### MICHIGAN DEPARTMENT OF TRANSPORTATION MDOT

#### THREE YEAR EVALUATION OF WHITETOPPING PROJECT ON M-46

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Testing and Research Section Construction and Technology Support Area Research Project 98 G-0322 Research Report R-1417

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#### **EXECUTIVE SUMMARY**

This report summarizes the condition of thin and ultra-thin concrete overlays (also known as whitetopping) on M-46 between Carsonville and Port Sanilac. This is the first whitetopping project constructed in Michigan by the Michigan Department of Transportation (MDOT). This report also summarizes the condition of several standard bituminous rehabilitation methods from a project just to the west of the whitetopping project. The purpose of this trial project is to study whitetopping as an alternative to MDOT's standard bituminous fixes for rehabilitating deteriorated bituminous pavements.

The test sections are as follows:

**Bituminous Fixes** 

- 1. Mill and resurface with 3.5 inches of bituminous.
- 2. Minor surface repair with 3 inches of bituminous overlay.
- 3. Crush and shape and overlay with 3.5 inches of bituminous.

Concrete Whitetopping Fixes

- 4. 6 inches whitetopping without fibers.
- 5. 6 inches whitetopping with fibers.
- 6. 5 inches whitetopping with fibers.
- 7. Mill and overlay (inlay) with 3 inches whitetopping with fibers.

Section 1 is the control for section 7, section 2 is the control for section 6, and section 3 is the control for sections 4 and 5.

All three bituminous test sections are performing very well with about a dozen cracks totaling less than 25 feet for all three sections. No rutting has been observed yet.

Sections 4, 5, and 6 have experienced some longitudinal cracking. A total of 148 (3.4 percent) of the ten foot long (three meter) panels have longitudinal cracking down the center of the lane. There is also one transverse crack and eight spalls greater than six inches. An investigation of the longitudinal cracking using the Falling Weight Deflectometer (FWD) and Ground Penetrating Radar concluded that the cause was most likely less support under the right edge of the lane, which is causing it to bend about the center.

Section 7 (ultra-thin) has also experienced a significant amount of distress; 456 (4.8 percent) of the 3.3 foot by 3.3 foot (1 meter by 1 meter) panels have some form of distress. Approximately 80 percent of the distressed panels are over the edge of the old pavement (bituminous over concrete). The milling operation left a very ragged edge in the bituminous surface that is a support problem, resulting in cracked and shattered panels.

#### **INTRODUCTION**

In 1998 Michigan decided to join the growing number of states who use whitetopping as an alternative for bituminous pavements in need of rehabilitation. A site on M-46 from east of Carsonville to Port Sanilac was chosen to try the whitetopping because a project on M-46 from the Village of Carsonville to the east was already being designed using a standard method of rehabilitation. This site was chosen because it would provide similar pavement cross sections, pavement conditions, and traffic conditions for both jobs. A location and test section map are shown in Figure 1.



Average Annual Daily Traffic is 2800, with about 12 percent being commercial. The standard method job (herein referred to as the bituminous job) was changed to three test sections using bituminous fixes. This job starts at the west village limits and continues east out of Carsonville for approximately 2.5 miles to just west of Goetze Road. The whitetopping job begins where the bituminous job ends and continues west for approximately 4.5 miles to the junction of M-46 and

M-25 in the Village of Port Sanilac. Both projects were designed and built using metric units.

The test sections are as follows:

Bituminous Fixes

- 1. Village of Carsonville mill and resurface with bituminous existing pavement is composite (1.00 miles long).
- 2. East village limits to Loree Road minor surface repair with 3 inches bituminous overlay existing pavement is flexible (0.54 miles long).
- 3. Loree Road to Goetze Road crush and shape with new 3.5 inches bituminous pavement existing pavement is flexible (0.975 miles long).

Concrete Whitetopping Fixes

- 4. Goetze Road to Ridge Road 6 inches whitetopping without fibers existing pavement is flexible.
- 5. Ridge Road to 1,000 feet west of west village limits of Port Sanilac 6 inches whitetopping with fibers existing pavement is flexible.
- 6. 1,000 feet west of west village limits of Port Sanilac to the west village limits 5 inches whitetopping with fibers existing pavement is flexible.
- 7. West village limits to M-25 mill and overlay (inlay) with 3 inches whitetopping with fibers existing inner lanes are composite and outer lanes are flexible.

In test section 1, the existing pavement was 4 inches of bituminous over 8 inches non-reinforced concrete. The base consisted of anywhere from 12 inches to 27.6 inches of sand or in some spots the pavement was built directly on clay. In test sections 2 through 6, the existing pavement was 4 inches of bituminous over 8 inches of gravel and about 12 inches of sand. In test section 7, the existing pavement was 4.8 inches of bituminous over 8 inches of concrete. The subbase averaged 6.7 inches and varied between a sand or gravel.

Table 1 - Expected Fix Lives										
Concrete Fix	Design Life, Years	Bituminous Fix (Control)	Design Life, Years							
Section 7, inner lanes	10	Section 1	10							
Section 7, outer lanes	10	Section 2	15							
Section 6	10									
Section 4	15	Section 3	15							
Section 5	15									

Expected lives of the various fixes can be found in Table 1. Section 1 is the control for section 7, section 2 is the control for section 6, and section 3 is the control for sections 4 and 5.

Typical cross-sections can be found in the Appendix. Details on design, preconstruction evaluation, and construction of these two projects can be found in MDOT's report *Whitetopping Project On M-46 Between Carsonville and Port Sanilac*.

#### EVALUATION

Both the bituminous and whitetopping projects were visually evaluated every six months. Any distresses found were recorded. FWD and ride quality testing were conducted annually in the fall.

#### **Bituminous Sections**

Test sections 1, 2, and 3 are near as-constructed condition. No observable cracks were found until the fall of 2002 when 13 cracks were noted. Five of these are longitudinal, with the longest being 4 feet. The other eight are transverse cracks, most of which are only about a foot long. In total, there are less than 25 feet of observable cracks on all three sections.

Ride quality was measured prior to construction, eight months after construction, and again at three and a half years. Michigan uses its own Ride Quality Index (RQI). Table 2 has the average RQI numbers. An RQI of 0 to 30 is considered excellent, 31 to 53 is considered good, 54 to 69 is considered fair, and greater than 70 is considered poor.

Г	Table 2. Ride Quality Numbers For Asphalt Sections										
Section	Pre-Con	struction	April	2000	February 2003						
	EB	WB	EB	WB	EB	WB					
1	114	95	53	48	53	55					
2	70	62	39	35	43	34					
3	56	68	38	41	33	32					

EB = Eastbound; WB = Westbound

As can be seen in the table, the sections fall in to the "good" category, with the exception of Section 1, which slipped into the *fair* category.

#### Normal Whitetopping Sections

Test sections 4, 5, and 6 have exhibited a few distresses; the primary one being longitudinal cracking. The first sign of longitudinal cracking came during the summer of 2000; about one year after project completion. A long longitudinal crack down the center of the eastbound lane near the west end of the project was reported. It was a hairline crack and 21 panels long.

Figure 2 shows what it looked like initially. Inspection of the remainder of the project turned up several cracks in the westbound lane totaling 18 panels. These were also right down the center of the lane, and in all cases the crack began and ended at a transverse joint.



In the Spring of 2001, the total number of panels with a longitudinal crack increased to 59. By the fall of that year the total had increased to 135, with only minor increases during each inspection since then. Figures 3 and 4 show the number and percentage, respectively, of





longitudinally cracked panels at each of the inspections. One transverse crack, the full-width of the pavement, and three large spalls were also noted during this inspection. Most of the longitudinal cracks were 5 panels or less, with a few reaching 9 panels, and the long one, which was now up to 22 panels. The 22 panel-long crack was starting to show signs of opening up slightly and had very minor spalling in some spots, as can be seen in Figures 5 and 6.



Figure 5. Looking Down the Pavement at the Long Longitudinal Crack.





Since this was a job warranted by the contractor, the contractor cored the long longitudinal crack as well as the centerline joint. They found that the centerline joint did have a relief crack, which was full-depth. This ruled out late sawing of the centerline joint as a possible cause.

At this point, MDOT needed to determine the cause of the longitudinal cracking. FWD testing was conducted at several randomly selected cracks to check load transfer efficiencies (LTE) across the cracks. Tests were also conducted at the mid-point of non-cracked panels in the vicinity of the crack, and at the corner of cracked panels near the shoulder. LTE's across the four cracks selected were in the 71 to 82 percent range, which is fair. The actual deflections under the load plate at the 22 panel-long crack were 8.1 to 9.7 mils. This is slightly higher than mid-panel deflections (away from joints and cracks) in the vicinity, which were 7.0 and 7.9 mils. Deflections at the other three cracks were 5.1 to 8.8 mils, which again is higher than mid-panel deflections of 4.3 to 5.6 mils. However, corner deflections for these cracks were 5.6 to 7.8 mils. This may explain why these three cracks are still in hairline condition, while the 22 panel-long crack with its higher corner deflections is starting to open and spall. The 22 panel-long crack is likely experiencing bending from less support under the right wheel path, resulting in a faster deterioration of the crack. In fact, this bending could be the cause of the longitudinal cracks to begin with.

