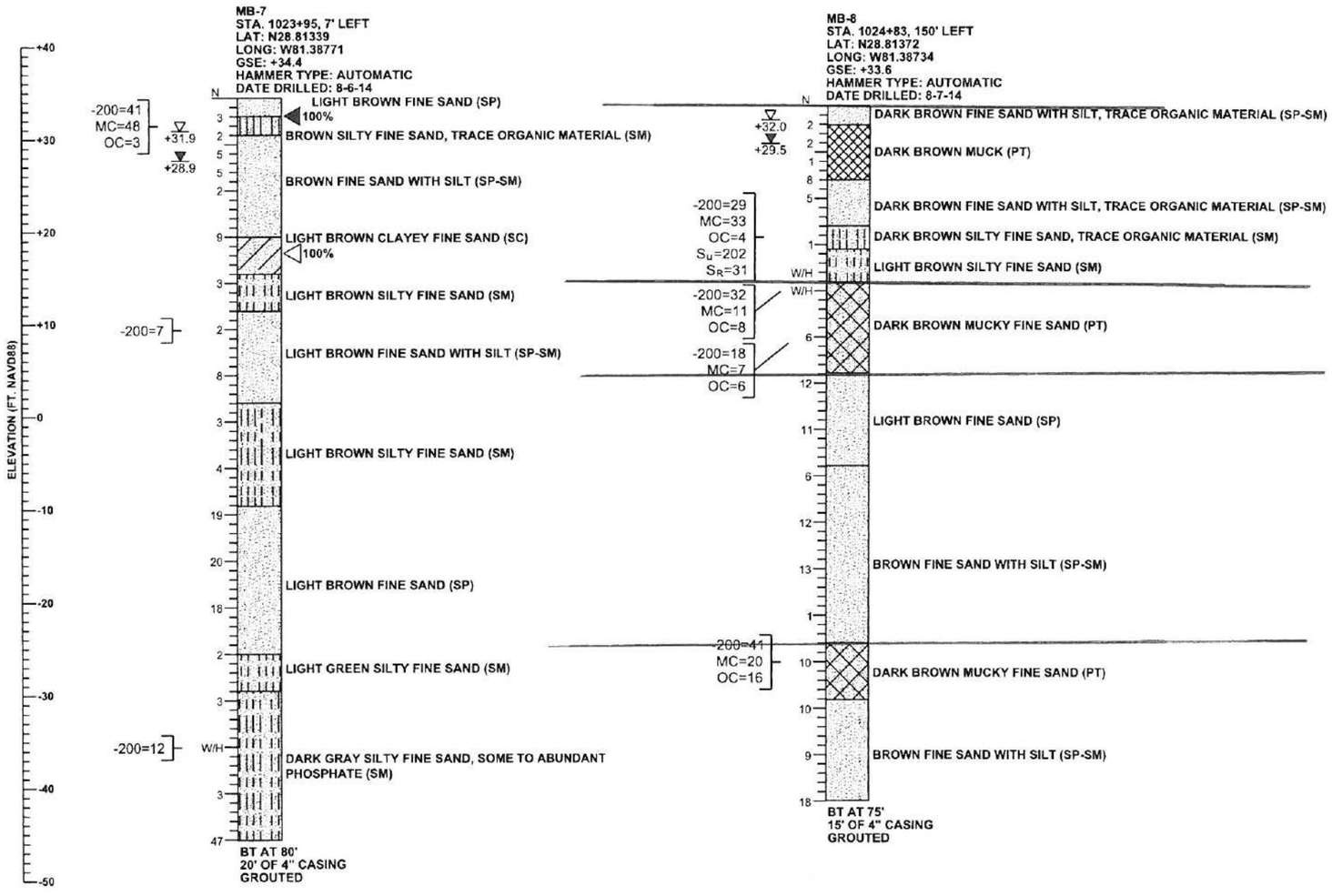
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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

SR 429
CROSS SECTIONS

SHEET NO. 830

robert_martin 5/2/2015 1:36:27 PM D:\Projects\CADD\24020025201\roadway\Xsect\RDXSRD02_429.DGN



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

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.

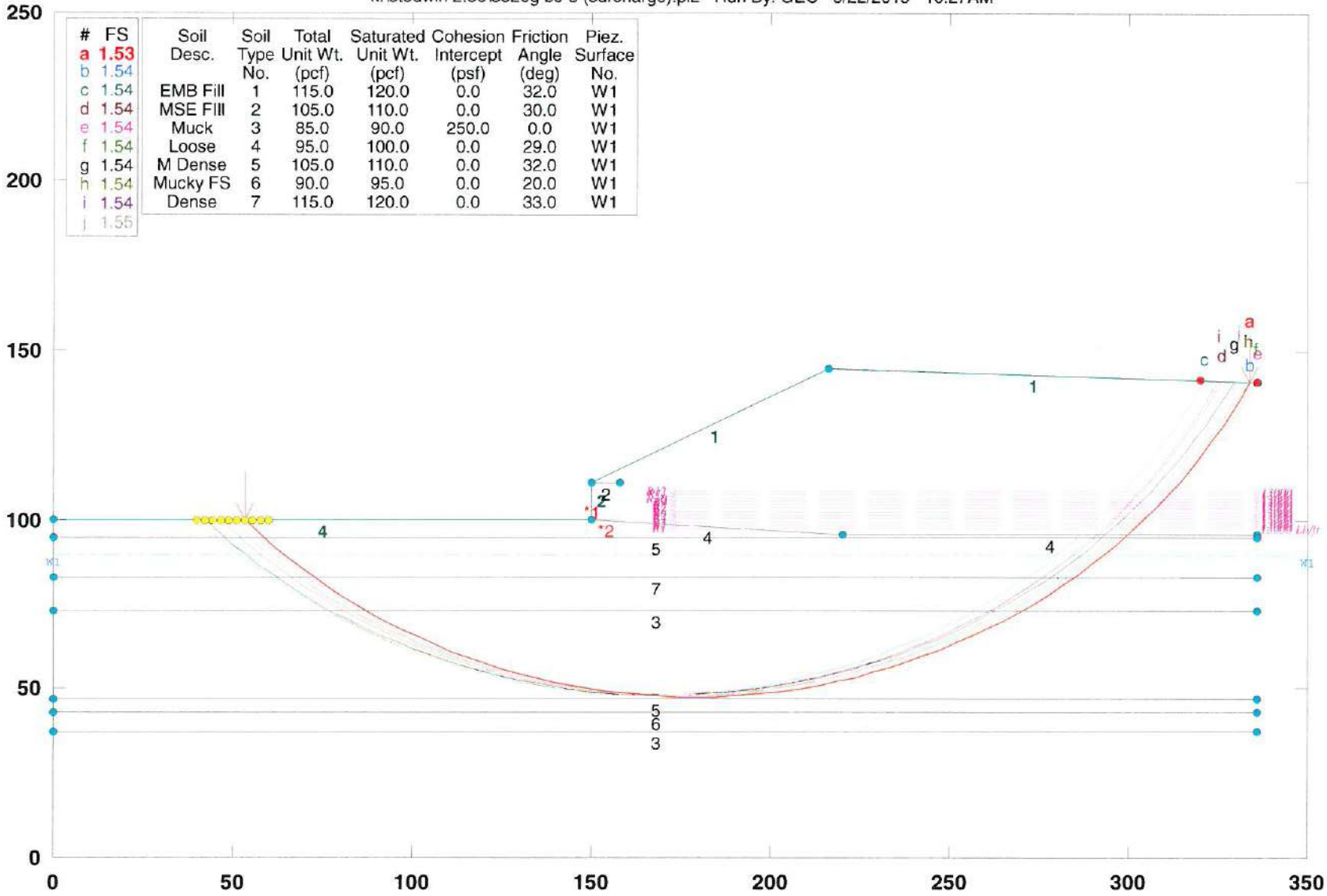
scott 2/6/2015 2:32:38 PM J:\D109\35206 Wekiva Parkway Section 7A\01boring16.dgn

Wekiva 7A BC-3 (1027+43)

k:\stedwin 2.86\3520g bc-3 (surcharge).pl2 Run By: GEC 5/22/2015 10:27AM

#	FS
a	1.53
b	1.54
c	1.54
d	1.54
e	1.54
f	1.54
g	1.54
h	1.54
i	1.54
j	1.55

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
Muck	3	85.0	90.0	250.0	0.0	W1
Loose	4	95.0	100.0	0.0	29.0	W1
M Dense	5	105.0	110.0	0.0	32.0	W1
Mucky FS	6	90.0	95.0	0.0	20.0	W1
Dense	7	115.0	120.0	0.0	33.0	W1



STABL6H FSmin=1.53

Safety Factors Are Calculated By The Modified Bishop Method

STED

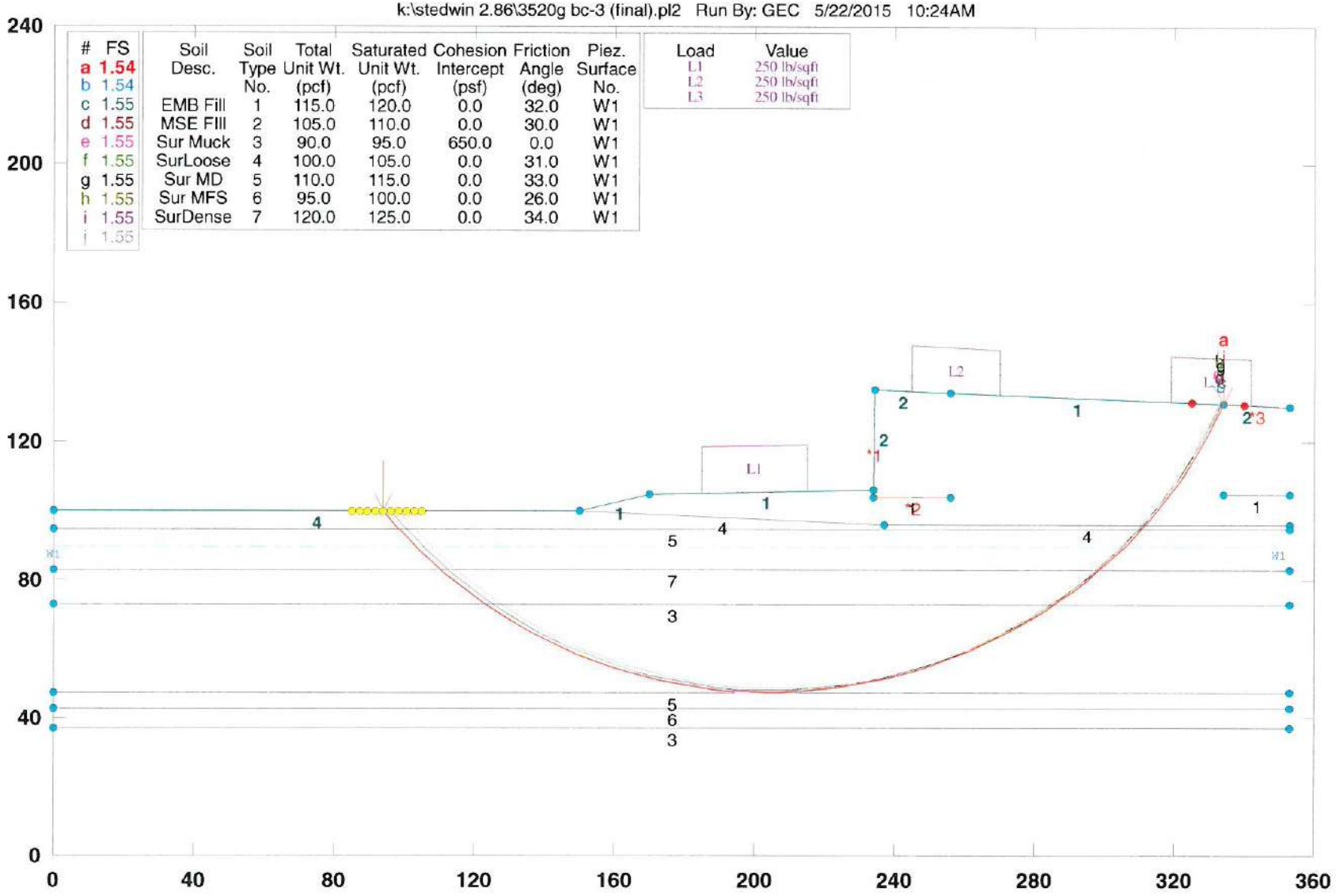
Wekiva 7A BC-3 (1027+43)

k:\stedwin 2.86\3520g bc-3 (final).pl2 Run By: GEC 5/22/2015 10:24AM

#	FS
a	1.54
b	1.54
c	1.55
d	1.55
e	1.55
f	1.55
g	1.55
h	1.55
i	1.55
j	1.55

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
Sur Muck	3	90.0	95.0	650.0	0.0	W1
SurLoose	4	100.0	105.0	0.0	31.0	W1
Sur MD	5	110.0	115.0	0.0	33.0	W1
Sur MFS	6	95.0	100.0	0.0	26.0	W1
SurDense	7	120.0	125.0	0.0	34.0	W1

Load	Value
L1	250 lb/sqft
L2	250 lb/sqft
L3	250 lb/sqft

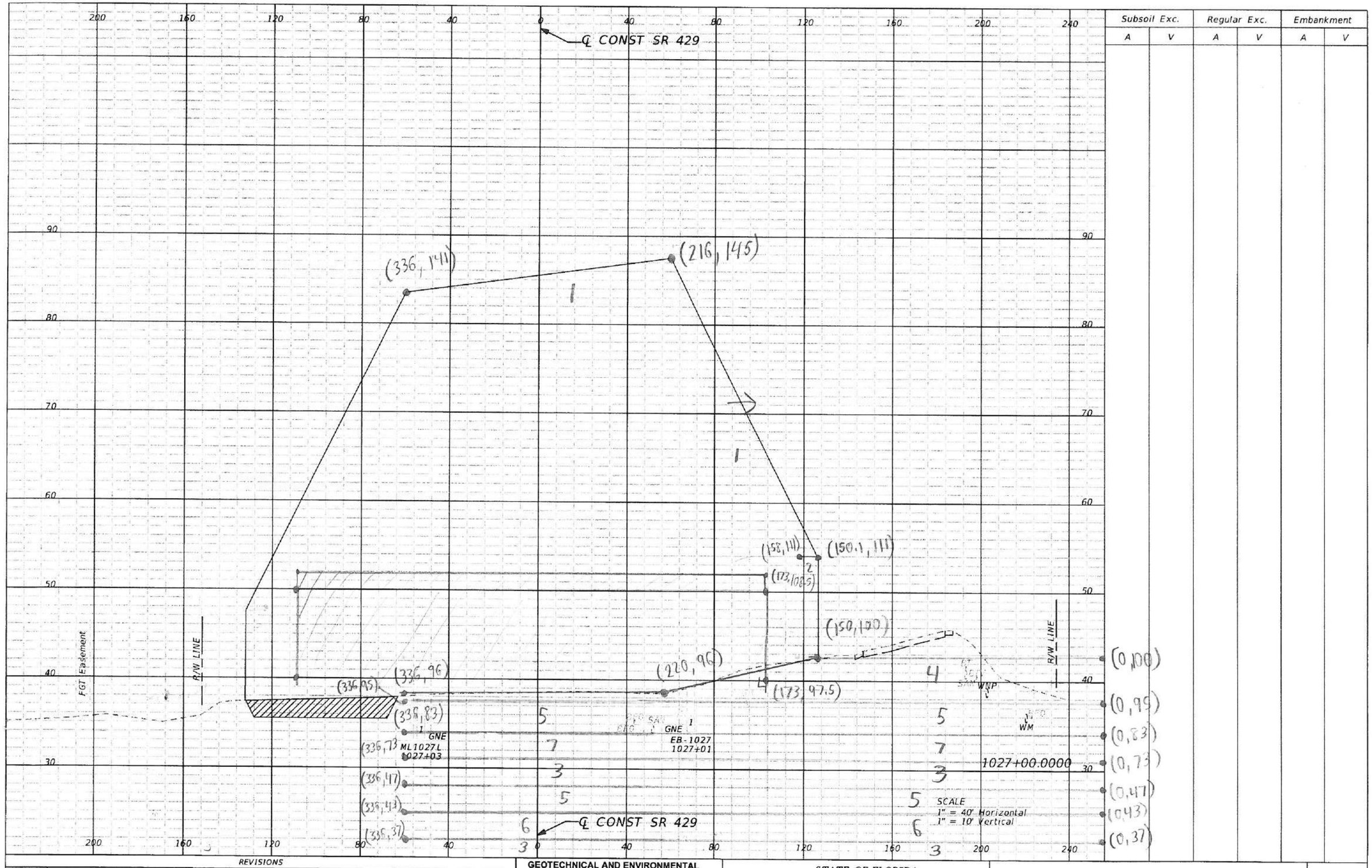


STABL6H FSmin=1.54

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

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

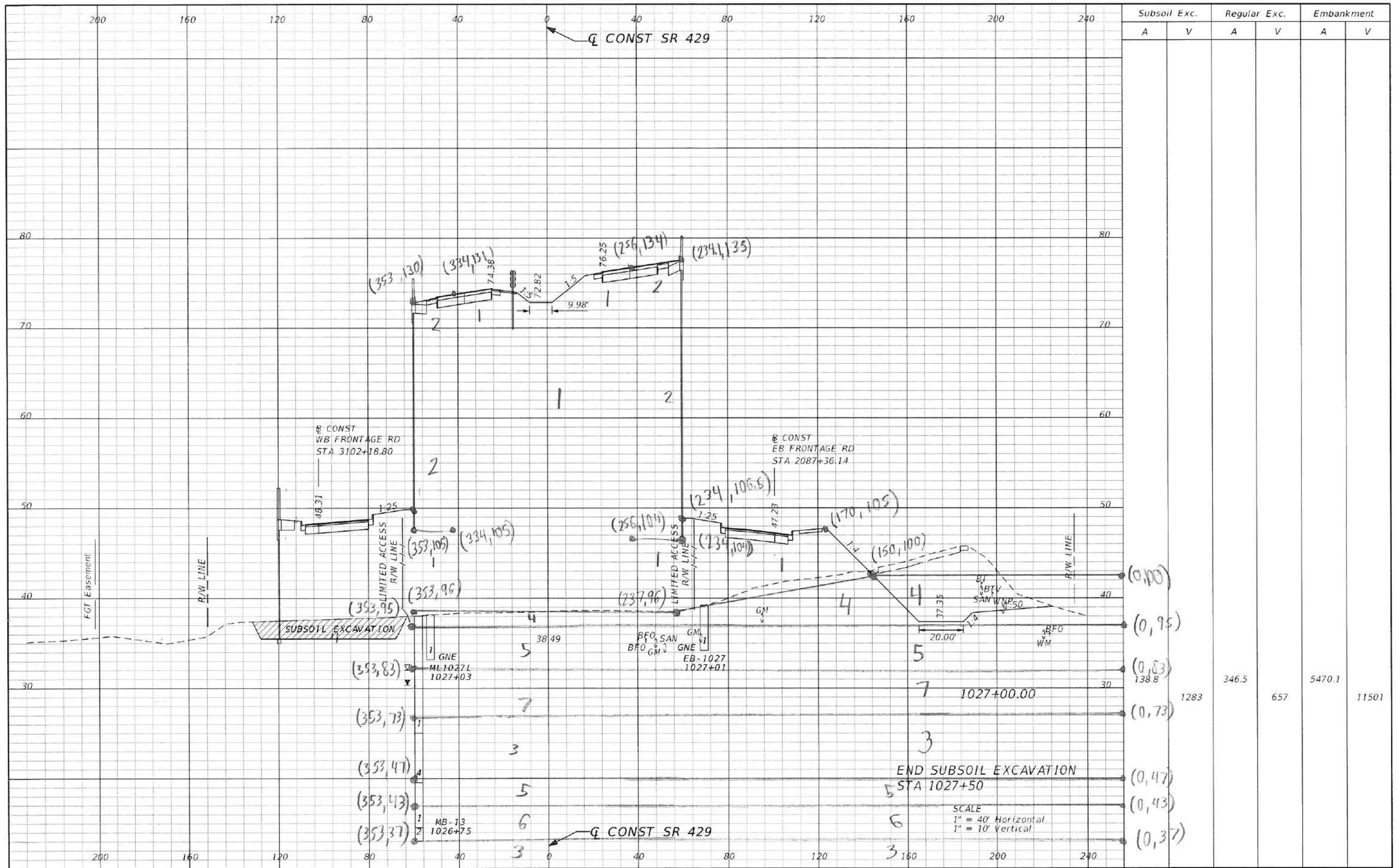
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
SURCHARGE CROSS SECTIONS

SHEET NO.

PRELIMINARY: NOT FOR CONSTRUCTION

scott 5/1/2015 2:42:24 PM J:\D109\35206 Wekiva Parkway Section 7A\REFS 9-3-14\REFS 4-23-15\CLIENT\RDXSRD0



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
138.8	1283	346.5	657	5470.1	11501

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

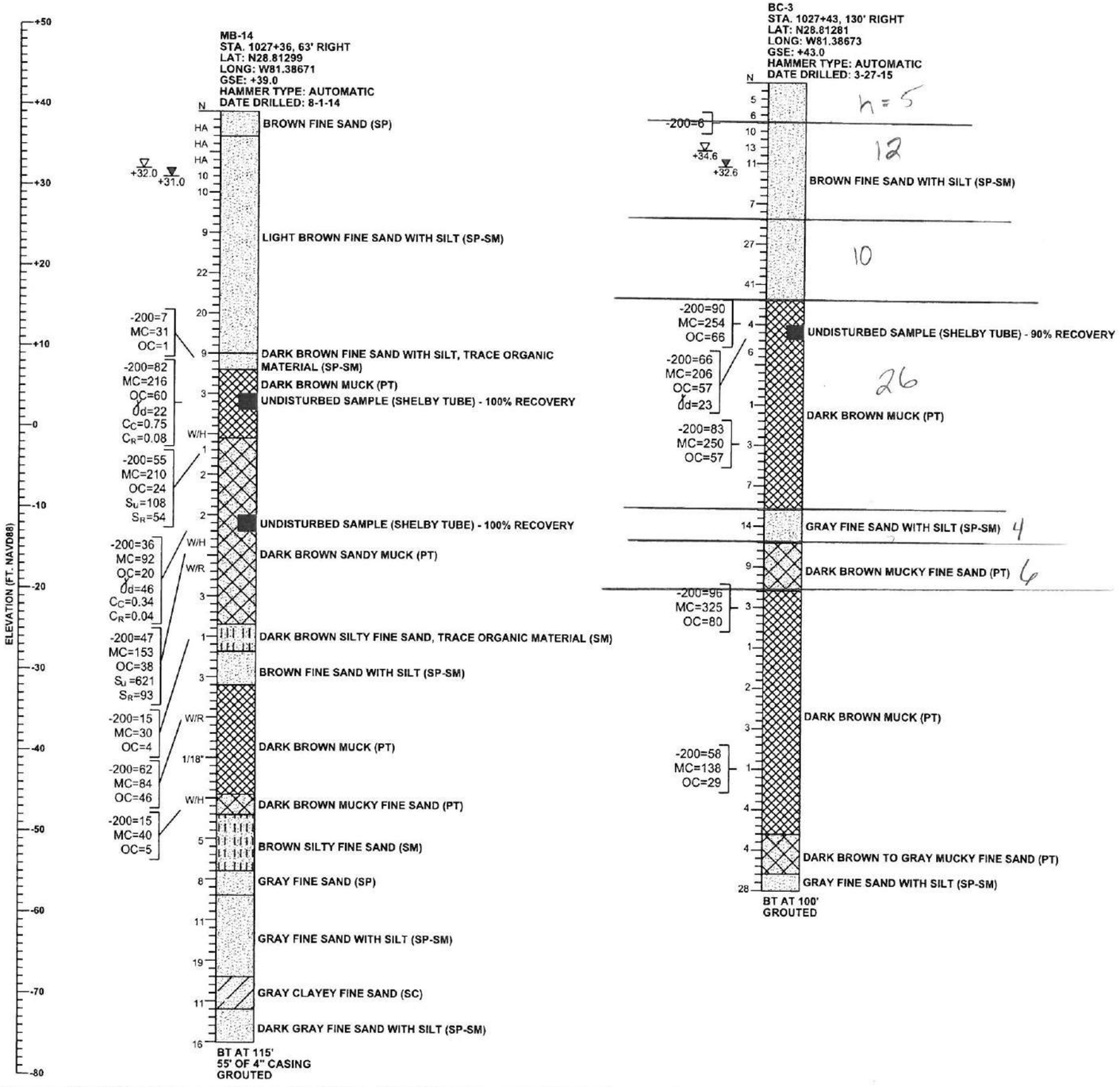
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
429	SEMINOLE	240200-2-52-01

SR 429
CROSS SECTIONS

SHEET NO. 834

robert_martin 5/2/2015 1:36:33 PM D:\Projects\CADD\240200252012\roadway\Xsect\RDXSRD03_429.DGN

BOX CULVERT CD-2



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
▽ +34.6	ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (FT. NAVD88)
▼ +32.6	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
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

ENVIRONMENTAL CLASSIFICATION:
SUBSTRUCTURE:
STEEL: MODERATELY AGGRESSIVE
CONCRETE: SLIGHTLY AGGRESSIVE

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 FOR BOX CULVERTS
PROJECT NAME: WEKIVA PARKWAY (SR 429) SECTION 7A
REF. DWG. NO.
SHEET NO.

scott 4/24/2015 8:59:13 AM J:\D109\35200 Wekiva Parkway Section 7A\b1boring16.dgn

TECHNICAL SPECIAL PROVISIONS

TECHNICAL SPECIAL PROVISION

FOR

Surcharge Embankment

WEKIVA PARKWAY (SR 429) – SECTION 7A
SR 429 Stations 1019+00 to 1028+86
Seminole County, Florida
Financial Project ID 240200-2-52-01

Notice: The official record of this document is the electronic file signed and sealed under Rule 61G15-23.004 F.A.C

Prepared By: Daniel C. Stanfill, P.E.
Florida License No: 42763
Date: May 4, 2017
Firm Name: Geotechnical & Environmental Consultants, Inc.
Firm Address: 919 Lake Baldwin Avenue
City, State, Zip Code: Orlando, FL 32814
Certificate of Authorization: 5882
Pages: 1 through 6

SECTION T120

SURCHARGE EMBANKMENT

T120-1 Description

A. The surcharge geometry and dimensions are shown in the plans. The surcharge will be 10 feet high (above final grades) and will be constructed along the SR 429 alignment between Stations 1019+00 to 1028+86 as defined on the Surcharge Control sheets. The surcharge zone is composed of 3 surcharge areas, referred to as Surcharge A, B & C. FDOT Type 3 temporary wire face retaining walls are to be constructed along the north and south longitudinal sides of the surcharge. The northern temporary wire face retaining wall (Temporary Retaining Wall 1) will begin at station 1019+00 and end at station 1028+86. The southern temporary wire face retaining wall will begin at station 1023+50 and end at station 1028+86. A summary of the geometry and location of the surcharge is presented in the following table:

Surcharge ID	Approximate Stations	Approximate Offset (feet)	Surcharge Height Above Final Grades (feet)	Approx. Surcharge Height Above Existing Grades (feet)	Side Slopes	Estimated Surcharge Duration After Construction (months)
A	1019+00 to 1022+14	132 LT to 100 RT	10	50	1:2	6 to 9
B	1022+14 to 1023+91	140 LT to 100 RT	10	20	1:2	
C	1023+91 to 1028+86	132 LT to 140 RT	10	50	1:2	

B. Geotechnical instrumentation (settlement plates, inclinometer casings, and pore pressure transducers) will be installed by the Contractor prior to embankment and surcharge construction for the purpose of monitoring the rate and amount of consolidation and general performance of the surcharge. Installation procedures and locations for geotechnical instrumentation are presented in T141, T144A and T144B of the Technical Special Provisions and the Surcharge Instrumentation Plan View sheet.

T120-2 Surcharge Construction/Monitoring

A. Construction associated with the surcharge program will be performed in the following sequence:

1. Install the permanent sheet pile wall in the surcharge area in accordance with the structure plans.
2. Clear and grub in accordance with the FDOT Specifications. Remove unsuitable, organic soils (demuck) as shown in the roadway cross sections. Backfill with Select fill which meets FDOT Standard Index 505 requirements.
3. Backfill to elevation +40 and provide a working platform over the prepared surface. Construct temporary wire face retaining walls as required to backfill to elevation +40. The construction of temporary retaining walls will be in accordance with the FDOT Index 6030.
4. Install vertical wick drains in accordance with T442 of the Technical Special Provisions and the Surcharge Control Sheet Wick Drain Plan View Limits sheet. The Contractor will notify the Engineer at least 48 hours in advance of the installation of the vertical wick drains.
5. Place one foot of soil cover (free-draining sand with less than 10% passing the No. 200 sieve) over the vertical wick drains.
6. Install geotechnical instrumentation (settlement plates, inclinometer casings, and pore pressure transducers) in accordance with T141, T144A and T144B of the Technical Special Provisions and the Surcharge Instrumentation Plan View sheet. The Contractor will notify the Engineer at least 48 hours in advance of the installation of the geotechnical instrumentation.
7. The Contractor will provide the Engineer access to all geotechnical instrumentation locations as needed by the Engineer.
8. Place one (1) layer of geosynthetic reinforcement in accordance with the Surcharge Control Sheet Geosynthetic Reinforcement Plan View sheet and Surcharge Typical Section sheets. The contractor will accommodate geotechnical instrumentation (casing, tubes, etc.) placed within limits of geosynthetic reinforcement and furnish shop drawings to the Engineer at least 48 hours in advance of installation of the geosynthetic reinforcement depicting splicing/overlap details in areas of instrumentation.
9. Place one foot of surcharge fill to stabilize the geotechnical instrumentation.
10. Construct the surcharge in level lifts placing geosynthetic reinforcement in accordance with the Surcharge Control Sheet Geosynthetic Reinforcement Plan View sheet and Surcharge Typical Section sheets. Place surcharge fill while allowing Engineer access to monitor settlement and stop fill operations if directed by the Engineer. The surcharge fill will be compacted to 100% of the Standard Proctor maximum dry density as determined by ASTM Standard D-698. The surcharge fill will be placed in layers no thicker than 12 inches.

11. Once the surcharge embankment construction is complete, continue allowing Engineer access to monitor instrumentation and report results. Place and compact additional fill as needed to maintain the top of embankment at or above the proposed final roadway subgrade elevations during the surcharge program.
12. Upon completion of the surcharge program as determined by the Engineer, construct bridge, drainage structures and permanent MSE walls in accordance with the plans.

B. Monitoring of settlement plates, inclinometer casings, and pore pressure transducers will be performed by the Engineer in accordance with T141, T144A and T144B of the Technical Special Provisions.

C. The Contractor will be responsible for maintaining a working platform over the prepared surfaces to allow installation of vertical wick drains and geotechnical instrumentation. Working platform fill will meet the FDOT Standard Index 505 requirements for “Select” fill except for T120-2A.4. The top of the working platform will be at elevation +40.

D. Fill material for embankment within the surcharge area will meet requirements in this Technical Special Provision.

E. Geotechnical instrumentation will be installed by the Contractor at the locations listed on the Surcharge Instrumentation Plan View sheet.

F. Embankment and surcharge fill will be placed in level lifts. The scheduled placement of fill must be time-phased based on the settlement plate readings, inclinometer casing readings and pore pressure transducers readings so that the soft subsurface soils have time to gain enough strength to support further loading. Filling rate will be variable; the Engineer will make all determinations concerning the allowable number of fill lifts per day and whether or not any temporary suspensions of filling are necessary to maintain stability. If any signs of "mud-waving" or other instability are observed during filling, they will be immediately reported to the Engineer and all filling will be halted. Filling may be resumed upon the approval of the Engineer. Fill placement will not be attempted at any time when the rate of settlement exceeds 0.5 inches per day at any monitor location.

G. Embankment and surcharge fill will meet the FDOT Standard Index 505 requirements for “Select” fill except for T120-2A.4. The embankment and surcharge fill will be placed and

compacted in the same manner as the embankment fill below the standard minimum slope in accordance with FDOT Specification Section 120. Each lift of fill will be placed in a level layer of uniform thickness across the entire length and width of the embankment and surcharge area. The Contractor will be responsible for maintenance of surcharge areas including compliance with all permit requirements and environmental regulations.

H. The Contractor is responsible for turbidity control during fill placement. The Contractor will employ the means necessary to control turbidity and those means will consider the very soft nature of the bottom soils to the depth necessary for adequate turbidity control.

I. The full surcharge loading will be left in place until the Engineer authorizes termination of the program. The required surcharge duration is anticipated to be 180 days after the surcharge fill has been constructed to the required height above finished grade and wick drains installed, as shown in the Plans. This does not include the time for placing the surcharge. The surcharge height above the finished grading template does not need to be maintained during the surcharge duration. However, at no time after the final surcharge elevation has been attained will the top of the embankment be allowed to settle below the proposed final roadway subgrade elevations. The Contractor will place additional fill, as needed to maintain the top of embankment elevation at or above the final roadway subgrade elevation. Remove surcharge only with the Engineer's approval. There will be no restriction to the rate of removal of the surcharge to the final template elevation. Upon completion of the surcharge program as determined by the Engineer, construct bridge, drainage structures and permanent MSE walls in accordance with the Plans.

J. Settlement of the soil layers during the surcharge is estimated to range from 12 to 52 inches across the surcharge areas. The actual quantity of settlement will vary significantly across the surcharge areas depending on multiple factors, including the thickness and composition of the muck.

T120-3 Method of Measurement

The work of constructing and maintaining the surcharge fill as shown in the plans and any extensions thereof directed by the Engineer will be included in the price and payment for Surcharge Embankment. The quantity will be measured as provided in FDOT Specification Section 120-13.7 with the exception that the original ground line used in computations will be

the finished grading template for the permanent construction. The measurement will include surcharge material actually placed above the finished grading template and within the lines and grades for surcharge construction as indicated in the plans or directed by the Engineer. No allowance will be made for subsidence of material below the finished grading template.

T120-4 Basis of Payment

The price and payment for Surcharge Embankment will be full compensation for all work and materials required to construct and remove surcharge fill.

Payment will be made under:

Item No. 120-74 – Surcharge Embankment - per cubic yard

END OF SECTION

TECHNICAL SPECIAL PROVISION

FOR

Settlement Plates

WEKIVA PARKWAY (SR 429) – SECTION 7A
SR 429 Stations 1019+00 to 1028+86
Seminole County, Florida
Financial Project ID 240200-2-52-01

Notice: The official record of this document is the electronic file signed and sealed under Rule 61G15-23.004 F.A.C

Prepared By: Daniel C. Stanfill, P.E.
Florida License No: 42763
Date: May 4, 2017
Firm Name: Geotechnical & Environmental Consultants, Inc.
Firm Address: 919 Lake Baldwin Avenue
City, State, Zip Code: Orlando, FL 32814
Certificate of Authorization: 5882
Pages: 1 through 5

SECTION T141

SETTLEMENT PLATES

T141-1 Description

A. The work specified in this Technical Special Provision consists of the fabrication, installation, protection and maintenance of settlement plates in accordance with Contract Documents and as directed by the Engineer. The Contractor will be responsible for the fabrication and installation of the settlement plates. The Contractor will also be responsible for protection and maintenance of the settlement plates.

B. The system of settlement plates is designed to enable the Engineer to observe, monitor and determine the magnitude and rate of embankment settlement. The determination of the time at which the necessary consolidation has taken place and the embankment may be released for additional lifts of fill or the next stages of construction will be determined by the Engineer on the basis of the data obtained from the combined settlement monitoring instrumentation.

T141-2 Materials

The settlement plate assembly will be constructed in accordance with the plate and stem options as shown in FDOT Standard Index 540. All iron pipe and fittings will be fabricated from standard weight stock; all PVC pipe and fittings will be Schedule 40; the sizes will be as shown on FDOT Standard Index 540. Materials will be accepted on the basis of a visual inspection by the Engineer.

T141-3 Installation

A. The settlement plates will be installed after any demucking and backfilling to the working platform elevation (+40 feet) is complete. The settlement plates will be installed on top of the one foot of soil cover placed above the wick drains in accordance with this Technical Special Provision and T120 of the Technical Special Provisions.

B. A table listing the settlement plate locations is shown on the Surcharge Instrumentation Plan View sheet in the plans.

C. An excavation slightly larger than the settlement plate will be made to an elevation established by the Engineer. The excavation will form a pit having a minimum depth of twelve inches with a level bottom.

D. The plate will be placed in the pit with one section of marker pipe attached. The attached marker pipe will be 4.5 feet in length as shown in FDOT Standard Index 540. The plate will have full bearing and the marker pipe plumb before proceeding with the stem assembly. When realignment of the plate and marker pipe is necessary, the plate and pipe will be removed and the pit bottom reshaped for proper alignment. If timber plates are selected for installation, and the soil is dense enough to suspend the plate on the fabrication bolts, the plate should be seated by grooving the soil surface under the lines of bolts.

E. With plate and marker pipe in place, wrap the lower six inches of marker pipe with oakum; slip one section of casing pipe over the marker pipe; and, lower the casing to uniformly encase the oakum seal while seating the casing on the plate as shown in FDOT Standard Index 540.

E. With marker pipe and casing centered with respect to each other and maintained in a vertical position, the pit will be backfilled in layers by hand and thoroughly compacted by hand. Prior to backfilling the pit, the elevation of the top of the plate will be determined. A maximum of one foot of embankment fill can be placed to stabilize the settlement plates.

F. When the installation described in the above paragraph is complete, the Contractor will notify the Engineer and allow the Engineer 48 hours to determine the elevation of the top of the marker pipe. No embankment will be placed until this elevation has been determined. The casing will be capped, as shown in FDOT Standard Index 540, immediately after the elevation is determined. The settlement plate stem will be flagged and protected from construction vehicles and equipment. If the settlement plate assembly is disturbed, it will be replaced in kind, unless otherwise directed by the Engineer.

G. The embankment material in the immediate vicinity of the settlement plate stem will be placed and compacted in accordance with T120 of the Technical Special Provisions, or as directed by the Engineer. Embankment within three feet of the stem will be placed and compacted by hand with non-impact, light vibratory plate compactors.

H. When the surface of the embankment reaches a level approximately two feet below the top of the stem section in place, the Engineer will be notified. The Engineer will be allowed 48 hours to survey the marker pipe. After the Engineer establishes the elevation of the marker pipe in place, the next section of marker pipe and casing will be installed by the Contractor in the presence of the Engineer. As soon as the Engineer establishes the elevation of the added marker pipe, the casing will be capped, and the stem flagged for protection. Added sections will be five feet in length.

I. As the height of the embankment increases, this procedure will be repeated until the embankment is completed.

J. Upon completion of the surcharge program as determined by the Engineer, settlement plate assemblies will be cut off a minimum of 2 feet below the bottom of the proposed base. The remainder of the settlement plate assembly will remain in place and become the property of FDOT.

K. The Engineer will obtain and record all measurements and elevations necessary for accurate determinations of settlement data during construction of the embankment and surcharge.

L. Monitoring of settlement plates will be performed daily or on regular intervals determined by the Engineer during embankment and surcharge construction and during the surcharge duration. Graphs of settlement versus fill height will be provided weekly or at intervals determined by the Engineer during embankment construction and surcharge duration. The graphs will be prepared by the Engineer.

M. The Contractor will provide the Engineer access to all geotechnical instrumentation locations as needed by the Engineer.

T141-4 Protection and Maintenance

A. The settlement plate stem will remain in a vertical position at all times during the life of this Contract. The Contractor will operate his equipment in a manner to insure that settlement plate assemblies are not damaged or displaced laterally. Each assembly will be clearly marked and flagged as approved by the Engineer and protective barricades will be erected around each assembly. Stems deviating from a vertical position, becoming uncoupled or broken will be repaired or replaced by the Contractor, as directed by the Engineer, at the Contractor's expense.

B. The Contractor will not be held responsible for repair or replacement of any settlement plate assembly which is made inoperable as a result of instability of the embankment caused by factors, which in the opinion of the Engineer, are beyond the control of the Contractor.

T141-5 Method of Measurement

The quantities under this Technical Special Provision will be for each Settlement Plate Assembly correctly installed

T141-6 Basis of Payment

Each settlement plate assembly acceptably installed and maintained in a satisfactory operating condition until final acceptance of the project, will be paid for at the unit price bid for each assembly, which price and payment will be full compensation for furnishing all material, labor and equipment for proper installation of the assembly, for protecting the assembly, for repair and replacing damaged assemblies and for all other work and incidentals necessary to complete the work.

Payment will be made under:

Item No. 141-70 - Settlement Plate Assembly - per assembly.

END OF SECTION

TECHNICAL SPECIAL PROVISION

FOR

Pore Pressure Transducers

WEKIVA PARKWAY (SR 429) – SECTION 7A
SR 429 Stations 1019+00 to 1028+86
Seminole County, Florida
Financial Project ID 240200-2-52-01

Notice: The official record of this document is the electronic file signed and sealed under Rule 61G15-23.004 F.A.C

Prepared By: Daniel C. Stanfill, P.E.
Florida License No: 42763
Date: May 4, 2017
Firm Name: Geotechnical & Environmental Consultants, Inc.
Firm Address: 919 Lake Baldwin Avenue
City, State, Zip Code: Orlando, FL 32814
Certificate of Authorization: 5882
Pages: 1 through 8

SECTION T144A

PORE-PRESSURE TRANSDUCERS (PIEZOMETERS)

T144A-1 Description

The work specified in this Technical Special Provision consists of furnishing and installing pore-pressure transducers (piezometers) at the elevations and locations shown in the Surcharge Instrumentation Plan View Sheet in the plans in accordance with this Technical Special Provision and as directed by the Engineer. The pore-pressure transducer installation will be performed by an engineering firm prequalified in FDOT work groups 9.1, 9.2, 9.3 and 9.4.

T144A-2 Materials

Pore-pressure transducers will be designated for installation in boreholes prior to embankment construction for monitoring pore-pressures in foundation soils. Piezometers installed in drill holes or pressed-in type piezometers will be permitted. Transducers will convert pore pressure directly into pneumatic pressure utilizing pressurized gas from a portable indicator to flow through tubing against the transducer sensor diaphragm until gas pressure against this diaphragm equalizes the pore pressure outside the diaphragm.

Diaphragm will be of Nitrile rubber (Buna N) or non-corrosive approved equal. Transducer diaphragm movement during monitoring will not displace more than 0.001cc of water. The transducer is not to be subject to zero shifts and is to be able to monitor pore pressure changes of approximately one inch of water. The transducer will be capable of providing continuous output and be able to provide a direct profile of pressure changes to operate with recorder. The transducers will include high air entry porous elements. The transducer will be supplied with the specified tubing lengths and calibrated graphs. Tubing will be two-tube heavy wall nylon bundle with waterproofed jacket. Tubing diameter will be 1/8" minimum for lengths up to 500 feet. The transducer will be operable with tubing lengths up to 2,000 feet. The transducers will be laboratory tested prior to delivery to the field. Laboratory test reports will be submitted to the Engineer for his approval.

A table listing the location, tubing lengths and tip elevations of transducers/piezometers is shown on the Surcharge Instrumentation Plan View sheet in the plans.

T144A-3 Detailed Installation Procedures for Closed System Piezometer with Remote Readout

The installation of pore pressure transducers will be made by an engineering firm pre-qualified in FDOT work groups 9.1, 9.2, 9.3 and 9.4. Prior to installation of the pore pressure transducers, a description of the materials to be employed and a plan of the method of installation will be submitted to the Engineer for approval. No work will begin on installation of the pore pressure transducers until the proposed materials and installation plan have been approved by the engineer. Piezometer will be acceptable if the measured water head is within six inches of the actual water head in the casing.

Pore pressure transducer leads will be mounted in a junction box with quick-connect type fittings conforming to the pore pressure transducer control/readout unit, located as indicated on the plans or as directed by the Engineer.

T144A-3.1 Placement of Horizontal Tubing

Excavate a trench a minimum of one foot deep and one foot wide from the piezometer location to the readout protection box. The bottom of the trench will be two feet minimum below future construction (ditches, pipes, etc.). The horizontal tubing will be laid in a zigzag pattern in the trench on a bed of six inches of clean sand. When more than one tube is used in a trench, the lines will not cross. Tubing will be in one continuous length with no connections from the piezometer tip to the readout protection box. Splices will not be allowed except to repair damage incurred after installation is completed.

Prior to installation, the tubing for pneumatic piezometers will be immersed in clear water and checked for leaks under pressures exceeding the expected pore pressure. Also, the tubing will be flushed with high pressure air to clean any dust or moisture from tubing before final connections are made. The air used for flushing should come from a tank which holds only filtered air and which has been bled for excess moisture.

T144A-3.2 Piezometers installed in drill holes (Option)

A. The following additional equipment is required for installation of drilled-in piezometers:

1. A tamping hammer, made of a two feet length of seamless steel tubing, 1-5/8 inches O.D. and 5/8 inch I.D. or cast bronze of the same dimensions and weighing at least 25 pounds. These dimensions are for two-inch I.D. casing. Larger hammer dimensions are required for larger casing sizes. At the upper end, a loop of 1/8 inch diameter galvanized steel cable should be firmly attached to the hammer and to a

grooved ring. The inside surface of the hammer should be smooth and all edges that touch the tubing should be rounded. This hammer should be supplied with a 1-5/8 inch diameter disc ½ inch thick which can be firmly attached to the bottom. This disc will have a slot in the center (of suitable size to accommodate the size tubing used) with rounded edges. This hammer-cable assembly is used for the following purposes:

- To tamp the bentonite layers and thereby assure a water-tight seal between the casing and the risers.
- To center the risers while the bentonite seal is being tamped into place.
- To measure depths at various stages of the installation.

2. Galvanized steel cable 1/4 inch diameter of sufficient length to permit installation on the deepest piezometers. This should be securely fastened to one end of a snap-type swivel hook. Mark the cable at five feet intervals, starting at the bottom face of the hammer.

3. A tripod and sheave for operating the tamping hammer.

4. Drive sample drilling equipment.

5. Ottawa sand or a thoroughly washed sand between No. 20 and No. 40 mesh grain size.

6. Commercially available bentonite pellets, or bentonite balls about ½ inch in diameter, which are formed at a water content somewhat above the plastic limit but below the sticky limit (i.e. at a putty-like consistency) rolled in talcum powder to prevent sticking, and stored in glass jars to protect them from drying.

7. Rounded pebbles approximately ½ inch in diameter.

B. Drive casing, two-inch I.D. or larger, to the approximate elevation of the bottom of the piezometer cell. The bottom ten feet long section must be in one piece, without joints or couplings, and it is not to have a drive shoe on the lower end. The casing may be advanced by any means, except for the final 20 feet of penetration. It will then be advanced in five feet increments, and the casing must be washed out after each five foot advance. The casing will be kept filled with water at all times and no washing below the casing will be permitted.

C. Obtain a spoon sample of the material for 12 inches below the bottom of the casing and deliver the samples in sealed jars to the Engineer. Drive the casing 12 inches below the piezometer cell elevation and clean out the remaining soil to the bottom of the casing. Replace the water in the casing with clear water by reversing the flow of the pump and using the jet pipe as the intake, with the lower end of the pipe held a few inches above the bottom of the casing. Keep the casing filled with clean water and continue the operation until the return water becomes clear.

D. Pull the casing up one foot, and pour clean sand into the casing to fill up the one foot hole. The top of the sand should be measured by a sounding device.

E. Connect the tubing (in one continuous unspliced length, to extend ten feet above the ground surface) to the piezometer cell. The system should be checked for leaks and the tubing labeled or color coded before installation. Lower the assembly into the casing until the piezometer cell rests on the sand, and center the cell by lowering the tamping hammer to the top of the cell. The cell and readout gage should be checked for accuracy by measuring the pore pressure (equal to the head of water in the casing) at several depths between the top of the casing and the installation depth. Tubing will then be plugged to prevent entrance of dirt during the remainder of the installation.

F. Pull the casing up so that the bottom of the casing is one foot above the bottom of the cell and at the same time, slowly (if sand is poured too fast, it could fill the pipe such that when the pipe is pulled back, the tip would also move) pour a measured volume of clean sand into the casing so that the sand fills the space around the piezometer tip and to approximately 2-1/2 feet above the bottom of the casing. Maintain tension on the tubing but do not permit any vertical movements of the piezometer tip.

G. Form a one-inch thick layer of ½ inch diameter pebbles on top of the sand in the casing and apply 20 blows to the pebble layer with a six-inch drop of the hammer per blow.

H. Form a bentonite seal of five layers of bentonite balls, each layer three inches thick placed and compacted as follows; while maintaining a constant tension on the tubing.

1. Lower the water three inches below the top of the casing.

2. Drop bentonite balls individually into the casing until the water rises to the top of the casing and allow sufficient time for the balls to reach the bottom (about one minute for each ten feet of depth).

3. Drop enough ½ inch diameter pebbles into the casing to form a layer one inch thick and allow sufficient time for the pebbles to reach the bottom.

4. Slip the tamping hammer over the plastic tubing and, keeping tension on the tubing, apply 20 blows to the pebble layer with a six inch drop of the hammer per blow.

5. Repeat this procedure until a five-layer seal is formed. Whenever the tamper does not move freely, it should be immediately withdrawn and cleaned.

I. Pour enough sand into the casing to form a two foot layer of sand, cover with pebbles and compact with 20 blows of the hammer.

J. Repeat Step (H) forming another bentonite seal.

K. Disconnect the top section of the casing, so that the top of the casing is at least five feet below the ground surface. This can be done by having the upper sections of casing tightened to a lesser degree than the lower sections of casing. Fill the remainder of the casing with sand.

T144A-3.3 Alternate installation methods

Alternate installation methods (e.g. - transducers mounted in pressed-in wellpoints, etc.) may be considered, subject to approval by the Engineer. Details for alternate installation methods must be submitted for review at least three weeks prior to installation. The submittal will, at a minimum, contain the following information:

1. Size, type, weight and configuration of the installation rig.
2. Step by step procedures for installation including details for obtaining an adequate hydraulic seal.
3. Schematic diagram of any special equipment or housings used to install transducer.

Approval will not relieve the Contractor of the responsibility to install piezometers in accordance with the plans and this Technical Special Provision. If, at any time, the Engineer

considers that the method of installation does not produce a satisfactory piezometer, the Contractor will alter his method and/or equipment as necessary to comply with the plans and this Technical Special Provision. The Contractor will demonstrate that his equipment, method and materials produce a satisfactory installation in accordance with this Technical Special Provision. For this purpose, the Contractor will be required to install several trial piezometers at locations within the work area designated by the Engineer. The piezometers must meet an acceptance criterion that the measured water head is within six inches of the actual water level in the casing.

T144A-4 Protection and Maintenance

The Contractor will be responsible for each transducer/piezometer until such time as it has been installed, tested and approved by the Engineer for use by the Engineer. The Contractor will protect these units from damage by his equipment throughout the contract period. No payment will be made for a unit which has been rendered useless by the Contractor's construction equipment or activities as determined by the Engineer. Transducer/piezometers that become broken or inoperative will be repaired or replaced by the Contractor, as directed by the Engineer, at the Contractor's expense.

The Contractor will not be held responsible for repair or replacement or any transducer/piezometer which is made inoperable as a result of instability of the embankment caused by factors, which in the opinion of the Engineer, are beyond the control of the Contractor.

T144A-5 Method of Measurement

The quantities under this Technical Special Provision will be for each Pore Pressure Transducer (Piezometer) and Pore Pressure Transducer (Control/Readout Unit) and for lineal foot of Tubing for Piezometers correctly installed.

T144A-6 Basis of Payment

Each Pore Pressure Transducer assembly acceptably installed and maintained in a satisfactory operating condition until final acceptance of the project, will be paid for at the unit price bid for each Pore Pressure Transducer (piezometer) and for the unit price bid per lineal feet for Tubing for Piezometers. Price and payment will be full compensation for furnishing all material, labor, testing and equipment for proper installation of the assembly, for protecting the assembly, for

repair and replacing damaged assemblies and for all other work and incidentals necessary to complete the work.

Payments will be made under:

Item No. 144-71 - Pore Pressure Transducer (piezometer) - each.

Item No. 144-72 - Tubing for Piezometers - per linear foot.

Item No. 144-74 - Pore Pressure Transducer (Control/Readout Unit) – each.

END OF SECTION

TECHNICAL SPECIAL PROVISION

FOR

Vertical Inclinometers

WEKIVA PARKWAY (SR 429) – SECTION 7A
SR 429 Stations 1019+00 to 1028+86
Seminole County, Florida
Financial Project ID 240200-2-52-01

Notice: The official record of this document is the electronic file signed and sealed under Rule 61G15-23.004 F.A.C

Prepared By: Daniel C. Stanfill, P.E.
Florida License No: 42763
Date: May 4, 2017
Firm Name: Geotechnical & Environmental Consultants, Inc.
Firm Address: 919 Lake Baldwin Avenue
City, State, Zip Code: Orlando, FL 32814
Certificate of Authorization: 5882
Pages: 1 through 2

SECTION T144B

VERTICAL INCLINOMETERS

T144B-1 Description

The work specified in this Technical Special Provision consists of furnishing and installing vertical inclinometers at the elevations and locations shown in the plans, in accordance with this Technical Provision, and as directed by the Engineer, and furnishing the Department a complete vertical inclinometer system as specified below. The vertical inclinometers are used to verify that the stability of the slope is being maintained during fill placement. The inclinometer data will be used in conjunction with the other instrumentation data to determine the time that the embankment may be released for the next stage of construction and will be determined by the Engineer on the basis of the data obtained from the monitoring instrumentation.

T144B-2 Materials

The Contractor will provide and install inclinometer casing as shown on the Surcharge Instrumentation Plan View sheet in the plans. In addition, the Contractor will obtain and provide a complete vertical inclinometer monitoring system. The vertical inclinometer system will become the property of the Department at the completion of the monitoring.

The system will consist of:

1. One Vertical inclinometer with aluminum carrying case.
2. One 200 foot (one foot increments) of cable with sturdy locking storage box.
3. One Readout box (with self-contained memory), including power, downloading cables, and software for data analysis and reporting.
4. One Control guide (pulley assembly) for top of casing.

T144B-3 Protection and Maintenance

Such precautions as are necessary will be taken to protect the surface of the inclinometer casings from damage at all times during the life of this Contract. The Contractor will operate his equipment in a manner to ensure that the inclinometer casings are not damaged. Each inclinometer casing will be clearly marked and flagged with guard stakes. Inclinometer casings

deviating from a vertical position, becoming uncoupled or otherwise broken will be repaired or replaced by the Contractor, as directed by the Engineer, at the Contractor's expense.

The Contractor will not be held responsible for repair or replacement of any settlement platform that is made inoperable as a result of instability of the embankment caused by factors, which in the opinion of the Engineer, are beyond the control of the Contractor.

T144B-4 Method of Measurement and Basis of Payment

The work to be paid for under this Technical Special Provision will be made at the contract unit price per lineal foot for Inclinometer Casing, which will include the cost of the digital vertical inclinometer monitoring system. Such prices and payments will be full compensation for all work, materials, testing and incidentals required.

Payments will be made under:

Item No. 144-1 – Digital Inclinometer Casing, Vertical - per linear foot.

TECHNICAL SPECIAL PROVISION

FOR

Vertical Wick Drains and Horizontal Strip Drains

WEKIVA PARKWAY (SR 429) – SECTION 7A
SR 429 Stations 1019+00 to 1028+86
Seminole County, Florida
Financial Project ID 240200-2-52-01

Notice: The official record of this document is the electronic file signed and sealed under Rule 61G15-23.004 F.A.C

Prepared By: Daniel C. Stanfill, P.E.
Florida License No: 42763
Date: May 4, 2017
Firm Name: Geotechnical & Environmental Consultants, Inc.
Firm Address: 919 Lake Baldwin Avenue
City, State, Zip Code: Orlando, FL 32814
Certificate of Authorization: 5882
Pages: 1 through 6

SECTION T442

VERTICAL WICK DRAINS AND HORIZONTAL STRIP DRAINS

T442-1 Description

The work specified in this Technical Special Provision consists of furnishing all necessary labor, equipment and materials and all operations for placing prefabricated vertical wick drains and horizontal strip drains at the locations shown on the plans. The prefabricated vertical wick drains will be installed by the Contractor within the limits and the pattern shown on the Surcharge Control Sheet Wick Drain Plan View Limits sheet in the plans. The purpose of the vertical wick drains and horizontal strip drains is to allow the water emanating from the subsurface soils during consolidation to be rapidly evacuated from the embankment.

T442-2 Materials

A. Where installation procedures or special equipment are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations will be furnished to the Engineer prior to installation. The Contractor will submit a five-foot sample of the vertical drain materials and written material specifications to the Engineer for approval. The samples will be stamped or labeled by the manufacturer as being representative of the drain having the specified trade name. Approval of the sample materials by the Engineer will be required prior to site delivery of the production drain materials. Manufacturer certification will be provided for all drain materials delivered to the project.

B. The vertical wick drain will be a two-part prefabricated soil drain consisting of a formed polypropylene core covered on all sides with a spun-bonded polypropylene filter fabric. The core will be fabricated with suitable drainage channels and have a minimum tensile strength of 200 lbs. The drain will have a minimum discharge capacity of 1.5 gallons per minute. The filter fabric will have a grab tensile strength of at least 120 pounds.

C. The horizontal strip drain will be a two-part prefabricated drain consisting of a polymer core encapsulated with a non-woven filter fabric. The core will be fabricated with suitable drainage channels and have a minimum compressive strength of 6,000 psf and a minimum in-plane flow of 20 gallons per minute per foot of width for a hydraulic gradient of 0.1 and a load of 10 psi. The filter fabric will have a minimum grab tensile strength of 90 lbs.

D. During shipment and storage, the drains will be wrapped in heavy duty protective covering. The storage area will be such that the drains are protected from mud, dirt, dust, debris and detrimental substances. Materials will be stockpiled and stored so as not to be buried or damaged. The drains will be free of defects, rips, holes or flaws. Damaged materials will be replaced by the Contractor at his expense.

E. The prefabricated drains will have an equivalent drain diameter (d_w) of at least 2.6 inches as calculated by the following formula:

$$d_w = [2\ (a+b)]/\pi$$

Where: a = width of the wick drain

b = thickness of the wick drain

F. The locations of survey stakes identifying wick drain locations will not vary by more than six inches from the locations indicated on the plans or as directed by the Engineer.

G. After the working platform is placed, the Contractor will demonstrate that his equipment, method and materials produce a satisfactory installation in accordance with this Technical Special Provision. For this purpose, the Contractor will be required to install no less than five vertical wick drains at production drain locations designated by the Engineer.

T442-3 Vertical Wick Drain Installation

A. At least three weeks prior to the installation of the vertical wick drains, the Contractor will submit to the Engineer for review and approval in accordance with Section 5-1.4 of FDOT Specifications, details of the sequence and method of installation. The submittal will, at a minimum, contain the following specific information:

1. Size, type, weight, maximum pushing force, vibratory hammer rated energy, and configuration of the installation rig.
2. Dimensions and length of mandrel.
3. Details of drain anchorage.
4. Detailed description of proposed installation procedures.
5. Proposed method(s) for overcoming obstructions.
6. Proposed method(s) for splicing drains.

B. Approval will not relieve the Contractor of the responsibility to install drainage wicks in accordance with the plans and this Technical Special Provision. If, at any time, the Engineer considers that the method of installation does not produce a satisfactory drain, the Contractor will alter his method and/or equipment as necessary to comply with the plans and this Technical Special Provision.

C. Where shown on the plans or as directed by the Engineer, vertical drains will be installed prior to embankment construction. Prior to the installation of prefabricated drains, the Contractor will stake out the proposed locations of the drains and then take all reasonable precautions to preserve the stakes.

D. The Engineer will observe the installation procedure and obtain all records necessary for verification of compliance with this Technical Special Provision and final drain lengths.

E. The vertical drains will be installed to penetrate the soft organic (muck) soils or as directed by the Engineer. Drains that deviate from the plan location by more than six inches, or are damaged, or are improperly installed, will be rejected. Rejected drains may be removed or abandoned in place, at the Contractor's option. Replacement drains will be offset approximately 18 inches from the location of the rejected drains. All rejected drains will be replaced at the Contractor's expense.

F. The drains will be installed vertically to completely penetrate the muck or to an elevation no deeper than the elevations shown on the Surcharge Control Sheet Wick Drain Plan View Limits sheet. Adequate penetration of each drain location will be determined by the Engineer. The Contractor will provide the Engineer with a suitable means of verifying the plumbness of the mandrel and determining the depth of the drain at any time. The equipment will be carefully checked for plumbness and will not deviate more than 0.25 inches per foot from vertical.

G. Splices or connections in the vertical drain material will be done in accordance with the manufacturer's installation instructions and will be approved by the Engineer so as to ensure continuity of flow through the wick material. The prefabricated vertical drain will be cut such that a sufficient length is provided to connect with the horizontal strip drain.

H. The drains will be installed in such a sequence so that construction equipment will not disturb any previously placed drains.

I. It may be necessary to pre-auger or use some method to clear obstructions and facilitate the installation of the drains. The depth to which pre-augering is used will be subject to approval by the Engineer.

J. Where obstructions are encountered which cannot be penetrated by augering or spudding, the Contractor will then install a new drain within 18 inches of the obstructed drain. A maximum of two attempts will be made as directed by the Engineer for each obstructed drain. If the drain still cannot be installed to the design tip elevation, the drain location will be abandoned and the installation equipment will be moved to the next drain location.

