Road File

Pavement Condition Assessment
and Rehabilitation Plan
CR44A from CR 44 to SR 44
Eustis, Lake County, Florida

CONDUCTED FOR
Lake County Board of County Commissioners

CENTRAL TESTING LABORATORY
LEESBURG, FLORIDA

CTL FILE NO. 1484099.200

October 29, 2014

Leesburg

October 29, 2014

Mr. Fred Schneider, P.E.
Lake County Public Works
437 Ardice Avenue
Eustis, Florida 32726
(352) 483-9040

Re: CR 44A from CR 44 to SR 44
Pavement Condition Assessment and Rehabilitation Plan
Eustis, Lake County, Florida
CTL Project No. 1484099.200

Dear Mr. Schneider:

Central Testing Laboratory, Inc. (CTL) is pleased to provide this report for the above referenced project. CTL was retained by Lake County to determine the pavement condition and to provide an engineering evaluation of the existing section and the ability of the existing section to handle truck traffic and to determine appropriate rehabilitation measures to be undertaken by Lake County to accommodate the current and projected traffic volume.

This report documents the basis of our evaluation and the work performed by CTL to evaluate the existing pavement section. The evaluation was performed after review of the *Truck Evaluation and Speed Study report* prepared by Traffic Engineering Data Solutions, Inc. dated May, 2013. From this report CTL identified four segments of roadway each having different traffic volume and historical annual growth rates which were considered during the evaluation process. This report includes all analysis and evaluations performed which is delineated by the four roadway segments identified as follows:

Segment 1	CR 44A from CR44 to Estes Road
Segment 2	CR 44A from Estes Road to CR 439
Segment 3	CR 44A from CR 439 to CR 437
Segment 4	CR 44A from CR 437 to SR 44

The project location with each segment is presented in Figures 1A through 1C of this report.

Basis of Evaluation

In addition to the Truck Evaluation and Speed Study report, CTL has utilized various references, historical data and work performed by this firm as the basis of evaluating each segment. Reference material utilized in this report includes the Florida Department of Transportation (FDOT) Flexible Pavement Design Manual, FDOT

Flexible Pavement Condition Survey Handbook, Historical Aerials from the Lake County web site and from Google Earth, and Lake~Sumter MPO-Transportation Management System Annual Reports.

The FDOT Flexible Pavement Design Manual defines the process of designing roadway pavement sections and is based primarily upon the classification of the roadway to be constructed and the projected Equivalent Single Axle Loads (ESALs) over a given design life (typically 20 years). One major factor in determining an appropriate pavement profile includes projected traffic data which is ultimately translated into ESALs. The number of ESALs is contingent upon many factors including the daily traffic loading, the percentage of truck traffic, the number of lanes, direction factor, and equivalency to an 18-kip axle load. Other factors in pavement design include the Resilient Modulus (M_R) of the existing roadbed materials and a reasonably-selected Reliability Factor (%R) which is analogous to a safety factor. CTL has utilized this publication to support our conclusions regarding the and to determine an appropriate pavement profile for rehabilitation.

FDOT Flexible Pavement Condition Survey Handbook is a publication which seeks to standardize the evaluation of asphaltic and concrete pavements. CTL has utilized this document to evaluate the condition of the existing pavement sections. This publication identifies asphaltic pavement distress features and quantifies the severity of these distress features so that a standard Pavement Condition can be established for any given roadway segment. While the most appropriate use of this publication is in large-scale roadway condition assessment of a large volume of roadway segments, CTL has utilized this publication to assist in determining the pavement condition for each roadway segment.

The Lake~Sumter MPO-Transportation Management System Annual Reports include studies and technical data relating to system performance, long range planning, and transportation needs. The information provided in these reports was used in our evaluation of the current system and for projections of future traffic volume.

Historical Data

CTL obtained historical data for this roadway which included historical aerials and maps available on the Lake County web site and traffic count data from the various reports available. There is limited historical data available regarding original design and construction of the road and therefore a pavement coring and condition survey was necessary to identify original construction and rehabilitation efforts made over the history of the road. Certain assumptions had to be made to complete the evaluations. The assumptions are based on the projections backward using the historical data that is available, data collected during our physical survey and the processes currently used for road design.

Historical Aerial Photos and Maps

A review of the historical aerials from 1941 shows the road alignment clearly visible indicating original road construction prior to 1941. Review of historical right of way maintenance maps from the period indicates many of the roads built during this time were constructed at 18 feet wide and either clay or limerock based with a surface treatment. Review of the aerials from February 1995 shows a distinct pavement color change beginning just east of CR 44 and continues to just east of Lake Norris Road indicating the latest rehabilitation effort for this portion of the road occurred late 1994 or early 1995. The rehabilitation appeared to include an overlay at that time.

Historical Traffic Data

Traffic data was obtained in the report provided to CTL by Lake County and the Lake~Sumter MPO-reports. The data extends back as far as 1997 for the segments involved in this evaluation. Other information available includes historic traffic volume trends and long range planning projections from calibrated models prepared by Tindal Oliver and Associates and presented in the 2025 Long Range Transportation Plan (LRTP) report. A review of the traffic count data suggests that traffic volumes on this road were steadily increasing between the period of 1997 and 2005 and steadily decreasing from 2005 to the traffic counts of 2013. Most recent traffic count data used to determine 5 year and 10 year average annual historical growth rates as presented in the Truck Evaluation and Speed Study report prepared by Traffic Engineering Data Solutions, Inc. indicate no growth or negative growth rate trends within each of the segments being evaluated having growth rates that range from 0.00% to -4.67%. These values differ from those presented in the LRTP which projects a growth rate of 2.5% based on numerous socioeconomic factors.

Condition Assessment Data

CTL performed condition assessment of the road on September 13 through 20, 2014. A total of eight (8) pavement sample sections were used to establish the pavement condition for the eastbound lanes and nine (9) more sample sections were used in the westbound lanes. These sample sections were generally equally spaced in areas considered to be typical through each segment. The location of the cores are presented on Figures 2A through 2C.

The condition assessment reveals various typical pavement distresses including low and medium-severity branch and longitudinal cracking and associated minor rutting with occassional severe longitudinal and alligator cracking and moderate rutting observed. The pavement is considered to have an average crack rating of 8 and an average rut rating of 8 for the eastbound section of roadway and considered to be in **Fair** condition. The westbound lanes also exhibit signs of distress including low and medium-severity branch and longitudinal cracking and rutting. With an average crack rating of 8 and an average rut rating of 8 this section of roadway is also considered in **Fair** condition. A copy of the Coring and Condition data sheet is presented in Appendix I.

Typical Section Identification

The information collected during the coring and condition survey revealed a typical road section 24 feet wide including an original roadbed approximately 16 feet wide with additional widening of approximately 4 feet on both sides of the road. The original roadbed typically consisted of subgrade sands with limited stabilization evident overlain with 5 to 6 inches of limerock base and a surface treatment covered with several layers of type II asphaltic concrete beneath the current exposed surface of type S aphaltic concrete. The widened portions of the road typically consisted of a 10 inches limerock base with a layer of type II asphaltic concrete beneath the currently exposed surface of Type S asphaltic concrete.

It was noted during the condition survey that several intersections had been widened further with turn lanes and associated intersection improvements. Review of aerial photographs indicate these improvements occurred at different times but generally after 1995 and as recent as 2011. These improvements were located at the following locations:

CR 44A and CR 44
CR44A and Estes Road
CR44A and CR 439
CR 44A at Forestdel Drive
CR44A at entrance to Black Bear Reserve Subdivision
CR44A and CR 437
CR44A at Clara Street
CR44A at Lake Norris Road

Cores were taken in several of these areas to identify the typical construction in the widened areas. These areas typically included limerock base materials ranging between 11.5 and 15 inches thick with 3.5 to 4.5 inches of Type S or Type SP Asphaltic concrete. These areas typically exhibited minor cracking and rutting and were considered to be in good condition. Because these areas were more recently constructed and in a good condition they were not considered in the evaluation of the roadway.

Index Property Testing

Composite samples of the road base materials and subgrade were obtained during the field coring operation to be tested to determine the Limerock Bearing Ratio (LBR) of the materials used in the construction of the road.
The results of the testing performed indicate that the limerock base materials are of the quality expected for use in FDOT roadways. The LBRs performed resulted in an average LBR value of 155. The subgrade LBR resulted in a value of 40. However considering the variability observed in the subgrade soils during the coring operation, CTL has used a design LBR value of 34 for our evaluation.

