

Geotechnical Technical Memorandum

Florida Department of Transportation

Florida's Turnpike Enterprise

Turnpike at I-95 Direct Connection Interchange Project Development and Environment Study

Limits of Project: Approximately 2 miles north and south of SE Bridge Road (CR 708) along
Florida's Turnpike (SR 91) and I-95 (SR 9)

Martin County, Florida

Financial Management Number: 446975-1

ETDM Number: 14444

June 2025

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated May 26, 2022, and executed by Federal Highway Administration and FDOT.

EXECUTIVE SUMMARY

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate the potential for a new system-to-system direct connection interchange between Florida's Turnpike (SR 91) and Interstate 95 (I-95) at SE Bridge Road (CR 708) in Martin County, Florida. The study area begins approximately two miles south of SE Bridge Road at Mile Post (MP) 123.44 and extends approximately two miles north of SE Bridge Road to MP 127.53. The proposed interchange concept aims to improve traffic operations for the north-south through trips in the project area and to enhance traffic conditions on existing local roadways that currently serve as connections between SR 91 and I-95. A Type 2 Categorical Exclusion is being prepared as part of this PD&E study, which will satisfy all applicable federal and state environmental requirements, including the National Environmental Policy Act (NEPA), to qualify the project for federal-aid funding in future phases such as design, right-of-way acquisition, and construction.

This Geotechnical Memorandum was prepared to review published information regarding the existing subsurface conditions along the project alignment and within the limits of the pond alternative sites to assist in the preparation of the PD&E Report for the project. Additional geotechnical explorations will be required during the design phase of this project. Tierra, Inc. (Tierra) performed Geotechnical Engineering Services for the referenced project. The results of our review of published information are enclosed herein. Tierra reviewed the USDA Soil Surveys published by the USDA-NRCS for the project alignment and within pond sites to support this phase of the PD&E study.

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- Appendix A USDA and USGS Maps
- Appendix B As-built Plans Excerpts

1.0 Project Summary

1.0 Project Description

The project involves the evaluation of a new connection via a system-to-system direct connection interchange to/from SR 91 and I-95 at SE Bridge Road in Martin County, Florida. The study area begins approximately two miles south of SE Bridge Road at Mile Post (MP) 123.44 and extends approximately two miles north of SE Bridge Road to MP 127.53. A map of the project limits is shown in **Figure 1-1**.

The existing limited-access right-of-way along SR 91 is generally 300 feet wide. SR 91 is classified as a Rural Principal Arterial Expressway. The existing typical section consists of a four-lane divided facility with 12-foot travel lanes. As part of the mainline widening, the proposed typical section for SR 91 will include an eight-lane divided facility with 12-foot travel lanes. The posted speed limit along the project corridor is 70 miles per hour. A Florida Gas Transmission (FGT) easement runs along the east side of SR 91 for the entire project limits. A Type 2 Categorical Exclusion is being prepared. The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right-of-way acquisition, and construction).

1.1 Purpose & Need

The purpose of this project is to improve traffic operations for north-south through trips in the project area and to improve traffic operations on existing local roadways that provide a connection between I-95 and SR 91 near the existing I-95/SE Bridge Road interchange in Martin County, Florida.

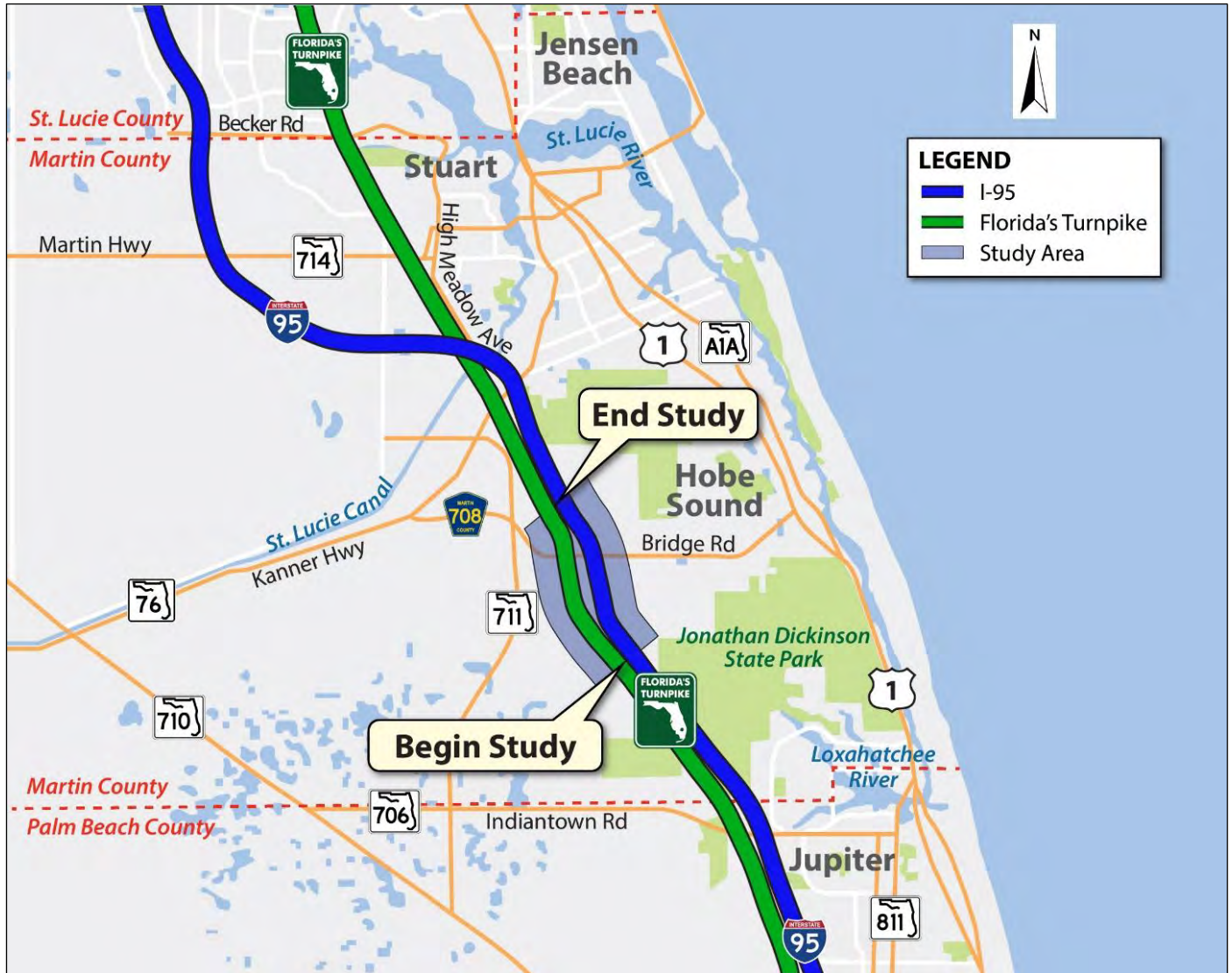


Figure 1-1: Project Location Map

1.2 Preferred Alternative

The preferred alternative for the Turnpike at I-95 direct connection interchange study includes the construction of four system-to-system ramps to accommodate all directional movements between SR 91 and I-95 near SE Bridge Road in Martin County. South of SE Bridge Road, the ramps will serve northbound I-95 to northbound SR 91 and southbound SR 91 to southbound I-95 movements. North of SE Bridge Road, ramps will accommodate northbound SR 91 to northbound I-95 and southbound I-95 to southbound SR 91 movements. Additionally, SR 91 will be widened from four to eight lanes, with all widening occurring to the west side to avoid impacts to existing Florida Gas Transmission (FGT) infrastructure located along the east side of SR 91. A two-lane collector-distributor (CD) road is proposed between the northbound SR 91 to northbound I-95 and northbound I-95 to northbound SR 91 ramps to facilitate safe and efficient weaving operations. No geometric changes are proposed for I-95, as all ramp tie-ins will occur at the outer edges of the existing facility. While the SE Bridge Road typical section will remain unchanged, the existing bridge will be reconstructed to accommodate SR 91 widening and to span the southbound SR 91 to southbound I-95 ramp. Two tolling points are proposed—one on the ramp from the CD road to northbound I-95 and the other on the ramp from southbound I-95 to southbound SR 91. All ramps will be single-lane facilities, with a 15-foot-wide lane and a design speed of 50 miles per hour. **Figure 1-2** shows the proposed interchange alternative.

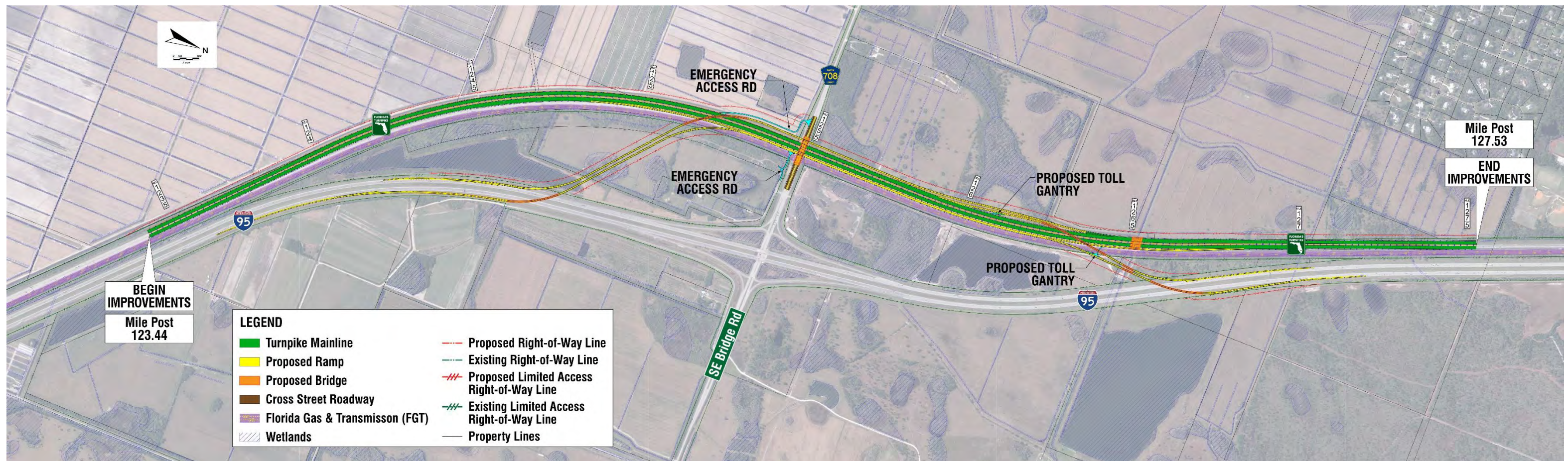


Figure 1-2: Proposed Turnpike at I-95 Direct Connection Interchange Alternative

2.0 Scope of Services

The purpose of the geotechnical portion of the PD&E study is to review published information regarding the existing subsurface conditions along the project alignment and within the limits of the pond alternative sites to assist in the preparation of the PD&E Report for the project. Additional geotechnical explorations will be required during the design phase of this project. The following services were provided to achieve the preceding objective:

1. Reviewed published topographic information. This published information was obtained from the "Gomez, Florida" Quadrangle Map published by the USGS.
2. Reviewed published potentiometric information. This published information was obtained from the Florida Department of Environmental Protection (FDEP) website of the elevation of the Upper Floridan Aquifer.
3. Reviewed published soils information. This published information was obtained from the Web Soil Survey of Martin, County, Florida published by the USDA – NRCS.
4. Reviewed existing as-built plans available along the project corridor.
5. Prepared this Geotechnical Technical Memorandum for the project.

3.0 REVIEW OF PUBLISHED DATA

3.0 Review of USGS Quadrangle Map

Based on a review of the "Gomez, Florida," USGS Quadrangle Map, it appears that the project site elevations are on the order of approximately +15 to +20 feet, National Geodetic Vertical Datum of 1929 (NGVD 29). The **USGS Quadrangle Map** of the project area is illustrated in **Appendix A**.

3.1 Review of Upper Floridan Aquifer Surface

Based on a review of the "Upper Floridan Potentiometric Surface" contours published by the FDEP, the potentiometric surface elevation of the Upper Floridan Aquifer within the project limits ranges from approximately +40 to +50 feet, NGVD 29. As indicated in Section 3.0, the project site elevations range from approximately +15 to +20 feet, NGVD 29.

3.2 Review of USDA-NRCS Soil Survey for Martin County

Based on a review of the Martin County Soil Survey published by the USDA-NRCS, it appears that there are nine (9) soil-mapping units noted within the project limits. A detailed soil survey map with the map unit locations is shown on the USDA Soil Survey sheet in **Appendix A**. The general soil descriptions are presented in the sub-sections below, as described in the Web Soil Survey.

3.2.1 Wabasso Sand (Unit 17)

The Wabasso component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, strongly contrasting textural stratification, is 9 to 50 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restrictive depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, and November. Organic matter content in the surface horizon is about 3 percent.

3.2.2 Winder Sand (Unit 19)

The Winder component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restrictive depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during July, August, September, and October. Organic matter content in the surface horizon is about 1 percent.

3.2.3 Pineda-Riviera Fine Sands (Unit 21)

The Pineda component makes up 45 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restrictive depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during July, August, September, and October. Organic matter content in the surface horizon is about 3 percent.

