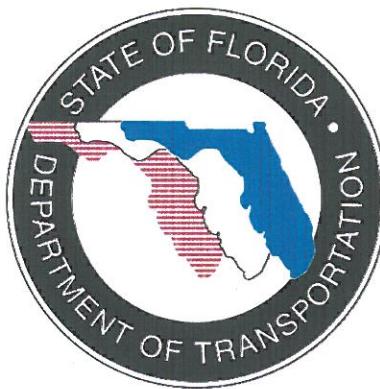


PAVEMENT SURVEY AND EVALUATION REPORT

FINANCIAL PROJECT NUMBER: 429079-1



STATE ROAD 400 (I-4)

SECTION NUMBER: 75280; MP 0.000 to MP 1.740
From Osceola County Line to East of SR 536

ORANGE COUNTY

October 3, 2012

PREPARED BY:



William A. Wall
Pavement Rehabilitation Specialist

APPROVED BY:



Rafael M. Rodriguez, PE
District Materials Office
PE Number 68482

EXECUTIVE SUMMARY

FPN 429079-1; SR 400 (I-4)
Section # 75280; MP 0.000 – 1.740

REHABILITATION RECOMMENDATIONS

Eastbound Mainline Lanes (R1, R2, R4):

We recommend that 2.75 inches of milling be performed to provide long-term pavement preservation of the existing pavement. This will remove the majority of all cracks and friction course raveling.

Eastbound Mainline Lane (R3):

We recommend that 3.25 inches of milling be performed to provide long-term pavement preservation of the existing pavement. This will remove all cracks and friction course raveling.

Westbound Mainline Lanes (L1, L2, L3, and L4):

We recommend that 2.75 inches of milling be performed to provide long-term pavement preservation of the existing pavement. This will remove all cracks and friction course raveling.

Inside and Outside Paved Shoulders (IL, IR, OL and OR):

We recommend that 2.00 inches of milling be performed to replace degraded structural course and provide long-term pavement preservation of the existing shoulders.

All Ramps and Connectors:

We recommend a minimal milling scheme of 2.25 inches for the ramps and their connectors and 1.5 inches of milling for the paved shoulders at each ramp. This will remove deteriorated and oxidized pavement.

PAVEMENT SURVEY AND EVALUATION REPORT

STATE ROAD 400 (I-4) From Osceola County Line to East of SR 536

INTRODUCTION

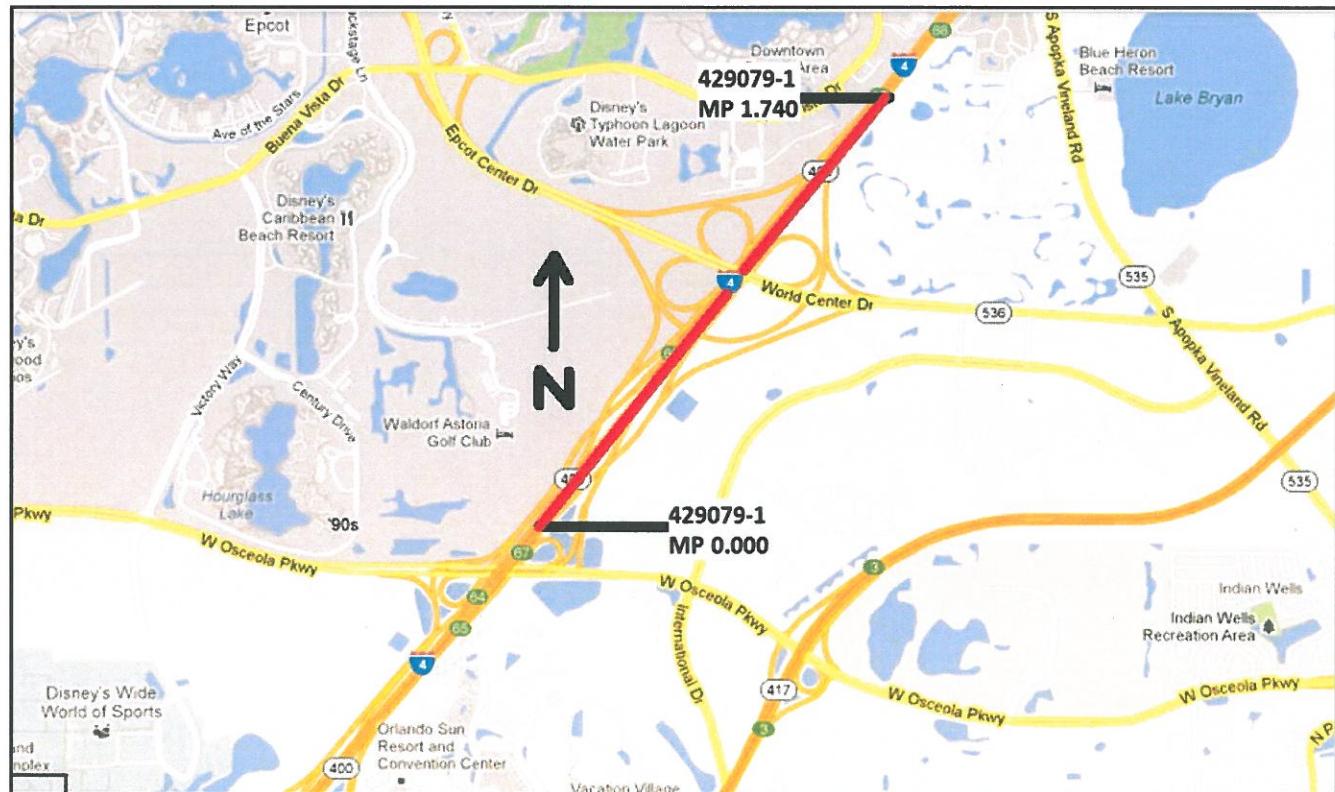
This report presents an analysis of information collected during the above-referenced Pavement Survey and Evaluation (PSE) report. The proposed resurfacing project starts at the Osceola County Line (MP 0.000) in Orange County across and continues northeast to east of the interchange of I-4 with SR 536 (MP 1.740). This project involves resurfacing of the mainline lanes and paved shoulders of I-4 along with select access ramps.

State Project Number 75280-3482 (Financial Project Number 242443-1-52-01): This project was from MP 0.000 to MP 14.808, and consisted of resurfacing the travel lanes and shoulders of eastbound I-4 only. This project was accepted on December 5, 1991.

In preparing this report we could not find any history by Roadway Characteristics Inventory (RCI), Pavement Condition Survey (PCS) or our archives of the last resurfacing of the westbound lanes from MP 0.000 to MP 1.740. A graph from the PCS survey on this segment of section 75280 shows a sharp increase in pavement condition indicative of resurfacing occurring in 2001.

There is also a project underway to add lanes to I-4 from the Osceola County Line (MP 0.000) to west of SR 528 (MP 5.650). Financial Project Number 242484-8 is currently in preliminary design phase and is not funded for construction. The current Project Manager for this project is Beata Stys-Palasz.

LOCATION MAP



CORING INFORMATION

Ardaman and Associates, Inc. performed coring at an interval of approximately two per lane mile on each travel lane, and two per lane mile for the inside and outside shoulders. Cores were not taken in the L2/R2 middle lanes due to safety and traffic concerns. The ramps selected for resurfacing each had one core taken from the ramp and one from its shoulder. Additional cores were taken where conditions warranted. The signed and sealed pavement core sheets (dated September 18, 2012) are included in the Appendix. A total of 55 core samples (18 mainline lanes 15 from inside/outside paved shoulders, 11 from ramps and 11 from ramp shoulders) were collected from the subject roadway.

The core photo directory is included in the Appendix for further review. The following tables show the types of material, average material thickness, layer thickness ranges, and total average pavement thickness along with a min-max range for the different sections of the subject roadway.

- Of the 18 cores taken from the mainline lanes, all (100%) were cracked. They were cracked to an average depth of 0.6 inches, with a range of 0.3 to 2.0 inches.
- Of the 15 cores taken from inside/outside paved shoulders, 1 core (7%) was cracked full depth to the base.
- Of the 11 cores taken from the ramps, all (100%) were cracked. They were cracked an average of 0.5 inches, with a range of 0.2 to 0.8 inches.
- Of the 11 cores taken from the ramp shoulders, 2 cores (18%) were cracked. One core was cracked full depth to the base. The other core was cracked 0.3 inches in depth.

SECTION 75280: SR400 (I-4) Inside Passing and Middle Travel Lanes (R1, R2, L1, L2) MP 0.000 to MP 1.740		
Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
FC-5	0.7	0.5 to 0.9
Type S	2.5	1.7 to 4.1
ARMI Layer	0.4	0.2 to 0.5
Type S (Older)	3.0	1.6 to 4.3
Type I	5.1	4.0 to 6.0
Binder Course	1.8	1.5 to 2.0
Limerock Base	11.6	10.0 to 14.7
Pavement Thickness:	12.0	8.8 to 14.3

Notes:

- 1) ARMI is an acronym for Asphalt Rubber Membrane Interlayer
- 2) Core #17 (MP 1.388/R1) does not have an ARMI layer or Type I in its composition.
- 3) Core #30 (MP 1.480/L1) does not have an ARMI layer or older Type S in its composition.

SECTION 75280: SR400 (I-4) Outside Travel Lanes (L3 and R3)
MP 0.000 to MP 1.240

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
FC-5	0.7	0.5 to 1.0
Type S	1.5	1.0 to 1.9
ARMI Layer	0.7	0.5 to 0.8
Type S (Older)	3.0	1.0 to 5.9
Type I	2.7	2.2 to 3.1
Limerock Base	10.2	10.0 to 10.3
Pavement Thickness:	7.4	6.7 to 9.2

Notes:

- 4) ARMI is an acronym for Asphalt Rubber Membrane Interlayer
- 5) Cores #1 (MP 0.260/R3) and #20 (MP 0.280/L3) does not have a bottom layer of Type I in their compositions.

SECTION 75280: SR400 (I-4) Outside Travel Lanes (L3 and R3)
MP 1.240 to MP 1.740

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
FC-5	0.7	0.5 to 0.8
Type S	6.9	5.2 to 8.0
Limerock Base	10.1	10.1 to 10.1
Pavement Thickness:	7.6	6.0 to 8.8

SECTION 75280: SR400 (I-4) Auxiliary Lanes (L4 and R4)
Eastbound: MP 0.574 to MP 1.029 & MP 1.659 to MP 1.740
Westbound: MP 0.000 to MP 0.208 & MP 0.778 to MP 1.183

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
FC-5	0.9	0.7 to 1.0
Type S	1.9	1.8 to 2.0
Asphalt Base Course	9.1	8.9 to 9.5
Pavement Thickness:	21.0	20.5 to 21.5

SECTION 75280: SR400 (I-4) Outside Paved Shoulders (OL and OR)
MP 0.000 to MP 1.740

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
Type S	1.7	1.3 to 2.4
Asphalt Base Course	4.3	3.7 to 4.6
Pavement Thickness:	5.8	5.2 to 6.2

Exception:

- 6) Core #21 (MP 0.650/OL) has an asphalt base course thickness of 8.5 inches. It is an outlier.

Notes:

- 7) Cores #32 (MP 1.620/OL), #2 (MP 0.263/OR), and #15 (MP 1.328/OR) has Limerock Base instead of Asphalt Base Course.

SECTION 75280: SR400 (I-4) Inside Paved Shoulders (IL and IR)
MP 0.000 to MP 1.740

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
Type S	2.4	1.5 to 3.3
Type I	2.2	1.3 to 4.7
Limerock Base	9.7	8.9 to 10.2
Pavement Thickness:	4.7	3.3 to 7.5

SECTION 75280: SR400 (I-4) Ramp Mainline
75039-008 From I-4 Eastbound to SR 536 Westbound
75039-001 From SR 536 Eastbound to I-4 Eastbound
75039-004 From Ramp 75280-127 to SR 536 Westbound
75280-127 I-4 Westbound Collector Ramp
92130-017 From the Osceola Parkway to I-4 Eastbound
92130-019 From I-4 Westbound to the Osceola Parkway

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
FC-5	0.8	0.6 to 1.0
Type S	3.8	1.8 to 5.4
Limerock Base	9.7	8.1 to 10.4
Pavement Thickness:	4.6	3.3 to 6.0

Notes:

- 8) Core #48 (7206 feet from Gore #1 on Ramp 75280-127) has Asphalt Base Course instead of Limerock Base.
- 9) Core #50 (1056 feet from MP 0.000 on Ramp 92130-107) has Asphalt Base Course instead of Limerock Base.

SECTION 75280: SR400 (I-4) Ramp Outside Paved Shoulders
75039-008 From I-4 Eastbound to SR 536 Westbound
75039-001 From SR 536 Eastbound to I-4 Eastbound
75039-004 From Ramp 75280-127 to SR 536 Westbound
75280-127 I-4 Westbound Collector Ramp
92130-017 From the Osceola Parkway to I-4 Eastbound
92130-019 From I-4 Westbound to the Osceola Parkway

Type of Material (by layer)	Avg. Layer Thickness (in.)	Layer Thickness Range (in.)
Type S	1.8	1.2 to 2.6
Limerock Base	7.7	7.1 to 8.5
Pavement Thickness:	1.8	1.2 to 2.6

Notes:

- 10) Core #49 (7212 feet from Gore #1 on Ramp 75280-127) has Asphalt Base Course instead of Limerock Base.
- 11) Core #51 (1062 feet from MP 0.000 on Ramp 92130-107) has Asphalt Base Course instead of Limerock Base.
- 12) Core #45 (2160 feet from Gore #1 on Ramp 75280-127) has an FC-5 friction course.