Other Notable Conditions and Exceptions

During the pavement condition survey it was noted that there were areas of significant cracking and rutting in isolated areas not included in the sections evaluated as typical for the roadway. One area in particular was a section in the eastbound direction on the east end of the project between the bridge over Black Water Creek and the intersection of SR 44. This area appeared to have significant patching and other related pavement distress that is typical of base and subgrade failure. These types of failures may be associated with a shallow water table and saturation of the subgrade and base material.

A second area was identified at the intersection of CR44A and Ramblewood Lane where it was observed to have a significant amount of ponded water extending into the westbound travel lane of CR44A after a storm event.

As stated other areas exist along the road alignment that may differ from the conditions identified in this report. It is recommended that a roadway design survey be conducted to further evaluate cross slope and rutting prior to rehabilitation design.

Evaluating Original Design

Knowing that standard design procedures utilize Equivalent Single Axle Loads (ESALs) over a given design life (typically 20 years) it is reasonable to expect that the original road section was designed to accommodate truck traffic at the time and truck traffic projections over the design life of the road. ESALs are determined using many factors including the daily traffic loading, the percentage of truck traffic, the number of lanes, direction factor, and equivalency to an 18-kip axle load.

Likewise when the road was widened it is reasonable to expect that the 4 foot widened section was also designed using a Structural Number for design (SND) to match an equivalent rehabilitated existing roadbed and to accommodate a specific number of Equivalent Single Axle Loads for the design (ESALD).

Evaluation of Existing Road Segments

In order to evaluate the existing road to see if it was designed to handle truck traffic we have to determine the Structural number from the latest rehabilitation effort then look back at the historical data available over the anticipated design life and project forward to the ending design year. To accomplish this we have used the data collected from the pavement condition survey where we have identified the materials used in the design for the rehabilitation effort. For segments 1, 2 & 3 it is evident that the rehabilitation included an overlay of at least 2 inches of new Type S asphaltic concrete and was completed late 1994 or early 1995. For segment 4 we could not determine the date of the last rehabilitation but we have included this segment in our evaluation for comparison as it appears to be of similar construction and condition. For segment 4 we have projected back as if it were designed for a 25 year life occurring between 1988 and 2013. We have assumed that the condition of the existing materials at the time of the rehabilitation were in a good condition. Using the reduced layer coefficients from Table 6.1 of the FDOT Flexible Pavement Design Manual we have determined the design structural numbers for each segment as follows:

Structural Number for Design SND at last Rehabilitation Effort

Segment 1	Widening and Rehabilitation SND = 3.11
Segment 2	Widening and Rehabilitation SND = 3.02
Segment 3	Widening and Rehabilitation SND = 3.24
Segment 4	Widening and Rehabilitation SND = 2.80

Structural Number Calculations are presented in Appendix II.

Other factors in pavement design include the Resilient Modulus (M_R) of the existing roadbed materials and a reasonably-selected Reliability Factor (%R) which is analogous to a safety factor. To evaluate the road segments to determine if the existing roads were designed to handle the truck traffic at the time of last rehabilitation we assumed that the truck traffic has remained essentially the same over the years and would be similar to the truck traffic today. Likewise we have assumed that truck traffic will continue at the same rate for the design life (20 years) for the future rehabilitation. For our evaluation we have used the following values and the traffic count data available to determine the ESALD:

	% of Trucks (T24) = 7.0% Segments 1, 2,& 3
Subgrade Modulus = 11,000 psi	% of Trucks (T24) = 10.0% Segment 4
Reliability 90%	Direction Factor (DF) = 0.5
Table A.4A From Flexible Pavement	Lane Factor (LF) = 1.0
	Equivalency Factor (E18) = 0.96

From Table A.4A we have determined that segments 1, 2, & 3 were designed for ESALs on the order of between 1,000,000 and 1,500,000 and segment 4 for ESALs between 600,000 and 700,000.

Using the traffic count data, the values above and a 20 year design life (1995 to 2015) for segments 1, 2,& 3 and a 25 year design life (1988 to 2013) for segment 4, we have determined actual and projected ESALs for the segments as follows:

Segment 1	1,223,744
Segment 2	1,203,199
Segment 3	1,160,380
Segment 4	564,416

Data Tables for each segment are presented in Appendix III. The values obtained in this evaluation indicated that the rehabilitated road segments were designed for the truck traffic. The evaluation also indicates that the road is nearing its serviceability life and rehabilitation should be considered in the near future.

<u>Evaluation of Existing Pavement for Rehabilitation</u>

To evaluate the existing pavement for rehabilitation you must first determine the existing structural number (SNE) then using the available traffic data project forward accounting for projected growth and anticipated truck traffic and loading to determine the design life ESALs (ESALD) and the design structural number for rehabilitation (SNO). In addition to evaluating for structural number, consideration must be given to the existing pavement condition relating to rutting, cracking, and cross slope correction to determine the processes to be incorporated into the rehabilitation effort.

Structural Numbers of Existing Pavement Section

We have used the data collected in our pavement coring and condition survey and the reduced layer coefficients from Table 6.1 of the FDOT Flexible Pavement Design Manual to evaluate the existing pavement section for each segment. Because there are essentially two different typical sections within the roadbed we have evaluated the segment for both the original roadbed and the widening that has been added. We will use the resulting structural number of the weakest section for our analysis. The results of this analysis are as follows:

Existing Segment 1	Original Roadbed SNE = 2.91	
	4 foot Widened Section SNE = 2.48	Use SNE = 2.48
Existing Segment 2	Original Roadbed SNE = 2.38	
	4 foot Widened Section SNE = 2.50	Use SNE = 2.38
Existing Segment 3	Original Roadbed SNE = 2.42	
	4 foot Widened Section SNE = 2.54	Use SNE = 2.42
Existing Segment 4	Original Roadbed SNE = 2.46	
	4 foot Widened Section SNE = 2.29	Use SNE = 2.29

Anticipating based on pavement condition that the rehabilitation will include milling prior to placing an overlay, these values will need to be adjusted to a SNE after removal of material from milling.

Projecting forward for a 20 year design life we have used the following values to determine the ESALD.

Subgrade Modulus = 11,0000
Reliability = 90%
Projected Growth Rate = 2.5%
% Truck traffic (T24) = 7.0% for segments 1, 2, & 3
% Truck traffic (T24) = 10.0% for segment 4
Direction Factor (DF) = 0.5
Lane Factor (LF) = 1.0
Equivalency Factor (E18) = 0.96

The projected growth rate selected is different than the 5 year and 10 year Average annual growth rates presented in the Truck Evaluation and Speed Study report. The value selected is based on the fact that a continuation of the negative growth rates would eventually lead to a zero traffic volume. This in our opinion is not reasonable. From the LRTP Report prepared by the Lake~Sumter MPO, a growth rate used for future projections in this area has been determined to be 2.5 percent based on numerous socioeconomic considerations. Therefore we have elected to use a value of 2.5 percent for projected estimates.

Using current traffic data available and the values above we have determined the ESALD for each pavement segment to be as follows:

Segment 1	1,487,075
Segment 2	1,371,508
Segment 3	1,147,146
Segment 4	519,114

These projects are also presented in Appendix III. From this data and values above rounded up, using Table A.4A we have determined that segments 1, 2, & 3 should be designed for ESALD 1,500,000 and segment 4 for ESALD of 600,000. Corresponding Structural Number Required (SNR) values are as follows:

Segment 1	SNR = 3.21
Segment 2	SNR = 3.21
Segment 3	SNR = 3.21
Segment 4	SNR = 2.76

Given the type and depth of cracking identified in the pavement condition survey it will be necessary to mill the existing pavement prior to placing the overlay. Therefore we have estimated milling depths and adjusted the SNE values to reflect the materials remaining after milling. The following milling depths were selected for each segment:

Segment 1	3.0 inches	Adjusted SNE = 2.03	(after milling)
Segment 2	3.0 inches	Adjusted SNE = 1.95	(after milling)
Segment 3	2.5 inches	Adjusted SNE = 2.06	(after milling)
Segment 4	2.0 inches	Adjusted SNE = 1.99	(after milling)

Using the formula SNO = SNR – SNE we obtain the required Structural number for the overlay. Once the SNO is known we can determine the thickness of the structural layer required by dividing by the layer coefficient for the material as follows:

Segment 1	SNO = 3.21 – 2.03,	SNO = 1.18	Thickness required = 1.18 ÷ 0.44 = 2.68 inches Use 3.0 inches
Segment 2	SNO = 3.21 – 1.95,	SNO = 1.26	Thickness required = 1.26 ÷ 0.44 = 2.86 inches Use 3.0 inches
Segment 3	SNO = 3.21 – 2.06,	SNO = 1.15	Thickness required = 1.15 ÷ 0.44 = 2.61 inches Use 3.0 inches
Segment 4	SNO = 2.76 – 1.99,	SNO = 0.77	Thickness required = 0.77 ÷ 0.44 = 1.75 inches Use 2.0 inches

Rehabilitation Plan for SR 44A Segments

From this evaluation it has been determined that the rehabilitation plan will include milling and resurfacing in all four segments of the road. Milling depths will vary and asphalt overlay thicknesses vary between segments. One process that in our opinion should be considered for all segments is a crack relief layer to provide resistance to reflective cracking from underlying layers with cracks remaining and the pronounced cracking along the longitudinal joint where the widening was placed on each side of the original road bed.