The FWD data can be found in the Appendix.

Another tool utilized to investigate the longitudinal cracking problem is a Ground Penetrating Radar (GPR) unit. This is a relatively new piece of equipment at MDOT, having been purchased in late 2000. MDOT's unit is a 1 GHz, air-launched antenna used to get the pavement cross-section down to about three feet. In December of 2001, both lanes were surveyed with the GPR, being very careful to mark the locations of the longitudinal cracks in the data. One run down the center of the lane in each direction was made.

The GPR results can be found in the Appendix. The bottom of the concrete is marked with the top row dots, the bottom of the asphalt is marked with the mid depth dots, and the bottom of the base (when it could be located) is marked with the lower most dots. Concrete thickness does not appear to be a factor, since it varies from 4.8 to 8.3 inches at the longitudinal cracks. The asphalt thickness at the cracks averages 3.5 inches for the eastbound and 3.0 inches for the westbound. Fifteen random cores taken from the project immediately after construction showed the asphalt thickness averaged 4.0 inches in the eastbound lane, and 3.2 inches in the westbound lane. The cracks also did not appear to be located over areas where the asphalt and base layers dipped down, which would have been an indicator of support problems.

Ride quality numbers for the concrete sections can be seen in Table 3. Once again, the sections fall in to the "good" category, with the exception of Section 7. There is a small amount of older asphalt included at the end of the eastbound run and at the beginning of the westbound run, which happens to be the M-46/M-25 intersection. Section 7 ends just short of the intersection and for consistency reasons, from year to year, the intersection is used as the starting point for westbound and the ending point for eastbound.

Т	able 3. Ri	de Quality	Numbers	For Conc	rete Sectio	ns	
Section	Pre-Con	struction	April	February 2003			
	EB	WB	EB	WB	EB	WB	
4	62	66	49	52	46	49	
5	73	67	50	50	48	48	
6	63	63	53	52	50	49	
7	81	84	54	60	55	62	

EB = Eastbound; WB = Westbound

#### **Ultra-Thin Whitetopping Section**

Strictly speaking, this section is not a whitetopping according to American Concrete Paving Association definitions due to the original pavement being a composite. However, for the purposes of this report, and the study in general, it will be referenced as an ultra-thin whitetopping.

This section has many of its 3.3 foot by 3.3 foot (1 m by 1 m) panels showing distress. In the latest visual survey, 223 panels in eastbound and 233 panels in westbound have some form of distress. Figures 7 and 8 show the number and percentage, respectively, of distressed panels at each of the inspections. Most of the distress (90%) is cracking, with a few panels (10%) showing just spalling. Figures 9 through 14 show typical distresses.



Figure 7. Number of Distressed Panels in the Ultra-Thin Whitetopping Section.



Figure 8. Percentage of Distressed Panels in the Ultra-Thin Whitetopping Section



Figure 9. Example of Transverse Cracking.



Figure 11. Example of Cracking Around the Joint Intersection.



Figure 13. Another Example of Multiple Cracks.



Figure 10. Example of Long Longitudinal Crack.



Figure 12. Example of Multiple Cracks in a Panel.



Figure 14. Another Example of Transverse Cracking.

Approximately 80 percent of the distressed panels are over the area of the thickened edge. The thickened edge is shown in Figure 15 (full cross-section can be found in the Appendix). Several inches of shoulder gravel were removed for the thickened area.



During construction, the asphalt in this section was milled down to about 1-1/2 to 2 inches thick. Figure 16 shows what the edge of the asphalt looked like after milling. This edge is providing poor support for the new concrete surface, resulting in heavy cracking and shattering of panels above it. Secondary distresses such as spalling of the cracks and faulting, are also beginning to show up.

Ride quality numbers were previously reported in Table 3.



Figure 16. Condition of the Edge of the Asphalt After Milling.

In 2000, a water main break necessitated the removal of four panels for repair work. These panels were in the eastbound direction at the very outside edge of the pavement (in the thickened edge area). They were replaced full-depth with concrete. It is not known if the village work crew made an attempt to tie the repairs to the surrounding concrete. To date, the new panels look very good except for a spall in one corner. Figure 17 shows what they looked like at the last inspection.



#### CONCLUSIONS

The visual evaluations and non-destructive testing to date support the following conclusions:

- The 5 inch (125 mm) and 6 inch (150 mm) thick concrete whitetopping sections are in good shape other than some longitudinal cracking.
- The longitudinal cracking may be due to bending about the center of the lane from poor support conditions under the right edge of the lane. The cracking is evenly distributed between the two lanes and the increase in quantity over time appears to be leveling off.
- The majority of the cracking in the ultra-thin whitetopping section is due to lack of (or differential) support at the edge of the underlying pavement.
- The thickened shoulder portion of the ultra-thin whitetopping section can be repaired fulldepth successfully as evidenced by the water main work.
- Care should be taken to ensure good and even support under whitetopping pavement, especially at the edge of the existing pavement.
- The bituminous sections are in very good shape with minimal cracking.