K. Vertical drain installation will be performed only by personnel experienced in this type of work. The vertical drains will be installed with equipment which will cause a minimum of disturbance of the subsoil during the installation. The prefabricated drains will be installed using a mandrel or sleeve that will be advanced to the required elevation using vibratory, constant load, or constant rate of advancement methods. Use of falling weight impact hammers will not be allowed. Jetting will not be permitted for installation of the drain. The mandrel will protect the prefabricated drain materials from tears, cuts and abrasions during installation and will be withdrawn after the installation of the drain. The drain will be provided with an "anchor" plate or rod at the bottom to anchor the bottom of the drain at the required depth at the time of mandrel removal.

T442-4 Horizontal Strip Drain Installation

A. Horizontal strip drain installation will be performed by the same personnel who install the vertical wick drains. At least three weeks prior to installation of the strip drains, the Contractor will submit to the Engineer for review and approval the details of the method of installation. The submittal will, at a minimum, contain the following:

1. Details of connection to vertical wick drains.
2. Detailed description of proposed installation procedures.
3. Proposed method for splicing drains.
4. Proposed layout of horizontal drains.

B. The horizontal strip drains will be adequately connected to the vertical wick drains to provide free flow of water between the drains. The strip drains will have a flow capacity that is at least equal to the flow capacity of the wick drains. The drains will extend beyond embankment limits to the extent necessary to allow free flow of water out of the

embankment. Each row of wick drains will have a separate line of strip drain. Care will be taken to prevent damage to any existing drains during installation and any damaged drains will be replaced by the Contractor at the Contractor's expense.

T442-5 Soil Cover

A one foot thick layer of soil cover (free-draining sand with less than 10% passing the No. 200 sieve) will be placed above the drains prior to continuing embankment and surcharge construction.

T442-6 Method of Measurement

The quantities under this Technical Special Provision will be for the length of acceptable vertical wick drain and horizontal strip drain installed.

T442-7 Basis of Payment

The work to be paid for under this Technical Special Provision will be made at the contract unit price. Such prices and payments will be full compensation for all materials, installation and incidentals required. All costs related to the horizontal strip drains are to be incorporated into the vertical wick drain cost.

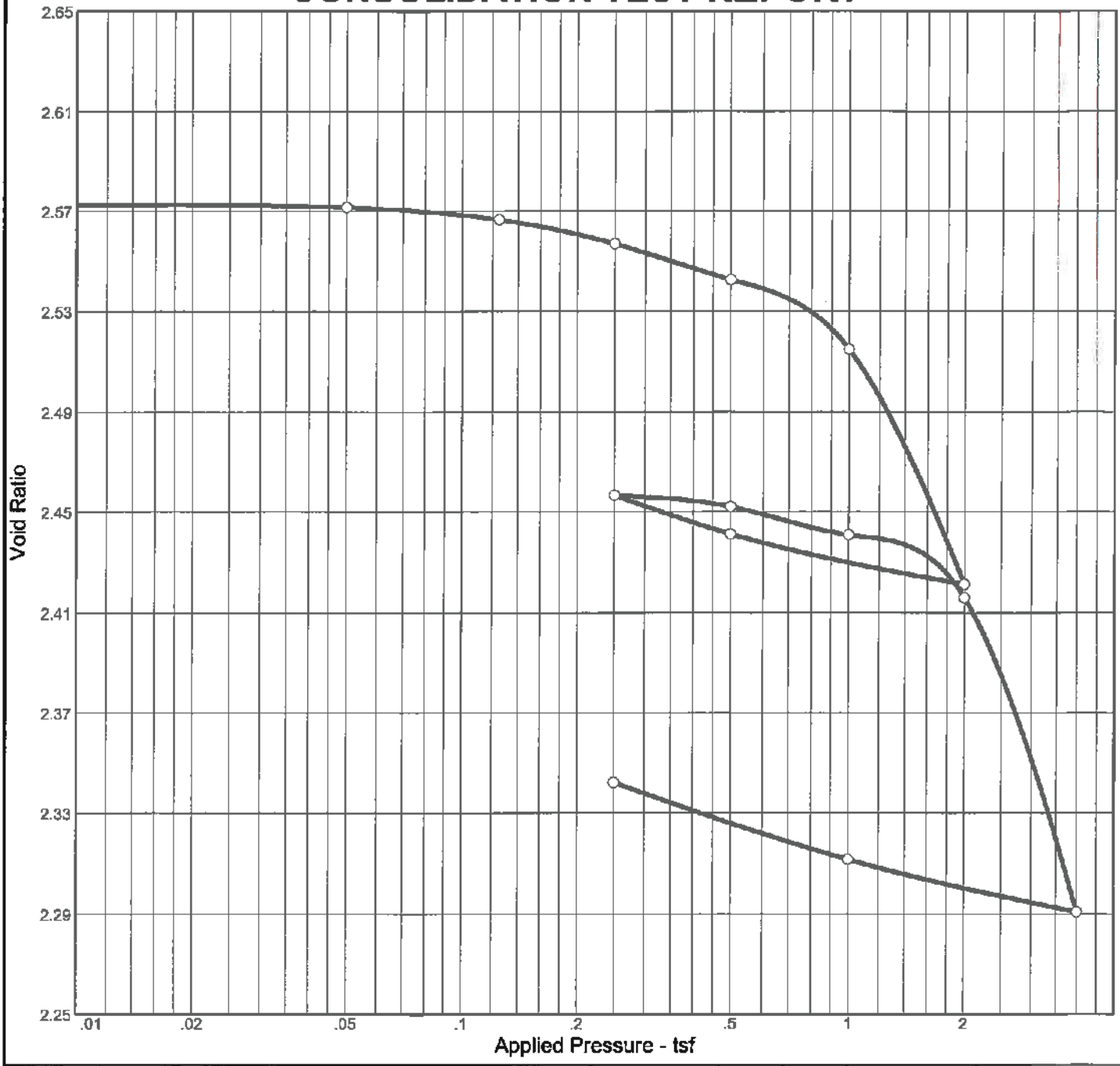
Payment for both vertical and horizontal wick drains will be made under:

Item No. 442-70 - Vertical Drainage Wicks - LF

END OF SECTION

CONSOLIDATION TEST RESULTS

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

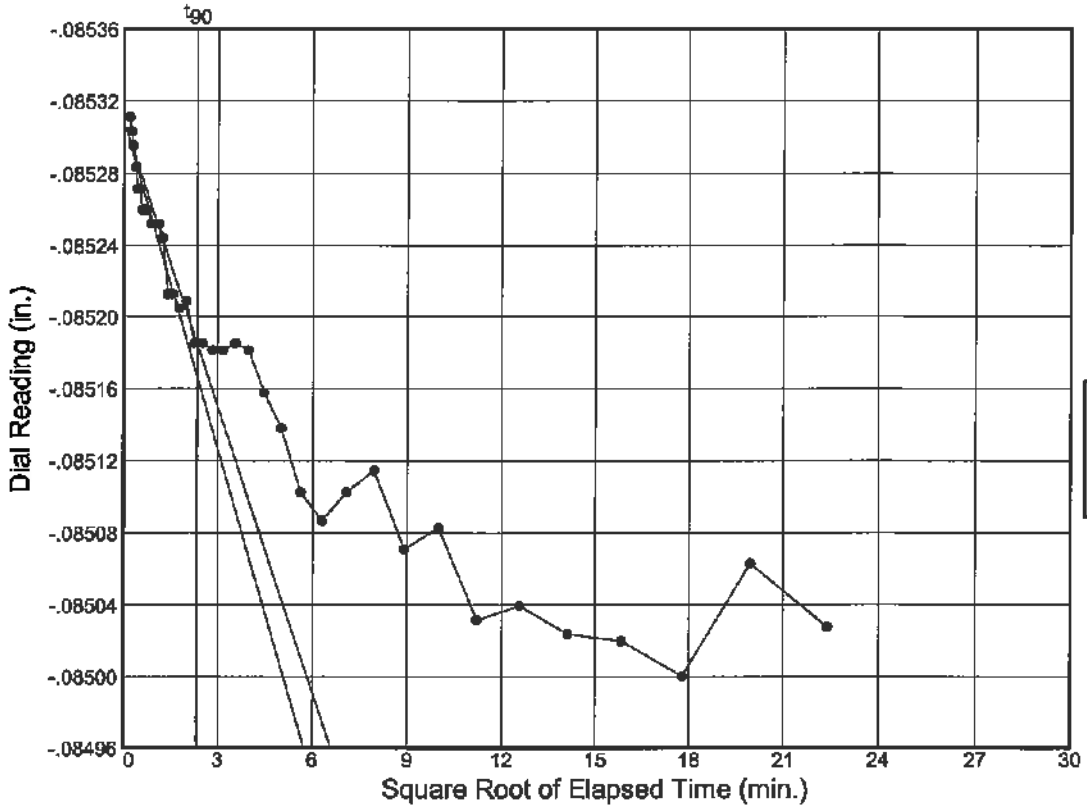
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

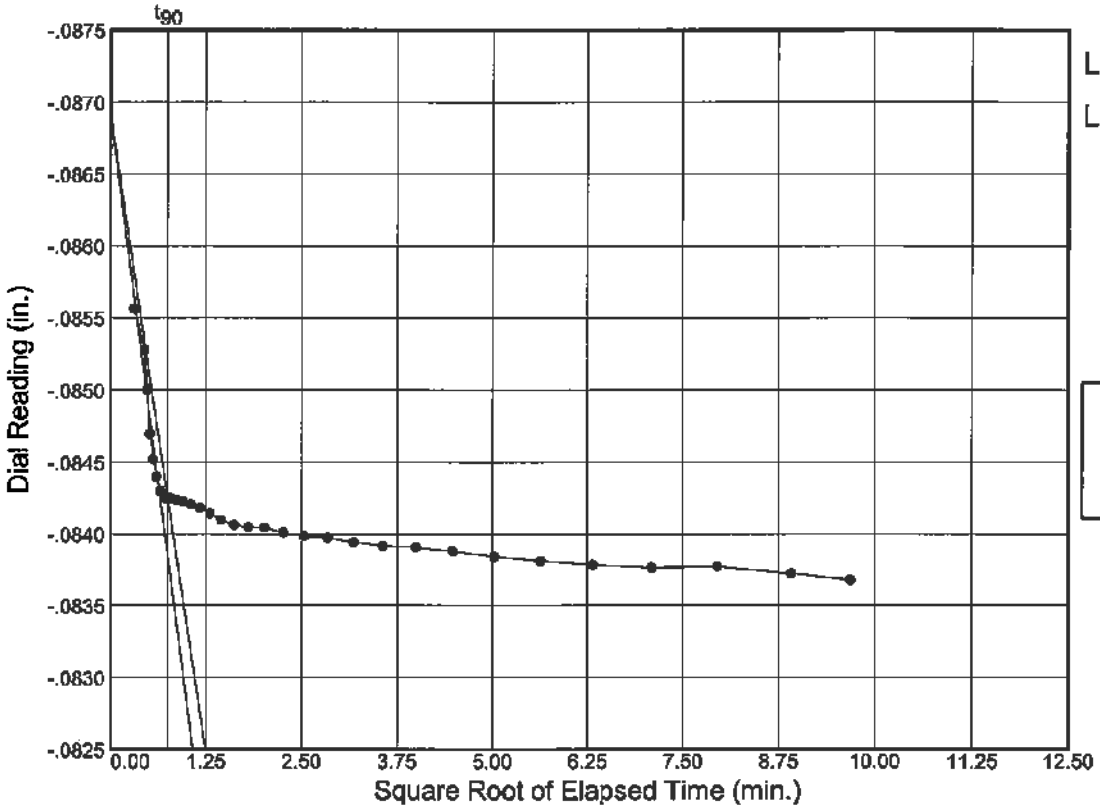
Project No.: 3520G
Project: Wekiva Parkway 7A

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



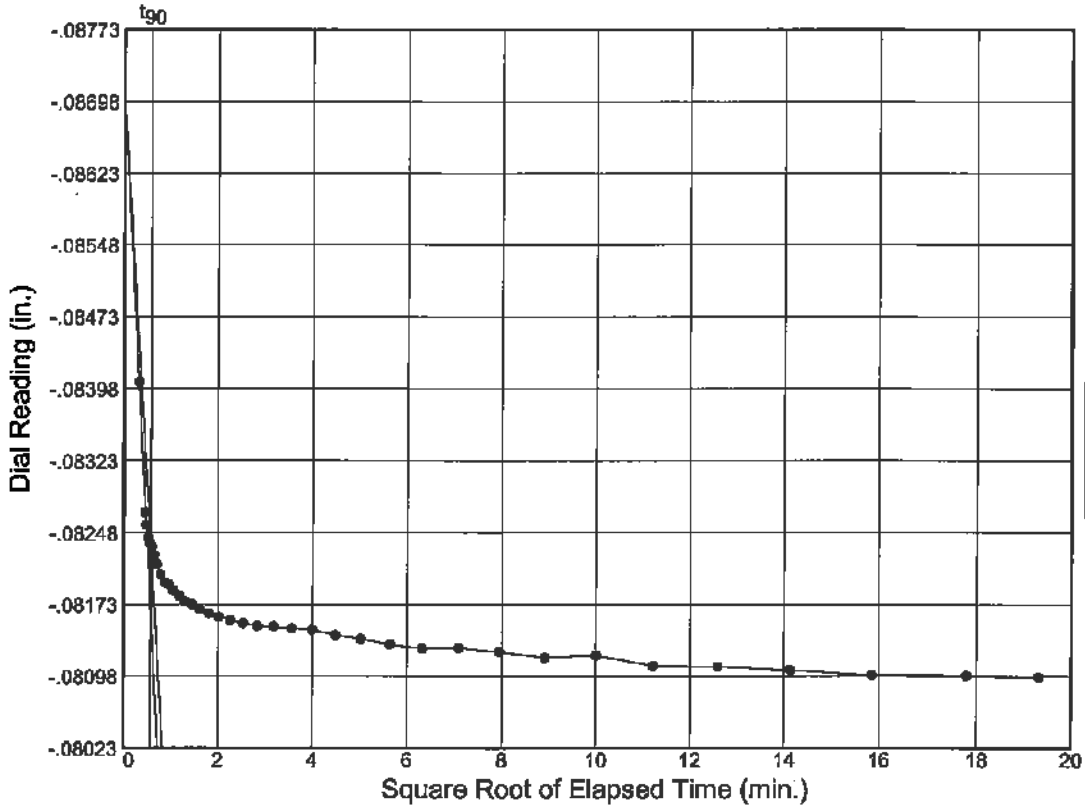
Load No.= 2
Load= 0.13 tsf
D_0 = -0.08692
D_{90} = -0.08425
D_{100} = -0.08395
T_{90} = 0.56 min.

C_v @ T_{90}
3.75 ft.^{2}/day

Dial Reading vs. Time

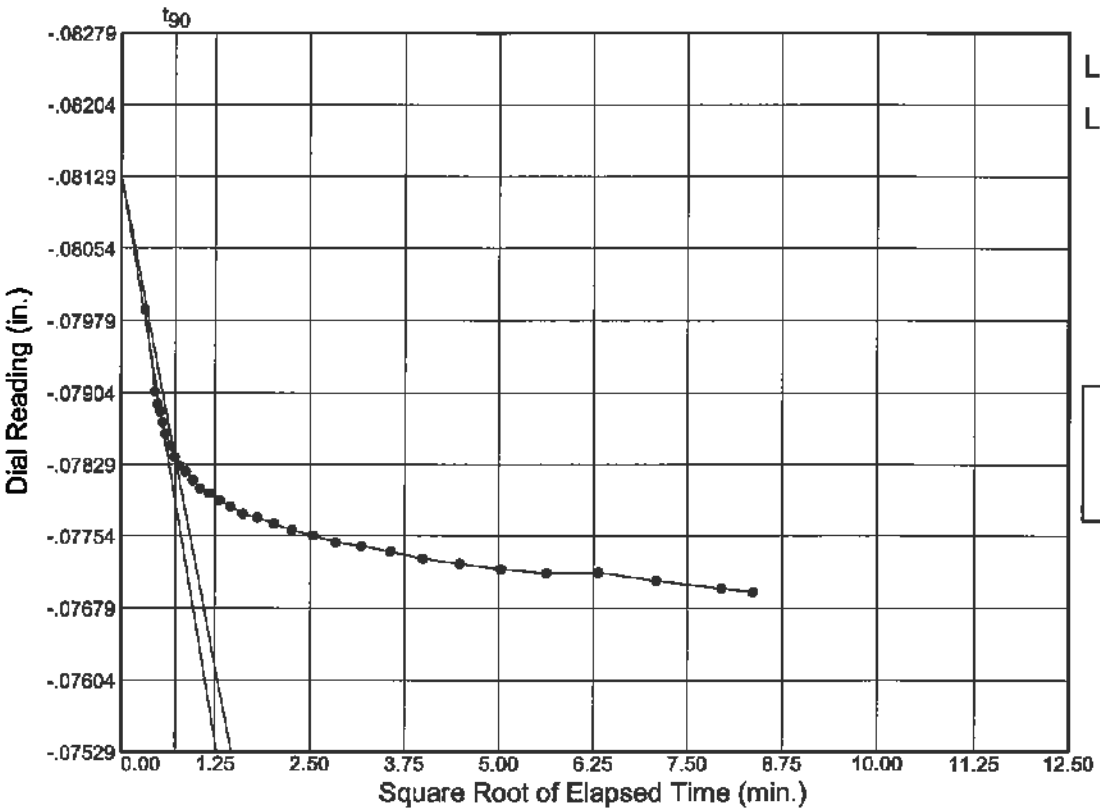
Project No.: 3520G
Project: Wekiva Parkway 7A

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



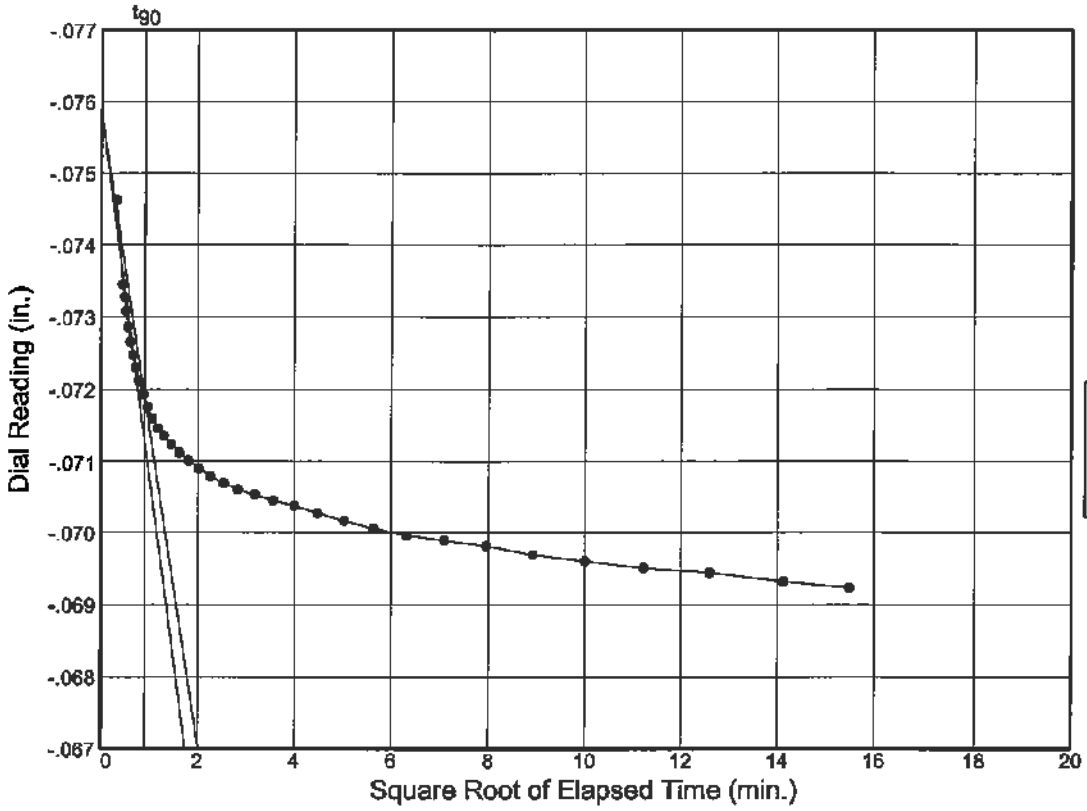
Load No.= 4
Load= 0.50 tsf
D_0 = -0.08129
D_{90} = -0.07835
D_{100} = -0.07802
T_{90} = 0.51 min.

C_v @ T_{90}
4.07 ft.^{2}/day

Dial Reading vs. Time

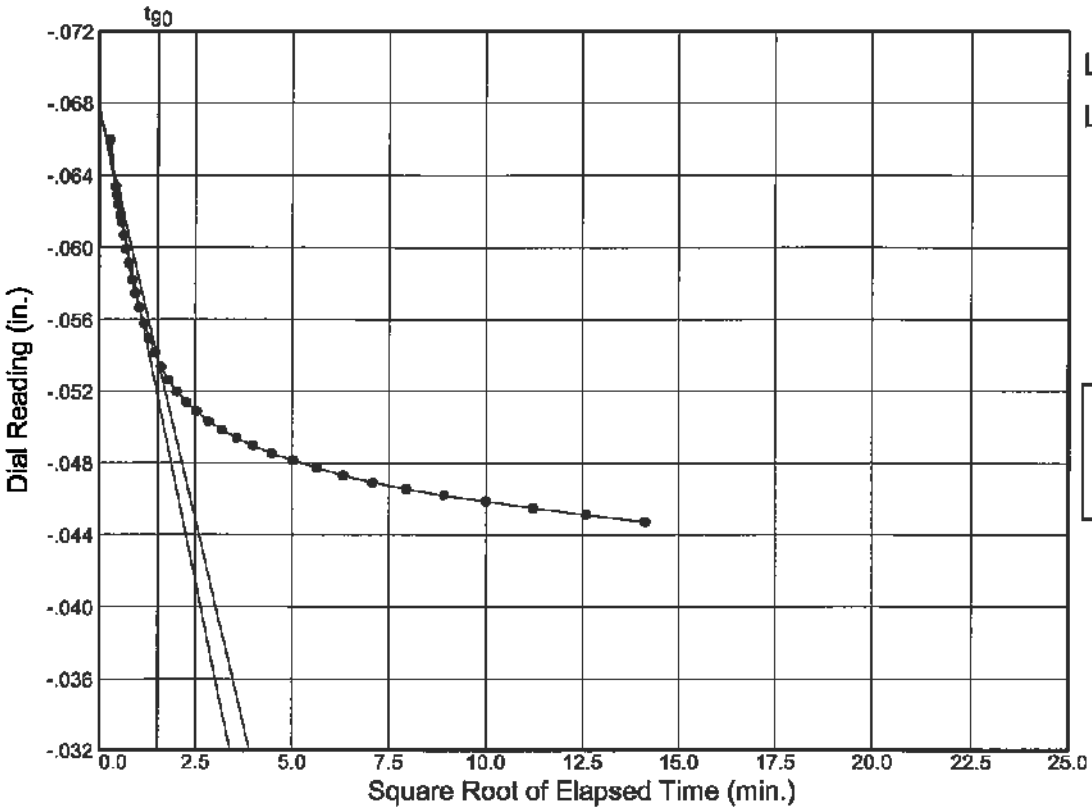
Project No.: 3520G
Project: Wekiva Parkway 7A

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



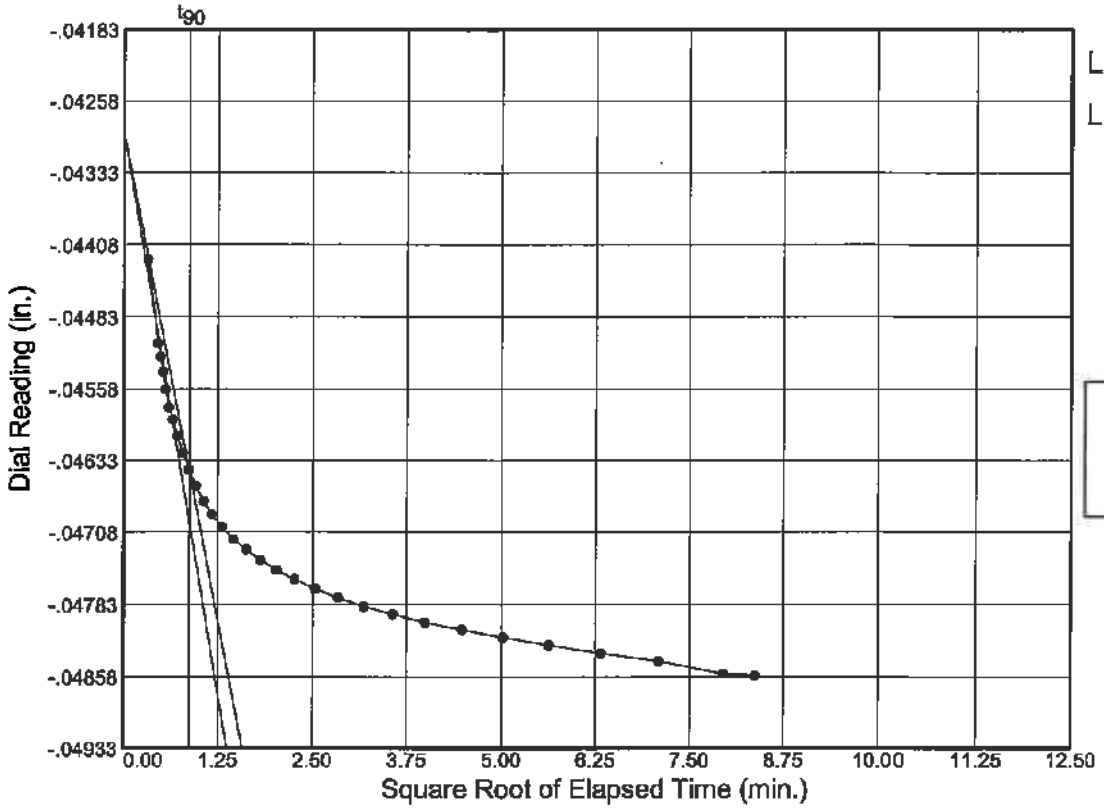
Load No.= 6
Load= 2.00 tsf
D_0 = -0.06777
D_{90} = -0.05378
D_{100} = -0.05223
T_{90} = 2.33 min.

C_v @ T_{90}
0.86 ft.^{2}/day

Dial Reading vs. Time

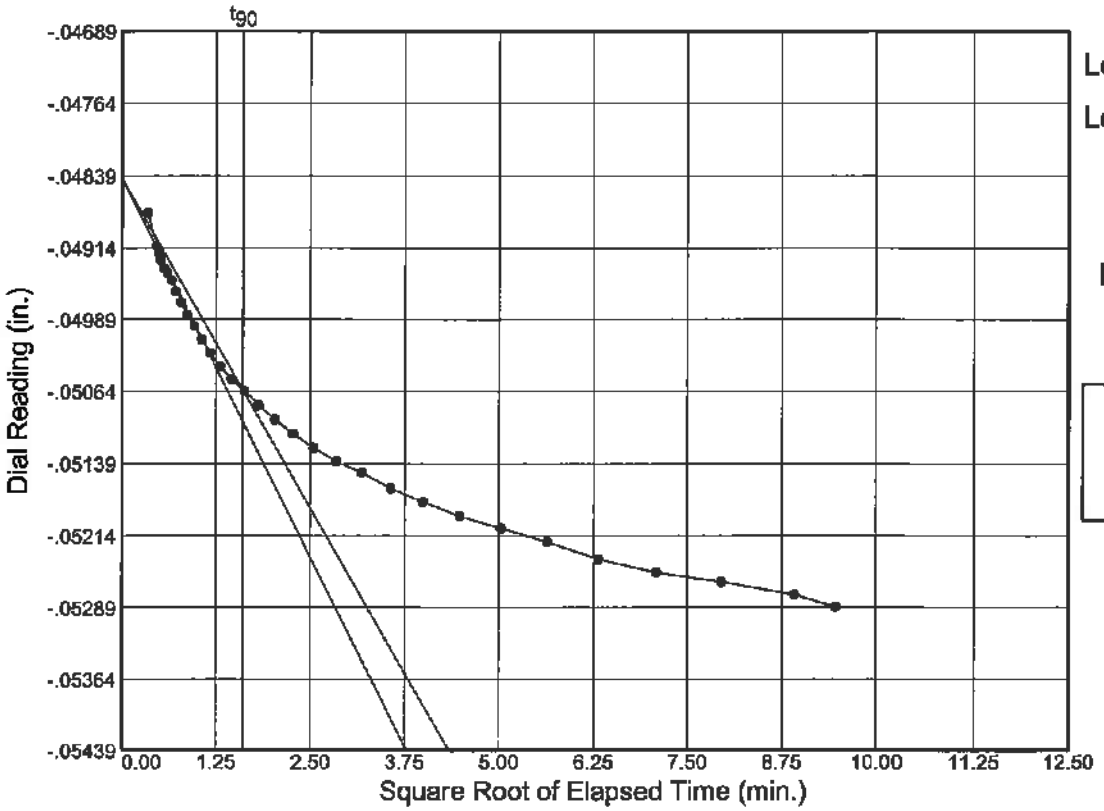
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

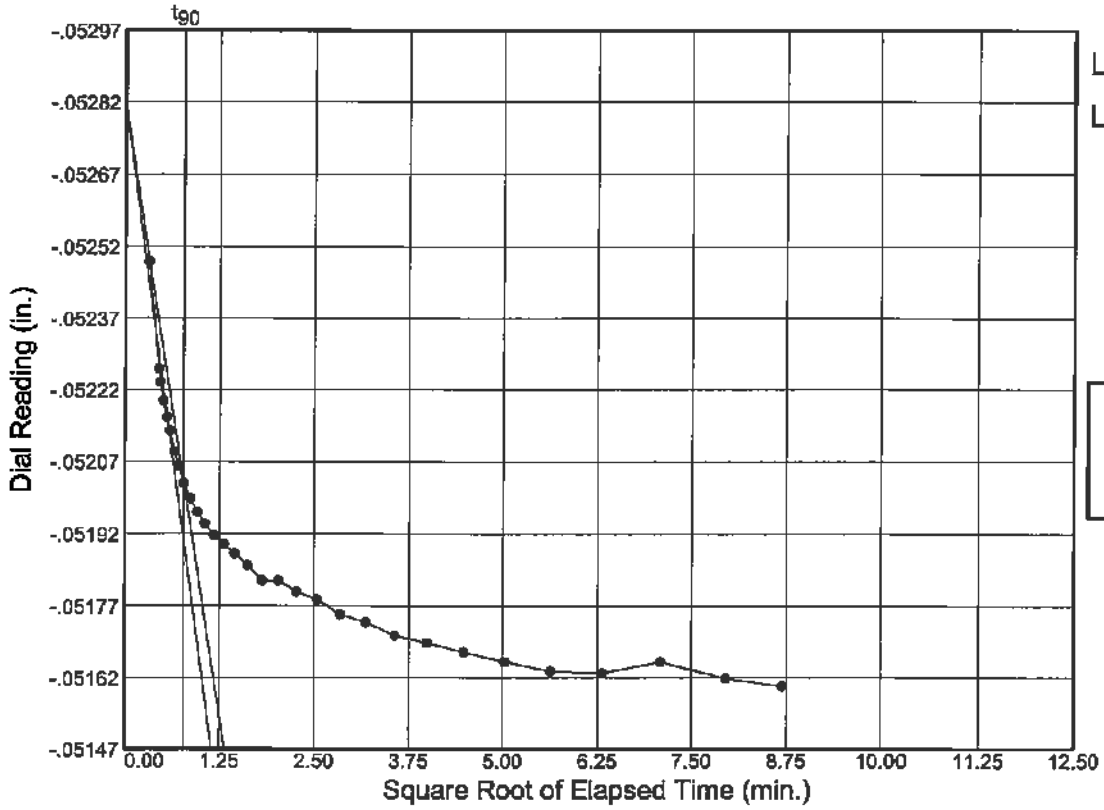
C_v @ T_{90}
0.77 ft.^{2}/day

Plate

Dial Reading vs. Time

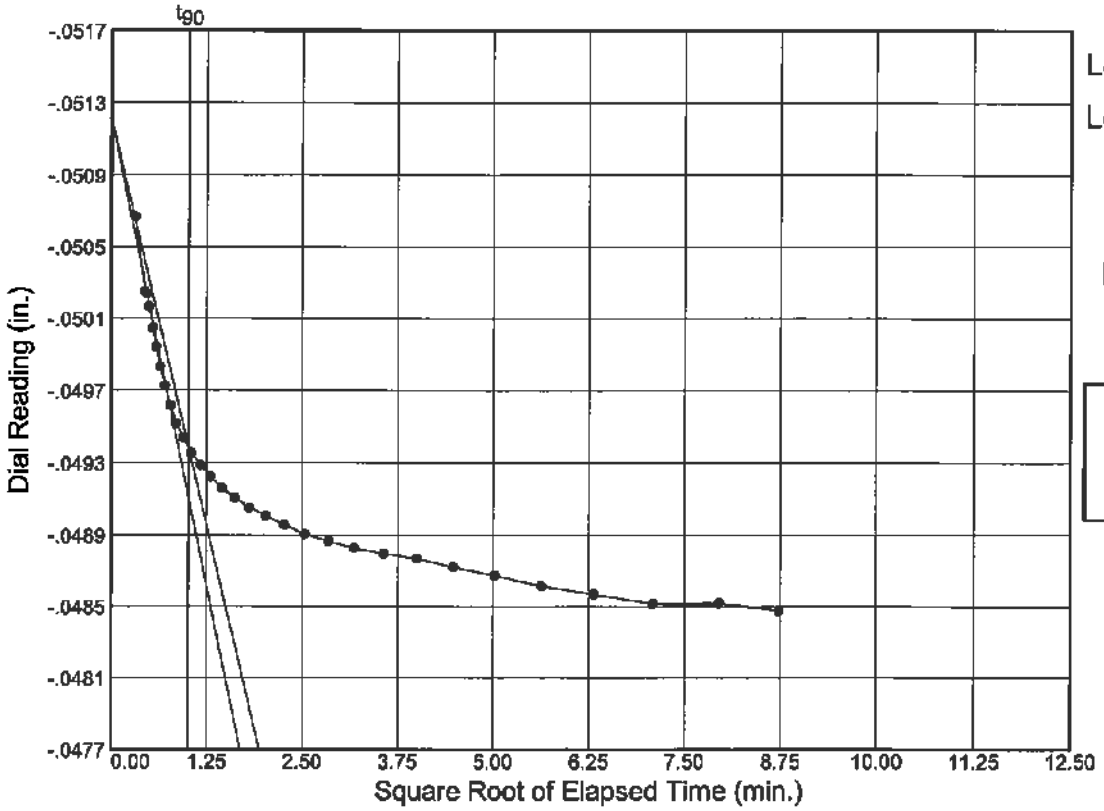
Project No.: 3520G
Project: Wekiva Parkway 7A

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



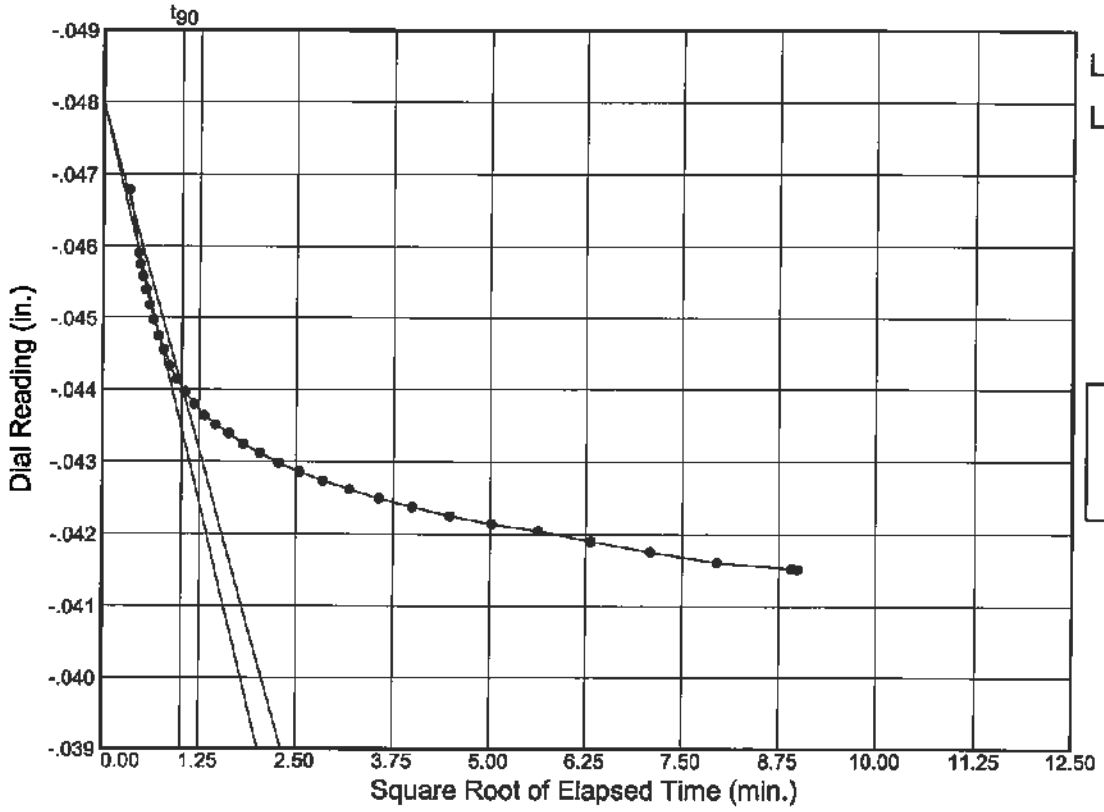
Load No.= 10
Load= 1.00 tsf
D_0 = -0.05122
D_{90} = -0.04939
D_{100} = -0.04918
T_{90} = 1.02 min.

C_v @ T_{90}
1.93 ft.^{2}/day

Dial Reading vs. Time

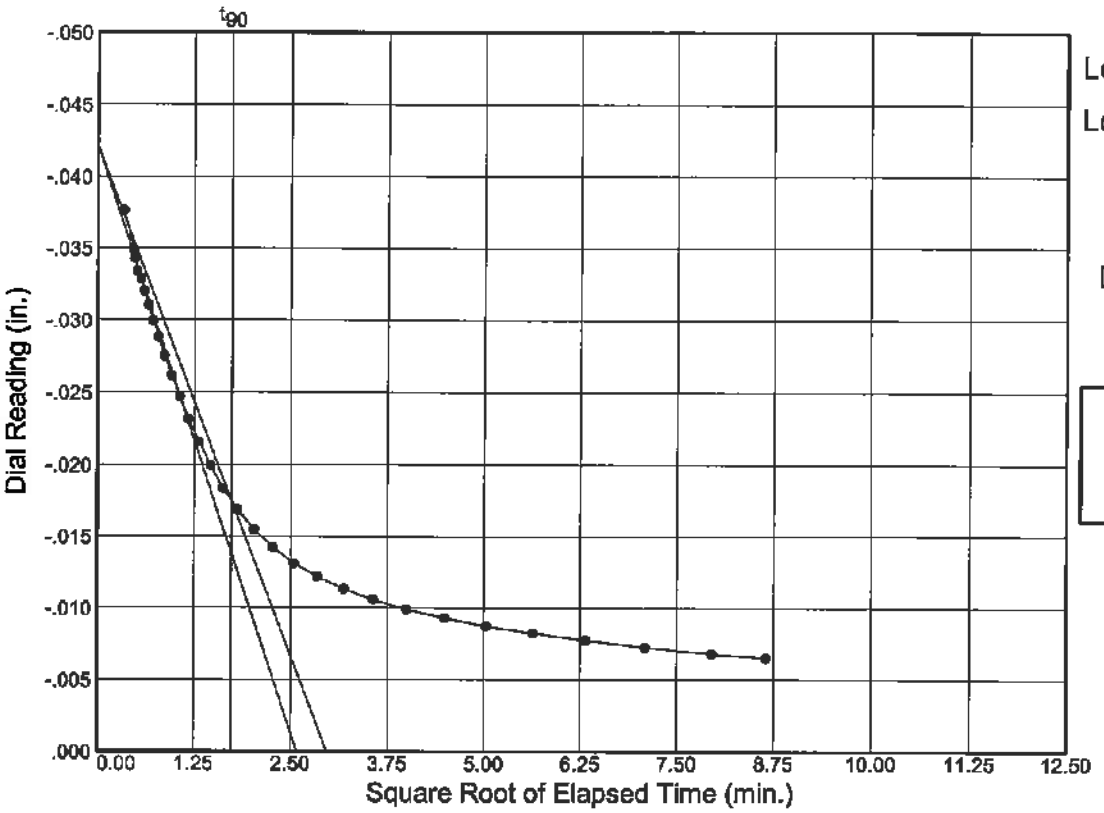
Project No.: 3520G
Project: Wekiva Parkway 7A

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



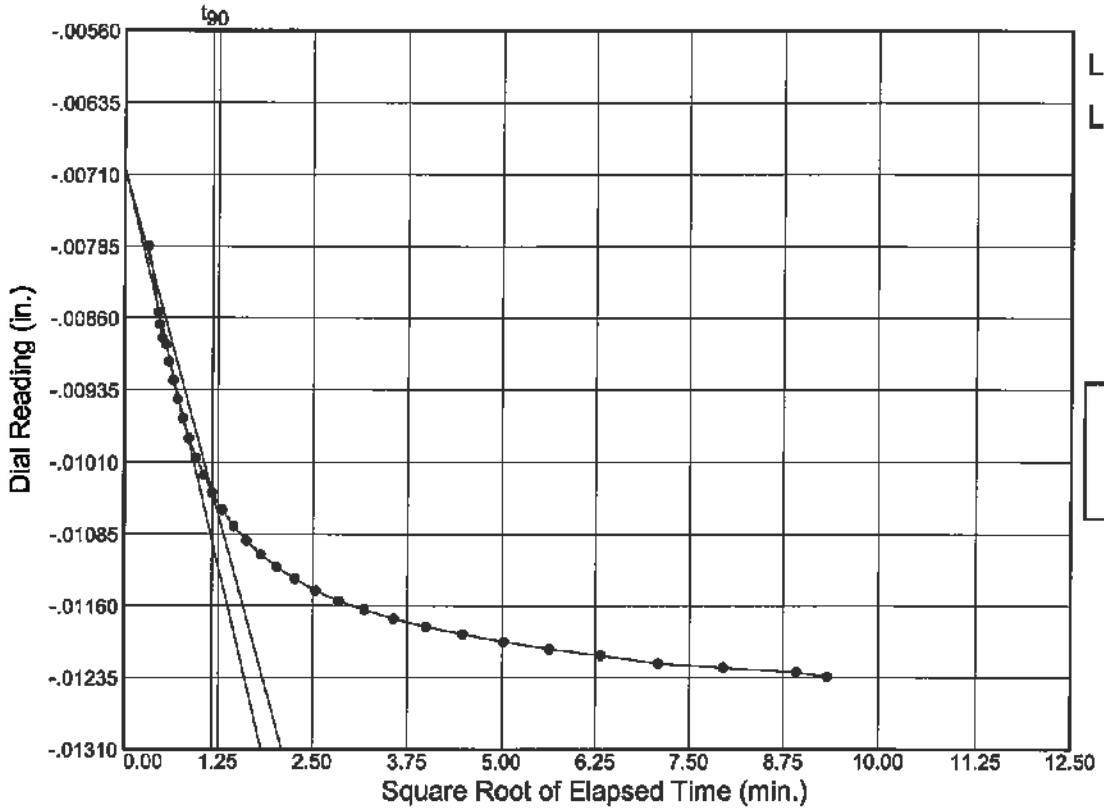
Load No.= 12
Load= 4.00 tsf
D_0 = -0.04210
D_{90} = -0.01752
D_{100} = -0.01479
T_{90} = 3.00 min.

C_v @ T_{90}
0.62 ft.^{2}/day

Dial Reading vs. Time

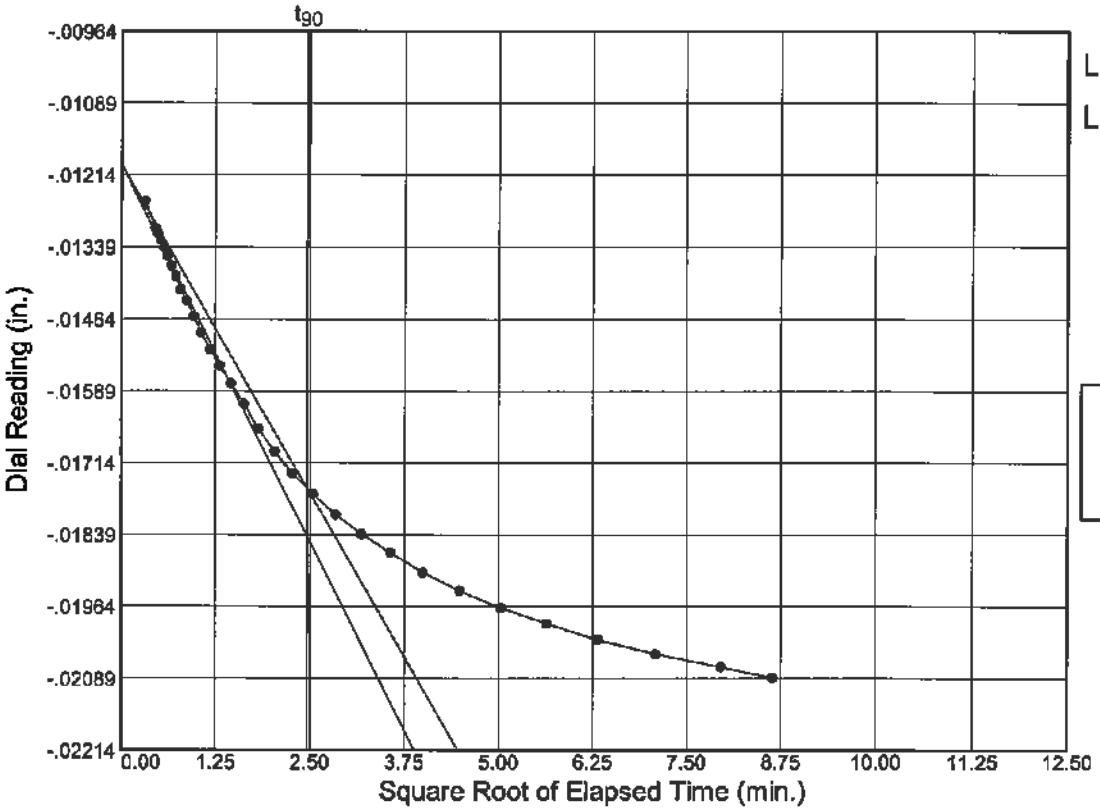
Project No.: 3520G
Project: Wekiva Parkway 7A

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



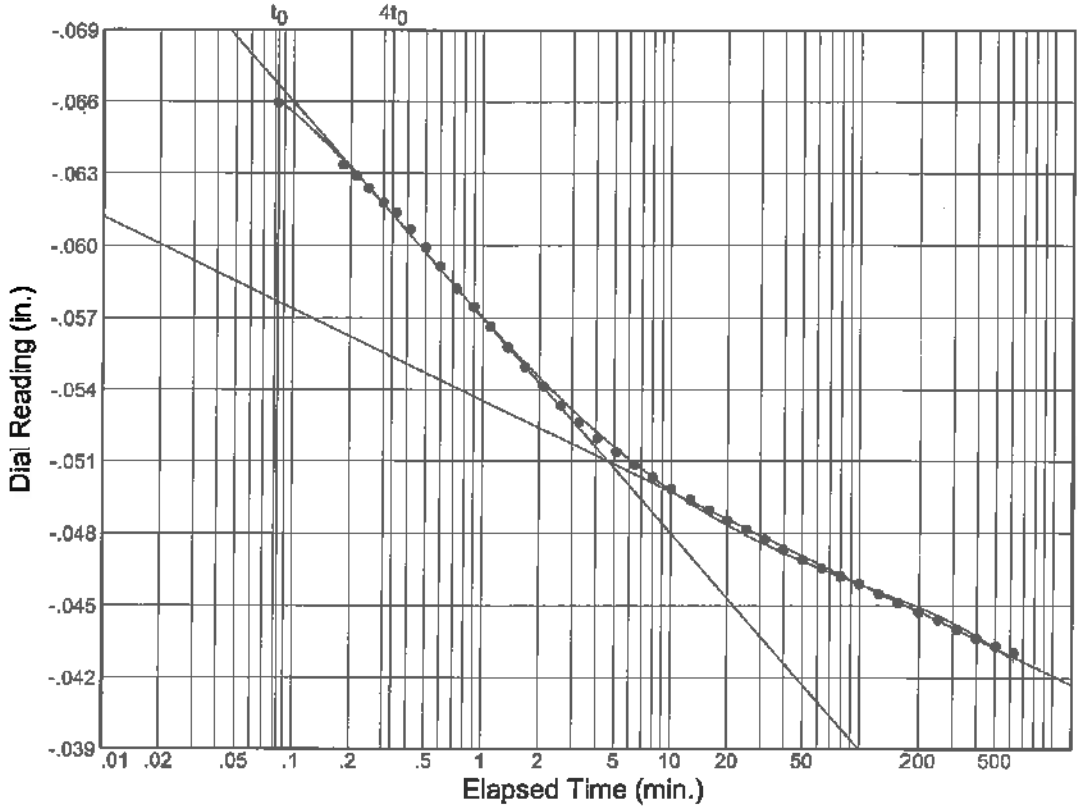
Load No.= 14
Load= 0.25 tsf
D_0 = -0.01196
D_{90} = -0.01759
D_{100} = -0.01821
T_{90} = 6.09 min.

C_v @ T_{90}
0.30 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

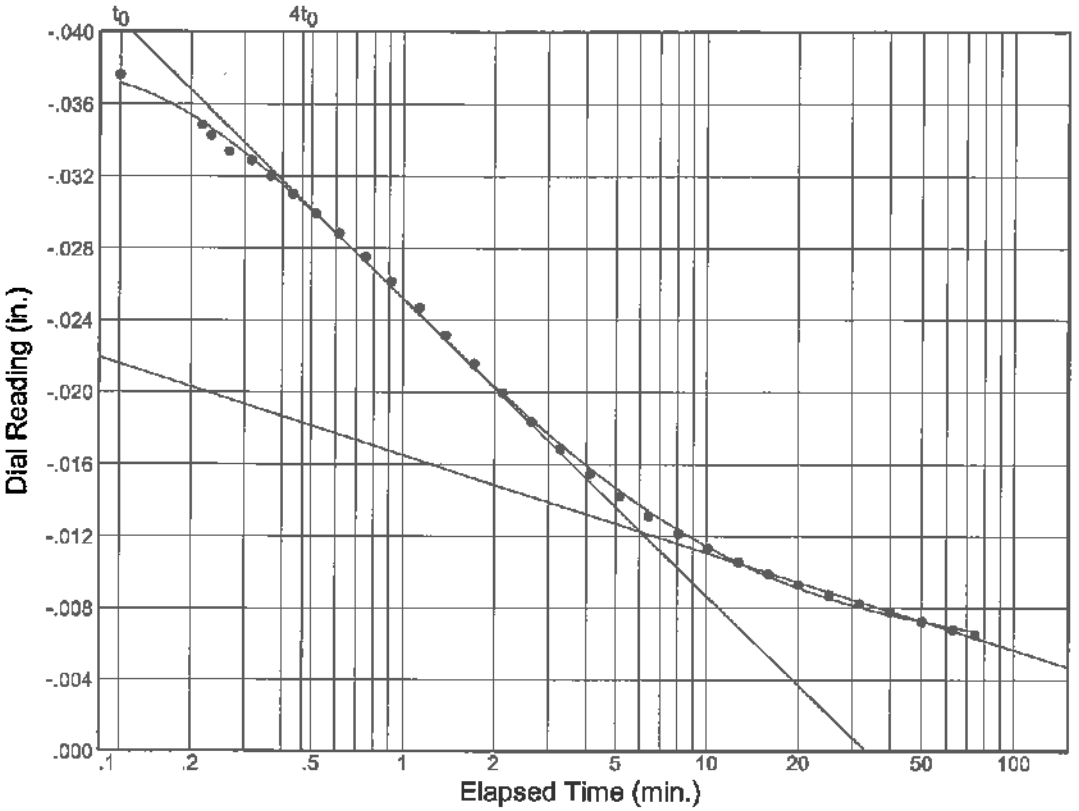
Location: BR-24 20.5'-22.5'



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.

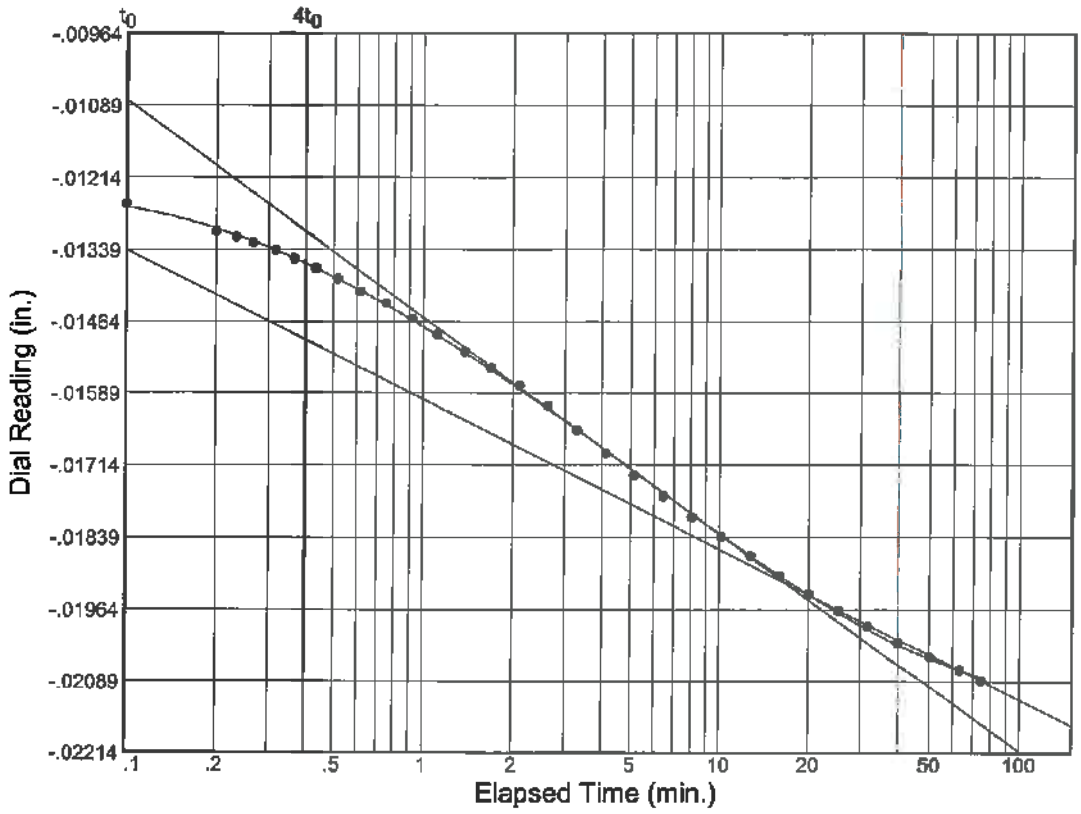
C_v @ T_{50}
0.65 ft.^{2}/day

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

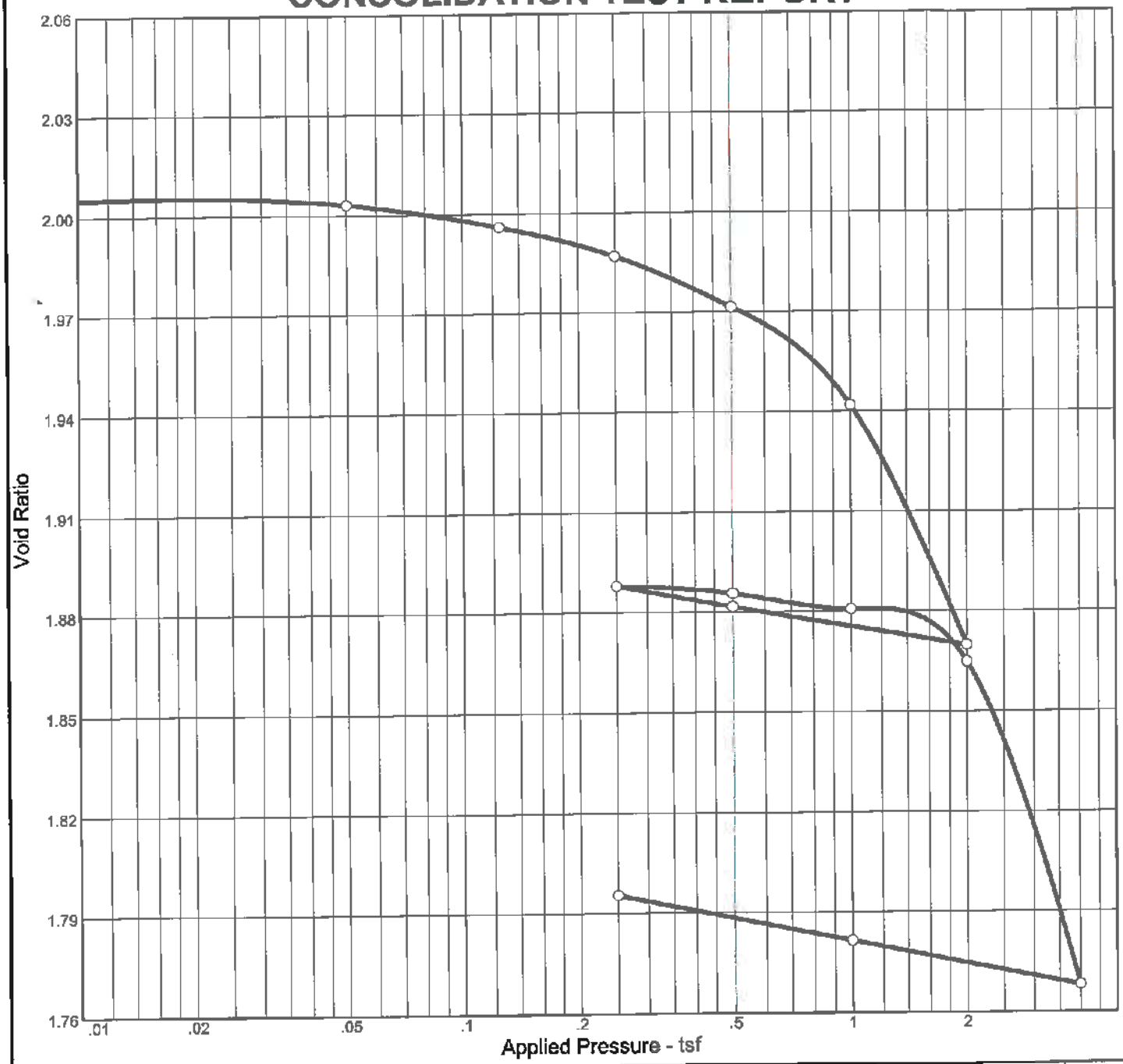
D_{50} = -0.01543

D_{100} = -0.01919

T_{50} = 1.63 min.