ROADWAY SURFACE CONDITION

A roadway surface condition survey was performed initially on July 17, 2012. The follow-up survey was done on July 30, 2012.

SEGMENT: Eastbound Lanes

The eastbound mainline lanes are in fair to poor condition. The inside R1 passing and R2 middle lanes are in fair condition with shallow open-graded friction course cracking, and minor raveling. The R3 travel lane is in poor condition. There is moderate pop-outs of the coarse aggregates within the friction course, and some raveling in the wheelpaths. The cracking observed is mostly shallow (under one inch) Class I branch cracking in the wheelpaths. There are also two moderate to severe longitudinal Class II/III cracks at the pavement joints between the R2 to R3 lane, and from the R3 lane to the R4 lane. The R4 auxiliary lane is in fair condition, with pavement distresses similar to the R1 and R2 lanes.

SEGMENT: Westbound Lanes

The westbound mainline lanes are in fair condition. All lanes (L1, L2, L3, and L4) have mostly shallow (less than one inch) Class I branch cracking of the open-graded friction course in the wheelpaths. There were no significant locations of rippling or raveling of the friction course. There is light longitudinal cracking in the pavement joints between all mainline lanes.

From MP 0.000 to MP 0.208 there is a pavement change that appears to be an overlap from recent resurfacing done on I-4 in Osceola County. It is across all mainline lanes and paved shoulders. This should not be considered an exception to rehabilitation.

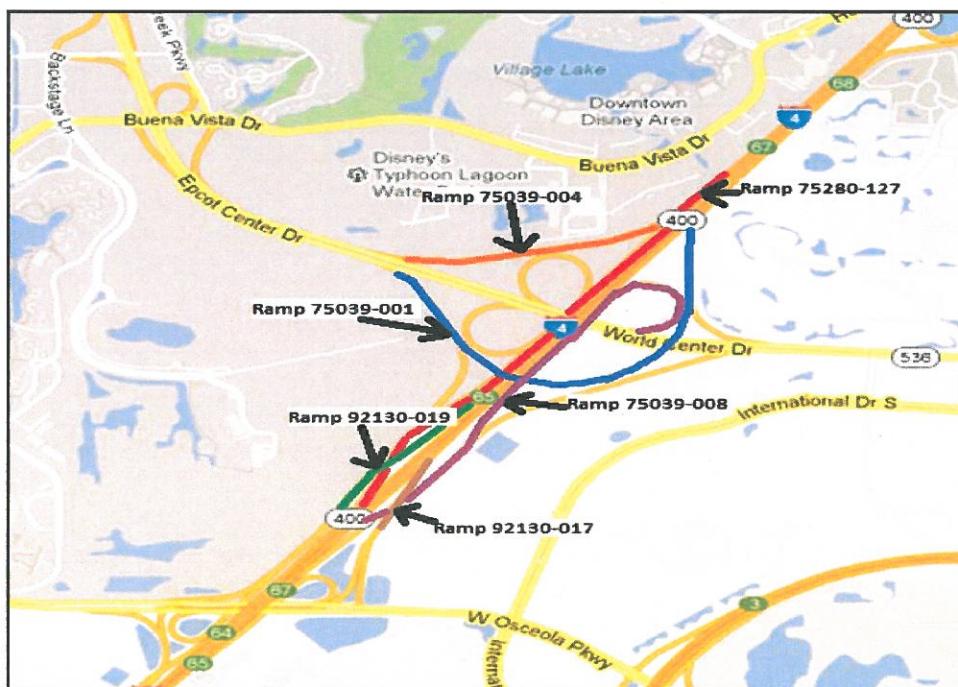
SEGMENT: Inside and Outside Paved Shoulders

The inside paved shoulders are in fair condition with few distresses. The inside shoulders have a negative cross-slope draining inward towards the center grass median.

The outside paved shoulders within the project limits are in fair condition with isolated branch cracking, minor rippling, and deteriorated Type S structural asphalt. There are two locations where the shoulders are overlaid with a coarse aggregate chip seal. It is from MP 0.049 to MP 0.499 on the eastbound shoulders, and from MP 0.443 to MP 0.658 on the westbound shoulders. The chip seal has severely raveled, its appearance is making the shoulders look to be in worse condition than they really are.

SEGMENT: Ramps and Collector Lanes

DIAGRAM OF RAMP LOCATIONS



The following ramps have been selected for rehabilitation:

75039-008 From I-4 Eastbound to SR 536 Westbound
75039-001 From SR 536 Eastbound to I-4 Eastbound
75039-004 From Ramp 75280-127 to SR 536 Westbound
75280-127 I-4 Westbound Collector Ramp
92130-017 From the Osceola Parkway to I-4 Eastbound
92130-019 From I-4 Westbound to the Osceola Parkway

The ramps that are to be resurfaced for this project are in fair condition. There is minor Class I surface cracking of the open-graded friction course along with minor rippling in the center of the ramp lanes. There are locations of isolated pop-out raveling of the friction course that is beginning to occur. This is expected to worsen over time between now and the time of resurfacing. The paved shoulders on these ramps are in fair condition with minimal cracking or other pavement distress.

SEGMENT: Curb and Gutter

The curb and gutter on this project are found at all ramp locations on the outside shoulders. They are in fair condition and fit flush to the shoulder pavement with no asphalt overlay or debris in the gutter.

CROSS SLOPE AND RUT DEPTH DATA

Cross slope and rut depth data were collected on the mainline lanes with the use of State Materials Office's Multi-Purpose Survey Vehicle (MPSV). This vehicle uses laser sensors, which are specifically positioned across the width of the test vehicle to measure the cross-slope and rutting. Rut depths and tangent cross slope information for the subject roadway are summarized as follows:

RUTTING:

MP 0.000 to MP 1.740								
Rut	L4	L3	L2	L1	R1	R2	R3	R4
Average (inches)	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Std. Deviation	0.07	0.06	0.05	0.05	0.05	0.06	0.08	0.07
Range (inches)	0.1 to 0.2	0.0 to 0.3	0.0 to 0.3	0.0 to 0.2	0.0 to 0.2	0.0 to 0.4	0.0 to 0.4	0.0 to 0.1

Note: Physical coring data used for rut calculations for the L4 and R4 lanes. MPSV data was only used for the mainline travel lanes.

CROSS-SLOPE:

The pavement along this project is a six lane standard profile and auxiliary lanes, with the crown in the median. The alignment for SR 400/I-4 within the project is tangent with no curves.

MP 0.000 to MP 1.740 Westbound	
Tangent	OL
Average	5.5
Std. Deviation	0.95
Range	4.4 to 6.7
L4	3.7
L3	2.9
L2	2.3
L1	1.8
IL	-4.5
0.28	0.27
0.51	0.27
1.6 to 3.6	0.2 to 3.2
0.5 to 2.6	0.5 to 2.6
-4.0 to -4.8	-4.0 to -4.8

MP 0.000 to MP 1.740 Eastbound	
Tangent	IR
Average	-4.6
Std. Deviation	0.28
Range	-4.4 to -4.8
R1	1.8
R2	2.4
R3	2.9
R4	3.7
OR	5.3
0.27	0.32
0.50	0.28
0.5 to 3.5	1.7 to 3.9
1.0 to 2.7	3.5 to 3.9
2.8 to 7.9	2.10

Note: Physical coring data used for cross-slope calculations for the L4 and R4 lanes and paved shoulders. MPSV data was used for the mainline travel lanes.

Rut and cross-slope data for each ramp to be resurfaced can be found in the Pavement Evaluation Core Data (PECD) sheets found in the Appendix.

The Designer should plan for additional survey in areas of suspected cross slope irregularities, especially in areas with extreme low or high cross-slope values, to verify the data provided by the MPSV. Rut depth and cross slope information for all individual core locations are provided in the “Pavement Evaluation and Condition Data” sheets in the Appendix. In addition, the MPSV data is available in the Appendix for review

RESILIENT MODULUS

The State Materials Office performed Falling Weight Deflection (FWD) testing for the entire length of the project. A copy of the report (dated April 25, 2012) along with the plot graph(s) is included in the Appendix.

MP 0.000-1.000 Eastbound: Recommended Resilient Modulus of 29,000 psi (200 MPa).

MP 0.000-1.000 Westbound: Recommended Resilient Modulus of 20,000 psi (138 MPa).

MP 1.000-1.740 Eastbound/Westbound: Recommended Resilient Modulus of 15,000 psi (103 MPa).

We recommend for the purposes of simplicity that the lowest resilient modulus of 15,000 psi (103 MPa) be used for all pavement designs for this project.

PAVEMENT PERFORMANCE DISCUSSION

Because of a lack of previous resurfacing project information within the length of this project, especially the westbound lanes, a pavement performance discussion could not be performed.

Currently, there is a borderline crack rating of 6.5 for the eastbound lanes according to the 2012 Pavement Condition Survey. The Pavement Condition Survey ratings are in the Appendix for review.

REHABILITATION RECOMMENDATIONS

Eastbound Mainline Lanes (R1, R2, R4):

We recommend that 2.75 inches of milling be performed to provide long-term pavement preservation of the existing pavement. This will remove the majority of all cracks and friction course raveling.

Eastbound Mainline Lane (R3):

We recommend that 3.25 inches of milling be performed to provide long-term pavement preservation of the existing pavement. This will remove all cracks and friction course raveling.

Westbound Mainline Lanes (L1, L2, L3, and L4):

We recommend that 2.75 inches of milling be performed to provide long-term pavement preservation of the existing pavement. This will remove all cracks and friction course raveling.

Inside and Outside Paved Shoulders (IL, IR, OL and OR):

We recommend that 2.00 inches of milling be performed to replace degraded structural course and provide long-term pavement preservation of the existing shoulders.

All Ramps and Connectors:

We recommend a minimal milling scheme of 2.25 inches for the ramps and their connectors and 1.5 inches of milling for the paved shoulders at each ramp. This will remove deteriorated and oxidized pavement.

APPENDIX

- i) Notations for Identifying Lane Types
- ii) Pavement Evaluation & Condition Data (PECD) Sheets
(Dated September 18, 2012) coring by Ardaman and Associates, Inc.
- iii) Falling Weight Deflection Test Results
(Resilient Modulus Recommendation) dated April 25, 2012
- iv) Ground Penetrating Radar (GPR) and Multi-Purpose Survey Vehicle (MPSV)
Thickness, Cross-Slope, and Rut Data (Including Cross-Slope Graphs)
- v) Pavement Condition Survey Charts
- vi) Core Photo Directory
- vii) Typical Roadway Survey Photographs

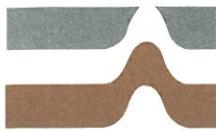
Notations for Identifying Lane Type

6-Lane Sections with Grass Median

OL	Westbound Outside Paved Shoulder
L4	Westbound Auxiliary Lane
L3	Westbound Outside Lane
L2	Westbound Middle Lane
L1	Westbound Inside Lane
IL	Westbound Inside Paved Shoulder Grass Median
IR	Eastbound Inside Paved Shoulder
R1	Eastbound Inside Lane
R2	Eastbound Middle Lane
R3	Eastbound Outside Lane
R4	Eastbound Auxiliary Lane
OR	Eastbound Outside Paved Shoulder

Ramps To Be Resurfaced

- 75039-008: From I-4 Eastbound to SR 536 Westbound
- 75039-001: From SR 536 Eastbound to I-4 Eastbound
- 75039-004: From Ramp 75280-127 to SR 536 Westbound
- 75280-127: I-4 Westbound Collector Ramp
- 92130-017: From the Osceola Parkway to I-4 Eastbound
- 92130-019: From I-4 Westbound to the Osceola Parkway



Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

September 18, 2012
File No. 12-5897

Florida Department of Transportation
1650 N. Kepler Road
DeLand, Florida 32724

Attention: Mr. Tim Keefe

Subject: Final Pavement Evaluation and Condition Data Report
SR 400 (I-4) from Osceola County Line to East of SR 536
MP 0.000 to MP 1.740
Seminole County, Florida
FPN: 429079-1
Section No.: 75280
Contract No. C8S59

Dear Mr. Keefe,

As requested, we have obtained pavement core and other relative information for the subject project. Our scope of work was conducted in accordance with your request for proposal issued, May 2, 2012.

The pavement core data is presented on the attached Pavement Evaluation and Condition Data (PECD) Sheets 1 through 4. We have also included a CD containing the PECD excel file and roadway and core photographs. To the best of our knowledge, the information presented is accurate and represents the existing pavement conditions at the locations cored. The cores have been retained in storage awaiting instructions from FDOT concerning their disposal.

Please contact us if you have any questions or need any additional information.