The Riviera component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restrictive depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August, September, and October. Organic matter content in the surface horizon is about 1 percent.

3.2.4 Floridana Fine Sand (Unit 38)

The Floridana component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restrictive depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during July, August, September, and October. Organic matter content in the surface horizon is about 6 percent.

3.2.5 Cypress Lake Fine Sand, 0 to 2 percent slopes (Unit 44)

The Cypress Lake, nonhydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone over sandy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 9 to 58 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent.

3.2.6 Pinellas Fine Sand (Unit 47)

The Pinellas component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restrictive depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, and November. Organic matter content in the surface horizon is about 3 percent.

3.2.7 Riviera Fine Sand (Unit 49)

The Riviera component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restrictive depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during July, August, September, and October. Organic matter content in the surface horizon is about 1 percent.

3.2.8 Wabasso and Oldsmar Fine Sands (Unit 56)

The Wabasso component makes up 45 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restrictive depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during June, July, August, September, October, November, and December. Organic matter content in the surface horizon is about 3 percent.

The Oldsmar component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restrictive depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during June, July, August, September, October, November, and December. Organic matter content in the surface horizon is about 2 percent.

3.2.9 Gator and Tequesta Mucks (Unit 58)

The Gator component makes up 50 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over loamy and sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restrictive depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during January, February, March, April, May, June, July, August, September, October, November, and December. Organic matter content in the surface horizon is about 70 percent.

The Tequesta component makes up 40 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of stratified sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restrictive depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at or above the natural ground surface during January, February, March, April, May, June, July, August, September, October, November, and December. Organic matter content in the surface horizon is about 48 percent.

3.3 General Soil Properties Presented in USDA Soil Survey

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

**Table 3-1:
Martin County USDA NRCS Soil Survey Information**

Map No.	Soil Name	Hydrologic Soil Group	Depth to High Water Table (ft)*	Typical Soil Types (Profile from Ground Surface to depth of approximately 80 inches)
17	Wabasso Sand	C/D	0.5-1.5	Sand to Sandy Clay Loam to Loamy Sand
19	Winder Sand	C/D	+2.0-0.0	Sand to Sandy Clay Loam to Sandy Loam to Sandy Clay Loam
21	Pineda-Riviera Fine Sands	A/D	+1.0-0.0; 0.3-1.5	Fine Sand to Fine Sandy Loam; Fine Sand to Fine Sandy Loam to Sandy Clay Loam to Fine Sand
38	Floridana Fine Sand	C/D	+2.0-0.0	Fine Sand to Fine Sandy Loam
44	Cypress Fine Sand (non-hydric)	A/D	0.5 – 1.5	Fine Sand to Sandy Loam; Bedrock Layer
47	Pinellas Fine Sand	B/D	0.5-1.5	Fine Sand, Fine Sandy Loam
49	Riviera Fine Sand	A/D	+2.0-0.0	Fine Sand to Fine Sandy Loam to Fine Sand
56	Wabasso and Oldsmar Fine Sands	C/D; A/D	+2.0-0.0	Fine Sand to Sandy Clay Loam; Fine Sand to Fine Sandy Loam
58	Gator and Tequesta Mucks	B/D; C/D	+2.0-0.0	Muck to Fine Sandy Loam to Fine Sand; Muck to Sand to Sandy Clay Loam
*Depth to High Water Table is also commonly known as the depth to the Seasonal High Groundwater Table.				

**Table 3-2:
Martin County USDA NRCS Soil Survey Information**

USDA Map Symbol and Soil Name	Soil Classification			
	Depth (in)	USCS	AASHTO	Permeability (in/hr)
(17) Wabasso	0-6	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	6-25	SP-SM, SP	A-3, A-2-4	6.0 - 20.0
	25-30	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	30-58	CL, SC	A-6, A-7-6	0.1 - 0.2
	58-80	SM, SC	A-2-4, A-2-6	0.6 - 6.0
(19) Winder	0-3	SP-SM, SM	A-2-4, A-3	6.0 - 20.0
	3-13	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	13-35	SC, CL	A-6, A-7-6, A-4	0.2 - 0.6
	35-71	SC, CL	A-2-4, A-6, A-7-6	0.1 - 0.2
	71-80	SC, CL	A-2-4, A-6, A-7-6	6.0 - 20.0

Table 3-2 (Continued)

Martin County USDA NRCS Soil Survey Information

USDA Map Symbol and Soil Name	Soil Classification			
	Depth (in)	USCS	AASHTO	Permeability (in/hr)
(21) Pineda-Riviera	0-1	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	1-5	SP-SM, SM	A-2-4, A-3	6.0 - 20.0
	5-36	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	36-54	CL, SC, SC-SM	A-4, A-2-4, A-6	2.0 - 6.0
	54-80	SP-SM, SM	A-2-4, A-3	2.0 - 6.0
	0-6	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	6-28	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	28-36	SC, SC-SM, SM	A-4, A-2-4, A-6	2.0 - 6.0
	36-42	CL, SC-SM	A-4, A-7-6, A-6	2.0 - 6.0
	42-80	SM, SP-SM	A-3, A-2-4	0.6 - 6.0
(38) Floridana	0-19	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	19-25	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	25-80	SC, CL, SC-SM	A-7-6, A-2-4, A-4	0.1 - 0.2
(47) Pinellas	0-5	SP-SM, SM	A-2-4, A-3	6.0 - 20.0
	5-18	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	18-34	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	34-46	SC, SC-SM	A-2-4, A-4, A-6	0.6 - 2.0
	46-80	SM, SP-SM	A-2-4, A-3, A-1-b	6.0 - 20.0

Table 3-2 (Continued)

Martin County USDA NRCS Soil Survey Information

USDA Map Symbol and Soil Name	Soil Classification			
	Depth (in)	USCS	AASHTO	Permeability (in/hr)
(44) Cypress Lake	0-7	SP-SM, SM	A-3, A-2-4	6.1 - 20.0
	7-25	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	25-32	SC, CL	A-2-4, A-7-6, A-6	2.0 - 6.0
	>32-40	Bedrock		2.0 - 20.0
	40-50	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	50-81	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	0-7	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	7-25	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
	25-32	SC, CL	A-6, A-7-6, A-2-4	2.0 - 6.0
	>32-40	Bedrock		2.0 - 20.0
	40-50	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	50-81	SP-SM, SM	A-3, A-2-4	6.0 - 20.0
(49) Riviera	0-4	SP-SM, SM	A-2-4, A-3	6.0 - 20.0
	4-36	SP-SM, SM	A-2-4, A-3	6.0 - 20.0
	36-42	CL, SC-SM, SM	A-6, A-4, A-2-4	2.0 - 6.0
	42-56	SM, SP-SM	A-3, A-2-4	0.6 - 2.0
	56-80	SM, SP-SM	A-3, A-2-4	0.6 - 6.0

Table 3-2 (Continued)

Martin County USDA NRCS Soil Survey Information

USDA Map Symbol and Soil Name	Soil Classification			
	Depth (in)	USCS	AASHTO	Permeability (in/hr)
(56) Wabasso- Oldsmar	0-5	SP, SP-SM	A-3	6.0 - 20.0
	5-31	SP, SP-SM	A-3	6.0 - 20.0
	31-35	SM, SP-SM	A-2-4, A-3	0.6 - 20.0
	35-43	SC, SC-SM	A-2-4, A-2-6	0.1 - 0.2
	43-80	SC, SC-SM	A-2-4, A-2-6	10.2 - 20.0
	0-12	SP, SP-SM	A-3	6.0 - 20.0
	12-34	SP, SP-SM	A-3	6.0 - 20.0
	34-52	SM, SP-SM	A-2-4, A-3	0.2 - 6.0
	52-68	SC, SC-SM	A-2-4, A-2-6	0.1 - 0.2
(58) Gator- Tequesta	0-24	PT	A-8	6.0 - 20.0
	24-48	SC, SC-SM, SM	A-2-4, A-2-6	0.6 - 2.0
	48-56	SM, SP-SM	A-2-4, A-3	6.0 - 20.0
	0-14	PT	A-8	6.0 - 20.0
	14-26	SP, SP-SM	A-3, A-2-4	6.0 - 20.0
	26-30	SP, SP-SM	A-3, A-2-4	6.0 - 20.0
	30-40	SC, SC-SM, SM	A-2-4, A-2-6	0.1 - 0.6
	40-48	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0.6 - 2.0
	48-64	SM, SP, SP-SM	A-1-b, A-2-4, A-3	2.0 - 20.0

3.4 Review of Existing plans

Tierra reviewed existing as-built plans (circa 1982) for the construction of SR 9/I-95 over CR 708 (Bridge Road) that were available for geotechnical information.

The amount of geotechnical information contained within these as-built plans was somewhat limited. In general, existing soil boring information within the roadway plans indicate sandy soils (A-3 and A-2-4) from the ground surface to the boring termination depths. The roadway auger borings did indicate some plastic A-2-6 soils common along the corridor at depths of 3 to 4 feet below grade. Organic A-8 soil was encountered approximately 2.5 miles south of the bridge site and was indicated for removal. The bridge plans indicated sandy soil from the ground surface to depths of 30 to 80 feet below grade.

Resurfacing plans for the Turnpike (SR 91) from the Bridge Road south were also reviewed. These indicated some organic soils along the corridor; however, since this was a resurfacing project, it does not appear they were removed.

Tierra has extracted pavement and soil information from the existing as-built plans that were reviewed as part of this study and has included this information in **Appendix B**.

4.0 Preliminary Engineering Evaluations

4.0 USDA Soil Survey

Based upon the USDA-NRCS Soil Survey for Martin County, sandy soils underlain by silty to clayey (loam) soils are reported along the majority of the project corridor to depths of 80 inches below the natural ground surface. Soil Unit 44 (Cypress lake fine sand) indicates a layer of “bedrock” and is sometimes referred to as “hardpan.” Some areas along the project corridor are expected to contain organic material/muck.

In general, the sandy soils are suitable for supporting proposed roadway embankments after proper subgrade preparation including removal and replacement of unsuitable materials. Areas along the project corridor where shallow groundwater conditions, clay soils, muck, and cemented soil layers may impact the project are detailed below.

4.1 Shallow Groundwater

The Seasonal High Groundwater Table (SHGWT) for the soil units presented above is reported to range from above natural grade to a depth of 2 feet below the predevelopment natural grade within the project limits. According to the USDA-NRSC Soil Survey, much of the project corridor consists of excessively drained to very poorly drained soils with shallow water table levels.

Clearance between the roadway base and groundwater levels will need to be evaluated to ensure minimum separation between the base and the SHGWT is maintained or to determine if additional measures are required. In areas where the existing SHGWT is above grade, the SHWGT will have to be established by the project biologist utilizing biological indicators. Additionally, drainage design will need to consider the impact of shallow groundwater levels on stormwater management facilities.

4.2 Near Surface Clayey Soils

Plastic soils are reported within the soil units presented above but are generally more than 24 inches below natural grades.

Plastic soils have limitations related to base clearance and are also poorly drained. Separation between plastic clayey soils and the roadway pavement sections should be in accordance with FDOT Standard Plans, Indices 120-001 and 120-002.

4.3 Organic Soils

According to the USDA, organic soil mapping unit (Unit 58) is reported at several areas along the proposed roadway alignment at depths ranging from the predevelopment natural ground surface to 24 inches below the ground surface within the project limits.

Organic/muck (A-8) soil should be removed in accordance with FDOT Standard Plans, Index 120-002 and replaced with backfill in accordance with Index 120-001.

4.4 Bedrock

A Soil mapping unit containing "bedrock" was reported. This is similar to a "hardpan" material and can be very dense/hard. Excavations of these materials may be difficult and may require specialized equipment and construction methods. Variations in the depth and relative density of hardpan materials should be anticipated.

4.5 Roadway Construction

Site preparation should consist of normal clearing and grubbing followed by compaction of subgrade soils. Subgrade preparation should include the removal of plastic soils, top-soils, organic soils, and unsuitable materials in accordance with FDOT Standard Plans, Index 120-002. Backfill embankment materials should consist of materials conforming to the FDOT Standard Plans, Index 120-001. Clearing and grubbing and compaction should be accomplished in accordance with the FDOT Standard Specifications.

FDOT Standard Plans Indices 120-001 and 120-002 should be consulted to determine the specific use/suitability of the soil types present within the project limits.