The following table summarizes the rehabilitation plan as determined by this pavement condition evaluation for the four road segments. The rehabilitation effort may include additional design elements relating to shoulder pavement and intersection improvements which may be necessary but are beyond the scope of this report.

Rehabilitation Summary Table

Segment No	Milling Depth (inch)	Crack Relief Layer	Structural Course SP 12.5 (inch)	Friction Course FC 9.5 (inch)
1	3.0	Yes*	2.0	1.0
2	3.0	Yes*	2.0	1.0
3	2.5	Yes*	2.0	1.0
4	2.0	Yes**	1.5	1.0

*crack relief Asphalt Rubber Membrane Interlayer (ARMI) used for.
**geosynthetic crack relief product

All materials and procedures used in the rehabilitation effort should be produced and performed to meet the specifications of the FDOT Standard Specifications for Road and Bridge Construction Latest edition.

<u>Additional Options for consideration in Rehabilitation Design</u>

Other options available for the rehabilitation effort include no milling or reduced milling depths and the use of geosynthetic products such as a Petrotac or Petromat product to reduce the potential for reflective cracking through the new pavement. The Petrotac product is generally used to address isolated area conditions such as along joints and severely distressed areas of limited extent. The Petromat product is typically used for general applications over broad areas.

If a geosynthetic product is used, a no milling option may be considered as these products are best installed to adhere to a clean, smooth, flat surface. If a no milling option is considered, areas where a vertical offset occurs across the longitudinal joint will require leveling to create a suitable surface condition for proper placement.

If a reduced milling option is considered, a leveling course of at least 1 inch is recommended to provide a suitable surface condition for the product to adhere to.

In either case crack sealing is recommended to fill existing or remaining cracks larger than ¼“ prior to application of the geosynthetic product. The crack sealent material shall have sufficient time to properly cure before the geosynthetic is applied. The use of a geosynthetic product will require installation of the product in strict adherence to the product manufactures specifications.

When considering no mill or a reduced milling depth additional consideration should be given to the increase in elevation of the pavement surface. Specifically, the outside edge drop off and the transitions into existing pavement sections to remain such as beginning and ending points, at intersections and turnouts and driveways. If shoulder construction is not included in the rehabilitation effort, shoulder rehabilitation is recommended.

Following are some options that may be considered in the rehabilitation process. The following options include the use of a geosynthetic product as a crack relief interlayer.

Options for No Mill or Reduced Depth Milling

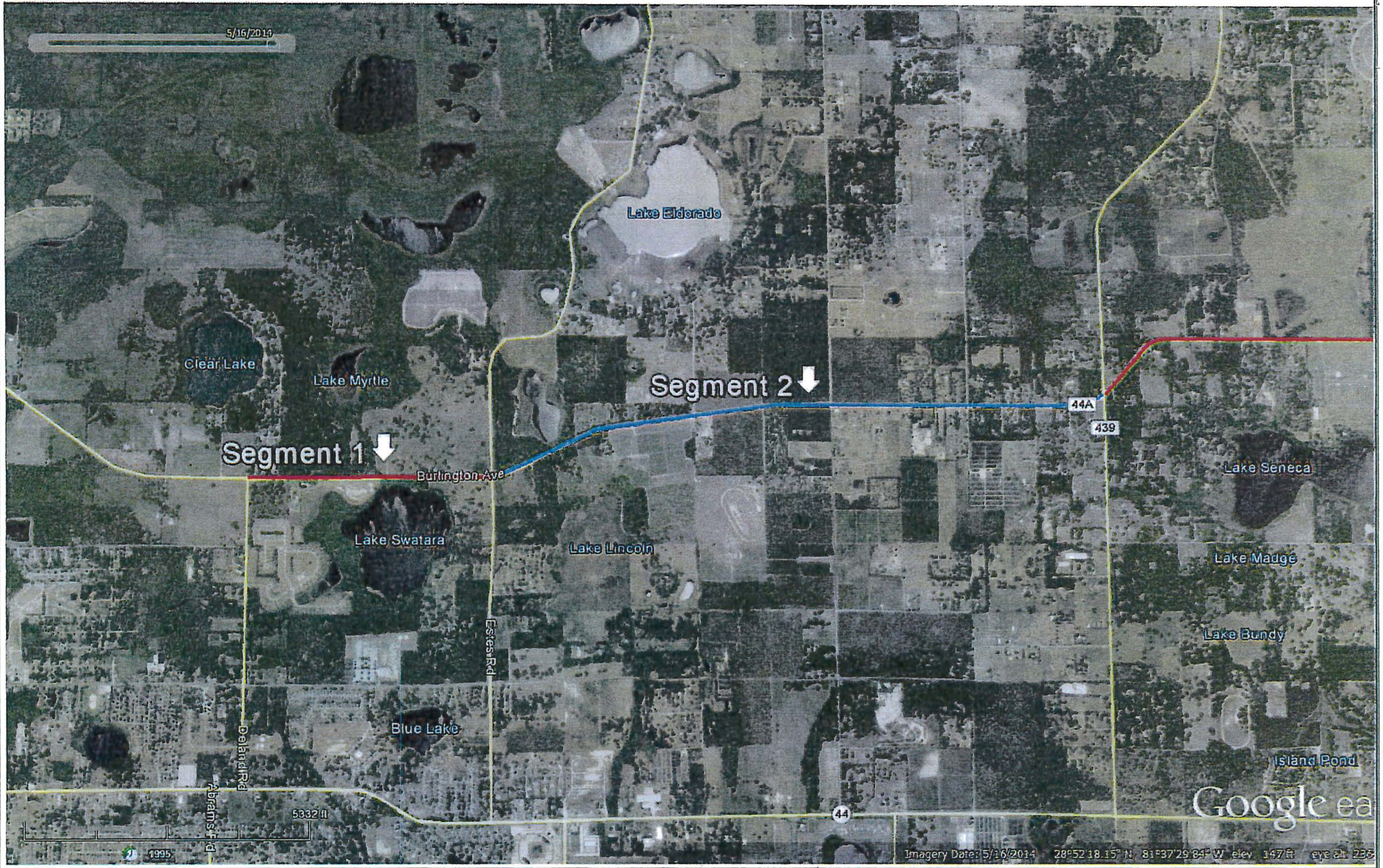
Segment 1	Friction FC 9.5	Structural SP 12.5	Leveling Required	Resulting Structural No.
No Mill	1"	1.5"	As needed	3.56
Mill 1"	1"	1.5"	1"	3.43
Mill 2"	1"	1.5"	1"	3.28
Segment 2	**Friction FC 9.5**	**Structural SP 12.5**	**Leveling Required**	**Resulting Structural No.**
No Mill	1"	1.5"	As needed	3.48
Mill 1"	1"	1.5"	1"	3.33
Mill 2"	1"	2"	1"	3.30
Segment 3	**Friction FC 9.5**	**Structural SP 12.5**	**Leveling Required**	**Resulting Structural No.**
No Mill	1"	1.5"	As needed	3.52
Mill 1"	1"	1.5"	1"	3.39
Mill 2"	1"	2"	1"	3.36
Segment 4	**Friction FC 12.5**	**Structural SP 12.5**	**Leveling Required**	**Resulting Structural No.**
No Mill	1.5"	-	As needed	2.95
Mill 1"	1.5"	-	1"	2.80

Closure

CTL is pleased to be of assistance on this project. Should you have any questions or comments regarding anything in this report, please do not hesitate to contact me at (352) 787-1268 or via email at tstrouse@ctlfl.com.

