

Final Report

State Study No. 140

Evaluation of E-Krete for Rut Filling

Prepared by:

Randy L. Battey, P.E.

March 2003

Conducted by:

**Research Division
Mississippi Department of Transportation**

**In Cooperation with the
U.S. Department of Transportation
Federal Highway Administration**

Technical Report Documentation Page

1. Report No. FHWA/MS-DOT-RD-03-140	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Evaluation of E-Krete for Rut Filling		5. Report Date March 2003	
		6. Performing Organization Code	
7. Author(s) Randy L. Battey, P.E.		8. Performing Organization Report No. MS-DOT-RD-03-140	
9. Performing Organization Name and Address Mississippi Department of Transportation Research Division P O Box 1850 Jackson MS 39215-1850		10. Work Unit No. (TR AIS)	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address Federal Highway Administration and Mississippi Department of Transportation		13. Type Report and Period Covered Final Report	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract Wheel path rutting in asphalt pavements presents a serious problem for highway agencies worldwide. There are several ways to rehabilitate rutted asphalt pavements, including milling by itself, milling and overlay, overlay without milling, and rut filling. Rut filling with various materials, primarily asphalt based, has been performed for several years. A new material, E-Krete, which is an acrylic and polymer modified cement based material, was evaluated by the Mississippi Department of Transportation (MDOT) for various highway related applications. One application that MDOT evaluated E-Krete for was the filling of wheel ruts in an asphalt pavement. This report will detail the findings of that evaluation.			
17. Key Words Asphalt, rutting, maintenance		18. Distribution Statement Unclassified	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 52	22. Price

Form DOT F 1700.7 (8-72)

Reproduction of completed page authorized

NOTICE

The contents of this report reflect the views of the author, who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the views or policies of the Mississippi Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government and the State of Mississippi assume no liability for its contents or use thereof.

The United States Government and the State of Mississippi do not endorse products or manufacturers. Trade or manufacturer's names appear herein solely because they are considered essential to the object of this report.

ACKNOWLEDGMENTS

The study reported herein was conducted by the Mississippi Department of Transportation (MDOT) under the sponsorship of the Federal Highway Administration, Mississippi Division Office. This work was accomplished during the period of August 1999 through April 2003 under the supervision of Ms. Joy F. Portera, P.E., State Research Engineer followed by Mr. Randy L. Battey, P.E., State Research Engineer. This report was prepared by Mr. Randy L. Battey, P.E. of MDOT's Research Division.

The author wishes to express his appreciation to the many people whose efforts contributed to the success of this study. Acknowledgment is made to Messrs. John W. Avent, S.C.E.T., Johnny L. Hart, S.C.E.T., Alan D. Hatch, S.C.E.T., Chester M. Drake, C.E.T., and Sammie D. Evans who assisted with the construction documentation and data collection.

During the period of this study, the Executive Director of MDOT was Mr. Hugh Long, P.E., followed by Mr. Larry "Butch" Brown. The Deputy Executive Director / Chief Engineer was Mr. James Kopf, P.E., followed by Mr. Harry Lee James, P.E.

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
Chapter 1 – Project Introduction	1
Chapter 2 – Initial Trial at Winona, MS	2
Chapter 3 – Detailed Project Trial near Flora, MS	5
Chapter 4 – Performance	13
Chapter 5 – Conclusions	19
Appendix A – Pavement Management Data I-55 @ Winona	
Appendix B – Pavement Management Data U.S. 49 Near Flora	
Appendix C – Rut Data From U.S. 49 Evaluation	
Appendix D – Crack Mapping From U.S. 49 Evaluation	
Appendix E – Cost For U.S. 49 Evaluation	

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Initial project location	2
2. E-Krete evaluation section near Winona, MS	3
3. Patches and delamination in Winona test site	4
4. Close-up of delaminated area	4
5. Second E-Krete trial project location	5
6. Project location near Flora, MS prior to E-Krete application	6
7. Priming of the asphalt surface with the liquid solution component of E-Krete's three part system	7
8. 4 foot wide screed for initial application of E-Krete	8
9. Transverse crack at a screed stoppage during previous days pour	8
10. Broadcasting of Georgia granite on fresh E-Krete for skid resistance	9
11. Second day of construction utilizing two mortar mixers	10
12. 10'-6" screed utilized for the final surface application	11
13. Using squeegees to distribute E-Krete ahead of the 10'-6" screed	12
14. Completed E-Krete application	12
15. Friction Data	13
16. Graphical representation of average skid number (Red = Section 1, Blue = Section 2)	14
17. Manual Rut Measurement	15
18. percent of rutting when compared to baseline measurements that were taken prior to E-Krete application	16

LIST OF FIGURES (Continued)

	<u>Figure</u>	<u>Page</u>
19.	Delamination in multiple application with priming area approximately one year after E-Krete application	17
20.	Cracking in E-Krete approximately three months after application	17
21.	Wearing of E-Krete after one year	18

Chapter 1 – Project Introduction

This report will focus on a product known as E-Krete and its performance in the rehabilitation of wheel path rutting in flexible pavements. E-Krete is an acrylic and polymer modified concrete mix that is manufactured in Mississippi by Polycon, Incorporated.

E-Krete is a “three part system” that combines a liquid solution, cementitious dry mix and small aggregate. The liquid solution contains Polycon’s additives for hardening and bonding. Some aggregates are added for skid resistance and other material properties.

Wheel path deformation (rutting) is an undesirable distress associated with flexible pavement systems. This form of distress is especially dangerous for the traveling public during wet weather events.

In an attempt to preserve the condition of asphalt pavements, a cost effective maintenance treatment for rutted pavements is needed. With this in mind, the Mississippi Department of Transportation (MDOT) evaluated E-Krete as a treatment for wheel path rutting.

Chapter 2 – Initial Trial at Winona

In August of 1999, as part of MDOT’s product evaluation functions, a 375-foot test section of E-Krete was installed at no cost to the Department, in a severely rutted section of the outside lane on Interstate 55 Northbound in Montgomery County near Winona, Mississippi.

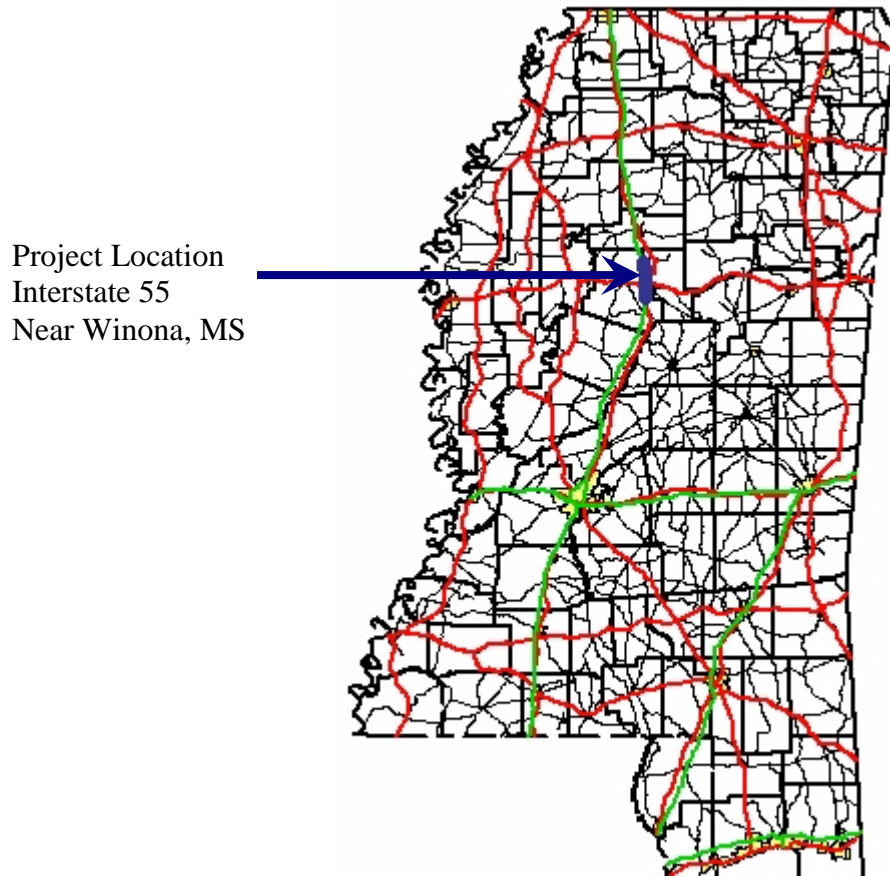


Figure 1 – Initial project location

The rutting in this 375 foot section of Interstate 55, averaged approximately 0.5 inches in depth as measured by the Departmental high speed profiler utilizing a three point laser system for rut depth. A complete condition report for this section of Interstate 55 can be found in Appendix A. Traffic levels on this section of I-55 equal approximately 1,100,000 18k ESALs annually with a design ADT of 14,000.

For this test location, E-Krete was placed only in each wheel path (See Figure 2).



Figure 2 – E-Krete evaluation section near Winona, MS

Approximately one month after the application of E-Krete, delaminations of the product from the existing asphalt began to occur. In addition to the delamination, approximately forty (40) transverse cracks were observed throughout the section. MDOT required the contractor on numerous occasions throughout the life of the project to repair areas throughout the test section.