# Appendix

## **Typical Cross Sections**









### FWD Data from Longitudinal Crack Investigation

KUAB FWD FILE	47172E	4.NOR														
Project :	White T	opping	Proie	ct 2001					WD d	lata a	t 4 selected	long, cracks	in the l	EB lane	e	
Droject Number	CS 740	62 IN 4	7472									iong. crucito				
Project Nomber .	N.46	02 314 4														
Direction :	EB															
Location :	WCIC	-	lle													
Location .	HUL G	arsonv	ine.													
Region ·	Ray															
Customer/Client :	MOOTO	Hike E.	ckar													
Customencaera :	KRana	MIKE EA	CKer													
Traffic Control :	Magaz	Dalmas	Canti	no Curt	e la											
Parament Tune	Elevible	Come	, canu	No Cun	us											
Favement Type	. Flexible	ercomp	osite/P	ugia												
Environment .	linht															
Trame :	light															
Comments :	Eacker	, Sweet	ny GPH	•												
	Notes 6	-level -					-									
•	NOTE: C	alcula	le long	tudina	i load ti	ransfer	0200									
	111 104	d trans	ster - De	etore D	1/D0, a	ner D4/	DO									
Date Created :	*****															
Load Mode :	2 (	3+3 bu	ffers, 7	plates	)											
Plate Radius :	5.91	(in)														
Extra Field Set :	FLEXIE	BLE														
Drop Sequence	: 22															
No of drops :	13															
Record Drop? :	NY															
Drop Height :	1 2	3 4														
Impact Load :	5000 9	000 15	500 205	500 lbf												
Sensor Number	:0	1 2	: 3	4	5	6	7 1	8								
Sensor Distance :	: 0.00 1	2.01 12	.01 7.	99 12.0	01 17.9	9 24.0	2 35.98	60.00	(in)							
Sensor Position :	CENTE	R FRC	NT R	IGHT B	EHIND	BEHIN	D BEH	IND BE	HIND E	BEHIND	BEHIND					
																1.0
Testpoint spacing	: 0 m : 150 m	<b>D1</b>	D2		M	55	<b>D6</b>	57	-	Air	Paus Pumt	Loc Pumt	Crack	loint	Crack	Mid Slab
Testpoint spacing	: 0 m : 150 m D0 mile	D1	D2 mils	D3	D4 mils	D5	D6 mils	D7	D8 mile	Air	Pave Pvmt	Loc. Pvmt	Crack	Joint	Crack	Mid Slab
Testpoint spacing Distance Load <u>m lbf</u> 4424 900	D0 mils	D1 mils	D2 mils	D3 mils	D4 mils	D5 mils	D6 mils	D7 mils	D8 mils	Air oF	Pave Pvmt eF Cond	Loc. Pvmt No. Crack*	Crack Sevty	Joint LTE. %	Crack	Mid Slab
Distance Load <u>m</u> lbf <u>4424</u> 900 <u>4425</u> 900	D0 mils 0 14.56	D1 mils 10.62	D2 mils 6.60	D3 mils 12.25	D4 mils 11.07	D5 mils 9.56	D6 mils 8.07	D7 mils 5.63	D8 mils 2.47	Air oF 68	Pave Pvmt eF Cond 73 TJT 73 TJT	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR	Crack Sevty BJT	Joint LTE. % 72.96 83.19	Crack	Mid Slab
Distance Load m lbf 4424 900 4425 900	0 m 150 m 0 150 m 0 14.56 10 13.56	D1 mils 10.62 11.28 6.35	D2 mils 6.60 5.65	D3 mils 12.25 14.14 6.54	D4 mils 11.07 11.96	D5 mils 9.56 10.28	D6 mils 8.07 8.62	D7 mils 5.63 5.92 3.61	D8 mils 2.47 2.52	Air eF 68 68 68	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA	Crack Sevty BJT AJT	Joint LTE. % 72.96 83.19	Crack	Mid Slab LTE. %
m     lbf       4424     900       4425     900       4426     900	0 m 150 m 00 mils 014.56 013.56 07.00 0.811	D1 mils 10.62 11.28 6.35 7.25	D2 mils 6.60 5.65 6.09	D3 mils 12.25 14.14 6.54 7.39	D4 mils 11.07 11.98 6.09 6.76	D5 mils 9.56 10.28 5.52	D6 mils 8.07 8.62 4.83	D7 mils 5.63 5.92 3.61	D8 mils 2.47 2.52 1.58	Air 68 68 68 68	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK	Crack Sevty BJT AJT NA	Joint LTE. % 72.96 83.19	Crack LTE. %	Mid Slab LTE. %
Reference Offset:       Testpoint spacing:       Distance     Load       m     lbf       4424     900       4425     900       4426     900       4432     900       4432     900	0 m 150 m 0 14.56 0 13.56 0 7.00 0 8.11 0 9.70	D1 mils 10.62 11.28 6.35 7.25 8.50	D2 mils 6.60 5.65 6.09 5.78 7.05	D3 mils 12.25 14.14 6.54 7.39	D4 mils 11.07 11.98 6.09 6.76	D5 mils 9.56 10.28 5.52 5.91 6.87	D6 mils 8.07 8.62 4.83 5.01	D7 mils 5.63 5.92 3.61 3.38	D8 mils 2.47 2.52 1.58 1.51	Air of 68 68 68 69	Pave Pvmt eF Cond 73 T.JT 73 T.JT 75 MID 77 LCK 70 LCK	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK	Crack Sevty BJT AJT NA NA	Joint LTE. % 72.96 83.19	Crack LTE. %	Mid Slab LTE.% 90.76
Reterence Offset1       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4432     900       4432     900       4432     900	D0 mils 0 14.56 0 13.56 0 7.00 0 8.11 0 9.70	D1 mils 10.62 11.28 6.35 7.25 8.59	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91	D4 mils 11.07 11.96 6.09 6.76 7.92	D5 mils 9.56 10.28 5.52 5.91 6.87	D6 mils 8.07 8.62 4.83 5.01 5.80	D7 mils 5.63 5.92 3.61 3.38 3.93	D8 mils 2.47 2.52 1.58 1.51 1.81	Air eF 68 68 68 69 69	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 79 LCK	Loc. Pvmt No. Crack* 1 CORNE 2 NA 3 LCK 4 LCK	Crack Sevty BJT AJT NA NA NA	Joint LTE. % 72.96 83.19	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. %
Reference Offset:       Testpoint spacing:       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4453     900       4474     900       4474     900	D0 mils 0 14.56 0 13.56 0 7.00 0 8.11 0 9.70 0 8.65 0 7.88	D1 10.62 11.28 6.35 7.25 8.59 7.22	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30	D5 mils 9.56 10.28 5.52 5.91 6.87 6.40	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11	Air eF 68 68 68 69 69 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 LCK	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA	Crack Sevty BJT AJT NA NA NA NA	Joint LTE. % 72.96 83.19	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76
Reference Offset:       Testpoint spacing:       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4453     900       4453     900       4474     900       4496     900       4496     900	0 m 150 m 0 14.56 0 14.56 0 13.56 0 13.56 0 7.00 0 8.11 0 9.70 0 8.658 0 15.18	D1 10.62 11.28 6.35 7.25 8.59 7.22 6.94	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30 7.13	D5 mils 9.56 10.28 5.52 5.91 6.87 6.40 6.54	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60	Air eF 68 68 69 69 70 70 69	Pave Pvmt eF Cond. 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 MID 26 TJT 75 TJT 75 TJT 75 MID 77 LCK 78 LCK 78 MID 76 TJT 76 TJT 77 TJT 78 TJT 77 TJT 77 TJT 78 TJT 77 TJT 78 TJT 78 TJT 77 TJT 78 TJT 78 TJT 77 TJT 78 TJT 7	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR	Crack Sevty BJT AJT NA NA NA NA GOOD BJT	Joint LTE. % 72.96 83.19	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07
Reference Offset:       Testpoint spacing:       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4433     900       4474     900       4496     900       4497     900	0 m 150 m 150 m 00 14.56 00 13.56 00 7.00 00 8.11 00 9.70 00 8.65 00 7.88 00 15.18 00 12.66	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 12.65	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 7.13 11.33 8.14	D5 mils 9.56 10.28 5.52 5.91 6.87 6.40 6.54 9.72 7.22	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15 6.20	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55 5.68	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18	Air 68 68 69 69 70 70 70 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 TJT 76 TJT	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR	Crack Sevty BJT AJT NA NA NA NA NA GOOD BJT	Joint LTE. % 72.96 83.19 55.33 77.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07
Reterence Offset 1       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4432     900       4435     900       4474     900       4495     900       4496     900       5686     State	0 m 150 m D0 mils 0 14.56 0 13.56 0 7.00 0 8.11 0 9.70 0 8.65 0 7.88 0 15.18 0 12.98 0 12.98	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 7.13 11.33 8.14	D5 mils 9.56 5.52 5.91 6.87 6.40 6.54 9.72 7.22	D6 mils 8.07 8.62 4.63 5.01 5.80 5.48 5.87 8.15 6.30	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55 5.68 4.62	D8 mils 2.47 2.52 1.58 1.51 1.81 1.81 2.11 2.60 2.18	Air eF 68 68 68 69 69 70 70 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 LCK 76 TJT	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR	Crack Sevty BJT AJT NA NA NA NA GOOD BJT AJT	Joint LTE. % 72.96 83.19 55.33 77.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07
