SPRINKLE TREATMENT EXPERIMENTAL PROJECT

CONSTRUCTION AND FIRST-YEAR EVALUATION

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DEMONSTRATION PROJECT NO. 50

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METRIC CONVERSION FACTORS*

To Convert from	To	Multiply by
	Length	
foot	meter (m)	0.3048
inch	millimeter (mm)	25.4
yard	meter (m)	0.9144
mile (statute)	kilometer (km)	1.609
	Area	
square foot	square meter (m^2)	0.0929
square inch	square centimeter (cm^2)	6.451
square yard	square meter (m^2)	0.8361
	Volume (Capacity)	
cubic foot	cubic meter (m^3)	0.02832
gallon (U.S. liquid)**	cubic meter (m^3)	0.003785
gallon (Can. liquid)**	cubic meter (m^3)	0.004546
ounce (U.S. liquid)	cubic centimeter (cm^3)	29.57
	Mass	
ounce-mass (avdp)	gram (g)	28.35
pound-mass (avdp)	kilogram (kg)	0.4536
ton (metric)	kilogram (kg)	1000
ton (short, 2000 lbs)	kilogram (kg)	907.2
	Mass per Volume	
pound-mass/cubic foot	kilogram/cubic meter (kg/m^3)	16.02
pound-mass/cubic yard	kilogram/cubic meter (kg/m^3)	0.5933
pound-mass/gallon (U.S.)**	kilogram/cubic meter (kg/m^3)	119.8
pound-mass/gallon (Can.)**	kilogram/cubic meter (kg/m^3)	99.78
	Temperature	
deg Celsius (C)	kelvin (K)	$t_k=(t_c+273.15)$
deg Fahrenheit (F)	kelvin (K)	$t_k=(t_F+459.67)/1.8$
deg Fahrenheit (F)	deg Celsius (C)	$t_c=(t_F-32)/1.8$

*The reference source for information on SI units and more exact conversion factors is "Metric Practice Guide" ASTM E 380.

**One U.S. gallon equals 0.8327 Canadian gallon.

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INTRODUCTION

Background

Louisiana developed an open-graded friction course in the late 1960s and early 1970s in order to provide a skid resistant surfacing. Also, due to the open texture of this material water spray was reduced and critical hydroplaning speeds were increased. While the State's native chert gravel could produce acceptable skid resistance initially in dense-graded wearing courses, it was found that skid numbers declined rapidly. Thus, the development of open-graded friction course utilizing a locally produced expanded clay aggregate or other imported non-polishing aggregates such as stone and slag, filled a void just prior to the initiation of the Federal Highway Safety Program Management Guide, Highway Safety Program 12, and Instructional Memorandum 21-3-73 of 1973 dealing with the establishment of a Skid Accident Reduction Program.

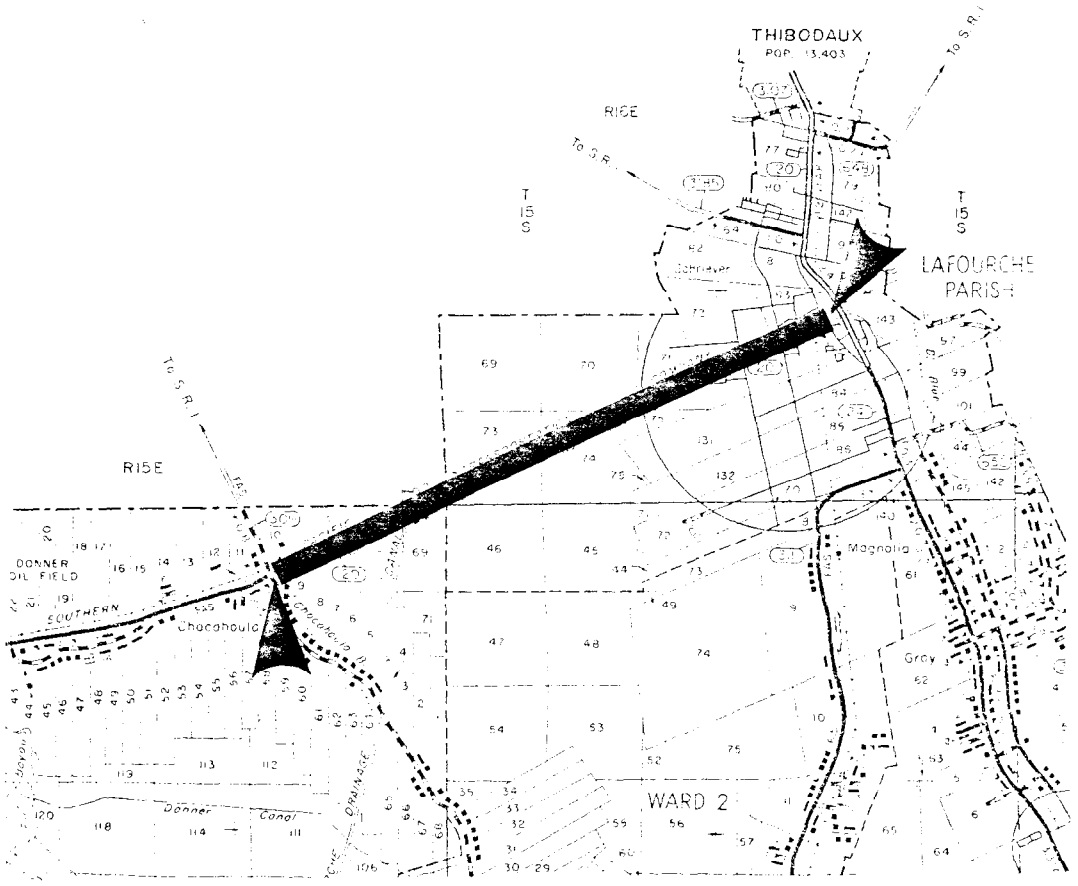
Many miles of friction course were placed, and by the late 1970s it had become the standard for high speed, high volume roadways. By 1980, however, some of these surfacings reached end of life, which was manifested by severe ravelling and an ensuing decrease in serviceability. This, in conjunction with a number of friction course failures either in the construction stage or shortly thereafter led to a moratorium on its use, in 1980. Use was continued after revisions were made to specifications. Severe winter weather conditions in 1982 and 1983 led to an inordinate amount of ravelling of friction courses regardless of age. The decrease in serviceability of these roadways was vocalized by the driving public, and the construction of open-graded friction course was suspended in 1984.

The Department's Research Section recognized the need for alternatives to the friction course materials. One such alternative which appeared promising was Sprinkle Treatment. Sprinkle Treatment, initiated in 1977 by the Federal Highway Administration under the auspices of Demonstration Project No. 50, was developed in England where it has been widely utilized to provide skid resistant wearing surfaces. Sprinkle Treatment is the application of a properly graded, pre-coated, non-polishing aggregate to a hot asphaltic concrete wearing course immediately behind the paving machine. The "sprinkled" chips are embedded into the mat with the initial rolling operation. By embedding costly imported non-polishing aggregates only in the wearing course surface, rather than using it in the entire mix, a substantial conservation of materials and cost could be realized.