In October of 2000, MDOT let an overlay project to contract which required the removal of this initial test section.



Figure 3 – Patches and delamination in Winona test site



Figure 4 – Close-up of delaminated area

Chapter 3 – Detailed Project Trial Near Flora, MS

After the failure of the initial E-Krete test section near Winona, MS., the manufacturer of the product, Polycon Inc., approached MDOT to request a second trial. Polycon blamed the failure of the initial application on materials, labor, and inadequate construction practices. Polycon convinced the Department that the necessary adjustments to the product and workforce had been made to insure a more representative product evaluation during the second trial.

To facilitate a more detailed evaluation, MDOT decided to perform the project through its Research Division and utilize State Planning & Research (SP&R) funding for the trial. The Research Division received approval from MDOT’s Research Advisory Committee to perform the research and in September of 2000, the second evaluation of E-Krete for rut filling began as MDOT State Study Number 140, “Evaluation of E-Krete for Rut Filling”.

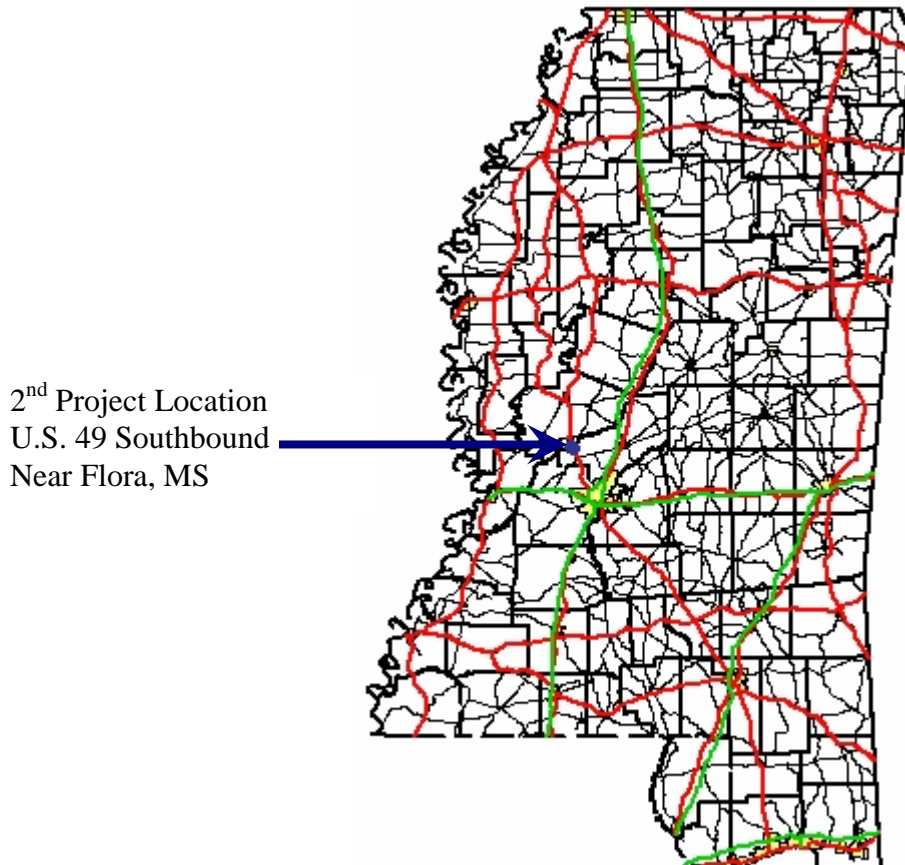


Figure 5 – Second E-Krete trial project location

MDOT chose a moderately rutted section of U.S. 49 Southbound in Madison County near Flora, Mississippi for this detailed evaluation. The average annual traffic loading for this site is approximately 300,000 18K ESALs with an ADT of approximately 10,000. The average preconstruction rutting throughout the test section measured approximately 0.25". Preconstruction measurements to quantify the pavement condition were taken and can be found in Appendix C.



Figure 6 – Project location near Flora, MS prior to E-Krete application

It was decided that a 500 foot segment of the test section would not have E-crete applied to it and would serve as the control segment for the experiment. Throughout the remaining 1500 feet of the test section, the following application methods would be attempted to determine what construction methodology would provide the highest level of performance:

1. Priming of the asphalt surface followed by multiple applications of E-Krete
2. Multiple applications of E-Krete with no initial surface priming
3. Single lane width application of E-Krete with no initial surface priming

The multiple application method of application would involve an initial 4 foot wide application of E-Krete placed in each wheel path followed by a 10'-6" foot wide application of E-Krete for the final surface.



Figure 7 – Priming of the asphalt surface with the liquid solution component of E-Krete's three part system (liquid, dry mix & aggregate)

On September 14, 2000, construction of the evaluation section began. The contractor, Polycon Inc., elected not to perform any surface cleaning of the existing asphalt surface prior to application of the product. A portion of the test section was primed in the wheel path with the liquid component of the E-Krete system (See Figure 7). During the priming process, the three components (liquid, dry mix & aggregate) of the product were mixed in a mortar mixer. Upon completion of the priming, a 4' wide screed assembly was utilized to apply the E-Krete mixture to the wheel paths (See Figure 8). Production was slow with many starts and stops due to the small amount of E-Krete that could be mixed using the contractor's equipment. These delays caused indentions to be placed transversely by the screed and produced a "weak plane" which led to premature cracking (See Figure 9).



Figure 8 – 4 foot wide screed application for initial application of E-Krete



Figure 9 – Transverse crack at a screed stoppage during the previous days pour



Figure 10 – Broadcasting of Georgia granite on fresh E-Krete for skid resistance

Georgia granite was broadcast behind the screed to improve the skid resistance of the E-Krete surface. This was necessary since traffic would be placed on this lift of E-Krete prior to the application of the final 10'-6" wide surface application.

Production levels were approximately 300 linear feet of wheel path per hour, which was too slow and can be attributed to the contractor's decision to utilize only one mortar mixer. The contractor decided to stop construction at approximately 11:30 am upon completing the initial application of E-Krete to the outside wheel path from Sta. 456+00 to Sta. 450+25. The E-Krete cured for a period of two hours before traffic was allowed to traverse the section.

The contractor began the second day of construction determined to increase his productivity. A second mixer was utilized and as could be expected the productivity doubled to approximately 600 linear feet of wheel path per hour. However, even with



Figure 11 – Second day of construction utilizing two mortar mixers

the increased level of production, the screed was stopping too often to provide a smooth riding surface. During the second day of production, the inside wheel path from Sta. 456+00 to Sta. 450+25 was applied with E-Krete. Before the days activities were completed, the outside wheel path from Sta. 450+25 to Sta 447+75 was also given its initial coat of E-Krete. Once again the E-Krete was allowed to cure for 2 hours before the onset of traffic.

On the final day of construction, the contractor decided to supply a 540 gallon tank for storage of the material. The tank arrived at the project location with a 250 gallon batch of E-Krete that was premixed at Polycon, Inc.

The contractor utilized a 10'-6" screed to pull the entire lane with for the 1500' length of the project. A 10'-6" screed width was utilized to maintain the existing pavement marking materials.



Figure 12 – 10'-6" Screed utilized for the final surface application

Arkansas granite was broadcast on the wet surface of the E-Krete to ensure adequate surface friction. Utilizing the 540 gallon tank provided a production rate of approximately 800 feet of 10'-6" wide E-Krete per hour. This higher rate of production minimized the need to stop the screed and provided a more acceptable final surface.

With the initial 250 gallon batch that was pre-mixed prior to arriving to the project location, the contractor was able to apply a 10'-6" wide application of E-Krete from Sta. 456+00 to Sta. 447+10 (890 feet of production). At Sta. 447+10, a cold joint was formed as the contractor had to wait for another 250 gallon batch to be transported to the project site.

At approximately 1:00 pm, the contractor finished his 10'-6" wide application of E-Krete throughout the entire 1500 foot application area. Once again the E-Krete was allowed to cure for 2 hours before permitting traffic to traverse the test section.



Figure 13 – Using squeegees to distribute E-Krete ahead of the 10'-6" screed



Figure 14 – Completed E-Krete application

Chapter 4 – Performance

Over the two year evaluation period (October 2000 - October 2002), the Research Division monitored the skid resistance, rutting, cracking/delaminations and durability in the E-Krete test section on U.S. 49 in Madison County. The following is a summary of those findings:

Skid Resistance

Concerned that E-Krete may not provide adequate surface friction to ensure the safety of the traveling public, MDOT Research Division periodically measured the skid resistance of the test section throughout the two year evaluation period. The Departmental high speed friction testing system which is designed to meet all of the requirements of ASTM E274-90 “Standard Test Method for Skid Resistance of Paved Surfaces Using a Full-Scale Tire” utilizing a ribbed tire was used for data collection.