Reterence Offset     Construction       Testpoint spacing     Distance     Load       m     Ibf     4424     900       4425     900     4425     900       4426     900     4432     900       4432     900     4435     900       44474     900     4496     900       4497     900     5686     State       7307     Ridge     Ridge     200	0 m 150 m D0 mils 0 14.566 0 13.566 0 7.00 0 8.11 0 9.70 0 8.65 0 7.88 0 15.18 0 12.98 Coad Mod	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 7.13 11.33 8.14	D5 mils 9.56 5.52 5.91 6.87 6.40 6.54 9.72 7.22	D6 mils 8.07 8.62 4.63 5.01 5.80 5.48 5.87 8.15 6.30	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55 5.68 4.62	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18	Air eF 68 68 68 69 69 70 70 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 LCK 78 MD 76 TJT 76 TJT	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR	Crack Sevty BJT NA NA NA NA NA GOOD BJT AJT	Joint LTE. % 72.96 83.19 55.33 77.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07
Reference Offset:       Testpoint spacing:       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4432     900       4432     900       4435     900       4443     900       44474     900       4496     900       4497     900       5686     State R       7307 <ridge ridge<="" td="">     Ridge R       7317<ridge ridge<="" td="">     Ridge R</ridge></ridge>	0 m 150 m 00 14.56 00 13.56 00 13.56 00 13.56 00 7.00 00 8.11 00 9.70 00 8.65 00 7.88 00 15.18 00 12.98 00 12.98	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30 7.13 11.33 8.14	D5 milis 9.56 10.28 5.52 5.91 6.87 6.40 6.54 9.72 7.22	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15 6.30	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55 5.68 4.62	D8 mils 2.47 2.52 1.58 1.51 1.64 2.11 2.60 2.18	Air eF 68 68 69 69 70 70 69 70 70 69 70	Pave Pvmt eF Cond. 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 LCK 78 LCK 78 LCK 76 TJT 76 TJT	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR	Crack Sevty BJT AJT NA NA NA NA AJT	Joint LTE. % 72.96 83.19 55.33 77.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE.% 90.76 88.07
Reference Offset:       Testpoint spacing:       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4433     900       4453     900       4474     900       4496     900       4497     900       5686     State R       7307     Ridge F       7317     Ridge S	0 m 150 m 00 14.56 00 14.56 00 13.56 00 7.00 00 8.11 00 9.70 00 8.65 00 15.18 00 12.98 00 12.98	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02 th 4.95	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30 7.13 11.33 8.14	D5 mils 9.56 10.28 5.91 6.87 6.40 6.54 9.72 7.22	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15 6.30	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 4.55 5.68 4.62	D8 mils 2.47 2.52 1.58 1.51 1.64 2.11 2.60 2.18	Air eF 68 68 69 69 70 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 70 70 70 70 70 70 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 TJT 76 TJT	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR	Crack Sevty BJT AJT NA NA NA GOOD BJT AJT	Joint LTE. % 72.96 83.19 55.33 77.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07
Reterence Offset     Construction       Testpoint spacing     Distance     Load       m     Ibf     4424     900       4425     900     4425     900       4425     900     4432     900       4432     900     44453     900       4495     900     4495     900       4496     900     5686     State       7307     Ridge F     7317     Ridge F       7317     Ridge F     900     8756     900	0 m 150 m D0 mils 0 14.56 0 13.56 0 7.00 0 8.11 0 9.70 0 8.11 0 9.70 0 8.15 18 0 12.98 0 12.98 0 12.98 0 12.98 0 12.98 0 14.56 0 7.88 0 15.18 0 12.98 0 14.56 0 5.60 0 2 5.6	D1 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02 th 4.95	D2 mils 6.60 5.65 6.05 5.78 7.05 6.15 6.84 9.85 11.54	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89	D4 mils 11.07 11.96 6.79 7.30 7.13 11.33 8.14 4.84	D5 mils 9.56 10.28 5.51 6.87 6.40 6.54 9.72 7.22 7.22	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15 6.30 3.81	D7 mils 5.63 5.92 3.61 3.38 3.95 4.55 5.68 4.55 5.68 4.62	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18	Air ef 68 68 69 70 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 70 69 70 70 69 70 70 70 70 70 70 70 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 MID 76 MID 75 TJT	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 8 NA 9 CORNE	Crack Sevty BJT AJT NA NA NA GOOD BJT AJT GOOD BJT	Joint LTE % 72.96 83.19 55.33 77.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07 88.34
Reterence Offset     Construction       Testpoint spacing     Distance     Load       m     Ibf     4424     900       4425     900     4425     900       4424     900     4425     900       4432     900     4432     900       44474     900     4496     900       4496     900     4497     900       5686     State     7307     Ridge F       7307     Ridge F     7317     Ridge F       8756     900     8761     900	0 m 150 m D0 mils 0 14.56 0 13.56 0 13.56 0 13.56 0 7.88 0 15.18 0 7.88 0 15.18 0 12.98 0 3.0 12.98 0 3.0 0 7.84 0 12.98 0 3.0 0 7.84 0 12.98 0 3.0 0 7.84 0 12.98 0 3.0 0 7.84 0 12.98 0 12.98	D1 milis 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02 th th th th th th th th th th th th th	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54 4.84 4.84 4.84	D3 mils 12 25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89 5.20 6.59 7.14	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 7.13 11.33 8.14 4.84 4.84 6.00	D5 mils 9.56 5.52 5.91 6.87 6.40 6.54 9.72 7.22 7.22 4.36 5.55	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15 6.30 3.81 3.81 4.49	D7 mils 5.63 5.92 3.61 3.38 3.93 4.55 5.68 4.62 2.85 3.28	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.26 1.26 1.26	Air 68 68 69 69 70 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 69 70 69 69 70 69 69 70 69 69 70 70 69 69 70 70 69 70 70 69 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 70 69 70 70 70 69 70 70 70 69 70 70 70 70 70 69 70 70 70 70 69 70 70 69 70 70 70 69 70 70 69 70 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 70 69 70 69 70 70 69 70 69 70 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 69 70 60 70 60 70 60 70 60 70 60 70 60 70 60 70 60 70 60 70 70 60 70 70 60 70 70 70 70 70 70 70 70 70 7	Pave Pvmt eF Cond. 73 TJT 73 TJT 75 MID 77 LCK 79 LCK 78 LCK 78 LCK 76 MID 76 TJT 76 MID 75 TJT 74 TJT	Loc. Pvmt No. Crack* 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 8 NA 9 CORNR	Crack Sevty AJT AJT NA NA NA MA GOOD BJT AJT GOOD BJT	Joint <u>LTE. %</u> 72.96 83.19 55.33 77.22 86.73 81.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07 88.34
Reterence Offset:       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4432     900       4435     900       4436     900       4496     900       4497     900       5686     State       7317     Ridge F       7317     Ridge F       8756     900       8761     900       8761     900	0 m 150 m 150 m 150 m 150 m 150 0 15156 10 13.56 10 13.56 10 13.56 10 2.70 10 8.65 10 15.18 10 12.96 10 15.18 10 12.96 10 15.60 10 15.60 10 5.60 10 5.60 1	D1 milis 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02 th th th th th th th th th th th th th	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54 11.54 4.84 6.45 6.36 4.63	D3 mils 12 25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89 5.20 6.59 7.14 5.32	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 7.13 11.33 8.14 4.84 6.00 6.39 4.88	D5 mils 9.56 10.28 5.52 5.91 6.87 6.40 6.54 9.72 7.22 4.36 5.25 5.55 5.52 4.24	D6 mils 8.07 8.62 4.83 5.01 5.80 5.48 5.87 8.15 6.30 3.81 4.49 4.62	D7 mils 5.63 3.61 3.38 3.93 3.95 4.55 5.68 4.62 2.85 3.25 3.25 3.25 3.26	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.26 1.55 1.49	Air ef 68 68 69 69 70 70 70 70 70 69 70 70 69 70 70 70 70 70 70 70 70 70 70	Pave Pvmt ef Cond. 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 76 TJT 76 TJT 76 MID 75 TJT 75 TJT 77 LCK	Loc. Pvmt No. Crack 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 9 CORNR	Crack Sevity BJT AJT NA NA NA NA BJT AJT GOOD BJT AJT NA	Joint LTE. % 72.96 83.19 55.33 77.22 86.73 81.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE.% 90.76 88.07 88.34