C_v @ T_{50}
0.26 ft.^{2}/day

CONSOLIDATION TEST REPORT



Natural 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

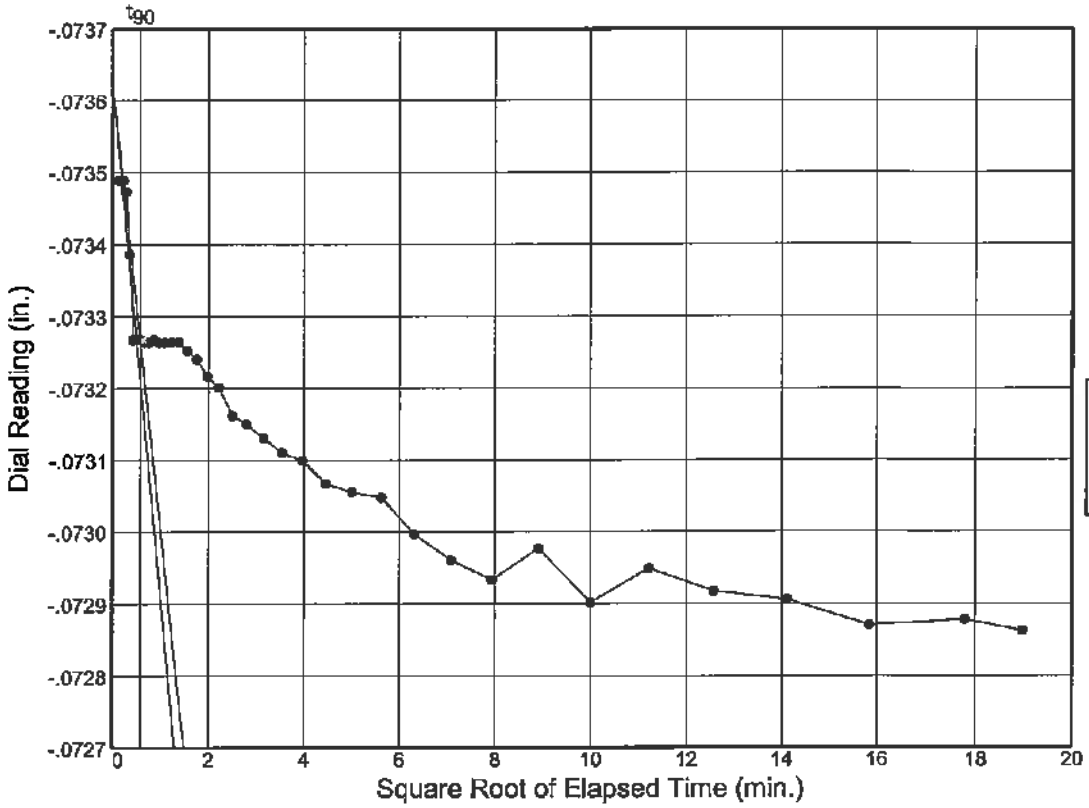
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

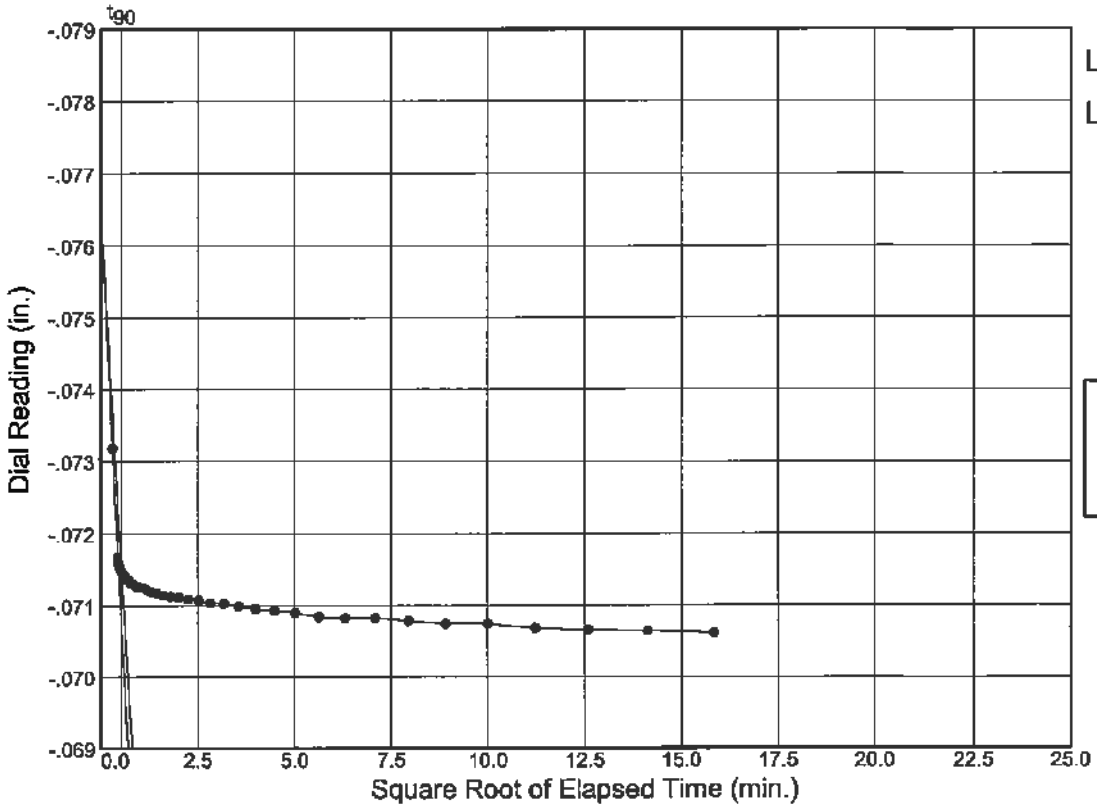
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

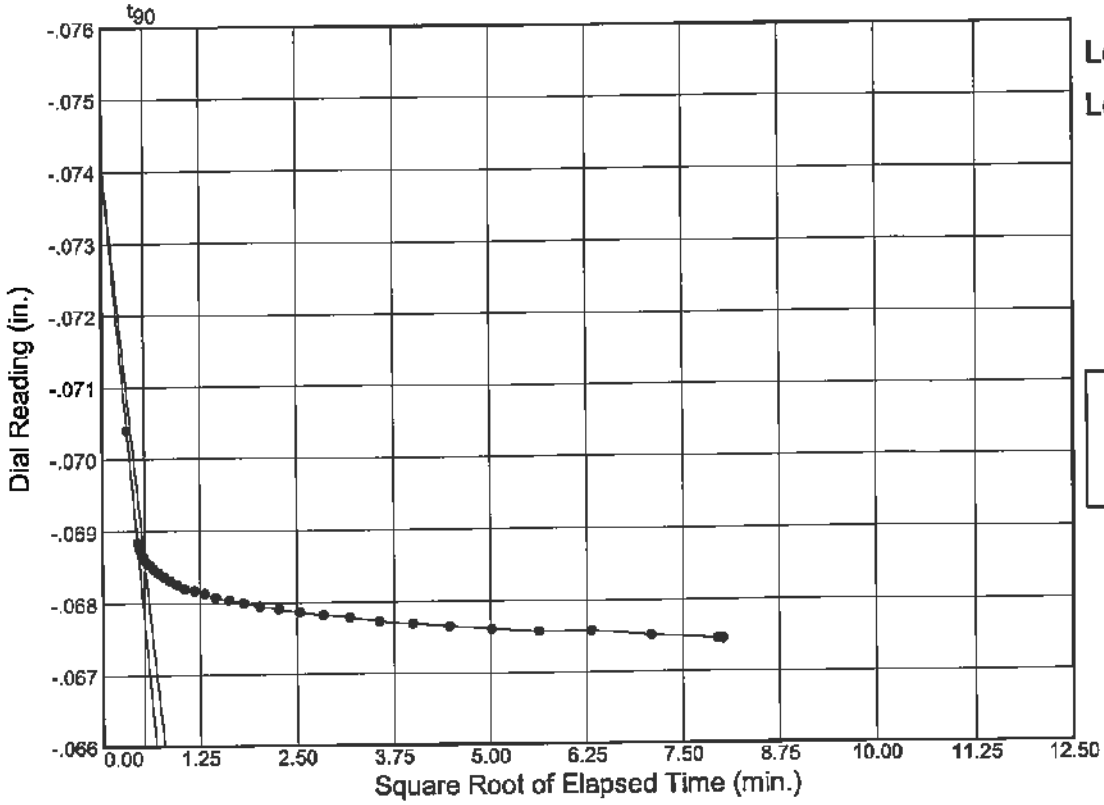
C_v @ T_{90}
7.21 ft.^{2}/day

Plate

Dial Reading vs. Time

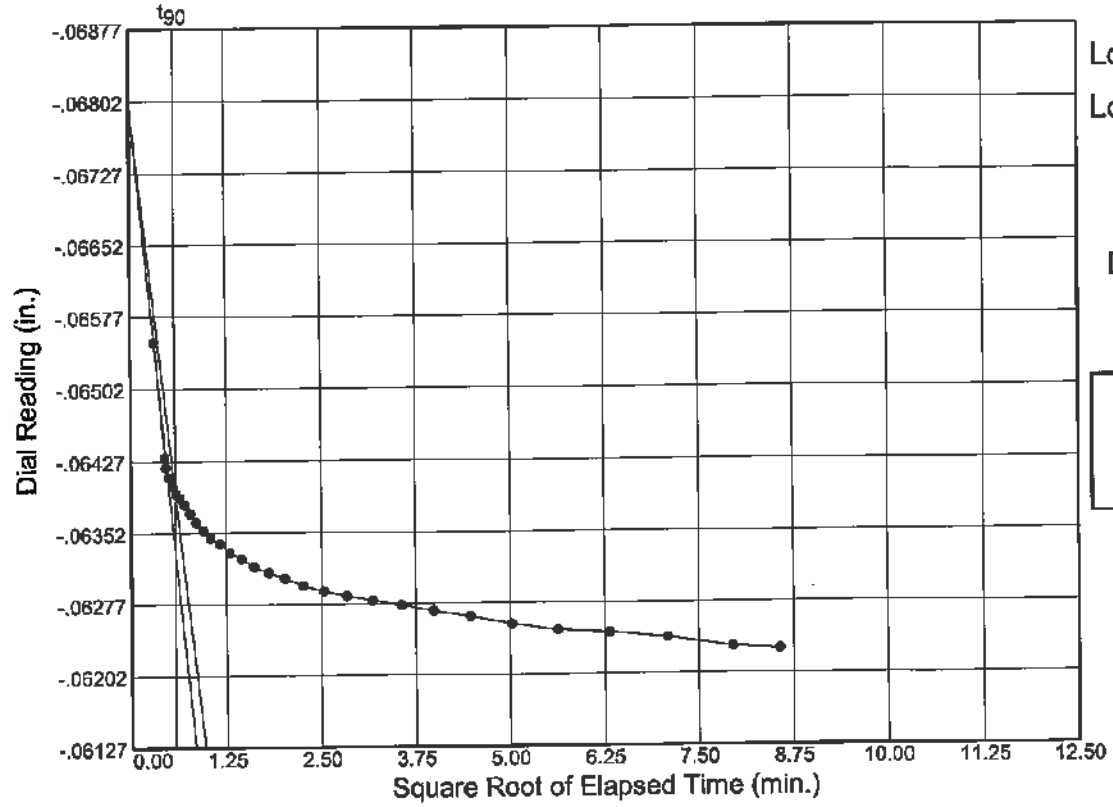
Project No.: 3520G
Project: Wekiva Parkway 7A

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



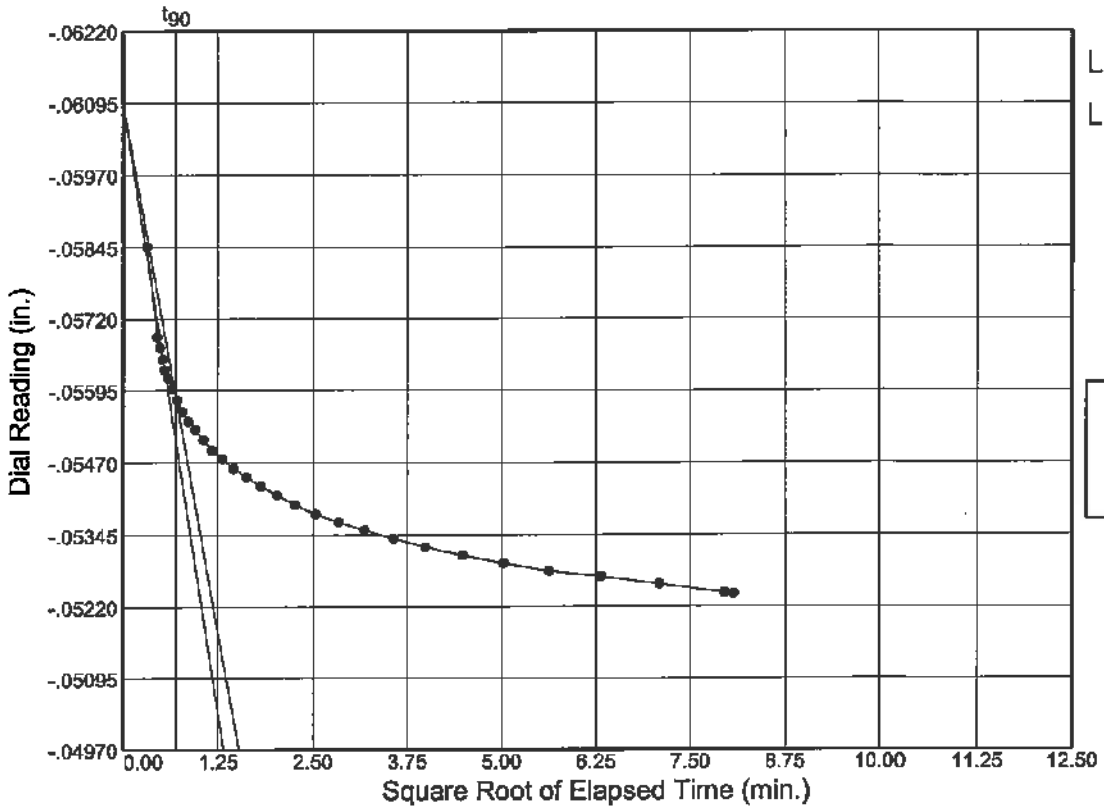
Load No.= 4
Load= 0.50 tsf
D_0 = -0.06801
D_{90} = -0.06395
D_{100} = -0.06350
T_{90} = 0.34 min.

C_v @ T_{90}
6.20 ft.^{2}/day

Dial Reading vs. Time

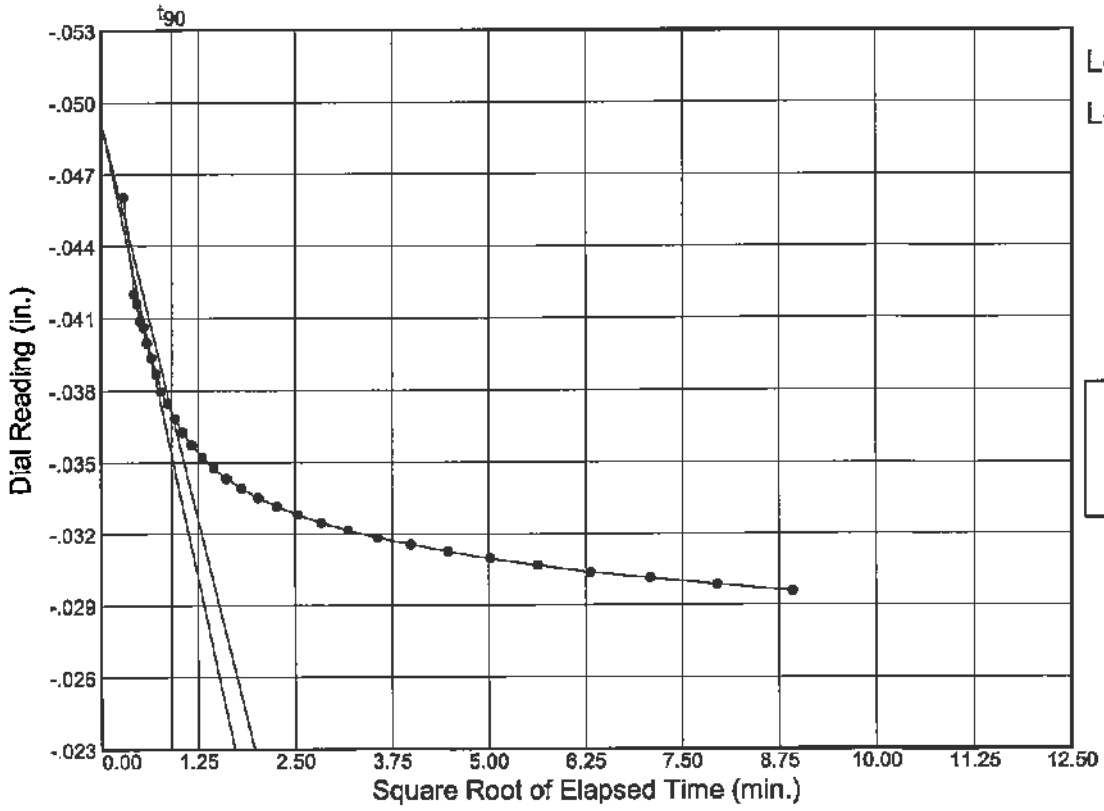
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

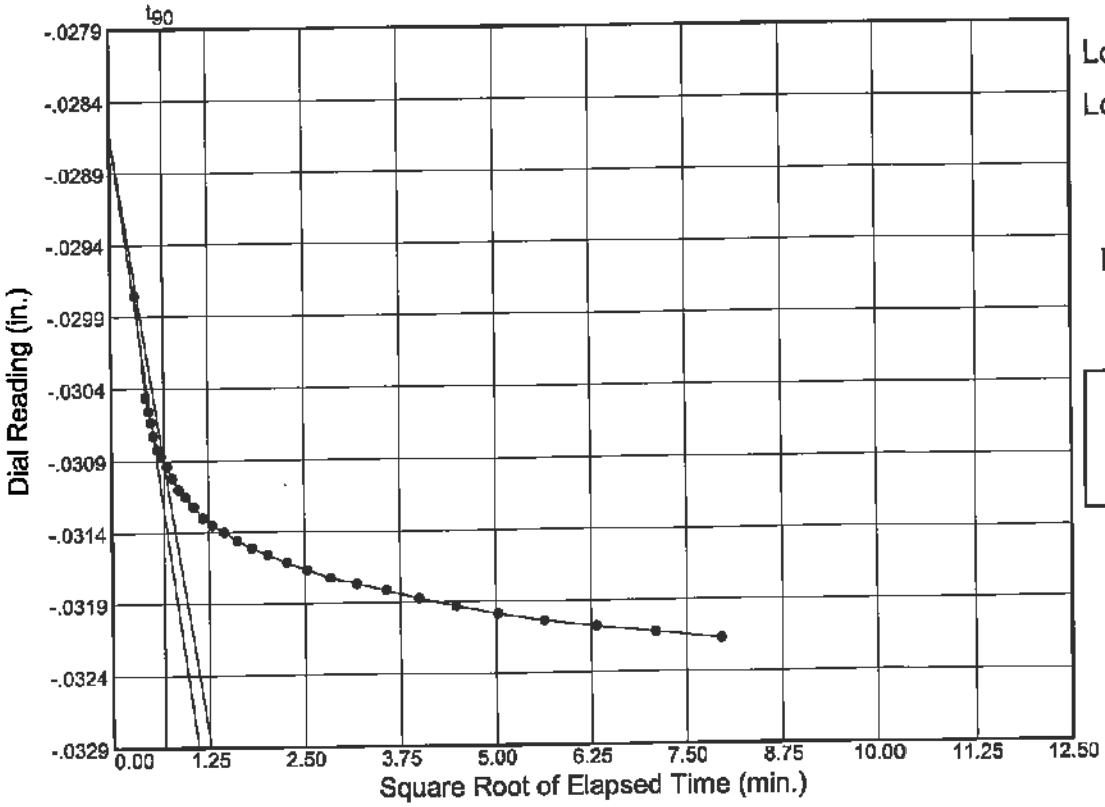
C_v @ T_{90}
2.40 ft.^{2}/day

Plate

Dial Reading vs. Time

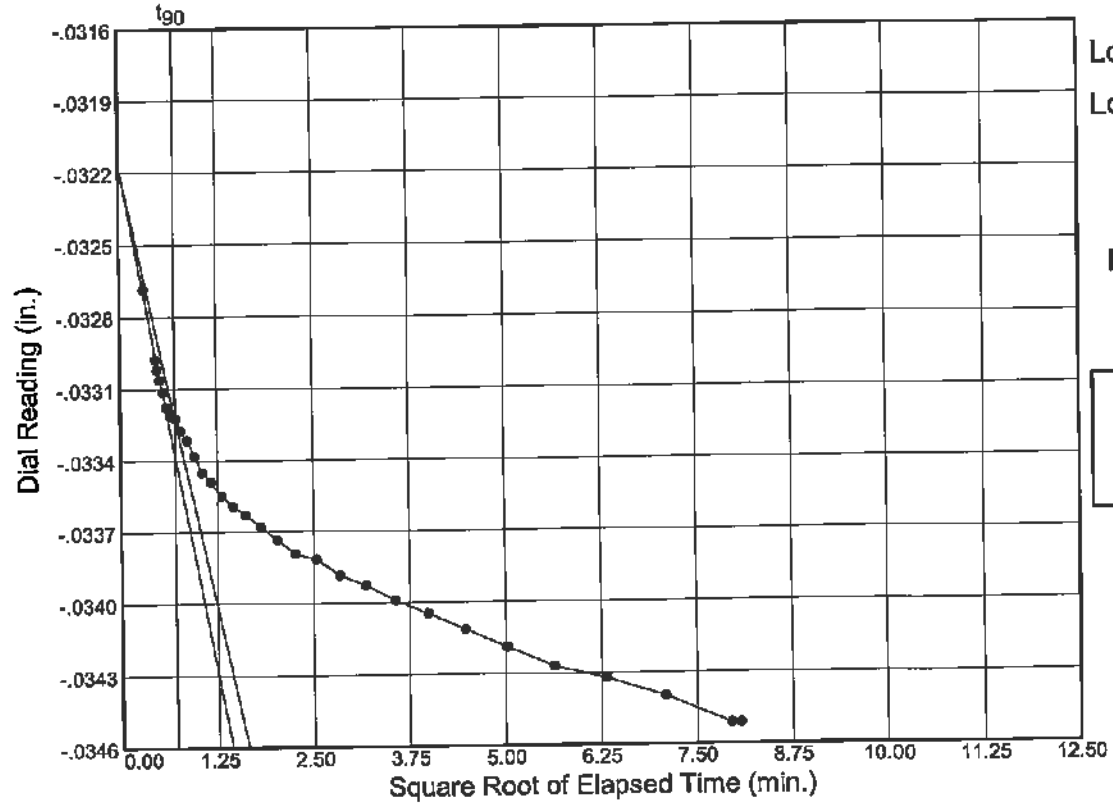
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

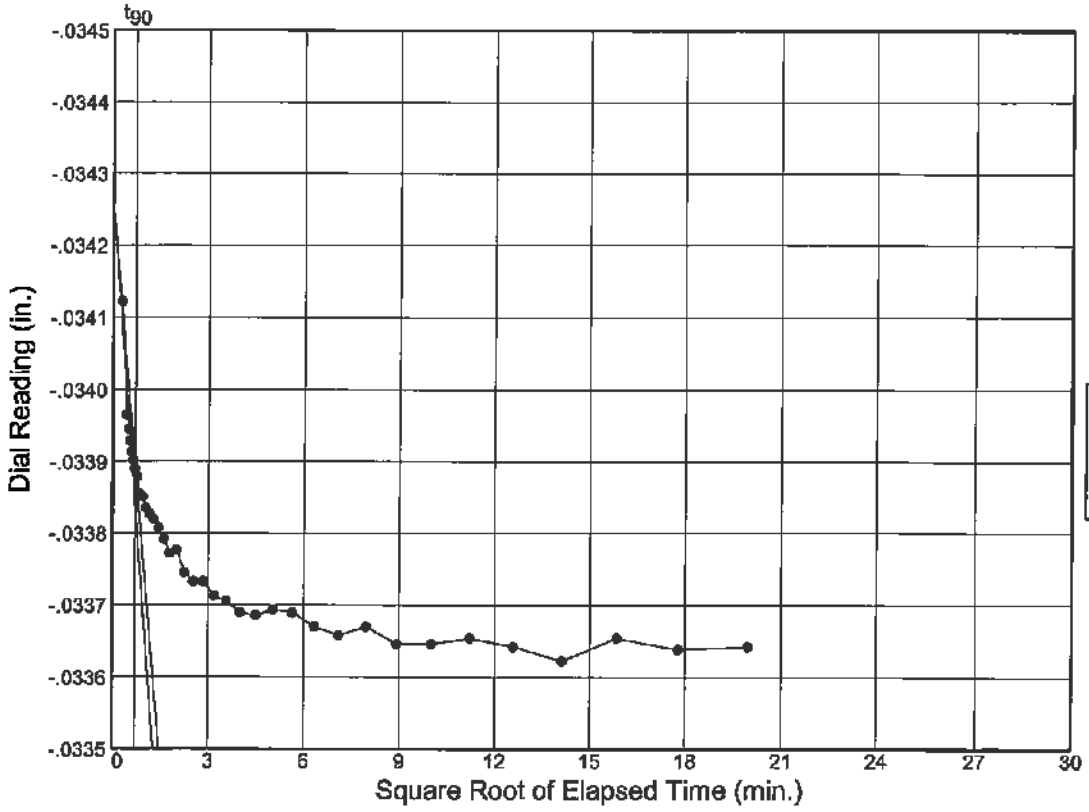
C_v @ T_{90}
3.85 ft.^{2}/day

Plate

Dial Reading vs. Time

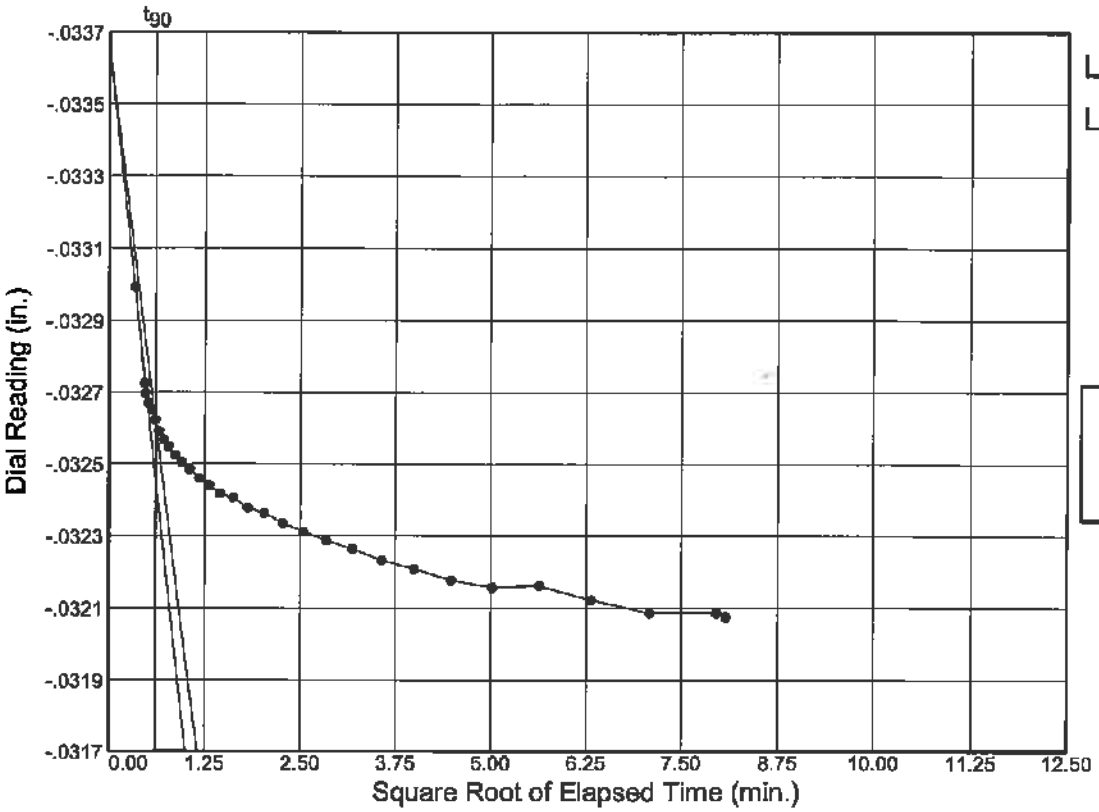
Project No.: 3520G
Project: Wekiva Parkway 7A

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



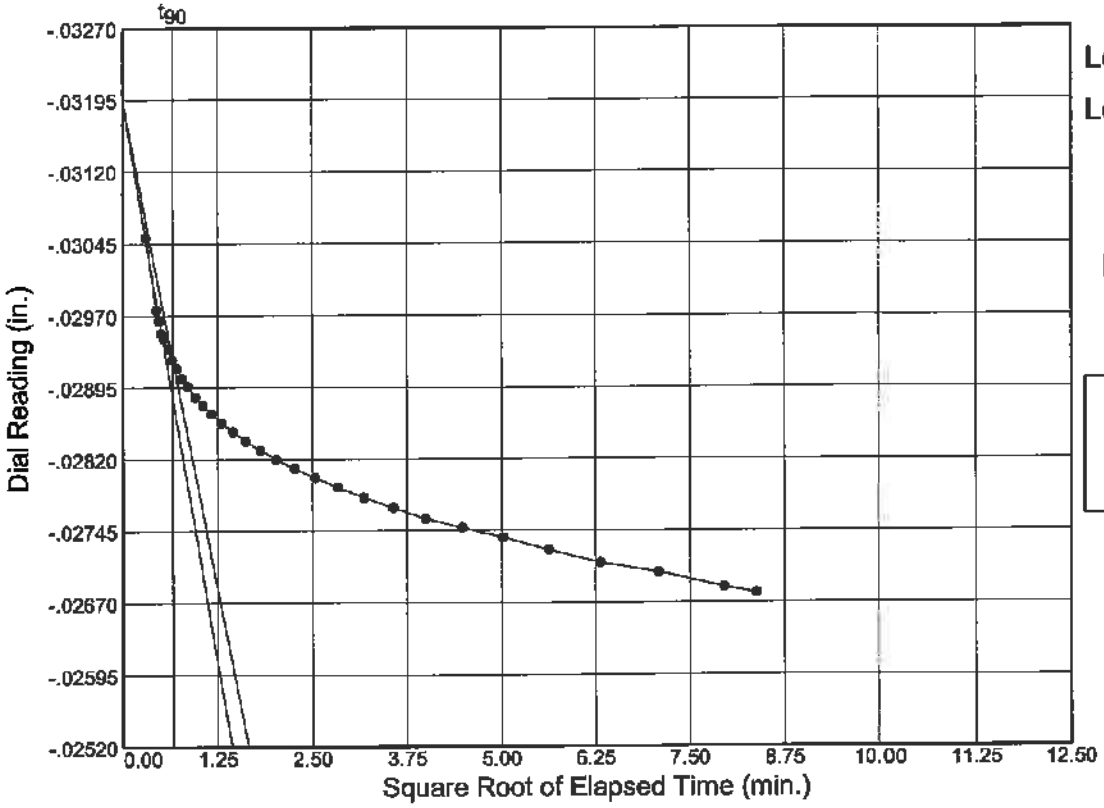
Load No.= 10
Load= 1.00 tsf
D_0 = -0.03365
D_{90} = -0.03262
D_{100} = -0.03251
T_{90} = 0.37 min.

C_v @ T_{90}
5.27 ft.^{2}/day

Dial Reading vs. Time

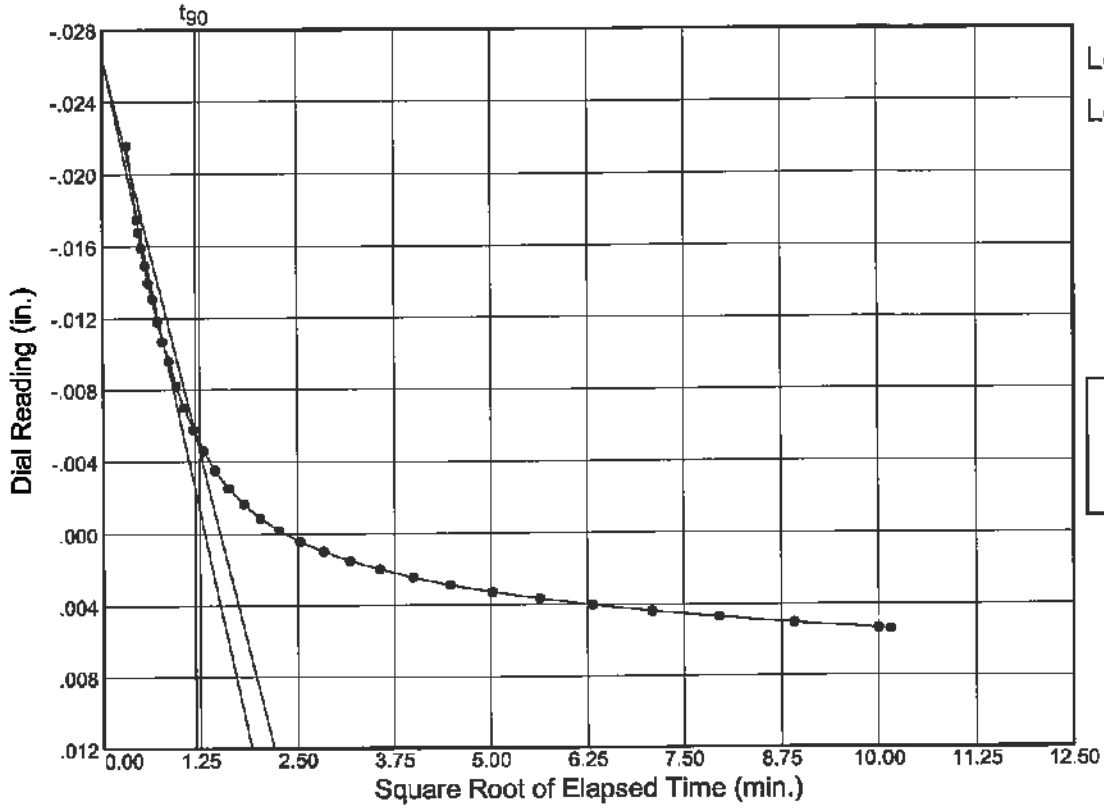
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

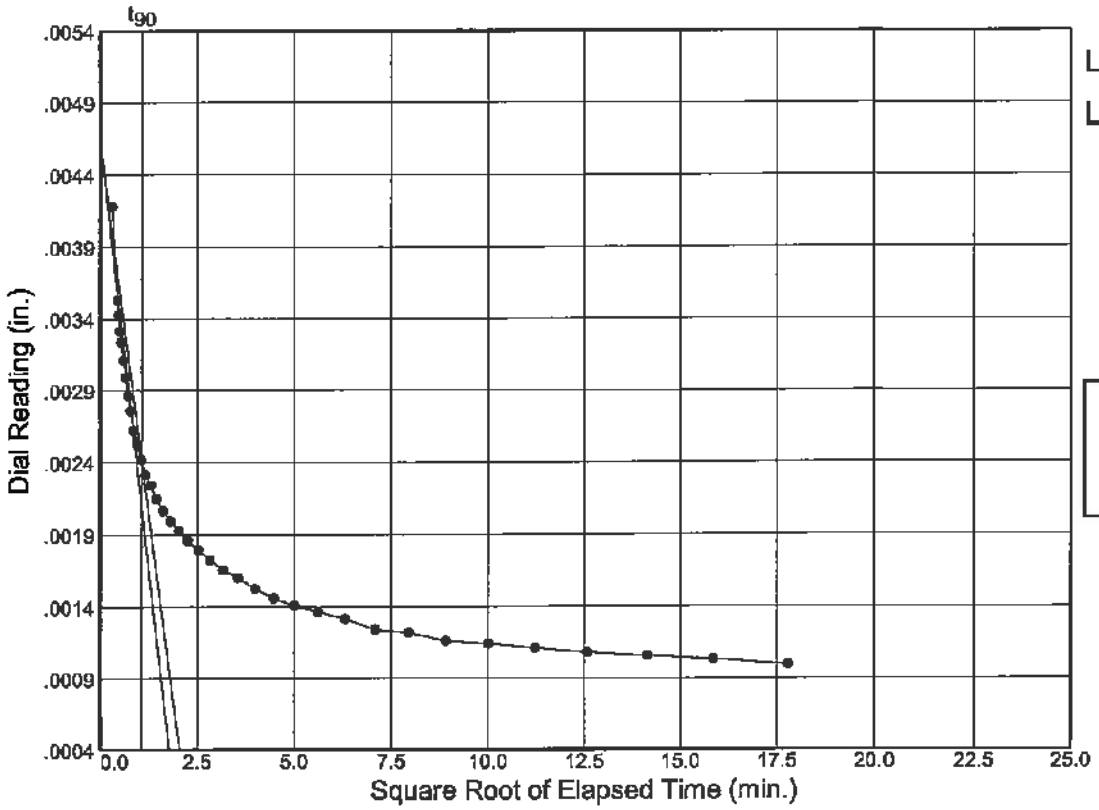
C_v @ T_{90}
1.31 ft.^{2}/day

Plate

Dial Reading vs. Time

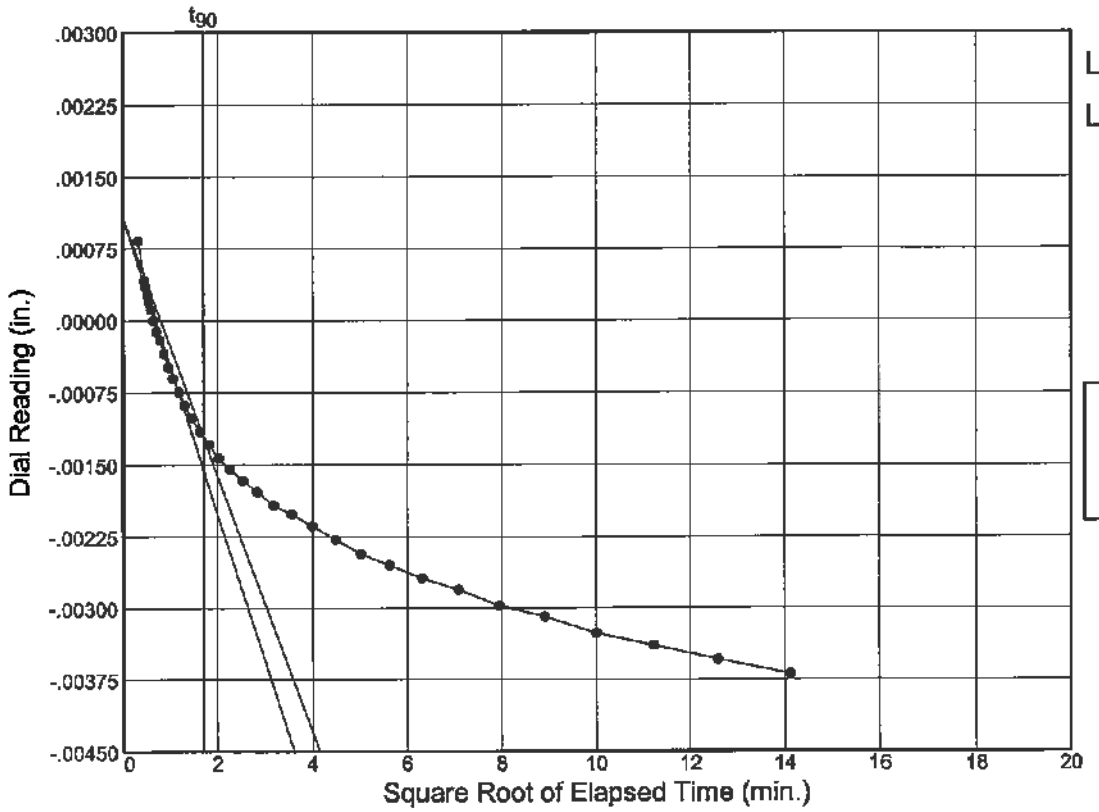
Project No.: 3520G
Project: Wekiva Parkway 7A

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



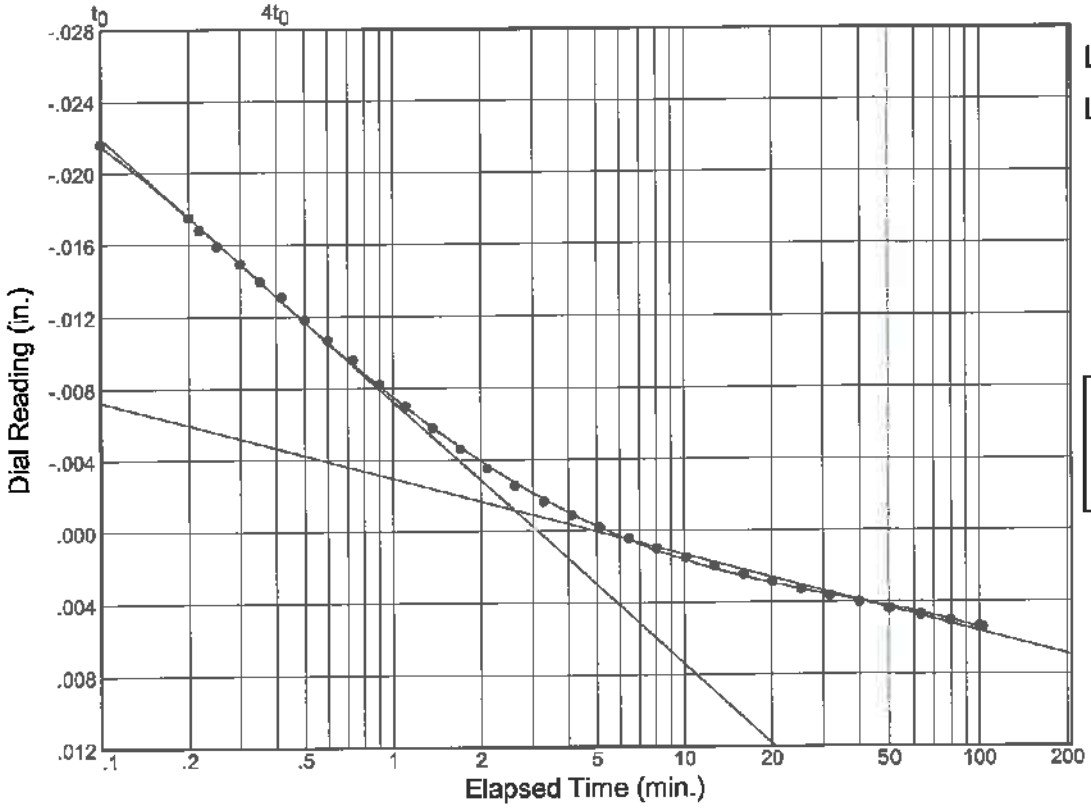
Load No.= 14
Load= 0.25 tsf
D_0 = 0.00107
D_{90} = -0.00121
D_{100} = -0.00146
T_{90} = 2.88 min.

C_v @ T_{90}
0.63 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

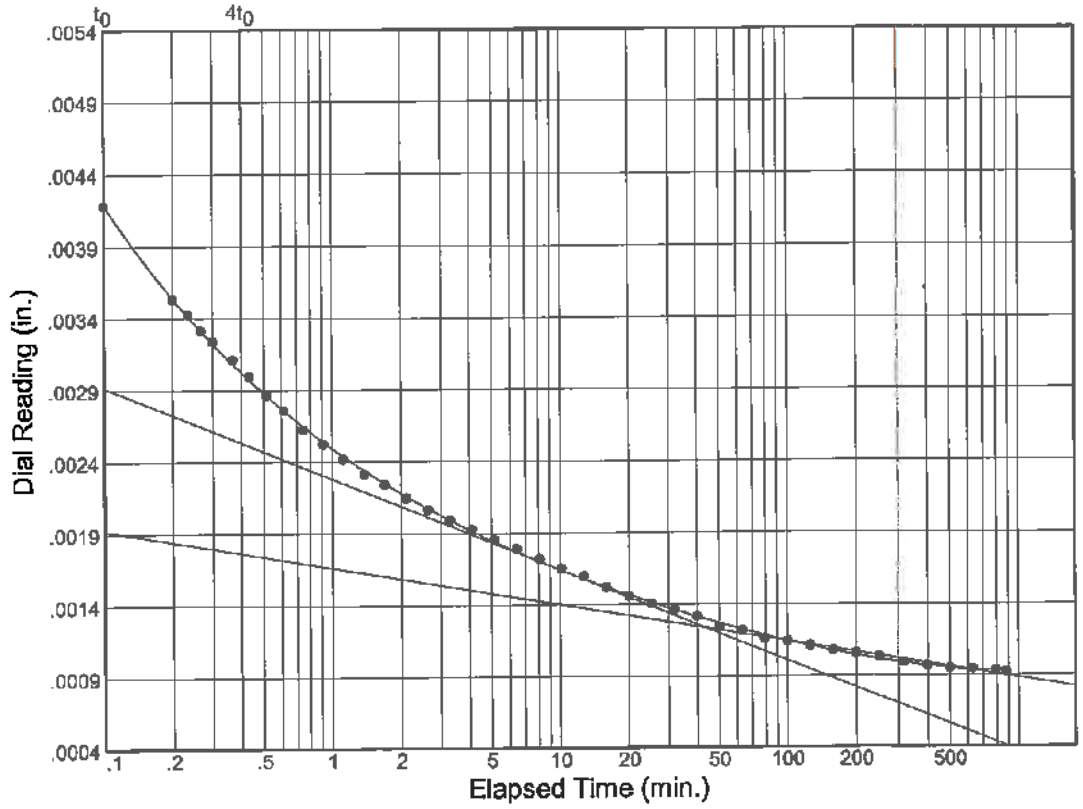
Location: WB-56 20'-22'



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

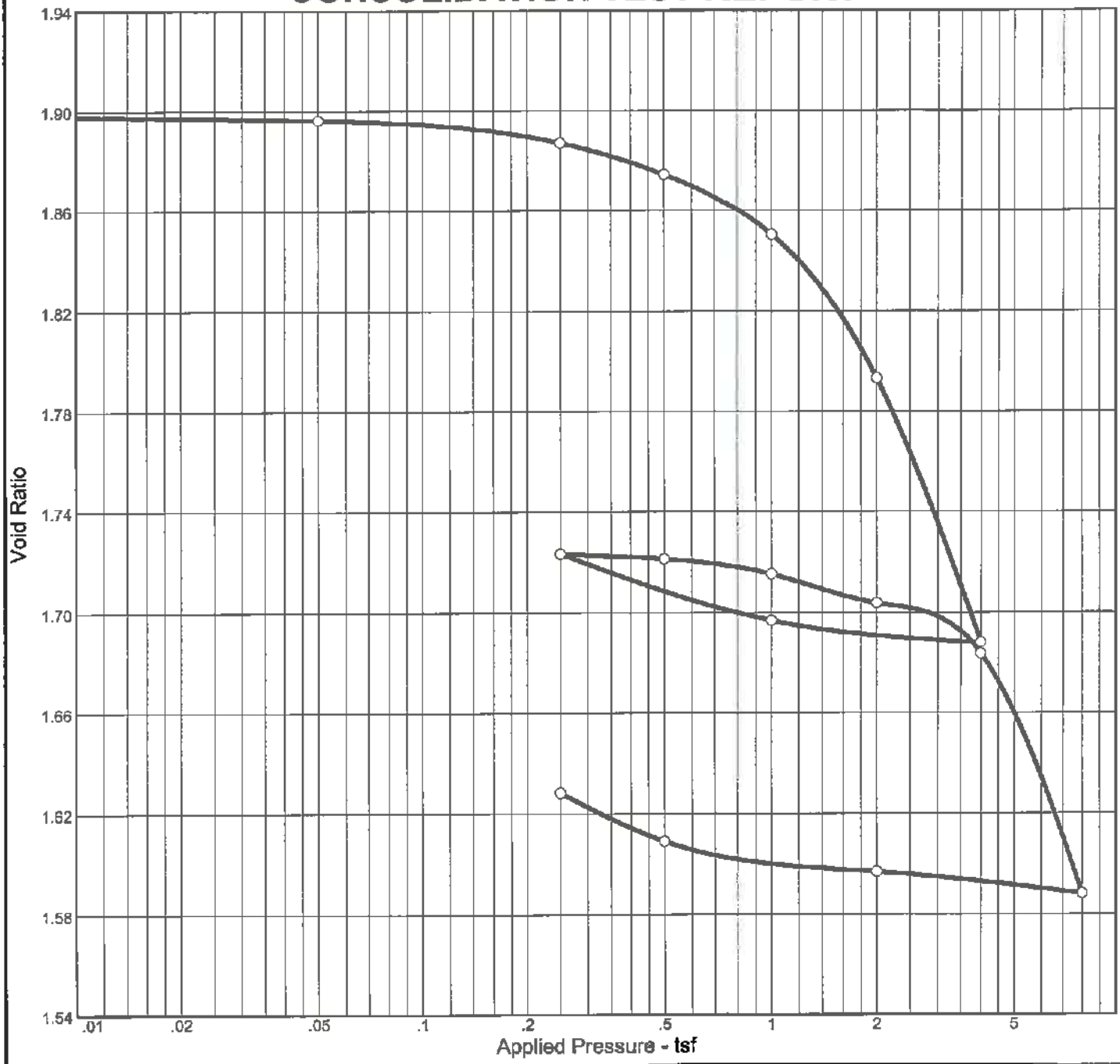
C_α = 0.004



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
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

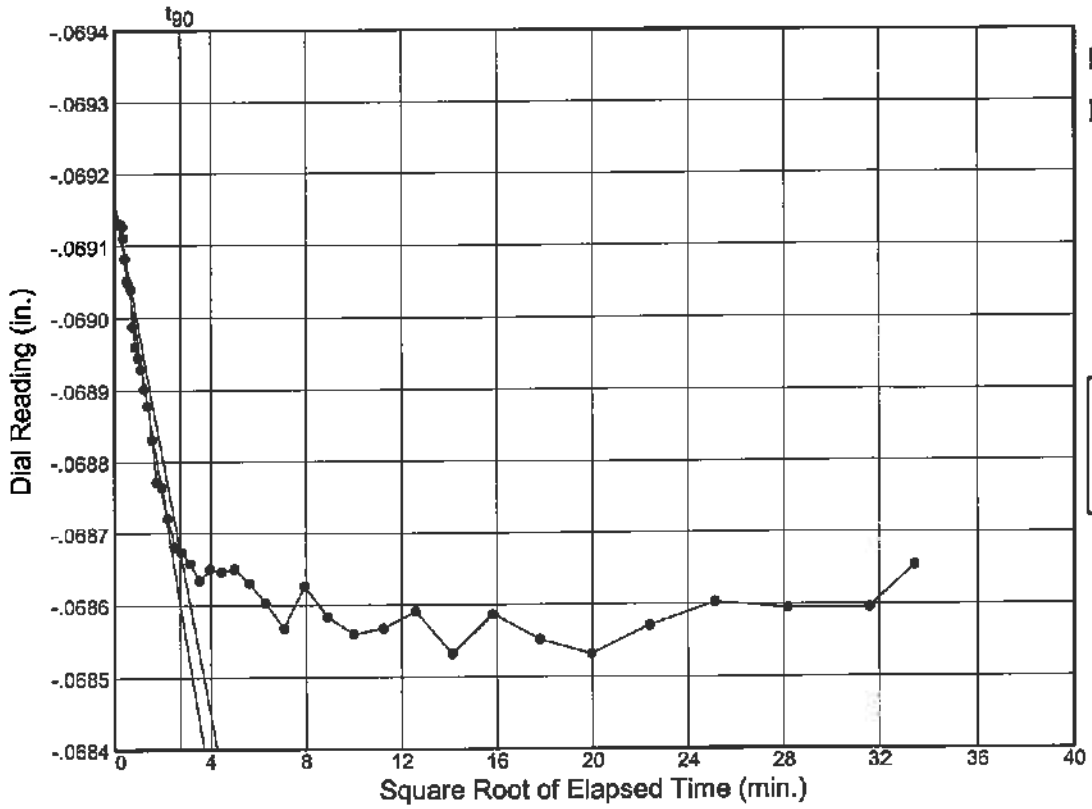
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

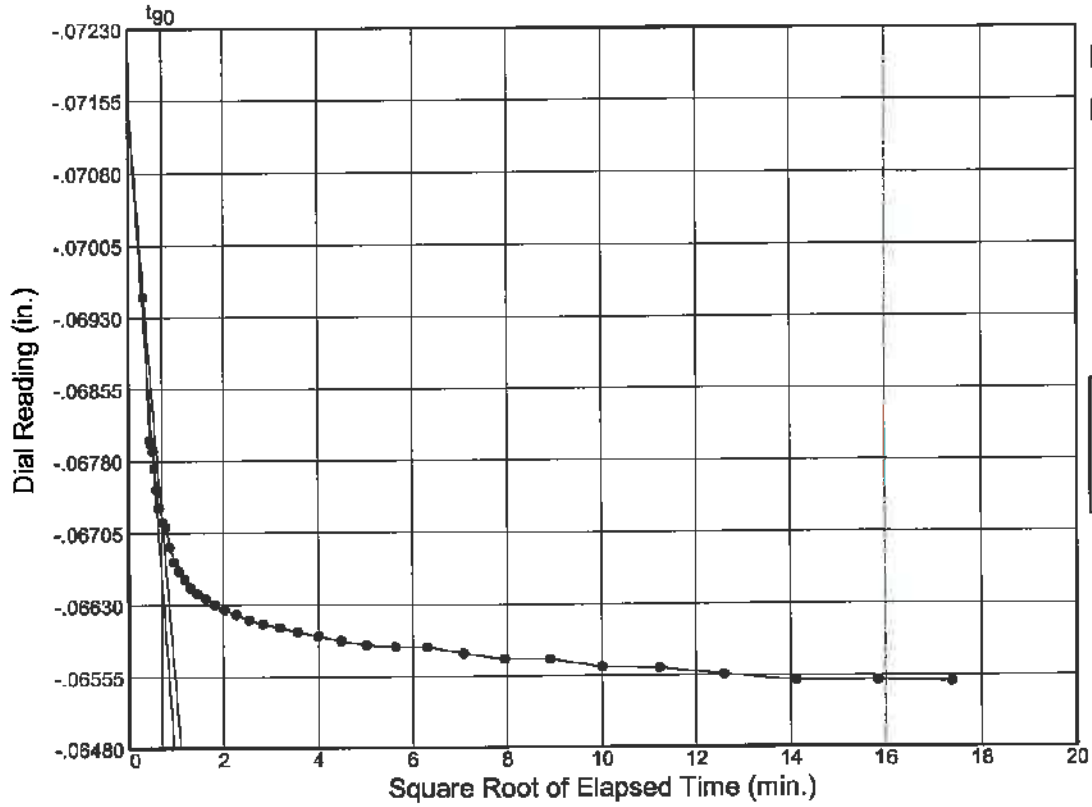
Project No.: 3520G
Project: Wekiva Parkway 7A

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



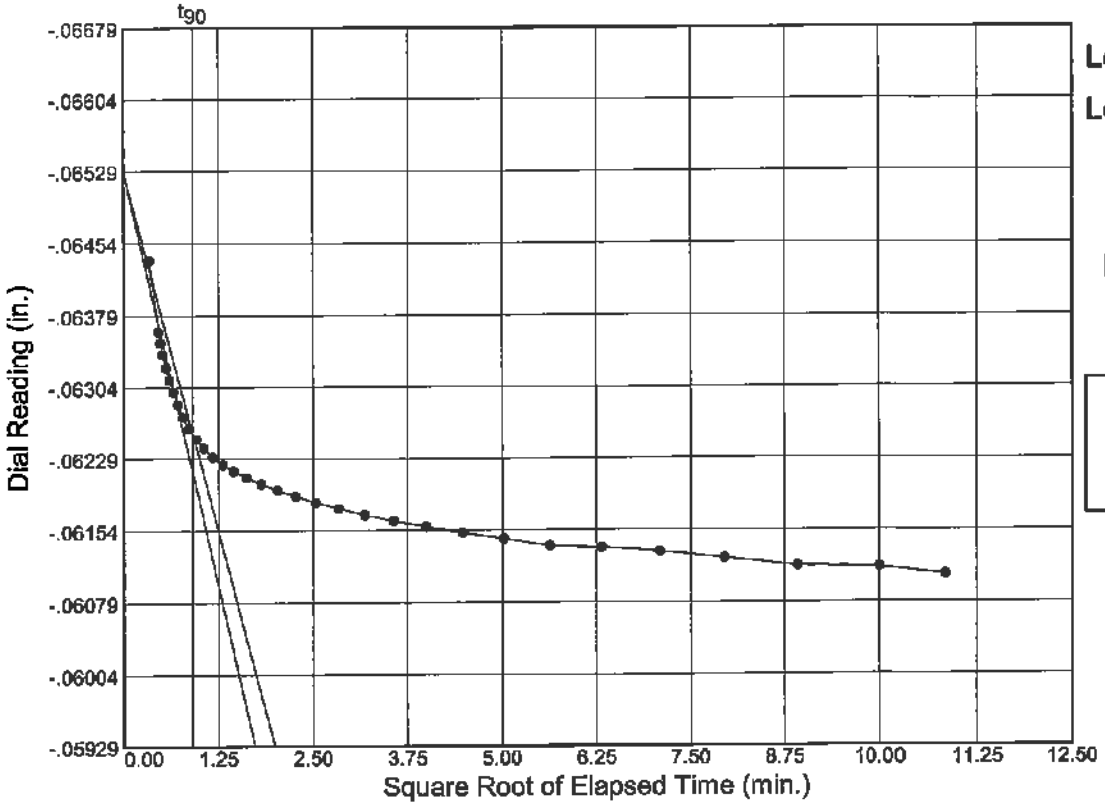
Load No.= 2
Load= 0.25 tsf
D_0 = -0.07155
D_{90} = -0.06719
D_{100} = -0.06671
T_{90} = 0.49 min.