For friction data collection purposes, the test section was divided into two separate monitoring areas:

1. Sta. 456+00 to Sta. 450+00 (area of multiple E-Krete applications)
2. Sta. 448+00 to Sta. 441+00 (area of single E-Krete application)

Friction data was collected on nine (9) separate occasions throughout the 2 year evaluation period:

<u>Date</u>	<u>Section 1</u> <u>(Multiple E- krete</u> <u>Applications)</u>			<u>Section 2</u> <u>(Single E- krete</u> <u>Application)</u>		
	<u>High Sn</u>	<u>Low Sn</u>	<u>Avg Sn</u>	<u>High Sn</u>	<u>Low Sn</u>	<u>Avg Sn</u>
9/26/2000	52.5	50.1	51.2	48.2	46.3	47
11/9/2000	50.4	48.1	49.1	47.2	43.5	45.7
1/30/2001	51.4	48.3	50.1	46.7	41.1	43.7
3/27/2001	49.4	44.6	47.3	44.9	39.1	41.2
7/18/2001	45.8	43.6	44.9	43	35.4	38.3
10/19/2001	51.5	46.5	48.9	45.5	39.2	41.9
12/14/2001	52.5	49.4	50.9	45.9	40.1	42.5
7/11/2002	46.8	42.9	44.3	41.6	35.9	38.7
10/11/2002	49.3	46.1	47.3	43.1	38.8	40.8

Figure 15 – Friction Data

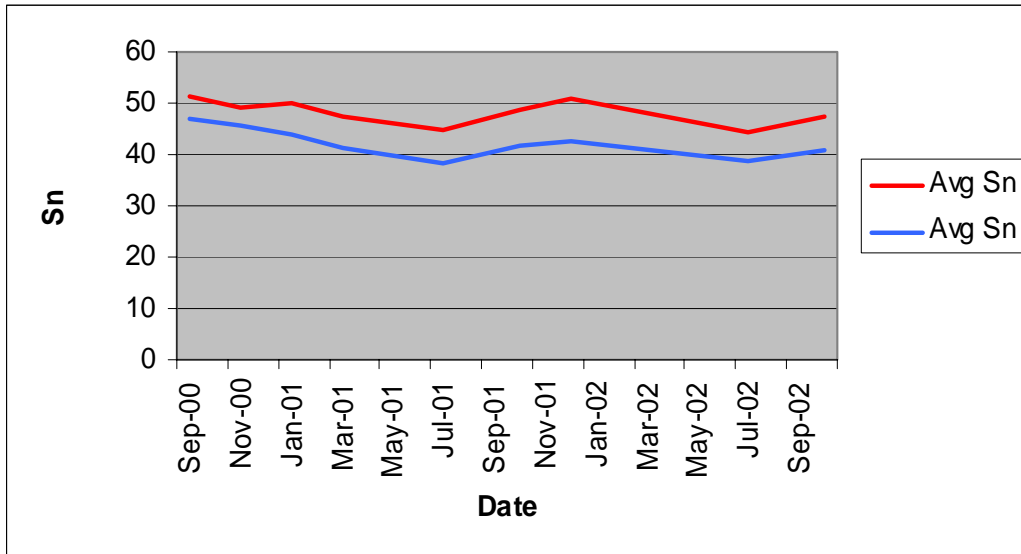


Figure 16 – Graphical Representation of Average Skid Number (Red = Section 1, Blue = Section 2)

On each of the nine (9) test dates, no less than five (5) skid readings were taken from each of the two monitoring areas. Figure 15 shows the low, high and average value of the five (5) reading taken on each section.

MDOT’s policy on friction is to maintain a skid number of thirty-five (35) or greater on all of our pavements to ensure the safety of the traveling public. The skid results from the E-Krete test section on U.S. 49 in Madison County never fell below the required thirty-five (35), however test section #2 (single E-Krete application) did approach the minimum requirement on multiple occasions. Test section #1 (multiple E-Krete applications) consistently yielded higher skid numbers than did test section #2 (single E-Krete application).

Rutting

Since the primary purpose of E-Krete used in this application is a maintenance treatment for rutting in asphalt pavements, MDOT was interested in determining over the two year evaluation period the effectiveness of E-Krete in the elimination of wheel path rutting. For the data collection with respect to rutting, the test section was divided into the following four separate analysis sections:

1. Left Wheel Path - Sta. 461+00 to 456+00
Right Wheel Path – Sta. 461+00 to 456+00
(Control Section – No E-Krete)
2. Left Wheel Path - Sta. 456+00 to 455+75
Right Wheel Path – Sta. 456+00 to 451+50
(Multiple E-Krete Application with Initial Asphalt Surface Priming)
3. Left Wheel Path - Sta. 455+75 to 449+75
Right Wheel Path – Sta. 451+50 to 448+00
(Multiple E-Krete Application with No Asphalt Surface Priming)
4. Left Wheel Path - Sta. 449+75 to 441+00
Right Wheel Path – Sta. 448+00 to 441+00
(Single E-Krete Application with No Asphalt Surface Priming)

Over the two year evaluation period, rut measurements were taken on four separate occasions. The initial rut measurement was taken prior to the application of the E-Krete to establish a “base-line” for comparison throughout the study. Rut measurements were also taken at the approximate one year, one and one-half year and two year intervals.



Figure 17 – Manual Rut Measurement

Rut measurements were taken at twenty-five foot intervals in each wheel path throughout the entire 2000' evaluation section. The entire rut data set measured in sixteenths of an inch can be found in Appendix C. Below is a summary of the rut measurements over the two year evaluation period:

<u>Section</u>	<u>12/10/2001</u>	<u>7/11/2002</u>	<u>10/11/2002</u>
#1 Control (No E-Krete)	119%	146%	150%
#2 Multiple Application w/prime	49%	55%	60%
#3 Multiple Application no prime	55%	59%	68%
#4 Single Application no prime	103%	123%	129%

Figure 18 - percent of rutting when compared to baseline measurements that were taken prior to E-Krete application

Figure 18 compares the total rut measurement for an evaluation section at the approximate one year, one and one-half year and two year increments with the pre-existing rut data for each section that was collected prior to the E-Krete application. For example, after approximately one year the control section had 119% of the rutting that it had the year earlier and the single application section exhibited 103% of the rutting that was present prior to the evaluation. In other words, it took approximately one year for all of the rutting in section #4 to return.

Cracking/Delamination

Given the performance of the initial E-Krete trial on Interstate 55 near Winona, MS, MDOT was interested in determining if the U.S. 49 test in Madison County would suffer a similar fate. Approximately one year after the application of E-Krete, MDOT surveyed the entire evaluation section for cracking. Appendix D contains the results of that survey.

In addition to excessive cracking throughout the evaluation section, there were several areas of delamination that concerned the Department. Even though the magnitude of delamination was not as great as was observed on the Interstate 55 section near Winona, MS, MDOT was still not satisfied with the results.



Figure 19 – Delamination in multiple application with priming area approximately one year after E-Krete application



Figure 20 – Cracking in E-Krete approximately three months after application

Durability

Over the two year evaluation period, the E-Krete appeared to wear throughout the entire test section. This was not limited to, but most prominently apparent in the “Single Application-No Priming” analysis section. An analysis of the rut data would support this observation, since within a year of application, the ruts had returned to pre-E-crete application levels in the single application section. Therefore, one could conclude that the durability of E-Krete is not adequate for this particular application.



Figure 21 – Wearing of E-Krete after one year

Chapter 5 – Conclusions

Rutting in flexible pavements continues to pose a maintenance problem for State Transportation Agencies nationwide. This distress if left unchecked can lead to unsafe travel conditions on an agencies network of pavements. With this in mind, the Mississippi Department of Transportation (MDOT) is continually seeking solutions to rutting in flexible pavements. Great strides in this area have been made with the advent of Superpave asphalt mixes; however there are many pre-Superpave mix designs still in service that require attention due to wheel path rutting.

Hopeful of finding a solution, MDOT evaluated E-Krete as a rut repair material. E-Krete is a material that exhibits many of the properties of a Portland cement concrete, and is therefore an excellent material for the repair of concrete spalling. However, the rigidity exhibited by E-Krete prevents it from maintaining a long-term bond when applied in a thin lift to a flexible material. This ultimately leads to cracking and delamination as evidenced in MDOT's two trial sections on Interstate 55 near Winona, MS. and U.S. 49 near Flora, MS.

Additionally, E-Krete did not exhibit the durability properties that would result in the desired long-term performance. Rutting returned within a year in the single application analysis section which leads one to question the durability of the material.

Another observation is that the lack of automated equipment to place the material contributed to premature cracking and poor ride quality due to unnecessary starting and stopping and a lack of a consistent application speed when using a manually pulled screed. A more automated construction method would undoubtedly improve the final product.

Finally, the cost of E-Krete is approximately double the cost of a conventional 1.5" asphalt overlay. Economically it appears that E-Krete is not feasible for this application.

It should be pointed out that MDOT has evaluated E-Krete for the following three separate applications:

- Concrete Spall Repair
- Bridge Deck Sealant
- Rut Repair

Of these three applications, E-Krete has only gained Departmental approval as a concrete spall repair material based on E-Krete's performance in MDOT State Study No. 139 – "Evaluation of E-Krete and ReSurf II IV for Concrete Spall Repair" (Available MDOT Document FHWA/MS-DOT-RD-00-139).

Low friction properties of the material and ride quality issues led to the disapproval of E-Krete as a bridge deck sealant.

Unfortunately, based on the results contained in this report, MDOT does not believe that E-Krete is suited for the application of rut repair. E-Krete was ultimately disapproved for utilization on flexible pavements by MDOT in October of 2002.