Reference Offset:       Testpoint spacing:       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4432     900       4432     900       4432     900       4432     900       4435     900       44474     900       4496     900       4497     900       5686     State R       7307     Ridge F       7317     Ridge F       8756     900       8761     900       8761     900	0 m 150 m 100 9.700 100 8.65 100 7.88 100 7.88 100 7.00 100 8.65 100 7.88 100 7.88 100 7.00 100 7.88 100 7.88 100 7.88 100 7.88 100 7.88 100 7.88 100 7.88 100 7.88 100 7.58 100 7.54 100 7.	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02 th th th th 5.01	D2 mils 6.60 5.65 6.09 5.78 7.05 6.15 6.84 9.85 11.54 4.84 6.45 6.36 4.63	D3 mils 12 25 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89 5.20 6.59 7.14 5.32	D4 mils 11.07 11.96 6.09 6.76 7.30 7.33 11.33 8.14 4.84 6.00 6.39 4.88	D5 mils 9.56 10.28 5.52 5.91 6.87 6.40 6.54 9.72 7.22 4.36 5.25 5.52 4.24	D6 mils 8.07 8.62 4.83 5.01 5.46 5.87 8.15 6.30 3.81 4.49 4.62 3.60	D7 mils 5.63 5.92 3.61 3.38 3.93 3.95 5.68 4.55 5.68 4.62 2.85 3.25 3.28 2.56	D8 mils 2.47 2.52 1.58 1.51 1.64 2.11 2.60 2.18 1.26 1.55 1.49 1.09	Air eF 68 68 69 69 70 70 69 70 69 70 69 70 67 67 67 67 67	Pave Pvntt eF Cond. 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 76 TJT 76 TJT 76 MID 75 TJT 74 TJT 77 LCK	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 8 NA 9 CORNR 9 CORNR 10 LCK	Crack Sevity BJT AJT NA NA NA NA BJT AJT GOOD BJT AJT NA	Joint <u>LTE. %</u> 72.96 83.19 55.33 77.22 86.73 81.22	Crack LTE. % 71.28 72.67 71.13	Mid Slab LTE. % 90.76 88.07 88.07 88.34
Reterence Offset       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4425     900       4423     900       4432     900       4453     900       4495     900       4497     900       5686     State       7317     Ridge F       7317     Ridge F       8756     900       8761     900       8765     900       828     Humon'       9929     900	0 m 150 m 150 m 0 14.56 0 14.56 0 7.00 0 8.11 0 9.70 0 8.65 0 7.00 0 8.65 0 7.00 0 8.65 0 7.54 0 5.90 View Roa	D1 mils 6.35 7.25 6.94 10.02 b b t t t t t t t t t t t t t t t t t	D2 mils 6.60 5.65 6.09 5.78 6.15 6.84 9.85 11.54 4.84 6.45 6.36 4.63	D3 mils 12 25 14.14 6.54 7.39 8.87 7.91 7.52 12.65 8.89 5.20 6.59 7.14 5.32	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 7.33 8.14 4.84 6.00 6.39 4.88	D5 mils 9,56 5,52 5,91 6,87 6,40 6,54 9,72 7,22 4,36 5,55 5,52 4,24	D6 mils 8.07 8.62 4.83 5.01 5.80 5.87 8.15 6.30 3.81 4.49 4.62 3.60	D7 mils 5.63 5.92 3.61 3.38 4.55 4.55 4.55 4.62 2.85 3.25 3.28 2.56	D8 mils 2.47 2.52 1.58 1.51 1.64 2.11 2.60 2.18 1.260 2.18 1.260 2.18 1.260 2.18	Air 9F 68 68 68 69 70 70 70 70 70 70 70 70 70 70 70 70 70	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 76 TJT 76 TJT 76 TJT 76 TJT 76 TJT 77 LCK 73 LIC	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 8 NA 9 CORNR 9 CORNR 10 LCK	Crack Sevity BJT AJT NA NA NA NA GOOD BJT AJT NA GOOD	Joint LTE: % 72.96 83.19 55.33 77.22 86.73 81.22	Crack LTE. % 71.28 72.67 71.13 71.13	Mid Slab LTE. % 90.76 88.07 88.07 88.34
Reterence Offset       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4425     900       4432     900       4432     900       4435     900       4436     900       4496     900       4586     State B       7317     Ridge F       7317     Ridge F       8756     900       8761     900       8765     900       8765     900       8765     900       8765     900	0 m 150 m 150 m 150 m 150 m 150 0 0 13.56 0 14.56 0 7.80 0 8.65 0 7.88 0 15.18 0 12.98 0 3.08 0 15.18 0 12.98 0 3.08 0 5.60 0 5.90 0 5.90 0 5.90 0 7.54 0 5.90 0 7.54 0 7.54	D1 mils 10.62 11.28 6.35 7.25 8.59 7.22 6.94 8.40 10.02 th th th th th th th th th th th th th	D2 mils 6.60 5.65 6.09 5.78 6.15 6.84 9.85 11.54 11.54 4.84 6.45 6.36 4.63 6.36 4.63	D3 mils 1225 14.14 6.54 7.39 8.67 7.91 7.52 12.65 8.89 5.20 6.59 7.14 5.32 7.14 5.32	D4 mils 11.07 11.98 6.09 7.30 7.13 11.33 8.14 6.00 6.39 4.88 4.84 4.84	D5 mils 9,56 10,28 5,52 5,91 6,87 6,40 6,54 9,72 7,22 7,22 4,36 5,25 5,52 4,24 4,36 7,525	D6 mils 8.07 8.62 4.83 5.01 5.80 5.80 5.80 5.87 8.15 6.30 3.81 4.49 4.62 3.60 3.311	D7 mils 5.63 5.92 3.61 3.38 3.93 4.55 5.68 4.62 2.85 3.25 3.25 3.28 2.26 2.48	D8 mils 2.47 2.52 1.58 1.51 1.81 1.84 2.11 2.60 2.18 1.26 1.55 1.55 1.49 1.09	Air ef 68 68 69 69 69 70 70 70 70 70 69 70 70 67 67 67 67 67 67 67 67 67 67	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 TJT 76 MID 75 TJT 74 TJT 77 LCK 73 MID 74 TJT	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 10 LCK	Crack Sevty BJT AJT NA NA NA GOOD BJT AJT AJT AJT AJT BJT AJT BJT	Joint LTE % 72.96 83.19 55.33 77.22 86.73 81.22 86.73 81.22	Crack LTE. % 71.28 72.67 71.13 71.13	Mid Slab LTE. % 90.76 88.07 88.34 90.19
Reterence Offset       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4432     900       4432     900       4435     900       44474     900       4496     900       4497     900       5686     State       7307     Ridge       7317     Ridge       8756     900       8761     900       8785     900       8785     900       8785     900       8785     900       8785     900       8785     900       8928     Huron 1       9925     902       9925     902       9925     902	0 m 150 m D0 mils 00 14.56 00 13.56 00 13.56 00 13.56 00 13.56 00 9.70 00 8.11 00 9.70 00 8.65 00 12.98 00 2.540 00 7.540 00 7.540	D1 mils 10.62 11.28 6.35 7.25 6.94 6.54 10.02 6.54 6.54 6.50 1 3.86 6.50 1 3.86 6.54	D2 mils 6.60 5.65 6.78 7.05 6.15 6.84 9.85 11.54 11.54 4.84 6.45 6.38 4.63 3.84 6.63	D3 mils 12 25 14.14 7.39 8.67 7.91 12.65 8.89 5.20 6.59 7.14 5.32 4.00 6.65 5.70	D4 mils 11.07 6.09 6.76 7.92 7.13 11.33 8.14 8.14 4.84 6.00 6.39 4.88 3.77 6.03	D5 mils 9.56 5.52 6.87 6.40 6.54 9.72 7.22 4.36 5.25 5.52 4.24 3.47 5.25	D6 mils 8.07 4.83 5.01 5.80 5.48 5.87 6.30 6.30 6.30 6.30 6.30 6.30 6.30 6.30	D7 mils 5.63 3.92 3.61 3.38 3.95 5.68 4.62 2.85 3.25 2.85 3.25 2.25 2.48 2.32 3.25 2.48 3.34	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.26 1.55 1.49 1.09 1.28 1.65 1.49	Air gr 68 68 69 69 70 70 70 69 70 67 67 67 67 67 67 67 67 67 67	Pave Pvmt ef Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 TJT 76 TJT 76 TJT 76 MID 75 TJT 77 LCK 73 MID 74 TJT 72 TJT	Loc. Pvmt No. Crack 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 9 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 12 CORNR	Crack Sevity BJT AJT NA NA NA NA BJT AJT GOOD BJT AJT NA GOOD BJT AJT	Joint LTE. % 72.96 83.19 55.33 77.22 86.73 81.22 86.73 81.22	Crack LTE. % 72.67 71.13 78.47	Mid Slab LTE.% 90.76 88.07 88.34 90.19
Reterence Offset:       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4426     900       4425     900       4432     900       4432     900       4432     900       4432     900       4432     900       4432     900       4435     900       4496     900       4497     900       5686     State       7317 <ridge f<="" td="">     7317<ridge f<="" td="">       7317<ridge f<="" td="">     900       8765     900       8765     900       9925     900       9925     900       9930     900       9930     900       9440     900</ridge></ridge></ridge>	0 m 150 m 150 m 150 m 150 m 150 m 150 0 151 56 10 13.56 10 13.56 10 13.56 10 13.56 10 13.56 10 2.70 10 8.65 10 3.70 10 8.65 10 12.98 10 12	D1 mile 10.62 11.28 6.35 7.25 6.94 8.40 10.02 h m 4.95 6.54 6.10 5.01 d 3.86 6.44 6.14 4.55	D2 mils 6.60 5.65 5.78 7.05 6.15 9.85 11.54 9.85 11.54 4.84 6.45 6.36 4.63 3.84 4.63 3.84 4.64 5.63 6.45 6.45 6.45 6.45 6.45 6.45 6.45 6.45	D3 mils 12 25 14.14 6.54 7.39 8.87 7.51 12.65 8.89 5.20 6.59 7.14 5.32 4.00 6.65 7.08	D4 mils 11.07 6.09 6.76 7.92 7.30 11.33 11.33 11.33 8.14 6.00 6.39 4.84 6.00 6.39 4.88 3.77 6.03 6.36 4.49	D5 mils 9.56 5.52 5.91 6.87 7.22 4.36 5.25 5.52 5.52 4.24 3.47 5.27 5.27 5.27	D6 mils 8.07 8.62 4.83 5.01 5.80 5.80 5.80 5.87 6.30 3.81 4.49 4.62 3.60 3.11 4.59 4.72 3.60	D7 mils 5.63 5.92 3.38 3.393 3.395 5.68 4.62 2.85 3.25 3.28 3.25 3.28 2.56 2.48 3.43 3.43 3.44	D8 mils 2.47 2.52 1.58 1.51 1.64 2.11 2.60 2.18 1.26 1.26 1.26 1.55 1.49 1.09 1.28 1.66 1.61 1.42	Air 9F 68 68 69 70 70 70 70 69 70 70 67 67 67 67 67 67 67 67 67 67	Pave Pvntt ef Cond. 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 TJT 76 TJT 76 TJT 76 TJT 76 TJT 76 TJT 77 LCK 73 MID 74 TJT 72 TJT 72 TJT 72 TJT 72 TJT	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 13 LCK	Crack Sevity BJT AJT NA NA NA BJT AJT AJT NA GOOD BJT AJT NA GOOD BJT AJT NA	Joint LTE. % 72.96 83.19 55.33 77.22 66.73 81.22 83.86 78.32	Crack LTE. % 71.28 72.67 71.13 71.13 78.47	Mid Slab LTE.% 90.76 88.07 88.34 90.19
