

Bonded CRCP Overlay of a Distressed Jointed Concrete

**Southeastern States Pavement Association
2018 Conference**

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Charleston, West Virginia**

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Texas Tech University

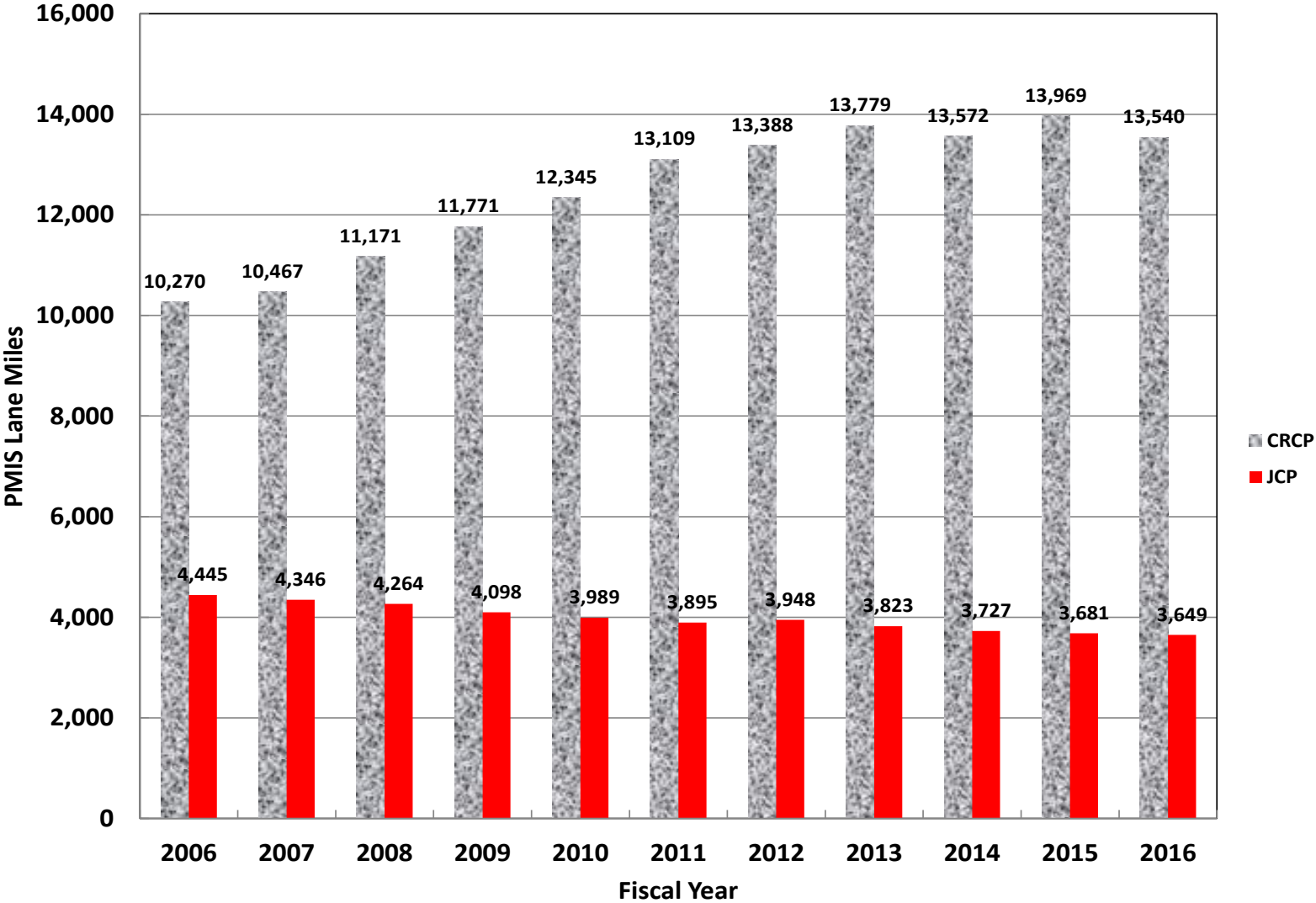
Presentation Overview

- **US 75 Project in Paris District**
- **Pre-Overlay Evaluations**
- **Design and Construction**
- **Performance Evaluations**
- **Summary & Future Plans**