The success of Demonstration Project No. 50 and the Department's problems with open-graded friction course led to the approval of an experimental project to examine Sprinkle Treatment. In May 1984 a plan change was issued to an ongoing contract to include the use of the Sprinkle Treatment process for approximately 3.0 miles on La. 20 from Chacahoula to Schriever. An agreement with the Demonstration Projects Division of FHWA provided for the use of a Bristowes Mk V chip spreader. This report documents the construction and presents the first-year performance data of the Sprinkle Treatment field trial.

Location and Section Design

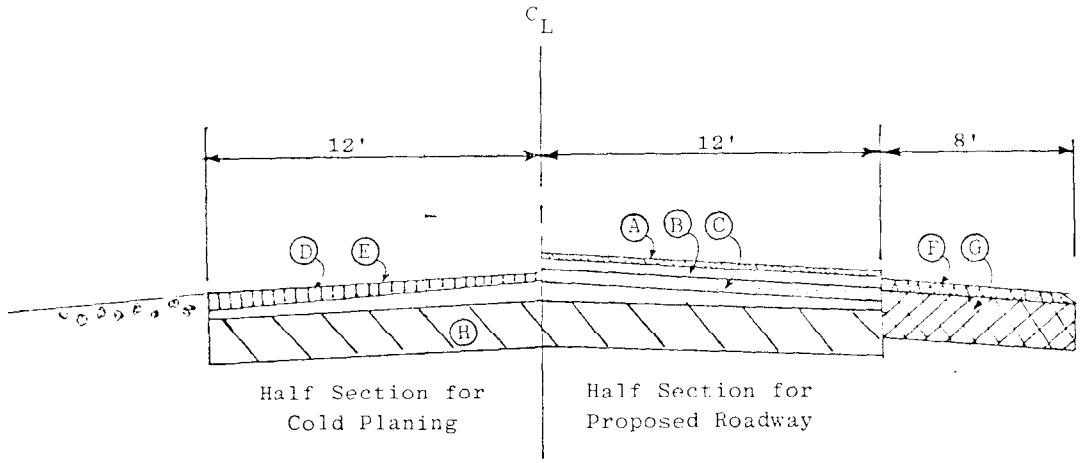
An agreement was made whereby the construction of the trial section was made part of an ongoing contract with Louisiana Paving Co., Inc., Kenner, Louisiana. This 6.1-mile project on La. 20 in Terrebonne Parish extended from Chacahoula to Schriever, as shown in Figure 1. This roadway was scheduled for cold planing (2-inch average), 3-1/2-inch overlay and the application of a 5/8-inch asphaltic concrete friction course (ACFC). The plan change



Project Location

FIGURE 1

substituted Sprinkle Treatment for approximately one-half of the scheduled friction course. The existing roadway was composed of portland cement concrete which had been overlaid twice with asphaltic concrete, adding approximately 6 inches to the cross section. Figure 2 presents the design typical section.



A 5/8" Asphaltic Concrete Friction Course

B 1-1/2" Type 3 Wearing Course

C 2" Type 3 Binder Course

D Existing Asphaltic Concrete to be Cold Planed (2" Avg)

E Existing Asphaltic Concrete Overlay

F 2" Asphaltic Concrete Shoulder Mix

G 6" Cement Stabilized Base Course

H Existing P.C.C. Pavement

Design Typical Section

FIGURE 2

Traffic and Accident Data

In 1984 the average daily traffic (ADT) was 8520, with 18 percent truck traffic. Accident data was obtained for the period 1980 through 1984 with a summary of accidents by type as classified by property damage only, injury excluding fatalities, and fatalities. This information is presented in Table 1 along with the total number of injuries or fatalities. Wet weather accidents have also been extracted and are indicated in parentheses.

TABLE 1

PRECONSTRUCTION TRAFFIC AND ACCIDENT DATA

Year ADT	Total Accidents	Property Damage Only	Injury	Fatality	Number of Injuries	Number of Fatalities
1980	67	25	40	2	75	2
7538	(12)*	(6)	(5)	(1)	(10)	(1)
1981	53	34	18	1	28	1
7116	(7)	(5)	(2)	(0)	(3)	(0)
1982	64	41	22	1	44	1
7572	(13)	(13)	(0)	(0)	(0)	(0)
1983	50	35	15	0	24	0
6284	(7)	(6)	(1)	(0)	(1)	(0)
1984	64	40	22	2	54	2
8520	(8)	(6)	(2)	(0)	(4)	(0)

*All data in parentheses refer to wet weather accidents.

EXPERIMENTAL FIELD PROJECT

Materials and Mix Design

The Special Provisions for this plan change, found in Appendix A, required that the sprinkle aggregate be either slag or stone graded such that most of the material passed the 1/2-inch screen and was retained on the No. 4 screen. The aggregate chosen for use was a slag from Godwin, Tennessee, supplied by Southern Stone. According to the specification, this material was required to possess a polish value greater than 35. Test results on material sampled from the stockpile representing 300 tons of aggregate are presented in Table 2 along with the gradation requirements. It was noted that the stockpiled material was slightly outside specification requirements.

TABLE 2

SPRINKLE AGGREGATE PROPERTIES

Gradation U.S. Sieve Size	Specification (% Passing)	Stockpile (% Passing)
1/2 inch	100	99
3/8 inch	20 - 55	42
No. 4	0 - 5	8
No. 200	0 - 1.5	0
Polish Value	35 min.	38
Specific Gravity		2.51

The Type 3 (high stability) wearing course used on the conventional section design was modified to create room in the mix matrix for the sprinkle aggregate so that a satisfactory level of embedment could be attained. A necessary criterion for proper embedment established through other Demonstration Project No. 50 field trials was the requirement that a minimum of 50 percent of the total aggregate should pass the No. 10 screen. The job mix formulae (JMF) submitted and approved for this project are provided in Table 3.

Three Rivers Rock Co. of Smithland, Kentucky, was the source of the limestone coarse aggregate and screenings for the modified wearing course. Normally this material source is prohibited from use in wearing surfaces where the average daily traffic per lane exceeds 1000 vehicles because of its low polish value. The sources of coarse and fine sands were Pearl River Sand and Gravel and Weber Pit, respectively. Sunshine Oil Co. supplied the AC-30 asphalt cement that was utilized to both pre-coat the slag sprinkle aggregate and in the asphaltic concrete. Southern Stone also supplied the slag aggregate used in the ACFC.

Plant Production

Louisiana Paving Co. utilized its 5-ton screenless batch plant located at Bayou Blue in Houma, Louisiana, for mix production on this job. The plant was located approximately 17 miles from the project site. There were no modifications required to normal plant operations for the production of either the pre-coated aggregate or modified Type 3 mix.