Very truly yours,
ARDAMAN AND ASSOCIATES, INC.
Certificate of Authorization No. 5950

Jason M. Parker, P.E.
Senior Project Engineer
Florida License No. 65928
JMP/ksb
12-5896 FPN 429079-1



State of Florida Department of Transportation
PAVEMENT EVALUATION AND CONDITION DATA SHEET

Project No.:	429079-1	Cored By:	Ardaman	Date:	5/22/2012	Page No.:	1 of 4														
County:	Orange	Highway Sect. No.:	75280	From:	Osceola County Line	To:	East of SR 536														
Road No.:	SR 400 (I-4)	Begin MP:	0.000	End MP:	1.740	Length:	1.74														
Core No.	MP	Distance from left edge of lane (ft.)	Lane	Wheel Path	Base	Crack	Comments														
				FC-S	Type-S	ARM	Type-I	Binder	ABC	Core Length (in)	Type	Thickness (in)	Depth (in)	Type	Class	Extent	Pav. Cond.	Rut Depth (in)	Cross Slope (%)		
1	0.260	3.5	R3	X	0.8	1.9	0.6	5.9		9.2	LR	10.3	0.5	OGFC	I	L	F	0.2	2.8	Split Core at 4.0"	
2	0.263	3.0	OR		1.5					1.5	LR	9.8	B	BR	I	L	F	---	2.8		
3	0.385	4.0	IR		3.3		1.4			4.7	LR	9.5	---	---	---	---	F	---	-4.8		
4	0.385	1.0	R1	0.5	2.0	0.5	2.5	5.0	2.0	12.5	LR	12.0	0.8	OGFC	I	L	F	0.2	2.0		
5	0.456	10.0	R3	X	0.5	1.5	0.7	1.3	2.8	6.8	LR	10.3	2.0	BR	III	L	F	0.2	3.1		
6	0.456	5.0	OR		1.5					4.5	10.5	ABC	4.5	---	---	---	---	F	---	3.6	
7	0.650	2.5	R4	X	1.0	2.0				9.0	21.0	ABC	9.0	0.3	OGFC	I	L	F	0.1	3.9	Split Core at 6.0"
8	0.650	5.0	OR		1.3					4.6	8.3	ABC	2.4	---	---	---	---	F	---	7.9	
9	0.876	1.5	R4	0.7	2.0					8.9	18.0	ABC	6.4	0.4	OGFC	I	L	F	0.0	3.5	Split Core at 7.0"
10	0.876	4.0	OR		1.5					3.7	7.1	ABC	1.9	---	---	---	---	F	---	6.5	
11	0.886	5.0	IR		3.0		2.1			5.1	LR	9.5	---	---	---	---	F	---	-4.8		
12	0.886	2.0	R1	X	0.8	1.7	0.5	4.0	4.9	1.6	13.5	LR	11.5	0.8	OGFC	I	L	F	0.2	2.0	
13	1.076	3.5	R3	X	1.0	1.5	0.5	2.3	2.2	7.5	LR	10.3	1.0	OGFC	II	M	F	0.1	3.0	Split Core at 5.5"	
14	1.328	10.0	R3	X	0.8	5.2				6.0	LR	10.1	0.4	OGFC	I	L	F	0.1	3.2		
15	1.328	4.5	OR		2.0					2.0	LR	9.8	---	---	---	---	F	---	5.9		
16	1.388	5.0	IR		1.5				1.8	3.3	LR	8.9	---	---	---	---	F	---	-4.4	Split Core at 2.0"	

Remarks: Crack Depth of "B" indicates full depth crack to the base. EOP = Edge of Pavement

Crack Extent: L= Light; M= Moderate; S= Severe **Pavement Condition:** G= Good; F= Fair; P= Poor **Crack Types:** A= Alligator; Bl= Block; Br= Branch

SL= Single Longitudinal; ST= Single Transverse; R= Reflective; J= Joint; OGFC= Open-Graded FC Stress Crack

Base Types: LR= Limrock; COQ= Coquina; SC= Soil Cement; ABC= Asphalt Base; SAHM= Sand Asphalt Hot Mix; NB= No Base

State of Florida Department of Transportation
PAVEMENT EVALUATION AND CONDITION DATA SHEET

Project No.:	429079-1	Cored By:	Ardaman	Date:	5/22/2012	Page No.:	2 of 4															
County:	Orange	Highway Sect. No.:	75280	From:	Osceola County line	To:	East of SR 536															
Road No.:	SR 400 (I-4)	Begin MP:	0.000	End MP:	1.740	Length:	1.74															
Core No.	MP	Distance from left edge of lane (ft.)	Lane	Wheel Path	FC-5	Type-S	ARM	Type-S	Type-I	Binder	ABC	Core Length (in)	Thickness (in)	Crack Depth (in)	Type	Class	Crack Extent	Pav Cond.	Rut Depth (in)	Cross Slope (%)	Comments	
17	1.388	8.5	R1	X	0.6	3.4		2.8		2.0		8.8	LR	14.7	0.6	OGFC	I	L	F	0.1	2.2	
18	0.380	3.5	L1	X	0.9	1.9	0.2	4.3	5.5	1.5	14.3	LR	11.0	0.5	OGFC	I	L	F	0.1	2.0		
19	0.380	5.0	IL		2.8			4.7			7.5	LR	10.2	---	---	---	---	F	---	-4.8		
20	0.280	10.0	L3	X	0.5	1.0	0.8	4.4			6.7	LR	10.2	0.5	OGFC	I	L	F	0.1	3.3		
21	0.650	4.0	OL		2.0						8.5	10.5	ABC	8.5	---	---	---	---	F	---	4.4	
22	0.650	8.5	L3	X	0.5	1.5	0.8	1.0	3.1		6.9	LR	10.0	0.5	OGFC	I	L	F	0.3	2.8	Split Core at 2.5	
23	0.810	6.0	OL		1.8						4.0	7.7	ABC	1.9	---	---	---	---	F	---	5.3	
24	0.810	10.0	L4	X	1.0	1.8					9.0	20.8	ABC	9.0	0.4	OGFC	I	L	F	0.2	3.5	
25	0.811	2.0	L1	X	0.7	1.8	0.2	1.6	6.0	1.6	11.9	LR	10.3	0.3	OGFC	I	L	F	0.1	2.0		
26	0.811	5.0	IL		2.0			2.0			4.0	LR	9.8	---	---	---	---	F	---	-4.0		
27	1.119	4.0	OL		1.7						4.5	10.7	ABC	4.5	---	---	---	---	F	---	6.7	
28	1.120	8.5	L4	X	0.7	1.8					9.5	21.5	ABC	9.5	0.7	OGFC	II	M	F	0.1	3.9	
29	1.247	3.5	L3	X	0.8	8.0					8.8	LR	10.1	0.5	OGFC	I	L	F	0.1	3.4		
30	1.480	1.0	L1		0.9	4.1					10.8	LR	10.0	0.4	OGFC	I	L	F	0.1	2.3		
31	1.479	3.5	IL		2.0			1.3			3.3	LR	10.1	---	---	---	---	F	---	-4.6		
32	1.620	3.5	OL		2.4						2.4	LR	9.8	---	---	---	---	F	---	5.6		

Remarks: Crack Depth of "B" indicates full depth crack to the base.

EOP = Edge of Pavement

Crack Extent: L= Light; M= Moderate; S= Severe

Pavement Condition: G= Good; F= Fair; P= Poor

Crack Types: A= Alligator; B|= Block; Br= Branch

SL= Single Longitudinal; ST= Single Transverse; R= Reflective; J= Joint; OGFC= Open-Graded FC Stress Crack

Base Types: LR= Limrock; COQ= Coquina; SC= Soil Cement; ABC= Asphalt Base; SAHM= Sand Asphalt Hot Mix; NB= No Base

State of Florida Department of Transportation
PAVEMENT EVALUATION AND CONDITION DATA SHEET

Project No.:	429079-1	Cored By:	Ardaman	Date:	5/22/2012	Page No.:	3 of 4														
County:	Orange	Highway Sect. No.:	75280	From:	Osceola County Line	To:	East of SR 536														
Road No.:	SR 400 (I-4)	Begin MP:	0.000	End MP:	1.740	Length:	1.74														
Core No.	MP	Distance from left edge of lane (ft.)	Lane	Wheel Path	Type-S	ARM	Type-I	Binder	ABC	Base	Crack	Pavt Cond.	Rut Depth (in)	Cross Slope (%)	Comments						
33	1.621	10.0	I3	X	0.5	7.5				8.0	LR	10.1	0.5	OGFC	I	L	F	0.0	2.8	Ramp 75039-008. Distance Measured in Feet	
34	1056	9.5	Ramp	X	0.8	4.3				5.1	LR	9.8	0.3	OGFC	I	L	F	0.1	2.3	From Gore No. 4	
35	1057	4.0	Shoulder			1.7				1.7	LR	8.5	---	---	---	F	---	F	---	4.5	Ramp 75039-008. Distance Measured in Feet From Gore No. 4
36	2640	9.5	Ramp	X	0.6	4.3				4.9	LR	10.1	0.2	OGFC	I	L	F	0.1	-2.0	Ramp 75039-008. Distance Measured in Feet	
37	2647	2.5	Shoulder			1.2				1.2	LR	7.1	---	---	---	F	---	F	---	1.9	Ramp 75039-008. Distance Measured in Feet From Gore No. 4
38	1057	10.0	Ramp	X	0.6	3.4				4.0	LR	9.8	0.3	OGFC	I	L	F	0.1	2.5	Ramp 75039-001. Distance Measured in Feet From Gore No. 5	
39	1066	3.0	Shoulder			2.3				2.3	LR	7.5	---	---	---	F	---	F	---	4.6	Ramp 75039-001. Distance Measured in Feet From Gore No. 5
40	3960	10.5	Ramp	X	0.8	3.0				3.8	LR	9.5	0.4	OGFC	I	L	F	0.1	-6.4	Ramp 75039-001. Distance Measured in Feet From Gore No. 5	
41	3971	2.5	Shoulder			1.4				1.4	LR	7.1	---	---	---	F	---	F	---	0.7	Ramp 75039-004. Distance Measured in Feet
42	796	10.0	Ramp	X	0.9	4.1				5.0	LR	9.8	0.2	OGFC	I	L	F	0.2	2.8	Ramp 75280-127. Distance Measured in Feet From Gore No. 2	
43	802	2.0	Shoulder			1.5				1.5	LR	8.5	B	BR	I	L	F	---	4.6	Ramp 75280-127. Distance Measured in Feet From Gore No. 1	
44	2158	13.0	Ramp	X	0.7	2.6				3.3	LR	10.0	0.4	OGFC	I	L	F	0.1	2.6	Ramp 75280-127. Distance Measured in Feet From Gore No. 1	
45	2160	2.0	Shoulder			0.8	2.2			3.0	LR	8.5	0.3	OGFC	I	L	F	---	3.5	Ramp 75280-127. Distance Measured in Feet From Gore No. 1	
46	4540	12.0	Ramp	X	0.6	5.4				6.0	LR	8.1	0.4	OGFC	I	L	F	0.0	3.1	Ramp 75280-127. Distance Measured in Feet From Gore No. 1	
47	4550	2.0	Shoulder			2.6				2.6	LR	7.8	---	---	---	F	---	F	---	8.9	Ramp 75280-127. Distance Measured in Feet From Gore No. 1
48	7206	12.0	Ramp	X	0.9	1.8				12.3	15.0	ABC	12.3	0.8	OGFC	I	L	F	0.0	1.8	Ramp 75280-127. Distance Measured in Feet From Gore No. 1

Remarks: Crack Depth of "B" indicates full depth crack to the base.