C_v @ T_{90}
4.28 ft.^{2}/day

Dial Reading vs. Time

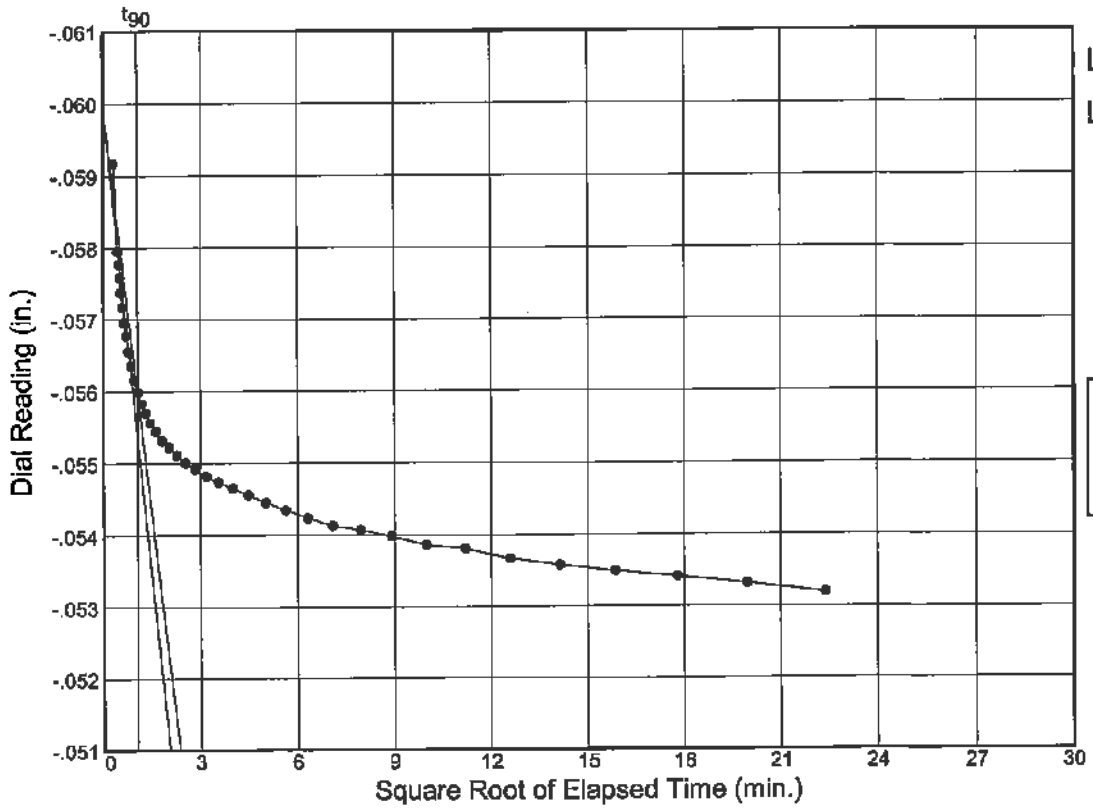
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

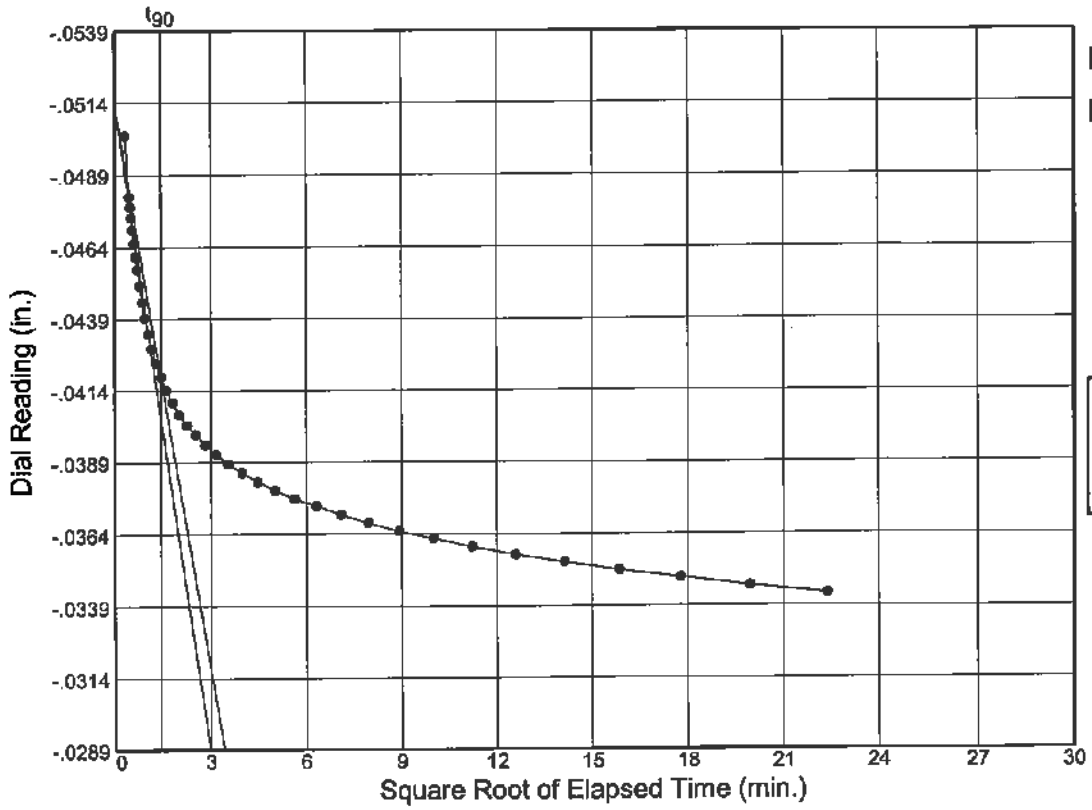
C_v @ T_{90}
1.90 ft.^{2}/day

Plate

Dial Reading vs. Time

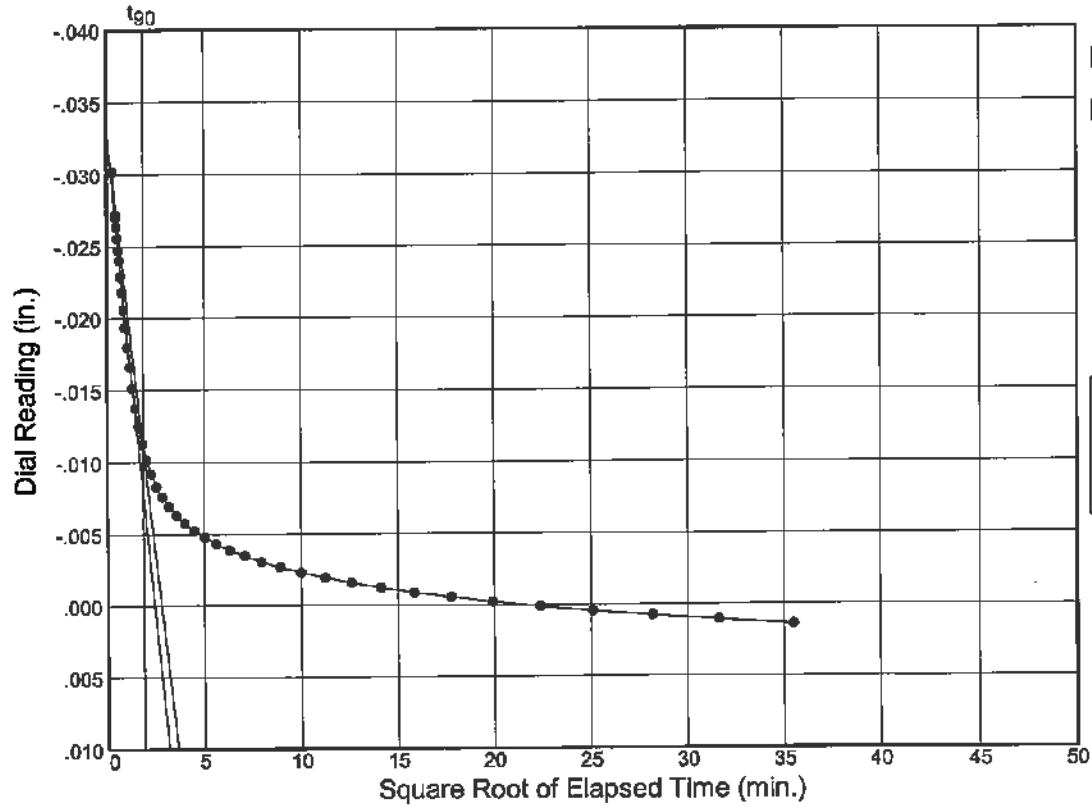
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

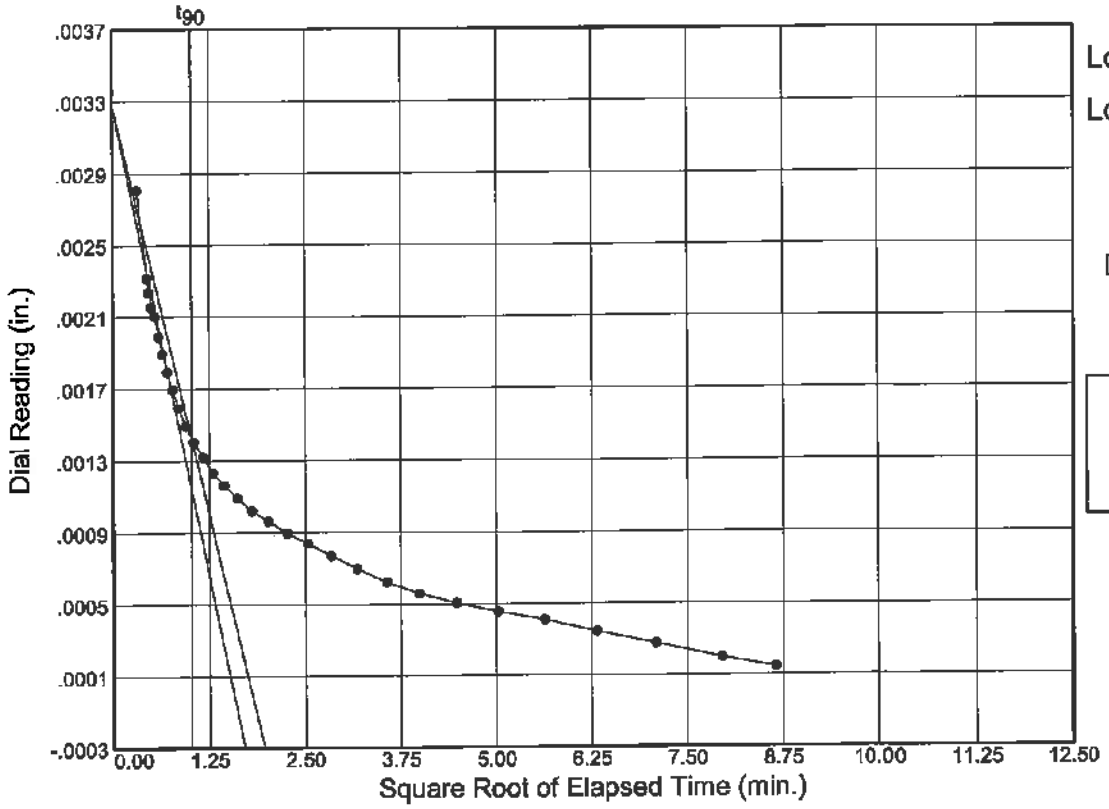
C_v @ T_{90}
0.55 ft.^{2}/day

Plate

Dial Reading vs. Time

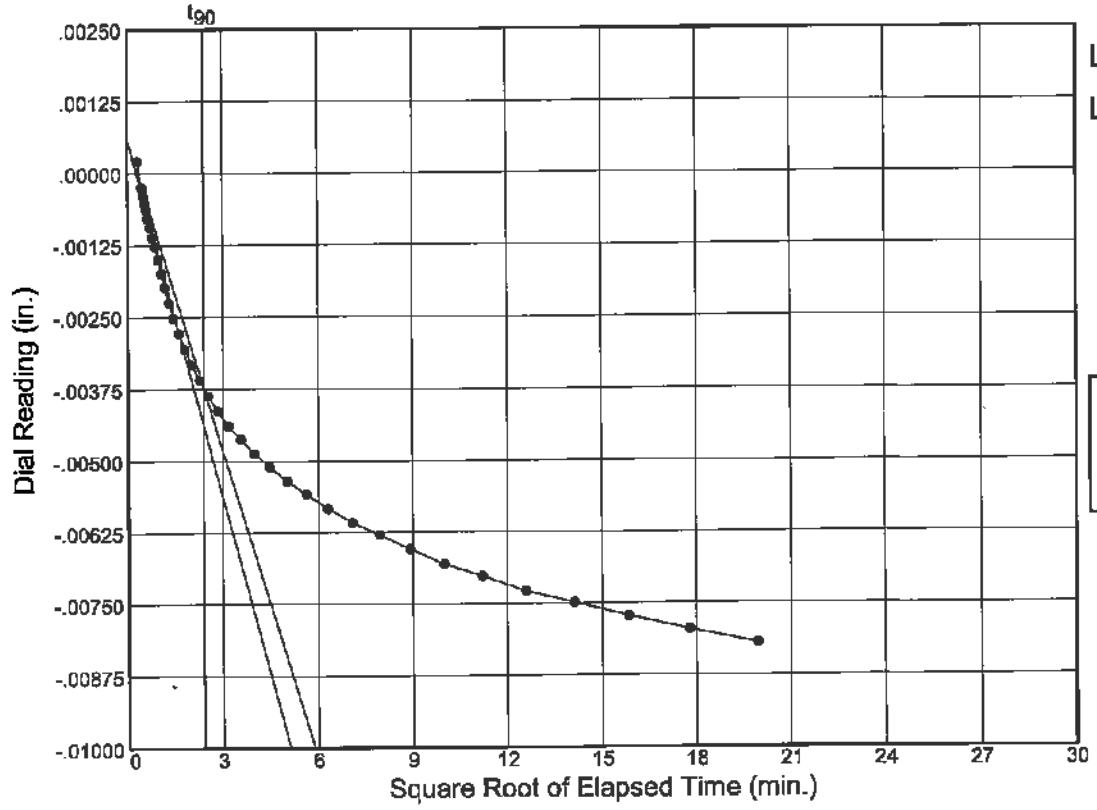
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

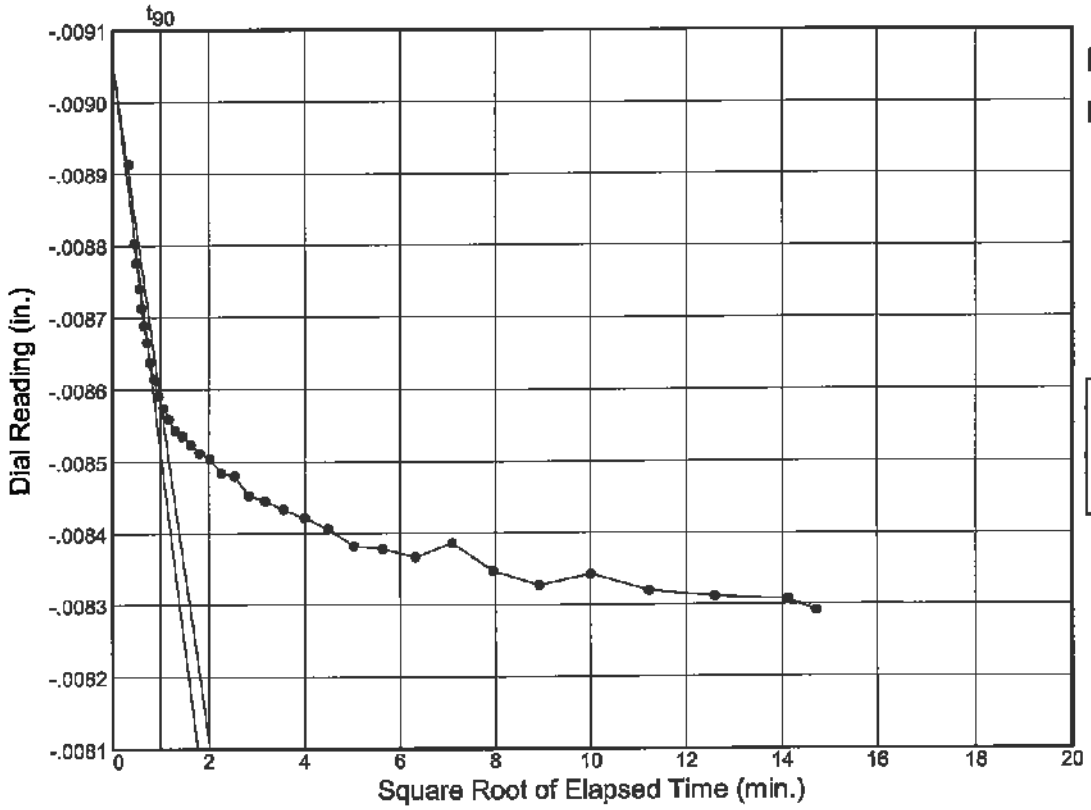
C_v @ T_{90}
0.33 ft.^{2}/day

Plate

Dial Reading vs. Time

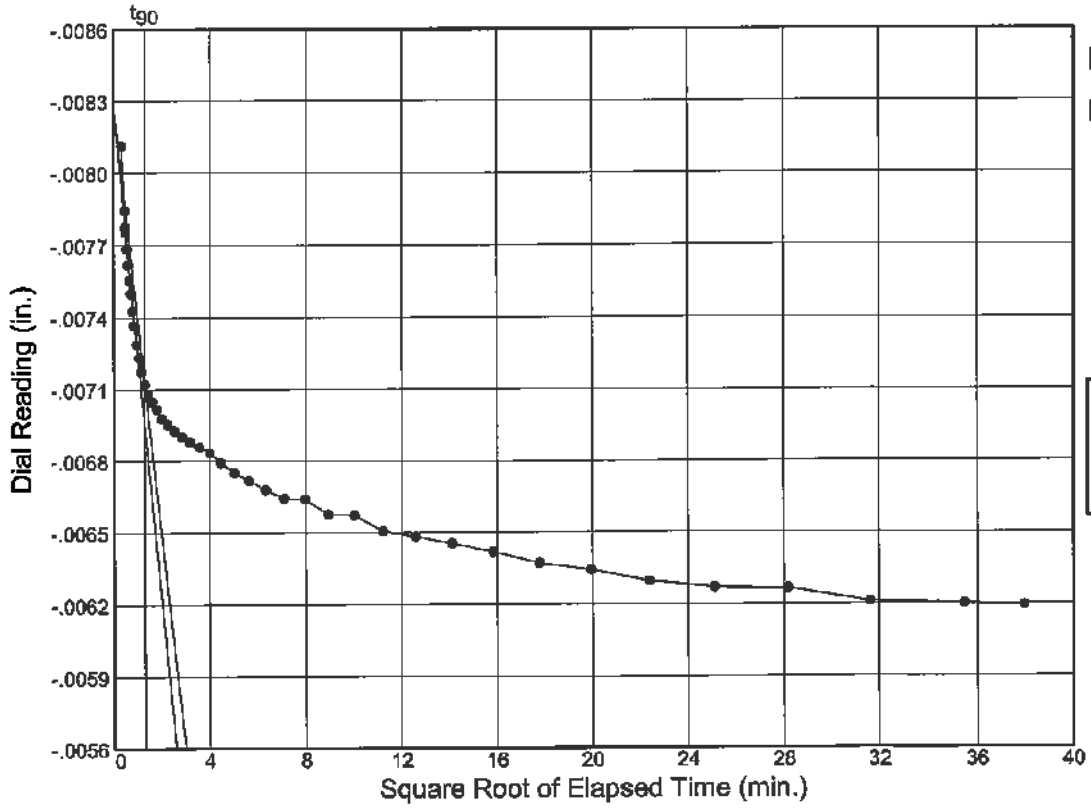
Project No.: 3520G
Project: Wekiva Parkway 7A

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



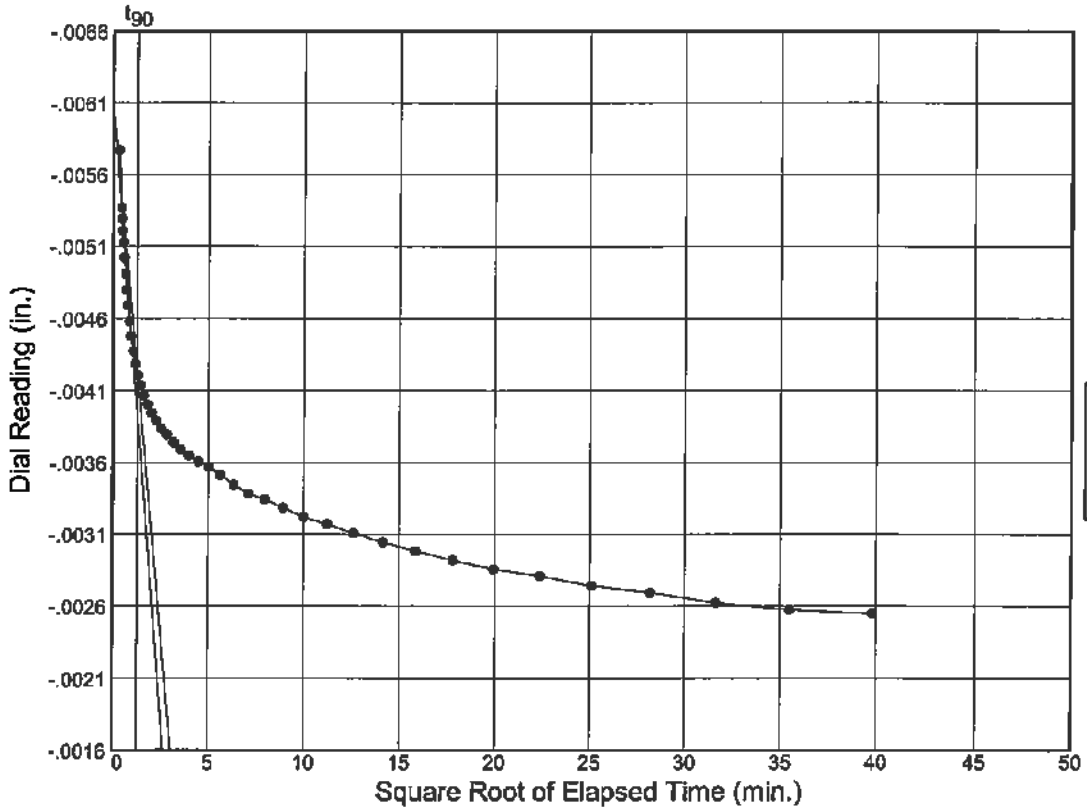
Load No.= 10
Load= 1.00 tsf
D_0 = -0.00828
D_{90} = -0.00713
D_{100} = -0.00700
T_{90} = 1.65 min.

C_v @ T_{90}
1.13 ft.^{2}/day

Dial Reading vs. Time

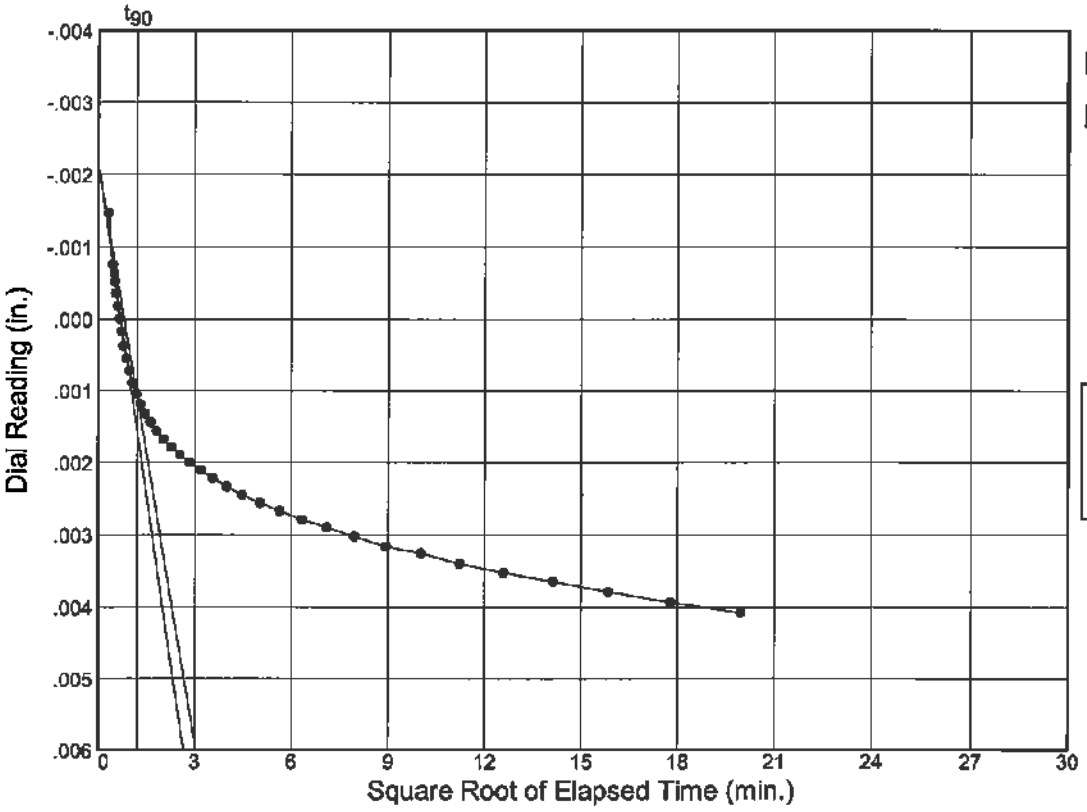
Project No.: 3520G
Project: Wekiva Parkway 7A

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



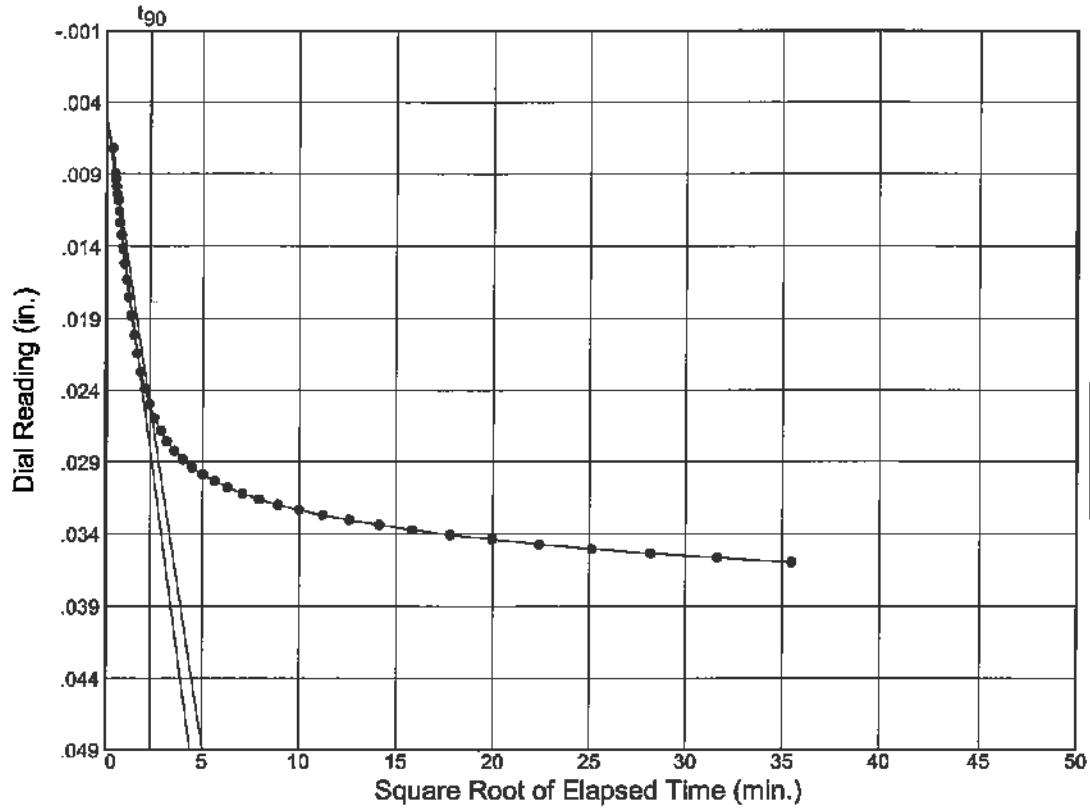
Load No.= 12
Load= 4.00 tsf
D_0 = -0.00214
D_{90} = 0.00108
D_{100} = 0.00143
T_{90} = 1.45 min.

C_v @ T_{90}
1.27 ft.^{2}/day

Dial Reading vs. Time

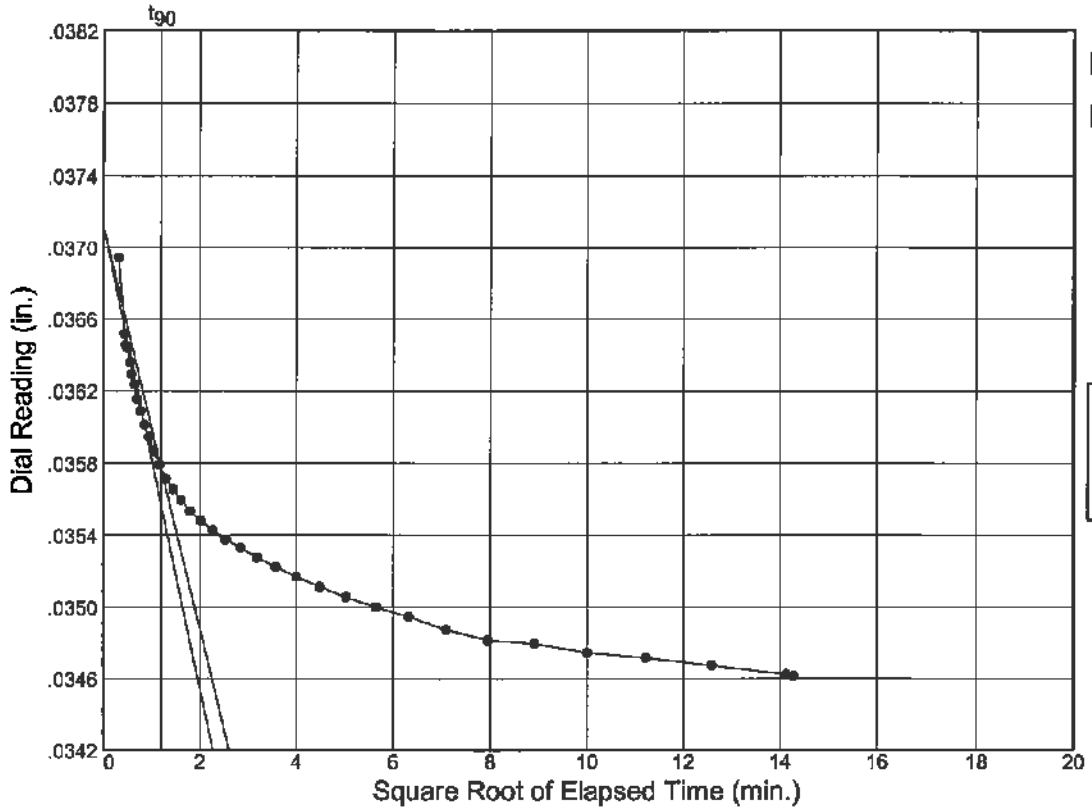
Project No.: 3520G
Project: Wekiva Parkway 7A

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



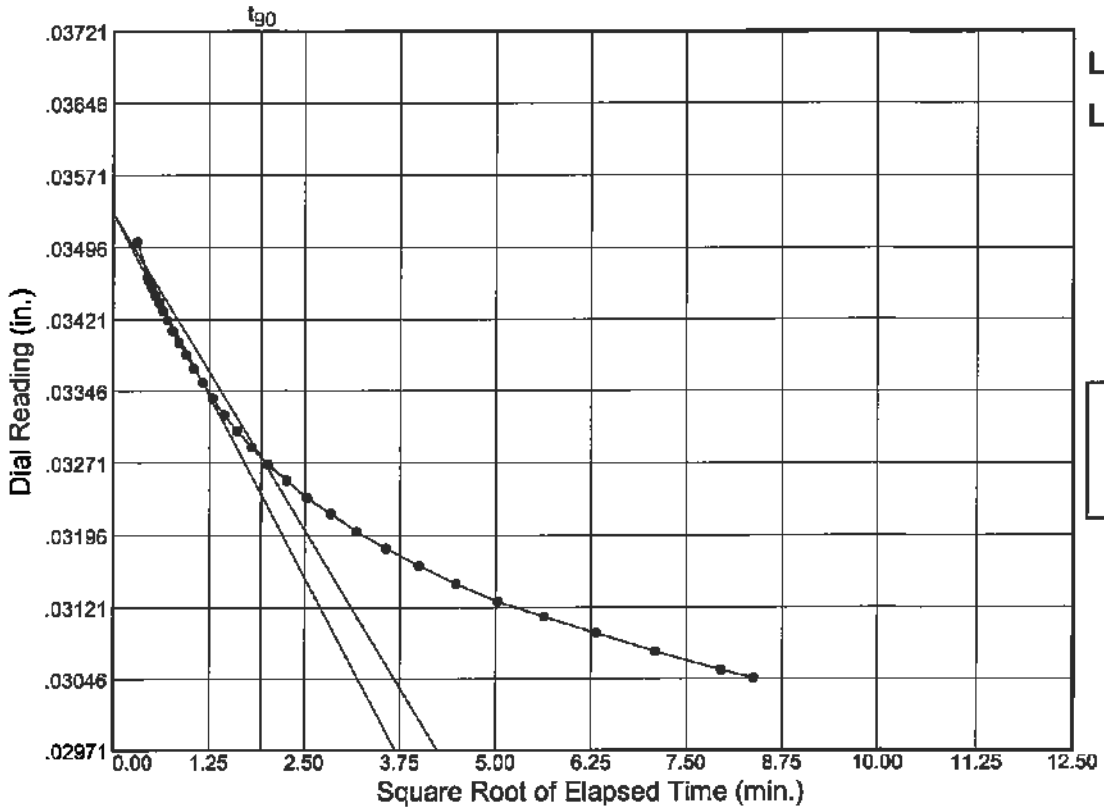
Load No.= 14
Load= 2.00 tsf
D_0 = 0.03712
D_{90} = 0.03577
D_{100} = 0.03562
T_{90} = 1.44 min.

C_v @ T_{90}
1.17 ft.^{2}/day

Dial Reading vs. Time

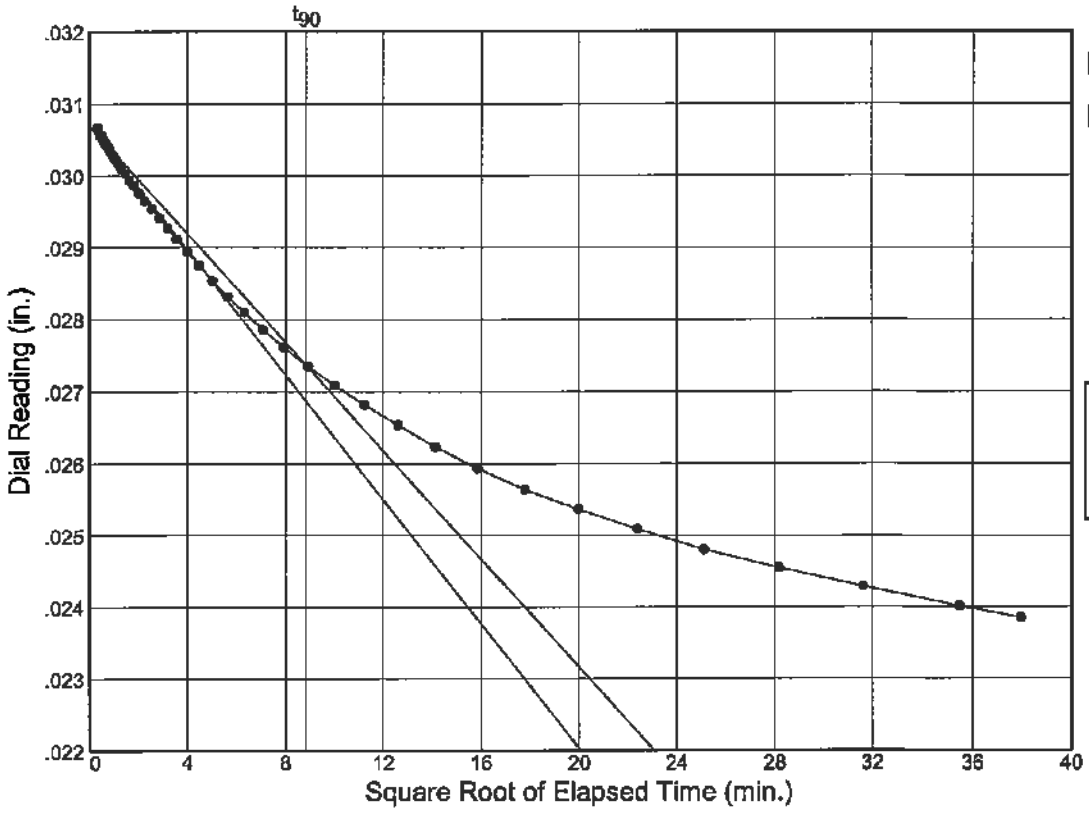
Project No.: 3520G
Project: Wekiva Parkway 7A

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



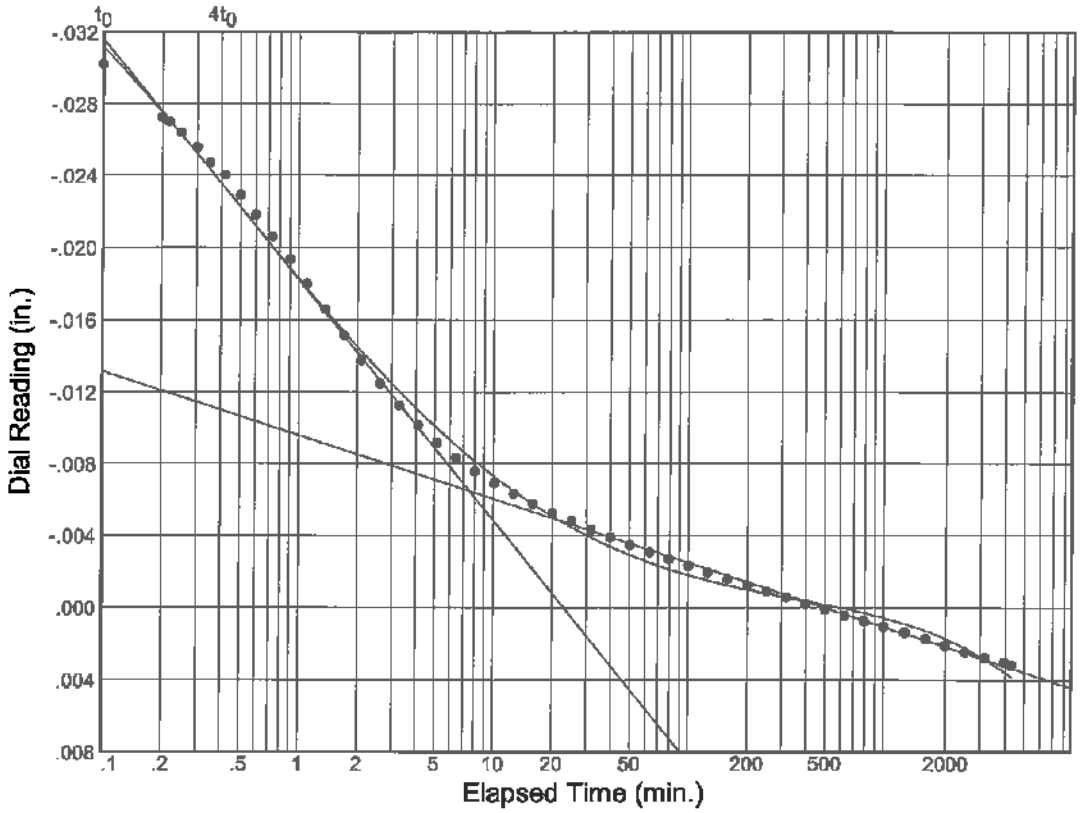
Load No.= 16
Load= 0.25 tsf
D_0 = 0.03070
D_{90} = 0.02737
D_{100} = 0.02700
T_{90} = 78.12 min.

C_v @ T_{90}
0.02 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

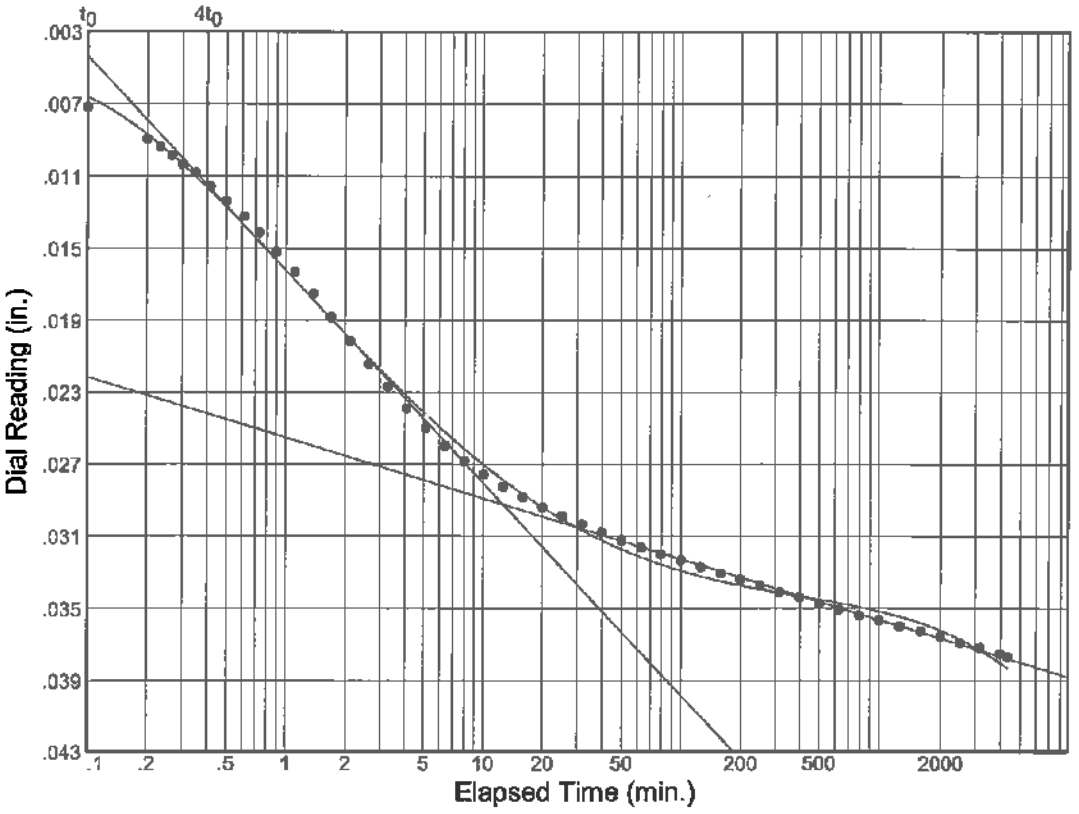
Location: MB-14 50'-52'



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

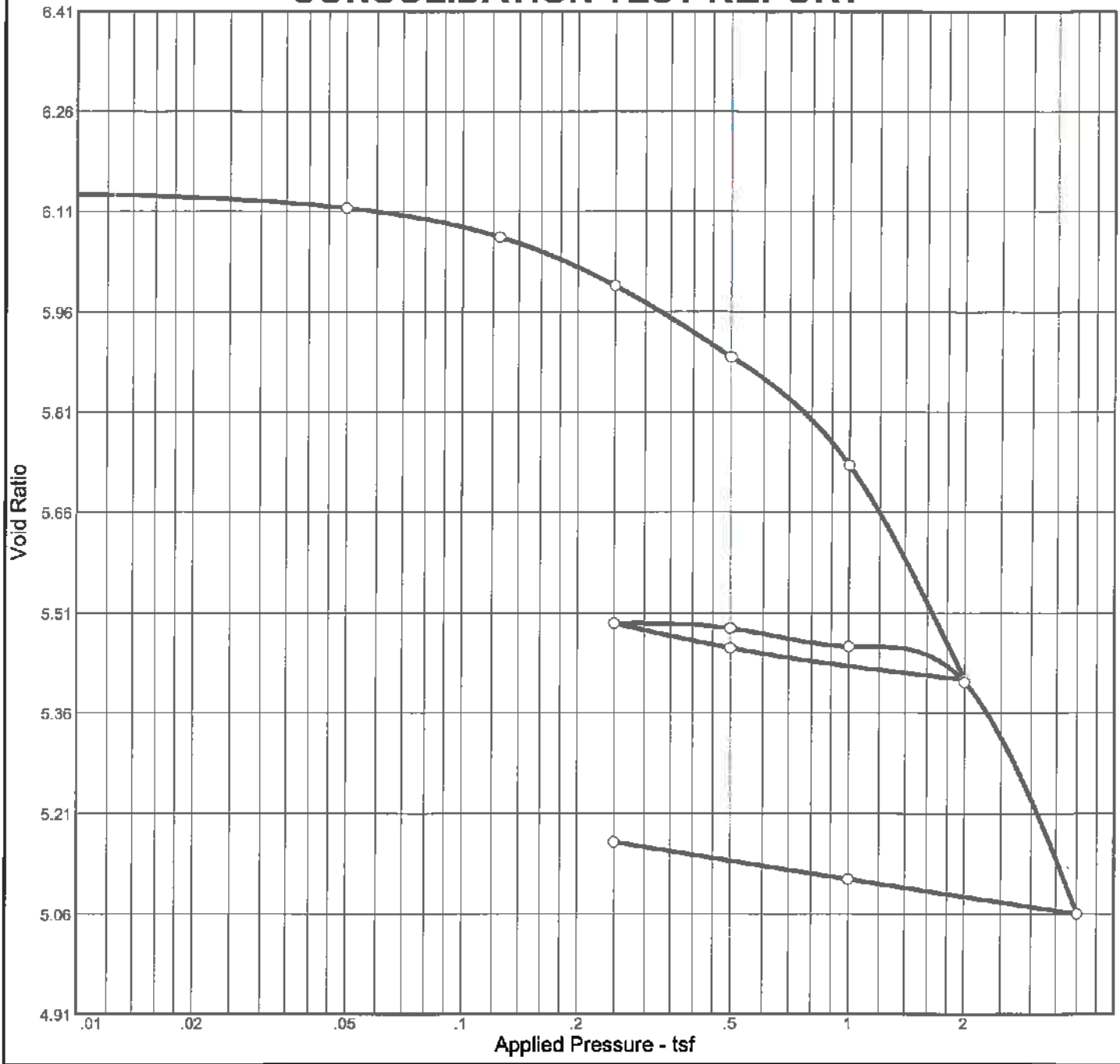


Load No.= 13
Load= 8.00 tsf
D_0 = 0.00163
D_{50} = 0.01543
D_{100} = 0.02924
T_{50} = 0.86 min.

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.											
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

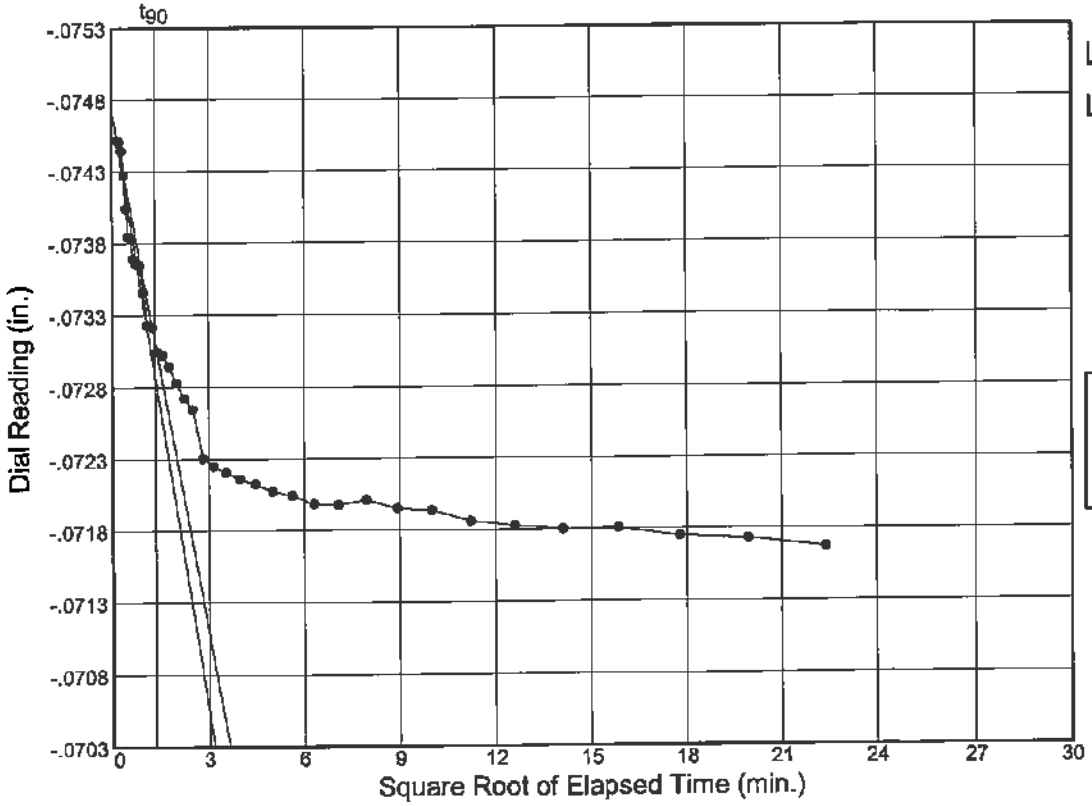
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

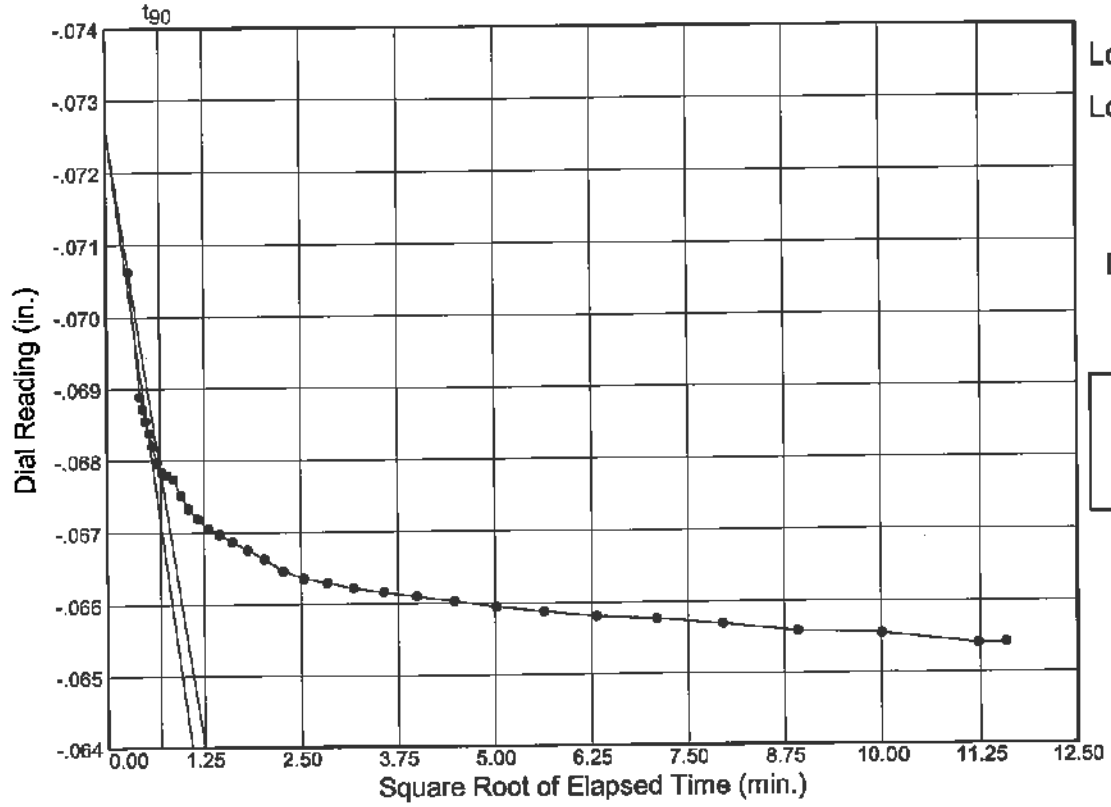
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

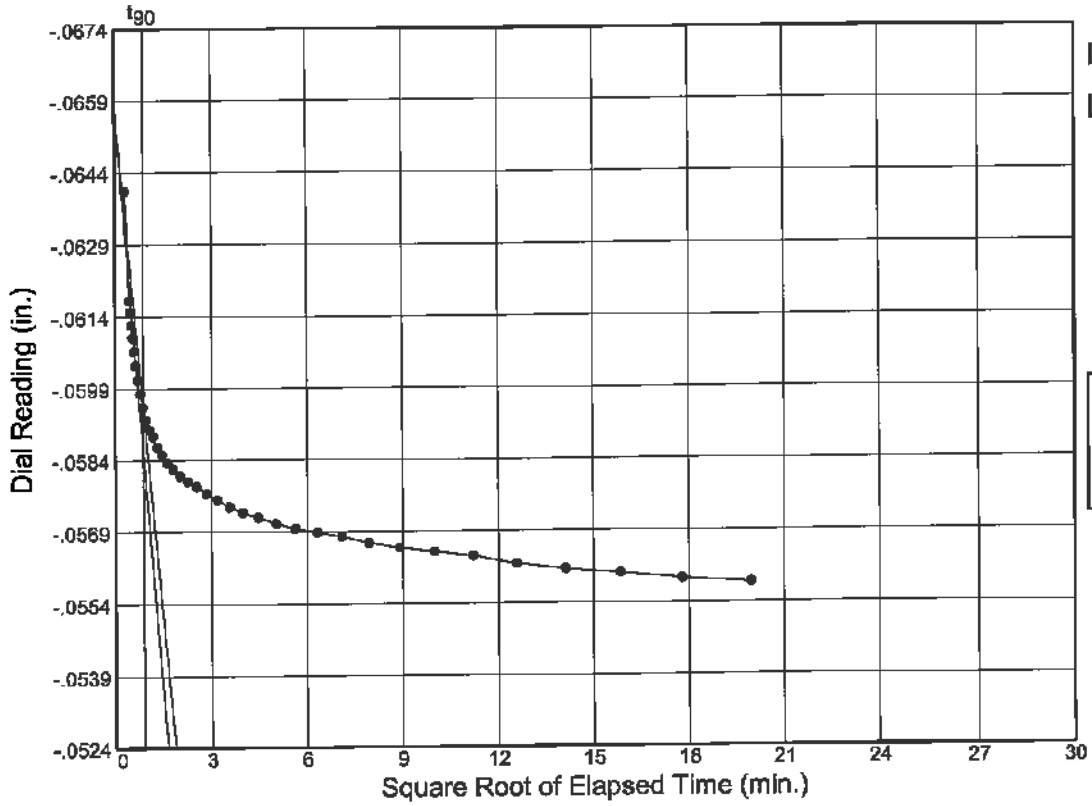
C_v @ T_{90}
4.43 ft.^{2}/day

Plate

Dial Reading vs. Time

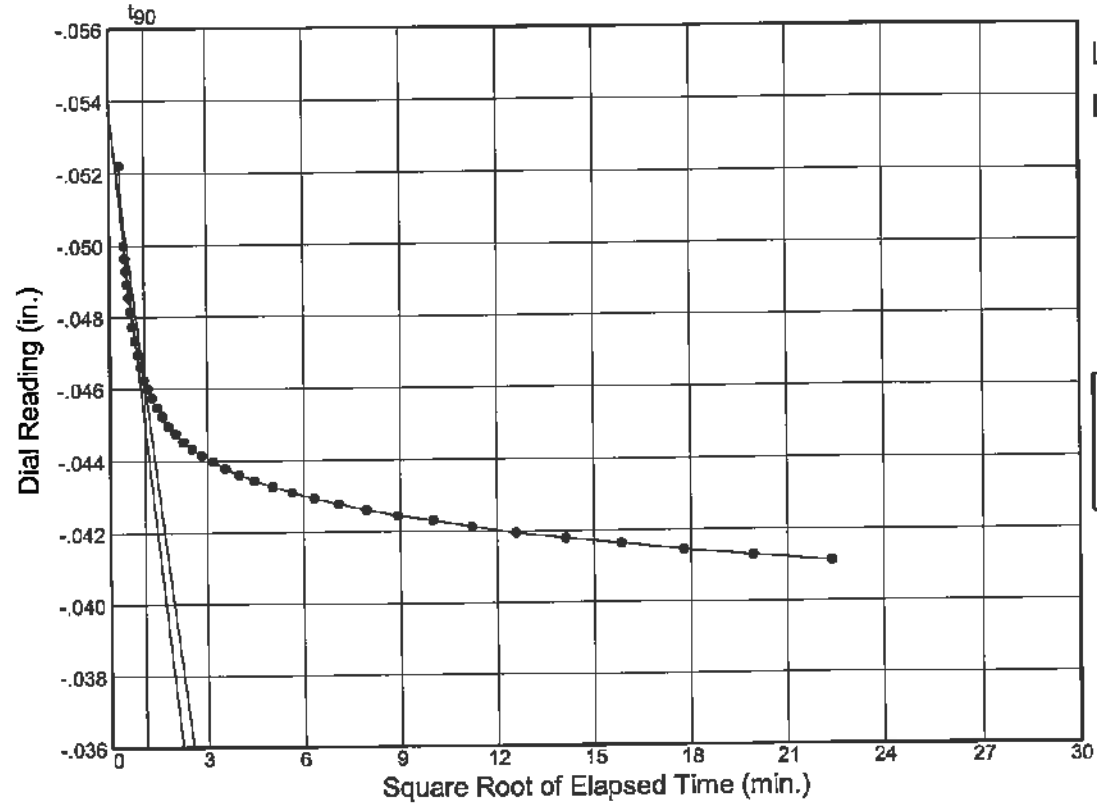
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

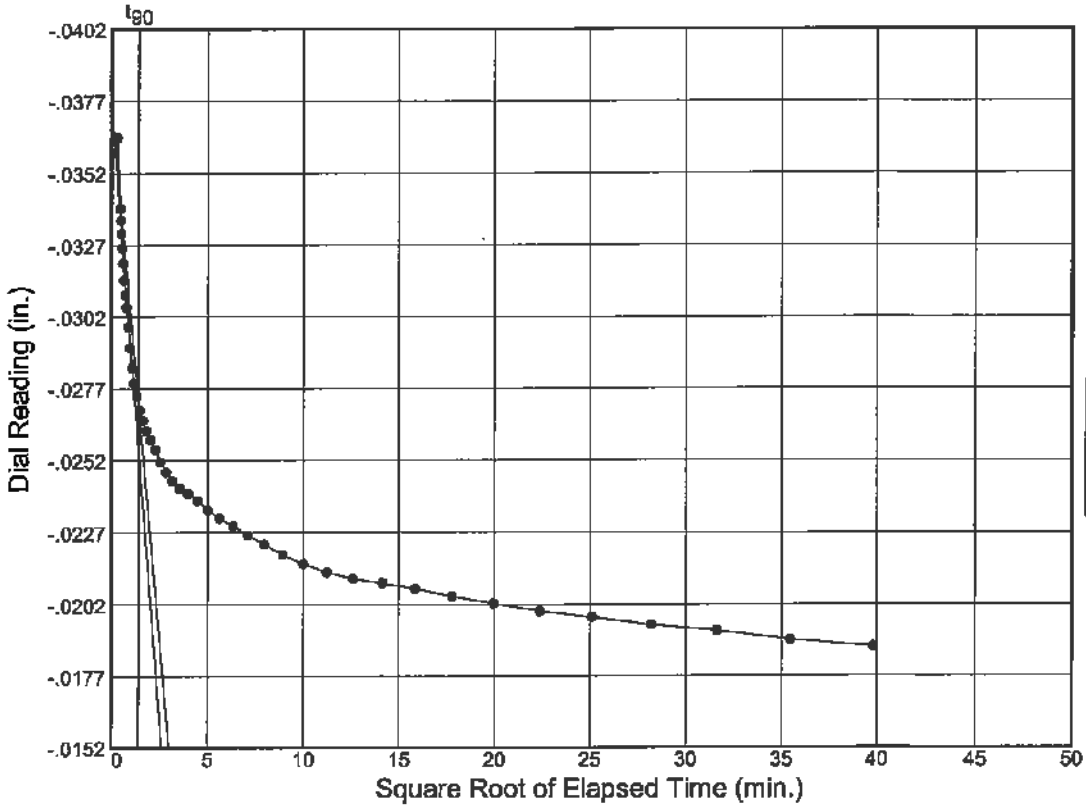
C_v @ T_{90}
1.74 $ft.^2$/day

Plate

Dial Reading vs. Time

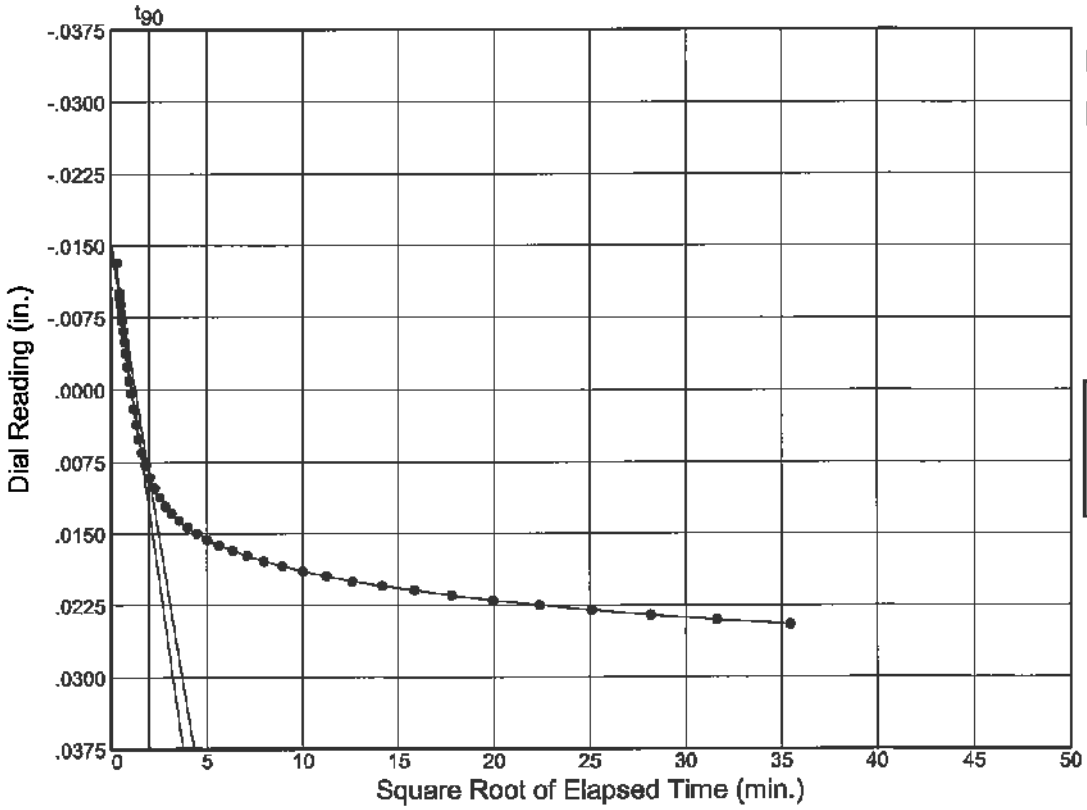
Project No.: 3520G
Project: Wekiva Parkway 7A

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



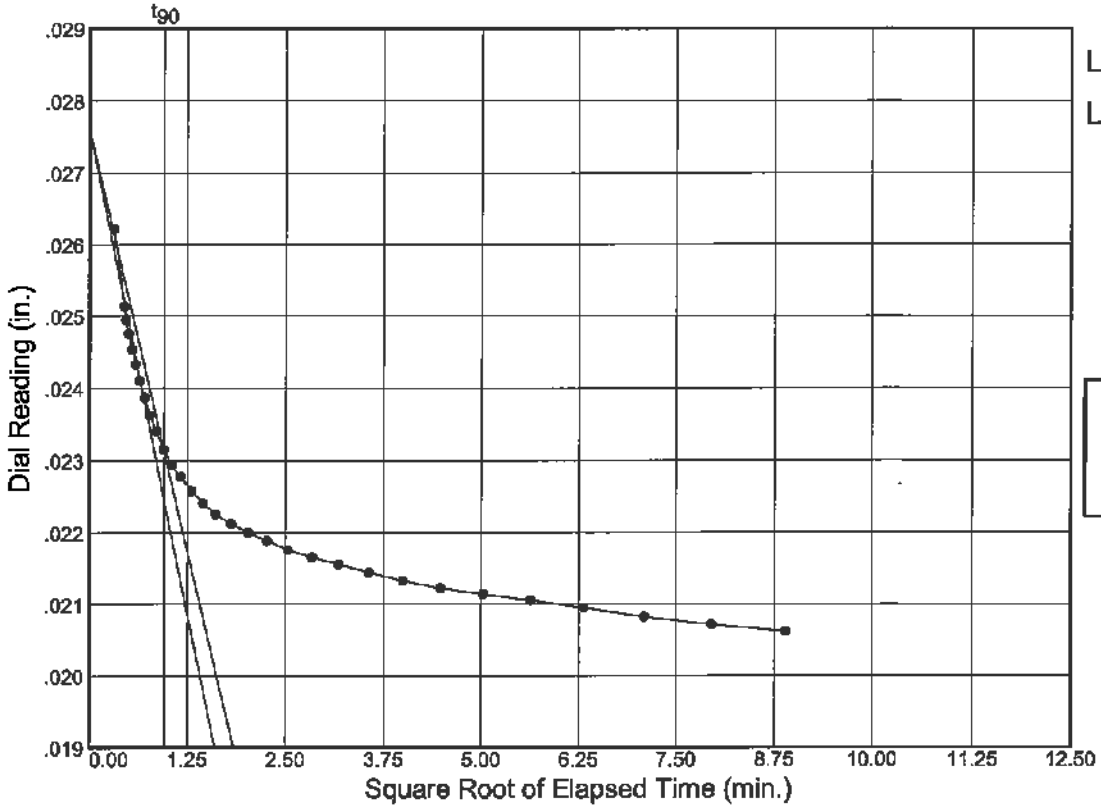
Load No.= 6
Load= 2.00 tsf
D_0 = -0.01552
D_{90} = 0.00891
D_{100} = 0.01162
T_{90} = 3.95 min.