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

5.0 Limitations

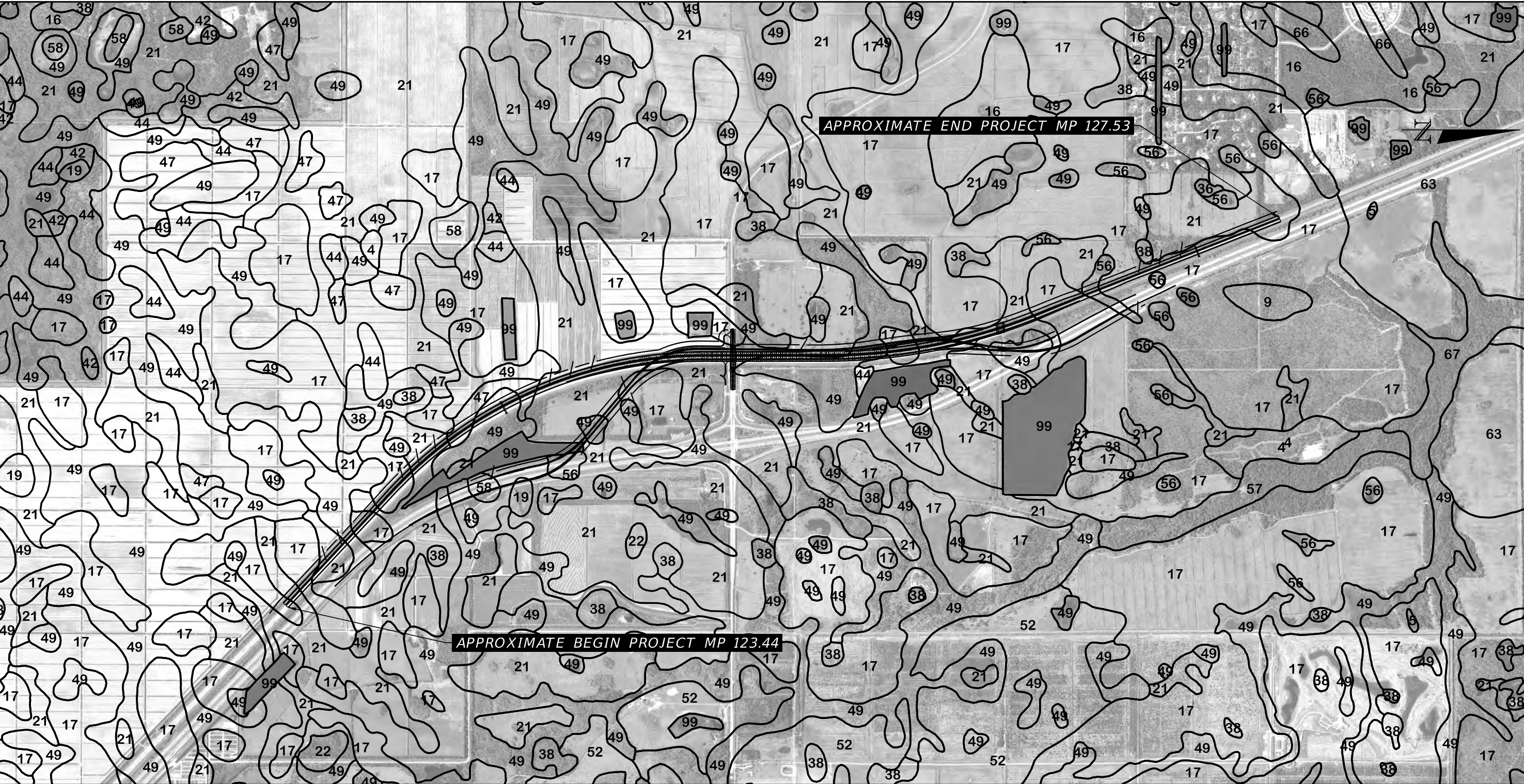
Our services have been performed and our preliminary evaluations prepared in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. Tierra is not responsible for the conclusions, opinions or recommendations made by others based on this data.

The scope of the geotechnical portion of the PD&E study is to provide preliminary information on the existing subsurface conditions along the project alignment based on a review of the Martin County Soil Survey published by the USDA-NRCS. The preliminary evaluations submitted in this report are based upon the data obtained from the published information. Additional geotechnical explorations will be required during the design phase of this project and should adhere to the FDOT Soils and Foundation handbook guidelines. Should subsoil variations become evident during the course of this project, a re-evaluation will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed roadway construction and stormwater management areas.

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

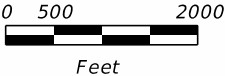
Appendix A

USDA AND USGS MAPS

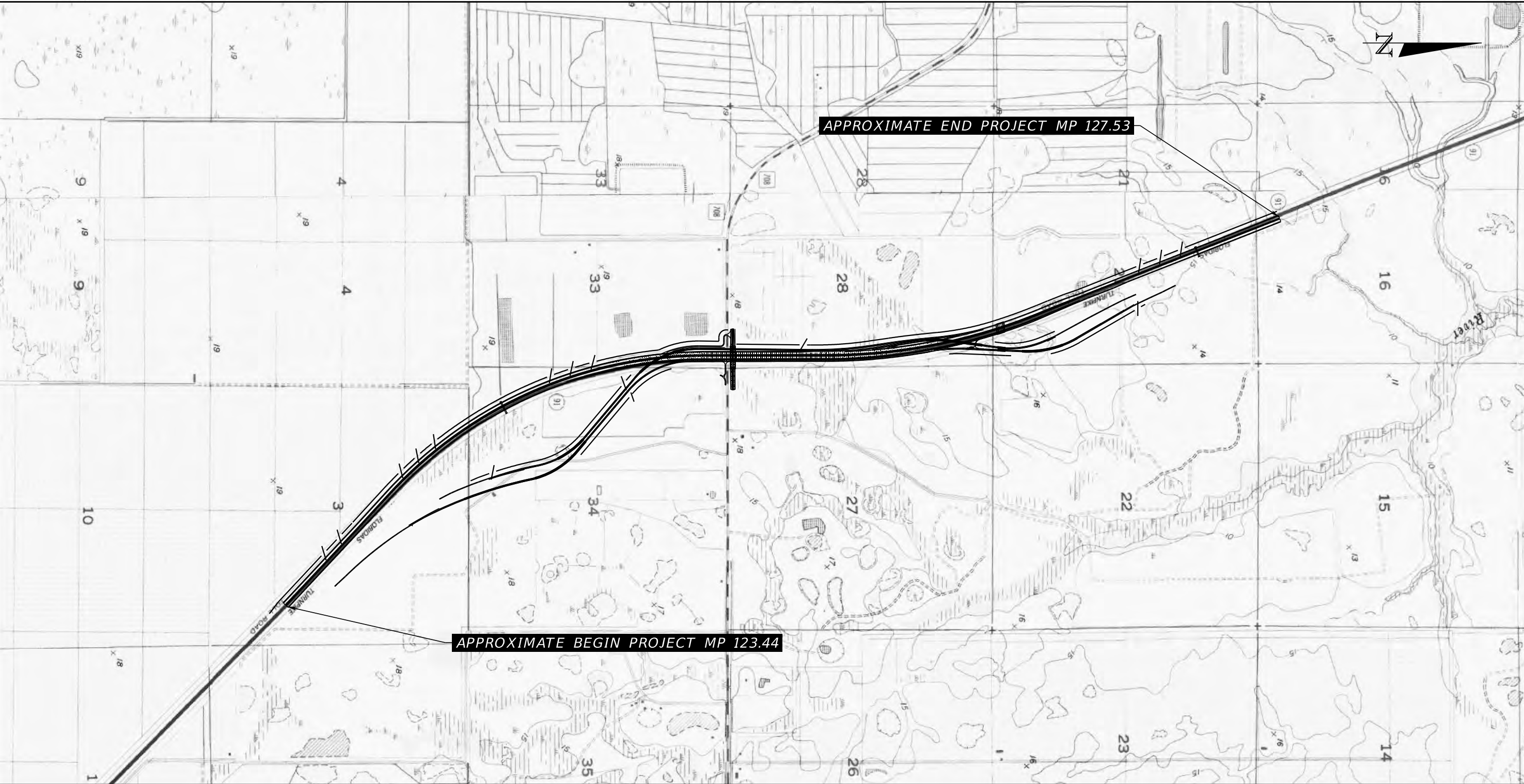


REFERENCE: USDA SOIL SURVEY OF MARTIN COUNTY, FLORIDA

TOWNSHIP: 39S & 40S
RANGE: 41E
SECTION: 3, 16, 21, 22, 27, 28, 33, & 34



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			USDA SOIL SURVEY	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				MARC E. NOVAK, PH.D., P.E. LICENSE NUMBER: 67431 TIERRA, INC. 7351 TEMPLE TERRACE HIGHWAY TAMPA, FLORIDA 33637	SR 91	MARTIN	446975-1		



REFERENCE: USGS QUADRANGLE MAP OF "GOMEZ, FLORIDA"

TOWNSHIP: 39S & 40S
RANGE: 41E
SECTION: 3, 16, 21, 22, 27, 28, 33, & 34

REVISIONS				ENGINEER OF RECORD		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			USGS QUADRANGLE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	MARC E. NOVAK, PH.D., P.E. LICENSE NUMBER: 67431 TIERRA, INC. 7351 TEMPLE TERRACE HIGHWAY TAMPA, FLORIDA 33637		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
						SR 91	MARTIN	446975-1		

Appendix B

As-Built Plans Excerpts

SR 91 Resurfacing Plans

THIS CONTRACT PLAN SET INCLUDES:

SUMMARY OF PAY ITEMS (3 SHEETS)
ROADWAY PLANS (INCLUDES)
SIGNING AND PAVEMENT MARKING PLANS)

A DETAILED INDEX APPEARS ON THE KEY SHEET
OF EACH GROUP OF PLANS

INDEX OF ROADWAY PLANS

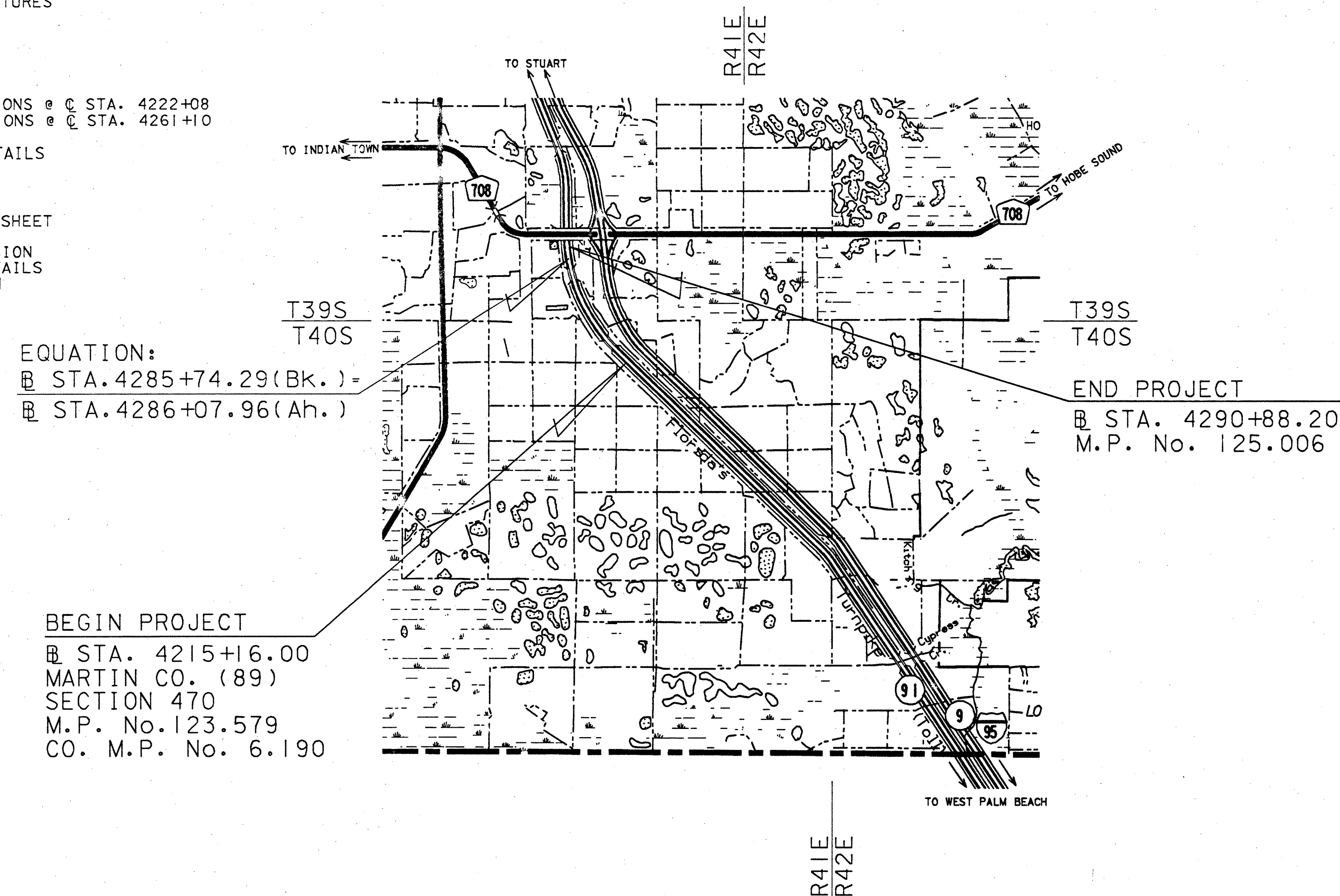
SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2-3	TYPICAL SECTIONS
4	SUMMARY OF QUNATITIES
5-6	SUMMARY OF DRAINAGE STRUCTURES
7-12	PLAN & PROFILE SHEETS
13	DRAINAGE STRUCTURES
14-15	SPECIAL MEDIAN PROFILES
16	SOIL SURVEY
17-28	CROSS SECTIONS
29-30	LATERAL DITCH CROSS SECTIONS @ @ STA. 4222+08
31-32	LATERAL DITCH CROSS SECTIONS @ @ STA. 4261+10
33-34	MISCELLANEOUS DETAILS
35	MOTORIST AID CALL BOX DETAILS
36	LANDSCAPING DETAILS
37	SHOULDER WARNING DEVICES
38-42	TRAFFIC CONTROL PLANS
43	TABULATION OF QUANTITIES SHEET
44	SIGNING & MARKING DETAILS
45	DOUBLE BOX CULVERT EXTENSION
46-47	BOX CULVERT EXTENSION DETAILS
48	FARM ACCESS BOX EXTENSION
49-54	UTILITY ADJUSTMENTS
55	MITIGATION PLAN