EOP = Edge of Pavement

Crack Extent: L= Light; M= Moderate; S= Severe

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Base Types: LR= Limerock; COQ= Coquina; SC= Soil Cement; ABC= Asphalt Base; SAHM= Sand Asphalt Hot Mix; NB= No Base

Supplemental Data to PECD

(GPS Coordinates for Each Locations Cored)
SR 400 FPN: 429079-1 County: Orange

Core #	GPS Coordinates	
1	N 28.350442	W -81.528648
2	N 28.350457	W -81.528589
3	N 28.351794	W -81.527575
4	N 28.351796	W -81.527530
5	N 28.352975	W -81.526366
6	N 28.352982	W -81.526324
7	N 28.355362	W -81.524180
8	N 28.355361	W -81.524146
9	N 28.357278	W -81.522456
10	N 28.357267	W -81.522439
11	N 28.357447	W -81.522453
12	N 28.357484	W -81.522466
13	N 28.359547	W -81.520471
14	N 28.362453	W -81.517865
15	N 28.362446	W -81.517832
16	N 28.363151	W -81.517338
17	N 28.363199	W -81.517344
18	N 28.352027	W -81.527620
19	N 28.351986	W -81.527613
20	N 28.350839	W -81.528795

Core #	GPS Coordinates	
21	N 28.355161	W -81.524952
22	N 28.355161	W -81.524899
23	N 28.356957	W -81.523374
24	N 28.356962	W -81.523347
25	N 28.356905	W -81.523236
26	N 28.356872	W -81.523228
27	N 28.360220	W -81.520450
28	N 28.360223	W -81.520429
29	N 28.361627	W -81.519083
30	N 28.364249	W -81.516651
31	N 28.364219	W -81.516642
32	N 28.365904	W -81.515309
33	N 28.365904	W -81.515266
34	N 28.349264	W -81.529205
35	N 28.349262	W -81.529174
36	N 28.352386	W -81.525754
37	N 28.352387	W -81.525723
38	N 28.360303	W -81.526074
39	N 28.360276	W -81.526074
40	N 28.356944	W -81.519102

Supplemental Data to PECD

(GPS Coordinates for Each Locations Cored)

SR 400 FPN: 429079-1 County: Orange

Core # GPS Coordinates

41	N 28.356939	W -81.519050
42	N 28.365803	W -81.515767
43	N 28.365801	W -81.515795
44	N 28.362815	W -81.518356
45	N 28.362818	W -81.518380
46	N 28.357664	W -81.522990
47	N 28.357655	W -81.523004
48	N 28.352130	W -81.528311
49	N 28.352121	W -81.528338
50	N 28.350810	W -81.527582
51	N 28.350808	W -81.527537
52	N 28.353564	W -81.526979
53	N 28.353556	W -81.527012
54	N 28.348991	W -81.530939
55	N 28.348973	W -81.530976

Core # GPS Coordinates



Florida Department of Transportation

RICK SCOTT
GOVERNOR

S T A T E M A T E R I A L S O F F I C E
5007 Northeast 39th Avenue, Gainesville, Florida 32609
Telephone: (352) 955-6341, Fax: (352) 955-6345

ANANTH PRASAD, P.E.
SECRETARY

TO: Tim Keefe, District V Project Manager
FROM: Hyung Lee, Nondestructive Testing Engineer
DATE: April 25, 2012
COPIES:
SUBJECT: Resilient Modulus Recommendation

Project Description: SR 400 / I-4
MP 0.000 to 1.740
Project Number: 75280
FIN No.: 429079-1
County: Orange

On March 19, 2012 deflection tests were conducted in the eastbound and westbound traffic lanes of SR 400 / I-4. Evaluation of the data and resulting deflection plots indicate the following Resilient Modulus values are representative of the existing pavement system and are hereby recommended for this project.

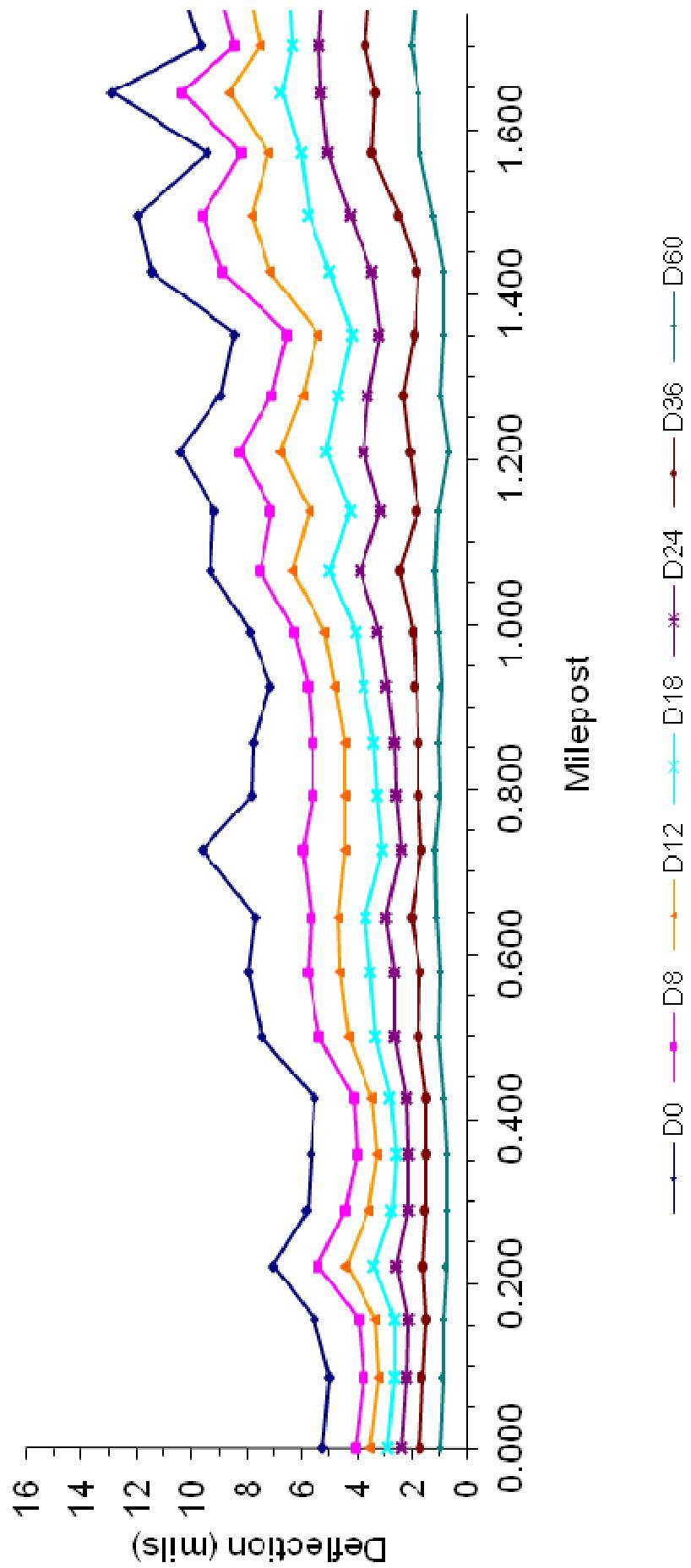
Travel Direction	Beginning Milepost	Ending Milepost	Modulus (psi)	Modulus (MPa)
Eastbound	0.000	1.000	29,000	200
Westbound	0.000	1.000	20,000	138
Eastbound/Westbound	1.000	1.740	15,000	103

Please let me know if you need further assistance.

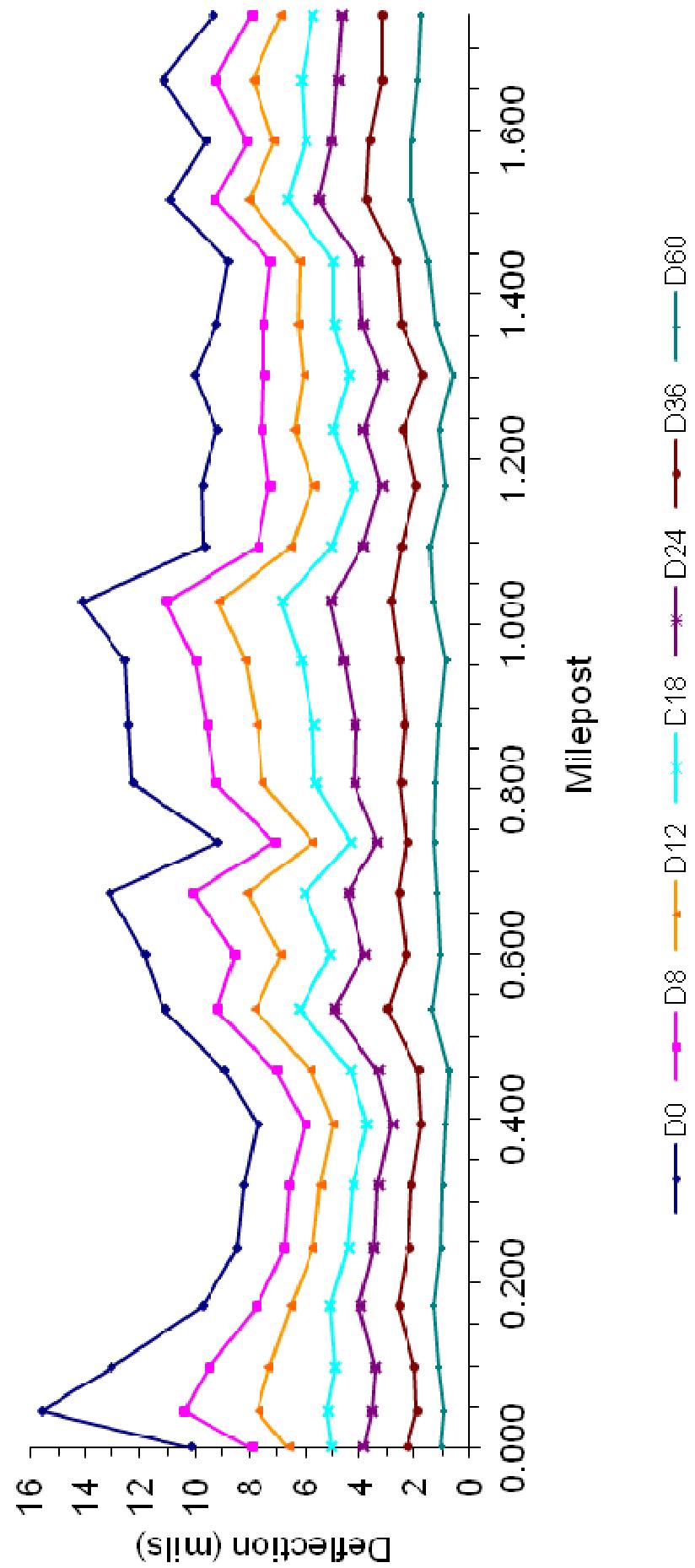
HSL/kek

Attachment: Deflection Plots

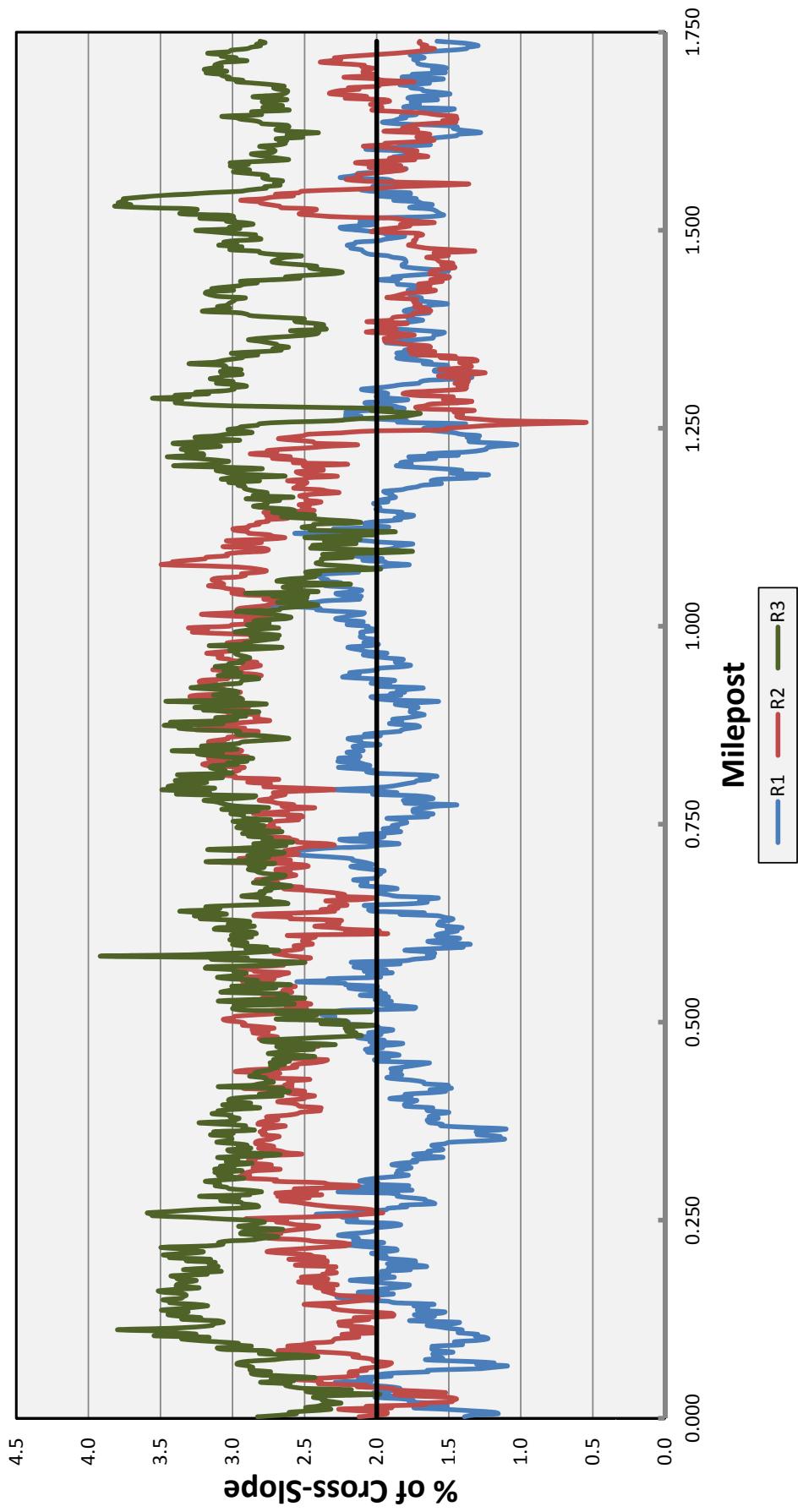
Falling Weight Deflections - 9 Kip Load
Orange County / Section 75280
SR 400 EBTL / MP 0.000 to 1.740