Sincerely,
CENTRAL TESTING LABORATORY, INC.

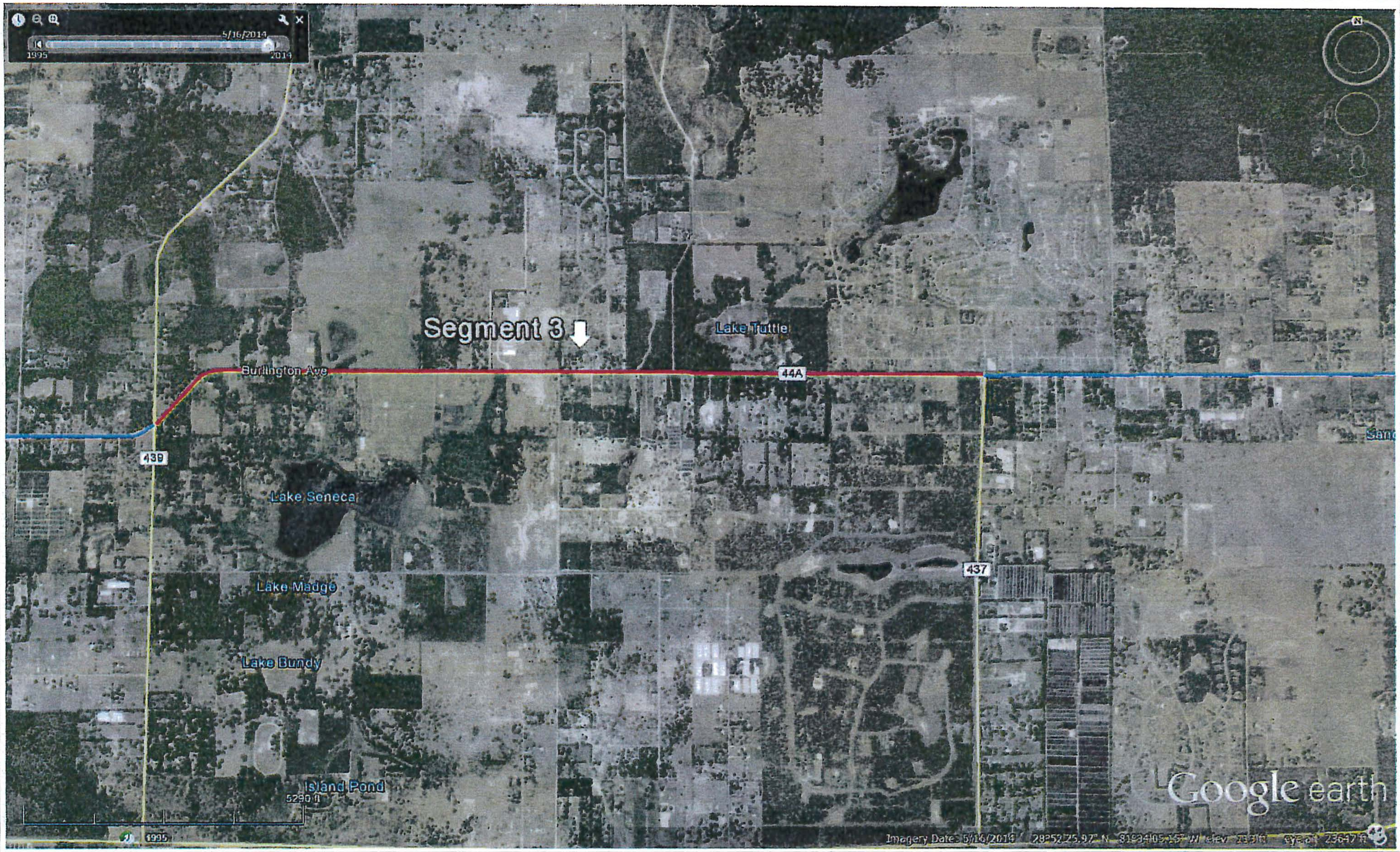
Theodore J. Strouse, P.E.
President
Florida Registration No. 48220
Cc: File



Central Testing Laboratory
ENGINEERING & MATERIALS TESTING

130 SATELLITE COURT
LEESBURG, FL 34748
(352)787-1268

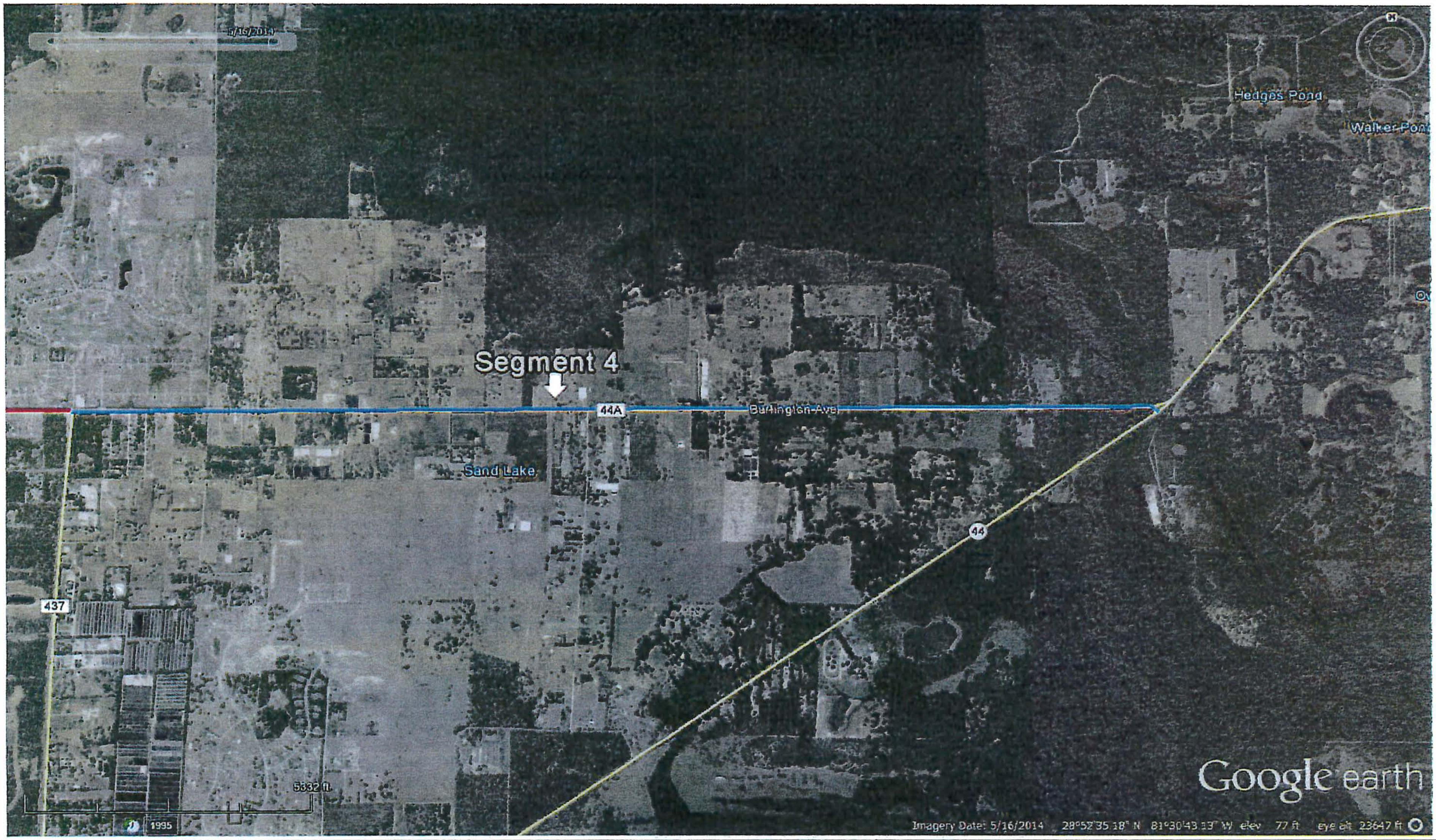
SITE LOCATION PLAN SEGMENTS 1 AND 2 CR 44A FROM CR 44 TO SR 44 EUSTIS, LAKE COUNTY, FLORIDA	DRAWN BY: TJS CHECKED BY: MCD DATE: 9/30/2014	JOB NUMBER 1484099.200 FIGURE NO. 1A