THESE PLANS HAVE BEEN PREPARED
IN ACCORDANCE WITH AND ARE GOVERNED
BY THE STATE OF FLORIDA,
DEPARTMENT OF TRANSPORTATION,
ROADWAY AND TRAFFIC DESIGN STANDARDS
(BOOKLET DATED JANUARY, 1990)

REVISION
ROADWAY SHEET NO. 33 (03-19-1992)

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY
STATE PROJECT NO. 97890-3325
MARTIN COUNTY
STATE ROAD NO. 91



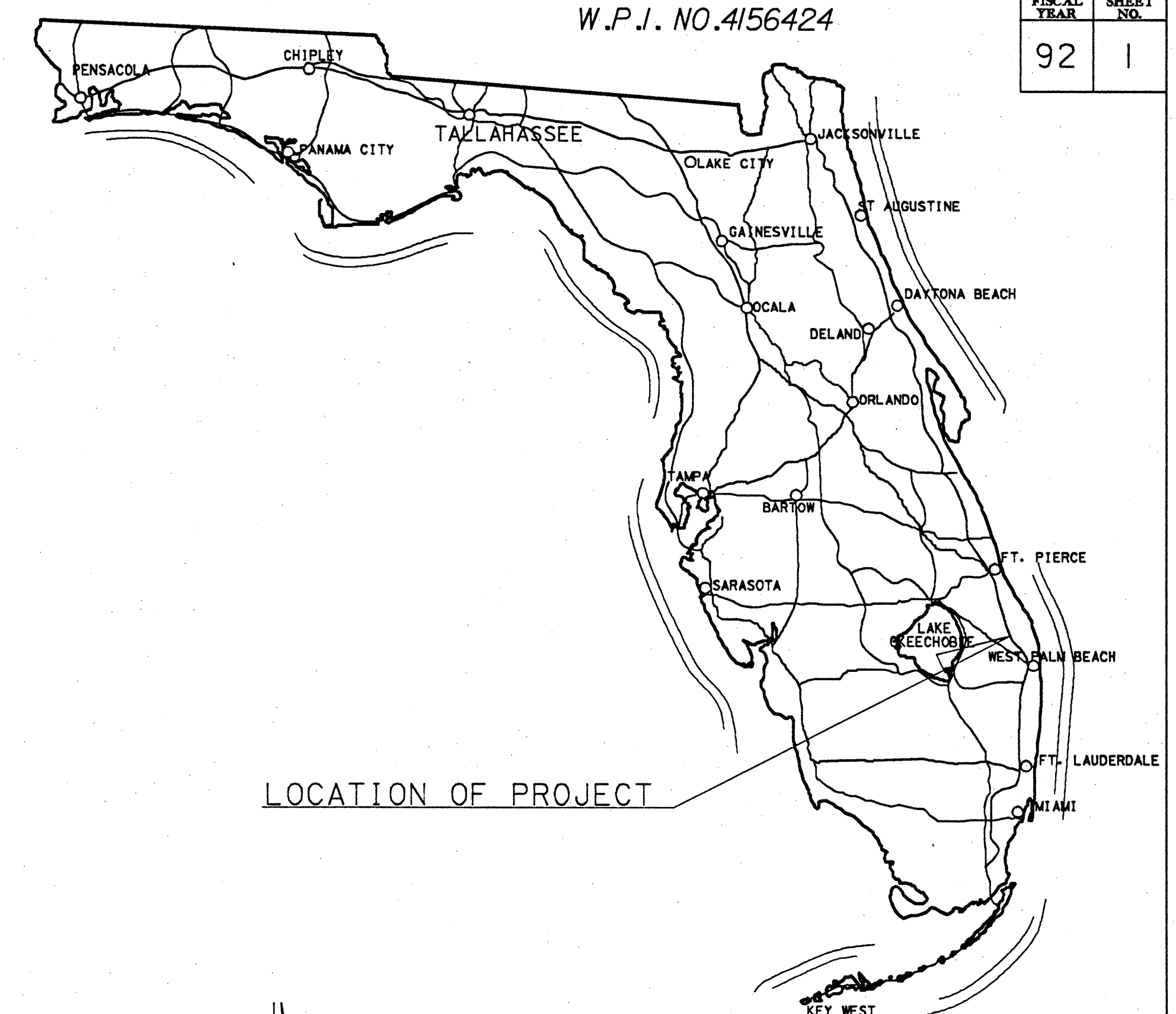
EQUATION:
@ STA. 4285+74.29(Bk.) =
@ STA. 4286+07.96(Ah.)

BEGIN PROJECT
@ STA. 4215+16.00
MARTIN CO. (89)
SECTION 470
M.P. No. 123.579
CO. M.P. No. 6.190

END PROJECT
@ STA. 4290+88.20
M.P. No. 125.006

LENGTH OF PROJECT		
	LINEAR FT.	MILES
ROADWAY	7538.53	1.427
BRIDGES	0.00	0.000
NET LENGTH OF PROJ.	7538.53	1.427
EXCEPTIONS	0.00	0.000
GROSS LENGTH OF PROJ.	7538.53	1.427

PROJECT MANAGER : ROWLAND LAMB, P.E.



LOCATION OF PROJECT

ROADWAY PLANS
ENGINEER OF RECORD
MURRAY D. THORNBURG, JR., P.E.
KEITH & SCHNARS, P.A.
6500 NORTH ANDREWS AVENUE
FORT LAUDERDALE, FLORIDA 33309-2132

PLANS PREPARED BY:

Keith & Schnars, P.A.
ENGINEERS - PLANNERS - SURVEYORS

6500 NORTH ANDREWS AVENUE
PHONE: (305) 776-1616
FORT LAUDERDALE, FLORIDA
ZIP CODE: 33309-2132

REVISIONS		
DATE	BY	DESCRIPTION

ATTENTION IS DIRECTED TO THE FACT THAT
THESE PLANS MAY HAVE BEEN REDUCED IN
SIZE BY REPRODUCTION. THIS MUST BE CON-
SIDERED WHEN OBTAINING SCALED DATA.

GOVERNING SPECIFICATIONS: STATE OF FLORIDA,
DEPARTMENT OF TRANSPORTATION, STANDARD
SPECIFICATIONS, DATED 1991 AND SUPPLEMENTS
THERETO.

ROADWAY PLANS
APPROVED BY: MURRAY D. THORNBURG JR., P.E.

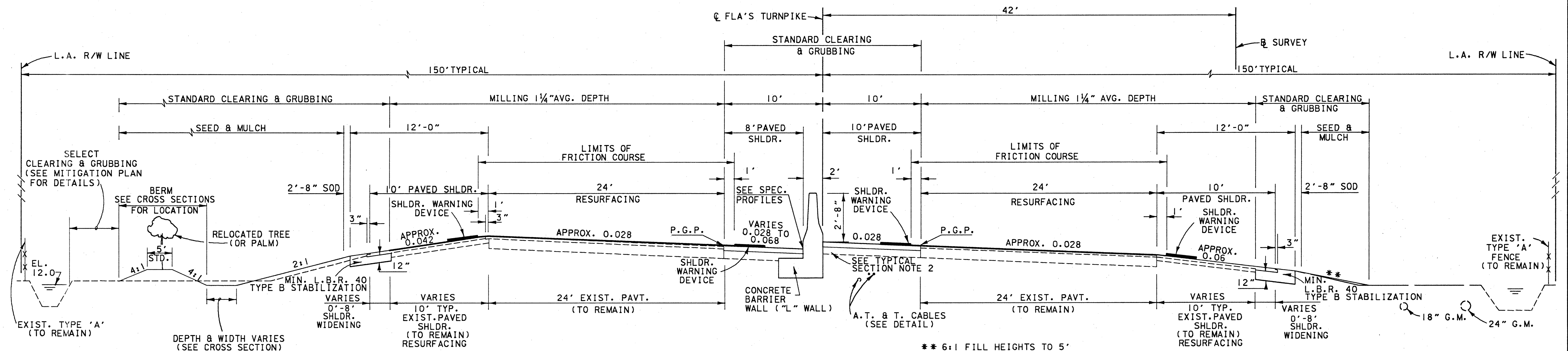
DATE: 01/23/92

P.E. No: 15819

053440113633RDKY2.DGN 03/19/92
RA888

FISCAL YEAR	SHEET NO.
92	1

515
T-71
97890-3325



TYPICAL SECTION ①
Q STA. 4215+16.00 TO Q STA. 4288+38.36

TYPICAL SECTION NOTES

1. ALL PERMANENT GRASS AREAS ARE TO RECEIVE 6" TOPSOIL TREATMENT.
2. THE SUBGRADE SHALL BE FIRM, UNYIELDING AND IN SUCH CONDITION THAT UNDUE DISTORTION, AS DETERMINED BY THE ENGINEER, WILL NOT OCCUR.
3. ACTUAL WIDTH OF BASE WIDENING MAY VARY DUE TO ACTUAL EXISTING PAVEMENT WIDTH. CONTRACTOR, MAY ELECT TO PLACE UNIFORM WIDTH BASE WIDENING STRIP AT NO ADDITIONAL COST.
4. SOD SLOPES STEEPER THAN 3:1.
5. THE COST OF MISCELLANEOUS PAVEMENT REMOVAL UNDER EXISTING GUARDRAIL IS TO BE PAID FOR UNDER CLEARING & GRUBBING.
6. THE CONTRACTOR WILL NOT BE ALLOWED TO STOCKPILE MILLED MATERIAL ON TURNPIKE RIGHT-OF-WAY.
7. THE P.G.P. ELEVATIONS SHOWN ON THE TYPICAL SECTIONS IS INTENDED TO ACHIEVE THE FINISHED ELEVATIONS THROUGH THE OVERBUILD PROCESS.
8. THE EXISTING A.T. & T. MANHOLE AT Q STA. 4262+60.6' RT., IS TO BE ABANDONED BY A.T. & T.. THE CONTRACTOR IS TO REMOVE TOP PORTION OF MANHOLE AND BACKFILL. PAYMENT IS TO BE INCLUDED UNDER CLEARING AND GRUBBING.

TRAFFIC DATA

CURRENT YEAR 1990 ADT = 18,700
ESTIMATED OPENING YEAR 1992 ADT = 20,057
DESIGN YEAR 2011 ADT = 38,096
K=9% D=60% T=5% (24 HOURS)
DESIGN SPEED 70 m.p.h.

MEDIAN
SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE BELOW) WITH
TYPE 'S' STRUCTURAL COURSE (250 LBS./S.Y.) (2 LIFTS, 1st LIFT (100 LBS./S.Y.) TYPE S-III ONLY, 2nd LIFT (150 LBS./S.Y.) TYPE S-I ONLY) AND FRICTION COURSE FC-2 (5/8")

OPTIONAL BASE COURSES PERMITTED	OPTION CODE
4" LIMEROCK BASE COURSE	001
4" ASPHALT BASE COURSE (TYPE 3)	007
4" CEMENTED COQUINA COURSE	003

OUTSIDE
SHOULDER PAVEMENT

RESURFACING
TYPE 'S' OVERBUILD COURSE (* LBS./SY AVG.) WITH
TYPE 'S' STRUCTURAL COURSE (150 LBS./S.Y.) AND FRICTION COURSE FC-2 (5/8")

WIDENING:

OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE BELOW) WITH
TYPE 'S' STRUCTURAL COURSE (200 LBS./S.Y.) AND FRICTION COURSE FC-2 (5/8")

OPTIONAL BASE COURSES PERMITTED	OPTION CODE
4" LIMEROCK BASE COURSE	001
4" ASPHALT BASE COURSE (TYPE 3)	007
4" CEMENTED COQUINA COURSE	003

MILLING

MILL EXISTING ASPHALTIC CONCRETE PAVEMENT (1 1/4" AVG. DEPTH)

RESURFACING

TYPE 'S' OVERBUILD COURSE (* LBS./SY AVG.) WITH
TYPE 'S' STRUCTURAL COURSE (150 LBS./S.Y.) AND FRICTION COURSE FC-2 (5/8")

WIDENING:

OPTIONAL BASE GROUP 9 (FOR THICKNESS, SEE BELOW) WITH
TYPE 'S' STRUCTURAL COURSE (400 LBS./S.Y.) AND FRICTION COURSE FC-2 (5/8")