In March of 1984, Type 3 binder course material was placed on the planed surface an average of 2 inches thick. The material was placed in six lots, numbers 21 through 26, between the 16th and the 30th of March. There were 8697 tons of binder course produced. The contractor ceased work on this project at that point.

TABLE 3

PROJECT JOB MIX FORMULAE

Sequence No.	49	87	03	01
Mix Use	Type 3 Binder	Type 3 Wearing	Type 3 Mod Wearing	ACFC
Recommended Formula Percent Passing				
U.S. Sieve Size				
1 inch	100	100	100	
3/4 inch	91	99	100	
1/2 inch	76	85	91	100
3/8 inch	-	-	-	95
No. 4	50	57	70	43
No. 10	41	44	54	14
No. 40	27	27	30	
No. 80	13	14	15	
No. 200	8	8	9	3
% AC	4.5	4.2	5.1	6.5
Mix Temp.	315	300	300	
Marshall Properties (75 blow design)				
Specific Gravity	2.40	2.43	2.38	
Theoretical Gravity	2.50	2.52	2.48	
% Theoretical	96.0	96.4	96.0	
% Voids	4.0	3.6	4.0	
% V.F.A.	72.4	73.3	75.0	
Marshall Stability	2130	2280	1820	
Flow	9	9	10	

In September, work on the roadway was resumed. The Type 3 wearing course for the control section (JMF No. 87) was placed in three lots, Nos. 55 through 57, between the 10th and the 13th of the month (4137 tons). The asphaltic concrete friction course (JMF No. 01) was placed over the control section from the 24th to the 26th. Two lots (Nos. 62 and 63) were produced, totaling 1202 tons.

All of the sprinkle aggregate was pre-coated at the plant approximately two weeks prior to production of the modified wearing course. This material was stockpiled according to the special provisions at the contractor's yard.

The modified Type 3 wearing course for the sprinkle treatment section (JMF No. 03) was produced from the 27th to 29th, in lots 64 through 66. There were 3321 total tons placed on the roadway. Table 4 presents the production data for the project.

TABLE 4

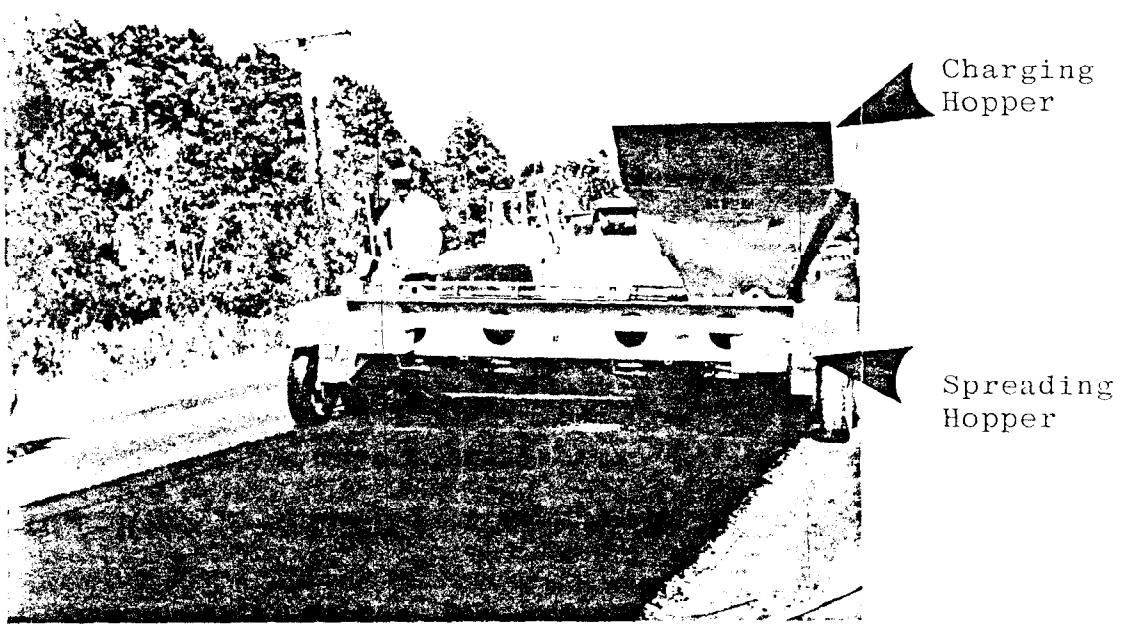
PLANT PRODUCTION

Lot No.	Date	Mix Type	Tonnage	Temp.
21	3/16	Binder	1481	314
22	3/19	Binder	1486	313
23	3/22	Binder	1385	307
24	3/23	Binder	1511	301
25	3/28	Binder	1519	317
26	3/30	Binder	1315	299
55	9/10	Wearing	1312	307
56	9/11	Wearing	1406	306
57	9/13	Wearing	1419	317
62	9/24	ACFC	661	249
63	9/25	ACFC	541	252
64	9/27	Mod. Wearing	1515	313
65	9/28	Mod. Wearing	1522	319
66	9/29	Mod. Wearing	284	312

Construction

Perhaps one of the most critical aspects to a successful treatment is the uniform dispersion of the sprinkle aggregate in a timely manner so that the breakdown roller can embed the chips while the mat is still hot. It is thus important that the chip spreader be able to keep a fully charged hopper holding a sufficient quantity of material in order to keep up with the paving machine. As part of the special provisions the FHWA would provide a Bristowes Mk V chip spreader which reportedly could fulfill these requirements.

The Bristowes Mk V chip spreader is the culmination of fifteen years of chip spreader development. This self-propelled, variable speed spreader completely spans the newly paved mat (Figure 3) and can spread the chips along the full 12-foot