Central Testing Laboratory
ENGINEERING & MATERIALS TESTING

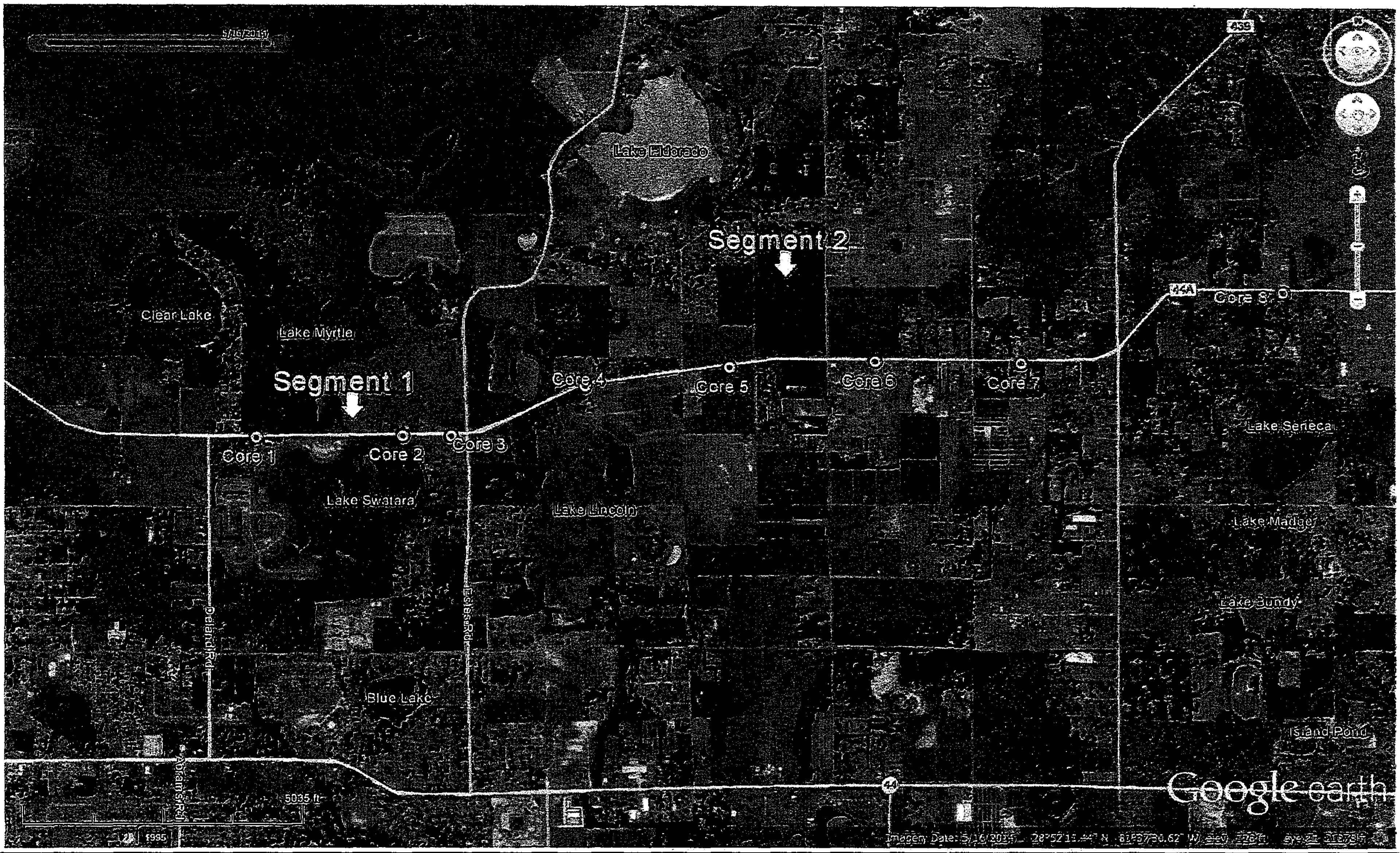
130 SATELLITE COURT
LEESBURG, FL 34748
(352)787-1268

SITE LOCATION PLAN SEGMENT 3 CR 44A FROM CR 44 TO SR 44 EUSTIS, LAKE COUNTY, FLORIDA	DRAWN BY: TJS CHECKED BY: MCD DATE: 9/30/2014	JOB NUMBER 1484099.200 FIGURE NO. 1B



Central Testing Laboratory **ENGINEERING & MATERIALS TESTING**	130 SATELLITE COURT LEESBURG, FL 34748 (352)787-1268

SITE LOCATION PLAN SEGMENT 4 CR 44A FROM CR 44 TO SR 44 EUSTIS, LAKE COUNTY, FLORIDA	DRAWN BY: TJS CHECKED BY: MCD DATE: 9/30/2014	JOB NUMBER 1484099.200 FIGURE NO. 1C



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LEESBURG, FL 34748
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CORE LOCATION PLAN SEGMENTS 1 AND 2 CR 44A FROM CR 444 TO CR 439 EUSTIS, LAKE COUNTY, FLORIDA	DRAWN BY: TJS CHECKED BY: MCD DATE: 9/30/2014	JOB NUMBER 1484099.200 FIGURE NO. 2A

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CORE LOCATION PLAN SEGMENT 3 CR 44A FROM CR 439 TO CR 437 EUSTIS, LAKE COUNTY, FLORIDA	DRAWN BY: TJS CHECKED BY: MCD DATE: 9/30/2014	JOB NUMBER 1484099.200 FIGURE NO. 2B

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CORE LOCATION PLAN SEGMENT 4 CR 44A FROM CR 437 TO SR 44 EUSTIS, LAKE COUNTY, FLORIDA	DRAWN BY: TJS CHECKED BY: MCD DATE: 9/30/2014	JOB NUMBER 1484099.200 FIGURE NO. 2C

APPENDIX I

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

PAVEMENT EVALUATION CORING AND CONDITION DATA

Cored by: Central Testing Laboratory, Inc. Date: 9-13 & 9-20-2014 Page 1 of 2 Typical Section No.: 1

W.P.I. No.:	Name: CR 44A		Lanes: R1 & L1
Fin. Proj. ID:	From: CR 44		Shoulder Type and Condition: Grass
F.A. Proj. No.:	To: SR 44		Inside:
County: Lake / SR No.:	Beg MP:	End MP: / Lgth: 10.3 mi	Outside:
Median Curbed (Y / N): N/A Paved Lawn	Other:		Curb & Gutter (Y / N): N

Core No.	Mile Post or Sta. No.	Lane	Wheel Path	Pavement Layer (in.) Top S3	T2	ST	S3	UNKW		Core Lgth (in.)	Base Limerock	Limerock	Crack Depth (in.)	Type	Class	Extent	Pvmt Cond	Rut Depth (in.)	Cross Slope (%)	Comments
1	1.0	R1		2.0	1.5	0.5	1.25*			5.3	7.5		5.3	B	III	Mod	Fair	0.1	1.90	Longitudinal Joint
2	4.0	L1	O	1.9	1.6			2*		5.5	5.0	10.0	3.5	B	II	Severe	Poor	0.1	1.60	On Joint @ 4' from edge
3	5.0	RT		4.5						4.5		15.0	N/A				Good	0.1	1.00	Turn Lane Widening
4	8.0	L1	I	10+						10.0				B	II	Mod	Fair	0.1	7.60	Super Elevated curve
5	11.0	R1		1.9	3.4	0.6				5.9	4.5	10.0	1.5	C	II	Severe	Poor	0.1	1.40	
6	14.0	L1	O	2.0	2.0					4.0		10.0		B	II	Mod	Fair	0.3	1.70	
7	17.0	R1	O	3.7						3.7		11.0		B	II	Mod	Fair	0.3	3.00	
8	23.0	R1	O	2.3	1.0			3.0		6.3	6.0	10.0	3.3	B	II	Mod	Fair	0.3	2.80	2.8% Outside, 1.9% Inside
9	26.0	L1	O	2.1	2.5					4.6		10.0		B	IB	Mod	Fair	0.1	0.70	
10	29.0	R1	I	2.0	1.6		2.5	0.5		6.6	5.0			B	III	Mod	Fair	0.4	2.80	
11	32.0	L1	I	3.6	1.1		2.0	1.3		4.6	5.0				IB	Slight	Good	-	1.00	
12	35.0	R1		2.8	3.1	0.8				6.7	5.5			B	II	Slight	Good	0.1	3.40	3.4%Outside, 2.8% Inside
13	38.0	L1	O	3.6						3.6		11.5			IB	Slight	Good	-	2.00	Widening & Turn Lane
14	41.0	R1	O	3.5	2.6					6.1		11.5		B	II	Slight	Good	0.4	3.40	3.4% Outside, 3.8% Inside
15	46.0	L1	I	2.4	2.8	0.5				5.8	6.0		5.8	B	II	Mod	Fair	0.3	1.30	
16	51.0	R1		1.5	2.8					4.3		11.0		C	III	Mod	Fair	0.1	1.60	
17	56.0	L1	O	3.0	1.3					4.3		10.0		B	II	Slight	Good	0.1	1.70	
18	61.0	R1	O	1.4	1.3					2.7		9.0		C	III	Severe	Poor	0.3	1.30	
19																				