OPTIONAL BASE COURSES PERMITTED

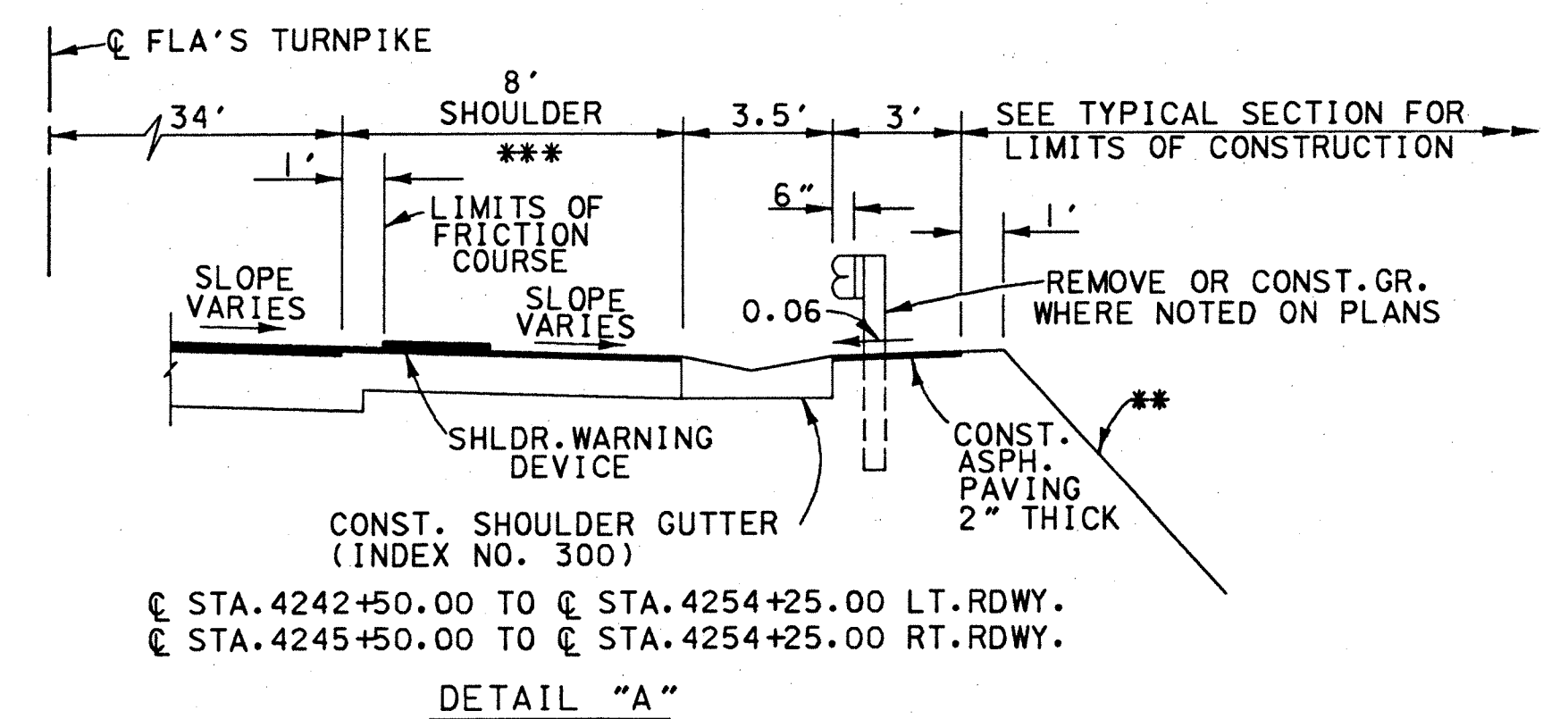
10" LIMEROCK BASE COURSE
6" ASPHALT BASE COURSE (TYPE 3)
10" CEMENTED COQUINA COURSE

OPTION CODE

990
327
989

FOR ADDITIONAL DETAILS SEE INDEX Nos. 105, 281, 400, 410, 415, 500, 505, 513 AND 514.

* SUMMARY OF OVERBUILD FOR BASIS OF ESTIMATE ONLY			
Q STA. TO	Q STA.	NB/SB	LBS./SY. AVG.
4215+16	TO 4218+66	SB	460
4218+66	TO 4221+66	SB	620
4221+66	TO 4225+50	SB	486
4225+50	TO 4238+00	SB	202
4238+00	TO 4248+90	SB	239
4248+90	TO 4260+00	SB	470
4260+00	TO 4280+00	SB	220
4280+00	TO 4282+40	SB	638
4284+40	TO 4286+00	SB	704
4286+00	TO 4288+38.36	SB	348
4220+00	TO 4221+41	NB	180
4221+41	TO 4238+00	NB	287
4238+00	TO 4248+90	NB	240
4248+90	TO 4260+00	NB	650
4260+00	TO 4280+00	NB	280
4280+00	TO 4288+38.36	NB	200



*** FROM Q STA. 4248+98.57 TO Q STA. 4249+12.57 RT. ROADWAY AT THE FARM ACCESS CROSSING CULVERT, THE SHOULDER IS TO BE CONSTRUCTED AT A 0.028 CROSS SLOPE TO MAKE PROVISIONS FOR THE CONSTRUCTION OF THE SHOULDER GUTTER ON TOP OF CULVERT. SEE FARM ACCESS CROSSING DETAILS FOR SHOULDER GUTTER CONSTRUCTION.

SUMMARY OF GUARDRAIL															
LOCATION STA. TO STA.	SIDE	REMOVAL OF EXISTING GUARDRAIL		REMOVAL OF EXISTING DOUBLE FACE GUARDRAIL		GUARDRAIL		RESET EXISTING GUARDRAIL		END ANCHORAGE				SPECIAL POSTS	
		P	F	P	F	P	F	P	F	TYPE II		TYPE IV		P	F
		LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
4214+52.00 TO 4221+60.00	RT							700.00		I					
4221+60.00 TO 4222+47.50	RT					87.50									
4222+47.50 TO 4222+97.50	RT							50.00		I					
4243+00.00 TO 4255+55.50	RT							1255.50		I		I		3	
4255+50.00 TO 4262+00.00	RT	650.00													
4215+05.33 TO 4221+63.33	MED			650.00											
4222+40.00 TO 4247+65.00	MED			2525.00											
4248+00.00 TO 4260+62.50	MED			1262.50											
4261+40.00 TO 4290+90.00	MED			2950.00											
4213+64.50 TO 4221+60.00	LT							787.50							
4221+60.00 TO 4222+47.50	LT					87.50									
4222+47.50 TO 4257+97.50	LT							3550.00		I		I		3	
4257+97.50 TO 4289+72.50	LT					3175.00									
4260+00.00 TO 4260+50.00	LT	50.00													
4261+50.00 TO 4262+50.50	LT	100.00													
												</			

SUMMARY - REMOVAL OF EXISTING BRIDGE STRUCTURES								
LOCATION STA. TO STA.		SIDE	P			F		
			L	W	S.F.	L	W	S.F.
4221+61 TO 4222+39		LT/RT	78'	66.50'	5,187.00'			
4260+61 TO 4261+39		LT/RT	78'	66.50'	5,187.00'			
TOTAL					10,374.00'			

NOTE:
SQUARE FOOTAGE SHOWN ABOVE DOES NOT INCLUDE APPROACH SLABS.
ALL BRIDGE AND APPROACH SLAB MATERIALS SHALL BE DISPOSED OF BY
THE CONTRACTOR IN AREAS PROVIDED BY HIM AND APPROVED BY THE ENGINEER.

SUMMARY OF FENCING										REMARKS
LOCATION STA. TO STA.		SIDE	FENCE TYPE A		CORNER POST ASSEMBLY-TYPE A		PULL & END POST-TYPE A		RESET FENCE TYPE A	
			LF		EA		EA		LF	
			P	F	P	F	P	F	P	F
4248+85.00 TO 4249+20.00		LT	185.00		4					
4248+85.00 TO 4249+20.00		RT	195.00		4					
TOTAL:			380.00		8		0		0	

NOTE:
THE LIMITS OF FENCE INDICATED ARE APPROXIMATE AND ARE TO BE ADJUSTED WHERE NECESSARY
AS DIRECTED BY THE ENGINEER.

SUMMARY OF EARTHWORK		
DESCRIPTION	P	F
	CU. YD.	CU. YD.
ROADWAY EXC. (A-2, A-3 MATL.)	14,848	
EMBANKMENT	20,841	

- NOTES:
- THERE IS NO DIRECT PAYMENT FOR LATERAL DITCH, ROADWAY OR CHANNEL EXCAVATION.
 - EARTHWORK HAS BEEN CALCULATED USING THE LIMEROCK BASE OPTION. IF ANOTHER OPTION IS CONSTRUCTED, THERE SHALL BE NO REVISION TO THE EARTHWORK QUANTITIES.
- PAY ITEM FOOTNOTES
- 102-1 INCLUDES ALL ITEMS OF MAINTENANCE OF TRAFFIC NOT INCLUDED FOR PAYMENT UNDER SEPARATE ITEMS.
- 102-10 ONLY FHP, TROOP K LAW ENFORCEMENT SHALL BE USED.
- 110-1-1 INCLUDES THE REMOVAL OF EXISTING CONCRETE FLUMES, CURB AND ETC. WITHIN THE LIMITS FOR CLEARING & GRUBBING AND THE SELECT CLEARING & GRUBBING SPECIFIED FOR ENHANCEMENT AREA. (SEE MITIGATION PLAN)
- 120-6 ANY BORROW EXCAVATION REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR FROM AREAS PROVIDED BY HIM AND THE COST OF FURNISHING SUCH MATERIAL IS INCLUDED IN THE PRICE FOR EMBANKMENT.
- 327-70 INCLUDES REMOVAL OF EXISTING RAISED PAVEMENT MARKERS PRIOR TO MILLING. ALL MILLED MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR.
- 337-3-2 ALL FRICTION COURSE TO BE USED ON THE PROJECT SHALL BE LATEX MODIFIED.
- 536-73 EXCESS GUARDRAIL TO BE DISPOSED OF BY THE CONTRACTOR.
- 550-1 } TIMBER POST ONLY PERMITTED. INCLUDES COST FOR
550-3-1 } REMOVAL AND DISPOSAL OF EXISTING FENCE.
- 570-5 BASED ON 2 APPLICATIONS.
- 570-11 BASED ON 20 APPLICATIONS OF 20 GALLONS PER TREE.
- 580-332-1 INCLUDED FOR RELOCATION OF MAN PLANTED TREES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. (MAY BE INCREASED OR DECREASED).

SUMMARY OF SODDING							
LOCATION STA. TO STA.		SIDE	P			F	
			L	W	S.Y.	L	S.Y.
4215+16.00 TO 4242+50.00		LT	2,734.00	15.00±	4557		
4242+50.00 TO 4254+25.00		LT	1,175.00	20.00±	2611		
4254+25.00 TO 4292+31.30		LT	3,806.30	12.00±	5075		
4215+16.00 TO 4242+50.00		RT	2,734.00	2.67	811		
4242+50.00 TO 4254+25.00		RT	1,175.00	2.00	261		
4254+25.00 TO 4292+31.30		RT	3,806.30	2.67	1129		
SUMMARY OF DRAINAGE STRUCTURES					911		
TOTAL:					15,355		

REVISIONS						FLORIDA DEPARTMENT OF TRANSPORTATION						SUMMARY OF QUANTITIES
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DESIGNED	NAME	DATE	DRAWN	NAME	DATE	
						CHECKED	R. KLEIN	04-91	CHECKED	R. AMERSON	04-91	
						BY	M. THORNBURG	04-91	BY	R. KLEIN	04-91	
						APPROVED BY MURRAY D. THORNBURG JR., P.E. DATE 1/17/92						
						SUPERVISED BY : MURRAY D. THORNBURG JR., P.E.						

LABORATORY NO.: N/A
KEITH & SCHNARS PROJ. NO.: 13633.2A
CLEINT: F.D.O.T.
PROJECT: REPLACEMENT OF 12 BRIDGES
S.R. 91 (FLA. TURNPIKE - MARTIN COUNTY)

DATE OF SURVEY: 1/28/91 TO 2/1/91
SURVEY MADE BY: PATTERSON/WASHBURN
SURVEY BEGIN STA.: 4215+00.00
END STA.: 4292+00.00

REPORT OF TESTS OF MATERIAL FROM ROADWAY
FOR USE IN EMBANKMENT AND SUBGRADE
AASHTO METHOD FOR SOIL CLASSIFICATION

STRATUM NO.	PERCENT ORGANICS	% PASS 3/4"	% PASS 1/2"	% PASS 3/8"	% PASS NO. 4	% PASS NO. 10	% PASS NO. 40	% PASS NO. 200	LIQUID LIMIT	PLASTIC INDEX	GROUP	DESCRIPTION
1	-	100.0	100.0	99.2	99.1	99.0	92.9	8.5	NP	NP	A-3 A-2-4	GRAY TO BROWN MEDIUM-FINE SILICA SAND.
2	0.9	100.0	100.0	97.2	94.6	92.0	86.1	6.6	NP	NP	A-3 A-2-4	BROWN TO DARK BROWN MEDIUM-FINE SILICA SAND WITH TRACE OF SHELL.
3	7.6	-	-	-	-	-	-	-	-	-	A-8	DARK BROWN MEDIUM-FINE SILICA SAND WITH ORGANICS.
4	-	100.0	100.0	99.0	96.2	92.8	86.7	10.4	NP	NP	A-3 A-2-4	TAN TO BROWN MEDIUM-FINE SILICA SAND WITH ORGANICS AND TRACE OF CLAY.
5	5.8	-	-	-	-	-	-	-	-	-	A-8	DARK BROWN MEDIUM-FINE SILICA SAND WITH ORGANICS AND TRACE OF CLAY.
6	-	100.0	100.0	100.0	100.0	99.8	94.2	17.2	28.1	10.5	A-2-4 A-2-6	GRAY TO BROWN MEDIUM-FINE SILICA SAND WITH CLAY AND TRACE OF SHELL.
7	3.9	100.0	100.0	100.0	99.9	99.4	92.6	5.7	NP	NP	A-3	BROWN MEDIUM-FINE SILICA SAND WITH TRACE OF SHELL AND ORGANICS.