Bristowes Mk V Chip Spreader

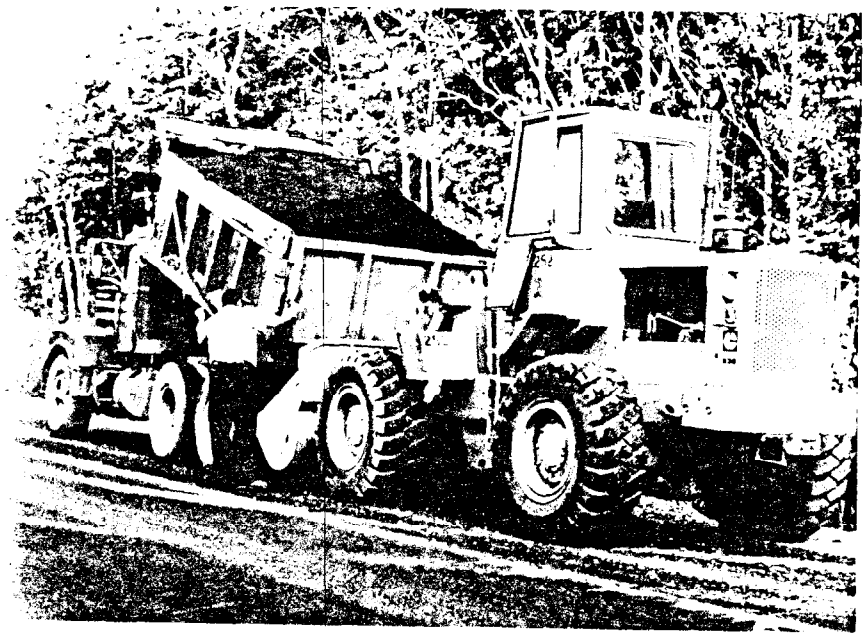
FIGURE 3

width. As indicated in the figure there are two separate hoppers. The charging hopper is a powered self-trimming traversing hopper which operates on command. The spreading hopper lays the chips behind the spreader such that the aggregate's speed of fall is commensurate with the forward speed of the spreader thus reducing the tendancy of the chips to roll on the mat. Distribution rate is set by gates.

In addition to the chip spreader and operator, two trucks holding the pre-coated aggregate, a front-end loader and three operators were used on this project. Figures 4 and 5 depict the process of loading the aggregate into the chip spreader. Note that extension plates were welded onto the charging hopper to accommodate the size of the loader bucket.

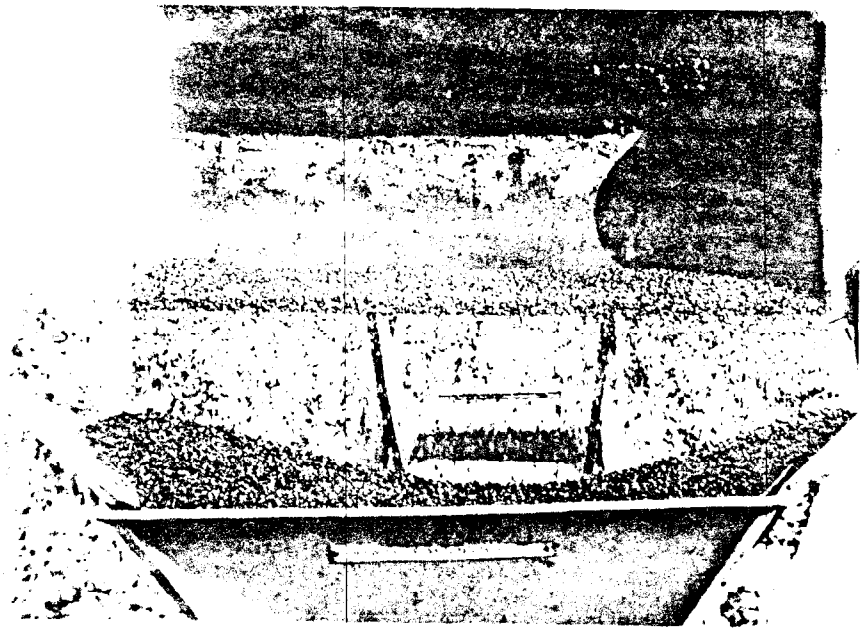
Figures 6 and 7 portray the paving train in operation. The modified Type 3 wearing course was placed through a standard paving machine. It is observed that the Bristowes chip spreader maintained a position immediately behind the paver. This was the case throughout production. The uniform distribution of the sprinkle aggregate should also be noted. This uniform placement occurred during the entire course of construction. An occasional exception happened when the paving train would stop due to lack of haul trucks. However, with a slight overlap the operator could correct the uniformity. Generally, the breakdown roller followed immediately behind the spreader, as shown, thereby compacting the mix at the same temperature as in a conventional operation.

Two separate experimental sections were attempted during the field trial with the rate of application of the sprinkle aggregate providing the distinction. For approximately 1.2 miles a chip spread rate of 7 pounds per square yard was applied. This rate was recommended by personnel of the FHWA as an optimum rate in order to provide good skid resistance and