C_v @ T_{90}
0.46 ft.^{2}/day

Dial Reading vs. Time

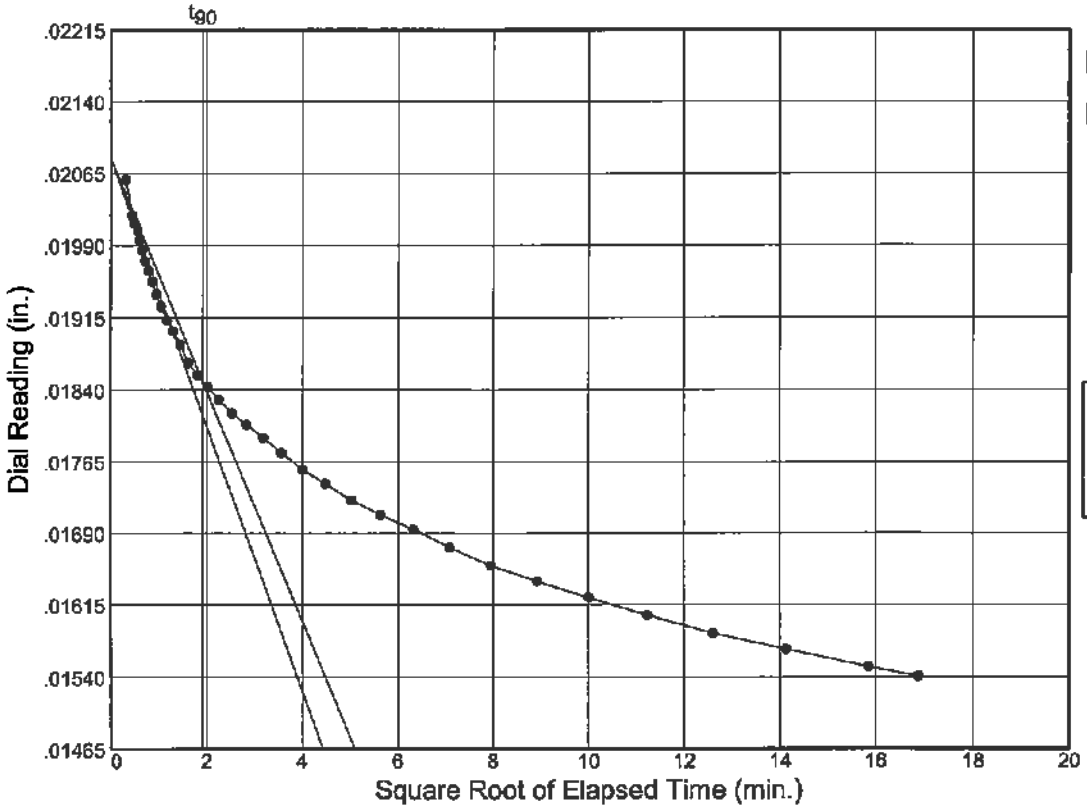
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

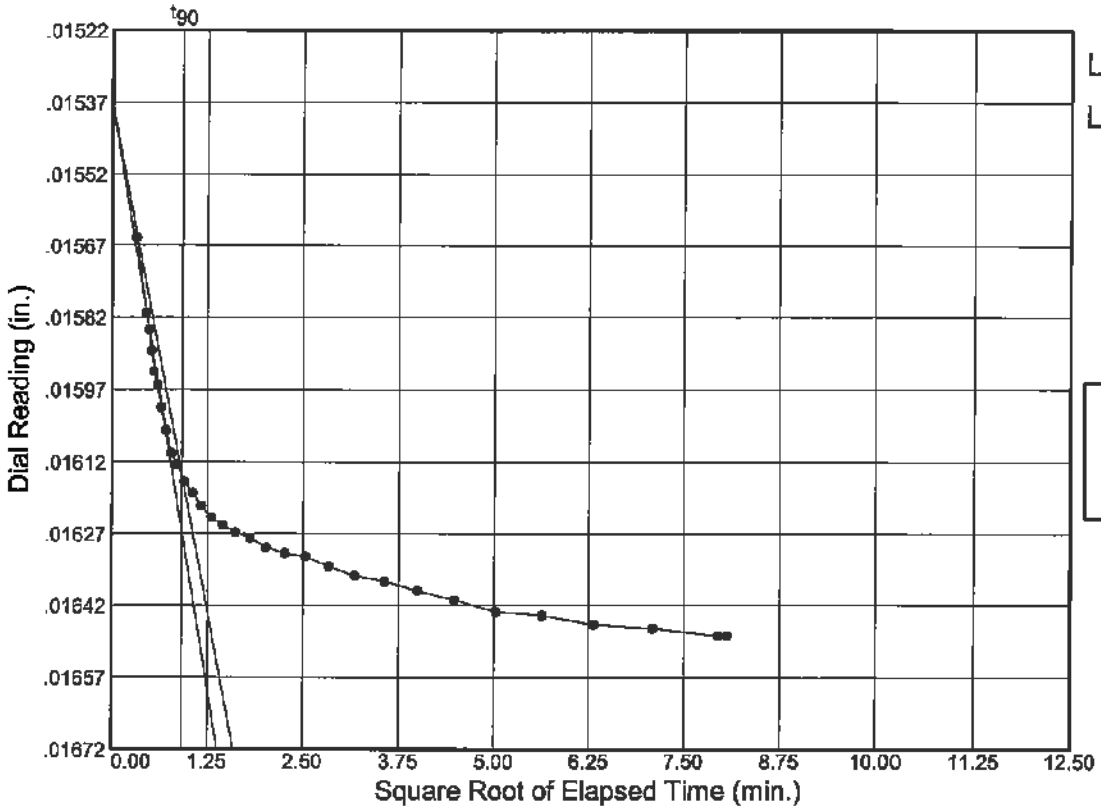
C_v @ T_{90}
0.48 ft.^{2}/day

Plate

Dial Reading vs. Time

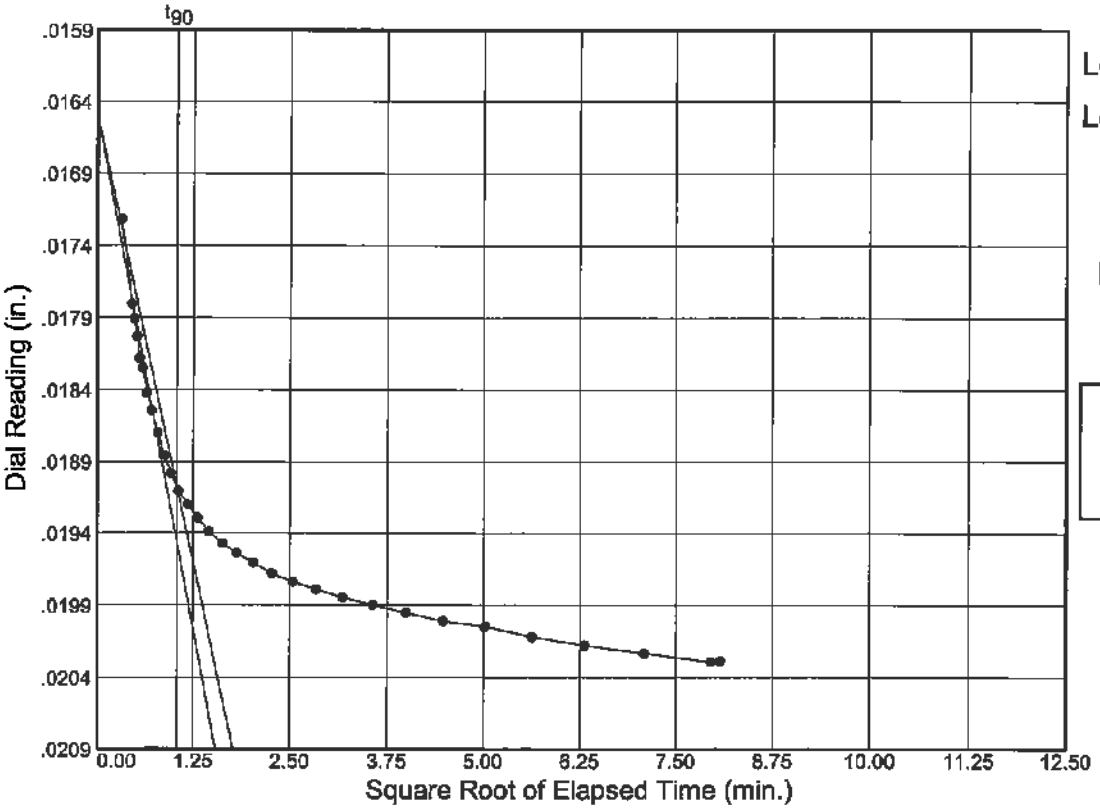
Project No.: 3520G
Project: Wekiva Parkway 7A

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



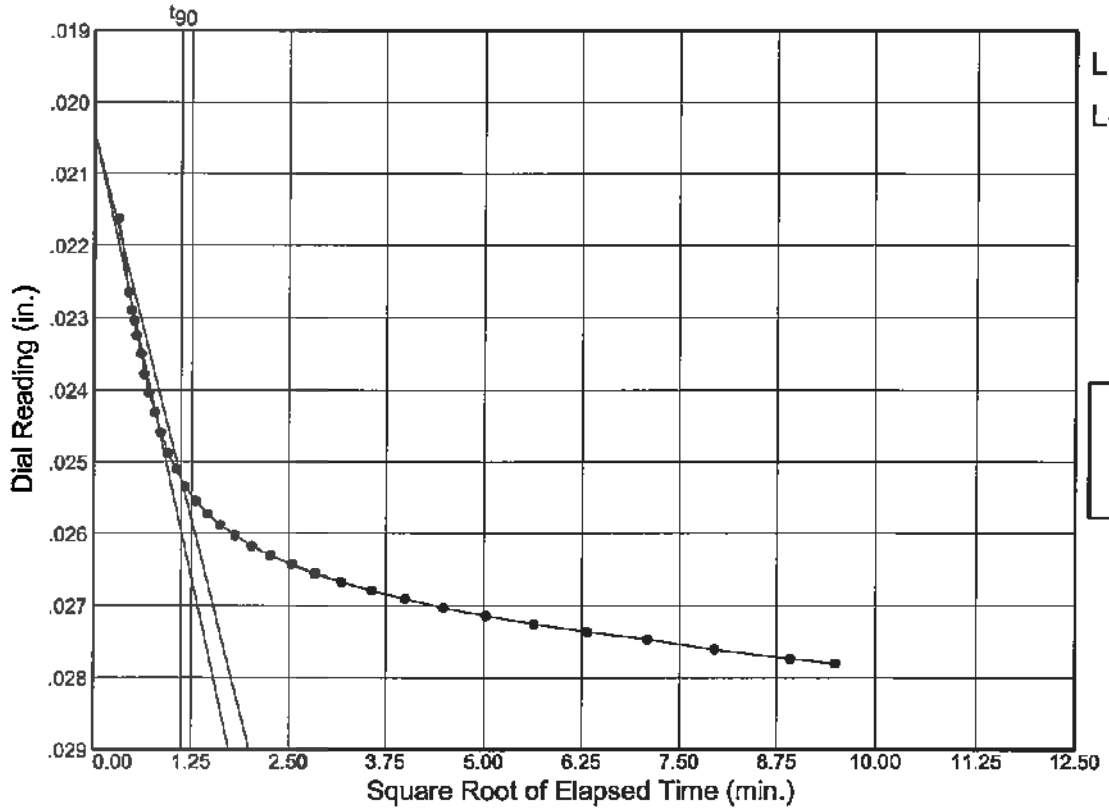
Load No.= 10
Load= 1.00 tsf
D_0 = 0.01650
D_{90} = 0.01908
D_{100} = 0.01937
T_{90} = 1.07 min.

C_v @ T_{90}
1.63 ft.^{2}/day

Dial Reading vs. Time

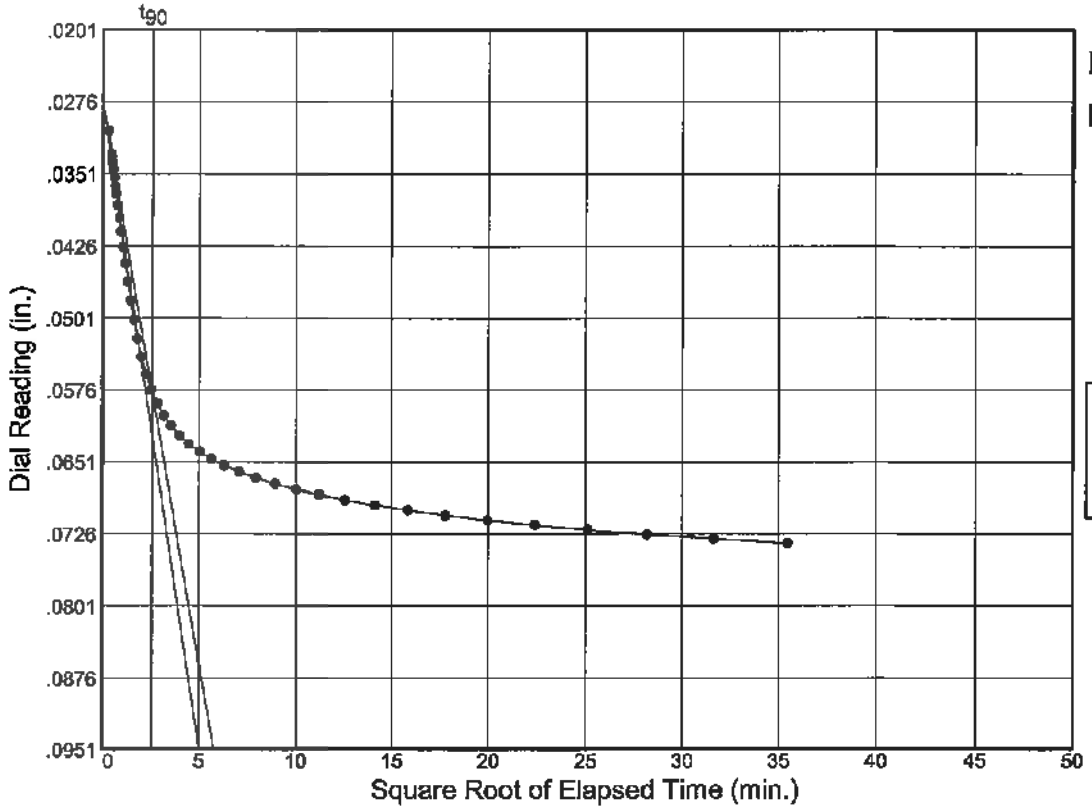
Project No.: 3520G
Project: Wekiva Parkway 7A

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



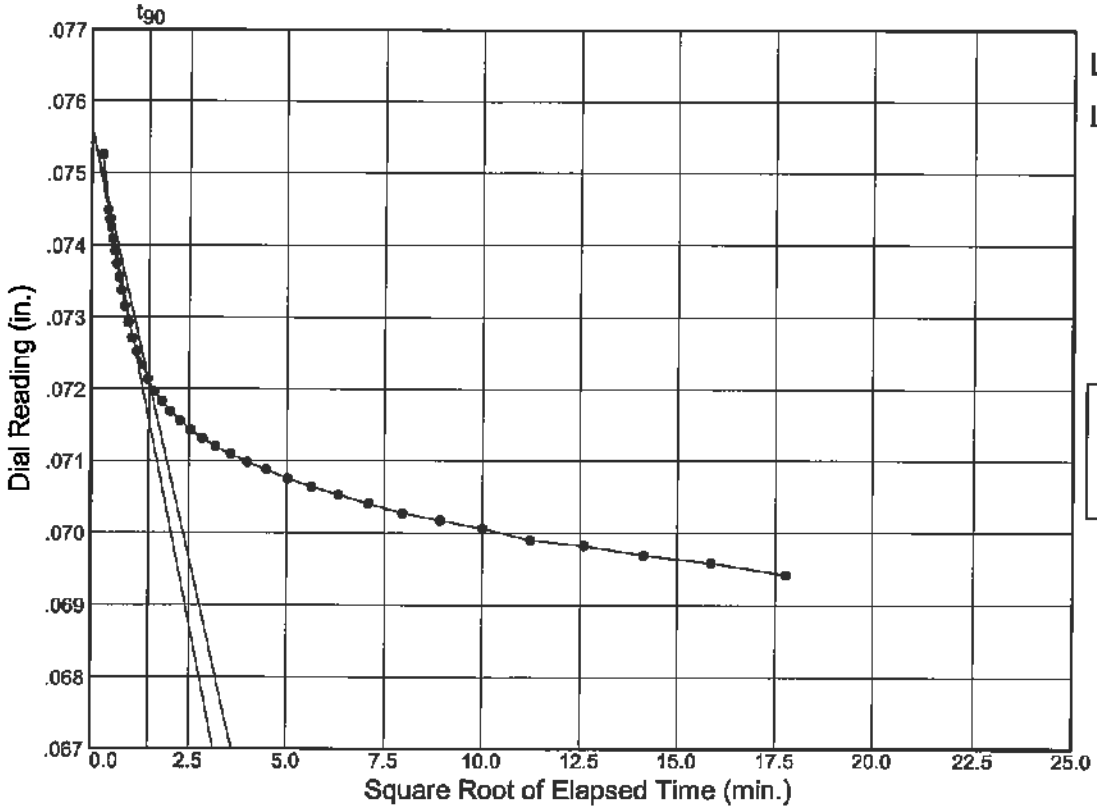
Load No.= 12
Load= 4.00 tsf
D_0 = 0.02761
D_{90} = 0.05774
D_{100} = 0.06109
T_{90} = 6.62 min.

C_v @ T_{90}
0.25 ft.^{2}/day

Dial Reading vs. Time

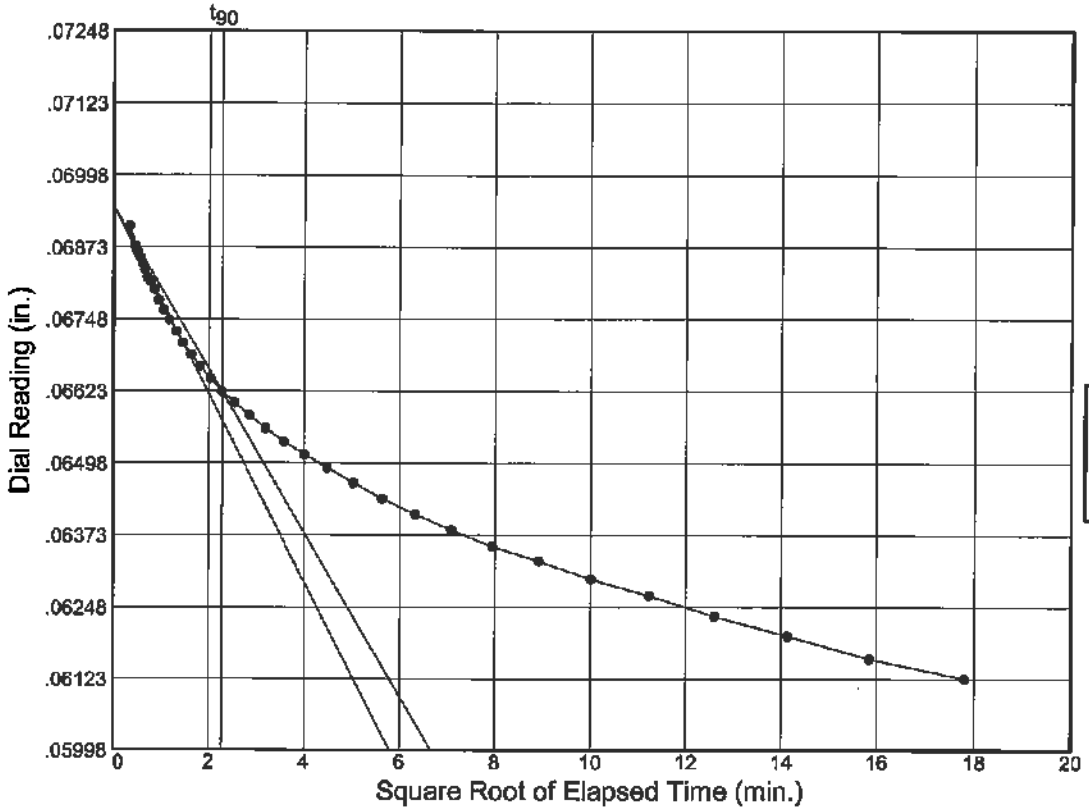
Project No.: 3520G
Project: Wekiva Parkway 7A

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



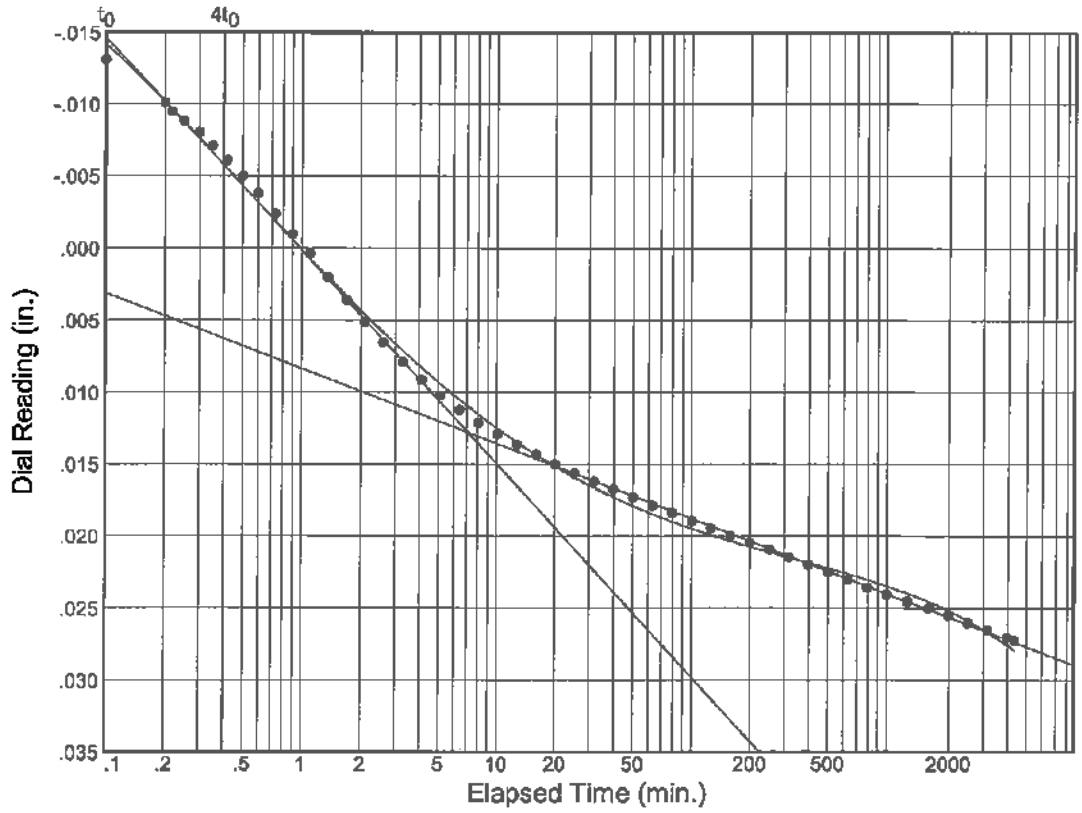
Load No.= 14
Load= 0.25 tsf
D_0 = 0.06945
D_{90} = 0.06621
D_{100} = 0.06585
T_{90} = 5.20 min.

C_v @ T_{90}
0.30 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

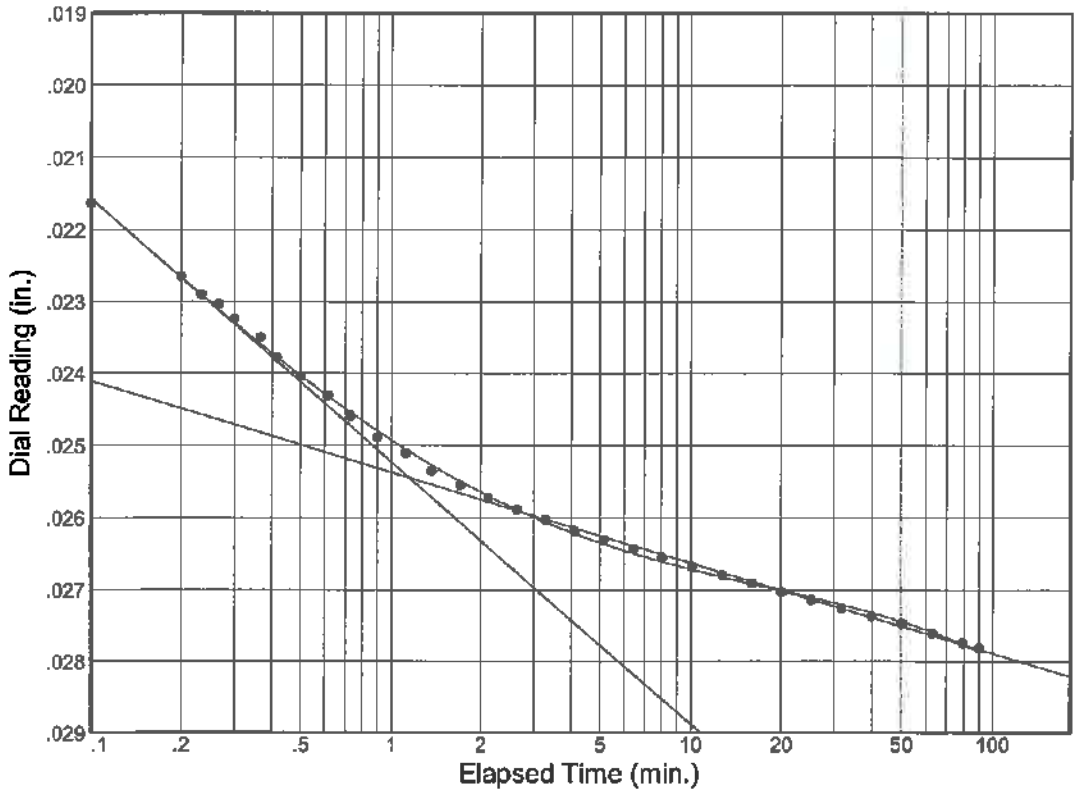
Location: MB-10 20'-22'



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.

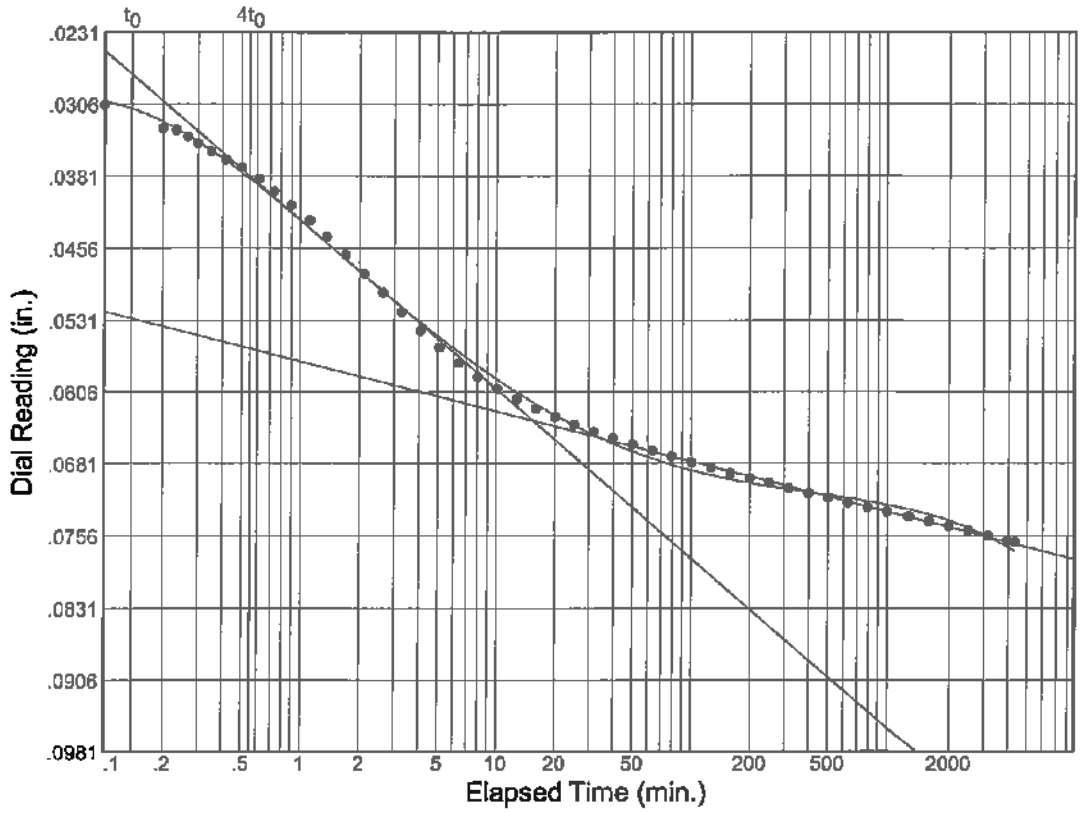
C_v @ T_{50}
2.58 ft.^{2}/day

C_α = 0.001

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

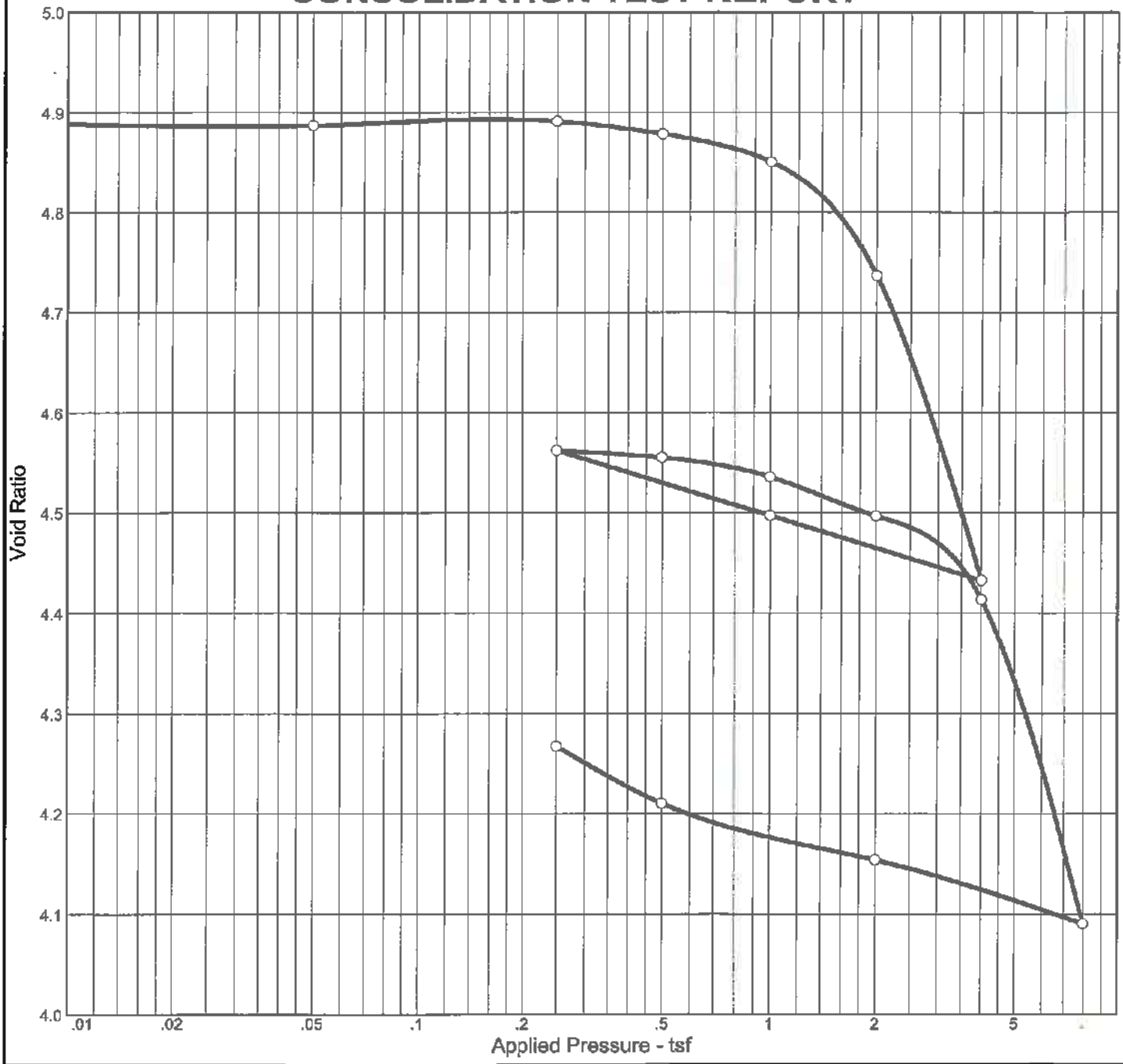
D_{100} = 0.06360

T_{50} = 1.15 min.

C_v @ T_{50}
0.33 ft.^{2}/day

C_α = 0.006

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Heave %	e_o
Sat.	Moist.											
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

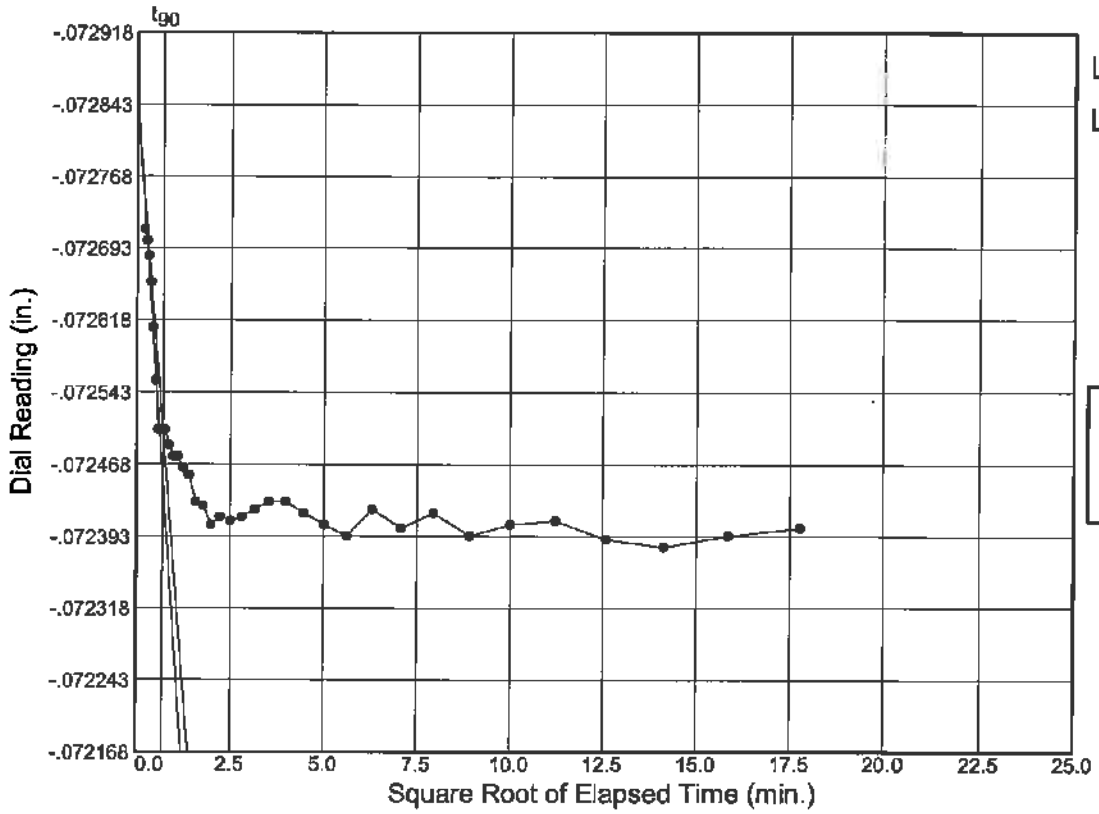
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

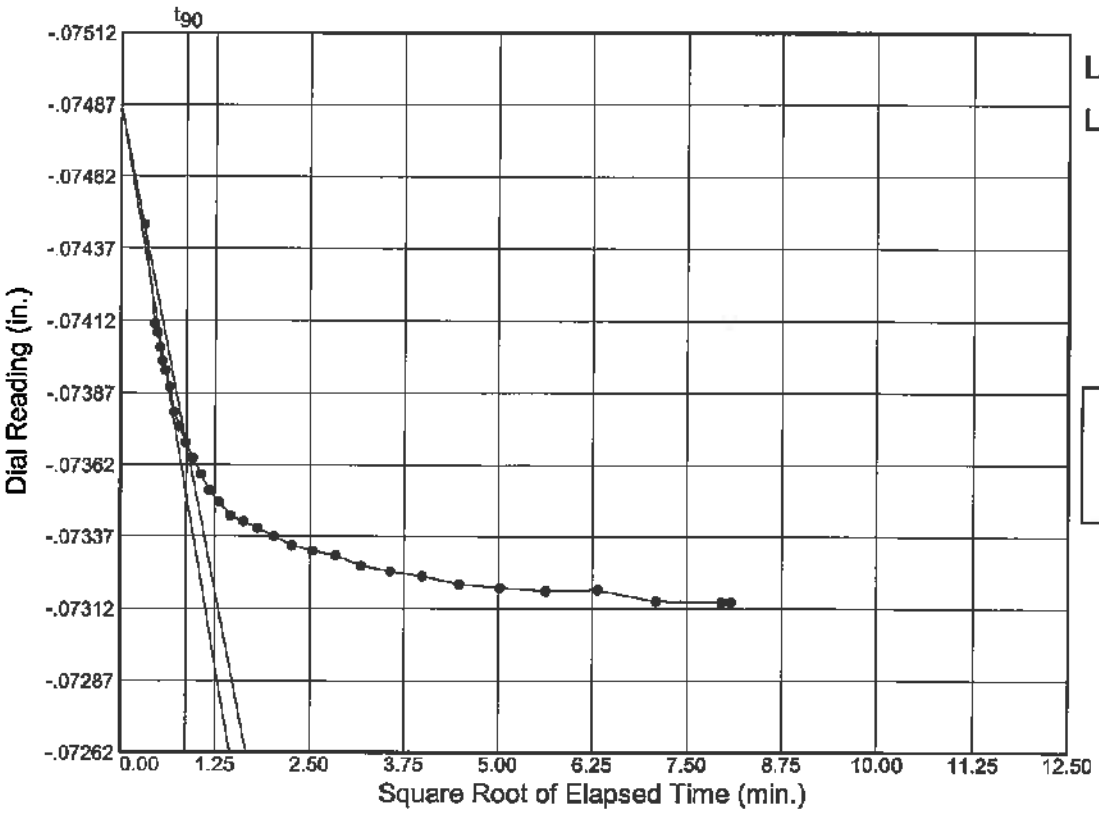
Project No.: 3520G
Project: Wekiva Parkway 7A

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



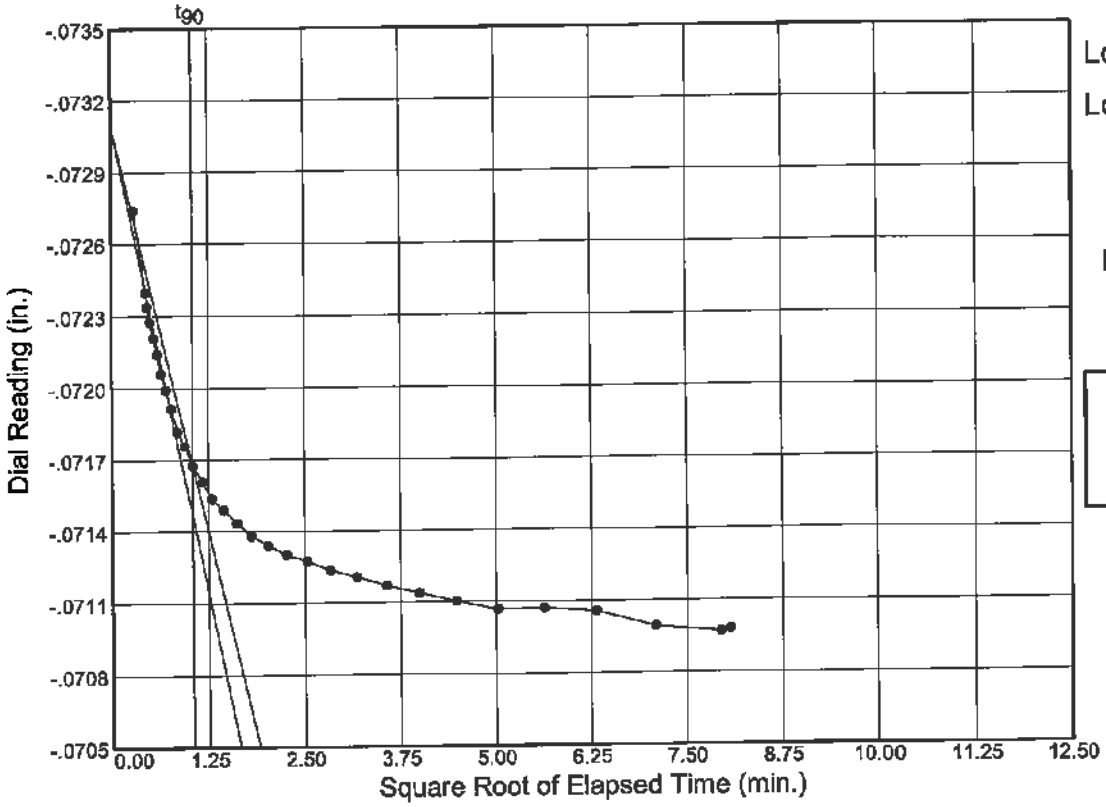
Load No.= 2
Load= 0.25 tsf
D_0 = -0.07487
D_{90} = -0.07369
D_{100} = -0.07356
T_{90} = 0.75 min.

C_v @ T_{90}
2.83 ft.^{2}/day

Dial Reading vs. Time

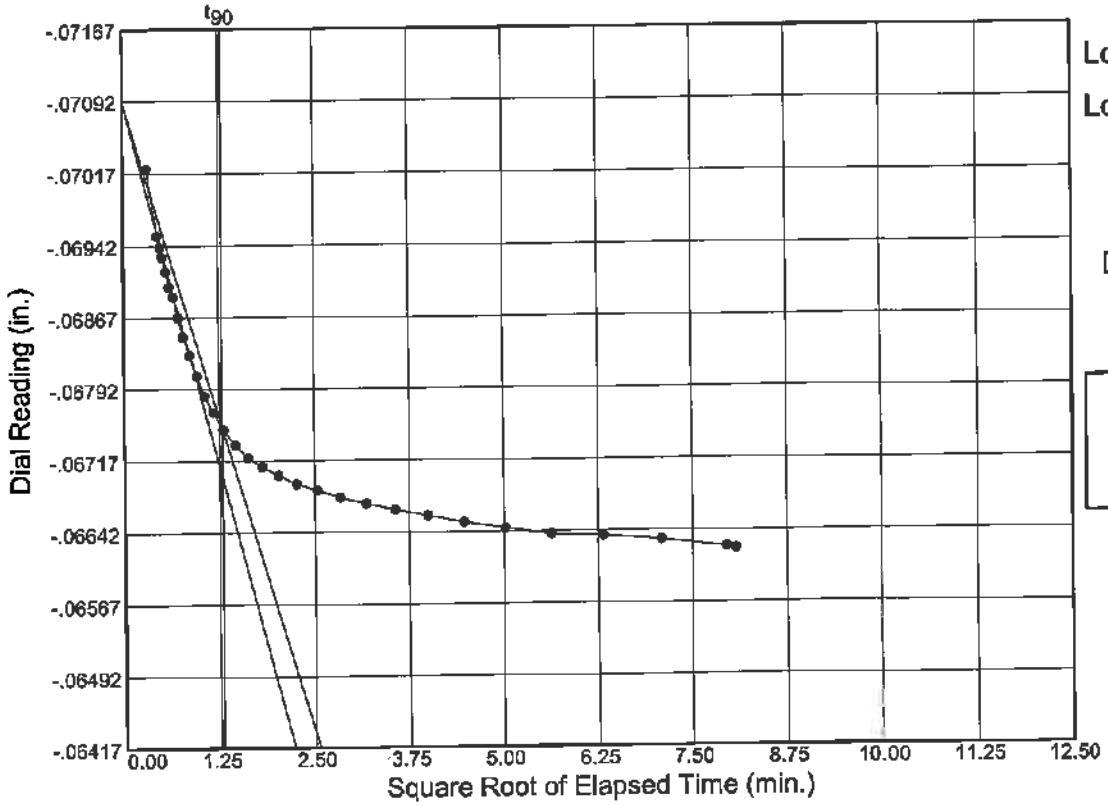
Project No.: 3520G
Project: Wekiva Parkway 7A

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



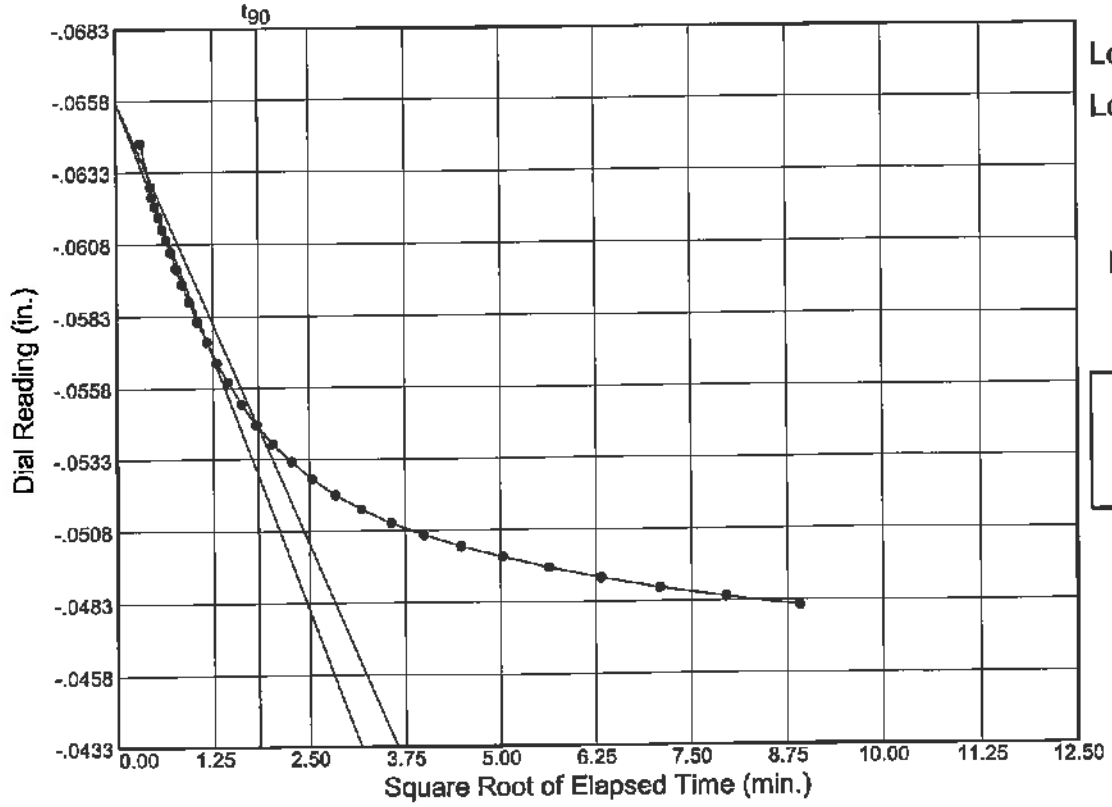
Load No.= 4
Load= 1.00 tsf
D_0 = -0.07092
D_{90} = -0.06752
D_{100} = -0.06714
T_{90} = 1.66 min.

C_v @ T_{90}
1.27 ft.^{2}/day

Dial Reading vs. Time

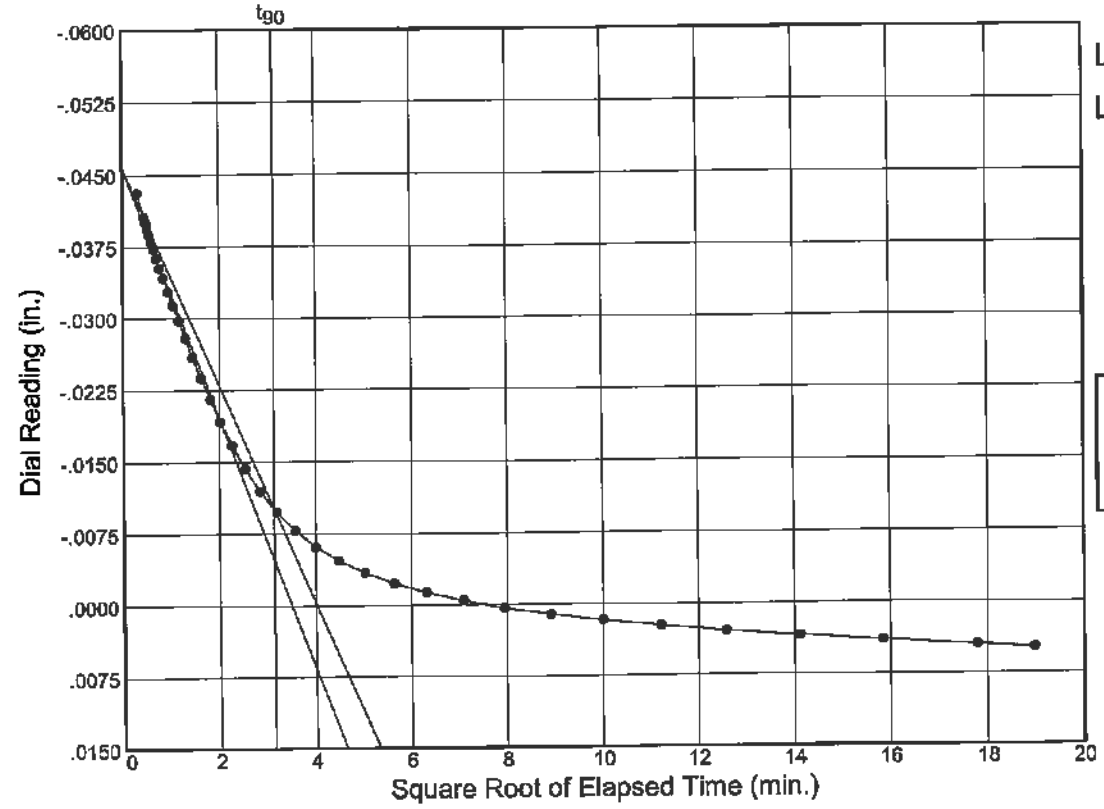
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

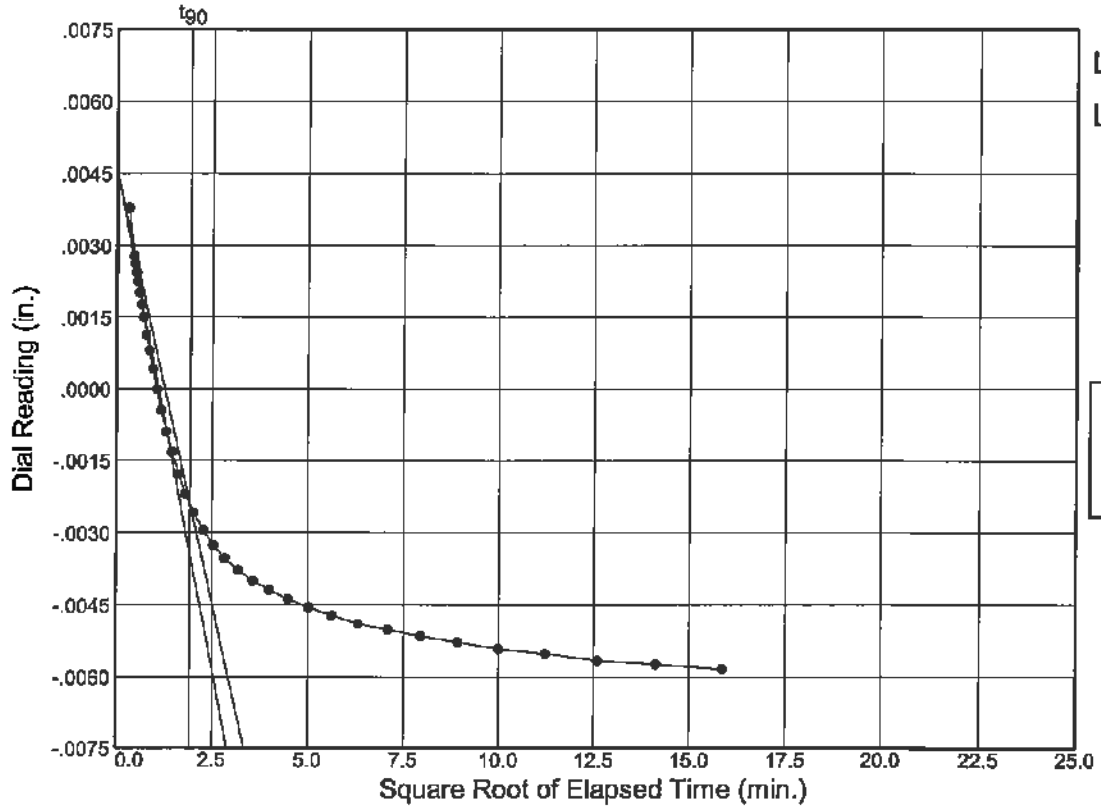
C_v @ T_{90}
0.19 ft.^{2}/day

Plate

Dial Reading vs. Time

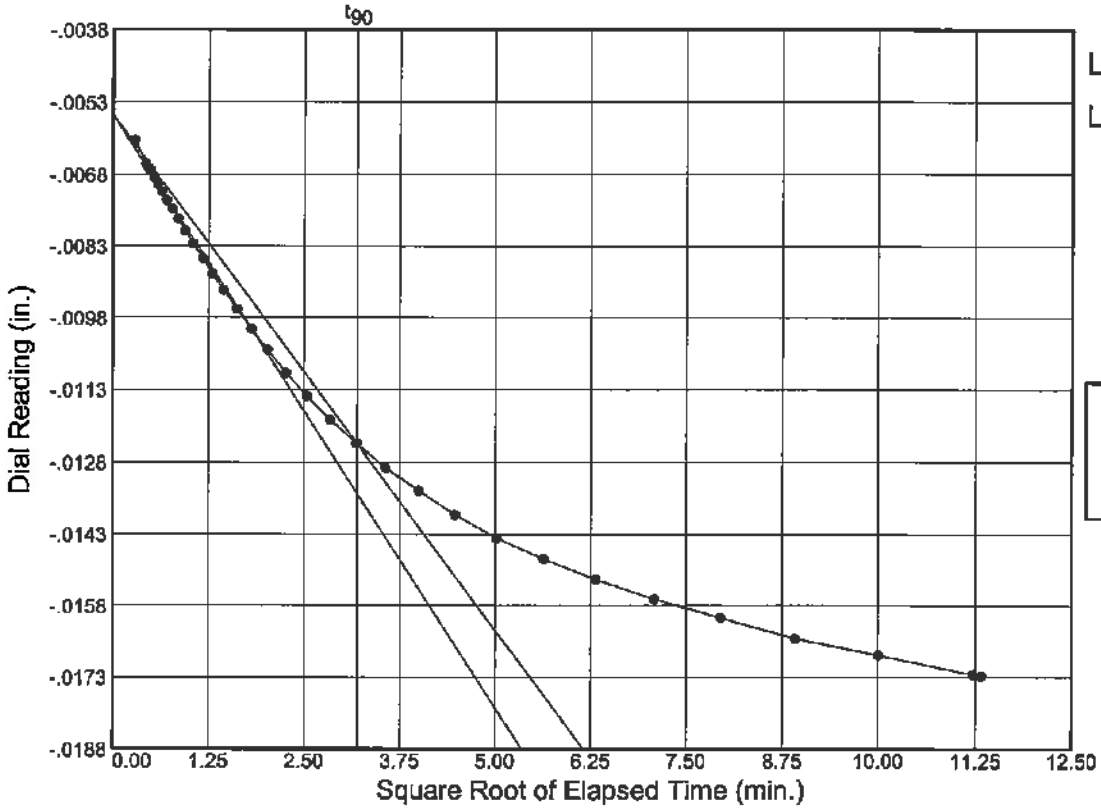
Project No.: 3520G
Project: Wekiva Parkway 7A

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



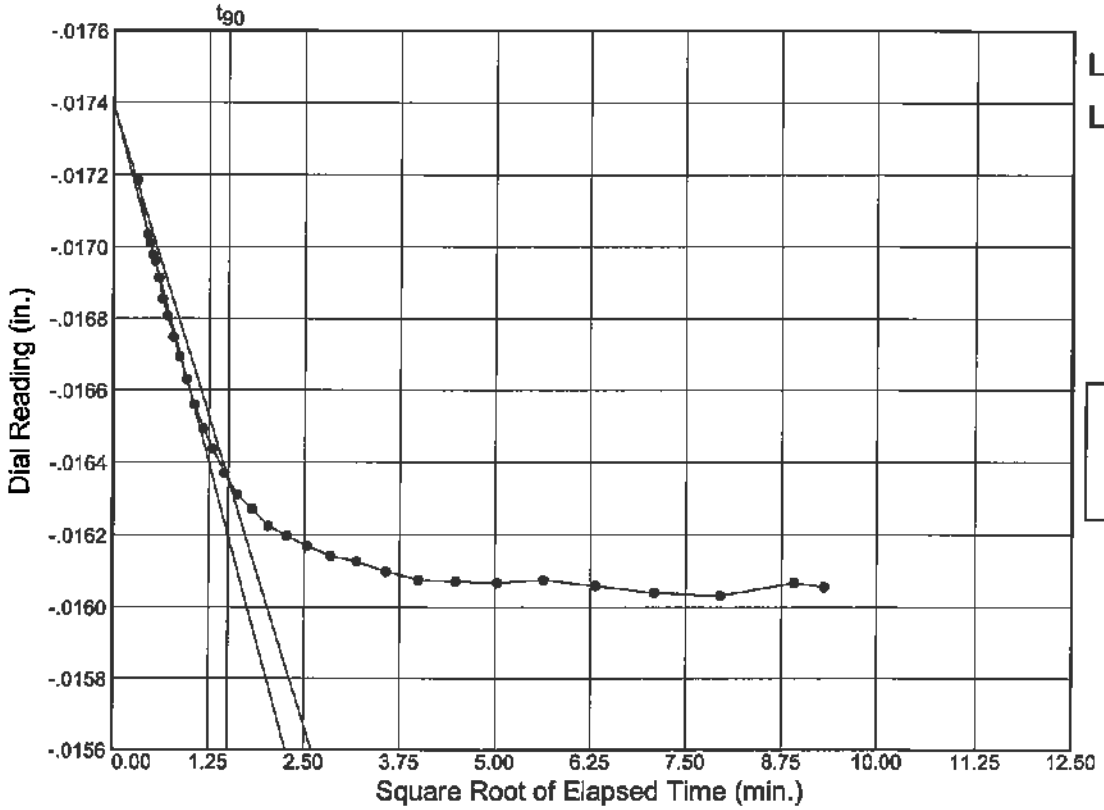
Load No.= 8
Load= 0.25 tsf
D_0 = -0.00556
D_{90} = -0.01242
D_{100} = -0.01319
T_{90} = 10.17 min.

C_v @ T_{90}
0.18 ft.^{2}/day

Dial Reading vs. Time

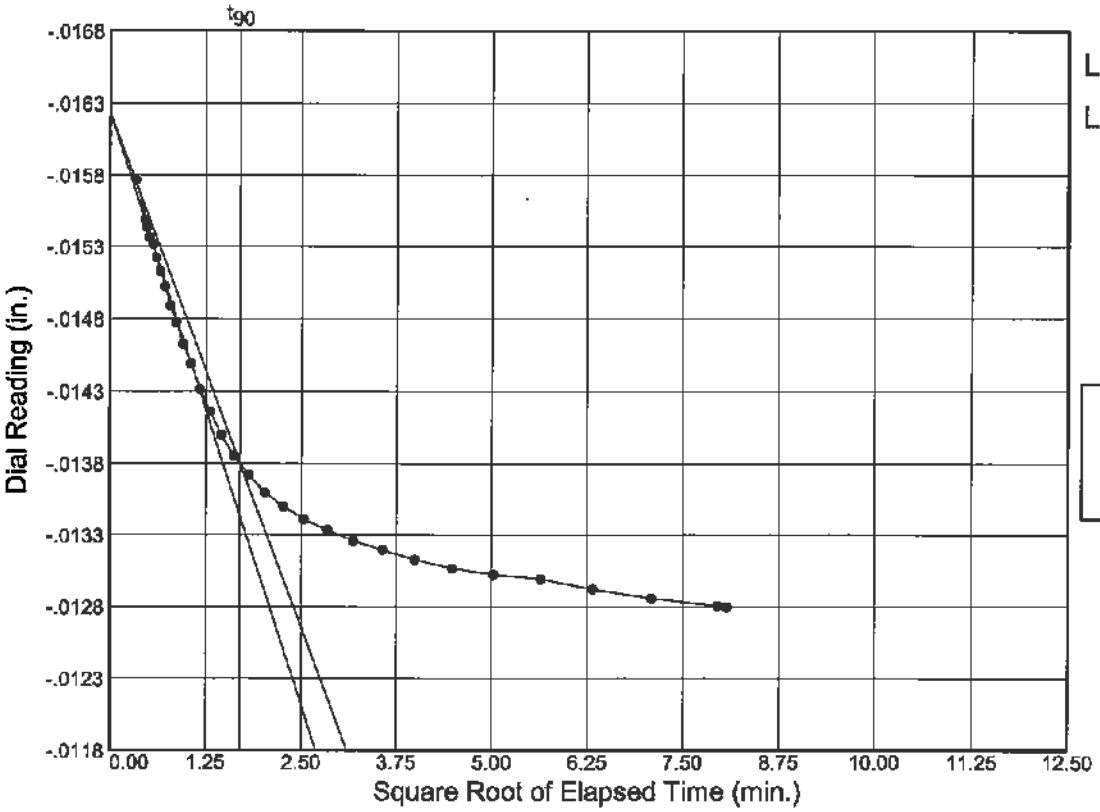
Project No.: 3520G
Project: Wekiva Parkway 7A

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



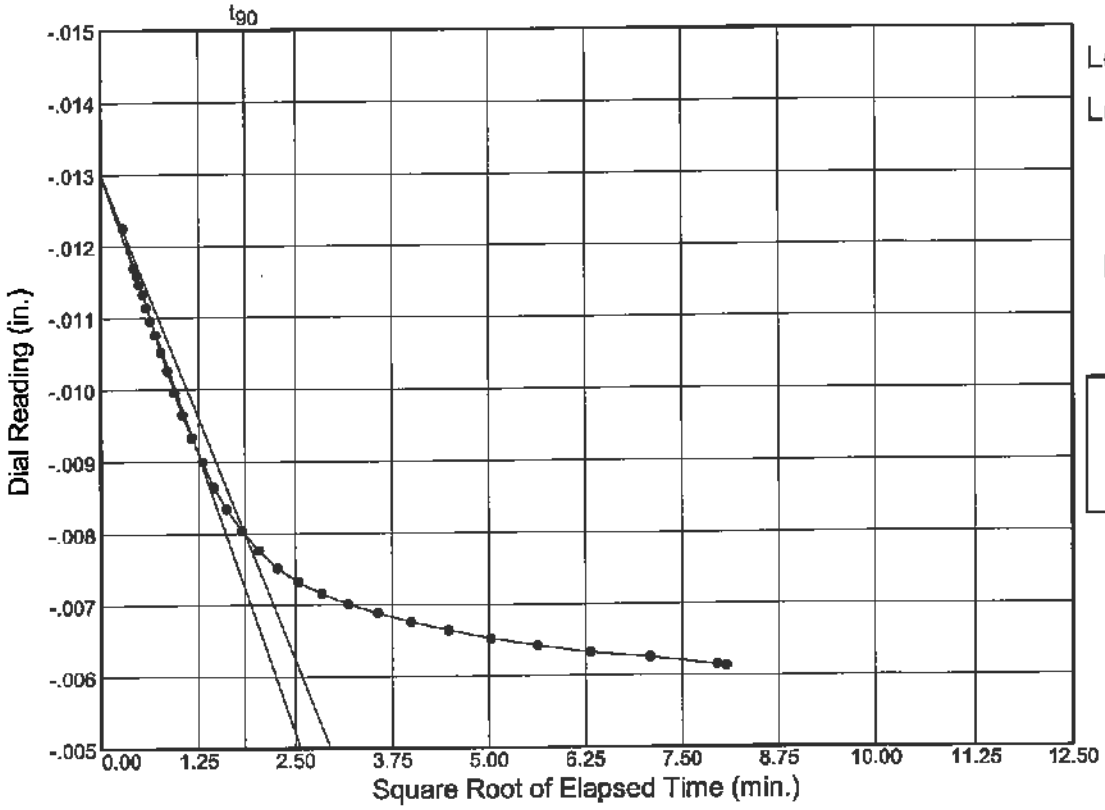
Load No.= 10
Load= 1.00 tsf
D_0 = -0.01624
D_{90} = -0.01380
D_{100} = -0.01353
T_{90} = 2.89 min.