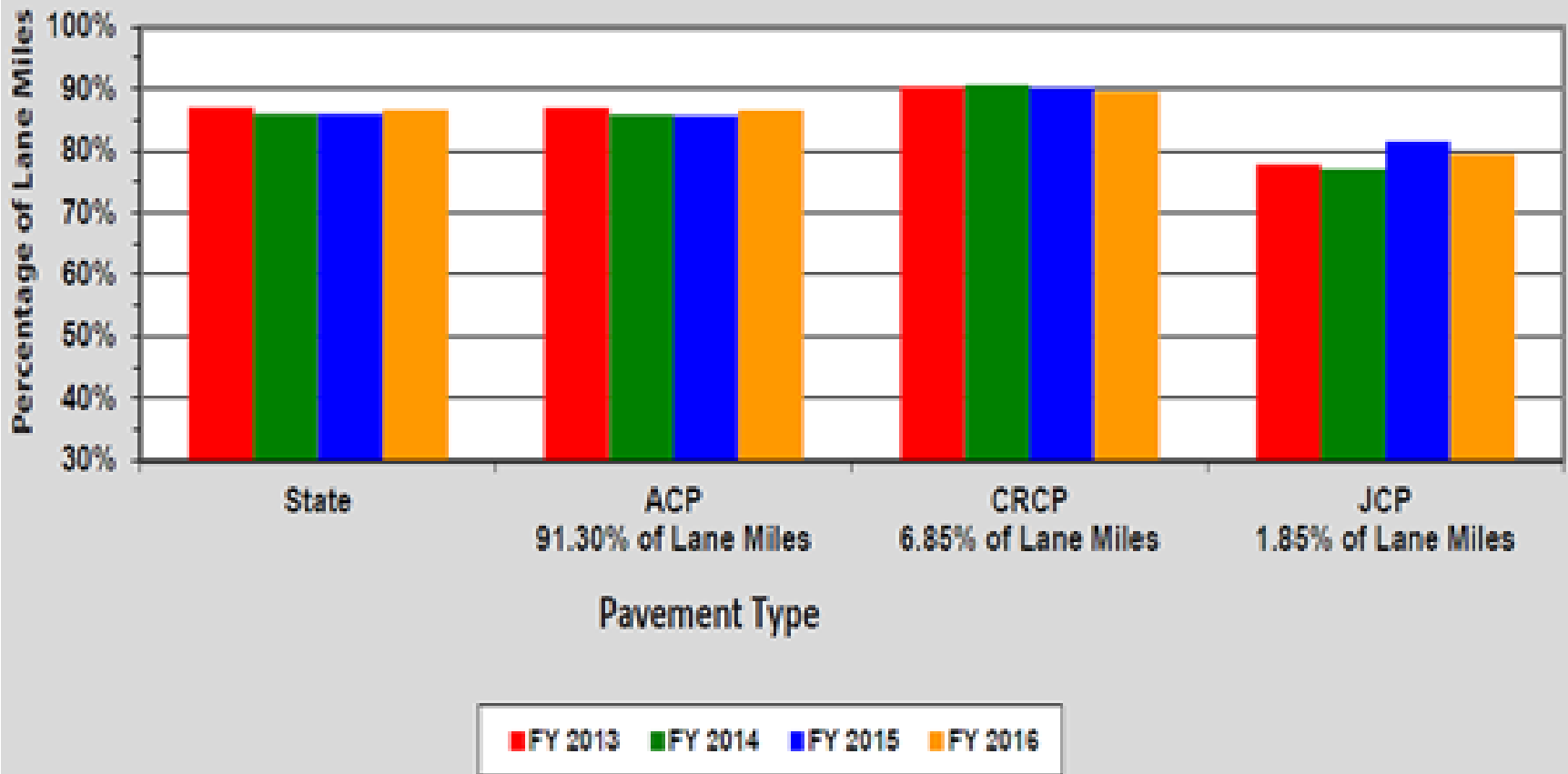
Acknowledgement

- Noel Paramanantham, Paris District Engineer, TxDOT
- Andy Naranjo, Construction Division, TxDOT
- Wade Blackmon, Paris District, TxDOT
- Texas Tech Research Team

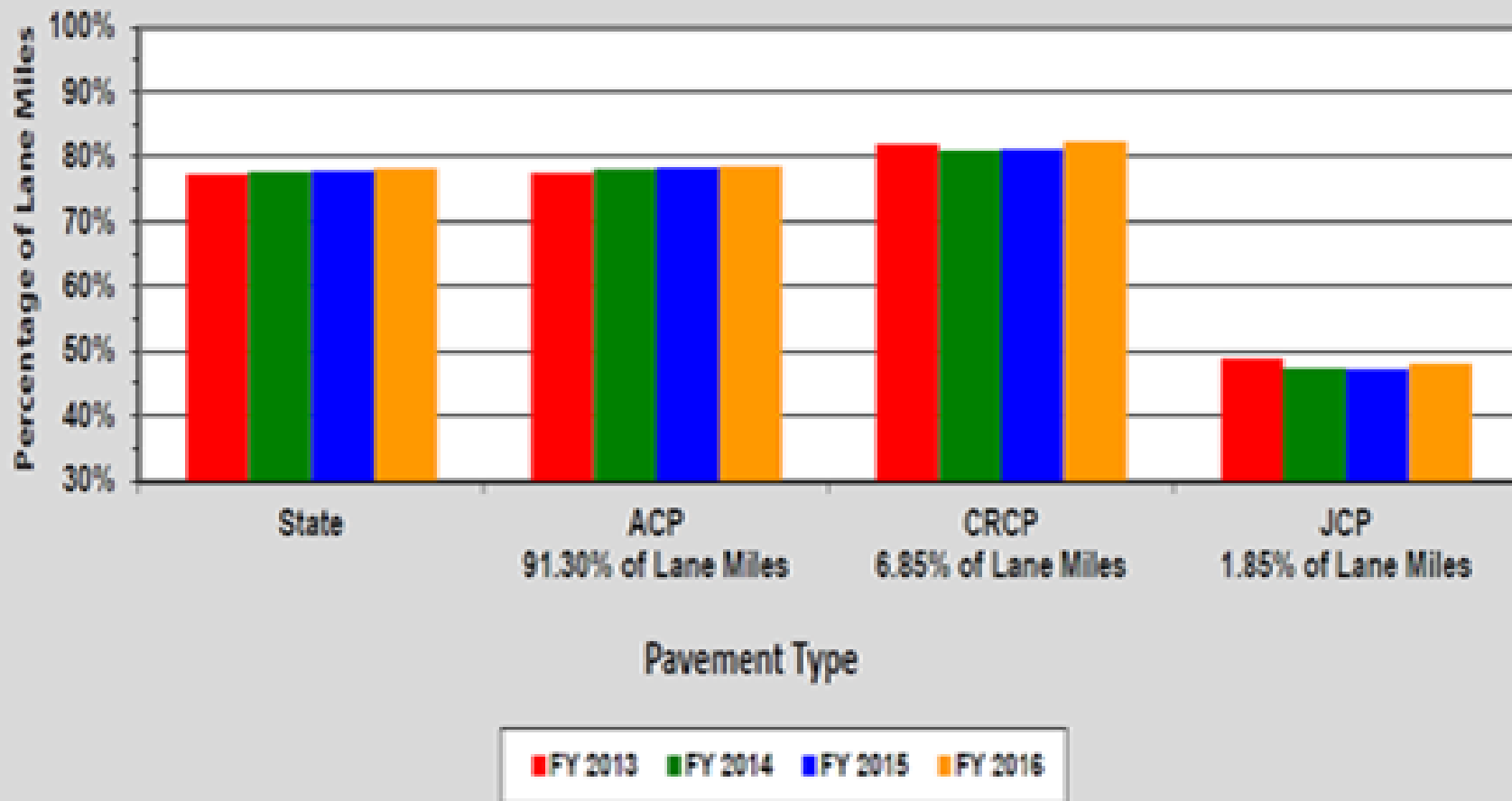
TxDOT Rigid Pavement Lane Miles



“Good” or Better Distress Scores (PMIS Distress Score 80 or above)