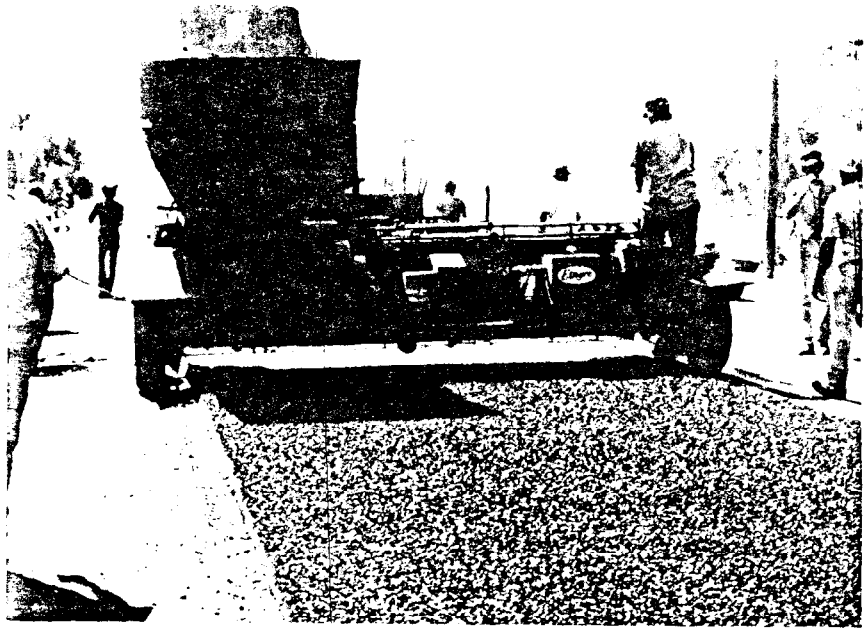
Haul Truck and Front End Loader

FIGURE 4



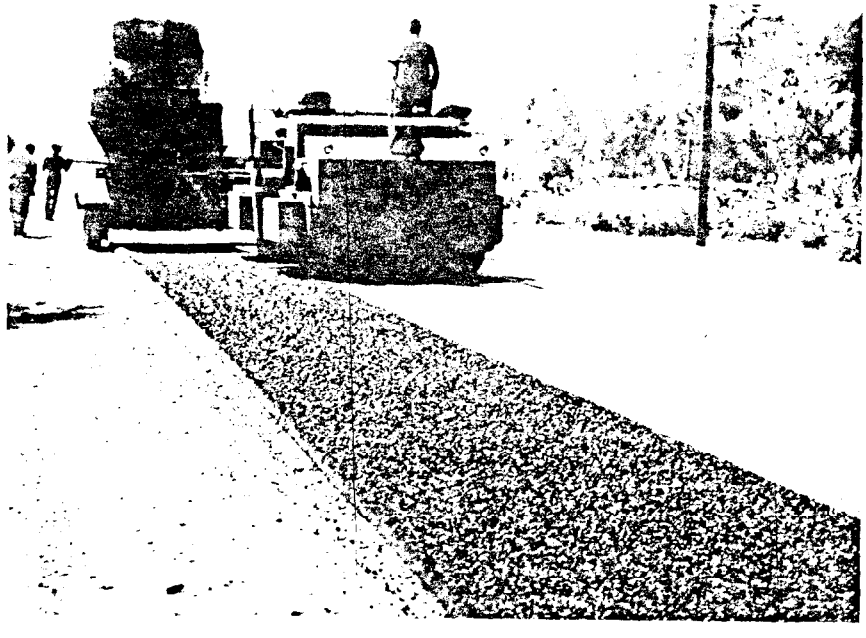
Fully Charged Hopper

FIGURE 5



Chip Spreading Operation

FIGURE 6



Initial Compaction and Embedment

FIGURE 7

reduce the amount of aggregate loss. The second section attempted utilized a spread rate of 10 pounds per square yard. It was reasoned that if this rate could be embedded, the surface macrotexture would behave similar to an open-graded friction course such that the critical hydroplanning speed could be increased.

Application rates for the sprinkle aggregate were checked by district laboratory personnel using a portable scale and a one square yard cloth. The cloth was placed on the freshly laid hot mix prior to spreading the chips. After the chips were placed, the cloth was gathered and the aggregate was emptied into a tared can. Several locations were checked both longitudinally and transversely. Gate settings were established at the beginning of each test section. The actual application rates for the 7 pound per square yard section ranged between 6.5 and 8.5 while the 10 pound per square yard section was found to range from 7.5 to 12. Despite this overlap in measured application rates there was a visual difference in the spread rates.

Quality Control

Several samples of the pre-coated slag aggregate were taken from the roadway to the research laboratory for gradation and asphalt content analysis. As is observed in Table 5, the aggregate did not meet the proposed specification and the asphalt content was higher than the 1.0 to 1.5 percent required. There were however no problems associated with these discrepancies at the roadway.

Marshall stability (75 blow design) was used for acceptance testing and other Marshall properties were used for mix control. Table 6 presents all Marshall data for this project. Table 7 contains the gradations and asphalt cement content from extracted loose mix samples. With the exception of two

TABLE 5

SPRINKLE AGGREGATE EXTRACTED PROPERTIES

Sample No.	1	2	3
US. Sieve Size (% Passing)			
1/2 inch	98	99	99
3/8 inch	40	37	38
No. 4	12	10	11
No. 8	3	3	3
% Asphalt Cement	2.2	2.2	2.1

TABLE 6

MARSHALL TEST DATA FOR PLANT SPECIMENS

Lot No.	Specimen Number	Stability (Lbs)	Flow (0.01 In)	Specific Gravity	VFA (%)	Voids (%)
			TYPE 3 BINDER COURSE			
21	1	2099	13	2.40	72	4.0
	2	2025	13	2.40	72	4.0
	3	2281	14	2.40	72	4.0
	4	2140	12	2.40	72	4.0
22	1	2198	9	2.40	72	4.0
	2	2257	9	2.40	72	4.0
	3	2343	8	2.40	72	4.0
	4	2168	9	2.40	72	4.0
23	1	2227	9	2.40	72	4.0
	2	2374	10	2.40	72	4.0
	3	2183	9	2.39	70	4.4
	4	2198	9	2.40	72	4.0
24	1	2140	9	2.39	70	4.4
	2	2124	9	2.40	72	4.0
	3	2388	10	2.40	72	4.0
	4	2083	10	2.40	72	4.0
25	1	2169	9	2.40	72	4.0
	2	2163	10	2.40	72	4.0
	3	2661	8	2.41	74	3.6
	4	2054	9	2.40	72	4.0
26	1	2225	9	2.40	72	4.0
	2	2169	9	2.40	72	4.0
	3	1955	8	2.39	70	4.4
	4	2113	9	2.40	72	4.0

TABLE 6 (CONTINUED)

MARSHALL TEST DATA FOR PLANT SPECIMENS

Lot No.	Specimen Number	Stability (Lbs)	Flow (0.01 In)	Specific Gravity	VFA (%)	Voids (%)
			TYPE 3 WEARING COURSE			
55	1	2100	8	2.42	71	4.0
	2	2135	10	2.44	76	3.2
	3	2096	10	2.42	71	4.0
	4	2192	9	2.42	71	4.0
56	1	1758	8	2.44	76	3.2
	2	1898	9	2.43	73	3.6
	3	1782	8	2.42	71	4.0
	4	1733	10	2.42	71	4.0
57	1	1901	7	2.45	78	2.8
	2	1930	8	2.42	71	4.0
	3	2079	9	2.44	76	3.2
	4	2029	9	2.43	73	3.6
			MODIFIED TYPE 3 WEARING COURSE			
64	1	1831	8	2.41	81	2.8
	2	1742	10	2.41	81	2.8
	3	2032	8	2.39	77	3.6
	4	1837	10	2.39	77	3.6
65	1	1877	9	2.40	79	3.2
	2	1782	9	2.38	77	3.6
	3	1732	8	2.39	77	3.6
	4	1756	8	2.40	79	3.2
66	1	1831	10	2.40	79	3.2

TABLE 7

EXTRACTED GRADATION AND ASPHALT CEMENT CONTENT

Mix Type	Type 3 Binder Course					
Lot No.	21	22	23	24	25	26
Date Laid	3/14	3/16	3/19	3/22	3/23	3/28
Gradation % Passing						
1 inch	100	100	100	100	100	100
3/4 inch	90	94	94	96	94	94
1/2 inch	74	80	74	80	78	80
No. 4	50	52	49	53	52	53
No. 10	42	42	40	43	42	44
No. 40	27	26	26	28	28	28
No. 80	13	12	13	14	15	12
No. 200	8	7	6	7	8	8
% Asphalt	5.1	5.1	4.8	3.1	4.8	4.8

Mix Type	Type 3 Wearing Course			Mod. Wearing Course		
Lot No.	55	56	57	64	65	66
Date Laid	9/10	9/11	9/13	9/27	9/28	9/28
Gradation % Passing						
1 inch	100	100	100	100	100	100
3/4 inch	100	100	100	100	100	100
1/2 inch	92	88	86	94	94	94
No. 4	59	56	56	70	72	73
No. 10	45	44	42	54	56	56
No. 40	28	28	25	30	30	30
No. 80	12	12	12	14	12	12
No. 200	8	8	8	8	8	7
% Asphalt	4.4	4.4	4.6	5.2	5.3	5.7

briquettes in lot 64 which exceeded VFA and air void control criteria, all mix properties concurred with specifications. The low asphalt content on the lot 24 binder course was not found in a verification sample which indicated a 4.6 percent asphalt content.