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

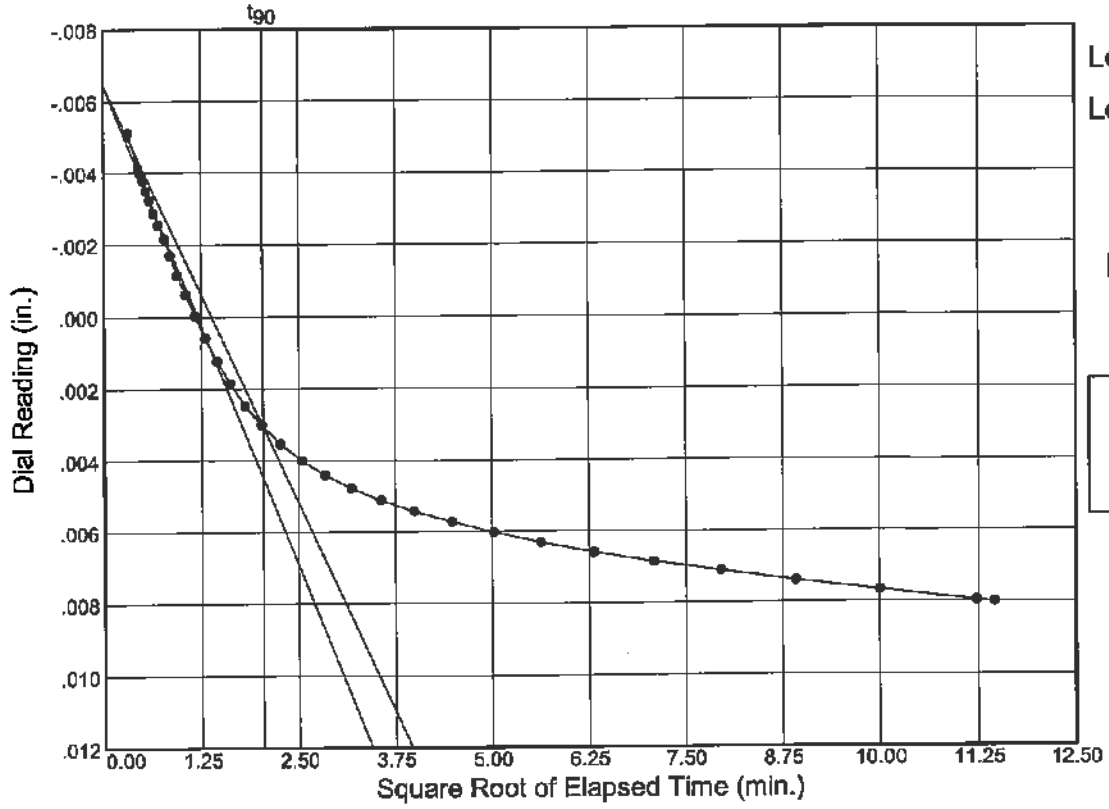
D_0 = -0.01301

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.

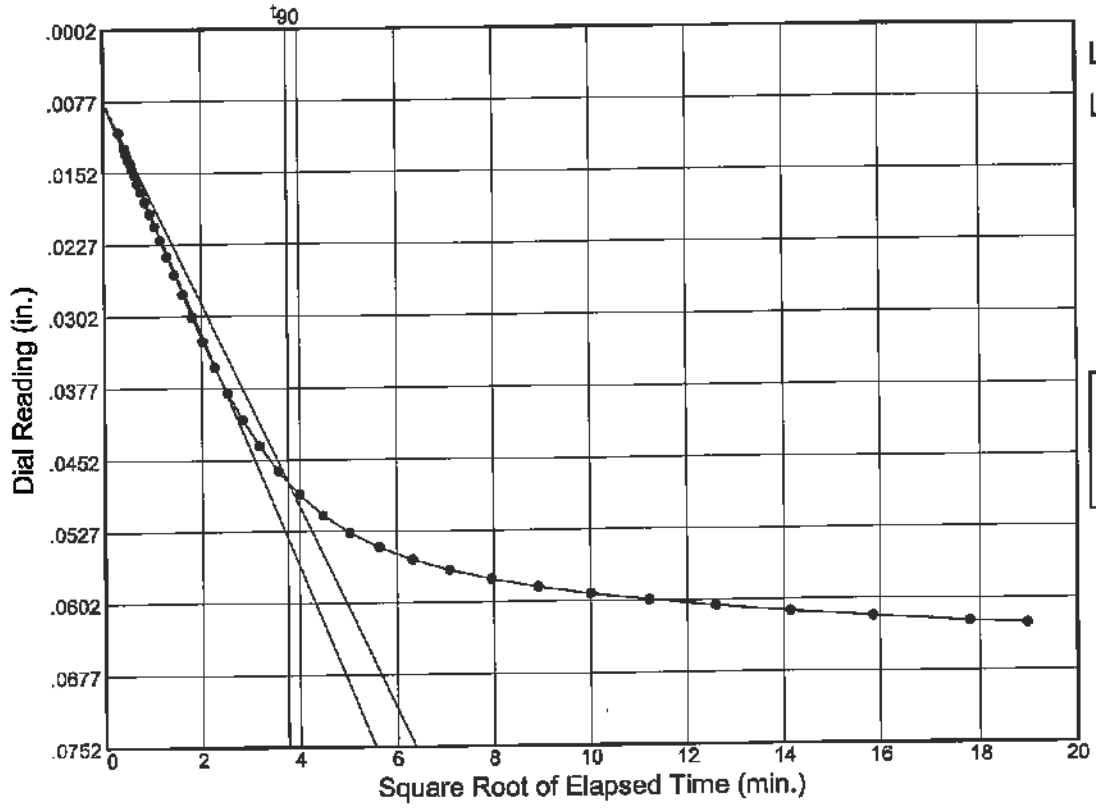
C_v @ T_{90}
0.44 ft.^{2}/day

Plate

Dial Reading vs. Time

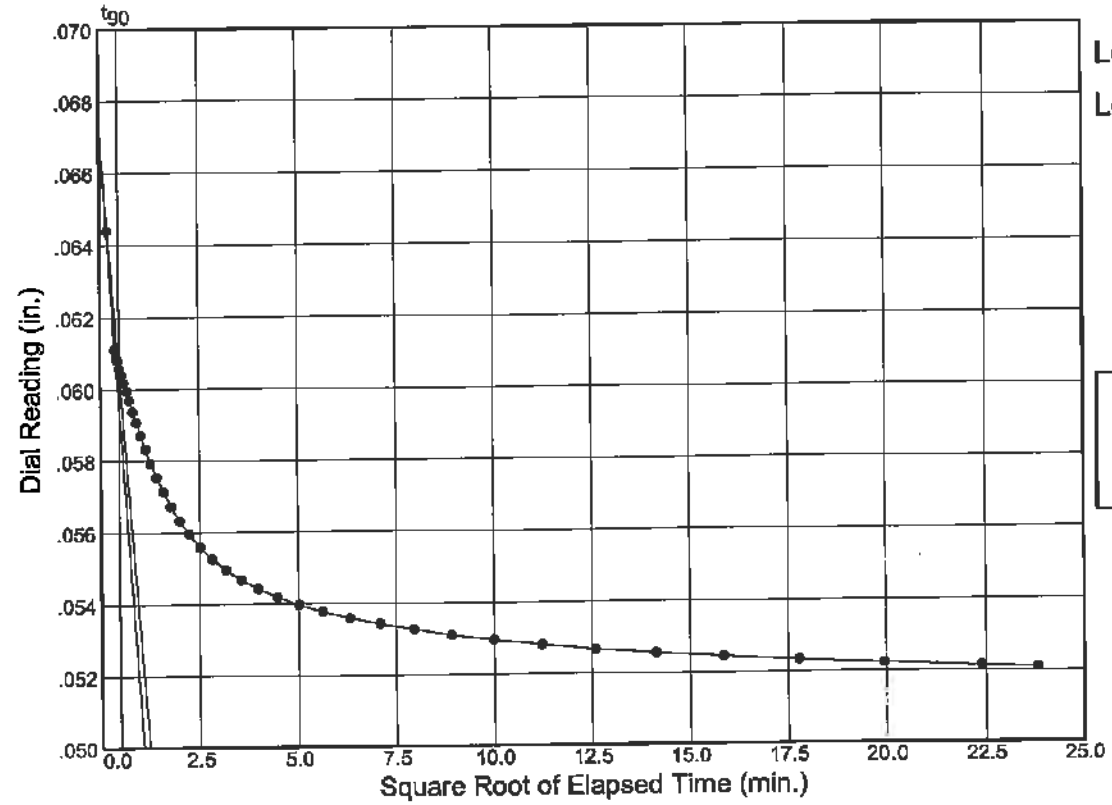
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

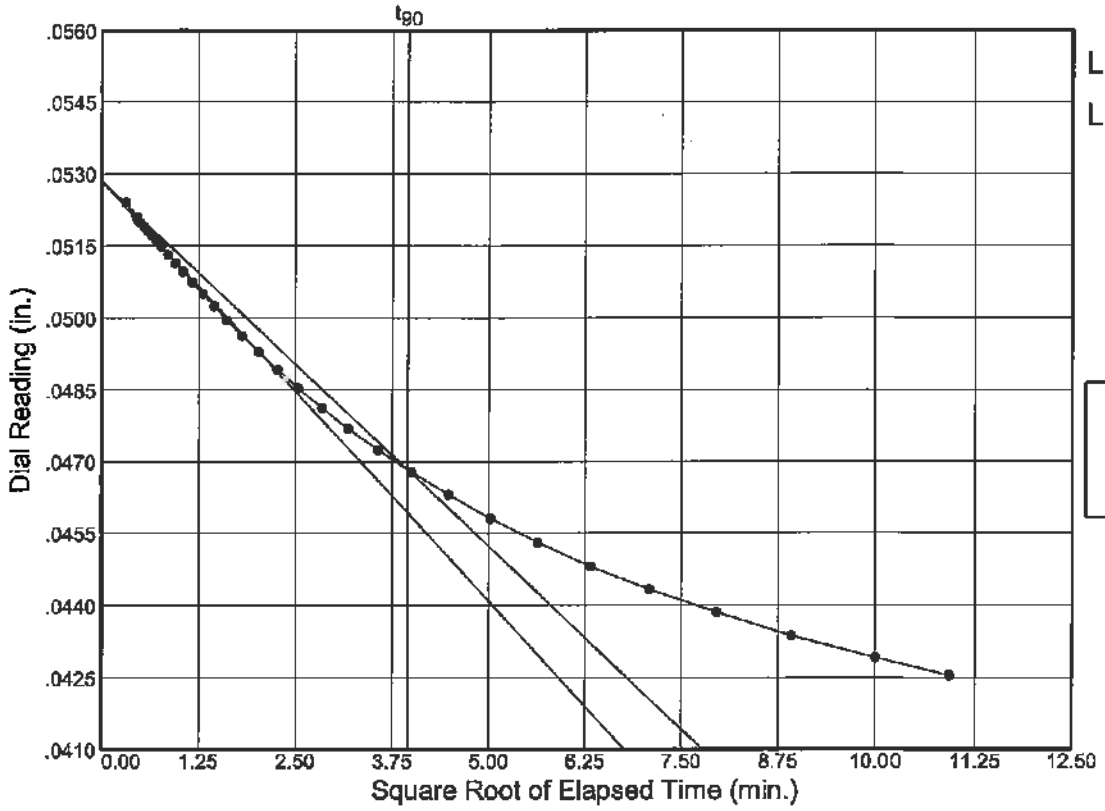
C_v @ T_{90}
7.12 ft.^{2}/day

Plate

Dial Reading vs. Time

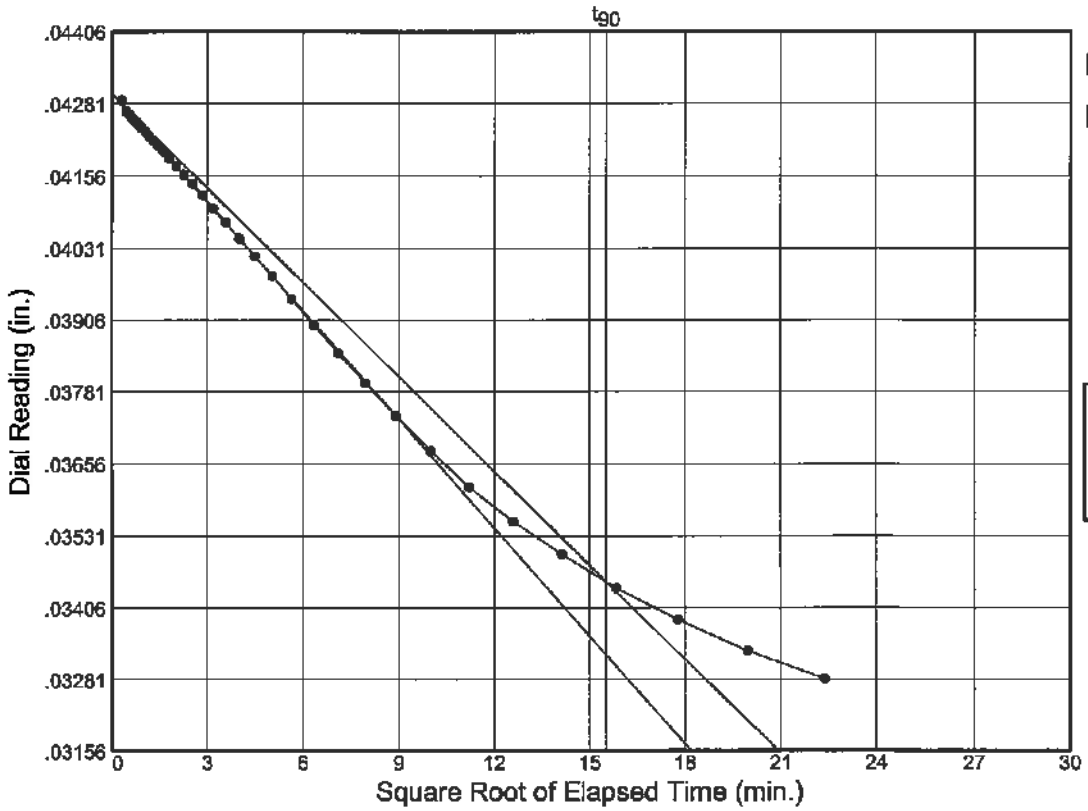
Project No.: 3520G
Project: Wekiva Parkway 7A

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



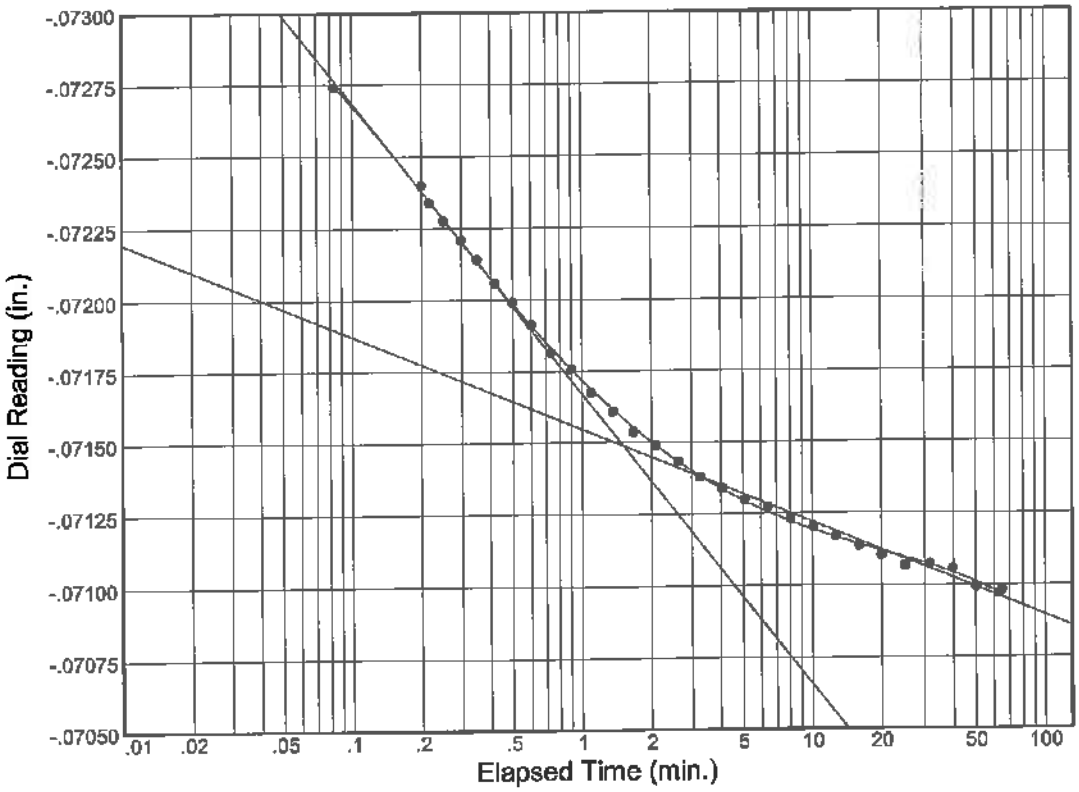
Load No.= 16
Load= 0.25 tsf
D_0 = 0.04299
D_{90} = 0.03451
D_{100} = 0.03357
T_{90} = 240.71 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

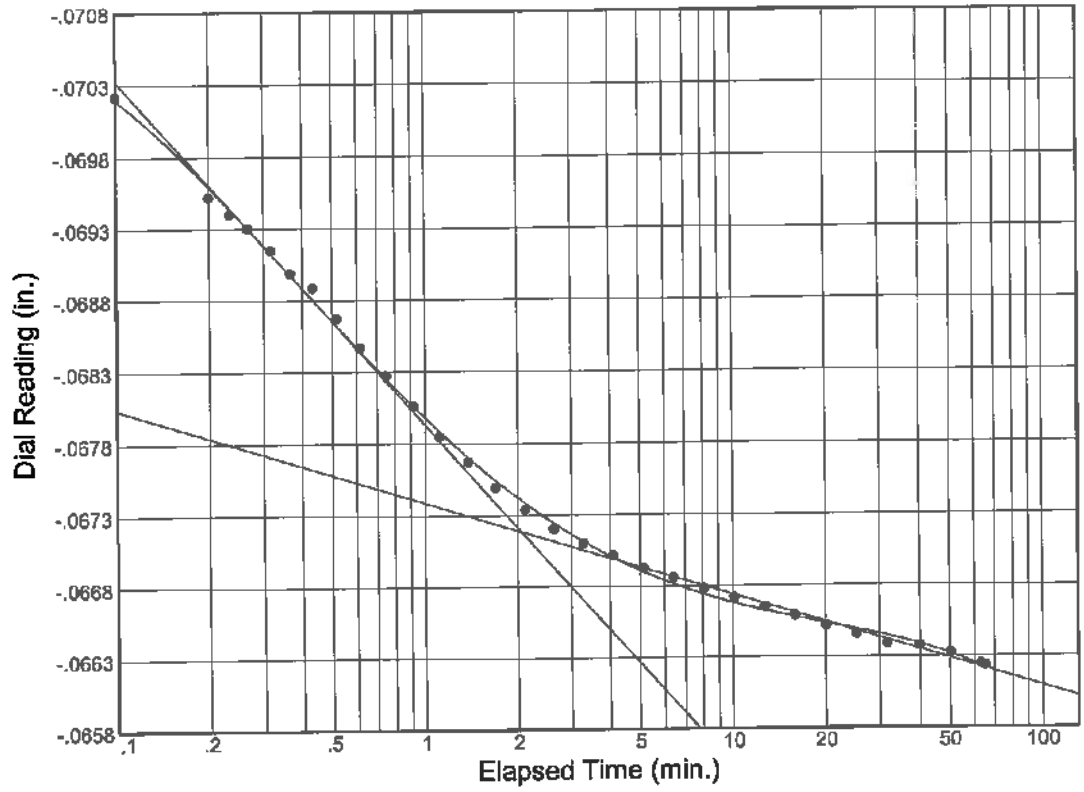
Location: WB-56 50'-52'



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.

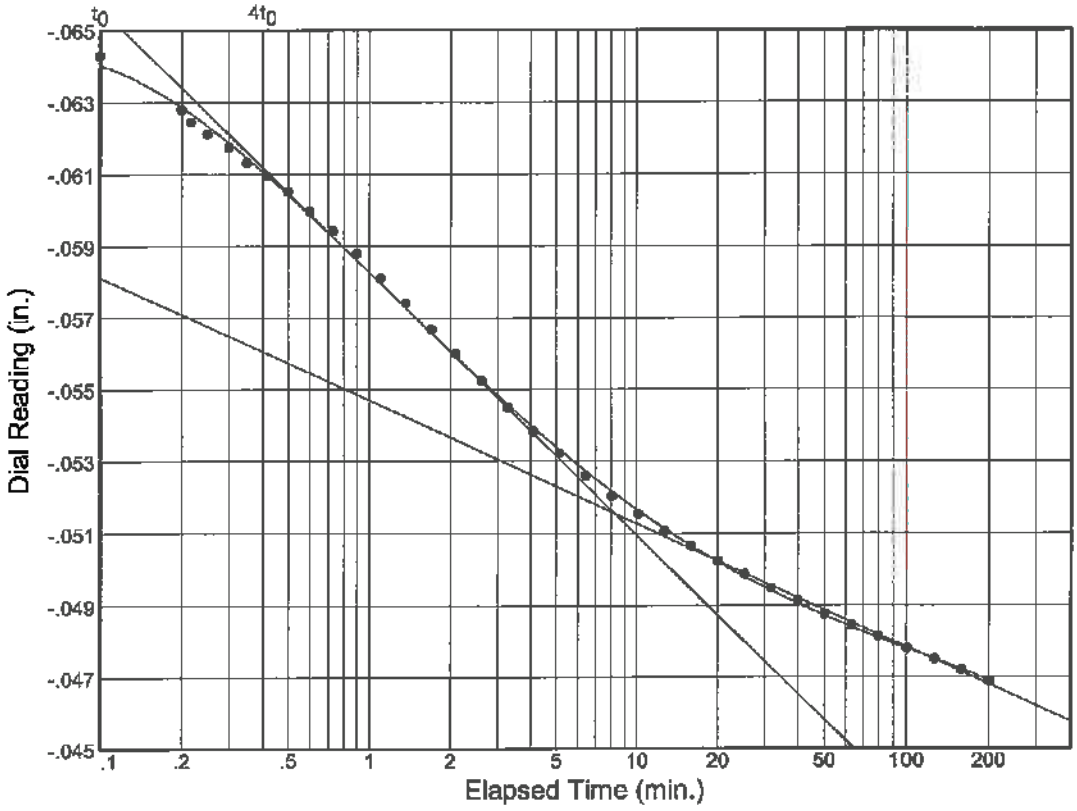
C_v @ T_{50}
2.76 ft.2/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

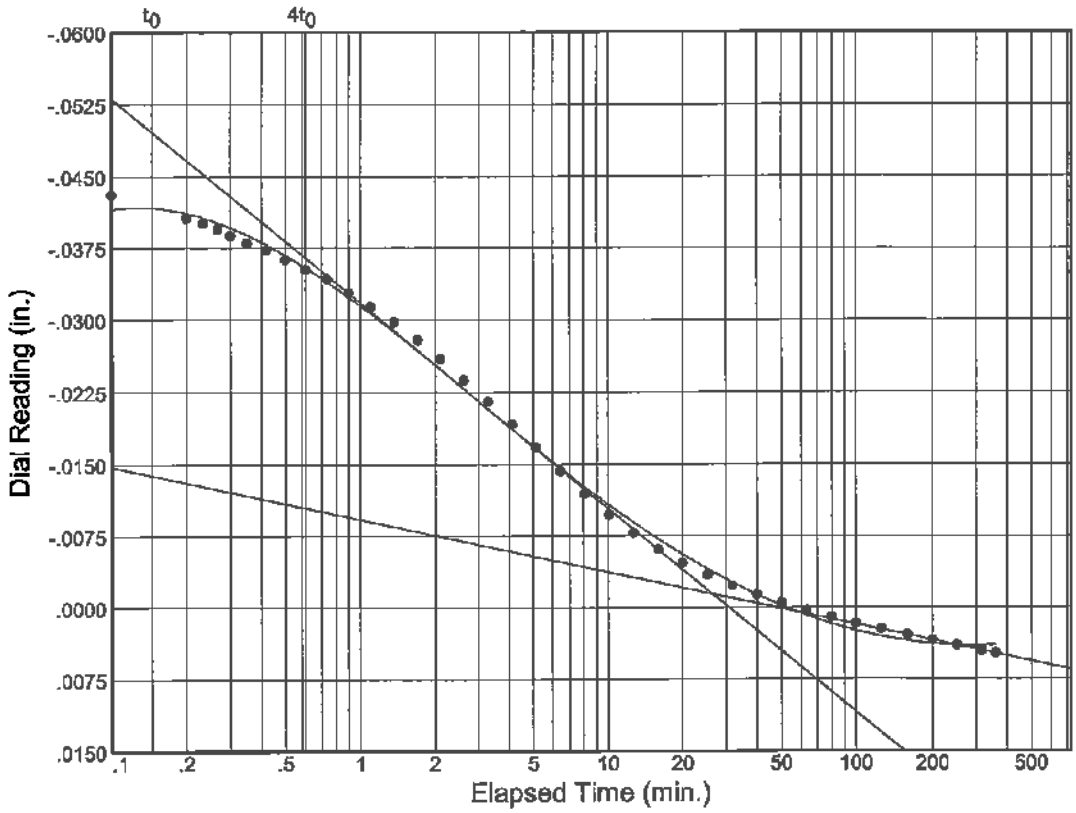
Location: WB-56 50'-52'



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.

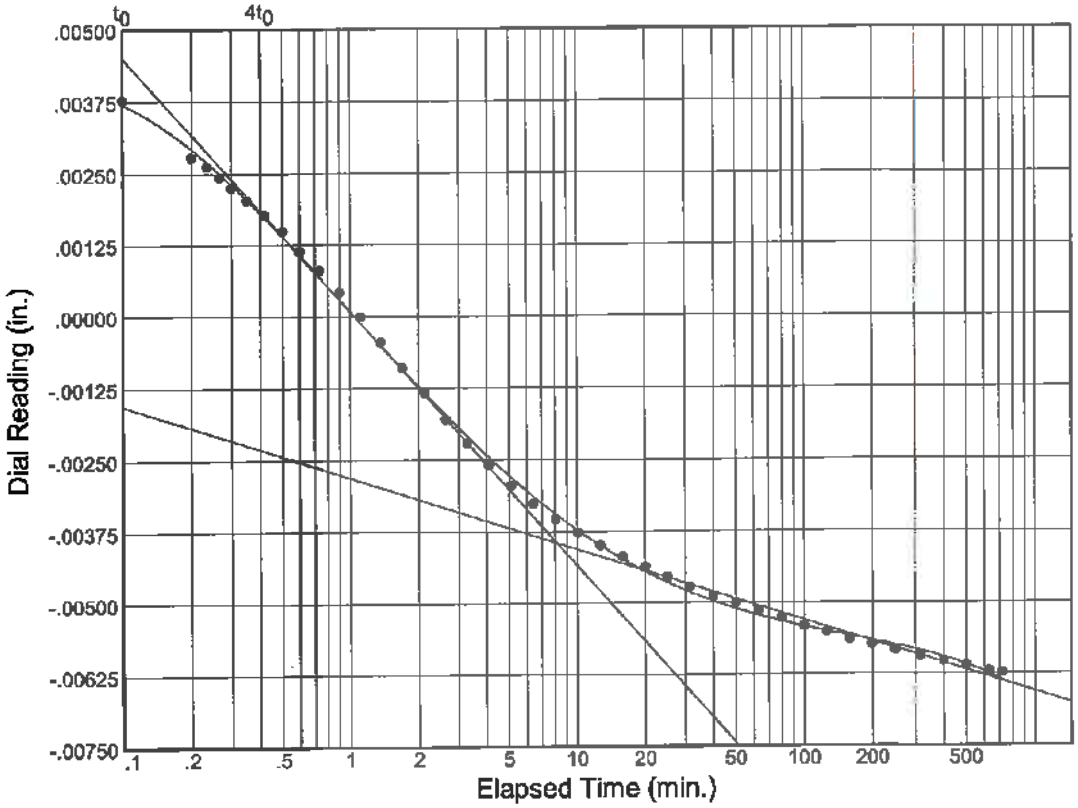
C_v @ T_{50}
0.20 ft.^{2}/day

C_α = 0.006

Dial Reading vs. Time

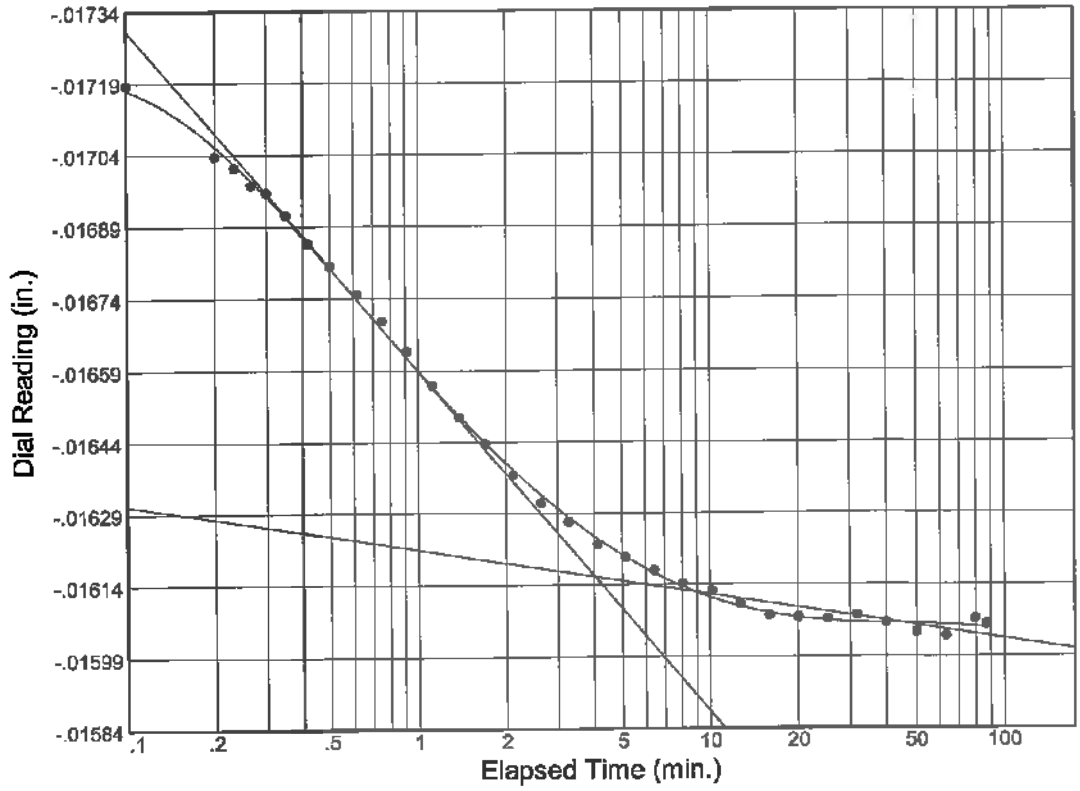
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

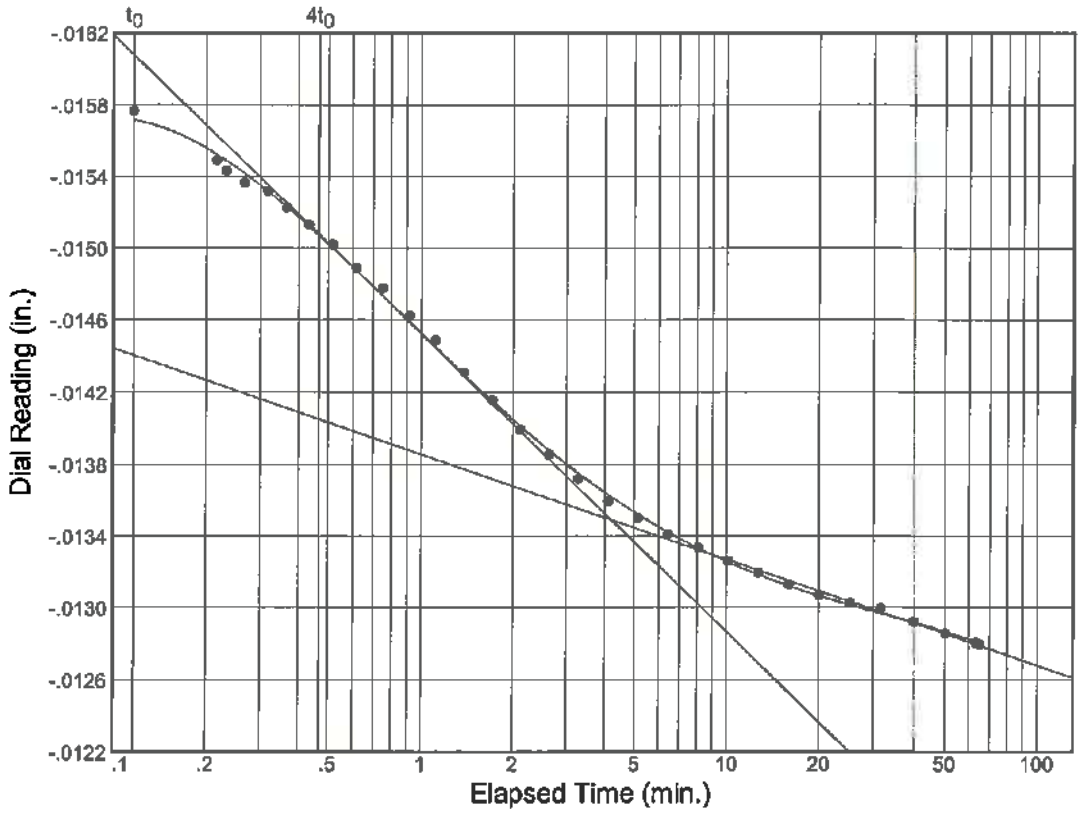
C_v @ T_{50}
1.41 ft.^{2}/day

C_α = 0.000

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

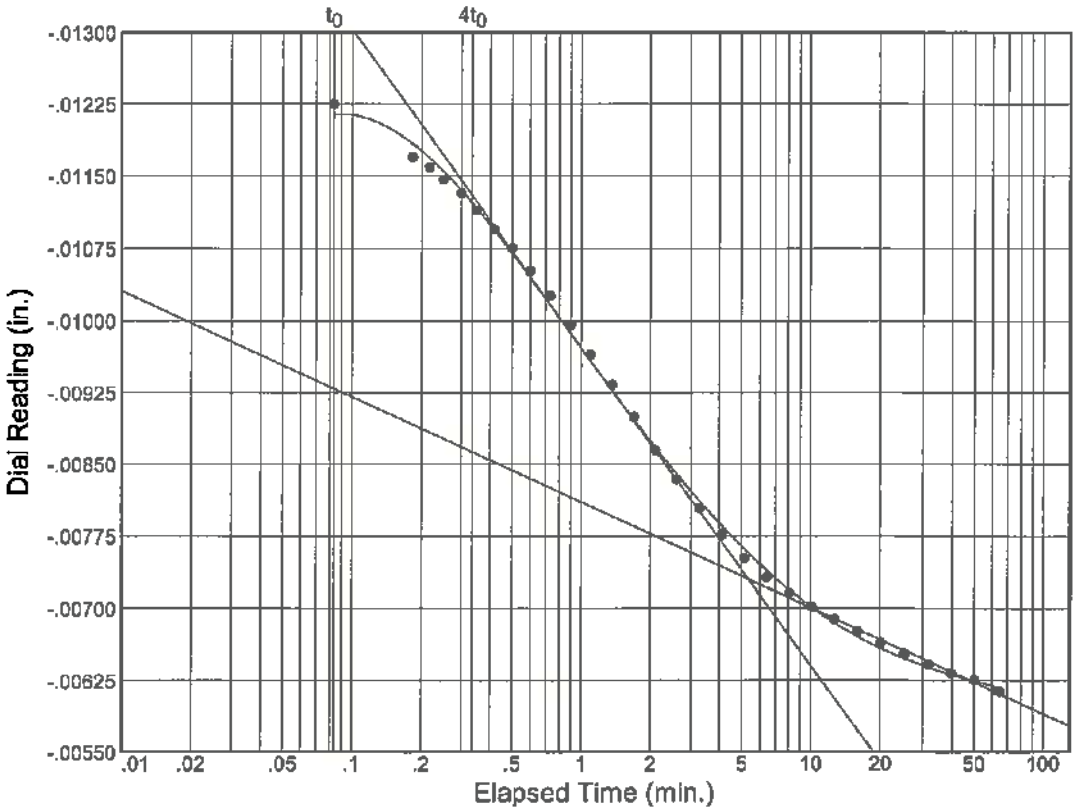
Location: WB-56 50'-52'



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.

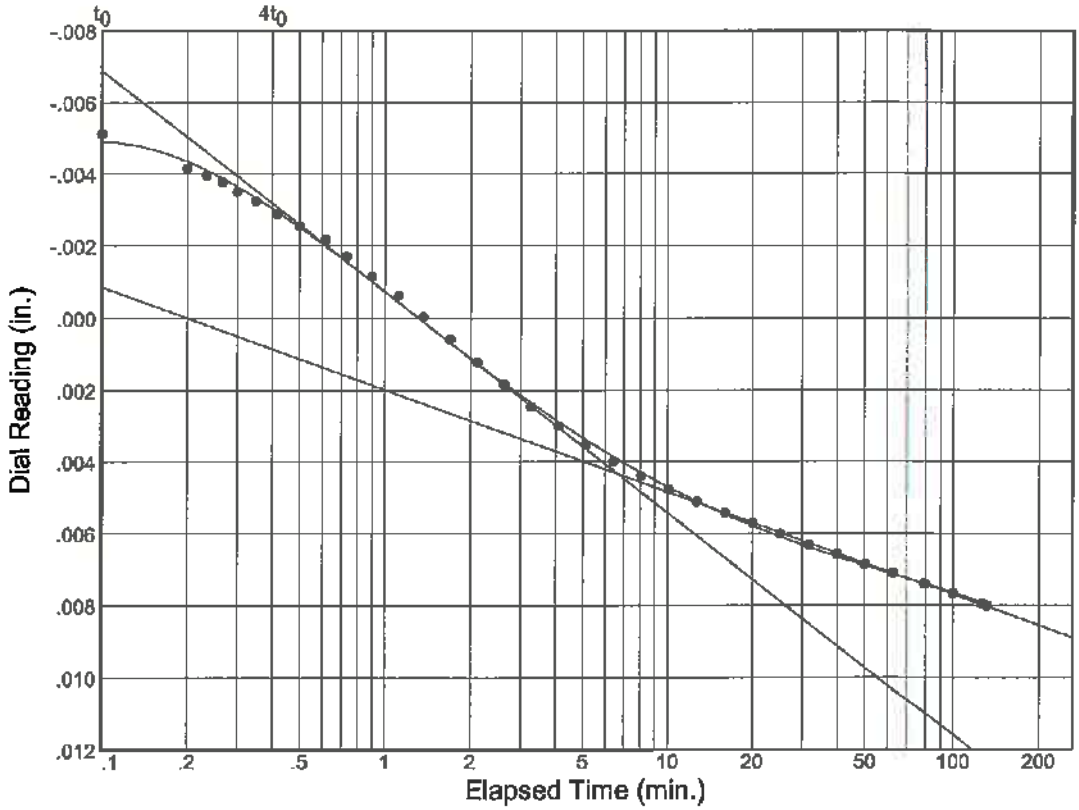
C_v @ T_{50}
0.60 ft.^{2}/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

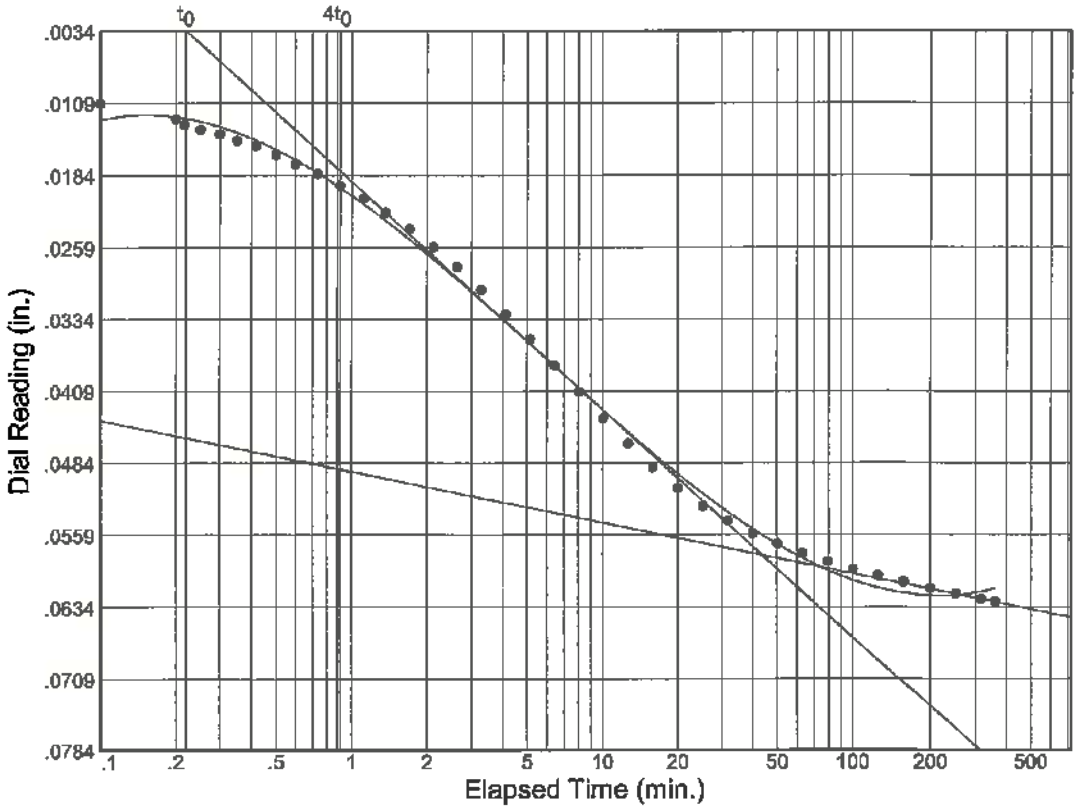
Location: WB-56 50'-52'



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.

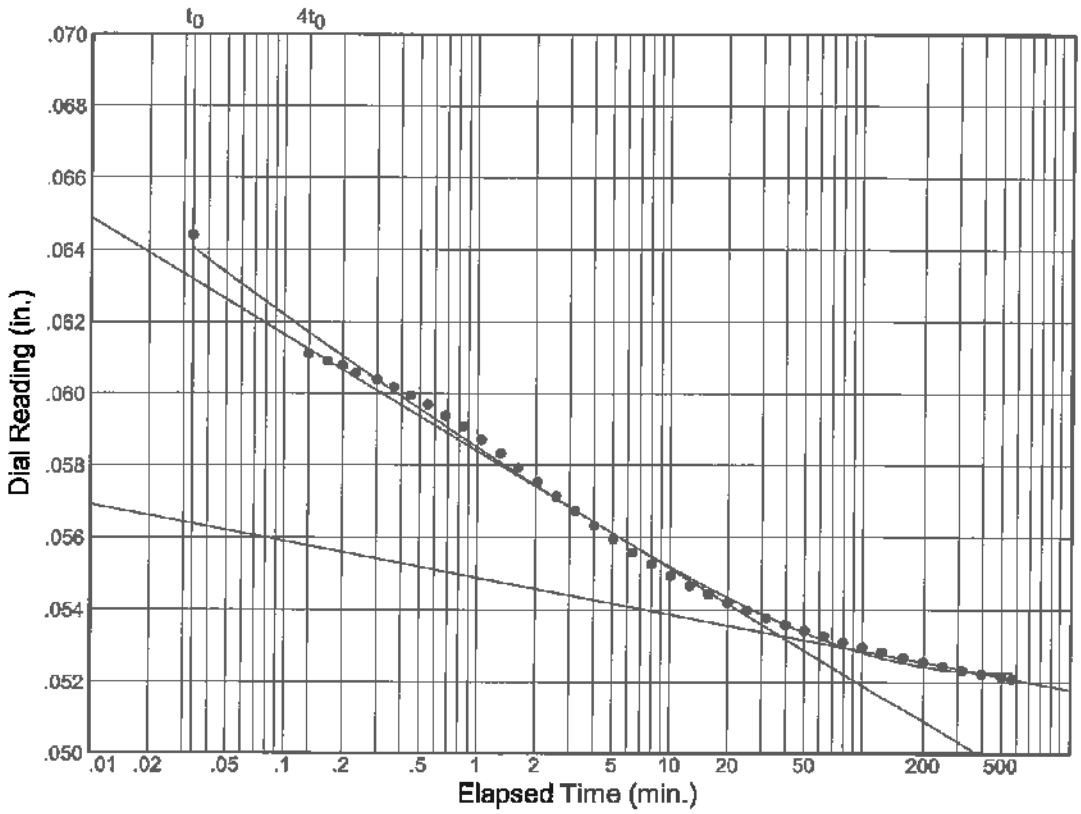
C_v @ T_{50}
0.11 ft.^{2}/day

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

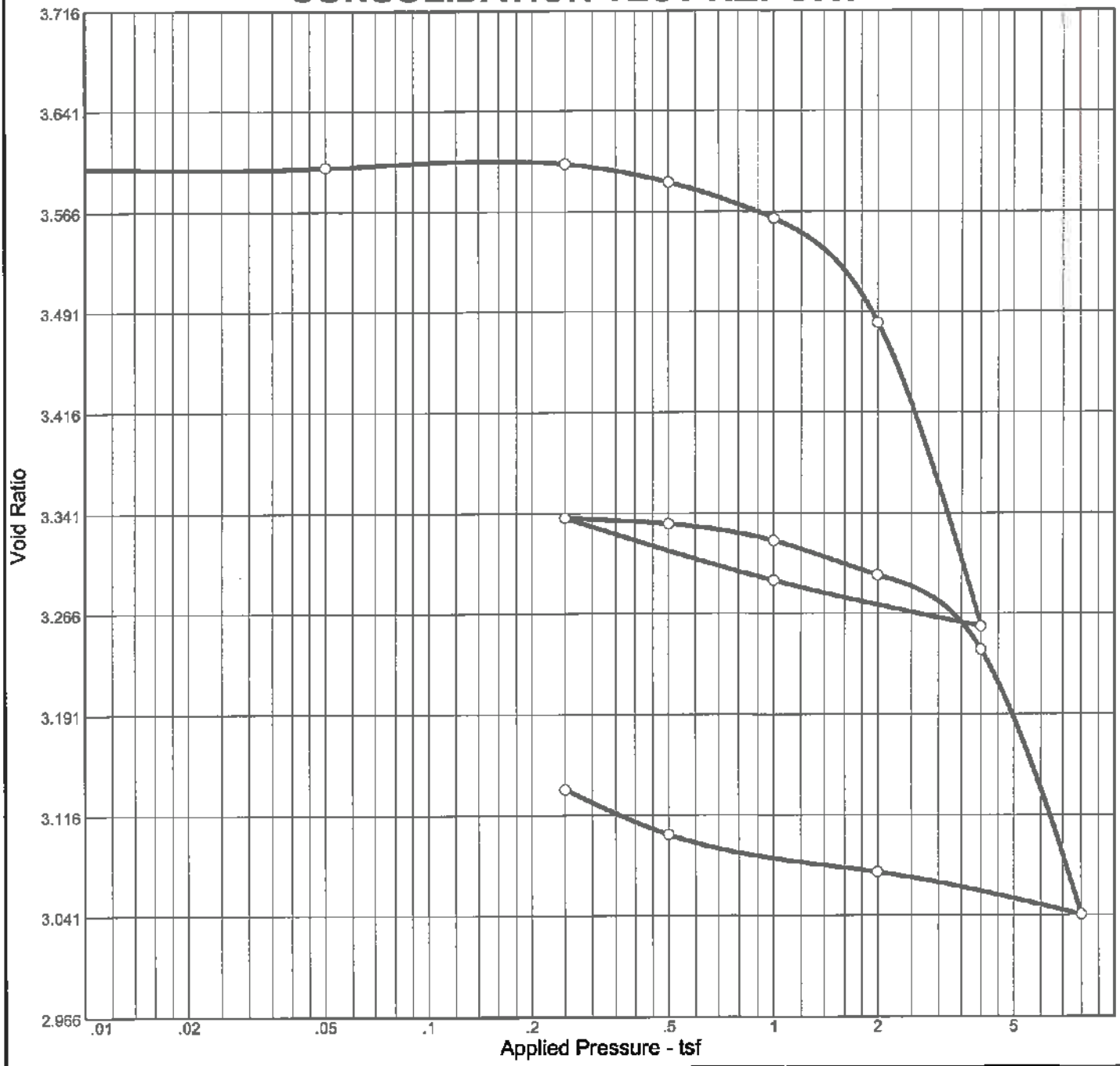
D_{50} = 0.05985

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

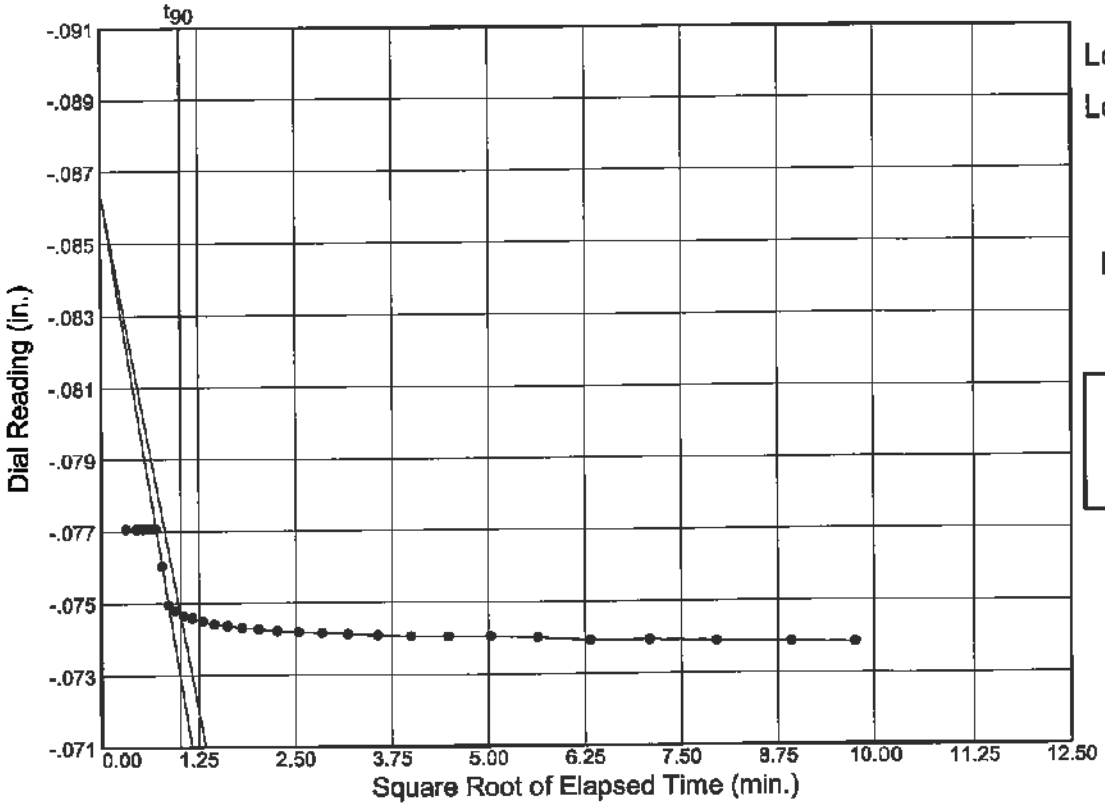
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

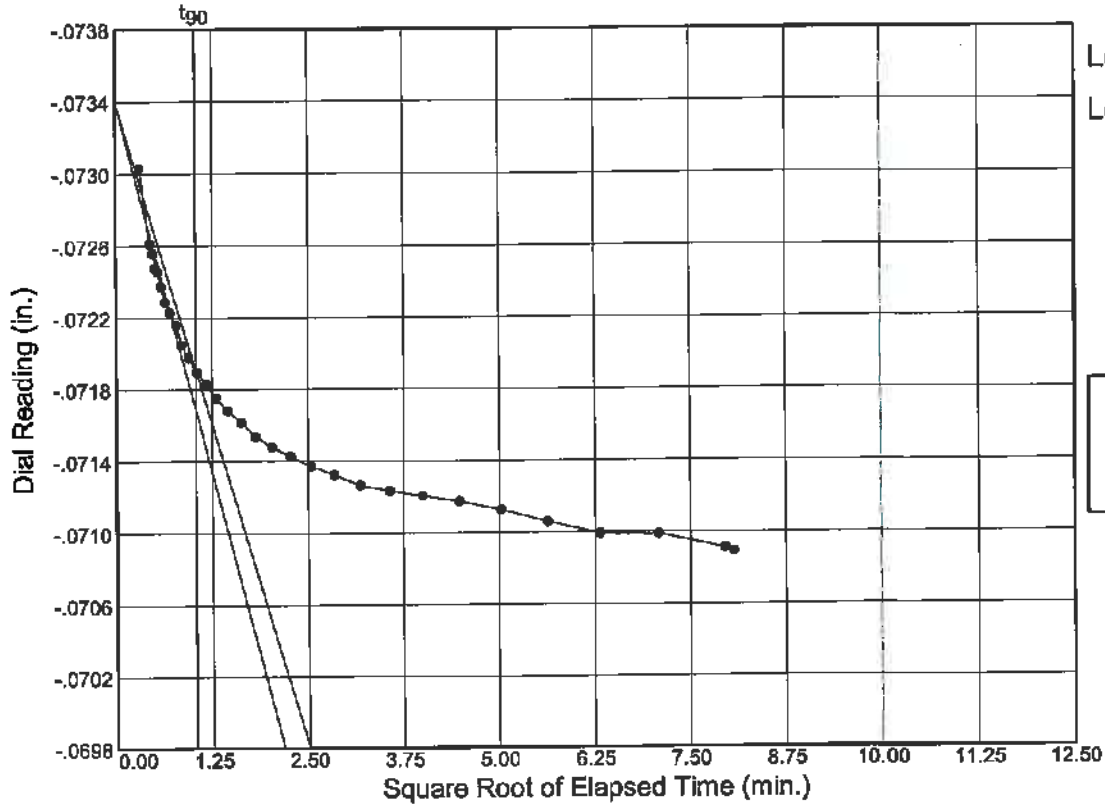
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

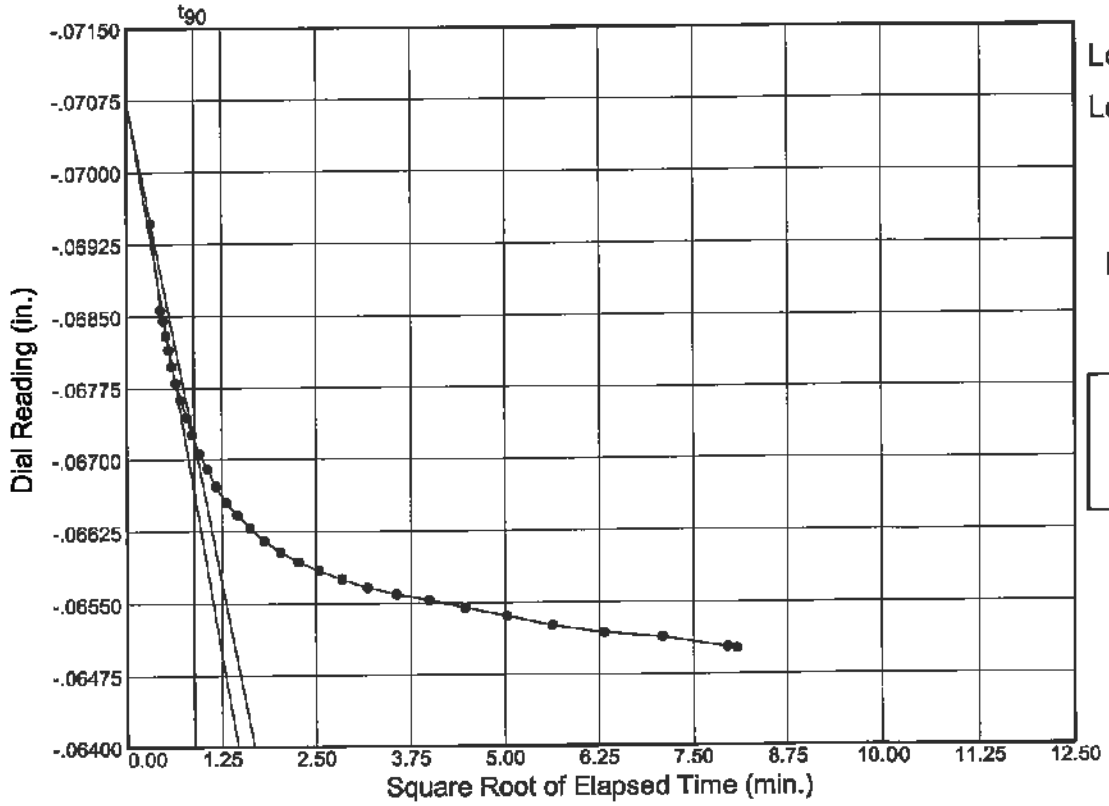
C_v @ T_{90}
1.97 ft.^{2}/day

Plate

Dial Reading vs. Time

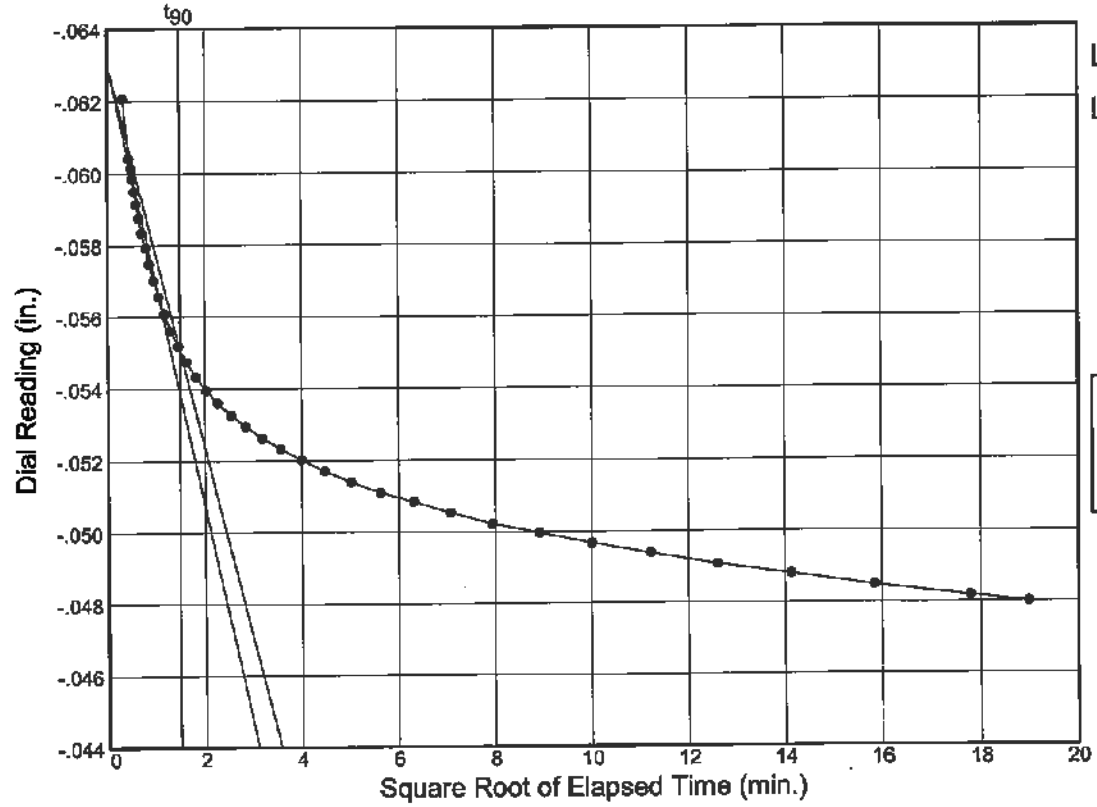
Project No.: 3520G
Project: Wekiva Parkway 7A

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



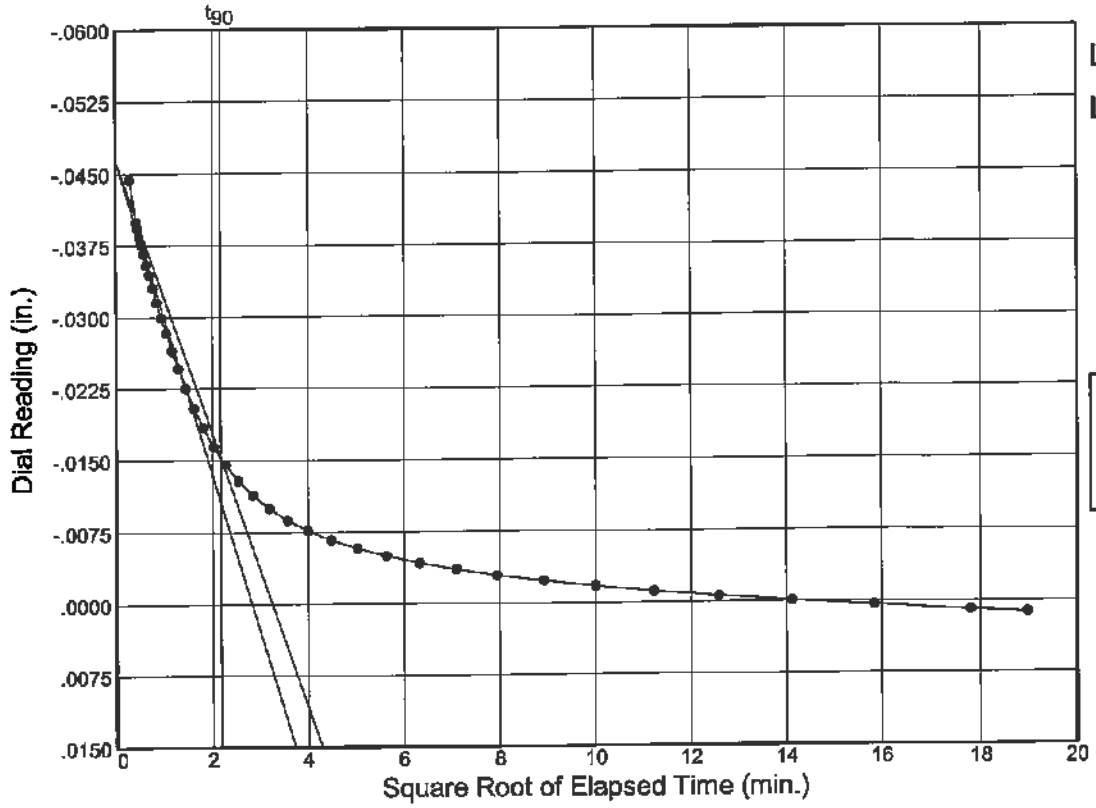
Load No.= 5
Load= 2.00 tsf
D_0 = -0.06305
D_{90} = -0.05509
D_{100} = -0.05420
T_{90} = 2.21 min.