"Good" or Better Ride Scores (PMIS Ride Score 3.0 or above)



US 75 Project in Paris District



US 75 Project

- Mainlanes: 10" JPCP + 6" Flexbase + LTS
- Shoulders: 1" ACP + 8" Flexbase
- Built in 1984
- Shoulders: In 1998, 10" JPCP + 6" Flexbase
- ADT in 1984 ~ 11,000, projected 20 yr ADT ~ 16,200
- ADT in 2010: 51,000 & projected 20 yr ADT ~71,000

US 75 Project

- Since 2002, Paris District spent around \$500K to \$1 million on slab repairs on US 75 per year.
- Project No. 5-4893 “Pilot Implementation of CRCP Overlay on Jointed Concrete Pavement”
- Funding for this implementation project was \$500K.
- 0.5-mile section in the worst condition





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08.17.2011 10:41



10.21.2011 07:43





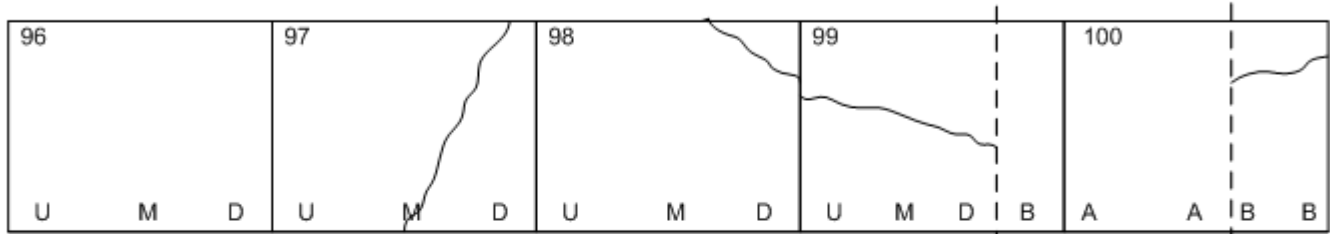
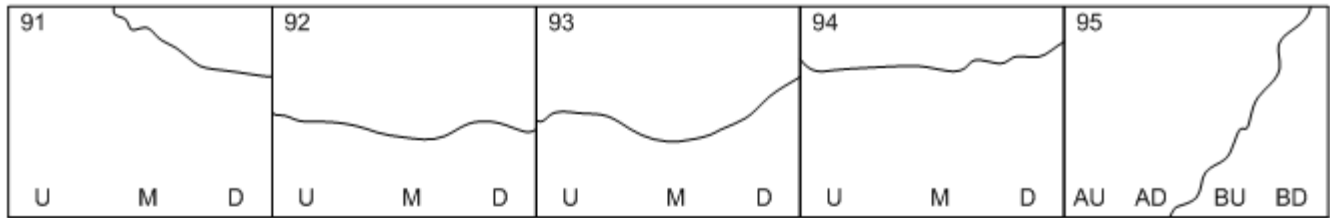


Pre-Overlay Evaluations

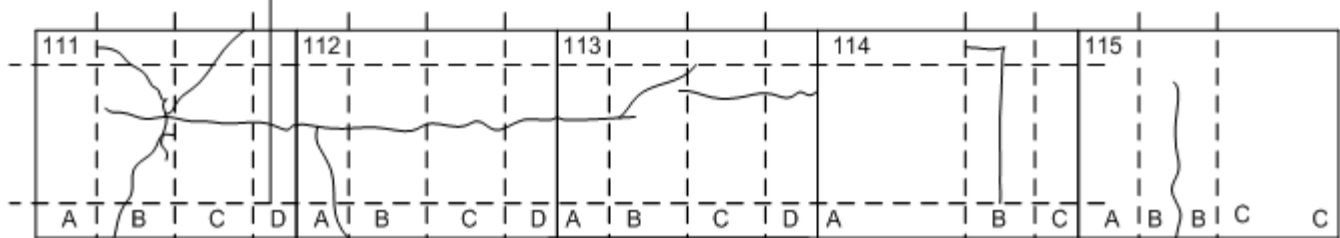
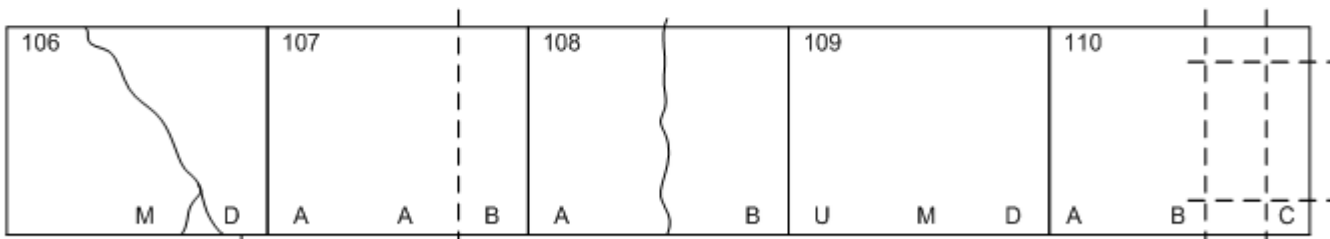
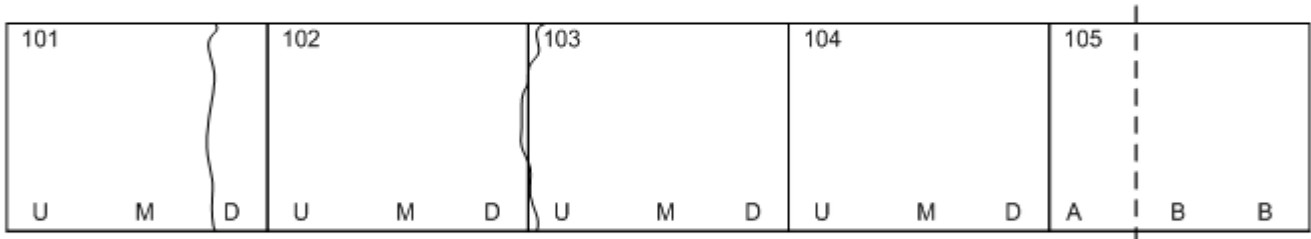