APPENDIX A

**PAVEMENT MANAGEMENT DATA
I-55 NORTHBOUND AT WINONA, MS**

Mississippi Department of Transportation
Transportation Management Information System
RDD680 Report

Date: 03/24/2003
Time: 09:30:54

Analysis Section ID: 2369

County: Montgomery (49)	Begin Distance: 4.223 mi	DDA: N	Federal Functional Class:
Route: 55	End Distance: 11.582 mi	District: 2	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 7.367 mi	
Structure Number: 600	Total Number of Lanes: 4	Measured Length: 7.359 mi	
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 8.0 ft / 2.40 m		
	Right Shoulder Width: 12.0 ft / 3.60 m		
Begin Station No.: 320+00	Begin Latitude: 33.477036	Begin Longitude: -89.763885	
End Station No.: 700+00	End Latitude: 33.562574	End Longitude: -89.775551	
Begin Landmark: + 0.5 Mile South U.S. 82			
End Landmark: + 2.5 Miles South Carroll/Montgomery Co. Line			
Memo:			

Lanes		Landmarks	
Lane	Width	Landmark	Landmark Offset (mi)
01 - Lane One	12.0 ft / 3.60 m	US 82	4.863
02 - Lane Two	12.0 ft / 3.60 m		

Original Construction

Completion Date: 01/01/1966	Total Number of Layers: 4	Edge Drain: N			
Project Number: P2369	Total Thickness of Structure: 24.50 in	Structure Removed: N			
Project Detail Number: 1	Soil Type: G30 - A-6, A-7, Clay Soils	Historical Project #: I-IG-3(23)182			
Layer	Thickness (in)	Material Type	Material Property 1	Material Property 2	Material Property 3
1	8	F60 - Lime Treated Material	4.5%		
2	8	F20 - Clay Gravel			
3	6.5	E30 - Asphalt Treated	5.5%	STAB-1700	
4	4	D30 - Orgnl Surface AC Surface	4.5%	STAB-2150	

Overlay/Resurfacing/Rehabilitations

Overlay Number: 1	Milling Thickness: 4.00 in	Preve Fabric: N		
Project Number: 102322	Rehab Thickness: 0.00 in	Edge Drain: N		
Project Detail Number: 301000	Resurfacing Type: 50 - ACP	% of Surface Area: 0		
Date Updated:	Rehab Type: 0 - N/A			
Completion Date: 02/19/2002	Historical Project #: 99-0055-03-074			
Layer	Material Type	Material Property 1	Material Property 2	Thickness (in)
1	HT19mm	3.5696	PG76-22	3.25
2	HT12.5mm	4.3296	PG76-22	1.75

**Mississippi Department of Transportation
Transportation Management Information System**

Date: 03/24/2003

Time: 09:38:04

RDD680 Report

Analysis Section ID: 2389

County: Montgomery [48]	Begin Distance: 4.223 mi	DDA: N	Federal Functional Class:
Route: 55	End Distance: 11.582 mi	District: 2	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 7.357 mi	
Structure Number: 600	Total Number of Lanes: 4	Measured Length: 7.350 mi	
Divided Highway: Y	Total Lane Width: 34.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 8.0 ft / 2.40 m		
	Right Shoulder Width: 12.0 ft / 3.60 m		
Begin Station No.: 320+00	Begin Latitude: 33.477006	Begin Longitude: -89.763885	
End Station No.: 700+00	End Latitude: 33.582874	End Longitude: -89.775551	
Begin Landmark: + 0.5 Mile South U.S. 82			
End Landmark: + 2.5 Miles South Carroll/Montgomery Co Line			
Memo:			

Overlay/Resurfacing/Rehabilitations (continued...)

Overlay Number: 2	Milling Thickness: 4.00 in	Pave Fabric: N		
Project Number: P10101	Rehab Thickness: 0.00 in	Edge Drain: N		
Project Detail Number: 1	Resurfacing Type: 50 - ACP	% of Surface Area: 0		
Date Updated: 08/24/1992	Rehab Type: 0 - N/A			
Completion Date: 04/01/1991	Historical Project #: 54-0055-03-054-10			
Layer	Material Type	Material Property 1	Material Property 2	Thickness (in)
1	BC-1	5.9%	STAB-1700	1.50
2	SC-1	8.1%	STAB-1500	1.50
Overlay Number: 3	Milling Thickness: 0.00 in	Pave Fabric: N		
Project Number: P0554	Rehab Thickness: 0.00 in	Edge Drain: N		
Project Detail Number: 1	Resurfacing Type: 30 - ACP 65BST or ACP & Slurry	% of Surface Area: 0		
Date Updated: 08/24/1992	Rehab Type: 0 - N/A			
Completion Date: 12/01/1983	Historical Project #: IR-55-3(47)182			
Layer	Material Type	Material Property 1	Material Property 2	Thickness (in)
1	BC-1	4.3%		1.00
2	SC-2	6.4%		1.00
3	CRS2			0.37

Mississippi Department of Transportation
Transportation Management Information System
RDD680 Report

Date: 03/24/2003
 Time: 09:30:04

Analysis Section ID: 2309

County: Montgomery [49]	Begin Distance: 4.223 mi	DDA: N	Federal Functional Class:
Route: 55	End Distance: 11.502 mi	District: 2	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 7.367 mi	
Structure Number: 6.00	Total Number of Lanes: 4	Measured Length: 7.359 mi	
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 8.0 ft / 2.40 m		
	Right Shoulder Width: 12.0 ft / 3.60 m		
Begin Station No.: 320+00	Begin Latitude: 33.477036	Begin Longitude: -89.763885	
End Station No.: 709+00	End Latitude: 33.582874	End Longitude: -89.770501	
Begin Landmark: + 0.5 Mile South U.S. 82			
End Landmark: + 2.5 Miles South Carroll/Montgomery Co Line			
Memo:			

Roadway Condition

Data Orientation: F	Roughness Rating: 58	Left Texture Number: 0.00
Year Data Collected: 1991	Distress Rating: 97	Center Texture Number: 0.00
Survey Date: 08/15/1991	Pavement Condition Rating: 88	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 208	Start Video Frame: 00:19:34.03	End Video Frame: 00:27:21.04
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 68.43 (in/mi)	Rutting Average: 0.16 in	Faulting Average:
Low: 0% 0 <= x <= 100	Low: 0% 0.13 <= x <= 0.250	Low:
Medium: 0% 100 < x <= 150	Medium: 0% 0.25 < x <= 0.500	Medium:
High: 0% x > 150	High: 0% x > 0.500	High:
Data Orientation: F	Roughness Rating: 77	Left Texture Number: 0.04
Year Data Collected: 1993	Distress Rating: 93	Center Texture Number: 0.04
Survey Date: 03/11/1993	Pavement Condition Rating: 82	Right Texture Number: 0.04
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 235	Start Video Frame: 00:00:00.00	End Video Frame: 00:00:00.00
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 91.24 (in/mi)	Rutting Average: 0.32 in	Faulting Average:
Low: 82% 0 <= x <= 100	Low: 13% 0.13 <= x <= 0.250	Low:
Medium: 23% 100 < x <= 150	Medium: 79% 0.25 < x <= 0.500	Medium:
High: 7% x > 150	High: 2% x > 0.500	High:

**Mississippi Department of Transportation
Transportation Management Information System**

Date: 03/24/2003
Time: 09:30:04

RDD680 Report Analysis Section ID: 2369

County: Montgomery [48]	Begin Distance: 4.223 mi	DOA: N	Federal Functional Class:
Route: 55	End Distance: 11.582 mi	District: 2	National Highway System: Y

Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 7.367 mi
Structure Number: 6.00	Total Number of Lanes: 4	Measured Length: 7.359 mi
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N
	Left Shoulder Width: 8.0 ft / 2.40 m	
	Right Shoulder Width: 12.0 ft / 3.60 m	

Begin Station No.: 320+00	Begin Latitude: 33.477036	Begin Longitude: -89.763865
End Station No.: 709+00	End Latitude: 33.502674	End Longitude: -89.775551
Begin Landmark: + 0.5 Miles South U.S. 82		
End Landmark: + 2.5 Miles South Carroll/Montgomery Co Line		

Memo:

Roadway Condition (continued...)

Data Orientation: F	Roughness Rating: 79	Left Texture Number: 0.04
Year Data Collected: 1995	Distress Rating: 100	Center Texture Number: 0.00
Survey Date: 06/08/1995	Pavement Condition Rating: 90	Right Texture Number: 0.04
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 208	Start Video Frame: 01:22:24.27	End Video Frame: 01:30:07.22
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 50.47 (in/mi)	Rutting Average: 0.30 in	Faulting Average:
Low: 79 % 0 <= x <= 100	Low: 4 % 0.13 <= x <= 0.250	Low:
Medium: 15 % 100 < x <= 150	Medium: 97 % 0.25 < x <= 0.500	Medium:
High: 4 % x > 150	High: 7 % x > 0.500	High:

Data Orientation: F	Roughness Rating: 82	Left Texture Number: 0.00
Year Data Collected: 1997	Distress Rating: 83	Center Texture Number: 0.00
Survey Date: 02/13/1998	Pavement Condition Rating: 78	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 210	Start Video Frame: 00:18:16.17	End Video Frame: 00:24:33.02
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 70.33 (in/mi)	Rutting Average: 0.46 in	Faulting Average:
Low: 97 % 0 <= x <= 100	Low: 44 % 0.25 <= x <= 0.500	Low:
Medium: 2 % 100 < x <= 200	Medium: 46 % 0.50 < x <= 1.000	Medium:
High: 0 % x > 200	High: 0 % x > 1.000	High:

**Mississippi Department of Transportation
Transportation Management Information System**

Date: 03/24/2003

Time: 09:30:04

RDD680 Report

Analysis Section ID: 2369

County: Montgomery [49]	Begin Distance: 4.223 mi	DDA: N	Federal Functional Class:
Route: 55	End Distance: 11.582 mi	District: 2	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 7.367 mi	
Structure Number: 6.00	Total Number of Lanes: 4	Measured Length: 7.359 mi	
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 8.0 ft / 2.40 m		
	Right Shoulder Width: 12.0 ft / 3.60 m		
Begin Station No.: 320+00	Begin Latitude: 33.477036	Begin Longitude: -89.763885	
End Station No.: 709+00	End Latitude: 33.582874	End Longitude: -89.775551	
Begin Landmark: + 0.5 Mile South U.S. 82			
End Landmark: + 2.5 Miles South Carroll/Montgomery Co.Line			
Memo:			

Roadway Condition (continued...)