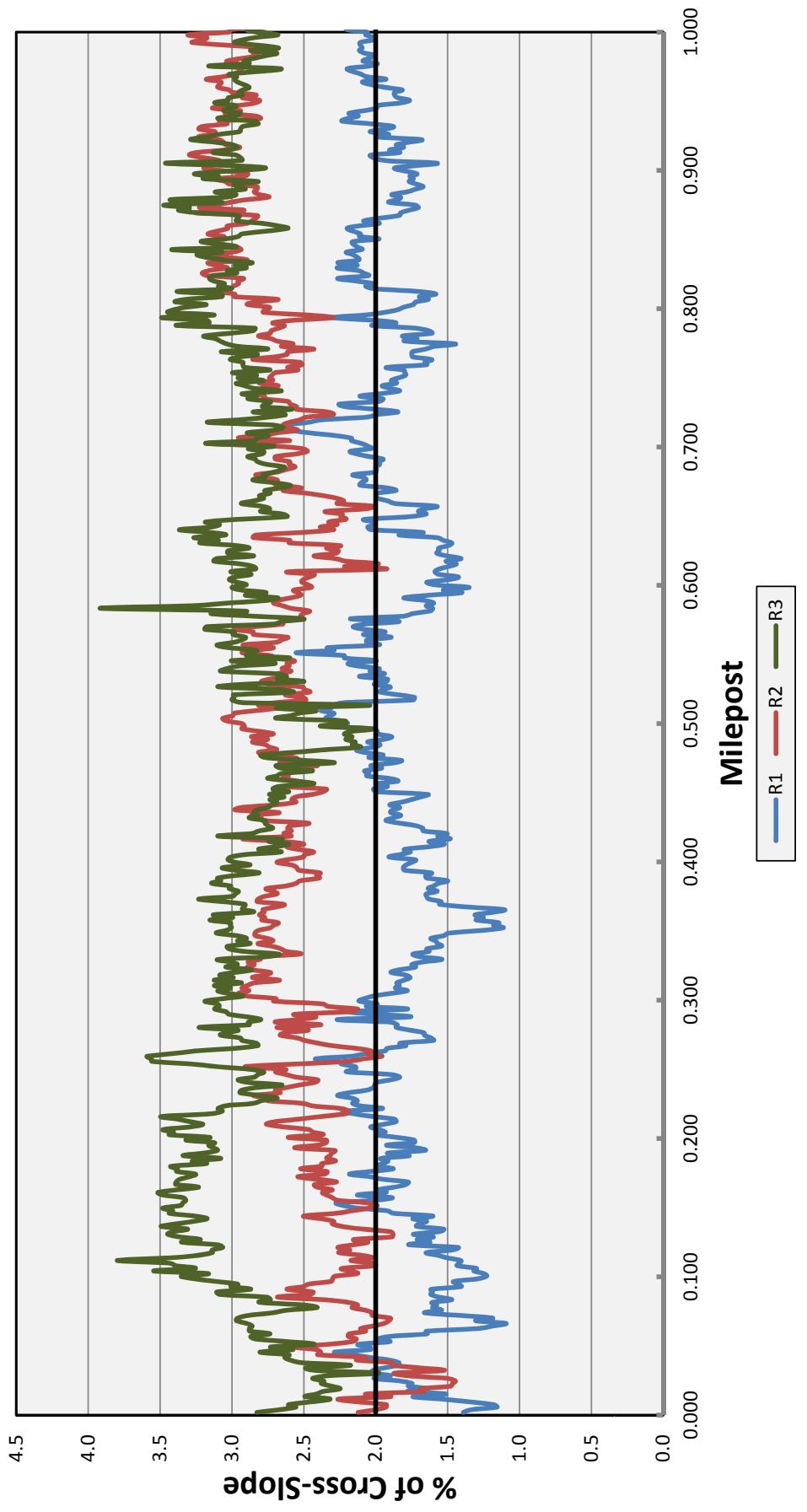
Falling Weight Deflections - 9 Kip Load
Orange County / Section 75280
SR 400 WBTL / MP 0.000 to 1.740



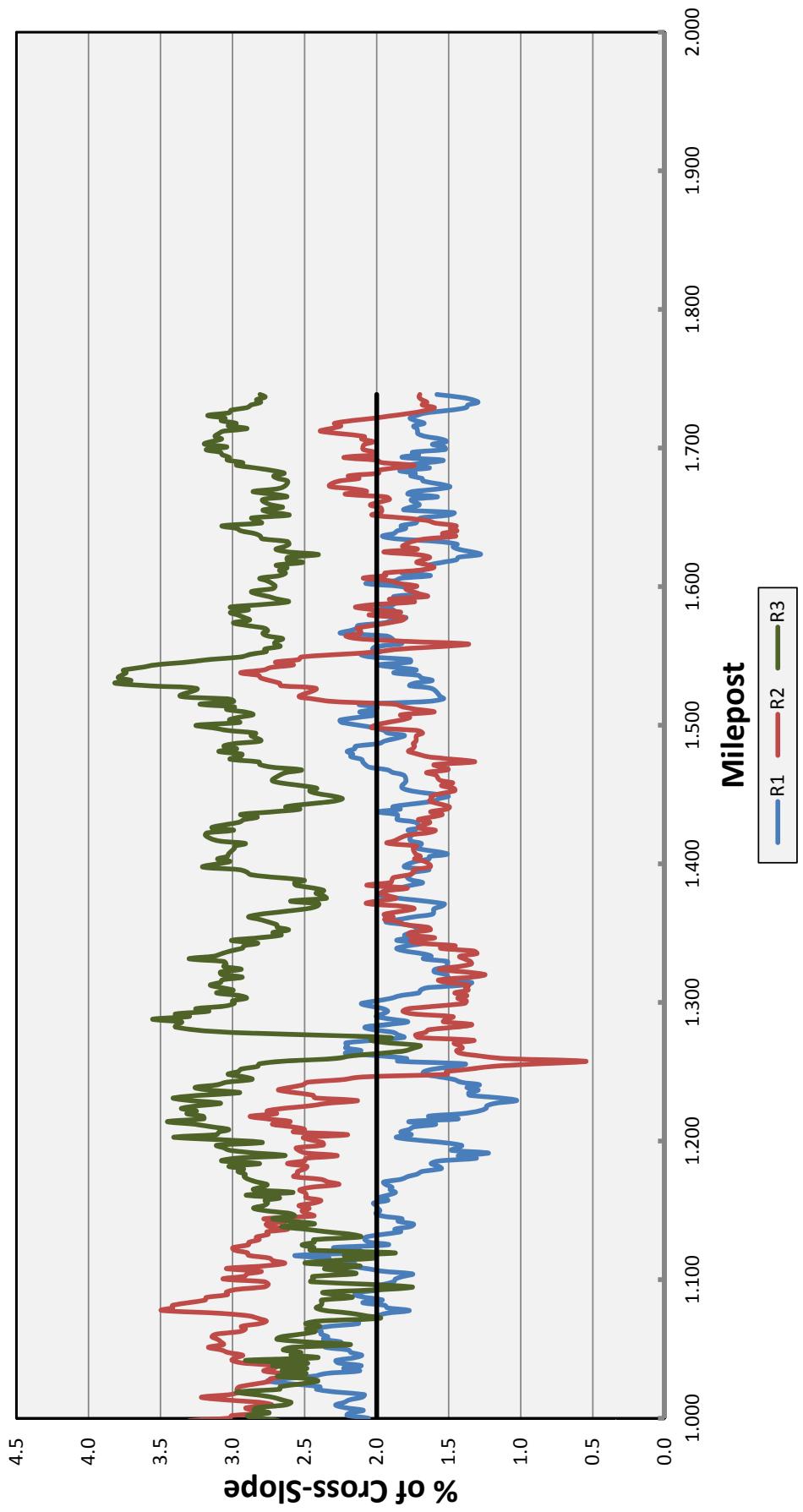
SR 400 (I-4) Eastbound From MP 0.000 to MP 1.740



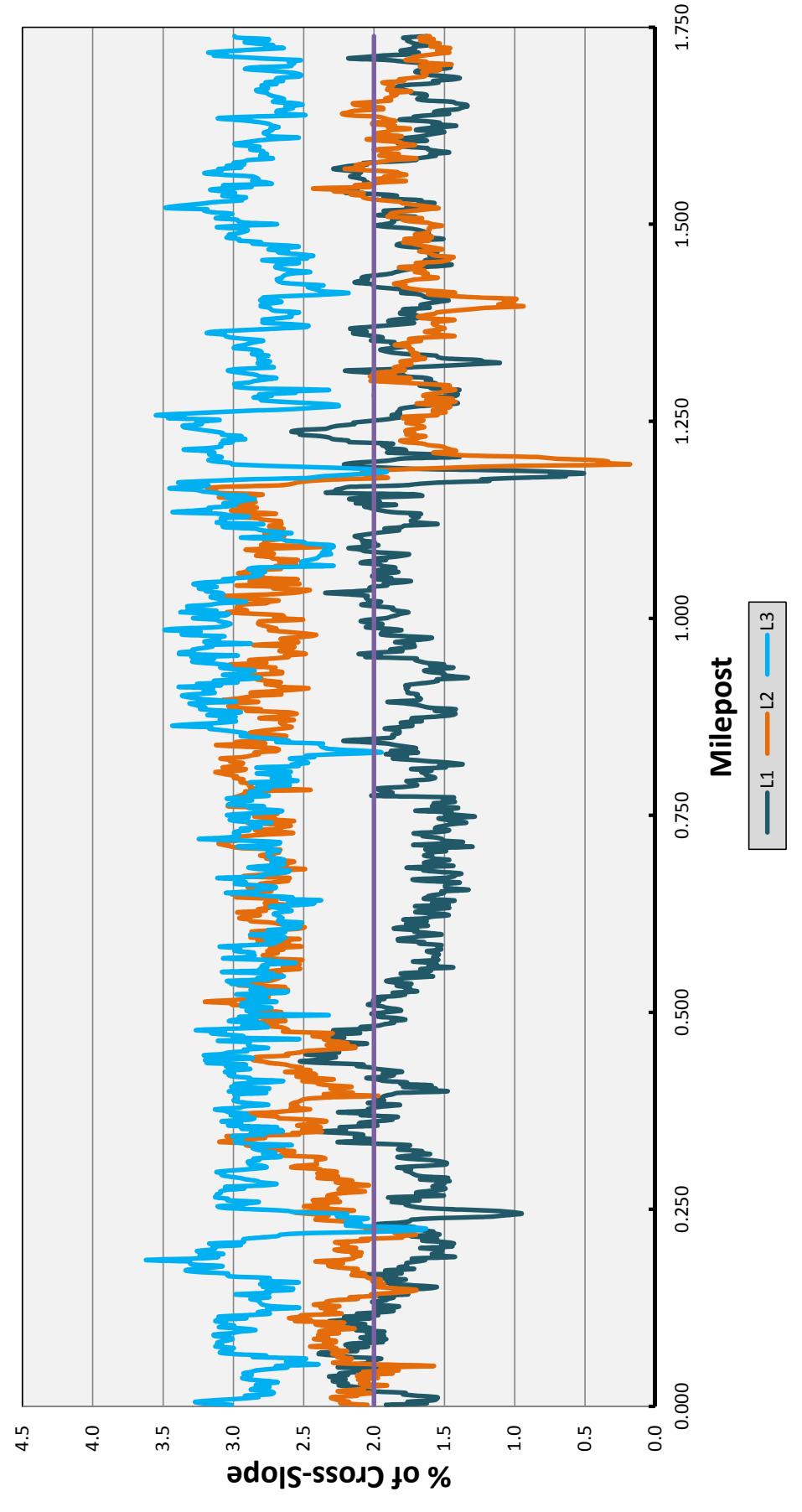
SR 400 (I-4) Eastbound From MP 0.000 to MP 1.000