Layer Codes

ARMI	Asphalt Rubber Membrane Interlayer
BIND	Asphalt Binder Course
BRCK	Brick Pavers
CONC	Portland Cement Concrete
CRL	Crack Relief Layer
FAB	Pavement Overlay Fabric
FC	Friction Course
FC1	Friction Course 1
FC2	Friction Course 2
FC3	Friction Course 3
FC4	Friction Course 4
FC5	Friction Course 5
FC6	Friction Course 6
F95	Friction Course 9.5 mm
F125	Friction Course 12.5 mm
S	Type S Asphaltic Concrete
SAHM	Sand Asphalt Hot Mix
SP1C	9.5mm Coarse Graded
SP1F	9.5mm Fine Graded
SP2C	12.5mm Coarse Graded
SP2F	12.5mm Fine Graded

APPENDIX II

Cores 1 -3

Structural Number of Existing Pavement (SNE)
Using Table 6.1 FDOT Flexible Pavement Design Manual

Segment 1 - original roadbed

Mix Type	Thickness	Coefficient	SNE
S 3	2	0.15	0.3
Type II	3.25	0.25	0.8125
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			2.9125

Segment 1 - 4 foot widening

Mix Type	Thickness	Coefficient	SNE
S 3	2	0.15	0.3
Type II	2.5	0.15	0.375
Limerock	10	0.18	1.8
			2.475

Mix Type	Widening Thickness	Coefficient	SND
S 3	2	0.44	0.88
Type II	2.5	0.17	0.425
Limerock	10	0.18	1.8
			3.105

Segment 1 Last Rehabilitation Design

Mix Type	Thickness	Rehabilitation Coefficient	SND
S 3	2	0.44	0.88
Type II	3.25	0.17	0.5525
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.2325

Segment 1 original Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
ARMI	0.75	N/A	N/A
Type II	2.25	0.15	0.3375
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.4575

Segment 1 Widened Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
ARMI	0.75	N/A	N/A
Type II	1.5	0.15	0.225
Limerock	10	0.18	1.8
			3.345

Worst case after milling SNo = 2.025

Mill 3.0 inches
ARMI 3/4 inches
SP 12.5 2 inches
FC 9.5 1 inch

Segment 1 Options

No Mill

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	2	0.15	0.3
Type II	3.25	0.25	0.8125
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			4.0125

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	2	0.15	0.3
Type II	2.5	0.15	0.375
Limerock	10	0.18	1.8
			3.575

1" Mill

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1	0.15	0.15
Type II	3.25	0.25	0.8125
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.8625

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1	0.15	0.15
Type II	2.5	0.15	0.375
Limerock	10	0.18	1.8
			3.425

2" Mill

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
Type II	3.25	0.25	0.8125
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.7125

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
Type II	2.5	0.15	0.375
Limerock	10	0.18	1.8
			3.275

Cores 4 - 7

Structural Number of Existing Pavement (SNE)
Using Table 6.1 FDOT Flexible Pavement Design Manual

Segment 2 original

Mix Type	Thickness	Coefficient	SNE
S 3	1	0.15	0.15
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			2.38

Segment 2 Widened

Mix Type	Thickness	Coefficient	SNE
S 3	1	0.15	0.15
S 3	1	0.25	0.25
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			2.5

Segment 2 Last Rehabilitation Design

Mix Type	Thickness	Rehabilitation Coefficient	SND
S 3	1	0.44	0.44
S 3	1	0.44	0.44
Type II	3	0.17	0.51
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.19

Mix Type	Widening Thickness	Coefficient	SND
S 3	1	0.44	0.44
S 3	1	0.44	0.44
Type II	2	0.17	0.34
Limerock	10	0.18	1.8
			3.02

Segment 2 original Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
ARMI	0.75	N/A	N/A
Type II	2	0.15	0.3
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.42

Segment 2 Widened Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
ARMI	0.75	N/A	N/A
S-1	1	0.15	0.15
Limerock	10	0.18	1.8
			3.27

Worst case after milling SNo = 1.95

Mill 3.0 inches
ARMI 3/4 inches
SP 12.5 2 inches
FC 9.5 1 inch

Segment 2 Options

No Mill

Segment 2 original

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1	0.15	0.15
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.48

Segment 2 Widened

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1	0.15	0.15
S 3	1	0.25	0.25
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			3.6

Mill 1"

Segment 2 original

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.33

Segment 2 Widened

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1	0.25	0.25
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			3.45

Mill 2"

Segment 2 original

Mix Type	Thickness	Coefficient	SNE
FC 12.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.3

Segment 2 Widened

Mix Type	Thickness	Coefficient	SNE
FC 12.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			3.42

Cores 8 - 13

Structural Number of Existing Pavement (SNE)
Using Table 6.1 FDOT Flexible Pavement Design Manual

Segment 3 original

Mix Type	Thickness	Coefficient	SNE
S 3	1.25	0.15	0.1875
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			2.4175

Segment 3 Widened

Mix Type	Thickness	Coefficient	SNE
S 3	1.25	0.15	0.1875
S 3	1	0.25	0.25
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			2.5375

Segment 3 last Rehabilitation Design

Rehabilitation

Mix Type	Thickness	Coefficient	SND
S 3	1.25	0.44	0.55
S 3	1.25	0.44	0.55
Type II	3	0.17	0.51
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.41

Widening

Mix Type	Thickness	Coefficient	SND
S 3	1.25	0.44	0.55
S 3	1.25	0.44	0.55
Type II	2	0.17	0.34
Limerock	10	0.18	1.8
			3.24

Segment 3 original Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
ARMI	0.75	N/A	N/A
Type II	2.75	0.15	0.4125
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.5325

Segment 3 Widened Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
ARMI	0.75	N/A	N/A
Type II	1.75	0.15	0.2625
Limerock	10	0.18	1.8
			3.3825

Worst case after milling SNo = 2.0625

Mill 2.5 inches
ARMI 3/4 inches
SP 12.5 2 inches
FC 9.5 1 inch

Segment 3 Options

No Mill

Segment 3 original

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1.25	0.15	0.1875
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.5175

Segment 3 Widened

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1.25	0.15	0.1875
S 3	1	0.25	0.25
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			3.6375

Mill 1"

Segment 3 original

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1.25	0.25	0.3125
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.3925

Segment 3 Widened

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
S 3	1.25	0.25	0.3125
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			3.5125

Mill 2"

Segment 3 original

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
S 3	0.25	0.25	0.0625
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.3625

Segment 3 Widened

Mix Type	Thickness	Coefficient	SNE
FC 9.5	1	0.44	0.44
SP 12.5	2	0.44	0.88
S 3	0.25	0.25	0.0625
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			3.4825

Cores 14 - 18

Structural Number of Existing Pavement (SNE)
Using Table 6.1 FDOT Flexible Pavement Design Manual

Segment 4 original

Mix Type	Thickness	Coefficient	SNE
S 3	1.5	0.15	0.225
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			2.455