C_v @ T_{90}
0.93 ft.^{2}/day

Dial Reading vs. Time

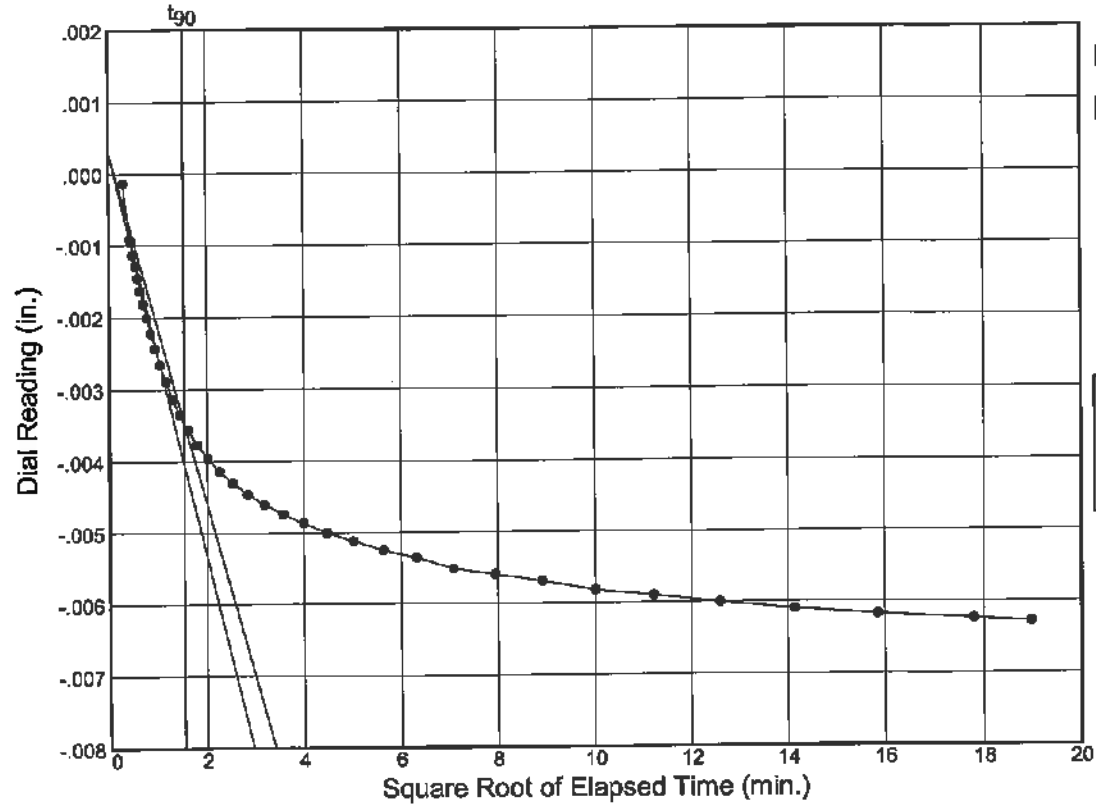
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

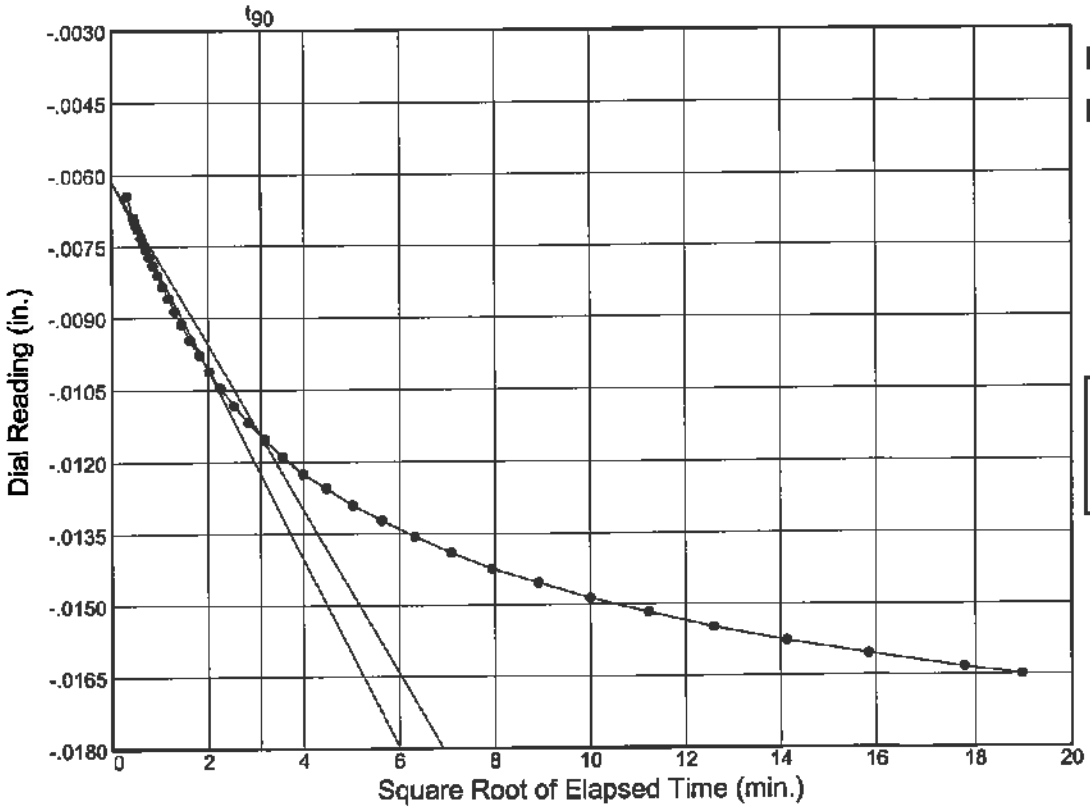
C_v @ T_{90}
0.77 ft.^{2}/day

Plate

Dial Reading vs. Time

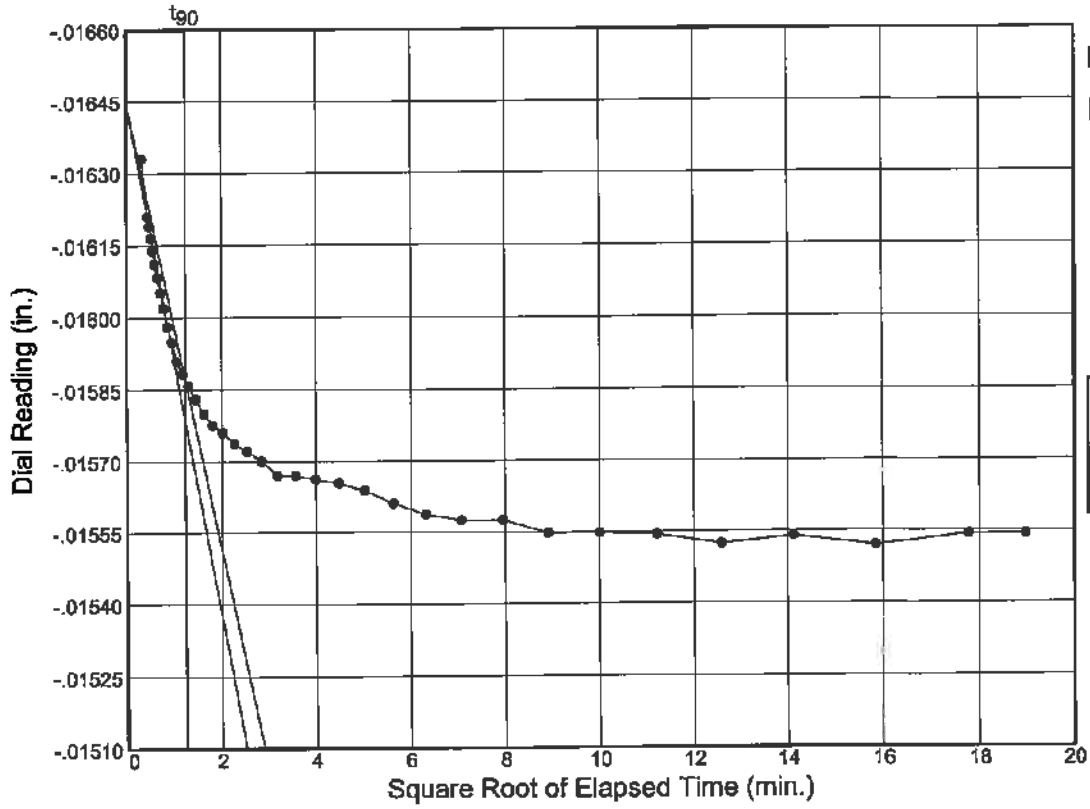
Project No.: 3520G
Project: Wekiva Parkway 7A

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



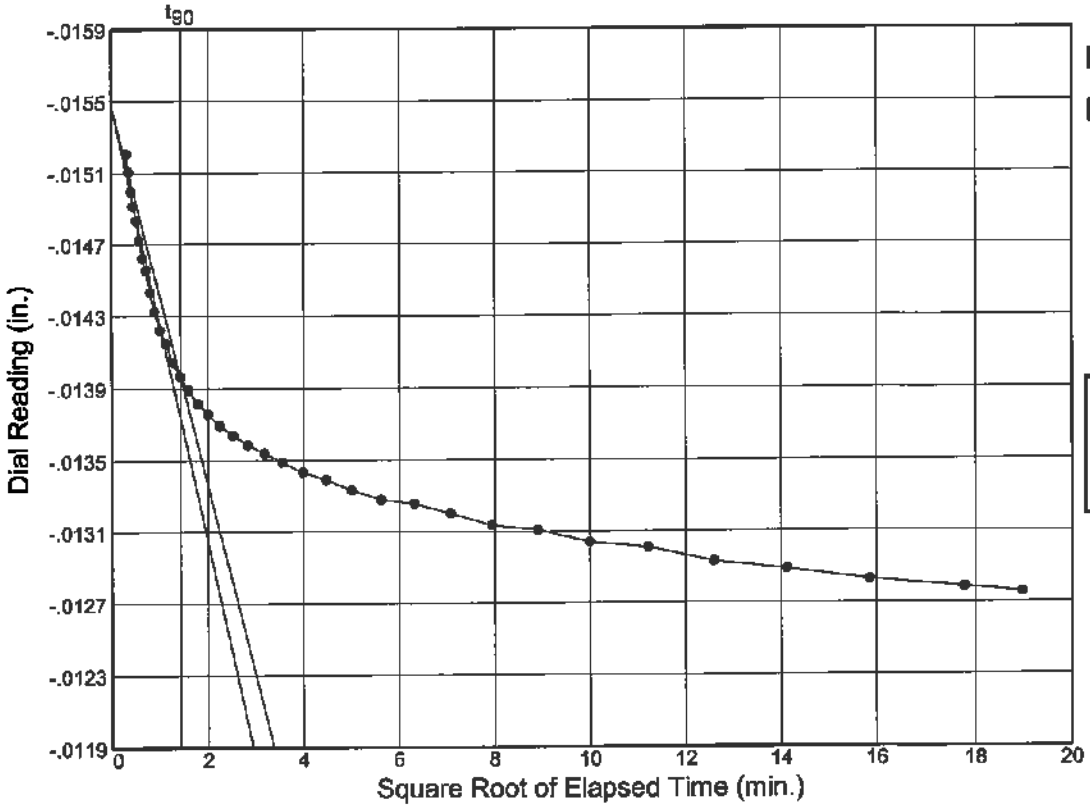
Load No.= 9
Load= 0.50 tsf
D_0 = -0.01645
D_{90} = -0.01587
D_{100} = -0.01581
T_{90} = 1.54 min.

C_v @ T_{90}
1.22 ft.^{2}/day

Dial Reading vs. Time

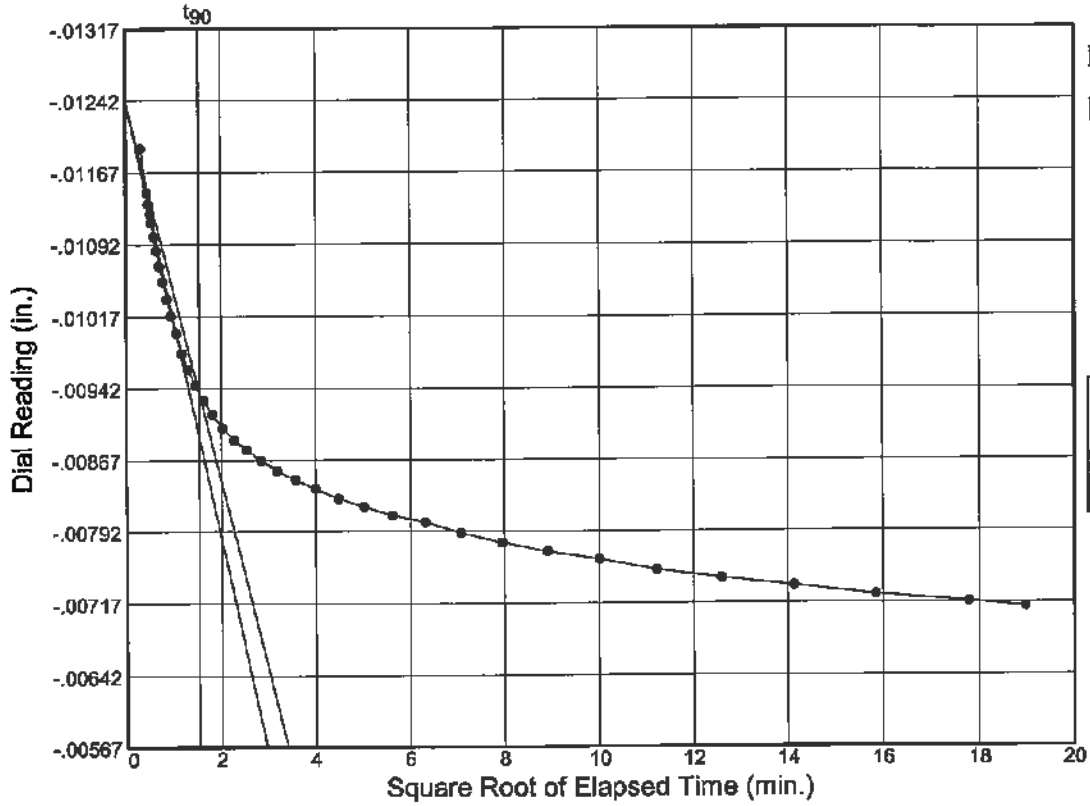
Project No.: 3520G
Project: Wekiva Parkway 7A

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



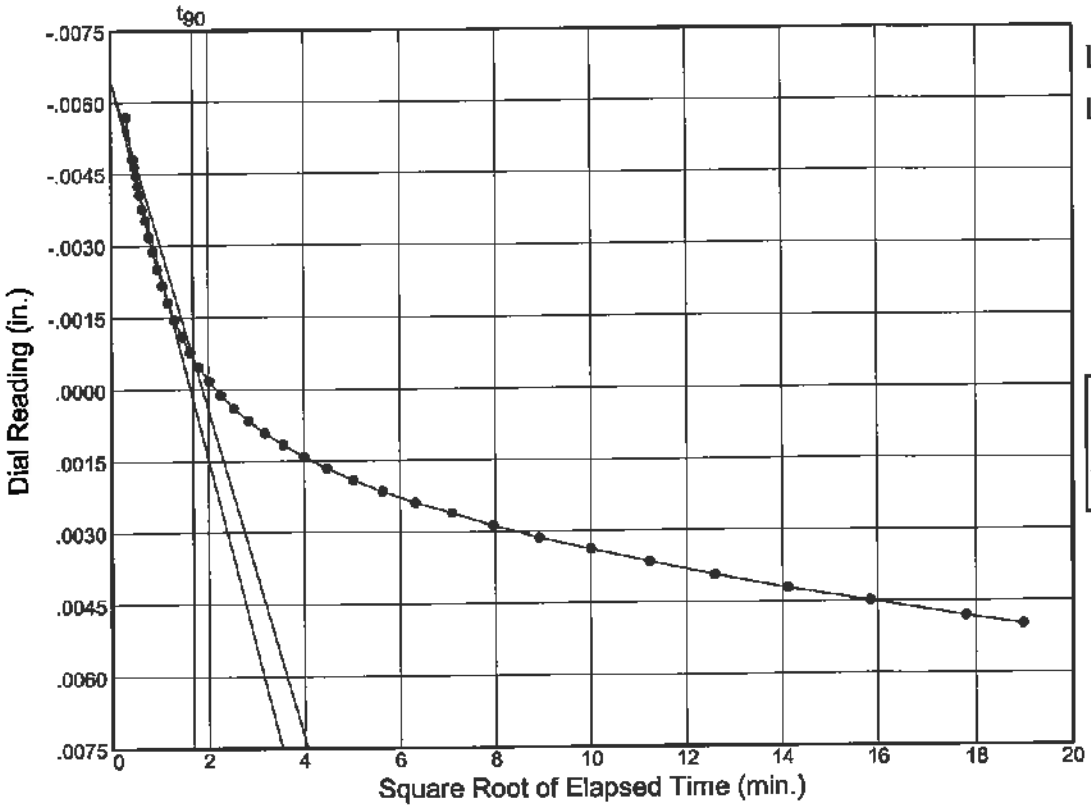
Load No.= 11
Load= 2.00 tsf
D_0 = -0.01241
D_{90} = -0.00938
D_{100} = -0.00905
T_{90} = 2.33 min.

C_v @ T_{90}
0.80 ft.^{2}/day

Dial Reading vs. Time

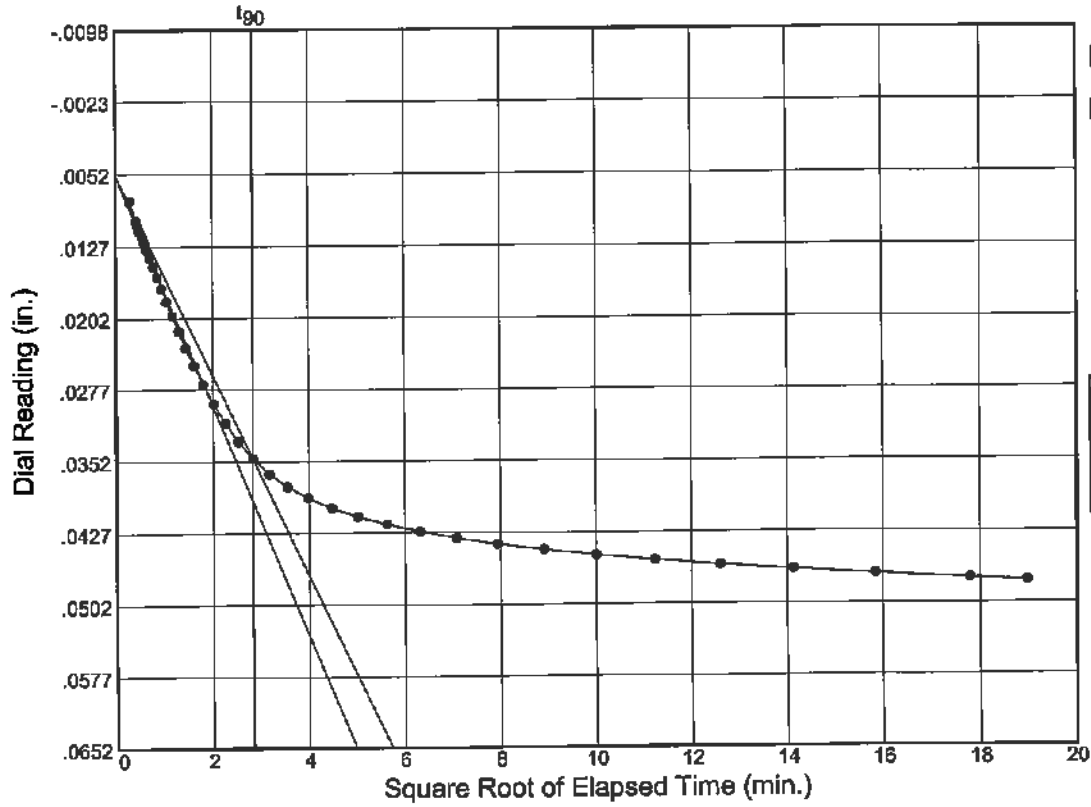
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

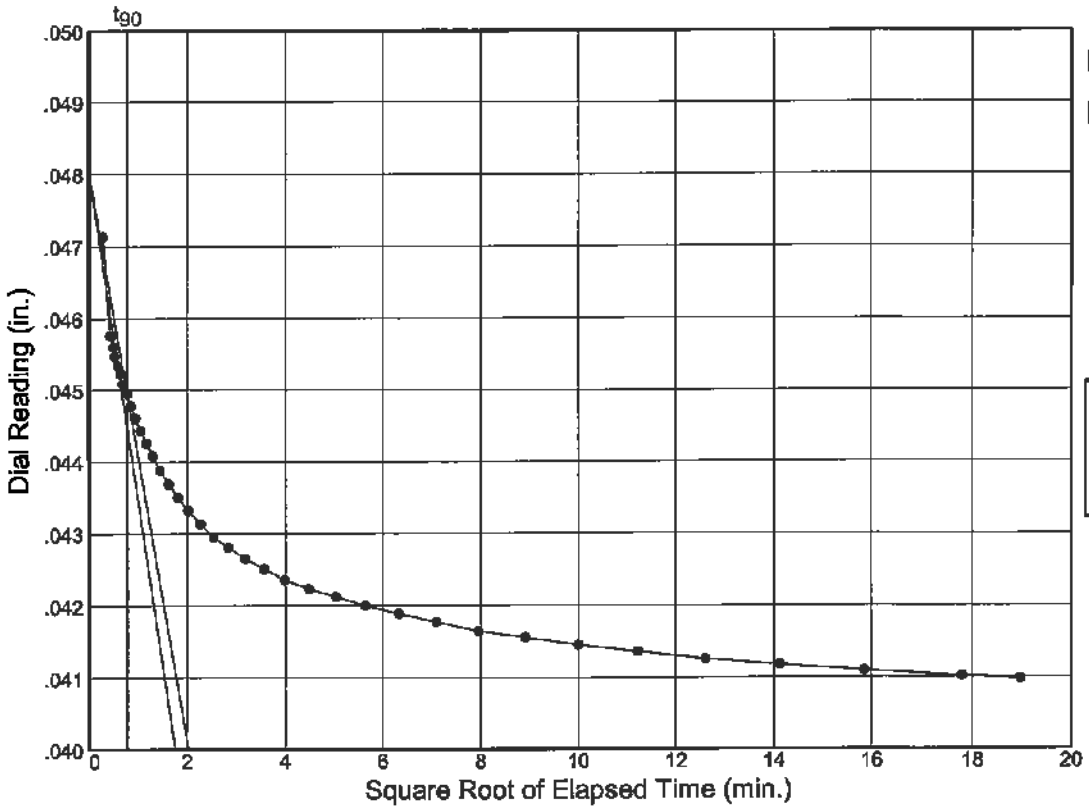
C_v @ T_{90}
0.22 ft.^{2}/day

Plate

Dial Reading vs. Time

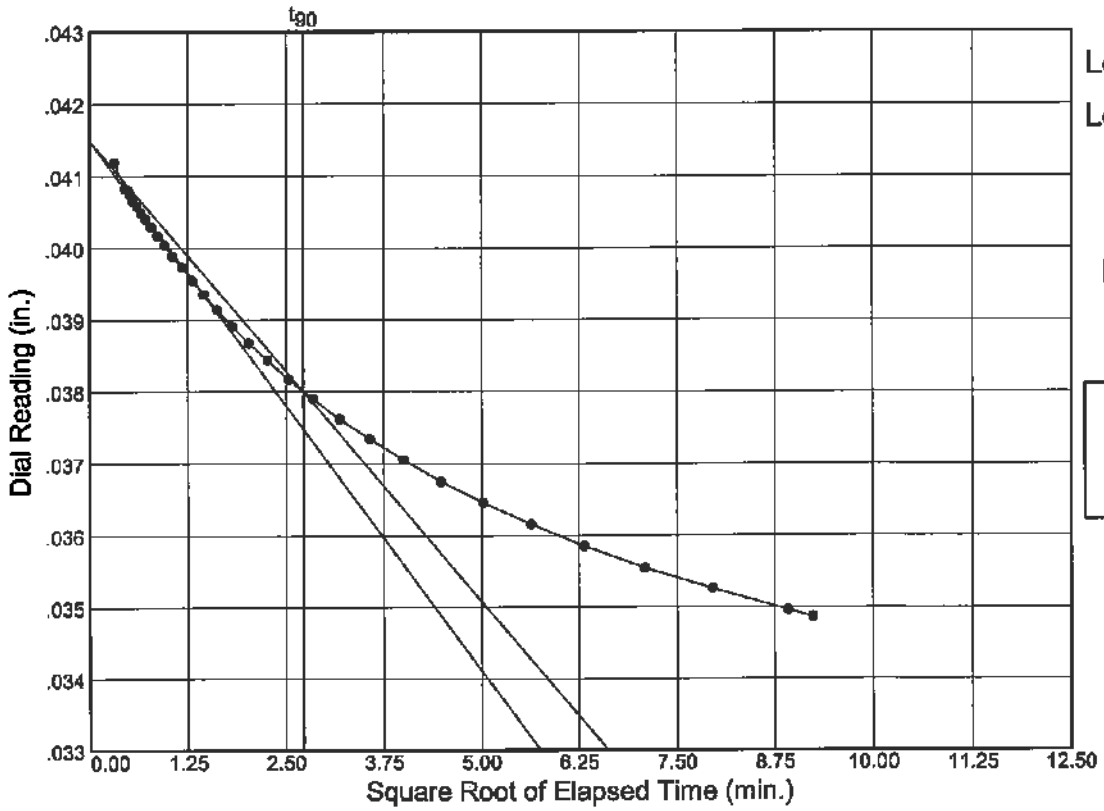
Project No.: 3520G
Project: Wekiva Parkway 7A

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.

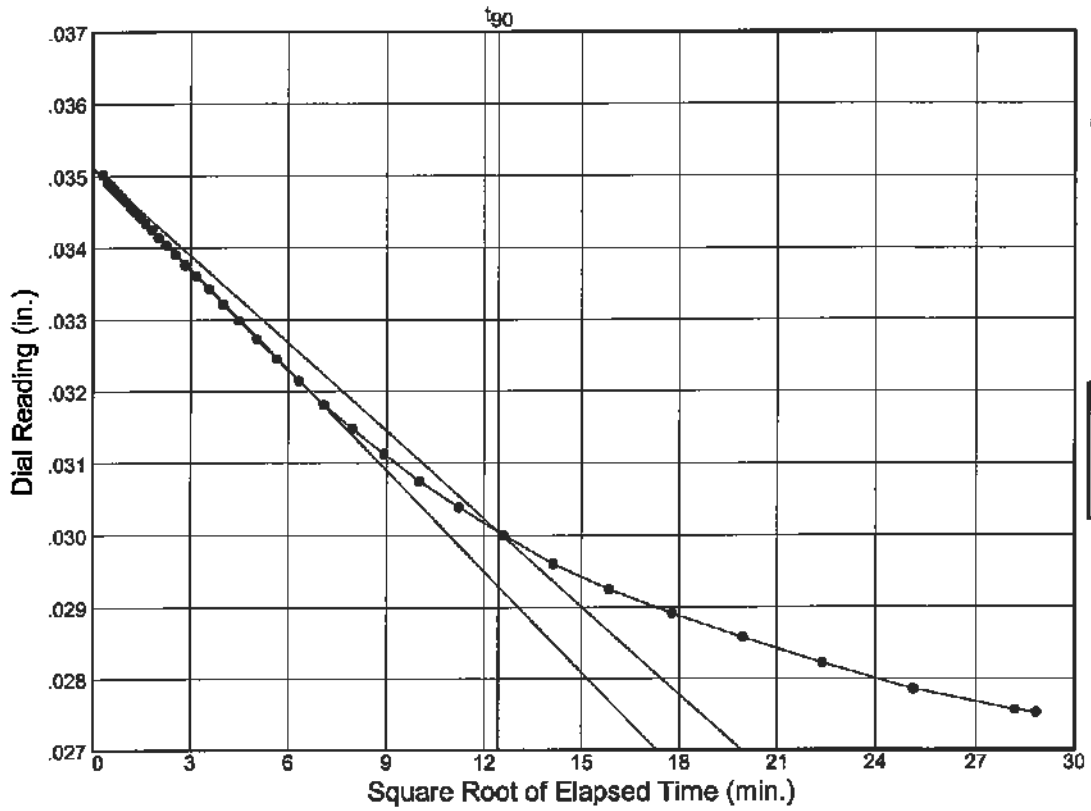
C_v @ T_{90}
0.23 ft.^{2}/day

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

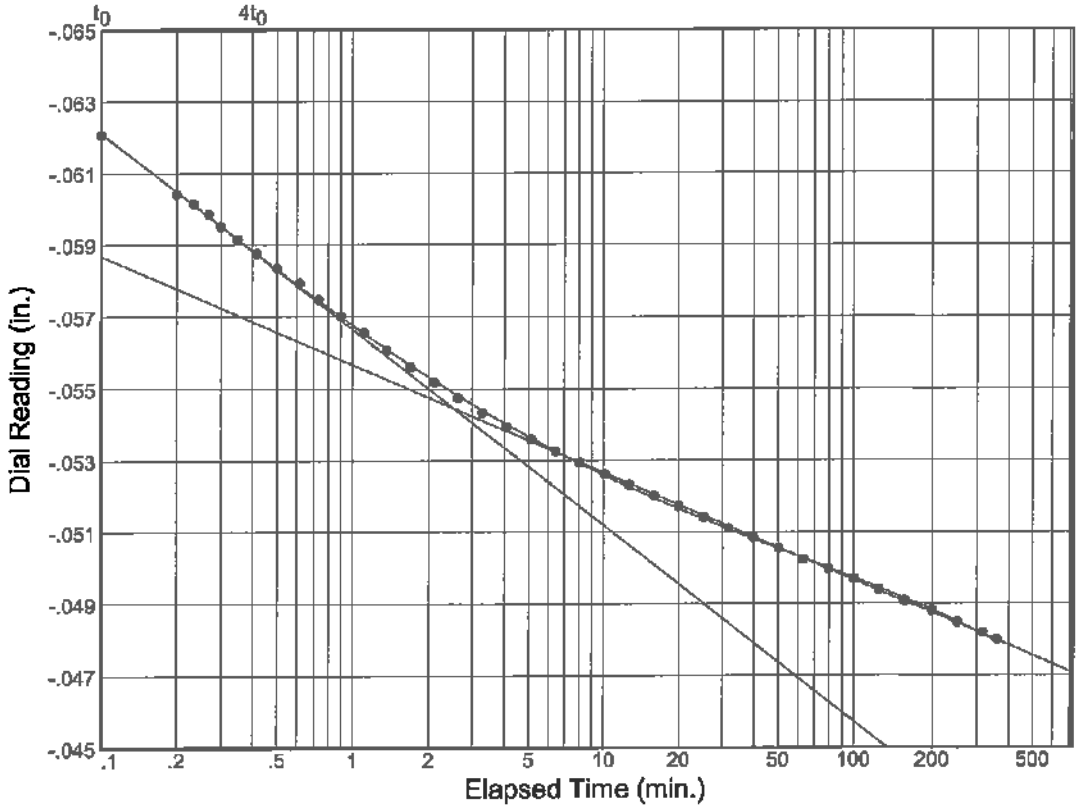
T_{90} = 154.48 min.

C_v @ T_{90}
0.01 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

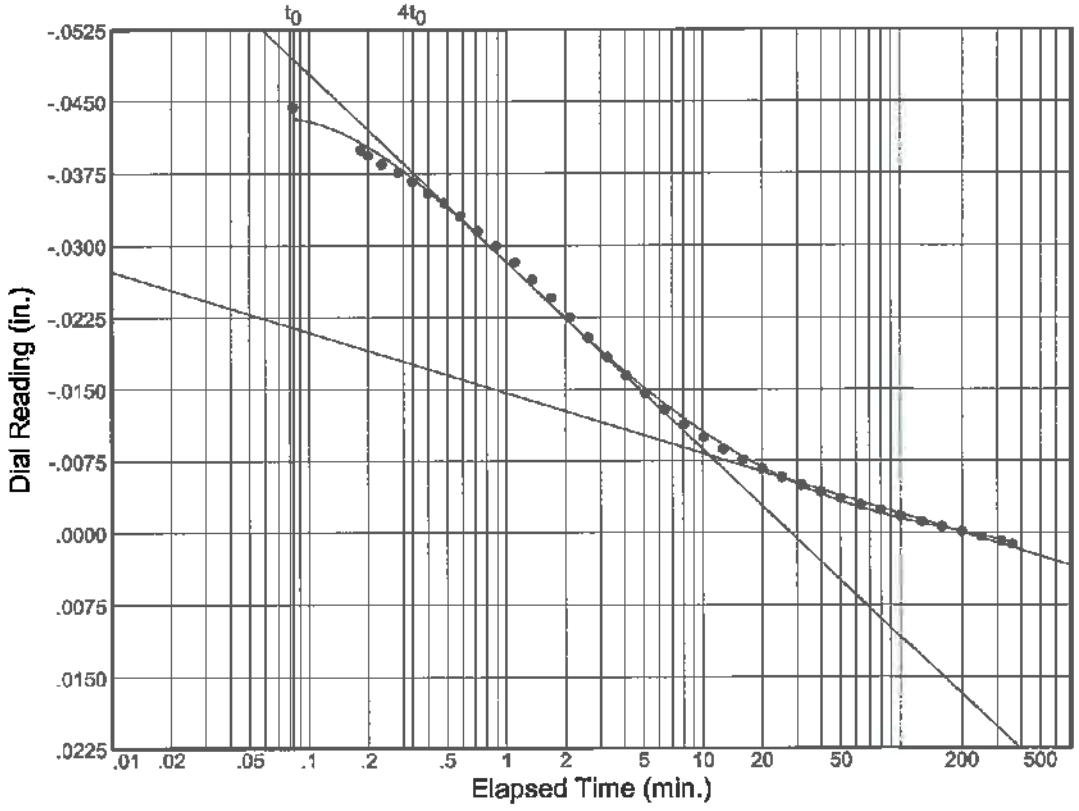
Location: MB-14 35'-37'



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.

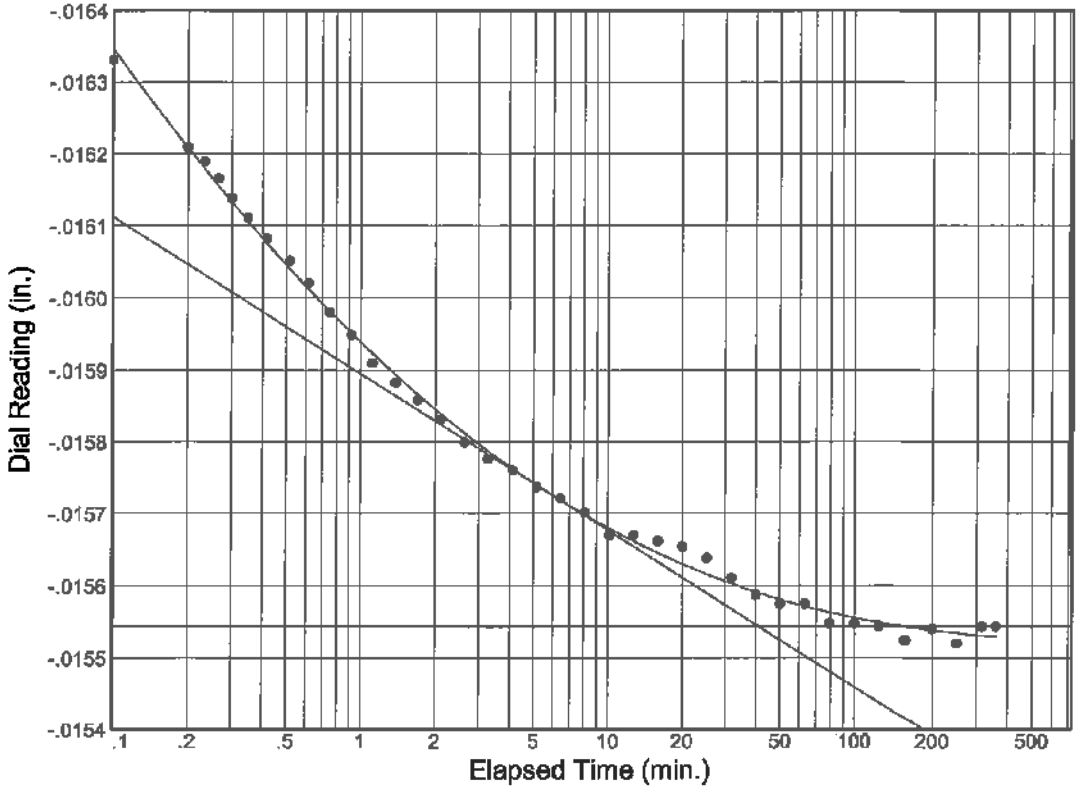
C_v @ T_{50}
0.47 ft.^{2}/day

C_α = 0.006

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

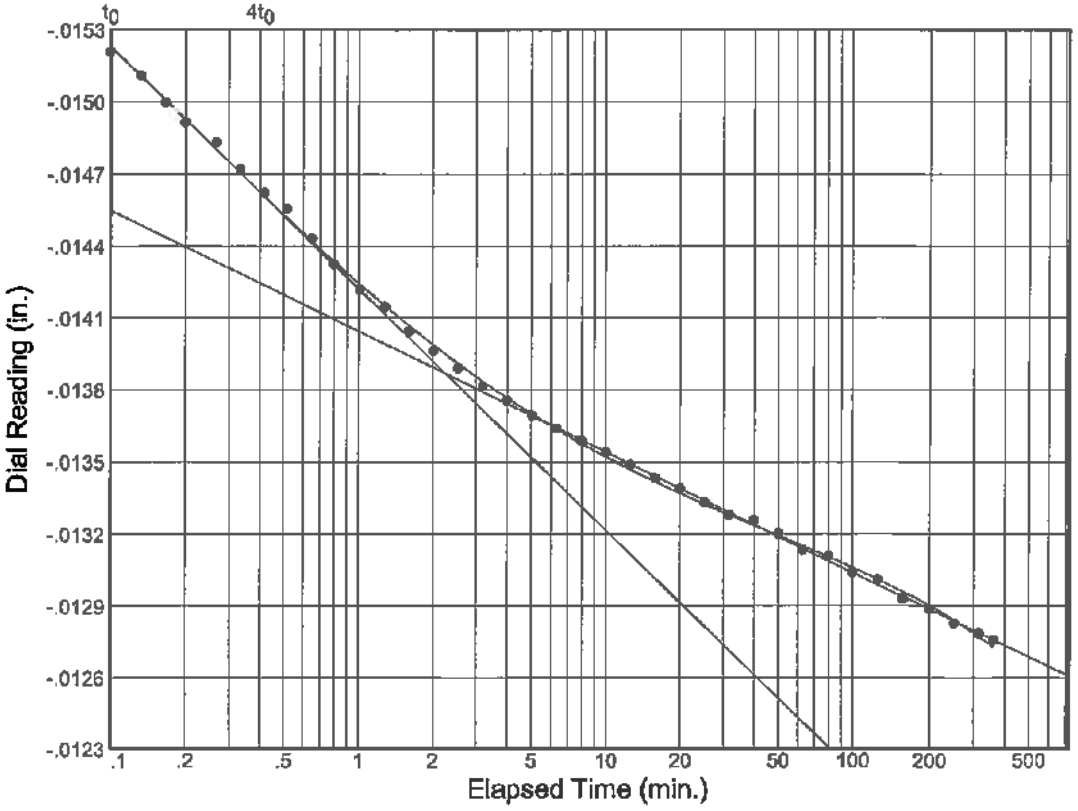
Location: MB-14 35'-37'



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.

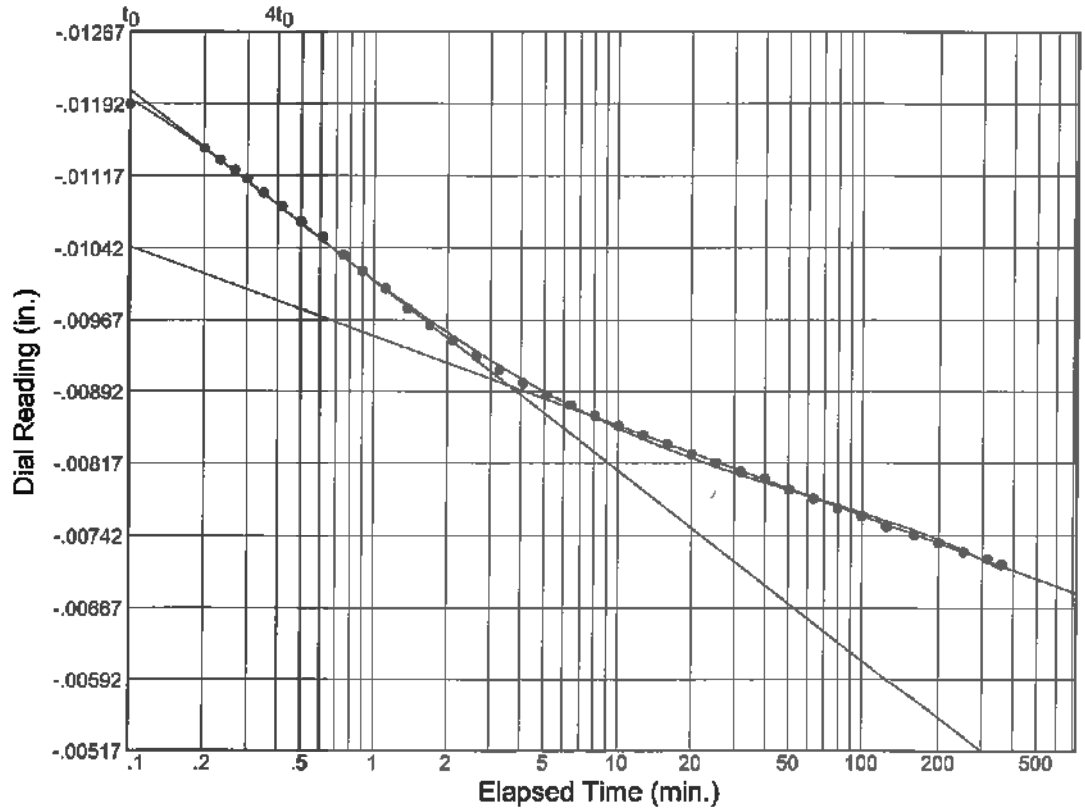
C_v @ T_{50}
1.81 ft.^{2}/day

C_α = 0.001

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

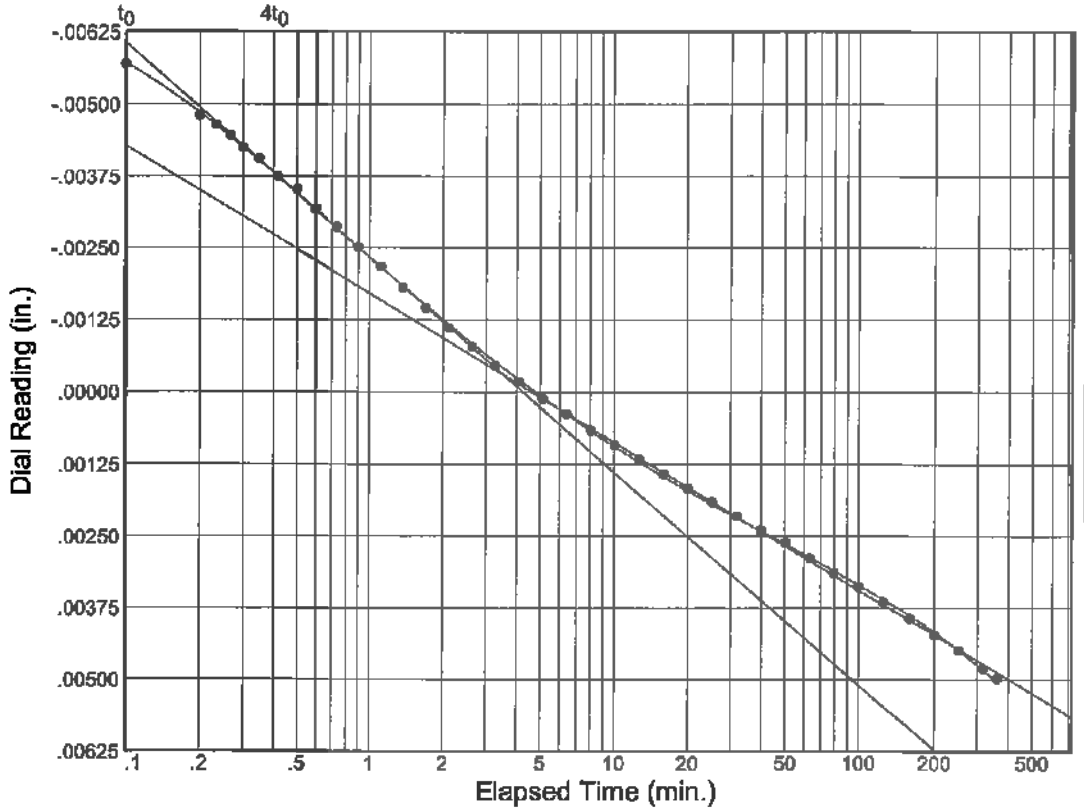
Location: MB-14 35'-37'



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.

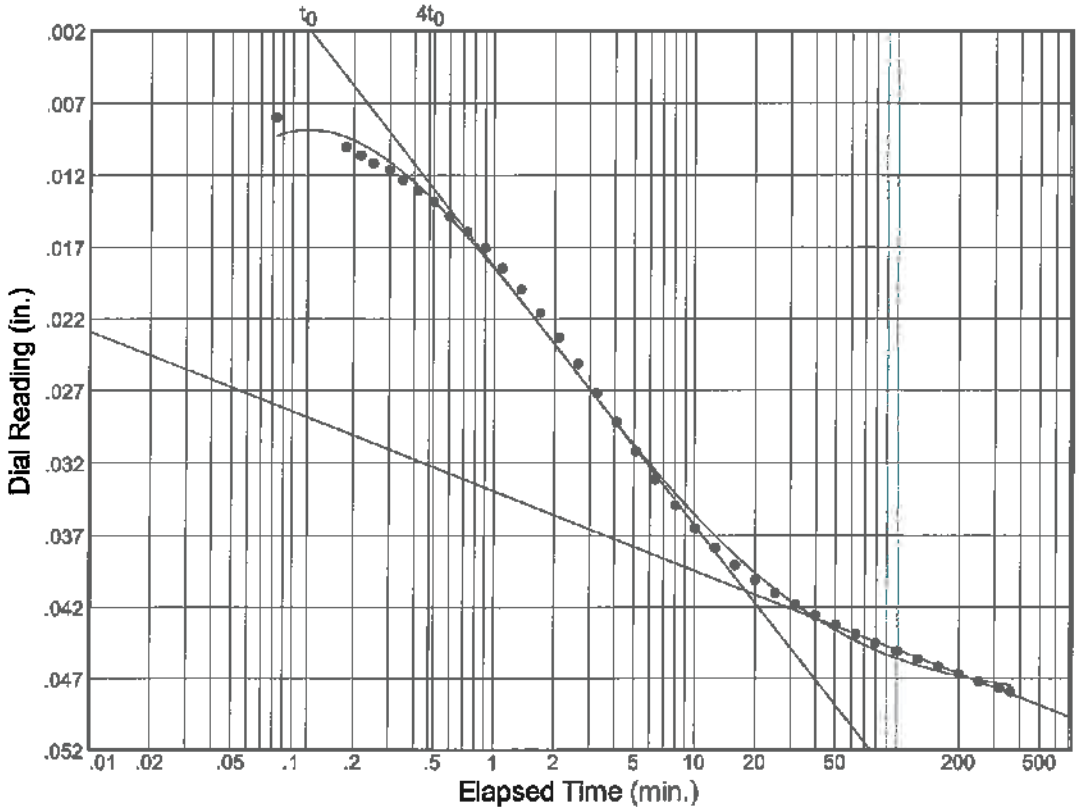
C_v @ T_{50}
1.17 ft.^{2}/day

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

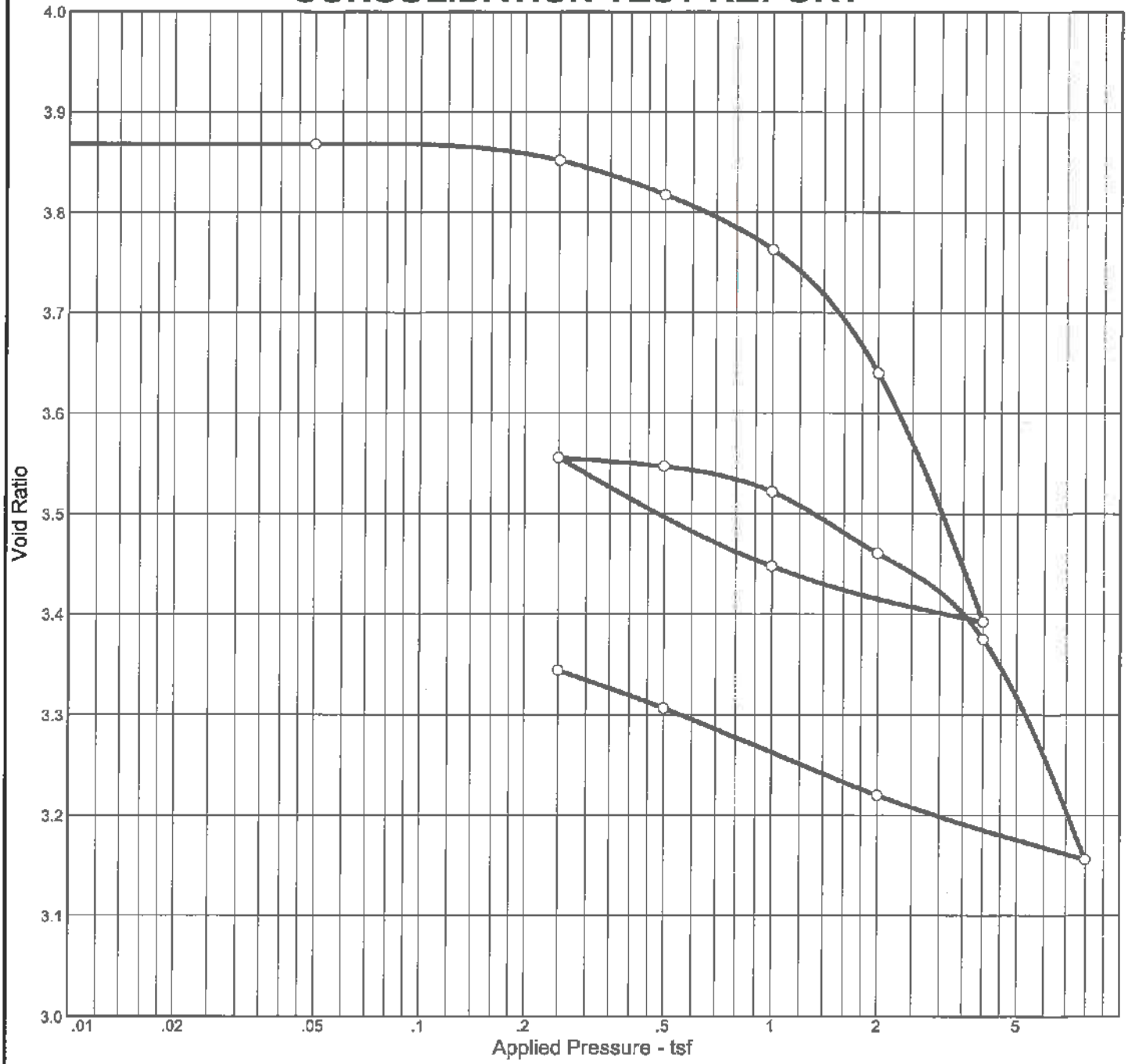
D_{100} = 0.04087

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
95.1 %	205.6 %	23.0			1.79	0.95	1.79	0.80	0.20			3.869

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Brown Sandy Muck	(PT)	

Project No. 3520G **Client:**

Project: Wekiva Parkway 7A

Location: BC-3 30'-32'

Remarks:

Percent Fines= 66.4%
Organic Content= 56.5%

CONSOLIDATION TEST REPORT

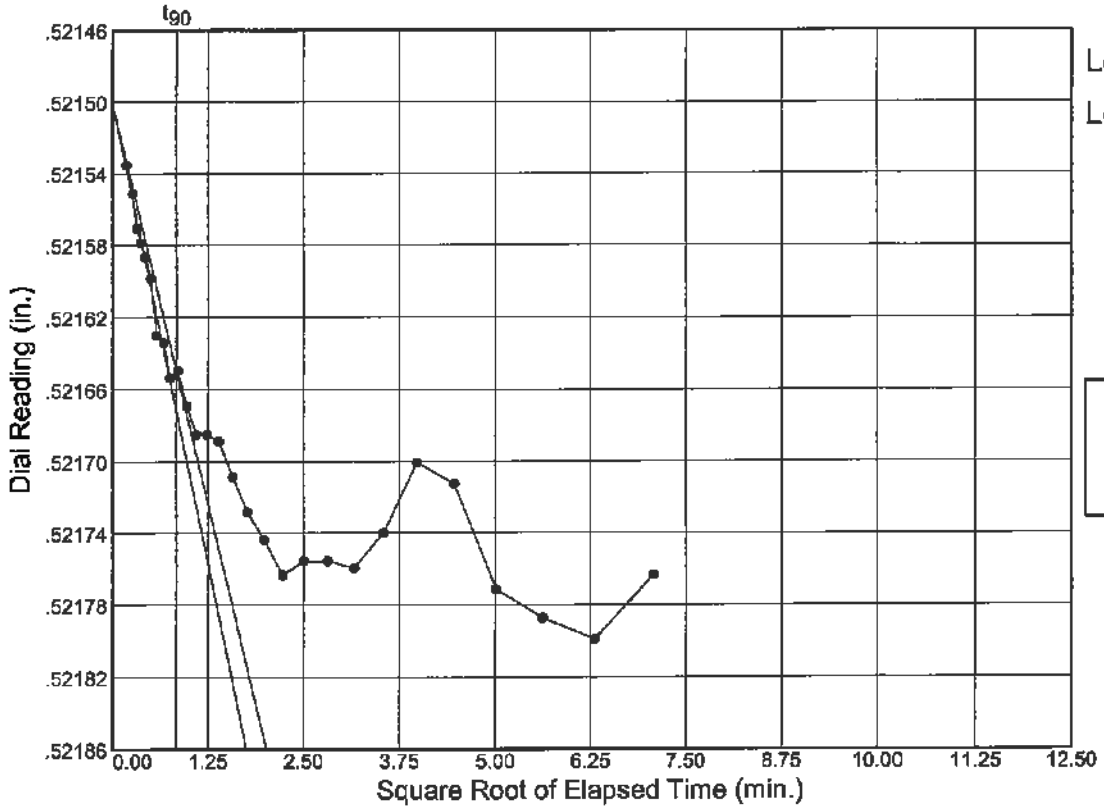
Geotechnical and Environmental Consultants, Inc.

Plate

Dial Reading vs. Time

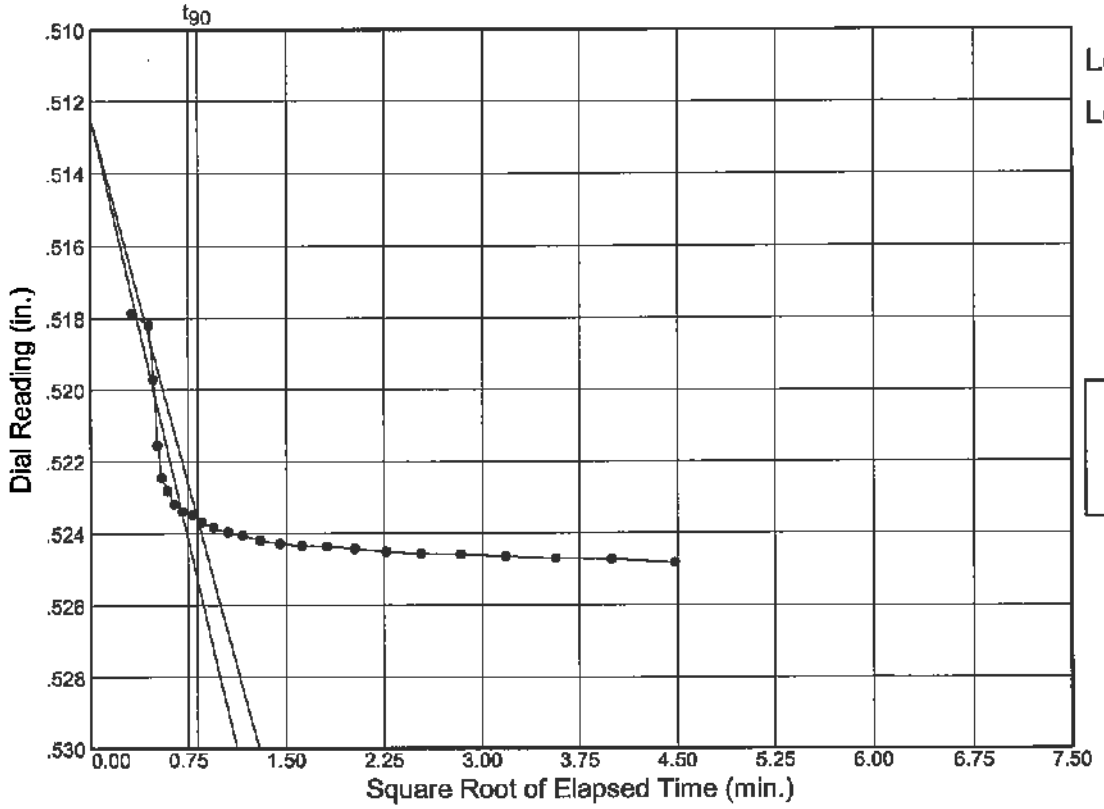
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 1
Load= 0.05 tsf
D_0 = 0.52150
D_{90} = 0.52165
D_{100} = 0.52167
T_{90} = 0.70 min.