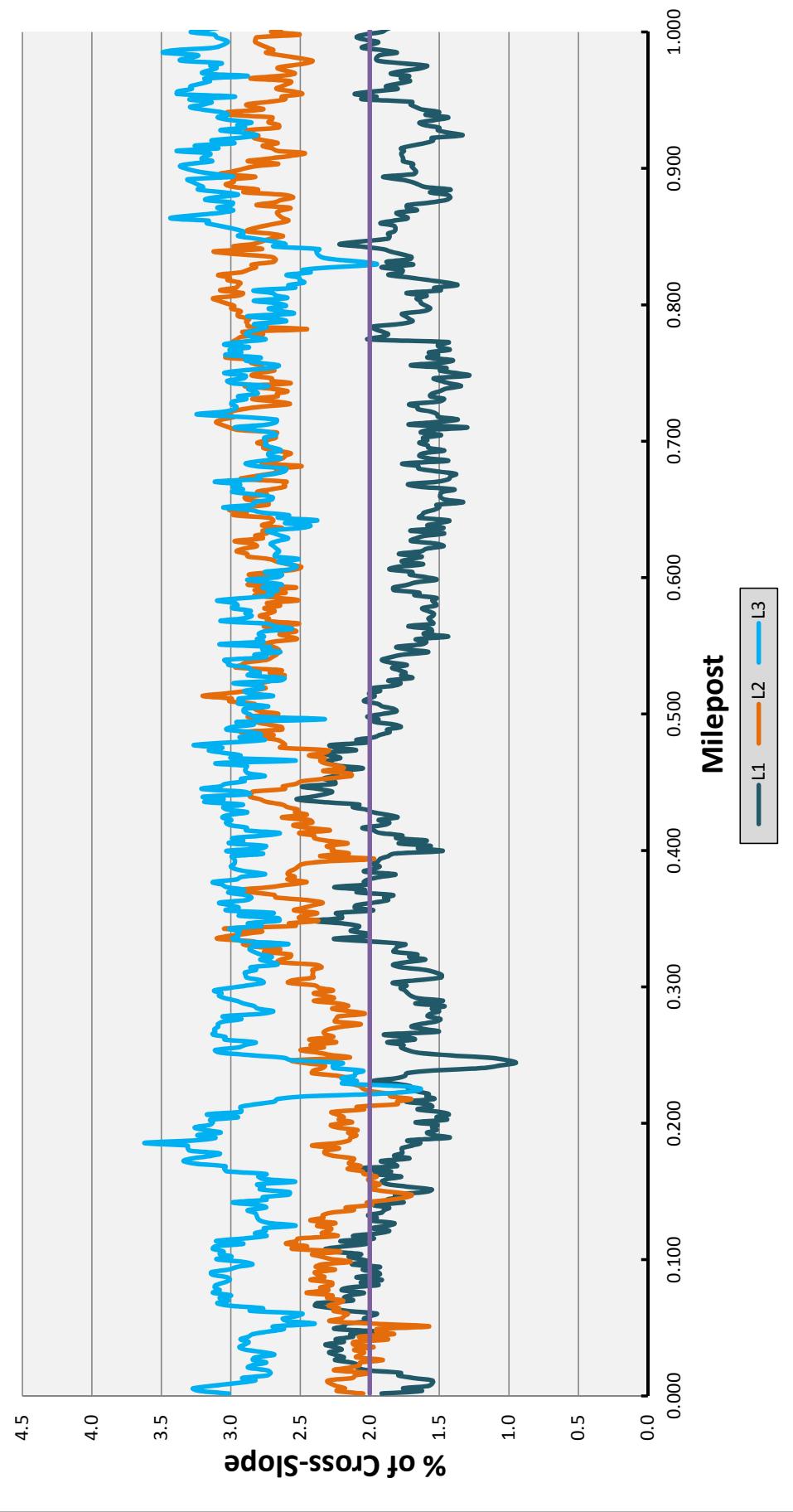
SR 400 (I-4) Eastbound From MP 1.000 to MP 2.000



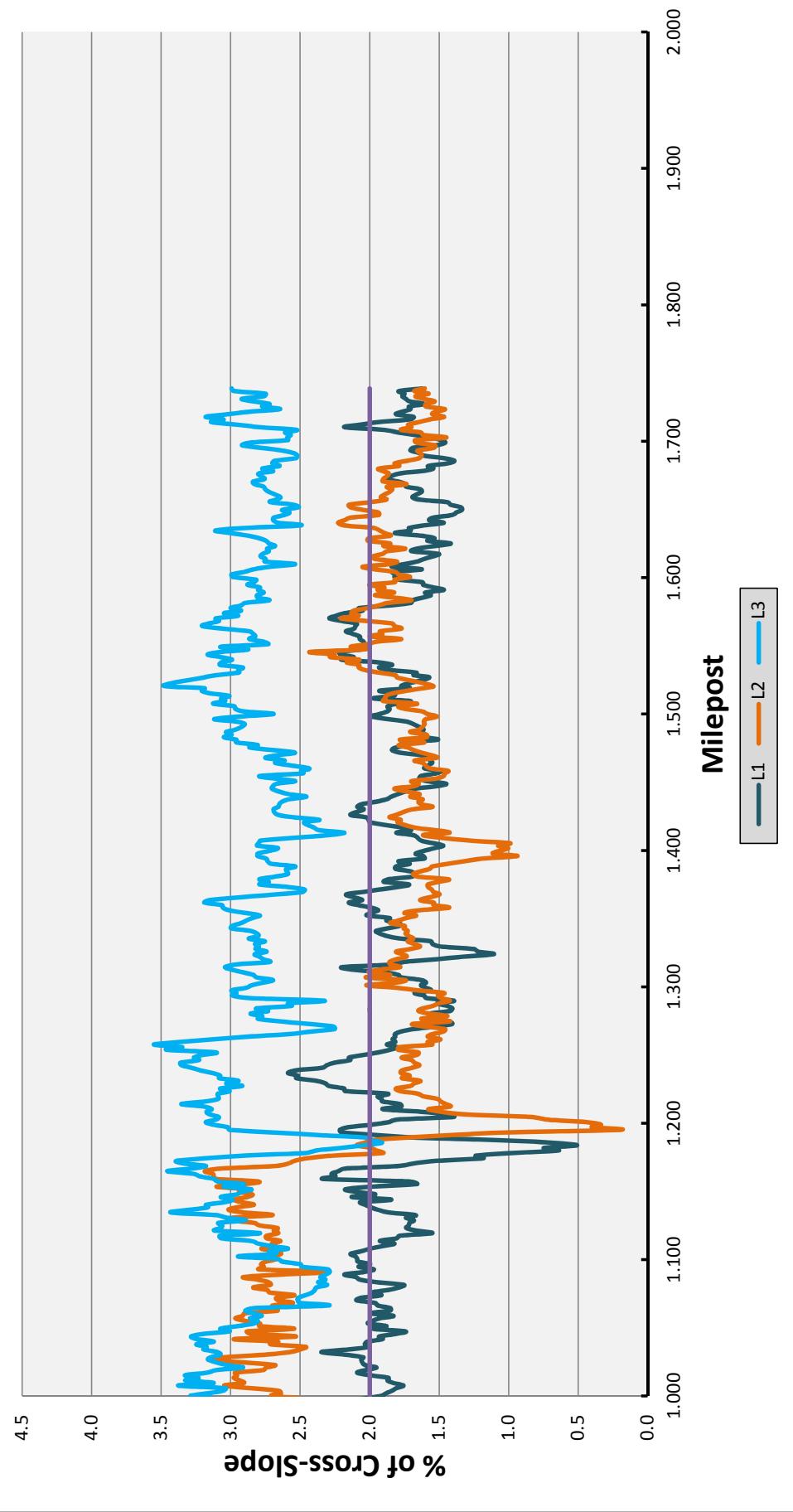
SR 400 (I-4) Westbound from MP 0.000 to MP 1.740