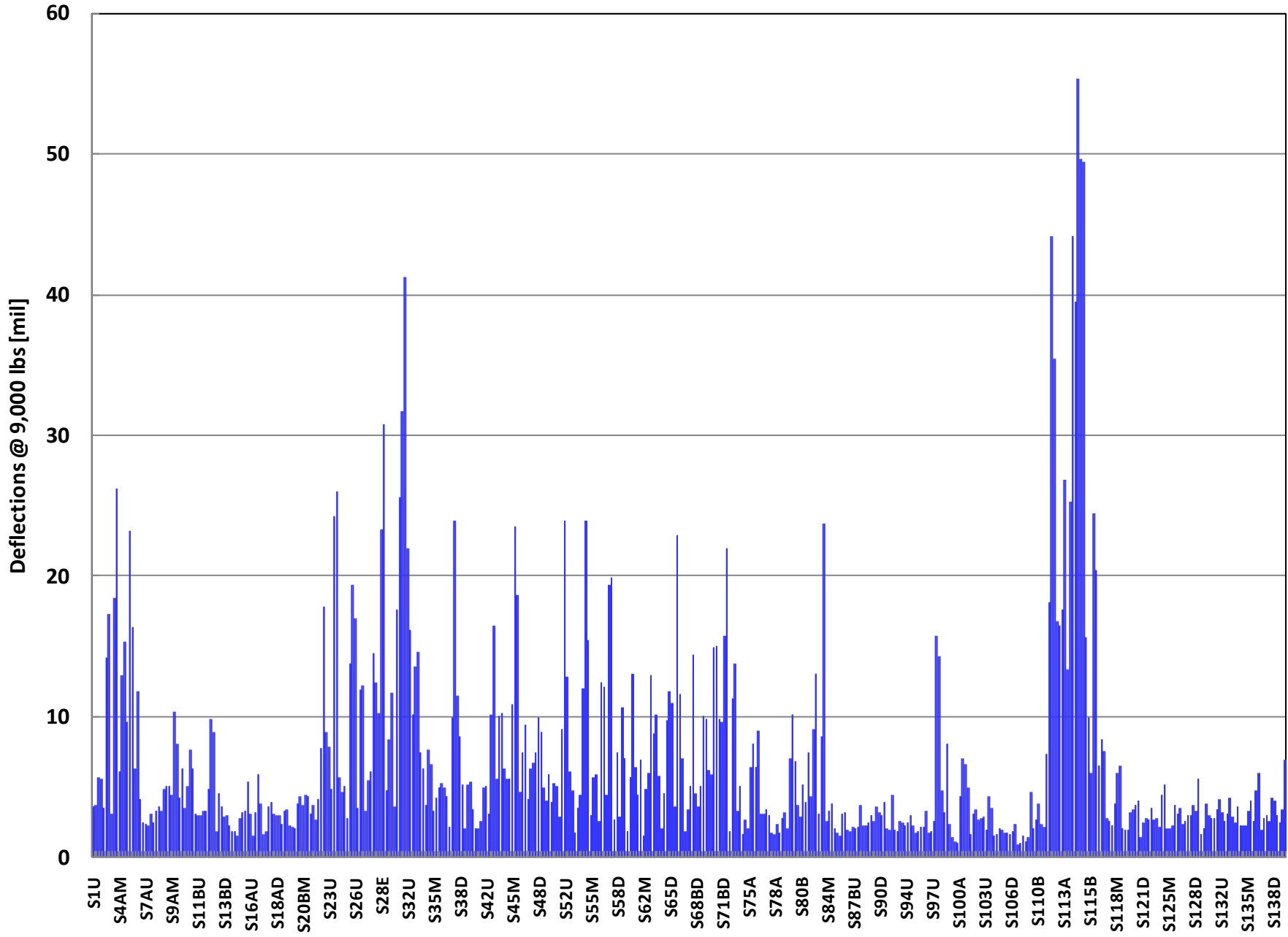


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US75 - South - Start at Exit 64

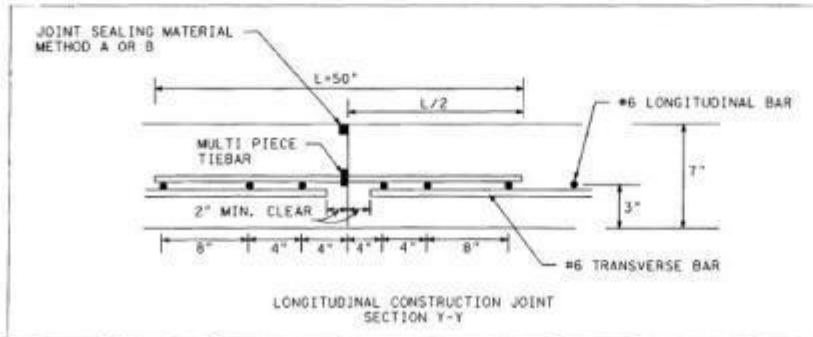
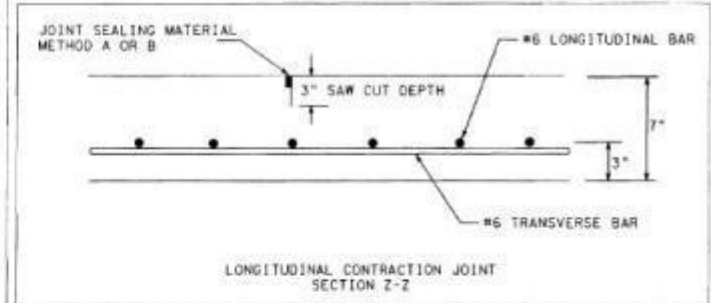
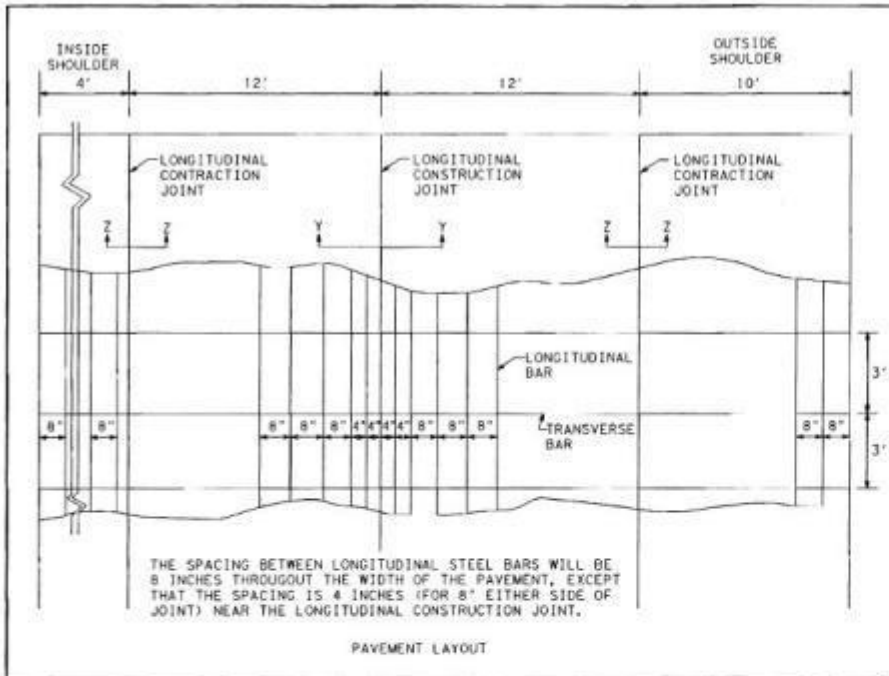