Segment 4 Widened

Mix Type	Thickness	Coefficient	SNE
S 3	1.25	0.15	0.1875
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			2.2875

Segment 4 last Rehabilitation Design

Rehabilitation

Mix Type	Thickness	Coefficient	SND
S 3	1.5	0.44	0.66
Type II	3	0.17	0.51
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			2.97

Widening

Mix Type	Thickness	Coefficient	SND
S 3	1.5	0.44	0.66
Type II	2	0.17	0.34
Limerock	10	0.18	1.8
			2.8

Segment 4 original Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
ARMI	0.75	N/A	N/A
Type II	3.5	0.15	0.525
Limerock	6	0.18	1.08
Subgrade	12	0.06	0.72
			3.425

Segment 4 Widened Rehabilitation Design (SNR)

Mix Type	Thickness	Coefficient	SNR
FC 9.5	1	0.44	0.44
SP 12.5	1.5	0.44	0.66
ARMI	0.75	N/A	N/A
Type II	1.25	0.15	0.1875
Limerock	10	0.18	1.8
			3.0875

Worst case after milling SNo = 1.9875

Mill 2.0 inches
ARMI 3/4 inches
SP 12.5 1.25 inches
FC 9.5 0.75 inch

Segment 4 Options

No Mill

Segment 4 original

Mix Type	Thickness	Coefficient	SNE
FC 12.5	1.5	0.44	0.66
S 3	1.5	0.15	0.225
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			3.115

Segment 4 Widened

Mix Type	Thickness	Coefficient	SNE
FC 12.5	1.5	0.44	0.66
S 3	1.25	0.15	0.1875
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			2.9475

Mill 1"

Segment 4 original

Mix Type	Thickness	Coefficient	SNE
FC 12.5	1.5	0.44	0.66
S 3	0.5	0.15	0.075
S 3	1	0.25	0.25
Type II	3	0.15	0.45
Limerock	4.5	0.18	0.81
Subgrade	12	0.06	0.72
			2.965

Segment 4 Widened

Mix Type	Thickness	Coefficient	SNE
FC 12.5	1.5	0.44	0.66
S 3	0.25	0.15	0.0375
Type II	2	0.15	0.3
Limerock	10	0.18	1.8
			2.7975

APPENDIX III

Segment 1

Existing Pavement current traffic

Year	AADT	T24	DF	LF	E18	ESALs	Comulative ESALs	Remarks
1995	3300	0.07	0.5	1.00	0.96	40471	23126	Assumed
1996	3700	0.07	0.5	1.00	0.96	45377	68503	Assumed
1997	3575	0.07	0.5	1.00	0.96	43844	112347	Actual Data
1998	4453	0.07	0.5	1.00	0.96	54612	166958	Actual Data
1999	4582	0.07	0.5	1.00	0.96	56194	223152	Actual Data
2000	4706	0.07	0.5	1.00	0.96	57714	280866	Actual Data
2001	5276	0.07	0.5	1.00	0.96	64705	345571	Actual Data
2002	5132	0.07	0.5	1.00	0.96	62939	408510	Actual Data
2003	5733	0.07	0.5	1.00	0.96	70310	478819	Actual Data
2004	5814	0.07	0.5	1.00	0.96	71303	550122	Actual Data
2005	5511	0.07	0.5	1.00	0.96	67587	617709	Actual Data
2006	5740	0.07	0.5	1.00	0.96	70395	688105	Actual Data
2007	5735	0.07	0.5	1.00	0.96	70334	758439	Actual Data
2008	5042	0.07	0.5	1.00	0.96	61835	820274	Actual Data
2009	4412	0.07	0.5	1.00	0.96	54109	874383	Actual Data
2010	4758	0.07	0.5	1.00	0.96	58352	932735	Actual Data
2011	4641	0.07	0.5	1.00	0.96	56917	989652	Actual Data
2012	4537	0.07	0.5	1.00	0.96	55642	1045294	Actual Data
2013	4731	0.07	0.5	1.00	0.96	58021	1103315	Actual Data
2014	4849	0.07	0.5	1.00	0.96	59472	1162786	Projected
2015	4971	0.07	0.5	1.00	0.96	60958	1223744	Projected

Projected Traffic

Year	AADT	T24	DF	LF	E18	ESALS	Comulative ESALs	Remarks
2013	4731	0.07	0.5	1	0.96	54705	54705	Actual Data
2014	4849	0.07	0.5	1	0.96	56073	110779	Projected
2015	4971	0.07	0.5	1	0.96	57475	168254	Projected
2016	5095	0.07	0.5	1	0.96	58912	227165	Projected
2017	5222	0.07	0.5	1	0.96	60385	287550	Projected
2018	5353	0.07	0.5	1	0.96	61894	349444	Projected
2019	5487	0.07	0.5	1	0.96	63442	412886	Projected
2020	5624	0.07	0.5	1	0.96	65028	477914	Projected
2021	5764	0.07	0.5	1	0.96	66653	544567	Projected
2022	5908	0.07	0.5	1	0.96	68320	612887	Projected
2023	6056	0.07	0.5	1	0.96	70028	682914	Projected
2024	6207	0.07	0.5	1	0.96	71778	754693	Projected
2025	6363	0.07	0.5	1	0.96	73573	828265	Projected
2026	6522	0.07	0.5	1	0.96	75412	903678	Projected
2027	6685	0.07	0.5	1	0.96	77297	980975	Projected
2028	6852	0.07	0.5	1	0.96	79230	1060205	Projected
2029	7023	0.07	0.5	1	0.96	81211	1141415	Projected
2030	7199	0.07	0.5	1	0.96	83241	1224656	Projected
2031	7379	0.07	0.5	1	0.96	85322	1309978	Projected
2032	7563	0.07	0.5	1	0.96	87455	1397433	Projected
2033	7752	0.07	0.5	1	0.96	89641	1487075	Projected

Segment 2

Existing Pavement current traffic

Year	AADT	T24	DF	LF	E18	ESALs	Comulative ESALs	Remarks
1995	4739	0.07	0.5	1.00	0.96	58124	58124	Assumed
1996	4812	0.07	0.5	1.00	0.96	59009	117133	Assumed
1997	4885	0.07	0.5	1.00	0.96	59908	177042	Assumed
1998	4959	0.07	0.5	1.00	0.96	60820	237862	Assumed
1999	5035	0.07	0.5	1.00	0.96	61747	299609	Assumed
2000	5111	0.07	0.5	1.00	0.96	62687	362296	Assumed
2001	5189	0.07	0.5	1.00	0.96	63642	425937	Assumed
2002	5268	0.07	0.5	1.00	0.96	64611	490548	Assumed
2003	5349	0.07	0.5	1.00	0.96	65595	556142	Assumed
2004	5430	0.07	0.5	1.00	0.96	66594	622736	Actual Data
2005	5094	0.07	0.5	1.00	0.96	62473	685209	Actual Data
2006	4988	0.07	0.5	1.00	0.96	61173	746382	Actual Data
2007	5267	0.07	0.5	1.00	0.96	64594	810976	Actual Data
2008	4630	0.07	0.5	1.00	0.96	56782	867758	Actual Data
2009	4117	0.07	0.5	1.00	0.96	50491	918249	Actual Data
2010	4429	0.07	0.5	1.00	0.96	54317	972566	Actual Data
2011	3814	0.07	0.5	1.00	0.96	46775	1019341	Actual Data
2012	4513	0.07	0.5	1.00	0.96	55347	1074689	Actual Data
2013	3441	0.07	0.5	1.00	0.96	42200	1116889	Actual Data
2014	3493	0.07	0.5	1.00	0.96	42833	1159723	Projected
2015	3545	0.07	0.5	1.00	0.96	43476	1203199	Projected