The normal density requirement of 95 percent of design compaction was waived for this project as there was concern that the coarse surface texture imparted by the partially embedded sprinkle aggregate could mask the true compactive effort. Table 8 provides the specific gravities and percent compaction for each of the roadway samples. As the contractor was achieving good although inconsistent compaction on his conventional binder and wearing courses, no changes were made to his rolling pattern. The first day's production of the sprinkle treatment seemed to demonstrate that the modified Type 3 mix could also be readily compacted and that the surface texture did not interfere in the density determination. By the time the second day's production was sampled and tested, the short third day's production had already been laid and as can be seen did meet the normal densification requirement. For insurance, though, a short section of the modified mix was placed during the first day of laydown without the sprinkle aggregate. It was believed that this section would demonstrate the ability to compact the modified mix. Unfortunately, two specimens indicated 95.4 and 93.3 percent compaction leaving in doubt whether the low densities were due to the sprinkle aggregate or the contractor's inability to compact the modified mix.

TABLE 8

ROADWAY DENSITIES AND PERCENT OF PLANT DENSITIES

Mix Type	Type 3 Binder Course					
Lot No.	21	22	23	24	25	26
Date Laid	3/14	3/16	3/19	3/22	3/23	3/28
Specific Gravity	2.28	2.39	2.36	2.31	2.34	2.30
	2.29	2.28	2.31	2.31	2.34	2.33
	2.30	2.36	2.32	2.35	2.36	2.25
	2.29	2.32	2.30	2.28	2.35	2.31
	2.35	2.30	2.32	2.30	2.37	2.34
Mean	2.30	2.33	2.32	2.31	2.35	2.31
% of Plant	95.9	97.1	96.8	96.3	98.0	96.3

Mix Type	Type 3 Wearing Course			Mod. Wearing Course		
Lot No.	55	56	57	64	65	66
Date Laid	9/10	9/11	9/13	9/27	9/28	9/28
Specific Gravity	2.31	2.39	2.31	2.34	2.27	2.24
	2.32	2.37	2.34	2.32	2.21	2.28
	2.31	2.38	2.32	2.32	2.27	2.26
	2.33	2.31	2.31	2.35	2.25	2.25
	2.28	2.39	2.35	2.31	2.29	2.30
Mean	2.31	2.37	2.33	2.33	2.26	2.27
% of Plant	95.5	97.4	95.3	97.0	94.5	94.4

PERFORMANCE EVALUATION

The sprinkle treatment and conventional asphaltic concrete sections were examined to evaluate performance characteristics from both a structural and serviceability aspect. Serviceability was monitored with a pavement condition rating (PCR) which incorporates Mays Ridemeter measurements for smoothness and different types of pavement distress such as bleeding, block, transverse and longitudinal cracking, corrugations, patching, rutting and ravelling. Each distress type is evaluated and assigned weighted deduct points based on severity and intensity of the distress. The total of deduct points forms a pavement distress rating (PDR) by subtracting from 100 percent, weighting and then combining with a weighted Mays reading in PSI in the following manner to provide the pavement condition rating.

$$PCR = [(100 - \text{Deduct Total Points})/4] + (\text{Mays PSI}) \times 5$$

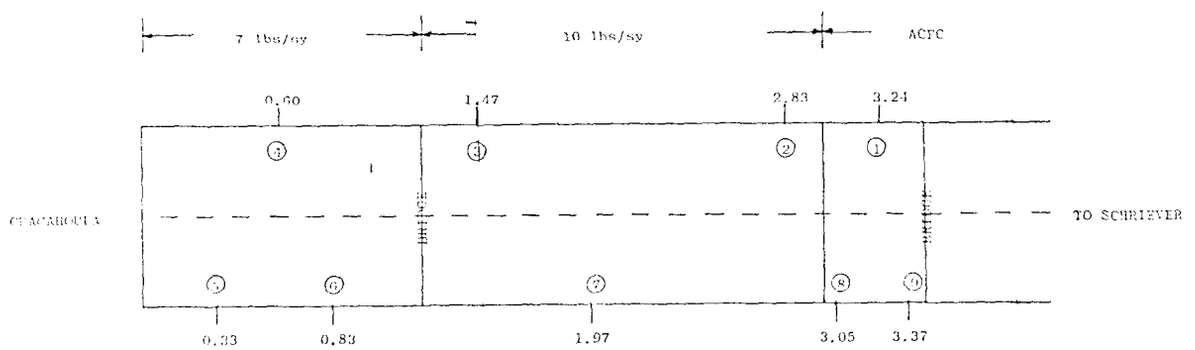
(A perfect pavement score would be 50)

The Dynamic Deflection Determination System (Dynaflect) was used to evaluate the relative strengths of both the modified and conventional pavements. Roadway cores were examined for further densification due to traffic and the quality of the asphalt cement.

The skid resistance of both experimental sections and the open-graded friction course were examined. Also, critical hydroplaning speeds were determined from texture depths obtained by sand patch testing. Finally, aggregate retention was monitored at selected locations on the project.

Figure 8 defines the experimental sections and identifies each evaluation site by log mile from the Chacahoula end of the project. There were nine sites chosen, each encompassing

approximately 200 feet, with 3 sites in each of the experimental sections and 3 sites in the conventional section.



Evaluation Sites

FIGURE 8

An initial evaluation was conducted in November 1984 shortly after construction. The one year evaluation took place in November 1985.

Serviceability

The Pavement Condition Rating forms are provided in Appendix B and are summarized in Table 9. Mays Ride Meter and rutting measurements which are included in the PCR have also been included. The slight reduction in Mays Ride Meter and PCR can probably be attributed to longitudinal and transverse reflection as indicated in the distress rating form.

TABLE 9

PAVEMENT CONDITION RATING

Rating		Rutting		Mays		PCR	
Evaluation Date		11/84	11/85	11/84	11/85	11/84	11/85
Site ID							
Sp. Treat.	4	0.12	0.13	3.2	3.0	40.25	38.85
7 lbs/yd	5	0.12	0.11	3.8	3.3	43.25	40.55
	6	0.08	0.11	3.8	3.3	43.25	40.55
Sp. Treat.	2	0.10	0.08	3.2	3.0	40.25	39.05
10 lbs/yd	3	0.10	0.10	3.2	3.0	40.25	38.35
	7	0.07	0.10	3.8	3.3	43.25	40.65
ACFC	1	0.15	0.10	3.8	3.6	43.25	41.35
	8	0.12	0.11	3.8	3.4	43.25	41.05
	9	0.15	0.15	3.8	3.4	42.50	40.75

Structural Evaluation

The Dynamic Deflection Determination System (Dynaflect) was used to evaluate the relative strength of both the conventional and sprinkle treated pavements. A temperature deflection adjustment procedure was applied to each section, converting all deflections to their equivalent deflection at 60 degrees Fahrenheit. Deflection data and corresponding structural number are included in Table 10. Additional deflection analysis with time will be used as a performance indicator.