Design & Construction

- Design:
 - O/L slab thickness: 7-in
 - Longitudinal steel: 0.78 %
- Construction:
 - Concrete: Class P concrete
 - Inside lane: May 21, 2010
 - Outside lane: June 21, 2010

CRCP O/L Design Standard



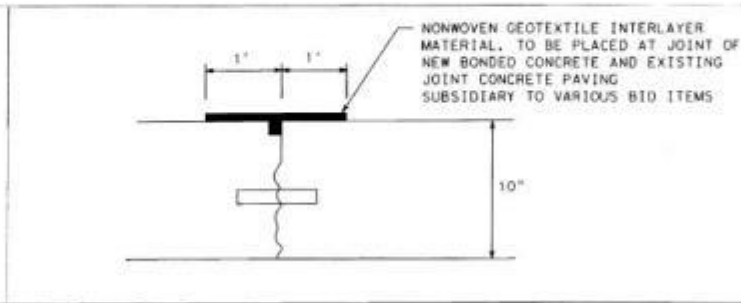
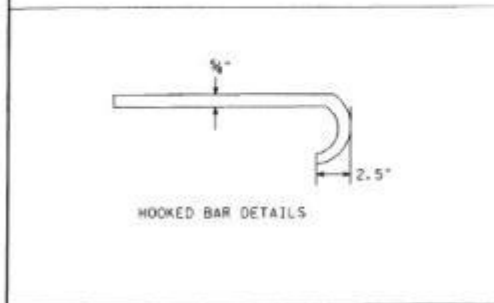
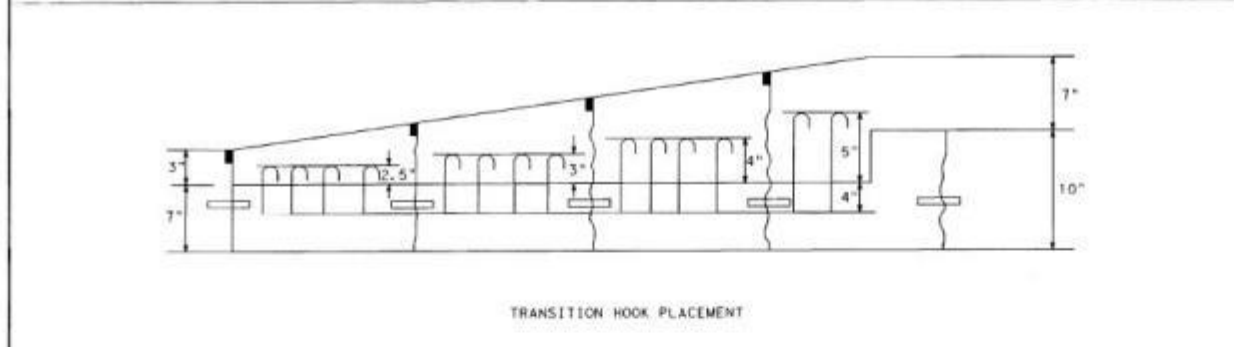
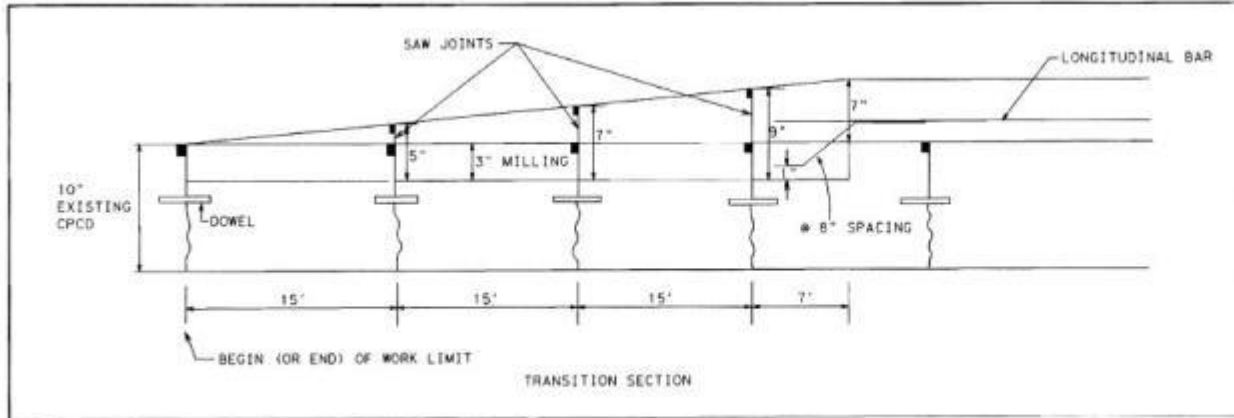
Octavio, P.E.
G-22-09