Reterence Offset       Testpoint spacing       Distance     Load       m     Ibf       4424     900       4425     900       4425     900       4425     900       4432     900       44453     900       4474     900       4495     900       4497     900       5686     State R       7317     Ridge P       8756     900       8761     900       9925     900       9929     900       9930     900       9940     900       9040     900	0 m 150 m 150 m 0 14.56 0 14.56 0 14.56 0 7.00 0 8.11 0 9.70 0 8.11 0 9.70 0 8.11 0 9.70 0 8.11 0 13.56 0 7.00 0 8.11 0 13.56 0 7.00 0 8.11 0 13.56 0 14.56 0 7.00 0 8.11 0 9.70 0 8.11 0 9.70 0 8.50 0 15.18 0 15.18 0 15.18 0 15.18 0 15.18 0 15.18 0 2.50 0 5.00 0 5.00 0 7.84 0 7.84	D1 mils 10.62 11.28 6.35 7.25 6.94 8.40 10.02 th 4.95 6.54 6.10 5.01 5.01 5.01 5.01 4 3.86 6.44 4.55	D2 mils 6.60 5.65 5.78 7.05 6.15 6.84 9.85 11.54 4.84 6.45 6.38 4.63 3.84 6.88 6.98 6.98 6.98	D3 mils 12.25 14.14 6.54 7.39 8.67 7.91 7.52 8.89 5.20 6.59 7.14 5.32 4.00 6.65 7.08 4.82 7.08	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30 7.13 8.14 4.84 4.84 4.84 6.00 6.39 4.88 3.77 6.03 6.03 6.03 6.03 6.03 6.03 6.03 6.03	D5 miis 9.56 5.52 5.91 6.87 7.22 7.22 4.36 5.25 5.52 4.24 3.47 5.27 5.51 4.26	D6 mils 8.07 8.62 5.80 5.80 5.80 5.80 5.80 5.80 5.80 5.80	D7 mils 5.63 5.92 3.38 3.93 3.93 4.55 5.68 4.62 2.85 3.25 3.25 3.25 3.25 2.48 3.43 3.44 2.81 3.44 2.85 3.25	D8 mils 2.47 2.52 1.58 1.51 1.64 2.18 2.18 1.260 2.18 1.260 1.55 1.49 1.09 1.28 1.66 1.61 1.42 1.28 1.28 1.51 1.28 1.51 1.51 1.51 1.51 1.51 1.51 1.51 1.5	Air eF 68 68 69 70 70 70 70 70 70 70 70 70 70	Pave Pvnt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 TJT 76 TJT 77 LCK 73 MID 74 TJT 74 TJT 72 TJT 73 LJT 73 LJT 75 LJT	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 12 CORNR 13 LCK	Crack Sevity BJT AJT NA NA NA NA GOOD BJT AJT NA GOOD BJT AJT NA NA	Joint LTE % 72.96 83.19 55.33 77.22 86.73 81.22 83.86 78.32	Crack LTE. % 71.28 72.67 71.13 71.13 78.47 78.47	Mid Slab LTE. % 90.76 88.07 88.34 90.19
Reterence Offset 2 Testpoint spacing Distance Load m lbf 4424 900 4425 900 4425 900 4432 900 4432 900 4433 900 4434 900 4436 900 4497 900 4497 900 4497 900 5686 State B 7317 Ridge F 7317 Ridge F 7317 Ridge F 8756 900 8761 900 8765 900 8765 900 9929 900 9929 900 9930 900 9944 900	0 m 150 m 150 m 150 m 150 m 150 0 0 13.56 0 14.56 0 14.56 0 2.811 0 8.65 0 7.88 0 15.18 0 12.98 0 15.18 0 12.98 0 7.84 0 5.60 0 5.60 0 7.54 0 7.55	D1 mils 10.62 11.28 6.55 7.25 8.59 7.25 6.54 6.54 6.54 6.10 5.01 d 3.86 6.44 6.14 4.56	D2 mils 6.60 5.65 6.15 5.78 7.05 6.15 6.84 9.85 11.54 9.85 6.36 4.63 6.36 4.63 6.36 4.63 6.36 4.63 6.96 6.96 6.96 4.31 4.23	D3 mila 12255 14.14 6.54 7.39 8.67 7.91 12.65 8.89 7.14 5.32 5.20 6.59 7.14 5.32 5.32 6.655 7.14 6.655 7.08 4.82 4.82 4.82	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 11.33 8.14 4.84 6.00 6.39 4.88 4.88 4.88 4.88 4.80 5.30 6.36 6.36 4.49 4.38 4.49	D5 mils 9.56 5.52 6.591 6.54 9.72 7.22 4.36 5.25 5.52 4.24 4.34 3.47 5.27 5.51 4.06 3.96 4.32	D6 mils 8.07 4.83 5.80 5.88 5.87 6.30 3.81 4.49 4.62 3.60 3.11 4.59 4.72 3.60 3.47	D7 mils 5.63 5.92 3.61 3.38 3.93 3.93 4.55 5.68 4.62 2.85 3.25 3.25 2.48 3.43 3.44 2.81 2.76	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.55 1.55 1.55 1.55 1.55 1.55 1.55 1	Air ef 68 68 69 69 69 70 70 70 70 67 67 67 67 67 67 67 67 67 67	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 TJT 76 MID 75 TJT 76 MID 75 TJT 74 TJT 77 LCK 73 MID 74 TJT 72 TJT 73 LJT 76 LJT 77 LCK	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 12 CORNR 12 CORNR 13 LCK 14 LCK	Crack Sevty BJT AJT NA NA NA GOOD BJT AJT NA GOOD BJT AJT NA NA NA NA	Joint LTE % 72.96 83.19 55.33 77.22 86.73 81.22 83.86 78.32	Crack LTE. % 71.28 72.67 71.13 72.67 71.13 72.67 71.47 82.51 82.51 82.61	Mid Slab LTE. % 90.76 88.07 88.34 90.19 90.19
Reterence Offset 2 Testpoint spacing Distance Load m lbf 4424 900 4425 900 4425 900 4426 900 4432 900 4432 900 4432 900 4437 900 4497 900 4497 900 4497 900 4497 900 4497 900 6886 State B 7307 Ridge F 7307 Ridge F 7317 Ridge F 8756 900 8761 900 8765 900 8765 900 9929 900 9930 900 9930 900 9940 900 9944 900	0 miles 150 m 150 m 100 13.56 100 9.70 100 8.65 100 7.88 100 7.51 100 5.60 10 5.60 10 5.60 10 5.60 10 5.60 10 5.60 10 5.51 10 5.50 10 5.51 10 5.51 10 5.51 10 5.50 10 5.51 10 5.51 10 5.51 10 5.50 10 5.50 10 5.51 10 5.50 10 5.51 10 5.51 10 5.51 10 5.50 10 5.51 10 5.50 10 5.50 10 5.51 10 5.51 10 5.50 10 5.50 10 5.50 10 5.51 10 5.50 10 5.50 10 5.50 10 5.50 10 5.50 10 5.51 10 5.50 10 5.50	D1 mile 10.62 11.28 6.35 7.25 6.94 6.35 7.22 6.94 10.02 10.0	D2 mils 6.60 5.65 6.15 6.84 9.85 11.54 11.54 4.84 6.45 6.36 4.63 6.36 4.63 3.84 6.36 6.36 6.36 6.36 6.36 5.43 1.423 4.84 5.45 5.45 5.45 5.45 5.45 5.45 5.45	D3 mils 12 25 14.14 7.39 8.67 7.91 12.65 8.89 5.20 6.59 7.14 5.32 4.00 6.65 5.70 8.89 7.14 5.32 4.00 6.65 5.32 4.00 6.65 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 5.20 6.54 5.32 7.91 7.52 7.91 7.52 7.91 7.52 7.91 7.52 7.91 7.52 7.91 7.52 7.52 7.52 7.52 7.52 7.52 7.52 7.52	D4 mils 11.07 6.09 6.76 7.92 7.13 11.33 6.14 8.14 8.14 8.14 8.14 8.14 8.14 8.14 8	D5 mils 9.566 5.52 5.52 7.22 7.22 4.36 5.55 5.52 4.24 3.47 5.51 5.52 4.24 3.47 5.51 3.47 5.51 4.36 3.95 4.37	D6 mils 8.07 8.62 4.83 5.80 5.87 6.30 6.30 6.30 6.30 6.30 6.30 6.30 6.30	D7 mils 5.63 3.592 3.61 3.38 3.93 3.95 5.68 4.62 2.85 3.25 3.28 2.56 2.48 3.43 3.44 2.81 2.70 3.10 2.49 2.49 2.49 2.49 2.49 2.49 2.49 2.49	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.26 1.55 1.49 1.09 1.26 1.55 1.49 1.09 1.26 1.61 1.42 1.51 1.42 1.52 1.54 1.51 1.51 1.51 1.51 1.51 1.51 1.51	Air 68 68 68 69 69 70 70 70 70 67 70 67 67 67 67 67 67 67 67	Pave Pvmt ef Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 77 LCK 73 MID 74 TJT 73 LJT 73 LJT 73 LJT 75 MID 75 TJT 75 MID	Loc. Pvmt No. Crack 1 CORNR 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 13 LCK 14 LCK 15 NA 16 CORNR	Crack Sevity BJT AJT NA NA NA BJT AJT GOOD BJT AJT NA GOOD BJT AJT NA BJT AJT NA BJT AJT NA BJT AJT NA BJT AJT NA BJT AJT	Joint LTE. % 72.96 83.19 55.33 77.22 86.73 81.22 83.86 78.32 83.86	Crack LTE. % 72.67 71.13 78.47 82.51 82.61	Mid Slab LTE.% 90.76 88.07 88.34 90.19 90.28