Data Orientation: F	Roughness Rating: 75	Left Texture Number: 0.08
Year Data Collected: 2000	Distress Rating: 82	Center Texture Number: 0.04
Survey Date: 05/01/2000	Pavement Condition Rating: 72	Right Texture Number: 0.04
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 203	Start Video Frame: 01:47:44:05	End Video Frame: 01:53:42:09
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 98.84 (in/mi)	Rutting Average: 0.54 in	Faulting Average:
Low: 94 % 0 <= x <= 150	Low: 27 % 0.25 <= x <= 0.500	Low:
Medium: 4 % 150 < x <= 300	Medium: 64 % 0.50 < x <= 1.000	Medium:
High: 1 % x > 300	High: 1 % x > 1.000	High:
Data Orientation: F	Roughness Rating: 81	Left Texture Number: 0.00
Year Data Collected: 2002	Distress Rating: 99	Center Texture Number: 0.00
Survey Date: 11/02/2001	Pavement Condition Rating: 90	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 205	Start Video Frame: 00:36:15:24	End Video Frame: 00:42:55:13
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 75.40 (in/mi)	Rutting Average: 0.03 in	Faulting Average:
Low: 93 % 0 <= x <= 150	Low: 0 % 0.13 <= x <= 0.250	Low:
Medium: 6 % 150 < x <= 300	Medium: 0 % 0.25 < x <= 0.500	Medium:
High: 1 % x > 300	High: 0 % x > 0.500	High:

Deflection

Deflection Data Collected: Average Load: lb

Mississippi Department of Transportation
Transportation Management Information System
RDD680 Report

Date: 03/24/2013
Time: 09:30:54

Analysis Section ID: 2369

County: Montgomery (49)	Begin Distance: 4.227 mi	DDA: N	Federal Functional Class:
Route: 55	End Distance: 11.582 mi	District: 2	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 7.367 mi	
Structure Number: 6.00	Total Number of Lanes: 4	Measured Length: 7.359 mi	
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 6.0 ft / 2.43 m		
	Right Shoulder Width: 12.0 ft / 3.80 m		
Begin Station No.: 320+00	Begin Latitude: 33.477036	Begin Longitude: -89.763865	
End Station No.: 709+00	End Latitude: 33.582674	End Longitude: -89.775551	
Begin Landmark: + 0.5 Mile South U.S. 82			
End Landmark: + 2.5 Miles South Carol/Montgomery Co Line			
Memo:			

	Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5	Sensor 6	Sensor 7
Average Deflection (mils)							
Modulus of Elasticity (ksi)							

***** END OF REPORT *****

Reported Rows: 1 of 36
 Select Criteria: WHERE (v_condition.county_rsnbr = 49 AND v_condition.route_id = '55')

APPENDIX B

PAVEMENT MANAGEMENT DATA
U.S. 49 NEAR FLORA, MS

**Mississippi Department of Transportation
Transportation Management Information System**

Date: 03/24/2002

Time: 09:46:58

RDD680 Report

Analysis Section ID: 1937

County: Madison (45)	Begin Distance: 2.944 mi	DDA: 0	Federal Functional Class:
Route: 48	End Distance: 9.290 mi	District: 5	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 6.370 mi	
Structure Number: 300	Total Number of Lanes: 4	Measured Length: 5.346 mi	
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 3.0 ft / 0.90 m		
	Right Shoulder Width: 8.0 ft / 2.40 m		
Begin Station No.: 867+00	Begin Latitude: 32.603670	Begin Longitude: -90.364993	
End Station No.: 484+86	End Latitude: 32.527068	End Longitude: -90.310554	
Begin Landmark: 2.944 MI N OF Hinds Co Line			
End Landmark: Yazoo Co Line			
Memo: Equation 101B+586x-306+00ah			

Lanes		Landmarks	
Lane	Width	Landmark	Landmark Offset (mi)
01 - Lane One	12.0 ft / 3.60 m	SR22	3.938
02 - Lane Two	12.0 ft / 3.60 m		

Original Construction			
Completion Date: 01/01/1980	Total Number of Layers: 4	Edge Drain: N	
Project Number: P1937	Total Thickness of Structure: 15.00 in	Structure Removed: N	
Project Detail Number: 1	Soil Type: G30 - A-6, A-7, Clay Soils	Historical Project #: 98-0006-03-027-10	

Layer	Thickness (in)	Material Type	Material Property 1	Material Property 2	Material Property 3
1	6	F60 - Lime Treated Material	CLASS C	18.9 LBS	SY
2	4.5	E30 - Asphalt Treated	BB-1		
3	3	D30 - Orgnl Surface AC Surface	BC-1		
4	1.5	D30 - Orgnl Surface AC Surface	SC-1		

Overlay/Resurfacing/Rehabilitations				
Overlay Number: 1	Milling Thickness: 0.00 in	Pave Fabric: N		
Project Number: P9467	Rehab Thickness: 0.00 in	Edge Drain: N		
Project Detail Number: 1	Resurfacing Type: 50 - ACP	% of Surface Area: 0		
Date Updated: 08/24/1992	Rehab Type: 0 - N/A			
Completion Date: 06/01/1987	Historical Project #: 91-3040-45-001-10			
Layer	Material Type	Material Property 1	Material Property 2	Thickness (in)
1	SC-1			1.50

**Mississippi Department of Transportation
Transportation Management Information System**

Date: 03/24/2003

Time: 09:46:58

RDD680 Report

Analysis Section ID: 1937

County: Madison (45)	Begin Distance: 2.944 mi	DDA: S	Federal Functional Class:
Route: 49	End Distance: 9.290 mi	District: 5	National Highway System: Y

Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 6.370 mi
Structure Number: 3.00	Total Number of Lanes: 4	Measured Length: 6.346 mi
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N
	Left Shoulder Width: 3.0 ft / 0.90 m	
	Right Shoulder Width: 6.0 ft / 2.40 m	

Begin Station No.: 867+00	Begin Latitude: 32.603670	Begin Longitude: -90.364693
End Station No.: 484+66	End Latitude: 32.527088	End Longitude: -90.310554
Begin Landmark: 2.944 MI N Of Hinds Co Line		
End Landmark: Yazoo Co Line		
Memo: Equation 1018+596k=306+00ch		

Roadway Condition

Data Orientation: F	Roughness Rating: 82	Left Texture Number: 0.00
Year Data Collected: 1991	Distress Rating: 84	Center Texture Number: 0.00
Survey Date: 09/25/1991	Pavement Condition Rating: 74	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Composite	

Start Tape Set Nbr: 580	Start Video Frame: 01:38:10:18	End Video Frame: 01:44:30:24
End Tape Set Nbr:	Start Video Frame:	End Video Frame:

IRI Average: 89.34 (in/mi)	Rutting Average: 0.22 in	Faulting Average:
Low: 0 % 0 <= x <= 100	Low: 0 % 0.13 <= x <= 0.250	Low:
Medium: 0 % 100 < x <= 150	Medium: 0 % 0.25 < x <= 0.500	Medium:
High: 0 % x > 150	High: 0 % x > 0.500	High:

Data Orientation: F	Roughness Rating: 74	Left Texture Number: 0.04
Year Data Collected: 1993	Distress Rating: 82	Center Texture Number: 0.00
Survey Date: 02/17/1993	Pavement Condition Rating: 78	Right Texture Number: 0.08
Number of Faults:	Survey Pavement Type: Flexible	

Start Tape Set Nbr: 521	Start Video Frame: 00:09:54:13	End Video Frame: 00:16:07:12
End Tape Set Nbr:	Start Video Frame:	End Video Frame:

IRI Average: 102.64 (in/mi)	Rutting Average: 0.24 in	Faulting Average:
Low: 61 % 0 <= x <= 100	Low: 21 % 0.13 <= x <= 0.250	Low:
Medium: 28 % 100 < x <= 150	Medium: 69 % 0.25 < x <= 0.500	Medium:
High: 11 % x > 150	High: 4 % x > 0.500	High:

**Mississippi Department of Transportation
Transportation Management Information System**

Date: 03/24/2003

Time: 09:46:58

RDD680 Report

Analysis Section ID: 1937

County: Madison [45]	Begin Distance: 2.944 mi	DDA: 5	Federal Functional Class:
Route: 49	End Distance: 9.290 mi	District: 5	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 5.370 mi	
Structure Number: 3.00	Total Number of Lanes: 4	Measured Length: 5.345 mi	
Divided Highway: Y	Total Lane Width: 34.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 3.0 ft / 0.90 m		
	Right Shoulder Width: 8.0 ft / 2.40 m		
Begin Station No.: 067+00	Begin Latitude: 32.603970	Begin Longitude: -90.354953	
End Station No.: 484+56	End Latitude: 32.527058	End Longitude: -90.310554	
Begin Landmark: 2.944 Mi N Of Hinds Co Line			
End Landmark: Yazoo Co Line			
Memo: Equation 1018+596m=306+00ah			

Roadway Condition (continued...)