SR 400 (I-4) Westbound from MP 0.000 to MP 1.000

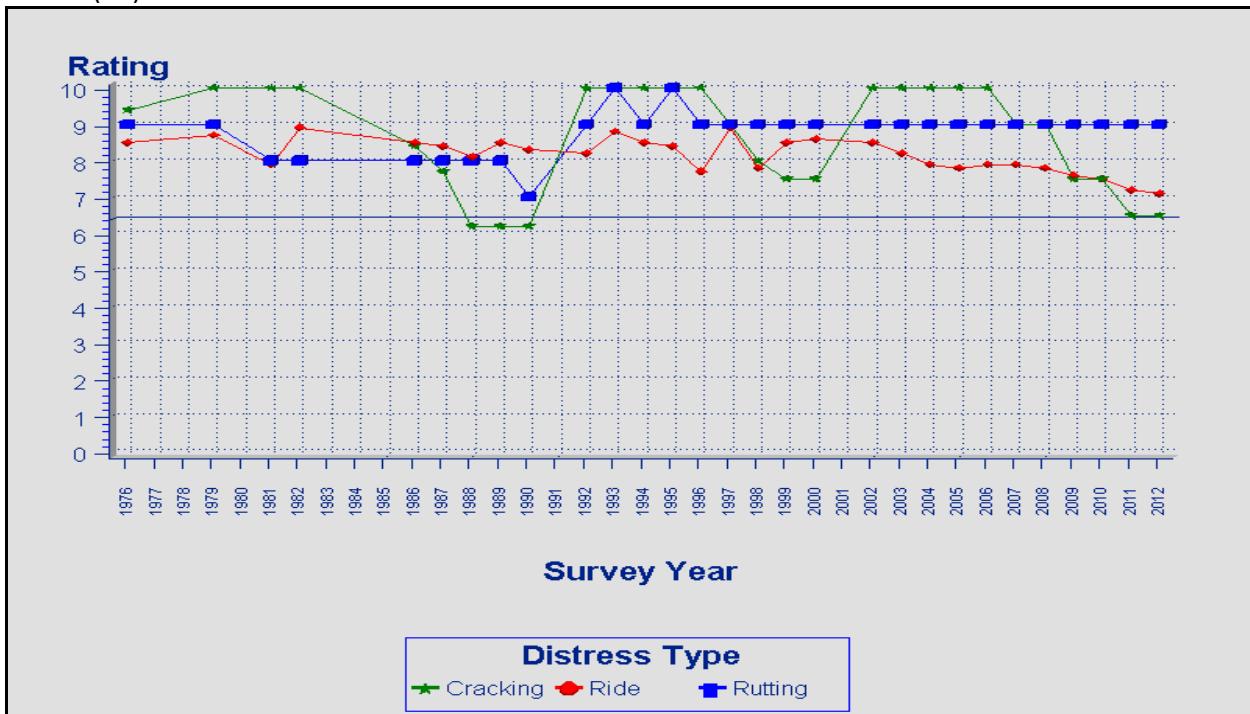


SR 400 (I-4) Westbound from MP 1.000 to MP 2.000

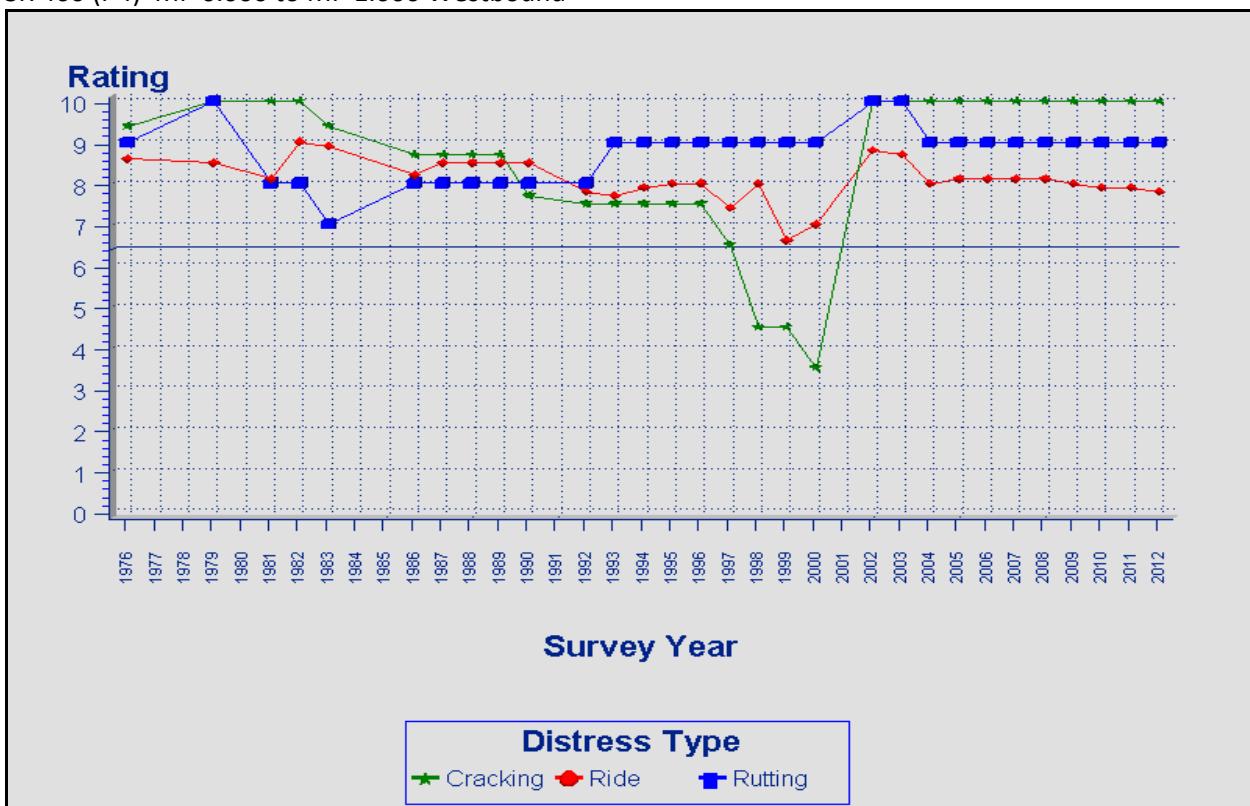


Pavement Condition Survey (PCS) Charts for 429079-1

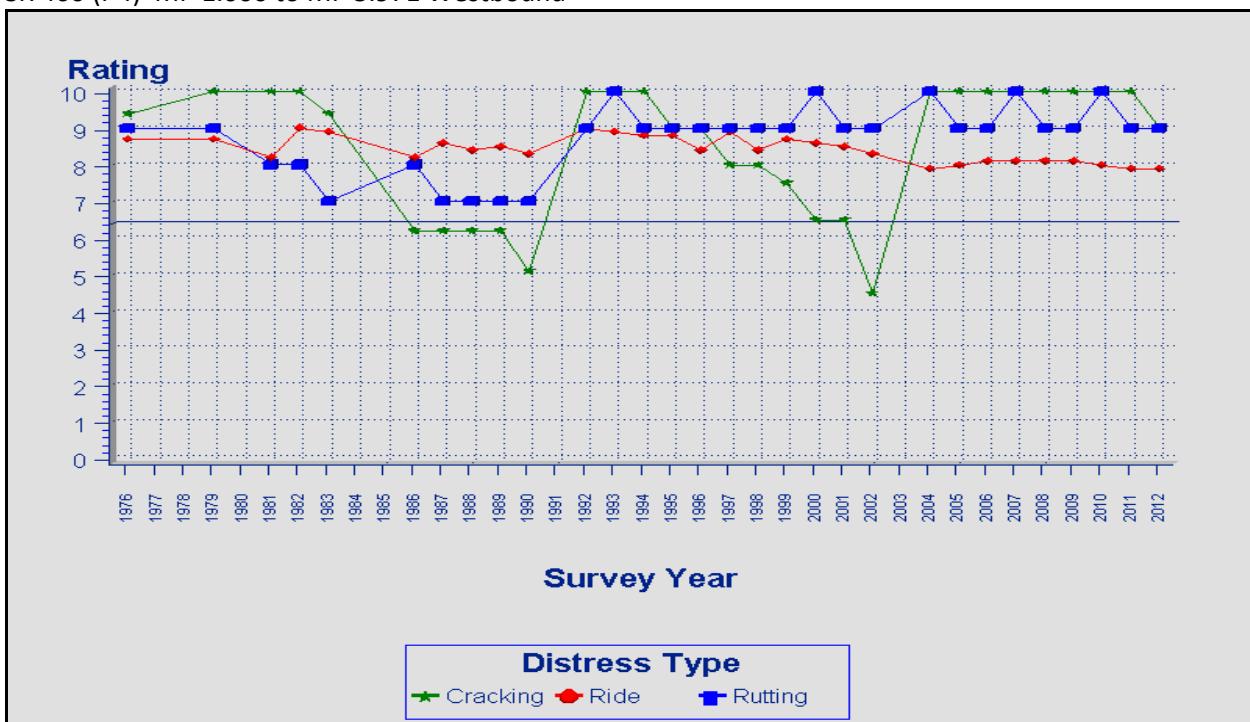
SR 400 (I-4) MP 0.000 to MP 1.740 Eastbound

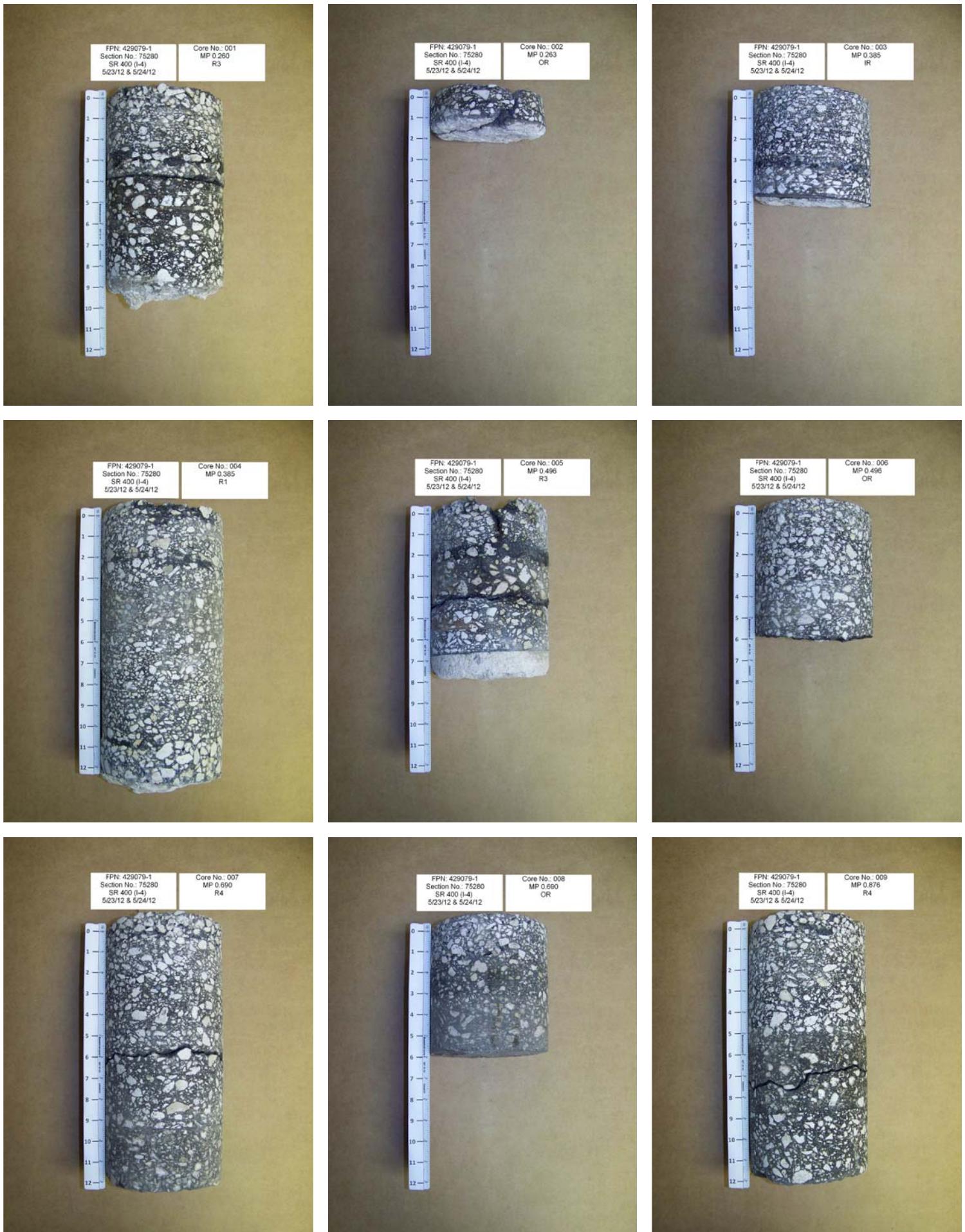


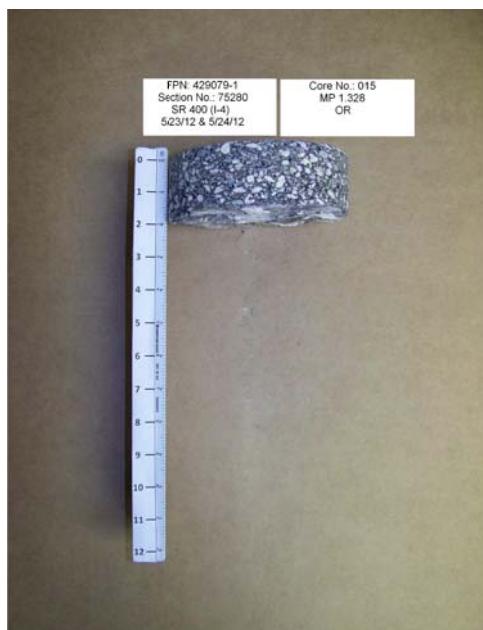
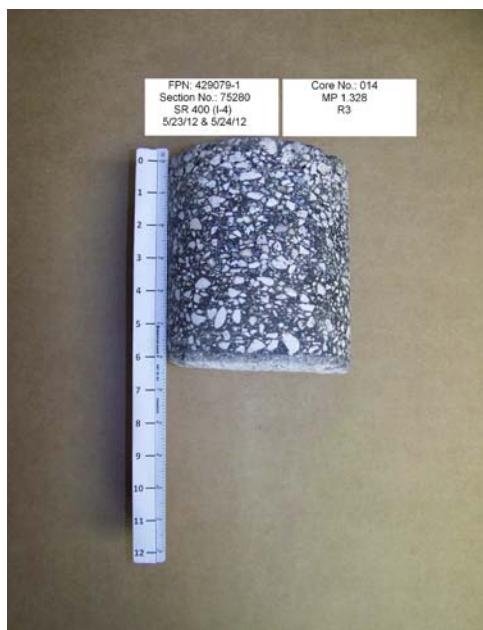
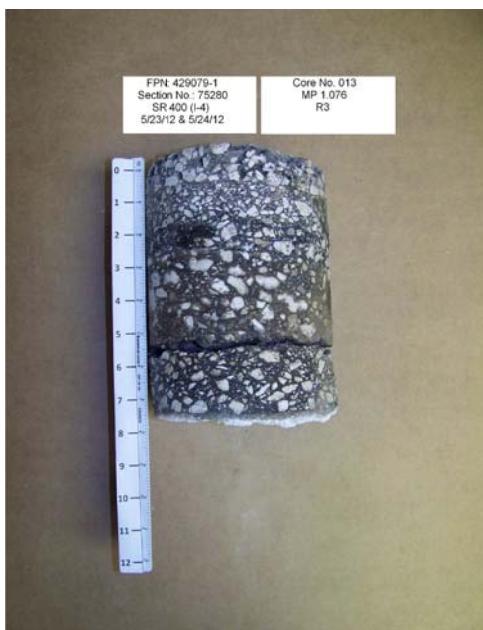
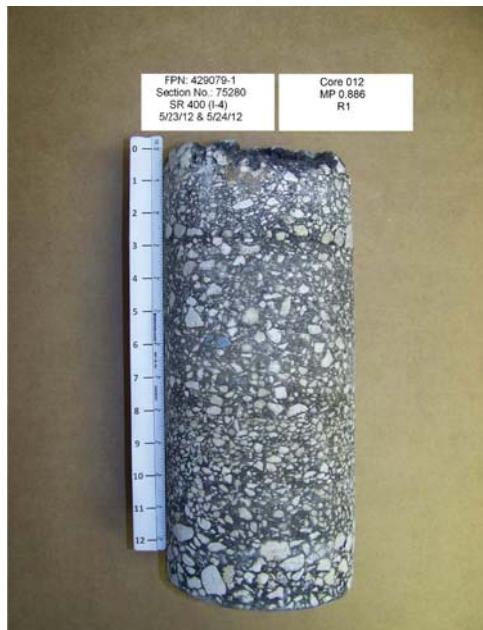
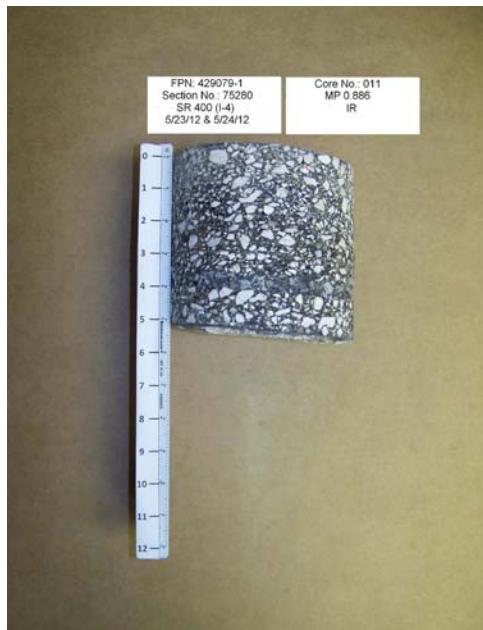
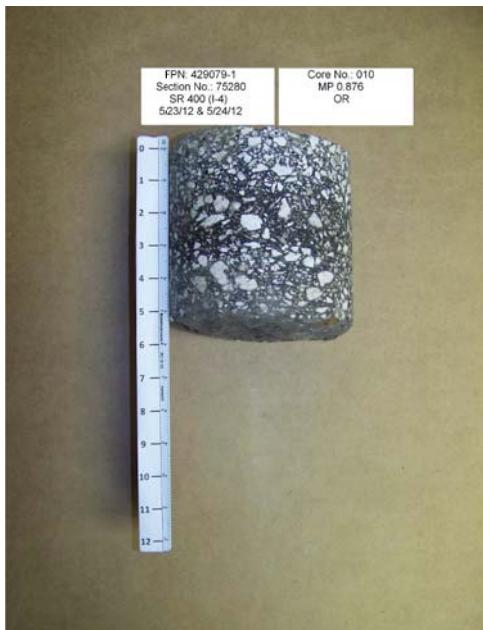
SR 400 (I-4) MP 0.000 to MP 1.000 Westbound