Reterence Offset 2 Testpoint spacing Distance Load m lbf 4424 900 4425 900 4425 900 4426 900 4432 900 4432 900 4432 900 4432 900 4439 900 4497 900 4497 900 4497 900 4497 900 5886 State B 7317 Ridge F 7317 Ridge F 7317 Ridge F 7317 Ridge F 7317 Ridge F 7317 Ridge F 917 Ridge F 917 Ridge F 917 Ridge F 917 Ridge F 918 900 8765 900 8765 900 8765 900 9929 900 9940 900 9944 900 10259 900	0 m 150 m 10 9.700 10 8.65 10 9.700 10 8.65 10 9.700 10 9.700 10 8.65 10 12.98 10 12.98	D1 mile 10.62 11.28 6.35 7.25 6.94 10.02 1	D2 mils 6.60 5.65 7.705 6.15 7.05 6.84 9.85 11.54 6.45 6.36 4.45 6.36 4.45 3.84 6.96 6.45 6.38 4.43 1.423 4.84 5.42 5.42	D3 mils 1225 14.14 6.54 7.39 8.87 7.91 2.65 8.89 7.12 6.59 7.14 5.32 4.00 6.655 7.08 4.82 4.71 5.06 5.25 5.20	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30 7.13 11.33 8.14 6.00 6.39 4.84 6.00 6.39 4.83 6.36 6.36 4.49 4.38 4.484 4.38 4.78	D5 mils 9.56 5.52 5.91 6.87 6.40 6.54 9.72 7.22 4.36 5.25 5.52 4.24 3.47 5.27 5.51 4.24 4.36 3.95 4.37 4.30	D6 mils 8.07 8.62 4.83 5.80 5.80 5.80 5.80 5.80 6.30 3.81 4.49 4.62 3.60 3.11 4.59 4.72 3.60 3.49 3.49 3.49 3.49 3.49 3.49 3.49 3.49	D7 mils 5.63 5.92 3.68 3.38 3.393 3.395 5.68 4.62 2.85 3.25 3.28 3.45 2.26 2.48 3.43 3.44 2.81 3.44 2.81 3.44 2.81 3.44 2.81 3.44 2.81 3.44 2.81 3.44 2.81 3.44 2.81 3.44 2.81 3.44 3.44 3.44 3.44 3.44 3.44 3.44 3.4	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.18 2.18 1.260 1.260 1.260 1.260 1.260 1.260 1.260 1.260 1.55 1.49 1.09 1.280 1.64 1.64 1.51 1.51 1.51 1.51 1.51 1.51 1.51 1.5	Air 6E 68 68 69 70 70 69 70 70 69 70 70 67 67 67 67 67 67 67 67 67 67	Pave Pvntt ef Cond. 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 TJT 76 TJT 76 TJT 76 TJT 76 TJT 77 LCK 73 MID 74 TJT 73 LJT 73 LJT 75 MID 75 TJT 75 MID 75 TJT 75 MID	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 13 LCK 14 LCK 15 NA 16 CORNR	Crack Sevity BJT AJT NA NA NA BJT AJT SOOD BJT AJT NA GOOD BJT AJT NA AJT NA AJT NA AJT NA AJT	Joint LTE. % 72.96 83.19 555.33 77.22 866.73 81.22 83.86 78.32 83.86 78.32 85.88 82.24	Crack LTE. % 71.28 72.67 71.13 71.13 78.47 82.51 82.51	Mid Slab LTE.% 90.76 88.07 88.34 90.19 90.28
Reterence Offset 1 Testpoint spacing Distance Load m lbf 4424 900 4425 900 4425 900 4425 900 4425 900 4432 900 4432 900 4474 900 4497 900 4497 900 4497 900 5686 State R 7317 Ridge F 7317 Ridge F 7317 Ridge F 8756 900 8756 900 8756 900 8761 900 8765 900 9925 900 9930 905 9930 905 9940 900 10259 900 10259 900	0 m 150 m 150 m 0 14.56 0 14.56 0 7.00 0 8.11 0 9.70 0 8.11 0 9.70 0 8.65 0 7.00 0 8.65 0 7.00 0 8.65 0 7.00 0 8.65 0 7.65 0 7.64 0	D1 mils 6.35 7.25 6.94 10.02 1	D2 mils 6.60 5.65 5.78 7.05 6.15 6.84 9.85 11.54 4.84 6.45 6.38 4.63 6.96 4.33 4.84 4.63 5.74 5.74 5.74 5.74	D3 mils 12.25 14.14 6.54 7.39 8.87 7.91 12.65 8.89 7.12 6.59 7.14 5.32 6.59 7.14 5.32 4.00 6.65 7.08 4.82 4.71 5.56 5.55 5.51	D4 mils 11.07 11.96 6.09 6.76 7.92 7.30 11.33 8.14 6.00 6.39 4.84 6.00 6.39 4.88 3.77 6.03 6.36 6.36 4.49 4.38 4.48 4.58 5.55 5.55	D5 mils 9.56 5.52 5.91 6.87 7.22 7.22 4.36 5.55 5.52 4.24 4.06 3.95 5.55 4.24 4.06 3.95 5.51 3.47 5.51 4.24 4.00 3.95 5.51 4.24 4.00 3.95 5.51 4.24 4.00 5.52 5.51 5.51 5.51 5.52 5.55 5.55 5.55	D6 mils 8.07 8.62 5.80 5.80 5.80 5.80 5.80 5.80 5.80 5.80	D7 mils 5.63 5.92 3.38 3.93 3.93 5.568 4.62 2.85 3.25 3.28 3.25 3.28 2.56 3.28 3.25 3.28 3.25 3.28 3.24 3.24 3.43 3.44 2.81 2.70 2.94 3.10 2.94 3.20 2.94 3.20 3.20 3.20 3.20 3.20 3.20 3.20 3.20	D8 mils 1.51 1.51 1.64 2.11 2.60 2.18 1.26 1.55 1.49 1.09 1.28 1.66 1.61 1.42 1.39 1.53 1.55 1.42	Air ef 68 68 69 70 70 70 70 70 70 70 70 70 70	Pave Pvnt ef Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 JT 76 TJT 76 TJT 76 TJT 77 LCK 73 MID 74 TJT 73 JT 73 JT 75 LJT 75 LJT 75 LJT 76 LJT 75 LJT 76 LJT 76 LJT 77 LCK	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 12 CORNR 13 LCK 14 LCK 15 NA 16 CORNR 17 LCK	Crack Sevity BJT AJT NA NA NA BJT AJT AJT NA GOOD BJT AJT NA NA GOOD BJT AJT NA NA NA NA SGOOD BJT AJT NA	Joint <u>LTE. %</u> 72.96 83.19 55.33 77.22 86.73 81.22 83.86 78.32 85.86 82.31	Crack LTE. % 71.28 72.67 71.13 71.13 78.47 82.51 82.61	Mid Slab LTE. % 90.76 88.07 88.34 90.19 90.19 90.28
Reterence Offset 1 Testpoint spacing Distance Load m lbf 4424 900 4425 900 4425 900 4432 900 4432 900 4432 900 4437 900 4497 900 4497 900 4497 900 5686 State B 7317 Ridge F 7317 Ridge F 7317 Ridge F 8756 900 8761 900 8761 900 8765 900 9925 900 9925 900 9925 900 9929 900 9930 900 9940 900 10259 900 10254 900 10264 900	0 m 150 m 150 m 0 14.56 0 14.56 0 14.56 0 7.00 0 8.11 0 9.70 0 8.65 0 7.88 0 15.18 0 15.18 0 15.18 0 15.18 0 2.560 0 5.60 0 5.90 View Road 0 5.90 View Road 0 5.90 0 7.54 0 5.90 0 5.90 0 5.12 0 5.55 0 6.45 0 6.45 0 8.97 0 9.97 0 8.97 0 9.97 0 9 0 9 0 9 0 9 0 9 0 9 0 9 0 9	D1 mils 10.62 11.28 6.35 7.25 8.59 7.25 8.59 7.25 8.59 10.02 10.02 10.02 10.02 10.02 10.02 10.63 10.63 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 10.02 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.40 1.28 8.59 1.25 8.59 1.48 8.40 1.48 8.50 1.50	D2 mils 6.60 5.65 6.15 5.78 7.05 6.15 6.84 9.85 11.54 9.85 6.38 4.63 6.38 4.63 6.38 4.63 6.38 4.63 6.38 4.63 6.96 4.31 4.23 4.84 4.574 5.76 5.76 5.78 5.78 5.78 5.78 5.78 5.78 5.78 5.78	D3 mila 12255 14.14 6.54 7.39 8.67 7.91 12.65 8.89 7.12 5.20 6.59 7.14 5.32 5.32 4.00 6.655 7.28 4.82 4.71 5.02 6.55 5.551 5.99 8.42	D4 mils 11.07 11.98 6.09 6.76 7.92 7.30 8.14 4.84 6.00 6.39 4.88 4.88 4.88 4.88 4.88 4.88 4.88 4.8	D5 mils 9.56 5.52 5.52 7.22 4.36 5.55 5.52 4.24 4.30 4.30 4.32 4.34 4.30 4.32 4.34 4.35 4.37 4.30 4.52 4.30 4.52	D6 mils 8.07 4.83 5.80 5.88 5.87 6.30 3.815 6.30 3.815 6.30 3.81 4.49 4.62 3.60 3.40 3.40 3.40 3.40 3.40 3.40 3.40 3.4	D7 mils 5.63 5.92 3.61 3.38 3.93 4.55 5.68 4.62 2.85 3.25 3.25 3.25 3.25 3.25 3.25 3.25 3.2	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.26 1.55 1.49 1.09 1.28 1.61 1.42 1.39 1.55 1.45 1.55 1.55 1.55 1.55 1.55 1.55	Air ef 68 68 69 70 70 69 70 70 69 70 70 67 67 67 67 67 67 67 67 67 67	Pave Pvmt eF Cond 73 TJT 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 TJT 76 TJT 76 TJT 77 LCK 73 MID 74 TJT 73 LJT 75 MID 75 TJT 75 MID 75 TJT 76 LJT 76 LJT 76 LCK	Loc. Pvmt No. Crack* 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 13 LCK 14 LCK 15 NA 16 CORNR 16 CORNR 16 CORNR	Crack Sevity BJT AJT NA NA NA GOOD BJT AJT NA GOOD BJT AJT NA GOOD BJT AJT NA NA NA NA NA NA NA NA	Joint LTE % 72.96 83.19 555.33 77.22 865.73 81.22 83.86 78.32 83.86 78.32 85.88 82.31	Crack LTE. % 71.28 72.67 71.13 71.13 78.47 78.47 82.51 82.61 77.26 77.26	Mid Slab LTE. % 90.76 88.07 88.07 88.34 90.19 90.19 90.28
Reference Offset: Testpoint spacing Distance Load m Ibf 4424 900 4425 900 4425 900 4426 900 4426 900 4432 900 4432 900 4437 900 4496 900 4497 900 4497 900 5686 State B 7307 Ridge F 7317 Ridge F 7317 Ridge F 7317 Ridge F 8756 900 8761 900 8765 900 8928 Huron 9929 900 9930 900 9944 900 10259 900 10254 900 10264 9	0 m 150 m D0 mils 0 14.56 0 13.56 0 13.56 0 13.56 0 14.56 0 13.56 0 7.88 0 15.18 0 7.88 0 15.18 0 7.88 0 7.88 0 7.51 0 5.90 0 5.90 0 7.84 0 7.54 0 5.92 0 5.92	D1 mils 10.62 11.28 6.35 7.25 6.94 6.94 10.02 6.94 6.94 6.94 6.10 5.01 5.01 5.01 6.54 6.44 6.14 6.14 6.14 6.14 5.50 5.51 7.25	D2 mils 6.60 5.65 6.15 5.78 7.05 6.15 6.84 9.85 11.54 4.84 6.45 6.36 4.63 4.63 4.63 6.36 4.63 4.63 4.63	D3 mils 12.25 4.14 7.39 8.67 7.91 12.65 8.89 7.152 5.20 6.59 7.14 5.22 7.08 4.82 4.71 5.06 6.52 5.51 5.59 9.8.14	D4 mils 11.07 7.13 6.09 6.09 7.13 11.33 8.14 4.84 6.00 6.39 4.88 3.77 6.03 6.38 4.49 4.38 4.49 4.38 4.49 4.38 5.05 5.560 7.53	D5 mils 9.56 5.52 5.52 6.87 6.40 6.54 9.72 7.22 4.36 5.55 5.52 4.24 3.47 5.51 5.51 3.96 3.96 3.96 4.37 4.30 6.59	D6 mils 8.07 8.62 4.83 5.80 5.87 6.30 3.81 4.49 4.62 3.60 3.11 4.59 4.72 3.60 3.49 4.72 3.60 3.49 3.30 3.49 3.377 3.95 4.39 5.73	D7 mils 5.63 3.592 3.61 3.38 3.93 3.95 5.68 4.62 2.85 3.25 5.68 4.62 2.85 3.25 3.28 2.56 2.48 3.44 2.81 2.70 3.10 2.94 3.44 2.81 3.44 2.81 3.30 3.01 3.01 3.02 3.01 3.01 3.01 3.01 3.01 3.01 3.01 3.01	D8 mils 2.47 2.52 1.58 1.51 1.81 1.64 2.11 2.60 2.18 1.26 1.55 1.49 1.09 1.28 1.61 1.42 1.39 1.55 1.45 1.51 1.51 1.51	Air 68 68 68 69 69 70 70 69 70 70 67 67 67 67 67 67 67 67 67 67	Pave Pvmt ef Cond 73 TJT 75 MID 77 LCK 78 LCK 78 LCK 78 LCK 78 LCK 78 MID 76 TJT 76 MID 75 TJT 77 LCK 73 MID 74 TJT 77 LCK 73 MID 74 TJT 75 LJT 75 LJT 76 LCK 75 LCK	Loc. Pvmt No. Crack 1 CORNR 2 NA 3 LCK 4 LCK 5 LCK 6 NA 7 CORNR 7 CORNR 7 CORNR 9 CORNR 9 CORNR 9 CORNR 10 LCK 11 NA 12 CORNR 12 CORNR 13 LCK 14 LCK 15 NA 16 CORNR 16 CORNR 17 LCK 18 LCK	Crack Sevity BJT AJT NA NA NA BJT AJT NA GOOD BJT AJT NA GOOD BJT AJT NA NA NA NA NA NA NA NA NA NA NA	Joint LTE. % 72.96 83.19 55.33 77.22 86.73 81.22 83.86 78.32 85.88 82.31	Crack LTE. % 72.67 71.13 78.47 78.47 82.51 82.61 77.26 74.30	Mid Slab LTE.% 90.76 88.07 88.07 88.34 90.19 90.19