Data Orientation: F	Roughness Rating: 70	Left Texture Number: 0.04
Year Data Collected: 1995	Distress Rating: 64	Center Texture Number: 0.00
Survey Date: 06/03/1995	Pavement Condition Rating: 72	Right Texture Number: 0.05
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 535	Start Video Frame: 01:05:45.22	End Video Frame: 01:12:13.00
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 124.82 (in/mi)	Rutting Average: 0.26 in	Faulting Average:
Low: 45 % 0 <= x <= 150	Low: 35 % 0.13 <= x <= 0.250	Low:
Medium: 30 % 150 < x <= 300	Medium: 45 % 0.25 < x <= 0.500	Medium:
High: 21 % x > 300	High: 3 % x > 0.500	High:
Data Orientation: F	Roughness Rating: 78	Left Texture Number: 0.00
Year Data Collected: 1997	Distress Rating: 99	Center Texture Number: 0.00
Survey Date: 04/10/1998	Pavement Condition Rating: 85	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 537	Start Video Frame: 00:08:56.05	End Video Frame: 00:14:36.05
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 54.27 (in/mi)	Rutting Average: 0.12 in	Faulting Average:
Low: 95 % 0 <= x <= 150	Low: 2 % 0.25 <= x <= 0.500	Low:
Medium: 4 % 150 < x <= 300	Medium: 0 % 0.50 < x <= 1.000	Medium:
High: 0 % x > 300	High: 0 % x > 1.000	High:

Mississippi Department of Transportation
 Transportation Management Information System
 RDD680 Report

Date: 03/24/2003
 Time: 09:48:58

Analysis Section ID: 1937

County: Madison (45)	Begin Distance: 2.944 mi	DDA: S	Federal Functional Class:
Route: 49	End Distance: 9.290 mi	District: 5	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 6.370 mi	
Structure Number: 3.00	Total Number of Lanes: 4	Measured Length: 6.346 mi	
Divided Highway: Y	Total Lane Width: 24.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 3.0 ft / 0.90 m		
	Right Shoulder Width: 6.0 ft / 2.40 m		
Begin Station No.: 007+00	Begin Latitude: 32.603670	Begin Longitude: -90.364503	
End Station No.: 494+00	End Latitude: 32.527060	End Longitude: -90.310554	
Begin Landmark: 2.944 MI N Of Hinds Co Line			
End Landmark: Yazoo Co Line			
Memo: Equation 1018+5964+306+00ab			

Roadway Condition (continued...)

Data Orientation: F	Roughness Rating: 79	Left Texture Number: 0.00
Year Data Collected: 2000	Distress Rating: 97	Center Texture Number: 0.08
Survey Date: 04/05/2000	Pavement Condition Rating: 67	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 535	Start Video Frame: 01:31:58.21	End Video Frame: 01:37:54.22
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 81.10 (in/mi)	Rutting Average: 0.14 in	Faulting Average:
Low: 90 % 0 <= x <= 150	Low: 0 % 0.25 <= x <= 0.500	Low:
Medium: 8 % 150 < x <= 300	Medium: 0 % 0.50 < x <= 1.000	Medium:
High: 2 % x > 300	High: 0 % x > 1.000	High:
Data Orientation: F	Roughness Rating: 74	Left Texture Number: 0.00
Year Data Collected: 2002	Distress Rating: 93	Center Texture Number: 0.00
Survey Date: 01/15/2002	Pavement Condition Rating: 80	Right Texture Number: 0.00
Number of Faults:	Survey Pavement Type: Flexible	
Start Tape Set Nbr: 528	Start Video Frame: 00:19:05.15	End Video Frame: 00:25:01.17
End Tape Set Nbr:	Start Video Frame:	End Video Frame:
IRI Average: 105.81 (in/mi)	Rutting Average: 0.24 in	Faulting Average:
Low: 71 % 0 <= x <= 150	Low: 37 % 0.13 <= x <= 0.250	Low:
Medium: 21 % 150 < x <= 300	Medium: 45 % 0.25 < x <= 0.500	Medium:
High: 8 % x > 300	High: 1 % x > 0.500	High:

Deflection

Deflection Data Collected: Average Load: 8

Mississippi Department of Transportation
 Transportation Management Information System
 RDD680 Report

Date: 03/24/2003
 Time: 09:48:58

Analysis Section ID: 1937

County: Madison (45)	Begin Distance: 2.944 mi	DDA: 5	Federal Functional Class:
Route: 49	End Distance: 9.290 mi	District: 5	National Highway System: Y
Pavement Type: Overlay Flexible	Number of Lanes in Section: 2	Plan Length: 6.370 mi	
Structure Number: 3.00	Total Number of Lanes: 4	Measured Length: 6.346 mi	
Divided Highway: Y	Total Lane Width: 34.0 ft / 7.32 m	Paved Shoulder: N	
	Left Shoulder Width: 3.0 ft / 0.90 m		
	Right Shoulder Width: 6.0 ft / 2.40 m		
Begin Station No.: 867+00	Begin Latitude: 32.603870	Begin Longitude: -90.364690	
End Station No.: 484+95	End Latitude: 32.527068	End Longitude: -90.310654	
Begin Landmark: 2.944 MI N OF HINDS CO LINE			
End Landmark: Yazoo Co Line			
Memo: Equation 1015+586k+305+00ah			

	<u>Sensor 1</u>	<u>Sensor 2</u>	<u>Sensor 3</u>	<u>Sensor 4</u>	<u>Sensor 5</u>	<u>Sensor 6</u>	<u>Sensor 7</u>
Average Deflection (mil)							
	<u>Subgrade</u>	<u>Subbase</u>	<u>Base</u>	<u>Surface</u>			
Modulus of Elasticity (ksi)							

***** END OF REPORT *****

Reported Rows: 1 of 54

Select Criteria: WHERE (v_condition.county_nmbr = 45 AND v_condition.route_id = '49')

APPENDIX C

RUT DATA FROM U.S. 49 EVALUATION

E-KRETE SOUTHBOUND US49 MADISON COUNTY

(Rut Measurements in 16ths of an inch)

Station	PreConstruction Rut Data		12-10-01 Rut Data			07-11-02 Rut Data			10-11-02 Rut Data	
	ISWP	OSWP	ISWP	OSWP		ISWP	OSWP		ISWP	OSWP
461+00	2	1	2	2		4	2		4	2
75	3	2	3	3		4	3		4	3
50	2	2	3	3		3	4		3	4
25	2	3	2	5		3	5		3	5
460+00	3	3	3	4		4	5		4	5
75	2	2	3	4		3	5		3	5
50	1	2	1	3		2	4		2	4
25	2	2	2	2		3	3		3	3
459+00	2	2	3	3	Control	3	4	Control	3	4
75	2	2	2	2	No E-krete	2	3	No E-krete	2	3
50	2	2	2	3		3	5		3	5
25	3	3	3	3		3	4		4	4
458+00	2	4	3	4		3	6		3	6
75	2	5	3	5		3	6		3	6
50	3	5	5	5		5	7		5	7
25	2	4	2	4		3	5		3	5
457+00	2	4	2	5		3	5		3	6
75	2	3	2	5		2	6		3	6
50	3	3	3	5		4	6		4	6
25	3	4	4	5		4	6		5	7
456+00	5	10	3	9		4	10		4	10

Total	50	68	118	56	84	140	1.19	68	104	172	1.46	71	106	177	1.50
75	4	5		3	1	Multiple		2	1	Multiple		2	1	Multiple	
50	3	5		2	1	E-krete		2	2	E-krete		2	2	E-krete	
25	2	6		2	4	Applications		2	3	Applications		2	4	Applications	
455+00	2	5		1	4	w/priming		1	3	w/priming		2	4	w/priming	
75	2	4		2	2			2	3			2	3		
50	2	3		1	0			2	1			2	2		
25	3	5		2	3			1	3			2	3		
454+00	4	4		3	1			3	3			3	3		
75	5	7		3	5			3	6			3	6		
50	7	8		2	4			2	5			3	5		
25	4	8		1	5			2	5			3	5		
453+00	8	5		2	2			2	2			2	2		
75	3	3		1	1			0	1			1	1		
50	3	3		1	1			2	3			2	3		
25	3	5		2	1			1	4			1	4		
452+00	3	4		1	4			2	2			3	2		
75	4	7		3	2			2	2			3	4		
50	3	6		2	4			1	2			1	2		
Total		93	97		45	48	0.49		51	53	0.55		56	58	0.60
25	4	7		1	2			2	3			2	4		
451+00	4	7		2	3	Multiple		2	3	Multiple		2	4	Multiple	
75	4	4		2	4	E-krete		2	2	E-krete		2	3	E-krete	
50	3	6		1	3	Applications		2	4	Applications		2	4	Applications	
25	2	6		1	3	No priming		2	5	No priming		2	5	No priming	
450+00	3	6		1	4			2	3			3	3		
75	3	3		2	3			2	3			2	3		