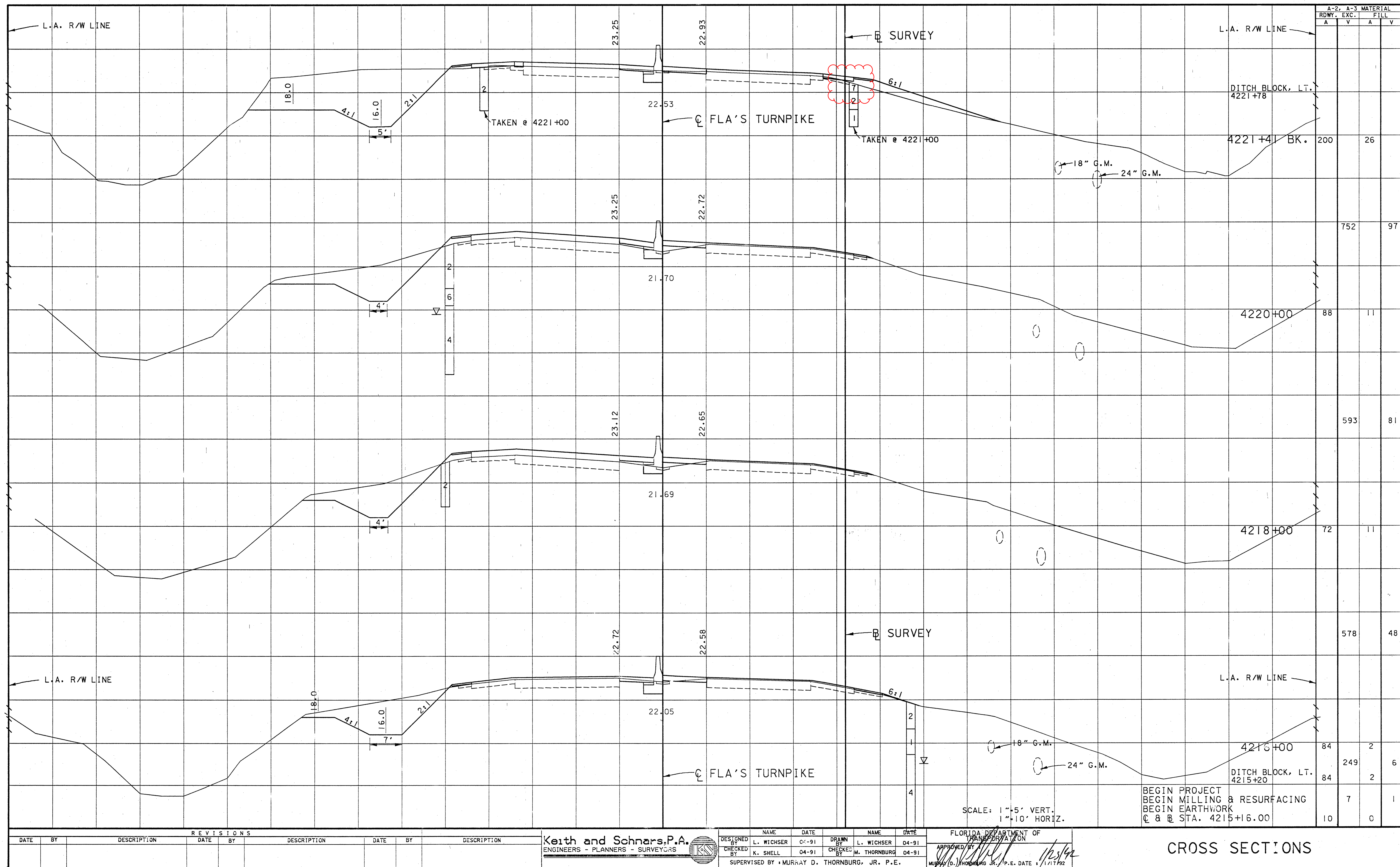
EMBANKMENT AND SUBGRADE MATERIAL

1. THE MATERIAL FROM STRATUM NOS. 1, 2, 4, AND 6 IS SUITABLE FOR USE AS SUBGRADE AND EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH INDEX 505.
2. THE MATERIAL FROM STRATUM NO. 7 IS NOT SUITABLE FOR USE AS SUBGRADE MATERIAL ACCORDING TO INDEX 505. HOWEVER, IT CAN BE UTILIZED IN THE EMBANKMENT PORTION OF THE ROADWAY.
3. THE MATERIAL FROM STRATUM NO. 3 AND 5 IS CLASSIFIED AS A-8 MATERIAL AND IS NOT SUITABLE FOR USE AS SUBGRADE OR EMBANKMENT. THE MATERIAL FROM STRATUM NO. 3 SHOULD BE REMOVED IN ITS ENTIRETY. THE MATERIAL FROM STATUM NO. 5 MAY REMAIN IN PLACE DUE TO ITS DEPTH AND RELATIVELY LOW ORGANIC CONTENT.

▼ = WATER TABLE ENCOUNTERED

George P. Ballock
GEORGE P. BALLOCK, P.E.

REVISIONS				Keith and Schnars, P.A.				DESIGNED BY K. SHELL DATE 03-91				DRAWN BY R. AMERSON DATE 03-91				FLORIDA DEPARTMENT OF TRANSPORTATION				
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
								CHECKED BY M. THORNBURG DATE 03-91				SUPERVISED BY MURRAY D. THORNBURG JR., P.E.				APPROVED BY <i>Murray D. Thornburg Jr.</i> DATE 1/17/92				

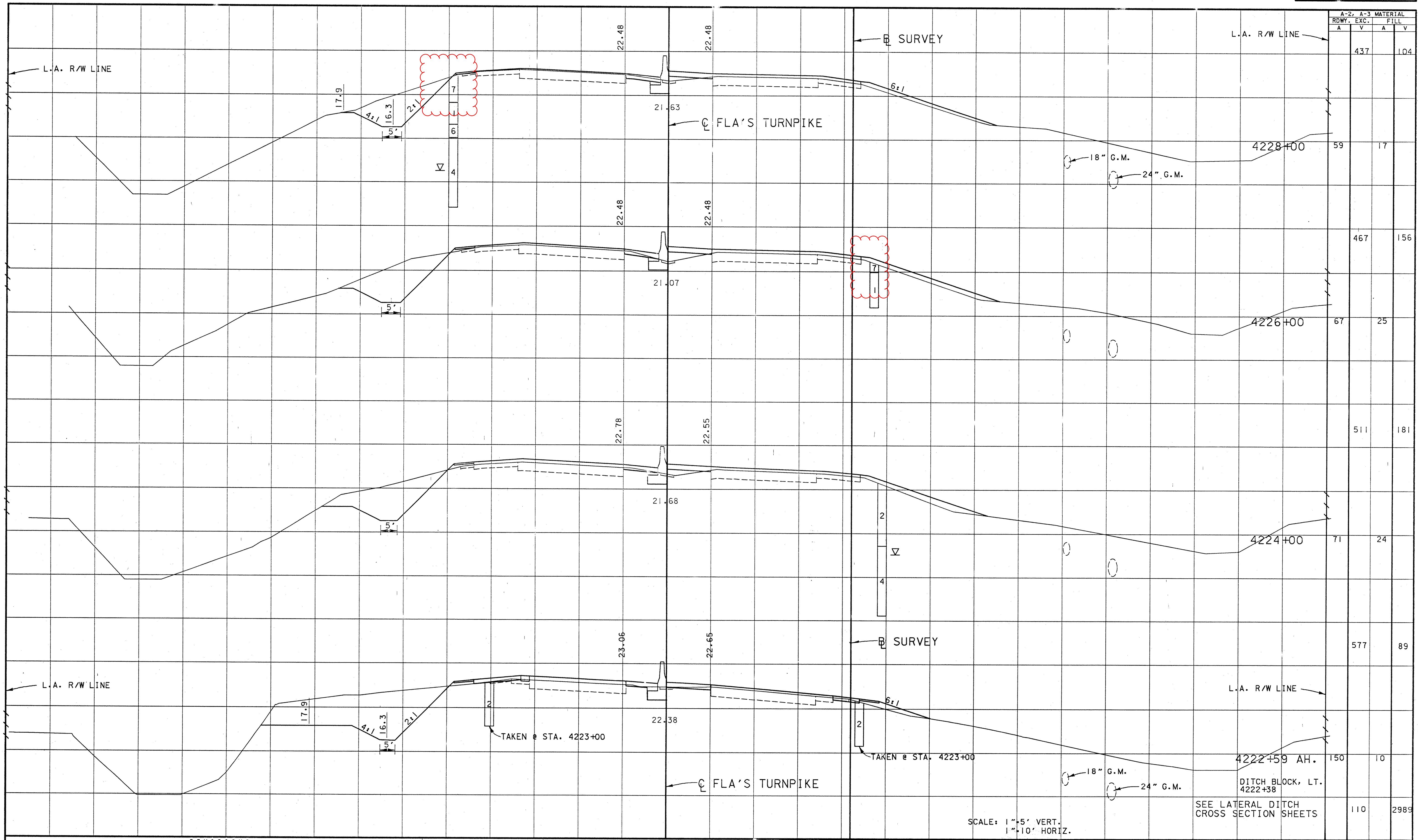


REVISIONS				REVISIONS			
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
CHECKED BY	K. SHELL	04-91	CHECKED BY	M. THORNBURG	04-91
SUPERVISED BY	MURRAY D. THORNBURG, JR.	P.E.			

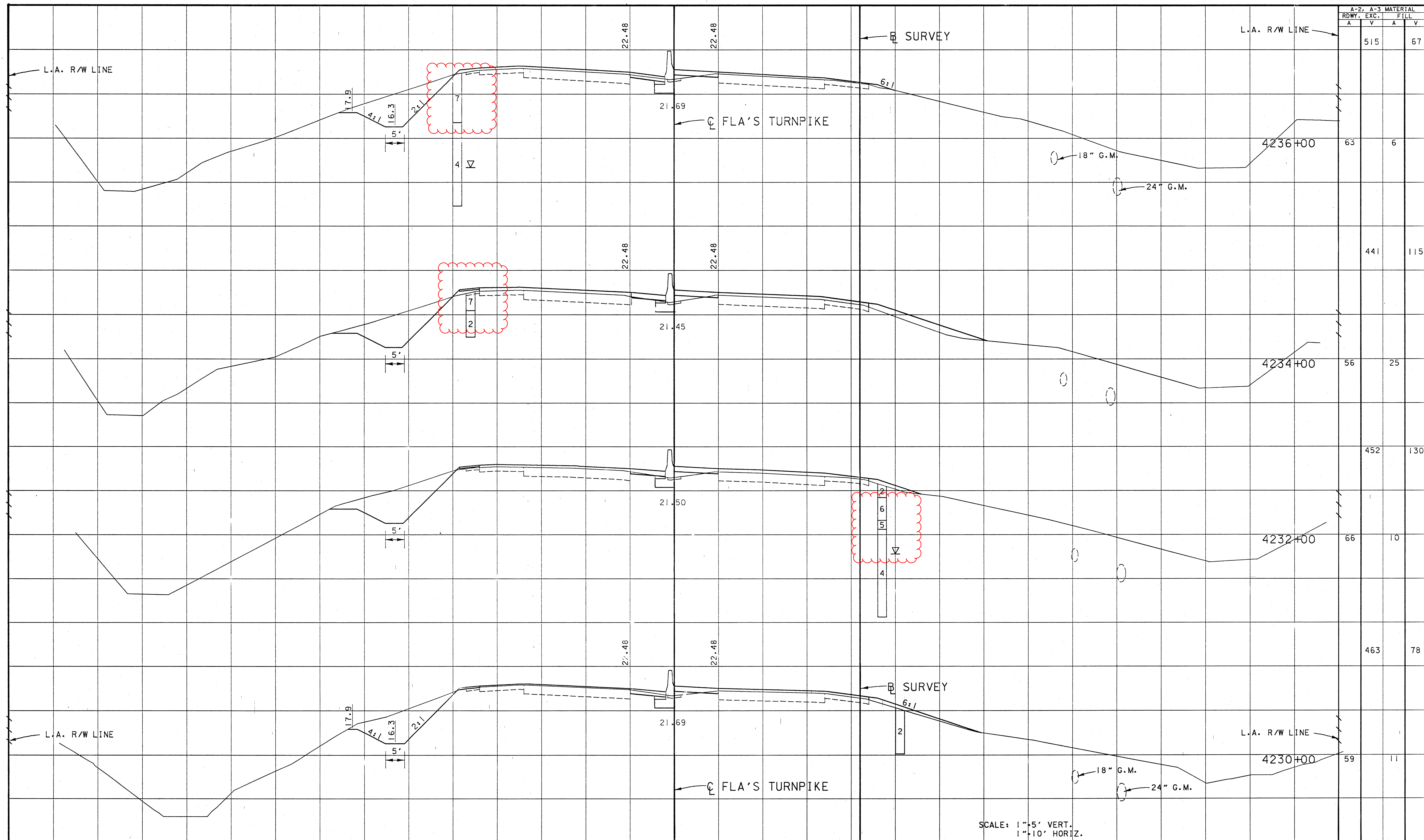
FLORIDA DEPARTMENT OF TRANSPORTATION	APPROVED BY	MURRAY D. THORNBURG, JR.	P.E. DATE	1/17/92
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BEGIN PROJECT	84	2	6
BEGIN MILLING & RESURFACING	84	2	6
BEGIN EARTHWORK	10	0	1