TABLE 10

STRUCTURAL ANALYSIS

Dynaflect Property	Corrected Max Deflection		Percent Spread		Surface Curvature Index		Subgrade Modulus Of Elasticity		Structural Number	
Date	11/84	4/86	11/84	4/86	11/84	4/86	11/84	4/86	11/84	4/86
Site ID										
Sp. Treat. 7 lb/yd^2										
4	0.82	0.68	86	90	0.07	0.04	4700	5000	4.6	5.2
5	0.73	0.65	87	92	0.02	0.04	5000	4900	4.8	5.4
6	0.72	0.69	88	90	0.05	0.02	4900	4900	4.9	5.1
Sp. Treat. 10 lb/yd^2										
2	0.82	0.84	90	94	0.03	0.02	4500	4200	4.8	5.0
3	0.99	0.84	85	89	0.11	0.05	4000	4400	4.3	4.8
7	0.71	0.64	88	89	0.04	0.02	5000	5400	5.0	5.3
ACFC										
1	0.88	0.78	89	90	0.05	0.02	4300	4500	4.7	4.9
8	0.93	0.82	91	93	0.04	0.03	4000	4300	4.6	5.0
9	0.96	0.92	93	94	0.03	0.02	3800	3800	4.6	4.8

Field Samples

Six inch diameter cores were sampled from each site at both the initial and the one year evaluation. Specific gravities were obtained for the wearing course mix (the ACFC was removed from those samples taken in the conventional section) to observe additional compaction with time due to traffic. The results are provided in Table 11. Generally, the one year old cores demonstrated increased densification.

Each one year sample was subjected to extraction and asphalt recovery by the Abson process. Binder content and mix gradations were determined. The recovered asphalt cement was tested for vicosity (140°F), penetration (77°F) and ductility (77°F). The gradations and binder contents presented in Table 11 generally verify the construction data. Subsequent evaluations will include asphalt cement properties testing which along with the data from this first year evaluation will be used to track the asphalt quality. The properties attained after one year demonstrate higher vicosities and lower penetrations and ductilities for their age than Louisiana's historical asphalts. Data obtained recently from other projects indicates that these accelerated aging properties may be characteristic of a crude source which has been utilized over the last several years by some refineries.

Skid Resistance and Critical Hydroplaning Speed

A primary measure of the performance of the sprinkle treatment section will be their ability to maintain an adequate level of skid resistance for the life of the pavement. Skid resistance of the experimental sections and the ACFC has been measured on three occasions by the Department's skid truck according to ASTM E 274-79 procedures. The skid resistance data (Table 12) indicates that the ACFC has a slightly higher skid value than

TABLE 11

ROADWAY CORE ANALYSIS

Sample Site	Sprinkle Treatment (7 lbs/yd^2)			Sprinkle Treatment (10 lbs/yd^2)			ACFC		
	4	5	6	2	3	7	1	8	9
Specific Gravity									
11/84	2.304	2.267	2.301	2.304	2.290	2.348	2.340	2.349	2.317
11/85	2.348	2.277	2.339	2.343	2.337	2.394	2.322	2.355	2.356
U.S. Sieve Size (% Passing)									
1"	100	100	100	100	100	100	100	100	100
3/4"	100	99	100	100	100	100	100	99	97
1/2"	91	95	94	95	93	90	87	85	82
No 4	67	73	68	70	72	65	55	53	52
No 10	52	58	52	54	56	50	42	40	41
No 40	30	35	29	27	32	28	28	25	26
No 80	12	14	12	11	12	13	13	10	12
No 200	7	9	8	7	8	9	9	7	8
Asphalt Content (%)	5.3	5.2	5.3	5.2	5.8	5.5	4.6	3.8	5.1
Viscosity (140°F)	35,487	38,155	36,386	52,232	25,836	23,444	73,715	29,347	22,494
Penetration (77°F)	25	26	25	24	29	29	23	25	24
Ductility (77°F)	22	18	22	13	40	66	10	35	69

the sprinkle treatment at this point. An initial skid disparity between the eastbound and westbound direction for the sprinkle treatment sections appears to have been reduced with the latest set of test data.

TABLE 12
SKID RESTANCE DATA

Direction	Eastbound			Westbound		
Date	11/84	3/85	11/85	11/84	3/85	11/85
Site						
Sp.Treat. (7 lb/yd^2)	36.6	40.3	39.7	46.1	45.0	43.0
Sp.Treat. (10 lb/yd^2)	39.0	43.9	40.0	45.8	44.9	43.0
ACFC	38.1	43.3	44.0	41.8	41.5	44.4

Critical hydroplaning speed is defined as the speed at which a vehicle will begin hydro-planing, or riding on a film of water instead of the pavement surface. The speed is calculated using measured texture depths of the pavement's surface and other factors such as tire tread depth, rainfall intensity, tire pressure, spin down, and pavement gradients. FHWA Report No. FHWA-RD-75-11, Tentative Pavement and Geometric Design Criteria for Minimizing Hydroplaning, February, 1975, was used as the basis for the critical hydroplaning speed analysis. A rainfall intensity of 2 inches per hour was assumed as being typical of Louisiana conditions along with a pavement cross slope of 0.025 and a longitudinal gradient of 0.0. A worst case scenario was used for the vehicle characteristics including tire pressure of 18 psi, spindown of 10 percent and tire tread depth of 2/32 inch. The pavement texture depth was measured using a sand patch. Table 13 contains the texture depth measurements and

the hydroplaning speeds developed according to the assumptions provided.

TABLE 13
CRITICAL HYDROPLANING SPEEDS

Date	November 84		November 85	
Property	Texture Depth (in)	Hydroplaning Speed (mph)	Texture Depth (in)	Hydroplaning Speed (mph)
Site				
Sp. Treat. (7 lbs/yd)				
4	0.036	52	.050	75
5	0.039	54	.039	54
6	0.030	50	.039	54
Sp. Treat. (10 lbs/yd)				
2	0.052	75	.053	75
3	0.049	66	.050	75
7	0.042	56	.045	58
ACFC				
1	-	-	.047	61
8	-	-	.048	62
9	-	-	.053	75

Aggregate Retention

In order to examine loss of the sprinkle aggregate on the experimental sections, a photographic log was established at three locations within each evaluation site. A box grid was used to assist in evaluating the aggregate loss. Each picture location was outlined so that the exact spot could be found at

subsequent evaluations. Figure 9 provides a sample photo. As observed in Table 14, the aggregate retention after one year was excellent.