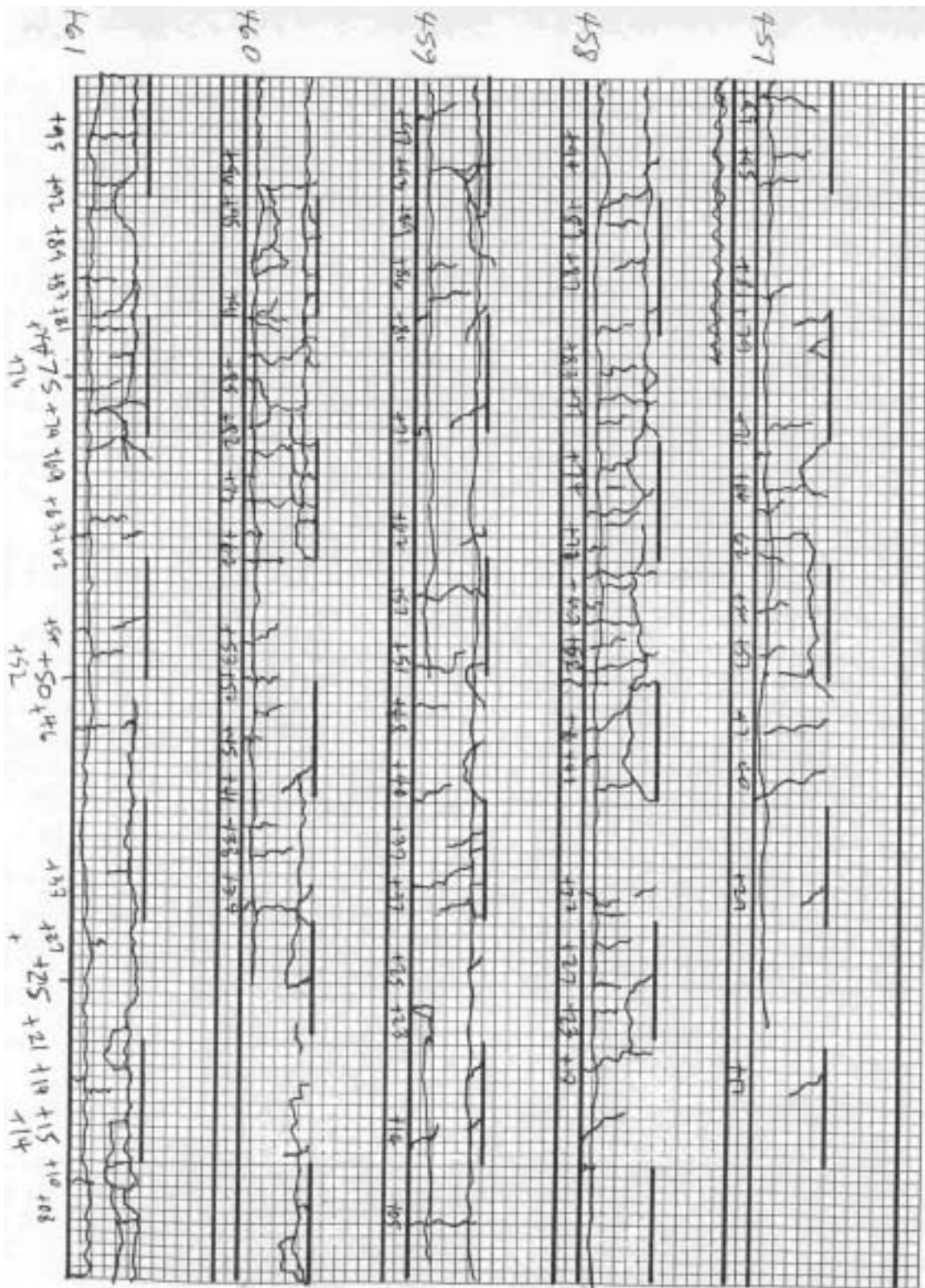
50	3	3		1	3		3	2		3	2				
25	4	6		3	2		5	5		5	5				
449+00	4	3		5	4		4	2		4	2				
75	3	4		3	2		4	3		4	3				
50	4	3		4	3		4	3		4	4				
25	3	3		5	1		5	2		5	2				
448+00	4	3		4	4		5	4		5	4				
Total	84	64	148	41	41	82	0.55	44	44	88	0.59	52	48	100	0.68
75	5	3		4	2		4	3		4	3				
50	4	4		3	3		5	3		5	3				
25	4	3		4	4		4	4		4	4				
447+00	3	4		3	4	Single Application of E-krete	4	5	Single Application of E-krete	5	5	Single Application of E-krete			
75	4	3		3	4	Application of E-krete	4	5	Application of E-krete	4	5	Application of E-krete			
50	5	5		5	5	No priming	6	6	No priming	6	6	No priming			
25	4	4		4	4		5	6	No priming	5	6	No priming			
446+00	5	4		4	5		6	6		6	6				
75	5	5		5	5		5	6		5	6				
50	5	5		4	5		5	6		5	6				
25	5	7		5	5		5	7		6	7				
445+00	5	7		6	6		6	8		7	8				
75	3	5		4	6		4	6		5	7				
50	3	4		3	4		3	4		3	4				
25	4	4		4	4		4	5		4	5				
444+00	4	3		5	4		5	5		5	5				
75	4	3		4	4		4	5		5	5				
50	3	4		3	4		5	4		5	5				
25	3	3		4	4		5	4		5	5				

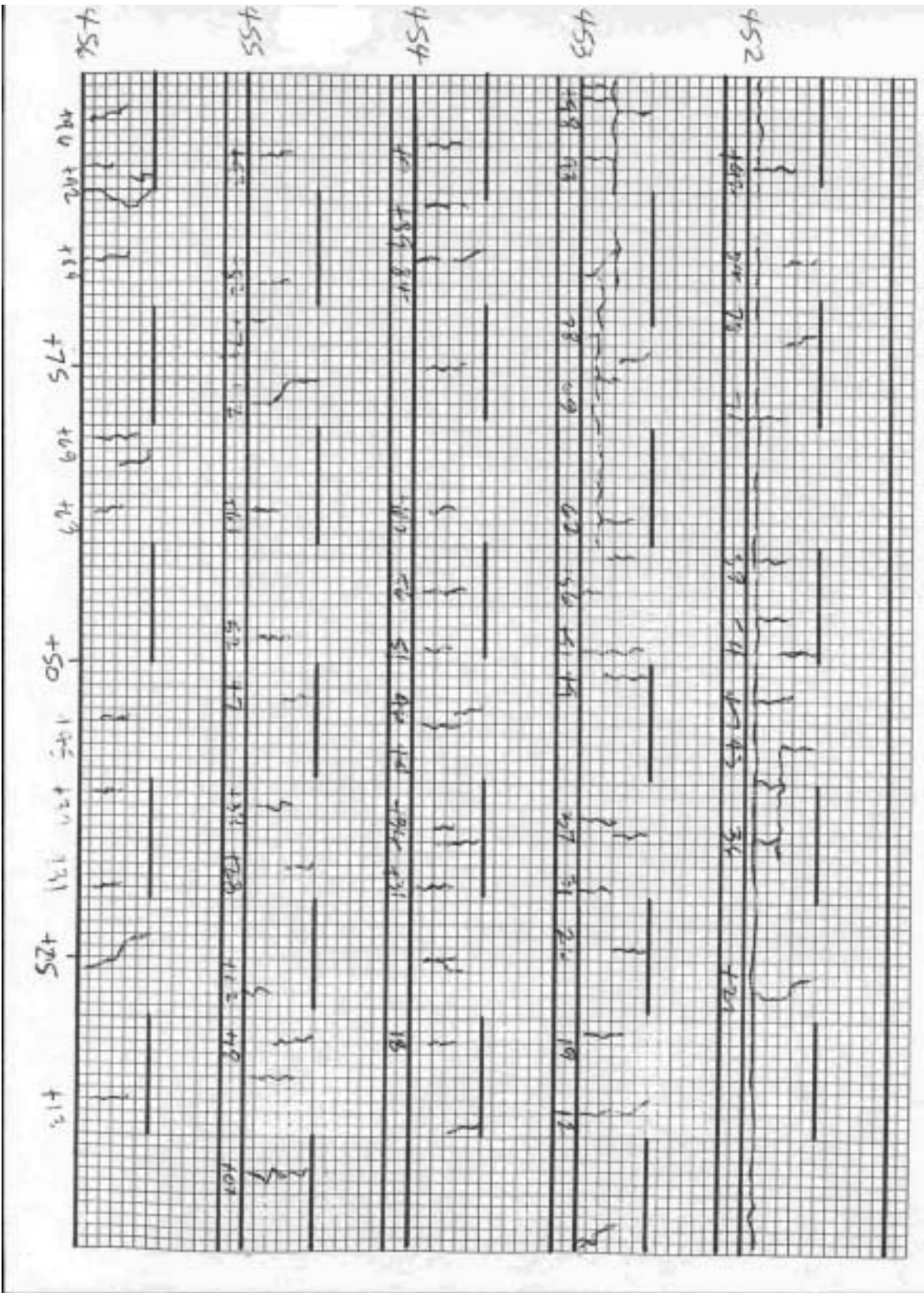
443+00	3	4		3	4		5	4		5	5				
75	3	3		3	3		4	3		4	4				
50	3	3		3	3		4	4		4	4				
25	1	2		2	3		3	2		3	3				
442+00	3	4		2	4		3	5		3	5				
75	2	3		3	3		3	5		4	6				
50	2	4		3	5		4	6		4	6				
25	2	5		3	6		3	6		4	7				
441+00	3	4		3	5		4	6		4	6				
Total	125	112	237	127	118	245	1.03	152	139	291	1.23	159	147	306	1.29