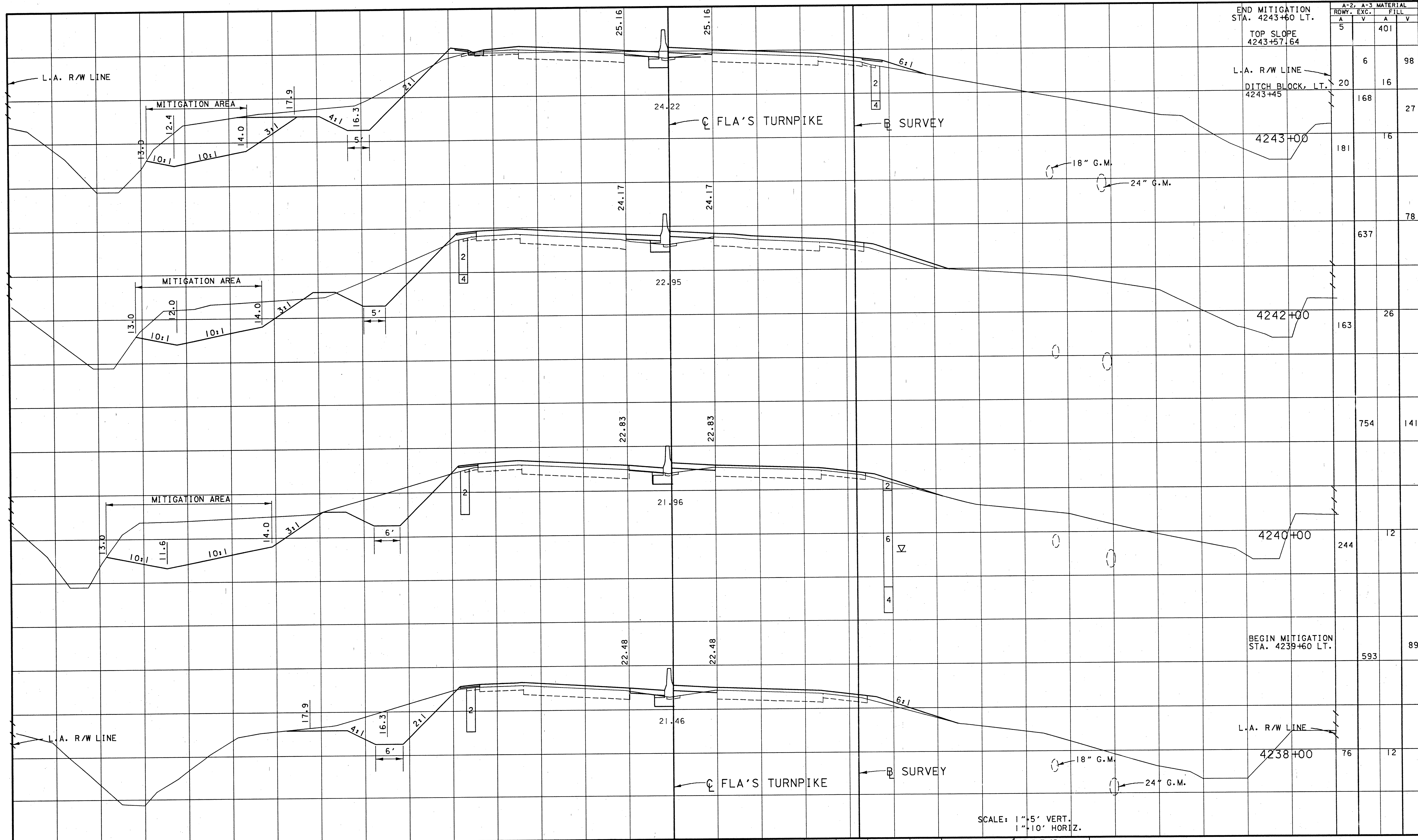


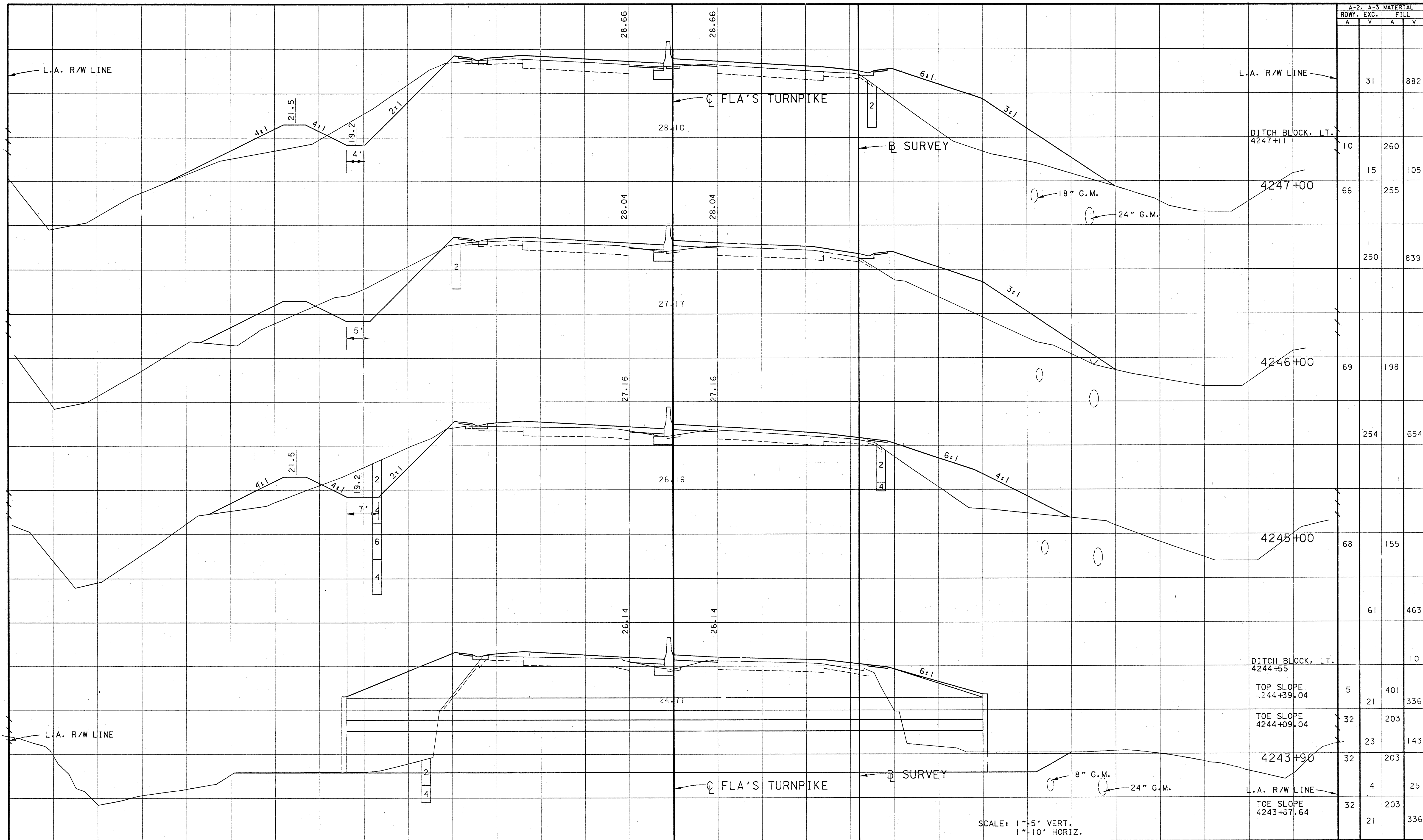
REVISIONS								Keith and Schnorr P.A.				FLORIDA DEPARTMENT OF TRANSPORTATION				CROSS SECTIONS				
DATE	BY	DESCRIPTION		DATE	BY	DESCRIPTION		DESIGNED	NAME	DATE		NAME	DATE	APPROVED BY	DATE					
								L. WICHSE	04-91			L. WICHSE	04-91		1/13/92					
								CHECKED BY	K. SHELL	04-91		CHECKED BY	M. THORNBURG							04-91
								SUPERVISED BY: MURRAY D. THORNBURG, JR. P.E.				MURRAY D. THORNBURG, JR. P.E. DATE: 1/17/92								

CROSS SECTIONS



REVISIONS DATE BY DESCRIPTION _____ _____ _____				DESIGN NAME DATE L. WICHSER 04-91 K. SHELL 04-91 MURRAY D. THORNBURG, JR. P.E.				FLORIDA DEPARTMENT OF TRANSPORTATION APPROVED BY MURRAY D. THORNBURG, JR. P.E. DATE 1/23/92				CROSS SECTIONS			
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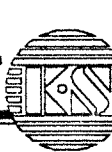




SCALE: 1"=5' VERT.
1"=10' HORIZ.

REVISIONS				REVISIONS				REVISIONS			
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

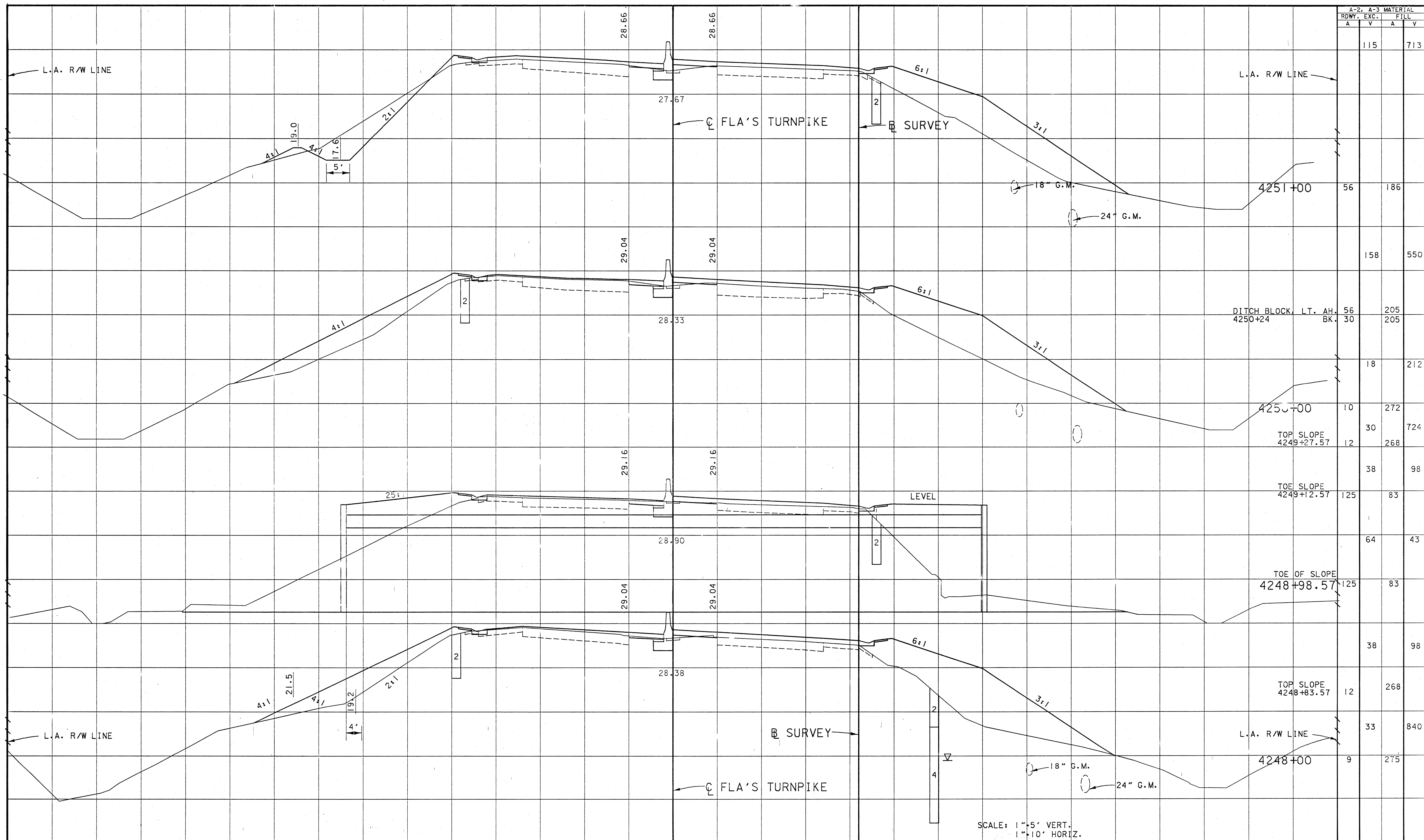
Keith and Schnars, P.A.
ENGINEERS - PLANNERS - SURVEYORS