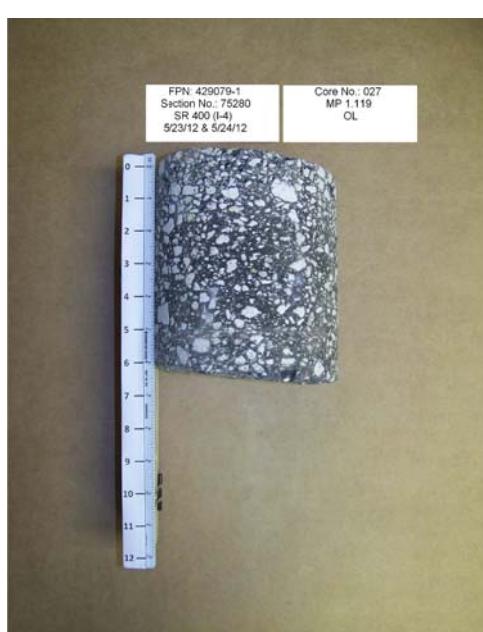
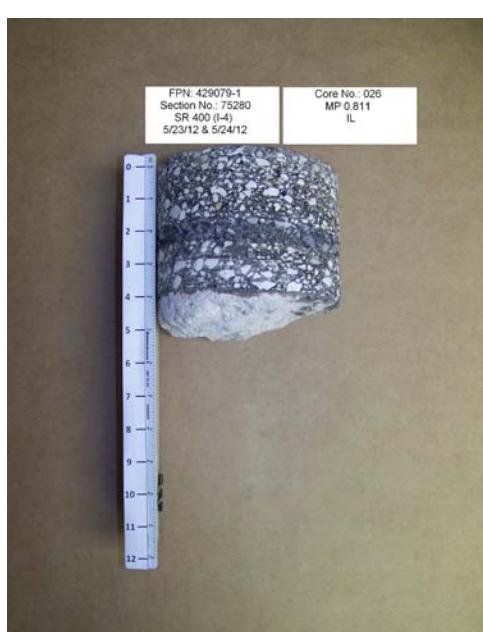
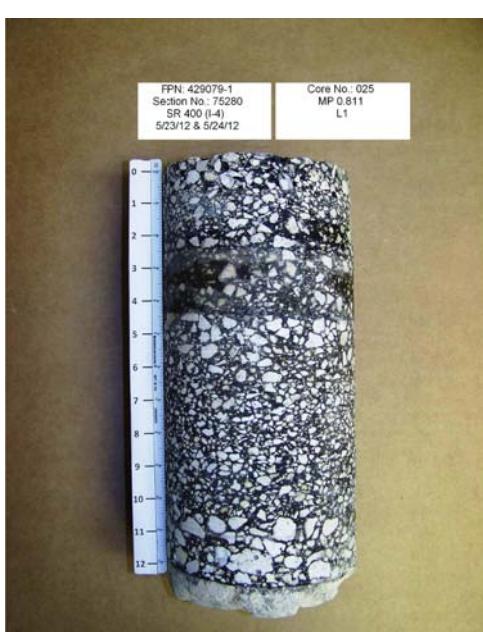
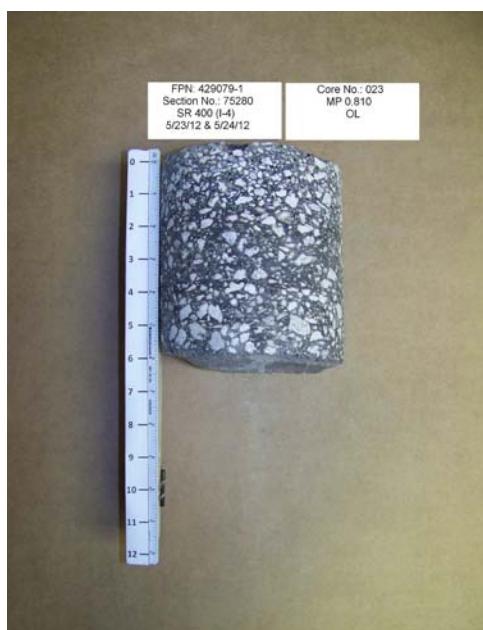
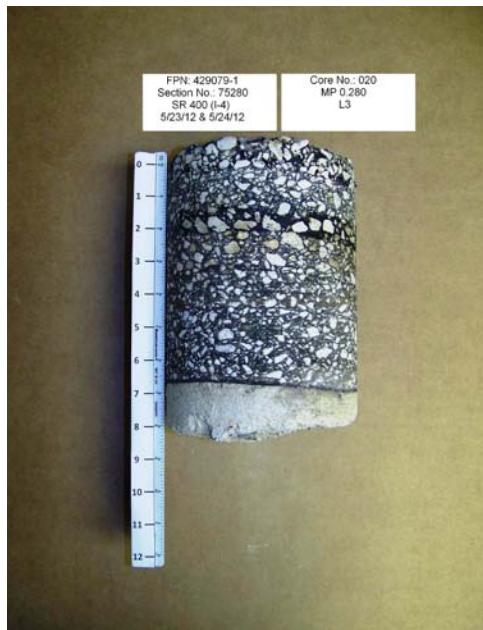


SR 400 (I-4) MP 1.000 to MP 5.971 Westbound

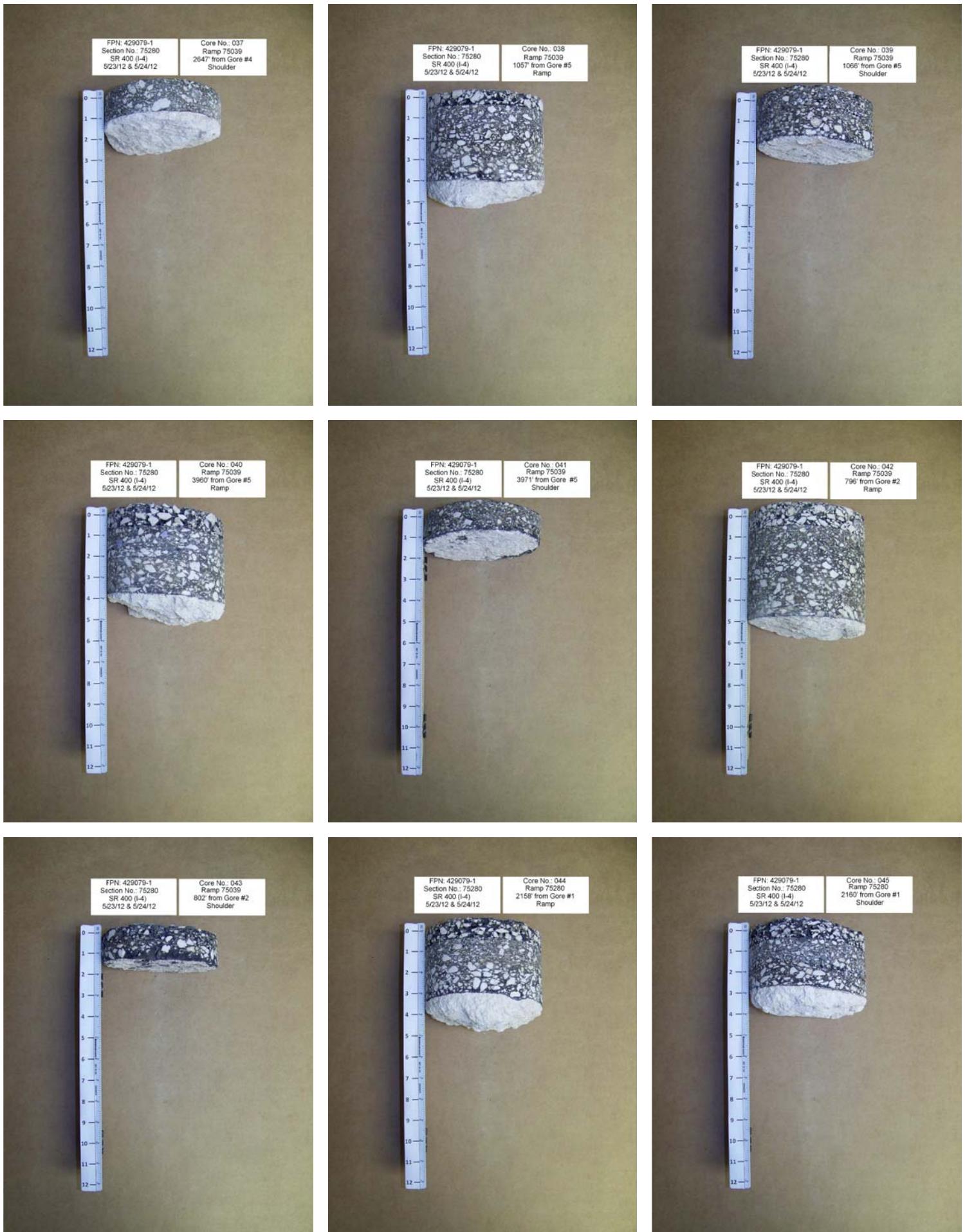


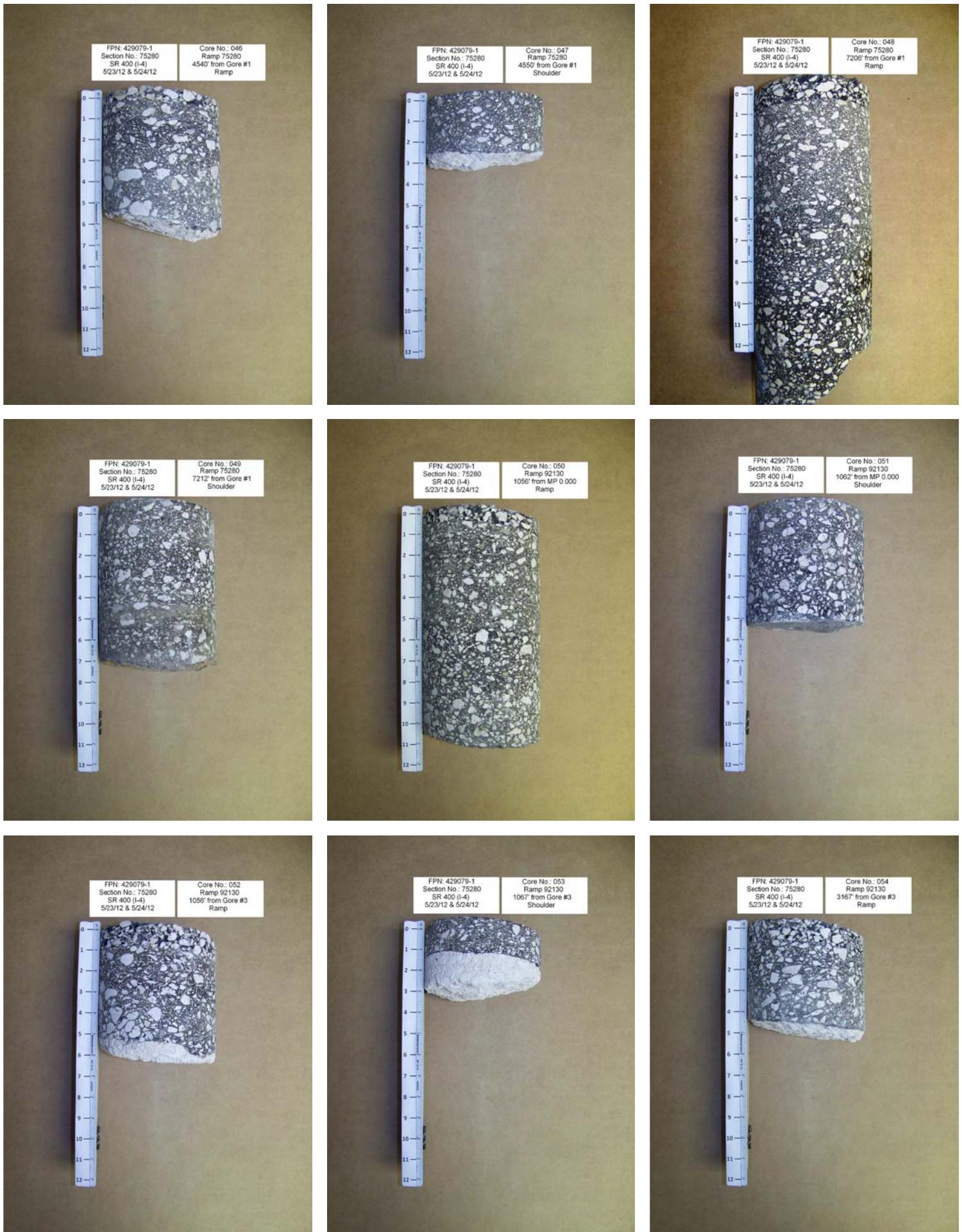












FPN: 429079-1
Section No.: 75280
SR 400 (I-4)
5/23/12 & 5/24/12

Core No.: 055
Ramp 92130
3176' from Gore #3
Shoulder





Photo 1: I-4 eastbound near MP 0.029. This photo shows the deteriorated condition of the R3 lane.



Photo 2: I-4 eastbound near MP 0.454. The R1 and R2 lanes are in better condition than the R3 travel and R4 auxiliary lanes. Note the chip seal overlay on the outside shoulder.



Photo 3: I-4 eastbound near MP 1.049. This photo shows the fair condition of the inside paved shoulder and the R1 lane.



Photo 4: I-4 westbound near MP 1.423. The westbound lanes are not in as degraded condition as the eastbound lanes. The mainline lanes of I-4 within the project limits are tangent with no curves. Our milling recommendations for the westbound lanes are for the long-term pavement preservation of the existing pavement.



Photo 5: I-4 westbound on Ramp 75280-127. This photo shows the relatively fair condition of this connector ramp. Note that the outside shoulder is not paved with an open-graded friction course.



Photo 6: I-4 westbound on Ramp 75039-008. This is the ramp from I-4 eastbound to SR 536 westbound.



Photo 7: I-4 eastbound on Ramp 75039-008. This is the ramp from I-4 eastbound to SR 536 westbound. Note the lack of pavement distress other than oxidized friction course.