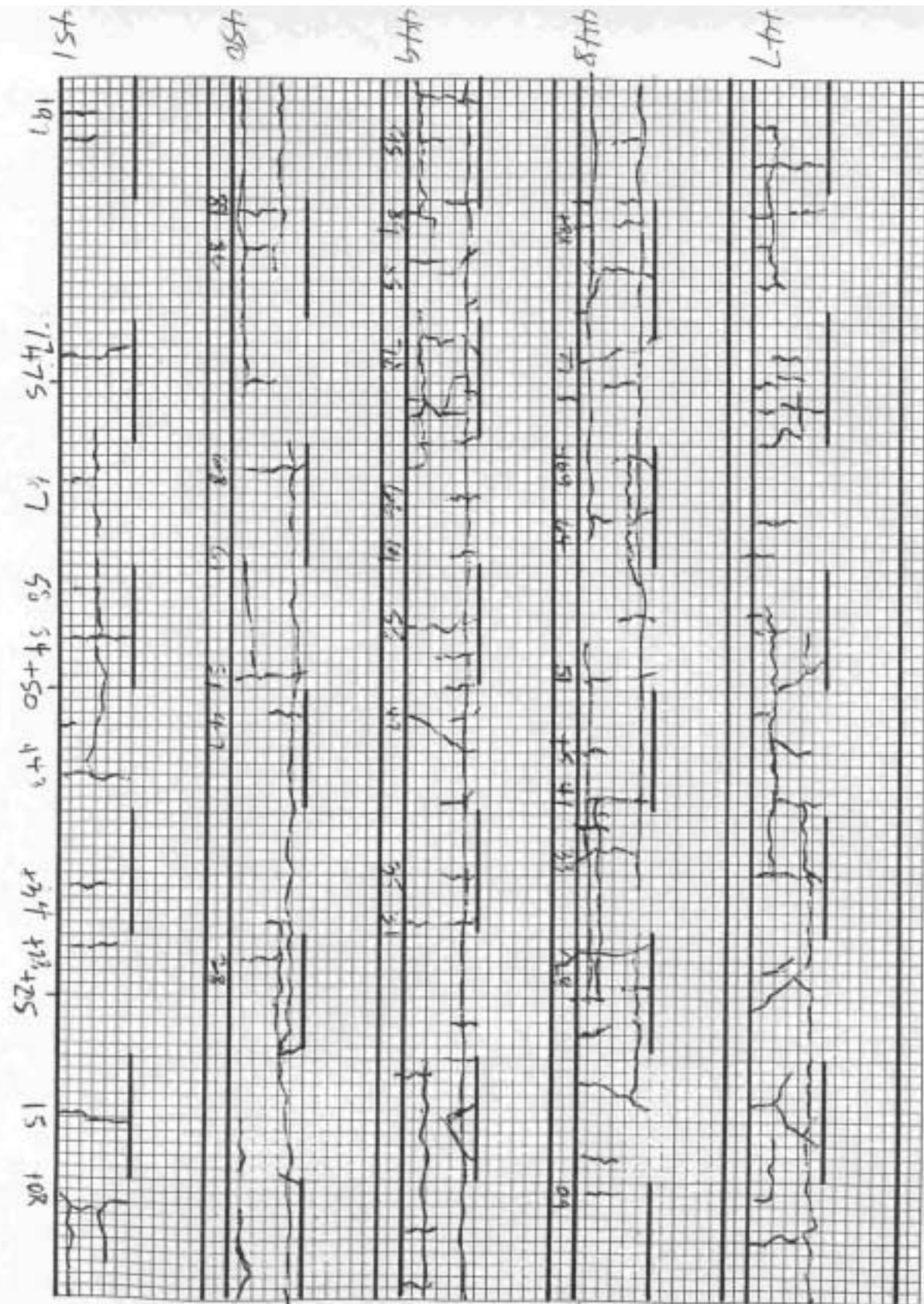
Note: ISWP is the left wheel path
OSWP is the right wheel path

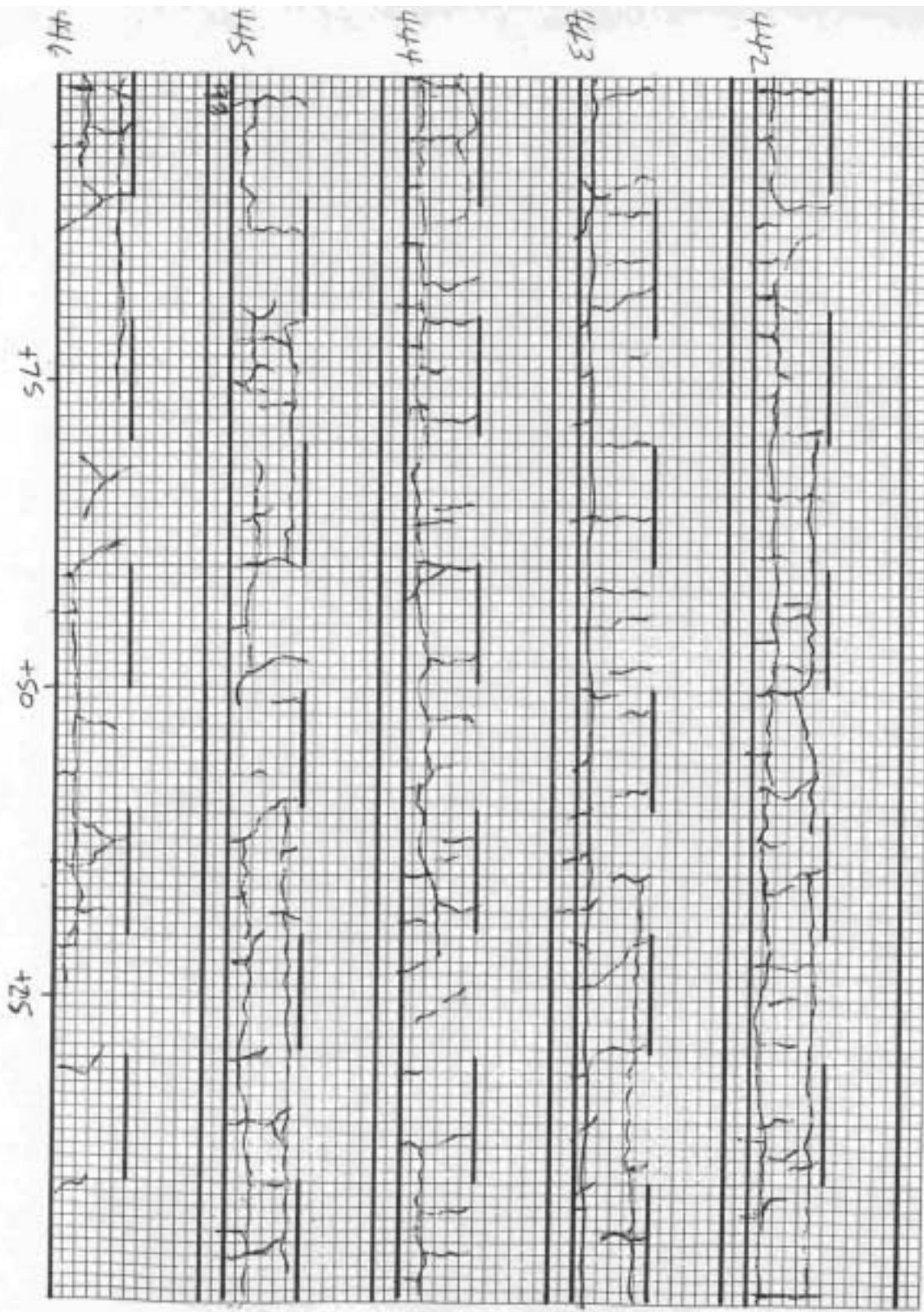
APPENDIX D

CRACK MAPPING FROM U.S. 49 EVALUATION









APPENDIX E

COST FOR U.S. 49 E-KRETE APPLICATION

Cost Information

Polycon Inc. received \$14,500 for 1500 linear feet of E-Krete application on U.S. 49 near Flora, MS.

(Traffic Control for this operation was supplied by MDOT)

1500 linear feet x 10.5' width equates to 15750 sq. feet

15750 sq. feet = 1750 sq. yds.

Cost to MDOT = \$8.28 per square yard for E-Krete

Additionally MDOT is paying (as of March 2003) roughly \$4 per square yard of 1.5" thick polymer modified asphalt.

Therefore, E-Krete is approximately twice as expensive as a conventional 1.5" thick asphalt overlay.