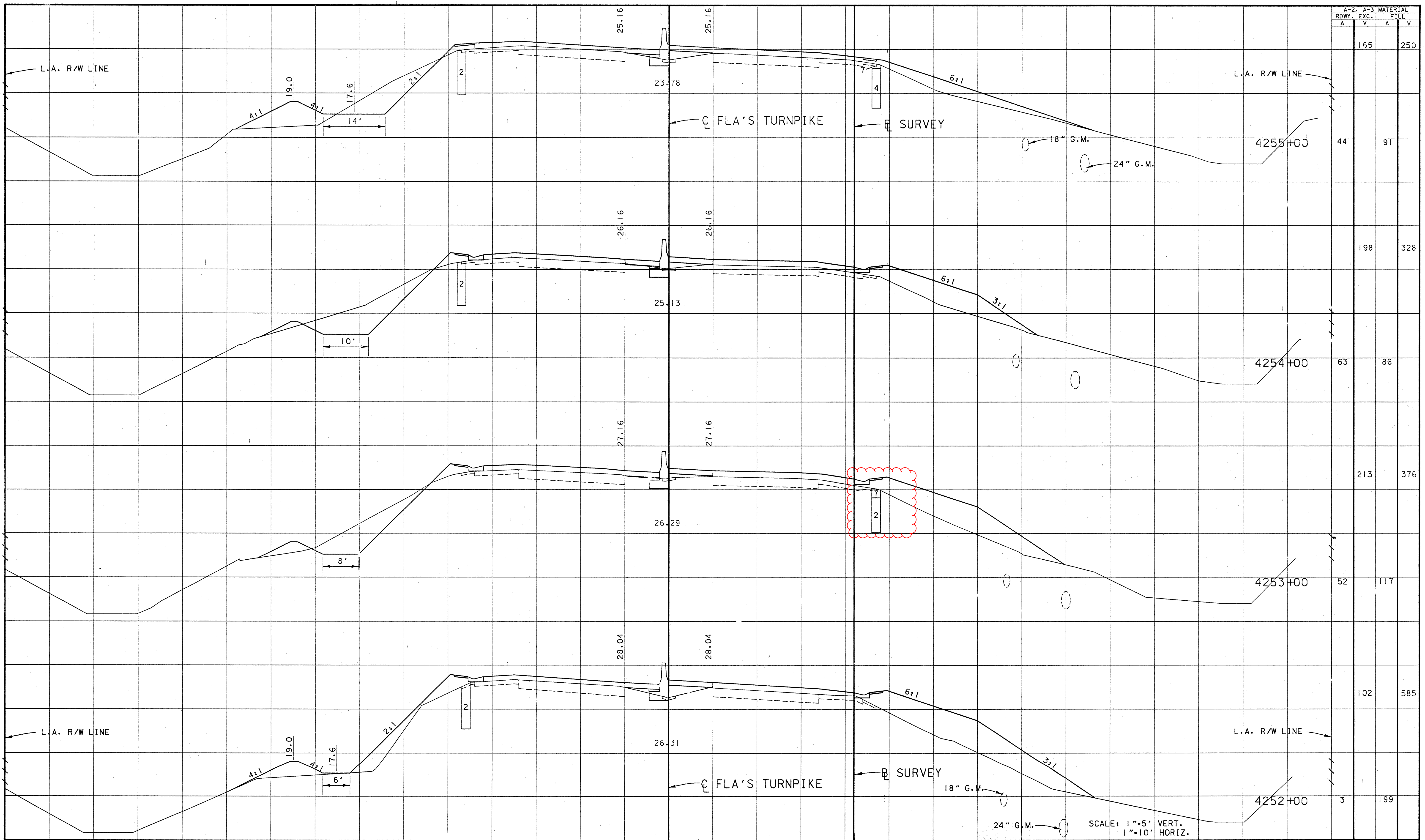
DESIGNED BY	NAME	DATE	CHECKED BY	NAME	DATE
L. WICHSER	L. WICHSER	04-91	K. SHELL	K. SHELL	04-91

FLORIDA DEPARTMENT OF TRANSPORTATION	APPROVED BY	DATE

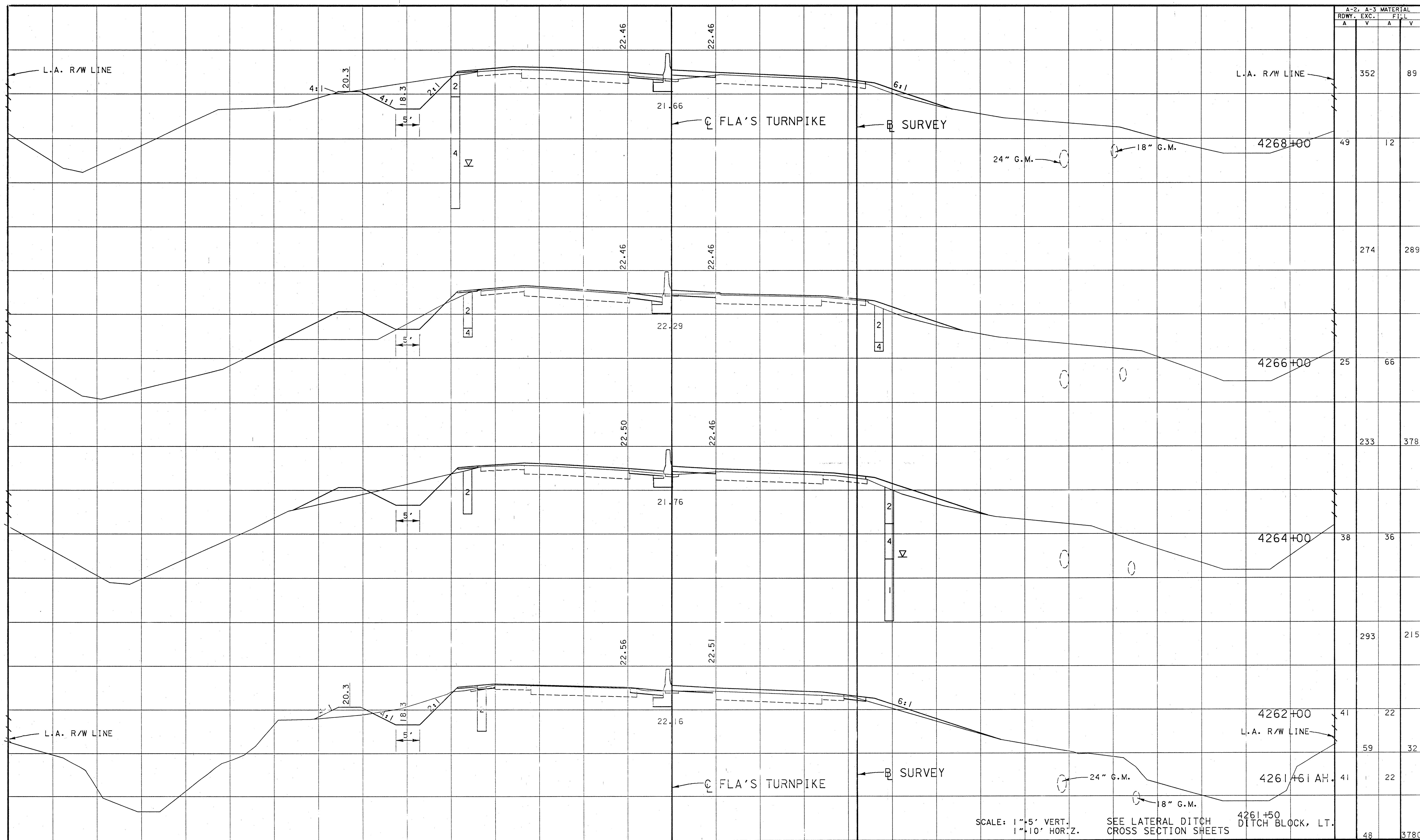
CROSS SECTIONS



REVISIONS DATE BY DESCRIPTION DATE BY DESCRIPTION DATE BY DESCRIPTION				Keith and Schnorr, P.A. ENGINEERS - PLANNERS - SURVEYORS				DESIGNED BY L. WICHSER 04-91 CHECKED BY K. SHELL 04-91 SUPERVISED BY MURRAY D. THORNBURG, JR., P.E.				DRAWN BY L. WICHSER 04-91 CHECKED BY M. THORNBURG 04-91 APPROVED BY MURRAY D. THORNBURG, JR., P.E. DATE 1/17/92				FLORIDA DEPARTMENT OF TRANSPORTATION CROSS SECTIONS			
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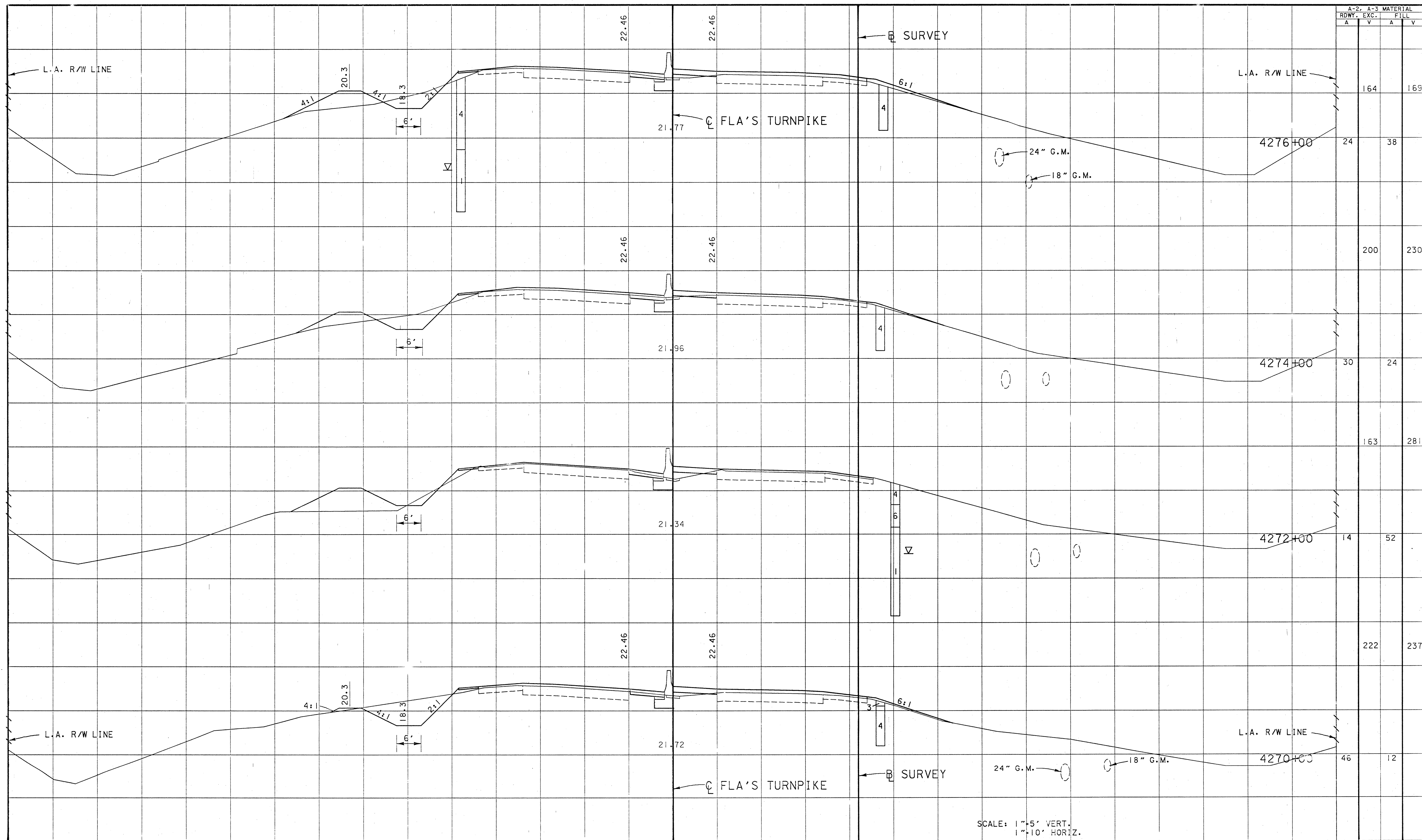


REVISIONS DATE BY DESCRIPTION _____ _____ _____				Keith and Schnars, P.A. ENGINEERS - PLANNERS - SURVEYORS				DESIGNED BY: L. WICHSER 04-91 CHECKED BY: K. SHELL 04-91 SUPERVISED BY: MURRAY D. THORNBURG, JR., P.E.				DRAWN BY: L. WICHSER 04-91 CHECKED BY: M. THORNBURG 04-91 APPROVED BY: <i>[Signature]</i> 1/23/92 MURRAY D. THORNBURG, JR., P.E. DATE: 1/17/92				FLORIDA DEPARTMENT OF TRANSPORTATION CROSS SECTIONS			
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REVISIONS DATE BY DESCRIPTION 				Keith and Schnars, P.A. ENGINEERS - PLANNERS - SURVEYORS				DESIGNED BY L. WICHSER 04-91 CHECKED BY K. SHELL 04-91 SUPERVISED BY MURRAY D. THORNBURG, JR. P.E.				FLORIDA DEPARTMENT OF TRANSPORTATION APPROVED BY MURRAY D. THORNBURG, JR. P.E. DATE 1/23/92			
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CROSS SECTIONS



REVISIONS			REVISIONS			REVISIONS			REVISIONS		
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

North and Schners, P.A.
ENGINEERS - PLANNERS - SURVEYORS

NAME	DATE	NAME	DATE
DESIGNED BY L. WICHSER	04-91	DRAWN BY L. WICHSER	04-91
CHECKED BY K. SHELL	04-91	CHECKED BY M. THORNBURG	04-91
SUPERVISED BY MURRAY D. THORNBURG, JR., P.E.			

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TRANSPORTATION
APPROVED BY
MURRAY D. THORNBURG, JR., P.E. DATE 1/17/92

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