DETAIL SHEET
SHEET 1 of 2

Texas Department of Transportation
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FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6	IMC 6182-90-001	27
STATE	DIST.	COUNTY
TEXAS	01	GRAYSON
CURT. SECT.	JOB	HIGHWAY NO.
6182	90	001

CRCP O/L Design Standard – Transition Area




Richard L. Rice, P.E.
 6-22-09

**DETAIL SHEET
SHEET 2 of 2**

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P.E. NO. DIV. NO.	PROJECT NO.	SHEET NO.
6	RMC 6182-92-001	28
STATE	DIST.	COUNTY
TEXAS	01	GRAYSON
CONTR.	SECT.	JOB
6182	92	001
		HIGHWAY NO.
		US 75

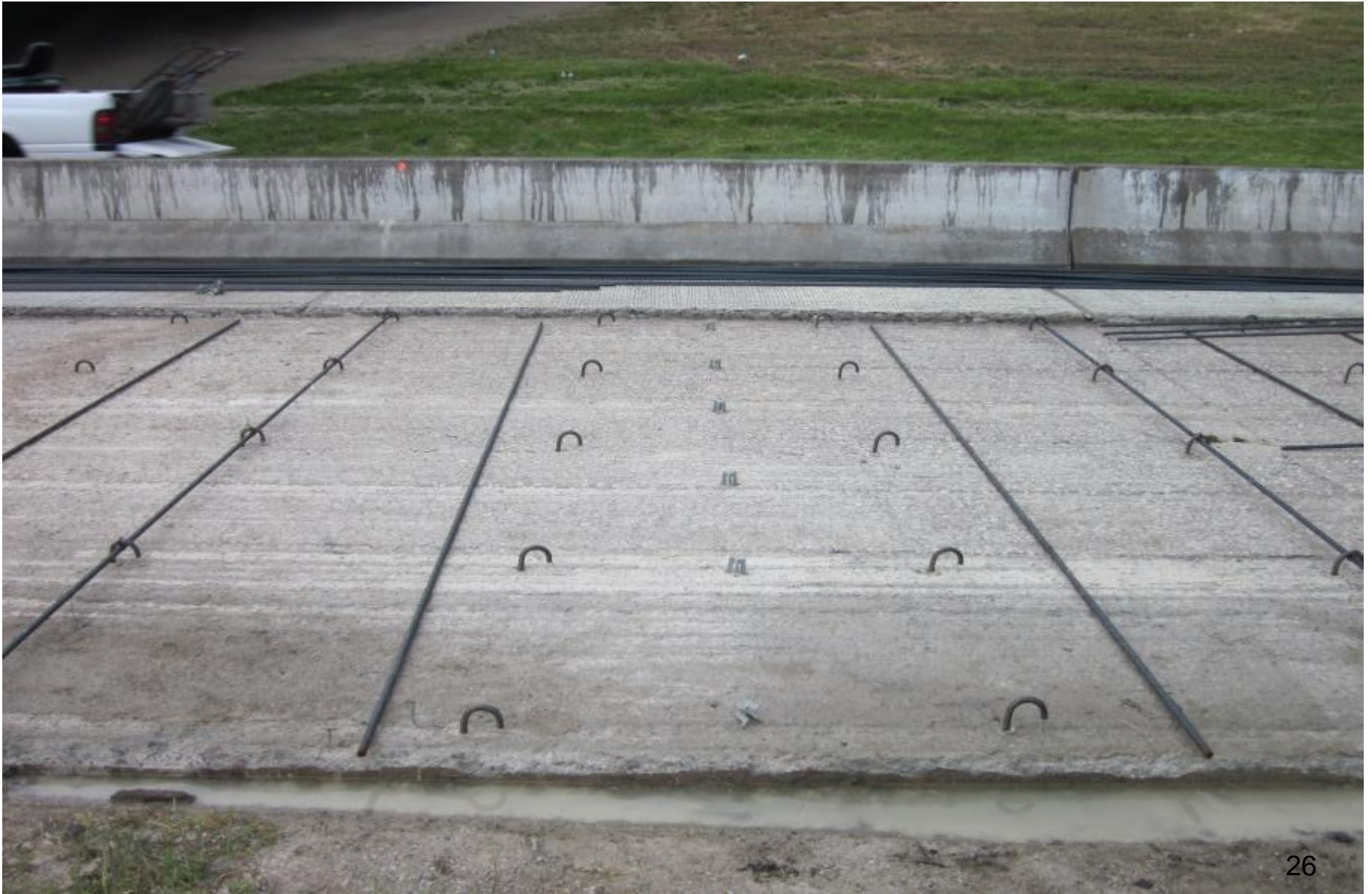
Milling transition sections



Cold Milling



Installing hook bars



Reinforcement in the transition area



Placing Geo-textiles at joint



Installing rebar(2)



Longitudinal steel spacing



Surface Cleaning



Placing Concrete(1)



Placing Concrete(2)



Curing



Longitudinal joint sawcut



Placing wet mats(1)



Placing wet mats(2)