Projected Traffic

Year	AADT	T24	DF	LF	E18	ESALS	Comulative ESALS	Remarks
2013	4114	0.07	0.5	1	0.96	50454	50454	Actual Data
2014	4217	0.07	0.5	1	0.96	51715	102170	Projected
2015	4322	0.07	0.5	1	0.96	53008	155178	Projected
2016	4430	0.07	0.5	1	0.96	54334	209511	Projected
2017	4541	0.07	0.5	1	0.96	55692	265203	Projected
2018	4655	0.07	0.5	1	0.96	57084	322287	Projected
2019	4771	0.07	0.5	1	0.96	58511	380799	Projected
2020	4890	0.07	0.5	1	0.96	59974	440773	Projected
2021	5013	0.07	0.5	1	0.96	61473	502246	Projected
2022	5138	0.07	0.5	1	0.96	63010	565256	Projected
2023	5266	0.07	0.5	1	0.96	64586	629842	Projected
2024	5398	0.07	0.5	1	0.96	66200	696042	Projected
2025	5533	0.07	0.5	1	0.96	67855	763897	Projected
2026	5671	0.07	0.5	1	0.96	69552	833449	Projected
2027	5813	0.07	0.5	1	0.96	71290	904739	Projected
2028	5958	0.07	0.5	1	0.96	73073	977812	Projected
2029	6107	0.07	0.5	1	0.96	74899	1052711	Projected
2030	6260	0.07	0.5	1	0.96	76772	1129483	Projected
2031	6416	0.07	0.5	1	0.96	78691	1208174	Projected
2032	6577	0.07	0.5	1	0.96	80658	1288833	Projected
2033	6741	0.07	0.5	1	0.96	82675	1371508	Projected

Segment 3

Existing Pavement current traffic

Year	AADT	T24	DF	LF	E18	ESALS	Cumulative ESALS	Remarks
1995	4393	0.07	0.5	1	0.96	53880	53880	Assumed
1996	4460	0.07	0.5	1	0.96	54701	108581	Assumed
1997	4528	0.07	0.5	1	0.96	55534	164115	Assumed
1998	4597	0.07	0.5	1	0.96	56380	220494	Assumed
1999	4667	0.07	0.5	1	0.96	57238	277732	Assumed
2000	4738	0.07	0.5	1	0.96	58110	335842	Assumed
2001	4810	0.07	0.5	1	0.96	58995	394837	Assumed
2002	4884	0.07	0.5	1	0.96	59893	454730	Assumed
2003	4958	0.07	0.5	1	0.96	60805	515535	Assumed
2004	5034	0.07	0.5	1	0.96	61731	577266	Assumed
2005	5110	0.07	0.5	1	0.96	62671	639937	Assumed
2006	5188	0.07	0.5	1	0.96	63626	703563	Assumed
2007	5267	0.07	0.5	1	0.96	64594	768157	Actual Data
2008	4630	0.07	0.5	1	0.96	56782	824940	Actual Data
2009	4117	0.07	0.5	1	0.96	50491	875431	Actual Data
2010	4429	0.07	0.5	1	0.96	54317	929748	Actual Data
2011	3814	0.07	0.5	1	0.96	46775	976523	Actual Data
2012	4513	0.07	0.5	1	0.96	55347	1031870	Actual Data
2013	3441	0.07	0.5	1	0.96	42200	1074071	Actual Data
2014	3493	0.07	0.5	1	0.96	42833	1116904	Projected
2015	3545	0.07	0.5	1	0.96	43476	1160380	Projected

Projected Traffic

Year	AADT	T24	DF	LF	E18	ESALS	Cumulative ESALS	Remarks
2013	3441	0.07	0.5	1	0.96	42200	42200	Actual Data
2014	3527	0.07	0.5	1	0.96	43255	85456	Projected
2015	3615	0.07	0.5	1	0.96	44337	129793	Projected
2016	3706	0.07	0.5	1	0.96	45445	175238	Projected
2017	3798	0.07	0.5	1	0.96	46581	221819	Projected
2018	3893	0.07	0.5	1	0.96	47746	269565	Projected
2019	3991	0.07	0.5	1	0.96	48940	318505	Projected
2020	4090	0.07	0.5	1	0.96	50163	368668	Projected
2021	4193	0.07	0.5	1	0.96	51417	420085	Projected
2022	4297	0.07	0.5	1	0.96	52703	472787	Projected
2023	4405	0.07	0.5	1	0.96	54020	526808	Projected
2024	4515	0.07	0.5	1	0.96	55371	582178	Projected
2025	4628	0.07	0.5	1	0.96	56755	638933	Projected
2026	4743	0.07	0.5	1	0.96	58174	697107	Projected
2027	4862	0.07	0.5	1	0.96	59628	756735	Projected
2028	4984	0.07	0.5	1	0.96	61119	817854	Projected
2029	5108	0.07	0.5	1	0.96	62647	880500	Projected
2030	5236	0.07	0.5	1	0.96	64213	944713	Projected
2031	5367	0.07	0.5	1	0.96	65818	1010532	Projected
2032	5501	0.07	0.5	1	0.96	67464	1077995	Projected
2033	5638	0.07	0.5	1	0.96	69150	1147146	Projected

Segment 4

Existing Pavement current traffic

Year	AADT	T24	DF	LF	E18	ESALS	Cumulative ESALS	Remarks
1988	958	0.10	0.5	1	0.96	16790	16790	Assumed
1989	973	0.10	0.5	1	0.96	17046	33836	Assumed
1990	988	0.10	0.5	1	0.96	17306	51142	Assumed
1991	1003	0.10	0.5	1	0.96	17569	68711	Assumed
1992	1018	0.10	0.5	1	0.96	17837	86548	Assumed
1993	1034	0.10	0.5	1	0.96	18108	104656	Assumed
1994	1049	0.10	0.5	1	0.96	18384	123041	Assumed
1995	1065	0.10	0.5	1	0.96	18664	141705	Assumed
1996	1082	0.10	0.5	1	0.96	18948	160653	Assumed
1997	1098	0.10	0.5	1	0.96	19237	179890	Actual Data
1998	1319	0.10	0.5	1	0.96	23109	202999	Actual Data
1999	1200	0.10	0.5	1	0.96	21024	224023	Actual Data
2000	1251	0.10	0.5	1	0.96	21918	245941	Actual Data
2001	1471	0.10	0.5	1	0.96	25772	271713	Actual Data
2002	1331	0.10	0.5	1	0.96	23319	295032	Actual Data
2003	1584	0.10	0.5	1	0.96	27752	322783	Actual Data
2004	1690	0.10	0.5	1	0.96	29609	352392	Actual Data
2005	1450	0.10	0.5	1	0.96	25404	377796	Actual Data
2006	1569	0.10	0.5	1	0.96	27489	405285	Actual Data
2007	1669	0.10	0.5	1	0.96	29241	434526	Actual Data
2008	1336	0.10	0.5	1	0.96	23407	457933	Actual Data
2009	1167	0.10	0.5	1	0.96	20446	478378	Actual Data
2010	1164	0.10	0.5	1	0.96	20393	498772	Actual Data
2011	1216	0.10	0.5	1	0.96	21304	520076	Actual Data
2012	1256	0.10	0.5	1	0.96	22005	542081	Actual Data
2013	1275	0.10	0.5	1	0.96	22335	564416	Actual Data

Projected Traffic

Year	AADT	T24	DF	LF	E18	ESALS	Cumulative ESALS	Remarks
2013	1090	0.10	0.5	1	0.96	19097	19097	Actual Data
2014	1117	0.10	0.5	1	0.96	19574	38671	Projected
2015	1145	0.10	0.5	1	0.96	20064	58735	Projected
2016	1174	0.10	0.5	1	0.96	20565	79300	Projected
2017	1203	0.10	0.5	1	0.96	21079	100379	Projected
2018	1233	0.10	0.5	1	0.96	21606	121985	Projected
2019	1264	0.10	0.5	1	0.96	22146	144132	Projected
2020	1296	0.10	0.5	1	0.96	22700	166832	Projected
2021	1328	0.10	0.5	1	0.96	23268	190099	Projected
2022	1361	0.10	0.5	1	0.96	23849	213949	Projected
2023	1395	0.10	0.5	1	0.96	24446	238394	Projected
2024	1430	0.10	0.5	1	0.96	25057	263451	Projected
2025	1466	0.10	0.5	1	0.96	25683	289134	Projected
2026	1503	0.10	0.5	1	0.96	26325	315459	Projected
2027	1540	0.10	0.5	1	0.96	26983	342442	Projected
2028	1579	0.10	0.5	1	0.96	27658	370100	Projected
2029	1618	0.10	0.5	1	0.96	28349	398450	Projected
2030	1659	0.10	0.5	1	0.96	29058	427508	Projected
2031	1700	0.10	0.5	1	0.96	29784	457292	Projected
2032	1743	0.10	0.5	1	0.96	30529	487821	Projected
2033	1786	0.10	0.5	1	0.96	31292	519114	Projected