C_v @ T_{90}
3.02 ft.^{2}/day



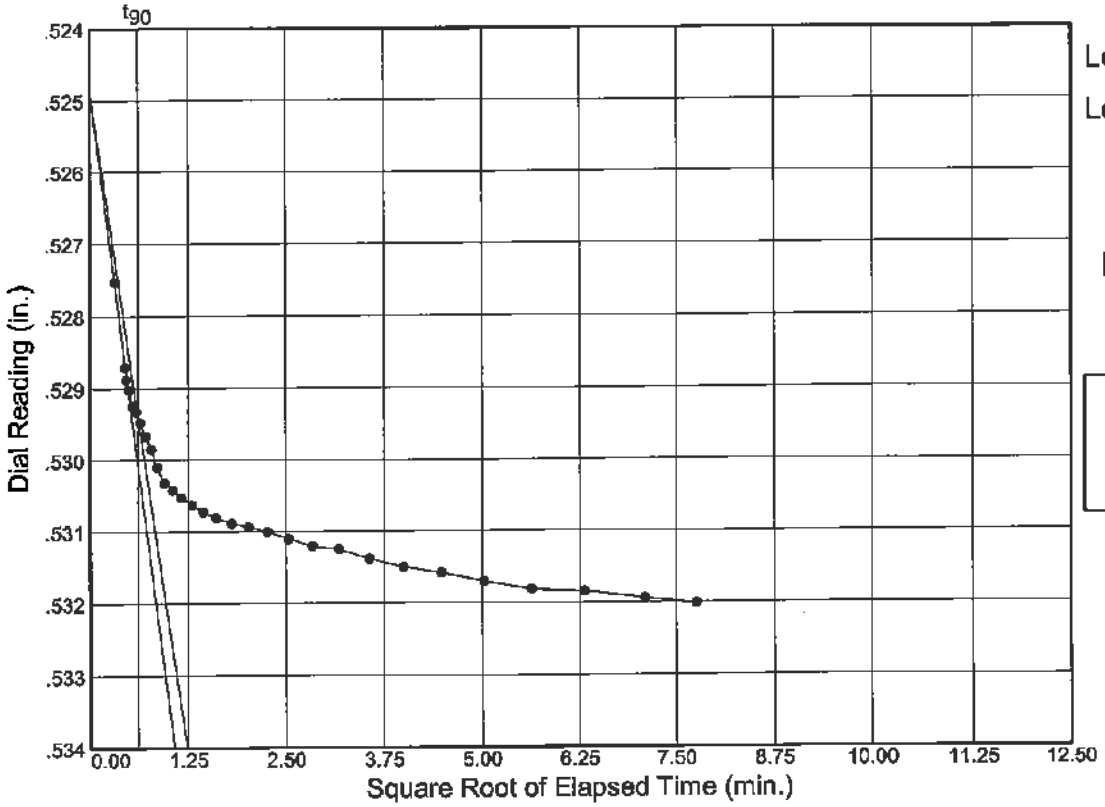
Load No.= 2
Load= 0.25 tsf
D_0 = 0.51246
D_{90} = 0.52359
D_{100} = 0.52483
T_{90} = 0.67 min.

C_v @ T_{90}
3.14 ft.^{2}/day

Dial Reading vs. Time

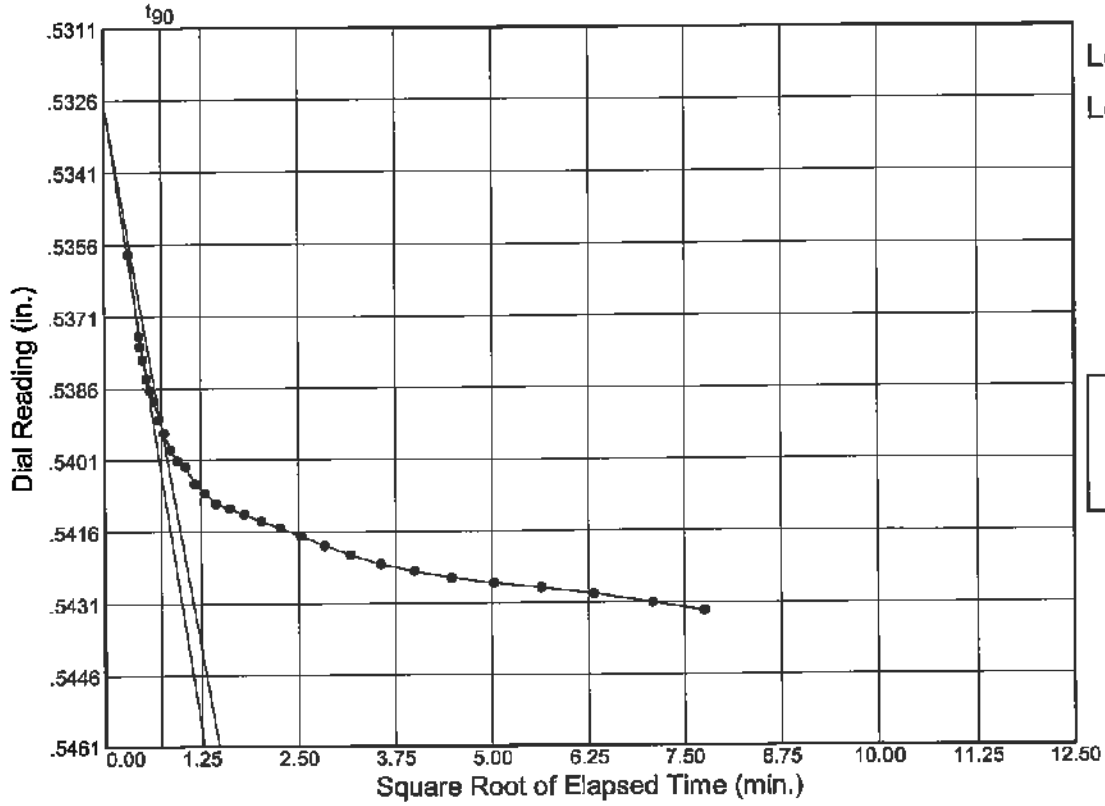
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 3
Load= 0.50 tsf
D_0 = 0.52488
D_{90} = 0.52939
D_{100} = 0.52989
T_{90} = 0.38 min.

C_v @ T_{90}
5.57 ft.^{2}/day



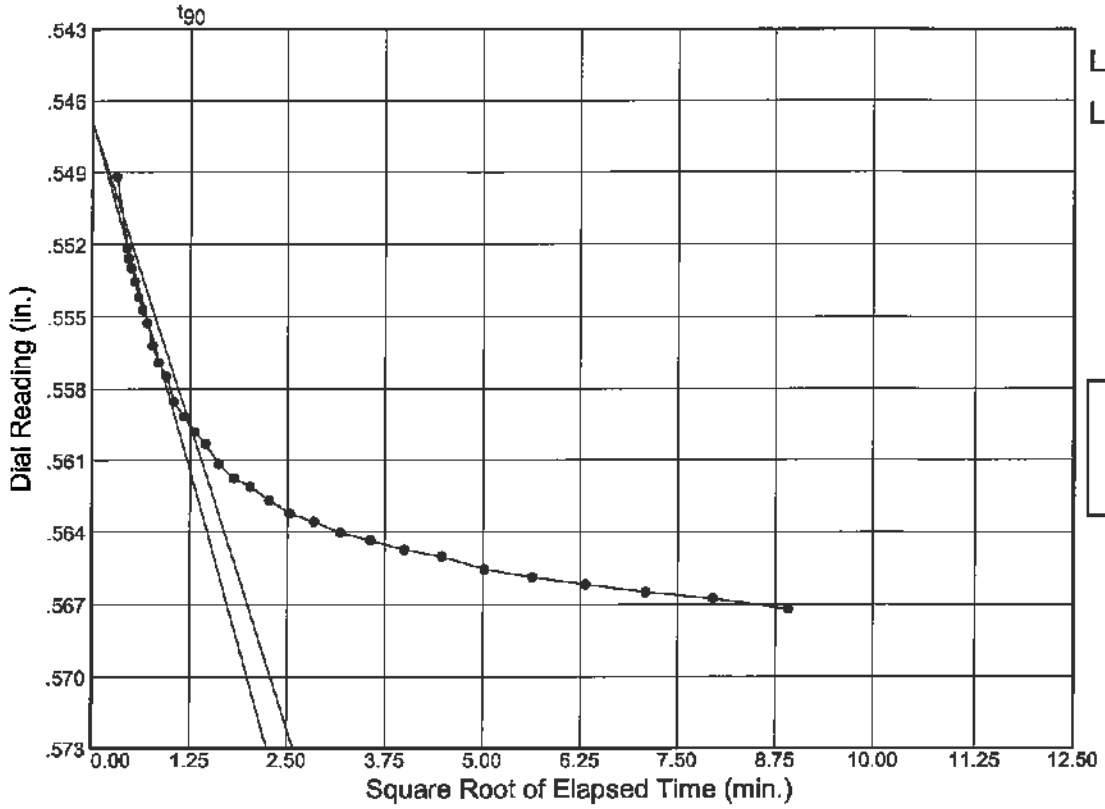
Load No.= 4
Load= 1.00 tsf
D_0 = 0.53269
D_{90} = 0.53938
D_{100} = 0.54012
T_{90} = 0.54 min.

C_v @ T_{90}
3.79 ft.^{2}/day

Dial Reading vs. Time

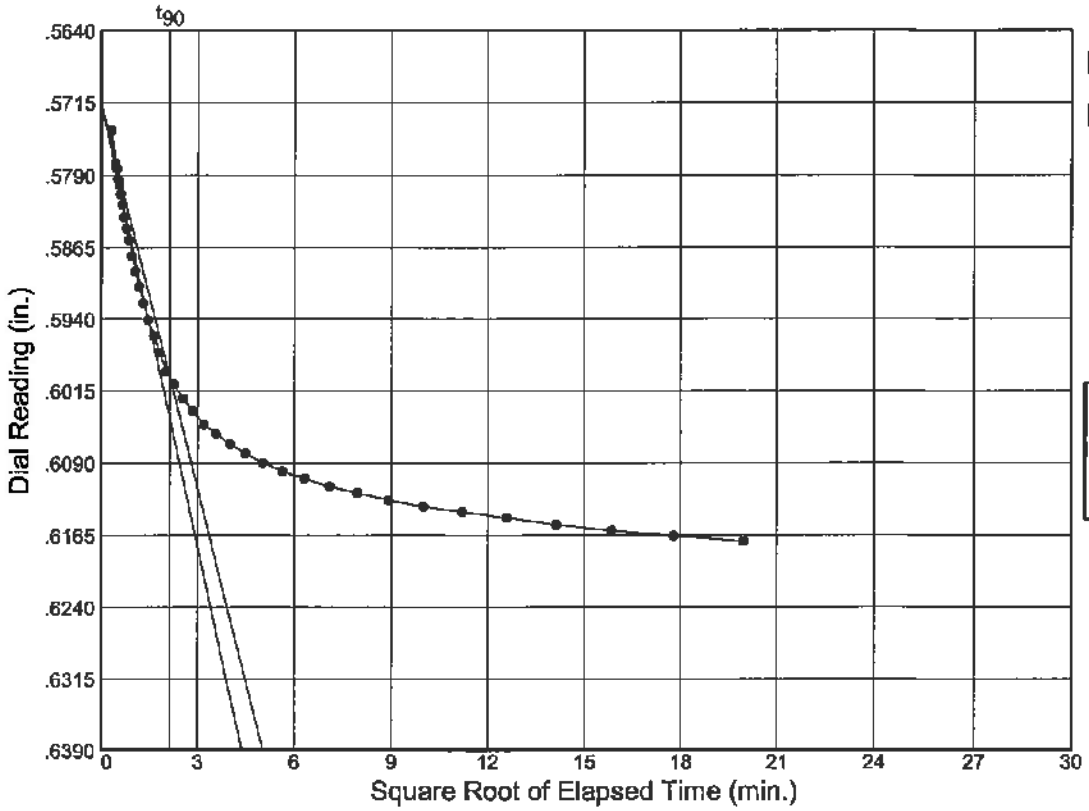
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 5
Load= 2.00 tsf
D_0 = 0.54685
D_{90} = 0.55956
D_{100} = 0.56098
T_{90} = 1.57 min.

C_v @ T_{90}
1.26 ft.^{2}/day



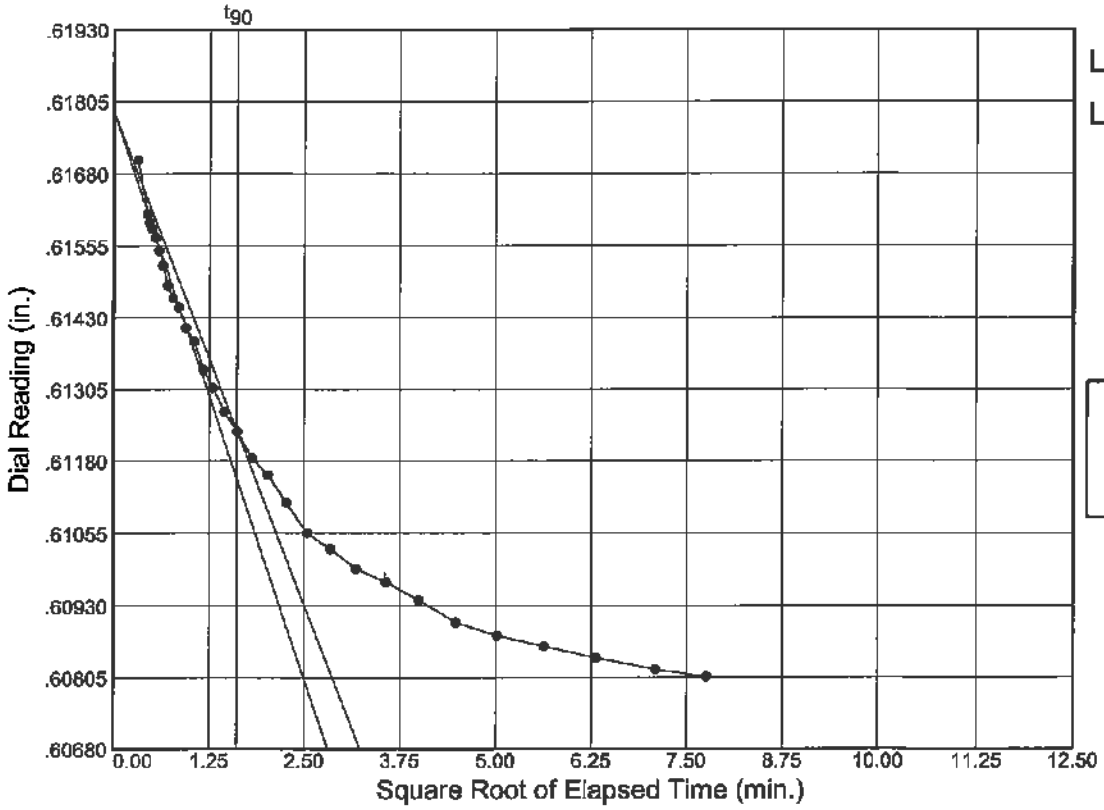
Load No.= 6
Load= 4.00 tsf
D_0 = 0.57158
D_{90} = 0.60005
D_{100} = 0.60321
T_{90} = 4.51 min.

C_v @ T_{90}
0.41 ft.^{2}/day

Dial Reading vs. Time

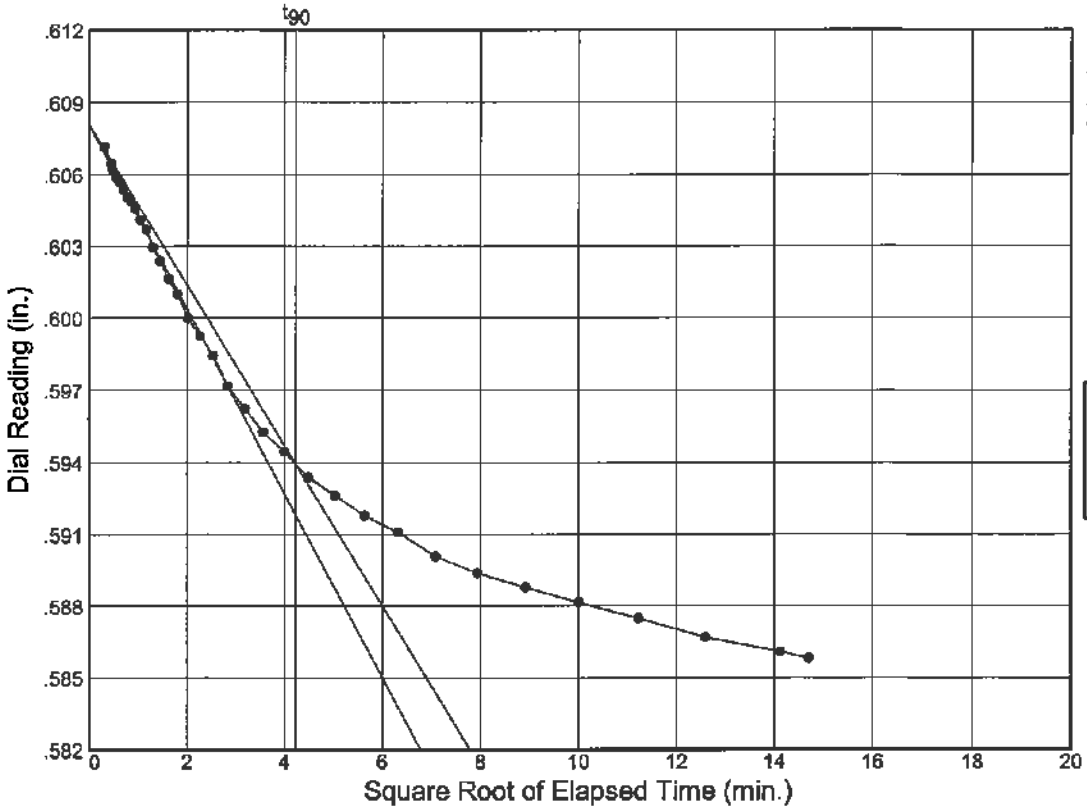
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 7
Load= 1.00 tsf
D_0 = 0.61787
D_{90} = 0.61232
D_{100} = 0.61170
T_{90} = 2.61 min.

C_v @ T_{90}
0.67 ft.^{2}/day



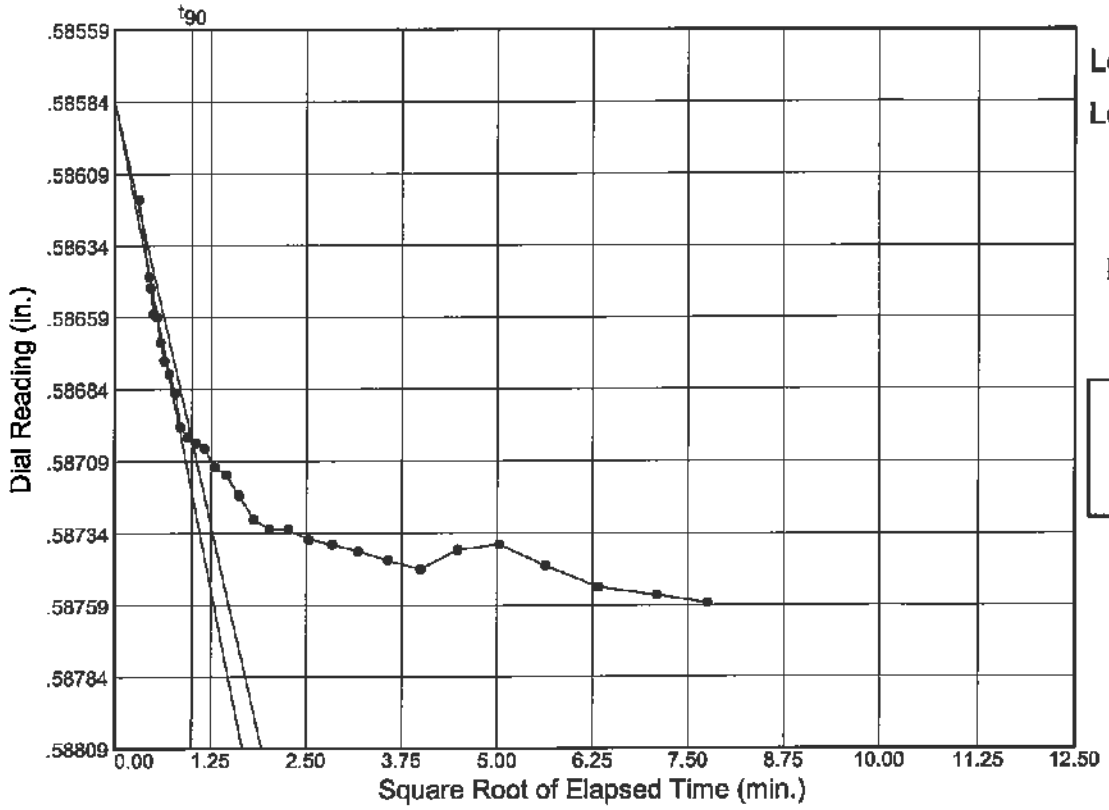
Load No.= 8
Load= 0.25 tsf
D_0 = 0.60809
D_{90} = 0.59395
D_{100} = 0.59237
T_{90} = 17.84 min.

C_v @ T_{90}
0.10 ft.^{2}/day

Dial Reading vs. Time

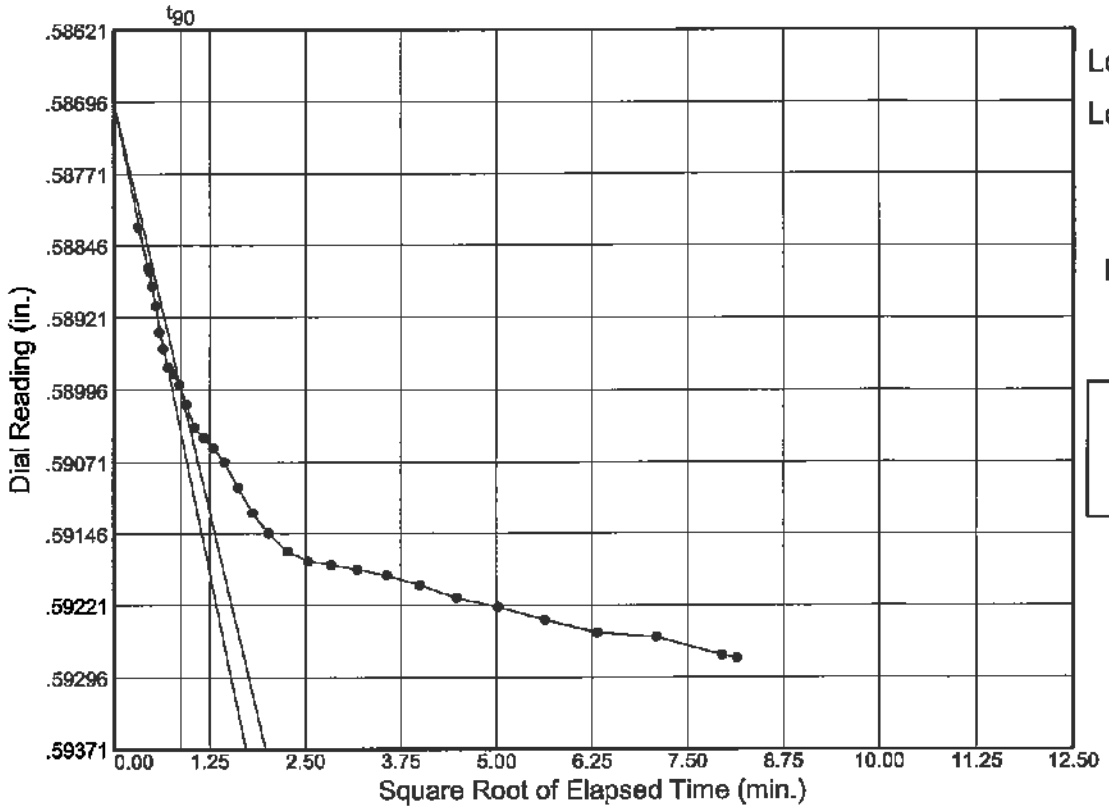
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 9
Load= 0.50 tsf
D_0 = 0.58584
D_{90} = 0.58702
D_{100} = 0.58715
T_{90} = 1.01 min.

C_v @ T_{90}
1.84 ft.^{2}/day



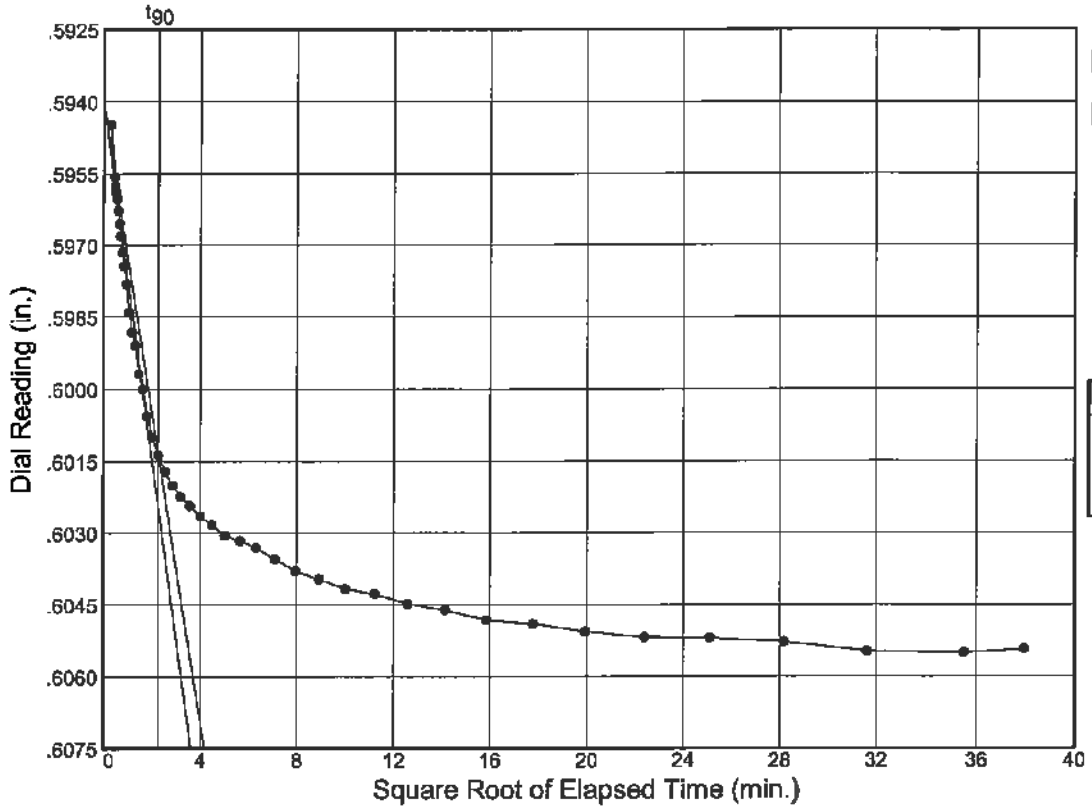
Load No.= 10
Load= 1.00 tsf
D_0 = 0.58697
D_{90} = 0.58994
D_{100} = 0.59027
T_{90} = 0.76 min.

C_v @ T_{90}
2.43 ft.^{2}/day

Dial Reading vs. Time

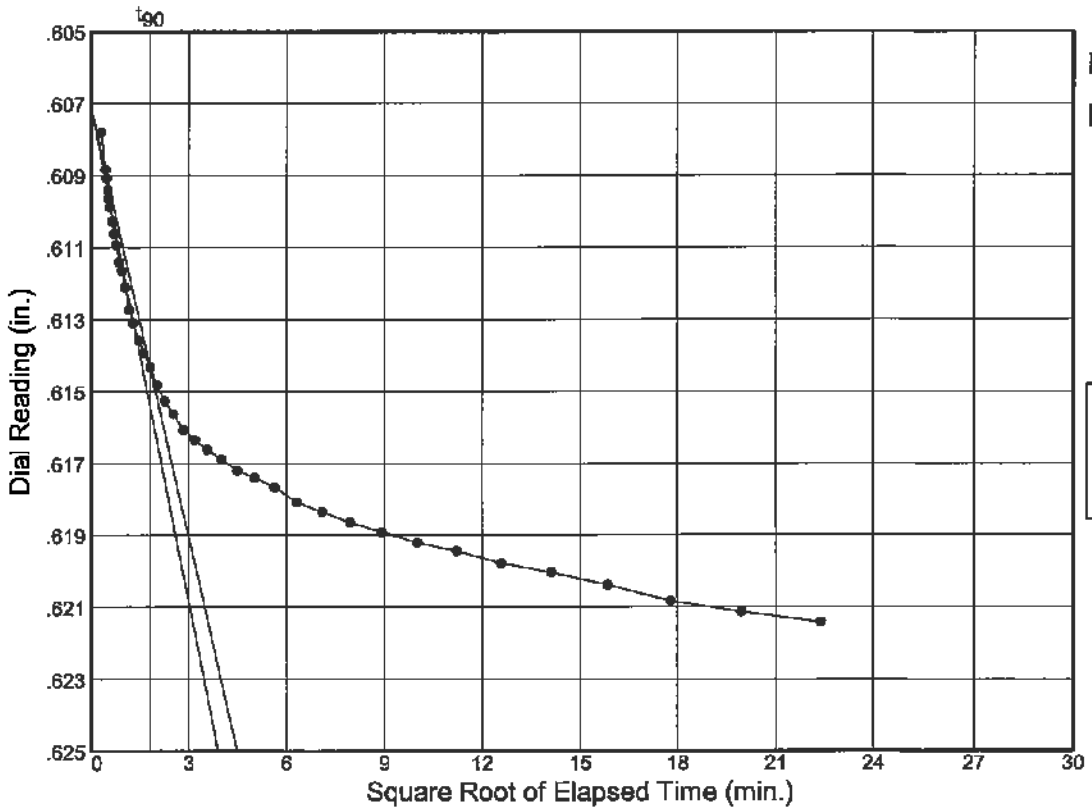
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 11
Load= 2.00 tsf
D_0 = 0.59402
D_{90} = 0.60138
D_{100} = 0.60220
T_{90} = 5.14 min.

C_v @ T_{90}
0.35 ft.^{2}/day



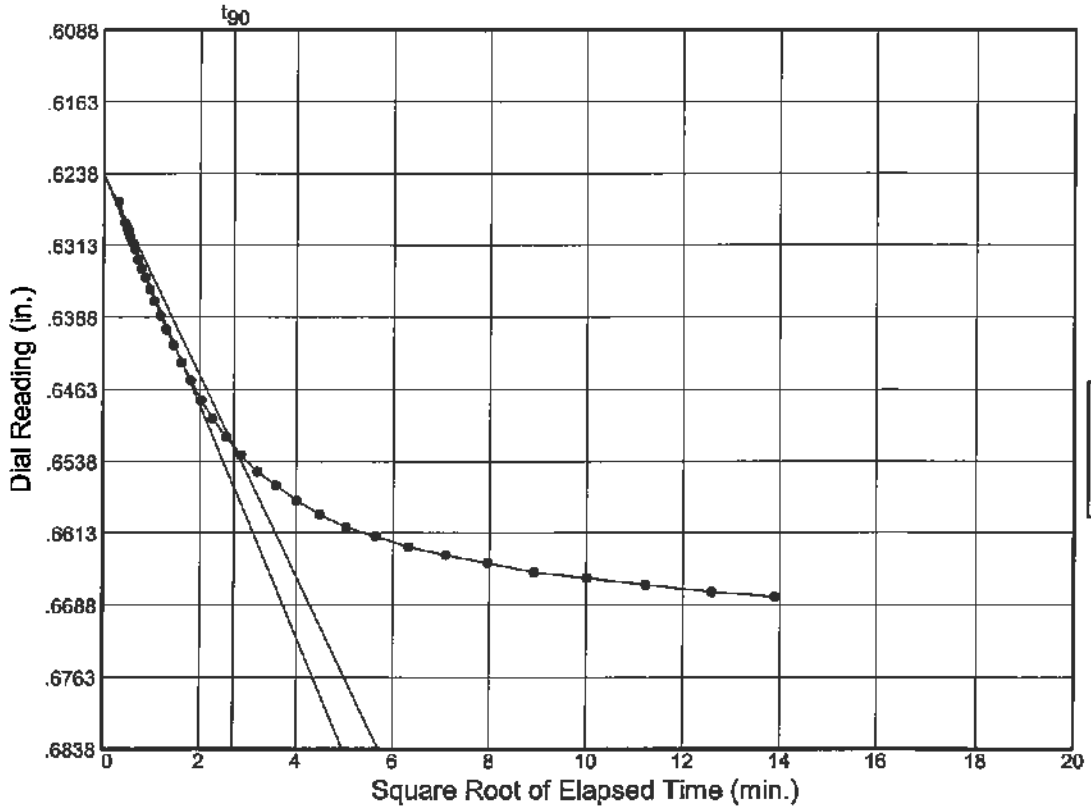
Load No.= 12
Load= 4.00 tsf
D_0 = 0.60706
D_{90} = 0.61430
D_{100} = 0.61511
T_{90} = 3.27 min.

C_v @ T_{90}
0.54 ft.^{2}/day

Dial Reading vs. Time

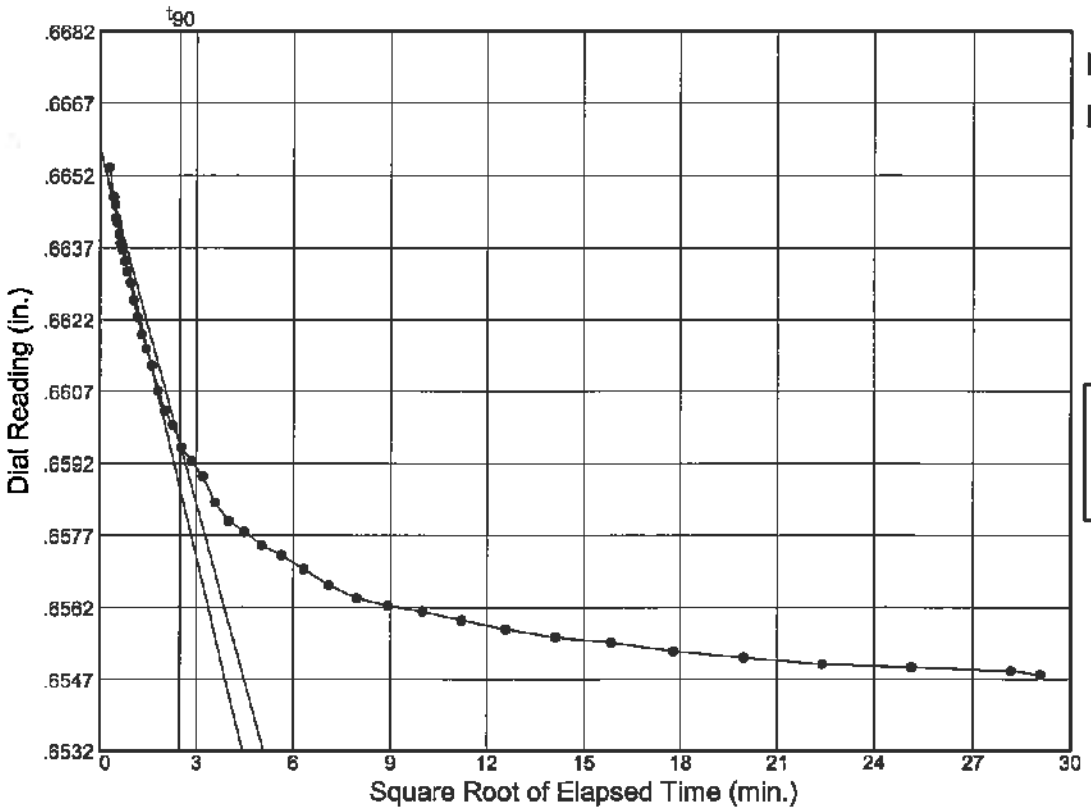
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 13
Load= 8.00 tsf
D_0 = 0.62389
D_{90} = 0.65228
D_{100} = 0.65543
T_{90} = 7.30 min.

C_v @ T_{90}
0.22 ft.^{2}/day



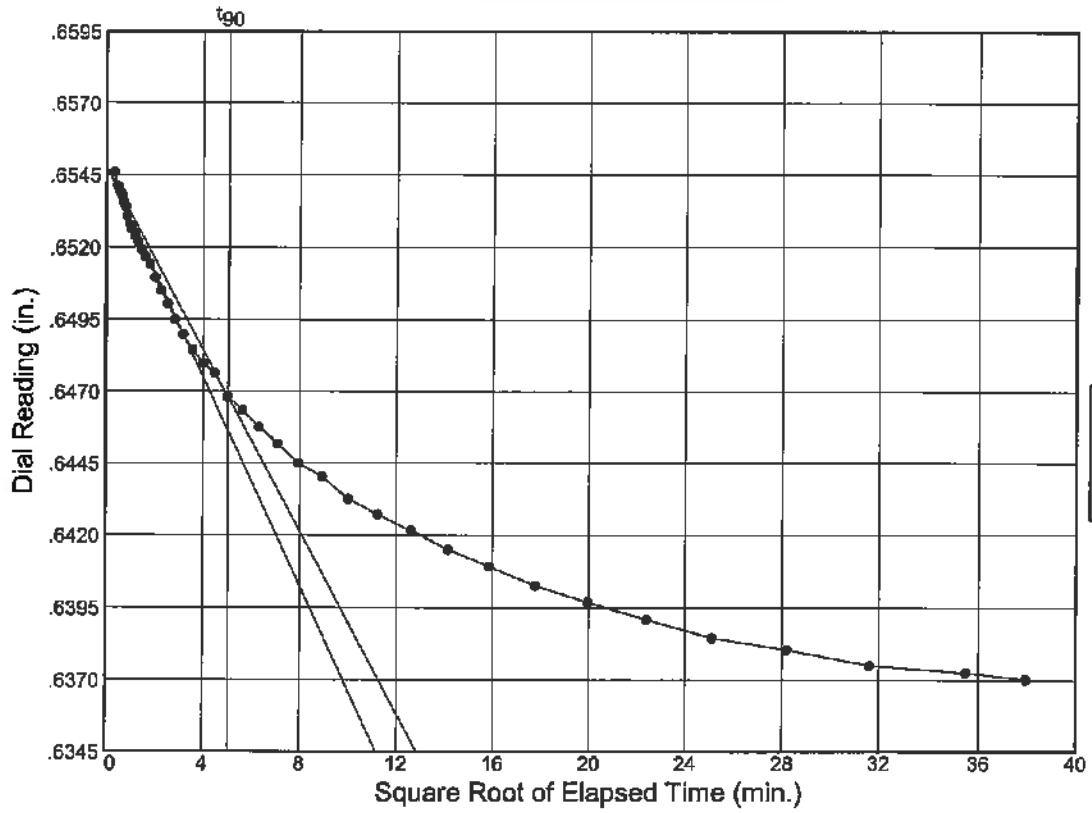
Load No.= 14
Load= 2.00 tsf
D_0 = 0.66576
D_{90} = 0.65961
D_{100} = 0.65893
T_{90} = 6.16 min.

C_v @ T_{90}
0.25 ft.^{2}/day

Dial Reading vs. Time

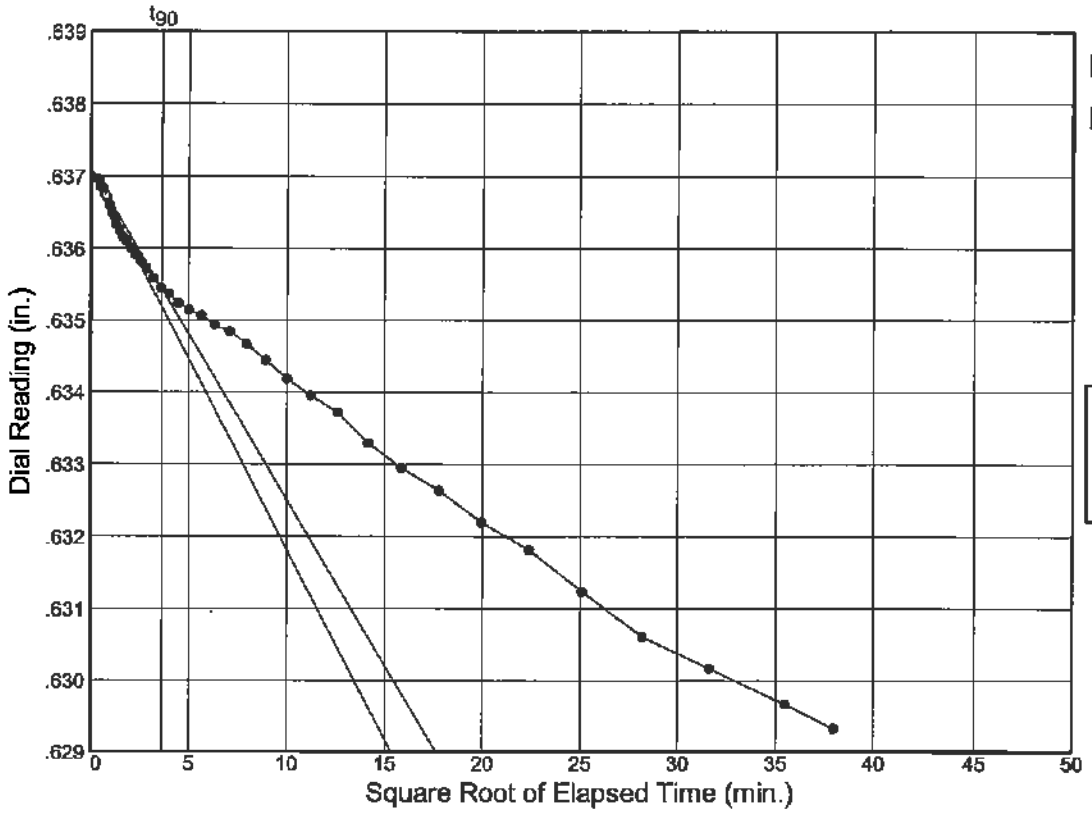
Project No.: 3520G
Project: Wekiva Parkway 7A

Location: BC-3 30'-32'



Load No.= 15
Load= 0.50 tsf
D_0 = 0.65476
D_{90} = 0.64679
D_{100} = 0.64591
T_{90} = 25.51 min.

C_v @ T_{90}
0.06 ft.^{2}/day



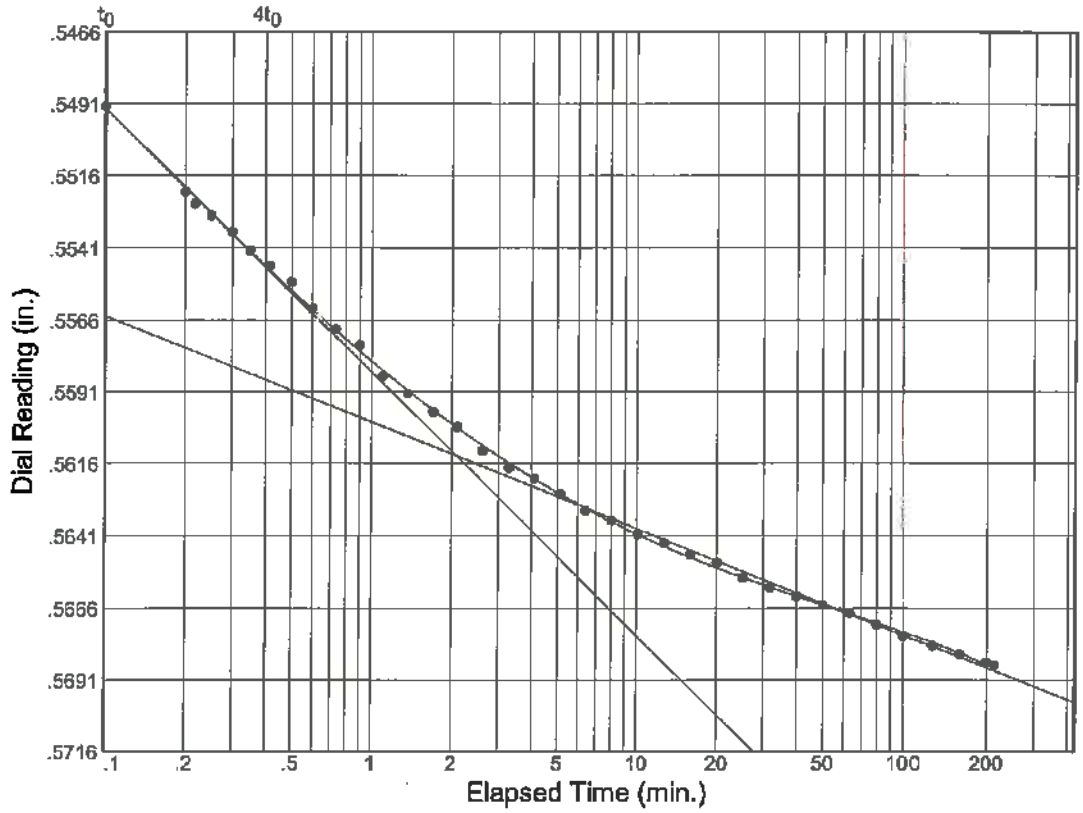
Load No.= 16
Load= 0.25 tsf
D_0 = 0.63711
D_{90} = 0.63543
D_{100} = 0.63525
T_{90} = 13.24 min.

C_v @ T_{90}
0.13 ft.^{2}/day

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

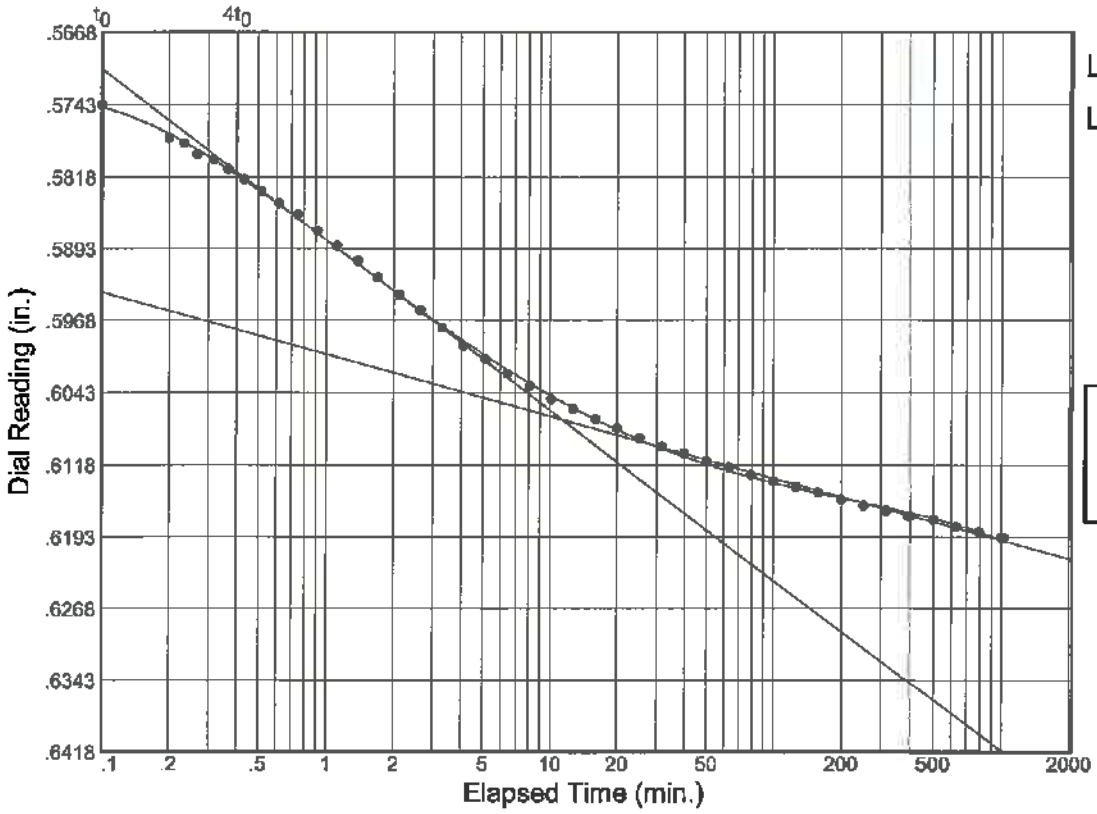
Location: BC-3 30'-32'



Load No.= 5
Load= 2.00 tsf
D_0 = 0.54383
D_{50} = 0.55258
D_{100} = 0.56134
T_{50} = 0.23 min.

C_v @ T_{50}
1.99 ft.^{2}/day

C_α = 0.004



Load No.= 6
Load= 4.00 tsf
D_0 = 0.56754
D_{50} = 0.58732
D_{100} = 0.60709
T_{50} = 0.87 min.

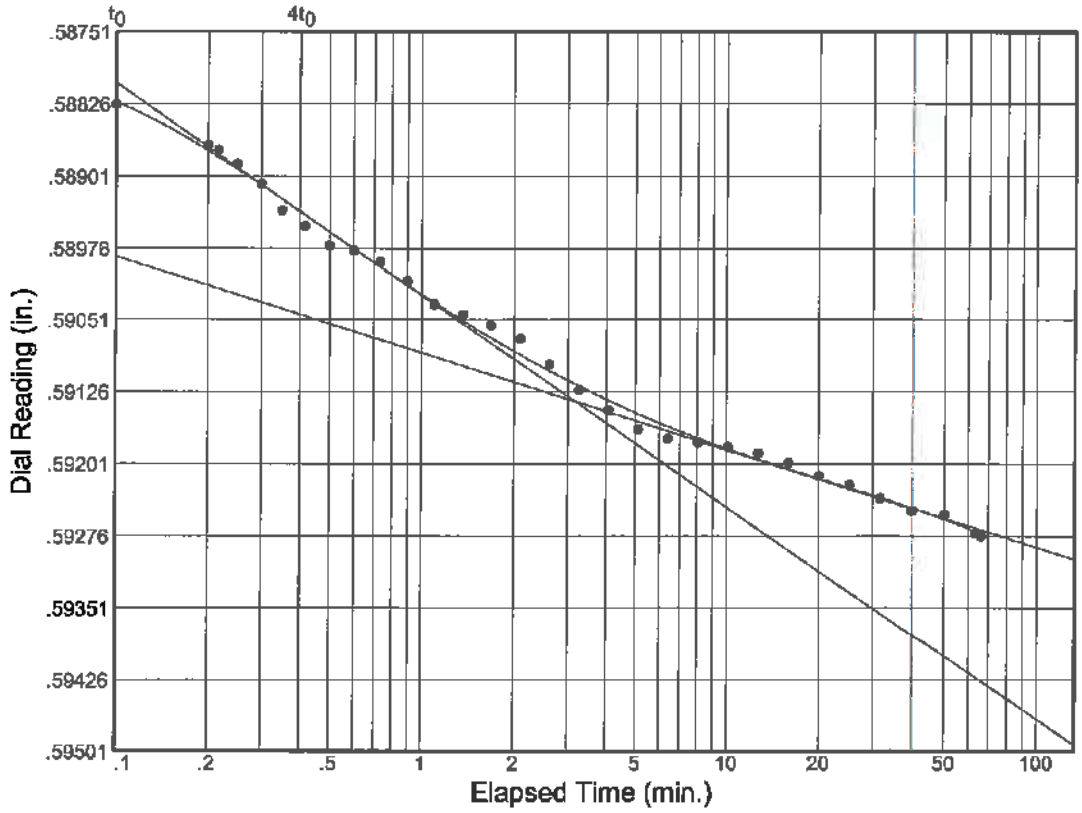
C_v @ T_{50}
0.49 ft.^{2}/day

C_α = 0.007

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

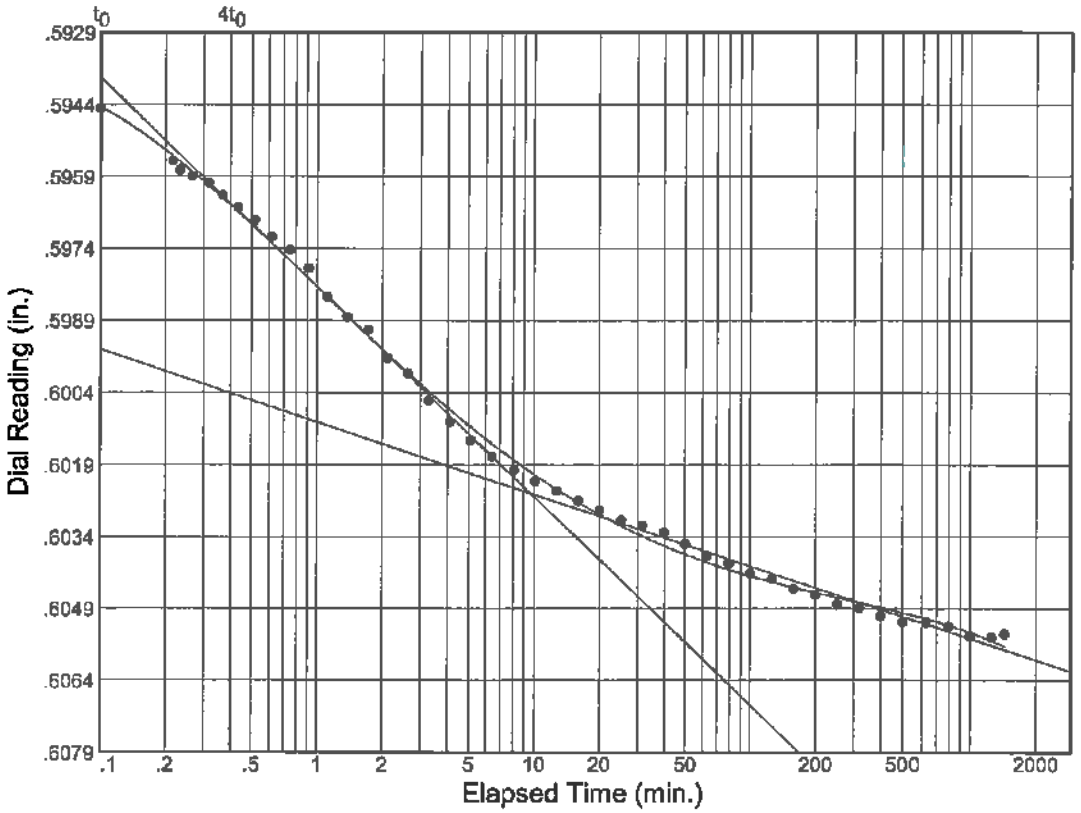
Location: BC-3 30'-32'



Load No.= 10
Load= 1.00 tsf
D_0 = 0.58712
D_{50} = 0.58924
D_{100} = 0.59136
T_{50} = 0.35 min.

C_v @ T_{50}
1.23 ft.^{2}/day

C_α = 0.001



Load No.= 11
Load= 2.00 tsf
D_0 = 0.59240
D_{50} = 0.59745
D_{100} = 0.60249
T_{50} = 0.67 min.

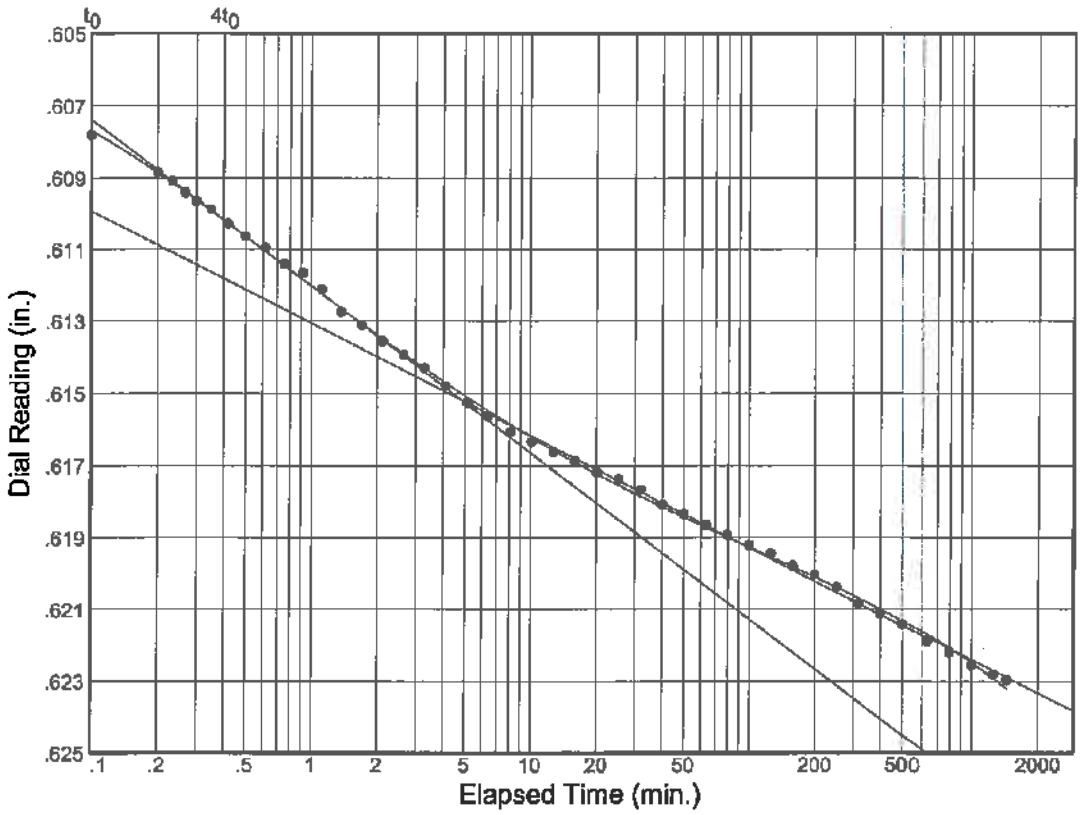
C_v @ T_{50}
0.63 ft.^{2}/day

C_α = 0.002

Dial Reading vs. Time

Project No.: 3520G
Project: Wekiva Parkway 7A

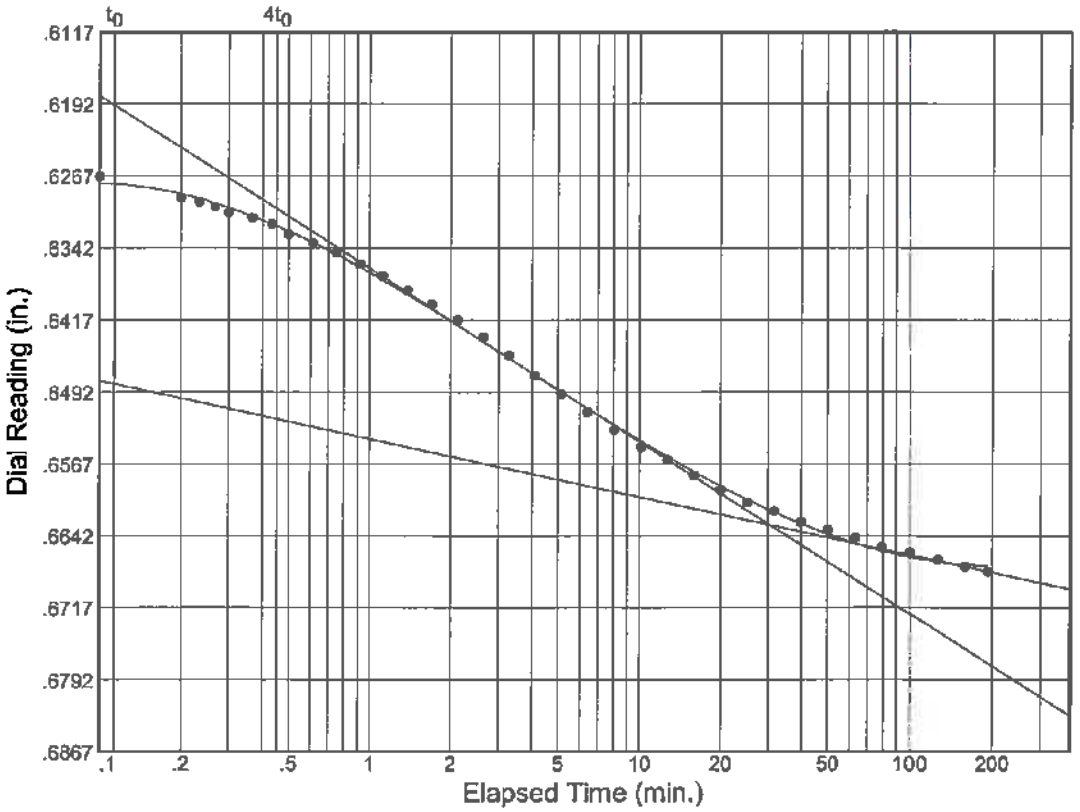
Location: BC-3 30'-32'



Load No.= 12
Load= 4.00 tsf
D_0 = 0.60521
D_{50} = 0.61020
D_{100} = 0.61519
T_{50} = 0.40 min.

C_v @ T_{50}
1.01 ft.^{2}/day

C_α = 0.003



Load No.= 13
Load= 8.00 tsf
D_0 = 0.62318
D_{50} = 0.64314
D_{100} = 0.66310
T_{50} = 2.37 min.

C_v @ T_{50}
0.16 ft.^{2}/day

C_α = 0.007