06.15.2010 13:26



06.15.2010 13:28





06/21/2010 04:58



PS 2600
GOMACO
GOMACO

GOMACO
CONCRETE PAVING MACHINE

06/21/2010 04:59



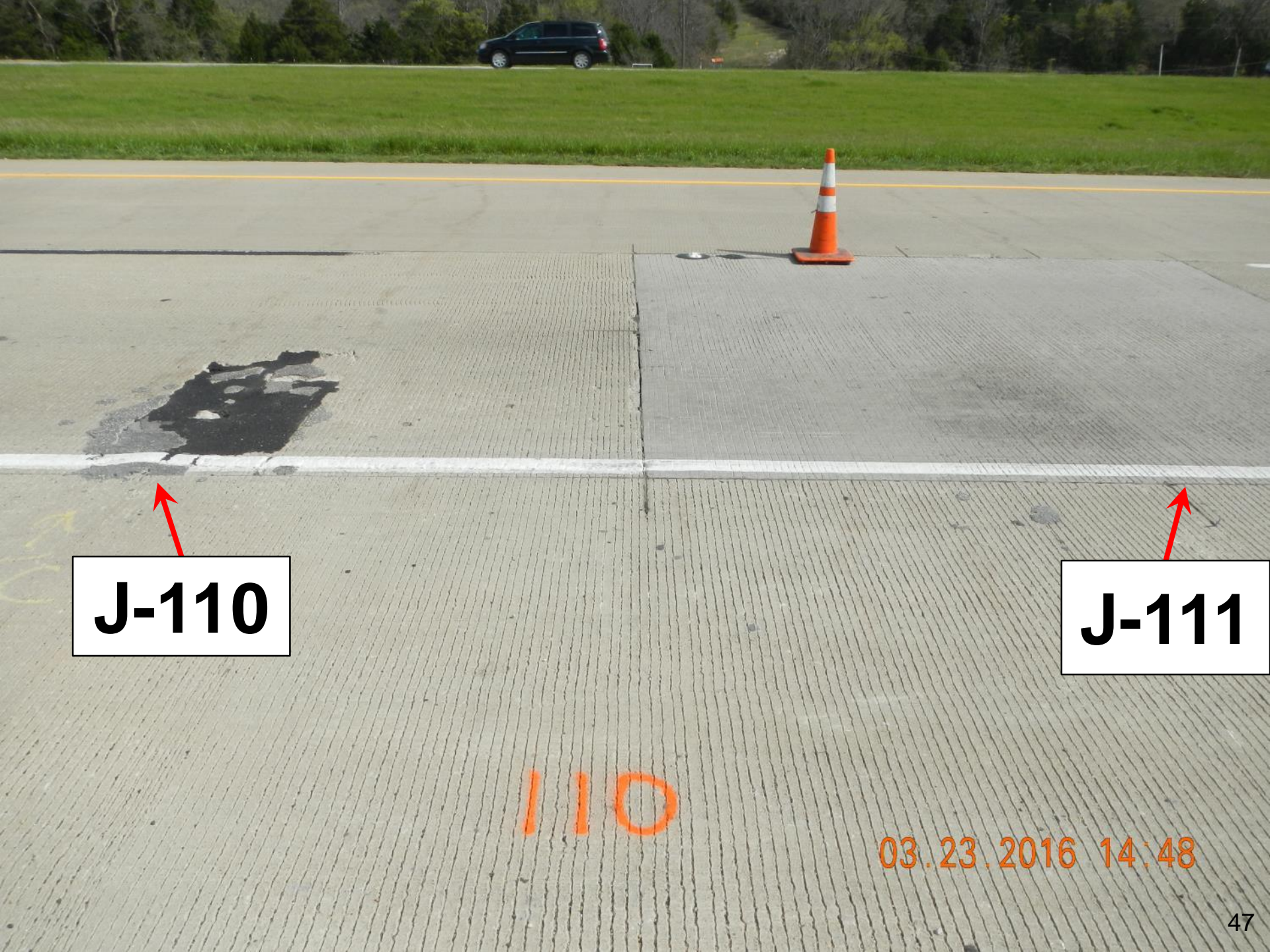


Completed CRCP BCO



Performance Evaluation

- Inside lane: perfect
- Outside lane: distresses at some joints



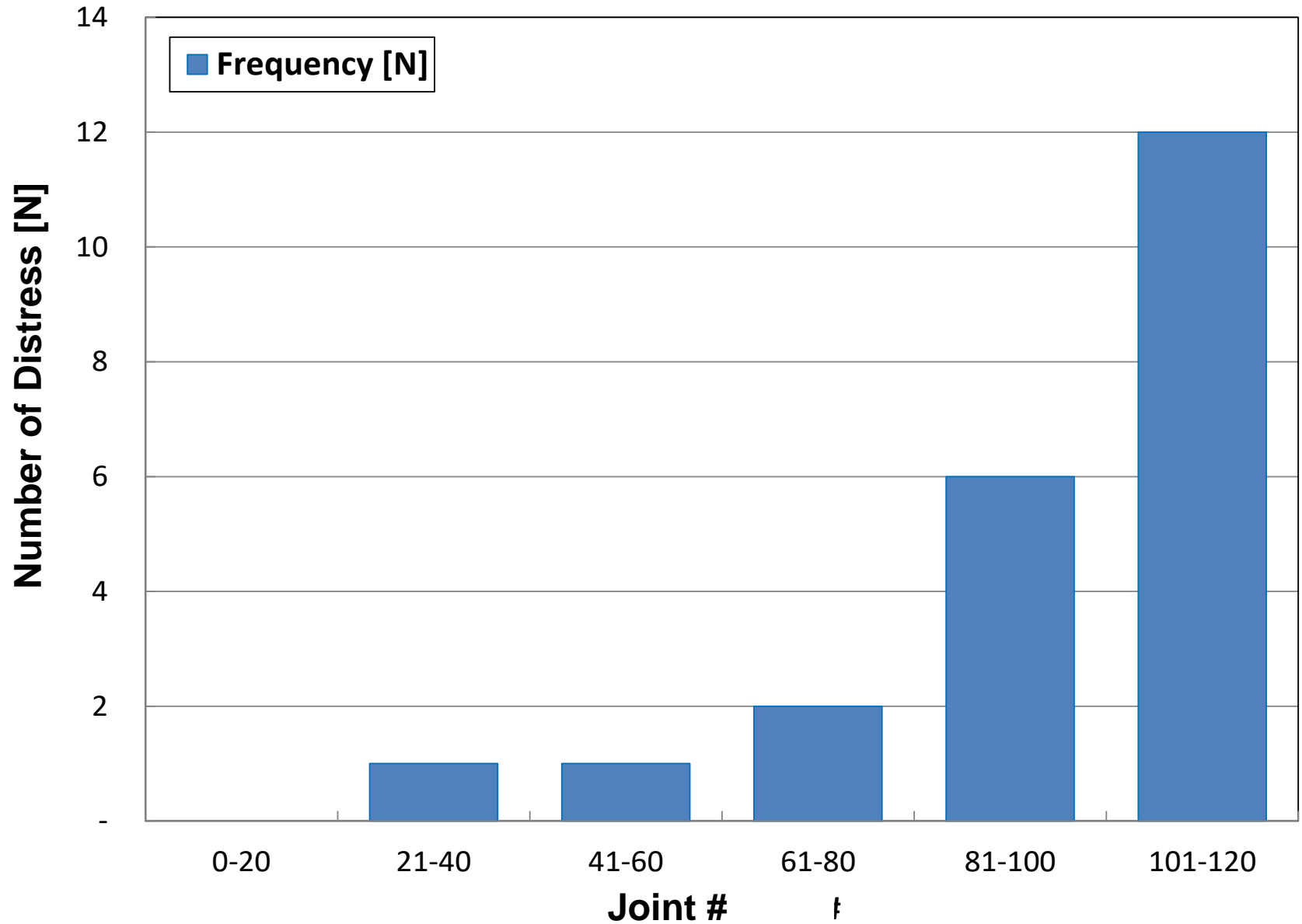
J-110

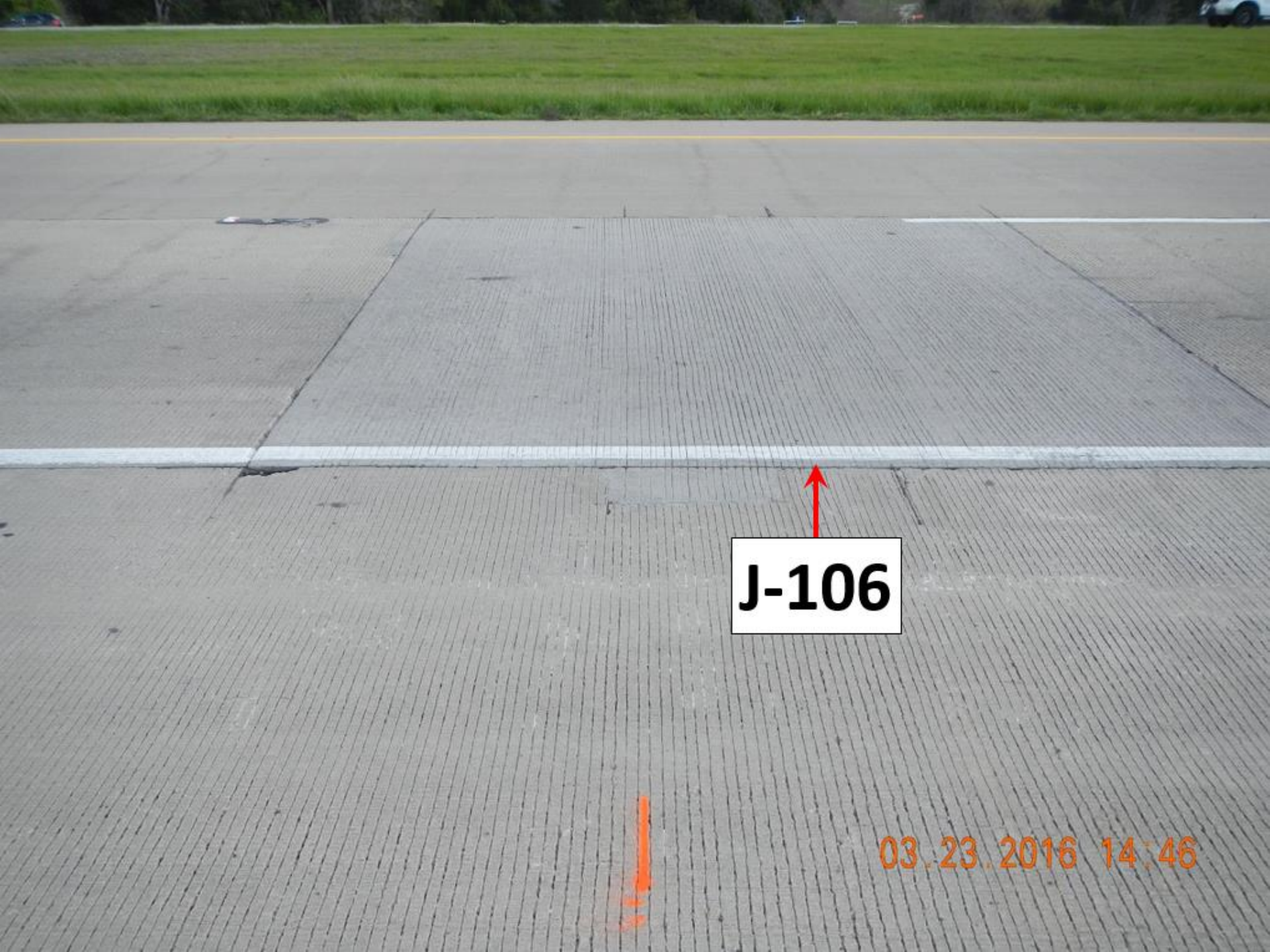
J-111

110

03.23.2016 14:48

Distress in the Outside Lane





J-106

03.23.2016 14:46

Summary & Future Plans

- **Annual Maintenance on US 75: \$1.0 Million**
- **Various Lane Closures: Average 3 months**
- **Cost of Maintenance for next 20 years without inflation: \$20 Million**
- **Road User Cost due to lane closures at current ADT and projected ADT for 20 years: over \$ 70 M**
- **Overlaying with 7” Concrete Overlay for this project limits is ~ \$30 M**

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- **Annual Maintenance on US 75: \$1.0 Million**
- **Various Lane Closures: Average 3 months**
- **Cost of Maintenance for next 20 years without inflation: \$20 Million**
- **Road User Cost due to lane closures at current ADT and projected ADT for 20 years: over \$ 70 M**
- **Overlaying with 7" Concrete Overlay for this project limits is ~ \$30 M**

Summary & Future Plans

- **CRCP Overlay will be placed on US 75 and other deteriorated jointed concrete pavement projects.**
- **Other design modifications will be tried and its behavior will be monitored under new implementation project.**

Thank you.

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