10533 Port Saniac WCL 10657 "checker board" whitetopping 11359 poe M-25

CORNR represents tests across the transverse joint in the corner of the slab (by the shoulder)
LCK represents tests transversely across the longitudinal crack MID represents tests at mid-slab (away from any joints or cracks)

## **GPR Results From Longitudinal Crack Investigation**

M46EBWHITETOP-REFL-LAY.DZT

cs 74062, M-46 eb whitetopping test section between Carsonville and Pt. Sanilac

Created Dec, 20 2001, 12:51:34 Modified Dec, 21 2001, 10:42:10 Channel(s) 1 Samples/Scan 512 Bits/Sample 16 Scans/Second 160 Scans/Meter 1.64042 Meters/Mark 30.48 Diel Constant 6

CHANNEL 1 4108 Position -3 ns Range 20 ns Range Gain (dB) 15.0 Vert IIR LP N =1 F =3000 MHz Vert Boxcar LP F =100 MHz Vert Boxcar LP F =5120 MHz Vert Boxcar HP F =480 MHz

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--Vertical dashed lines mark when the operator was over the center of a longitudinal crack or some reference point (an intersection, for example). Labels appear at the bottom of the lines. The radar antenna follows the operator over the point marked by about 13 feet after (to the right of) the mark on the printout.

--LC = longitudinal crack

--Vertical scale on top graph is nanoseconds. Vertical scale on bottom graph is inches.

--Measurements written on the bottom graph are depths to the bottom of the pavement layers at the mark (dashed line). These are my interpretations of the radar output as to where the bottoms of the concrete and asphalt layers are. The scale is a little distorted in the printout. These numbers were picked off of the computer screen.

--Yellow represents bottom of concrete, red = bottom of asphalt, green = bottom of base









