TABLE 14
AGGREGATE RETENTION
(% RETAINED)

Test No.		1	2	3
Site				
Sp. Treat.	4	93	95	95
(7 lbs/yd)	5	96	98	96
	6	99	97	98
Sp. Treat.	2	98	99	98
(10 lbs/yd)	3	98	97	98
	7	99	90	90

Aggregate Photo Log

FIGURE 9

ECONOMIC ANALYSIS AND MATERIALS CONSERVATION

As per the special provisions in Appendix A there were three pay items associated with the experimental section along with rebates for the conventional asphaltic concrete and asphaltic concrete friction course. The unit cost for these items were bid as follows:

ITEM	DESCRIPTION	UNIT	COST
501(1)	Asphaltic Concrete	TON	32.00
501(1)X	Modified Asphaltic Concrete	TON	36.50
502(1)	Asphaltic Concrete Friction Course	SYD	0.95
S-1	Pre-Coated Sprinkle Aggregate	TON	42.50
S-2	Handling and Spreading	SYD	0.25

The additional cost bid for the modified asphaltic concrete is related to an increase in asphalt cement content and the use of stone screenings. Converting this difference in price to a square yard basis the total cost of the sprinkle treatment would be:

Pre-Coated Sprinkle Aggregate (10 lbs/yd)	= $0.21
Handling and Spreading	= 0.25
Modified Asphaltic Concrete	= 0.38
	$ .84/yd

Thus, on a first cost basis, the sprinkle treatment provided a savings of $.11 per square yard or $1550 per mile of roadway. More typical bids for asphaltic concrete friction course in Louisiana average about $1.50 per square yard, however, which would provide cost savings in the neighborhood of $9300 per mile of roadway. Of course until the life cycle of the sprinkle treatment can be established long term savings cannot be addressed.

Perhaps a much larger savings is realized in the area of materials conservation. Using an application rate for the slag friction course of 56 lbs/yd^2 and the design asphalt content of 6.5%, one mile of two lane roadway would consume 25.6 tons of asphalt cement and 368.6 tons of slag aggregate. A sprinkle treatment of 10 lbs/yd^2 would utilize approximately 68.9 tons of slag aggregate. Considering the actual percentage of asphalt cement used on this project for sprinkle aggregate coating (2.2%) and the 0.7% additional asphalt in the modified wearing course, the asphalt cement requires were 1.5 tons per mile and 8.1 tons per mile, respectively. Thus an overall savings in materials of approximately 16 tons per mile of asphalt cement and 300 tons per mile aggregate was realized.

CONCLUSIONS

1. Normal plant and roadway operations were maintained throughout the construction of the sprinkle treatment section; there were no delays due to the chip spreader operation.

2. Specification density requirements were not met for two of the three lots representing the modified type 3 asphaltic concrete. Whether this lack of densification was due to the unfamiliarity of the contractor in compacting the modified mix or to the open surface texture imparted by the sprinkle aggregate could not be determined.

3. The first year performance evaluation indicated that both the 7 lb/yd^2 and 10 lb/yd^2 sprinkle treatment sections are performing as well as the asphaltic concrete friction course with respect to pavement condition rating, serviceability, structural integrity, skid resistance and critical hydroplaning speed. Only negligible losses of the sprinkle aggregate were found during this first evaluation.

4. On a first cost basis sprinkle treatment provided a small savings for this first project. When compared to typical costs for asphaltic concrete friction course savings of approximately $10,000 per mile could be realized.

APPENDIX A

SPECIAL PROVISIONS

SPECIAL PROVISIONS
SPRINKLE TREATMENT

DESCRIPTION: Sprinkle Treatment is the application of a properly graded, precoated aggregate on the surface of a wearing course immediately following laydown and prior to initial rolling in order to provide a skid resistant wearing surface.

MATERIALS:

Sprinkle Aggregate: The aggregate shall be slag or stone conforming to section 1003.06(b) of the Standard Specifications for Roads and Bridges, 1982 Edition, and meeting the following gradation:

U.S. Sieve Size	Percent Passing
1/2	100
3/8	20 - 55
No. 4	0 - 5
No. 200	0 - 1.5

Asphalt: The asphalt cement used to precoat the sprinkle aggregate shall be AC-30 with properly proportioned anti-strip additive.

Modified Type 3 Wearing Course: The aggregate used in the wearing course mix shall have a minimum of 50 percent passing the No. 10 sieve. The gradation requirements for the modified type 3 wearing course shall be:

U.S. Sieve Size	Percent Passing
3/4	100
1/2	80 - 100
No. 4	60 - 85
No. 10	50 - 70
No. 40	20 - 45
No. 80	10 - 25
No. 200	2 - 12

A job mix formula for the modified type 3 wearing course shall be submitted for approval prior to construction.

Modified type 3 wearing course shall meet all control and acceptance requirements of the Standard Specifications for Roads and Bridges, 1982 Edition, except as herein modified. Density requirements shall be waived for the modified type 3 wearing course.

EQUIPMENT: The equipment used for spreading the precoated aggregate shall be a Bristowes Mk V Hydrostatic Pre-coated Chip Spreader. This equipment and an operator shall be furnished to the contractor by the Federal Highway Administration.

PRECOATING THE SPRINKLE AGGREGATE: The sprinkle aggregate shall be dried at a temperature of 250-300°F and precoated with asphalt cement at 1.0-1.5 percent by weight. Freshly coated aggregate shall be stockpiled no higher than three (3) feet until sufficient cooling has occurred to preclude coking of the asphalt. The precoated aggregate shall be stored to prevent contamination and deterioration. Storage for an extended period of time may require the stockpile to be covered. Wetting down the precoated aggregate and manipulation of the stockpile should prevent crusting. Generally, the sprinkle aggregate should be precoated several days prior to use in order to allow for complete cooling.

CONSTRUCTION: The precoated aggregate material shall be uniformly applied to the surface of the wearing course as soon as possible after laydown and prior to initial breakdown rolling. The application rate shall be as directed by the engineer with a target rate of 10 pounds per square yard. This rate may be adjusted up or down; however, 12 pounds per square yard shall be the maximum application rate.

Rolling shall begin immediately behind the aggregate spreader with a steelwheel roller according to the established rolling pattern. The use of pneumatic-tired rollers will not be permitted.

Traffic shall not be permitted on the surface until the pavement has cooled to such an extent that the precoated aggregate does not ravel under tire traffic. A water truck may be required by the engineer to facilitate surface cool-down.

MEASUREMENT AND PAYMENT: The precoated sprinkle aggregate shall be measured by the ton at the time of precoating and payment shall be made under Item S-1.

Handling and spreading of the precoated sprinkle aggregate shall be measured by the square yard of completed and accepted surfacing, and payment shall be made under Item S-2.

Modified type 3 wearing course shall be measured by the ton at the time of processing, and payment shall be under Item S-3.

Item S-1, Precoated Sprinkle Aggregate, per ton.
Item S-2, Handling and Spreading of Precoated Sprinkle Aggregate, per square yard.
Item S-3, Modified Asphaltic Concrete, 501(1)(X), per ton.
Item S-4, Rebate, Asphaltic Concrete Friction Course, 502, per square yard.
Item S-5, Rebate, Asphaltic Concrete, 501(1), per ton.

APPENDIX B

PAVEMENT CONDITION RATINGS

SLAG ACFC

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	WB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	0.19	FUNCTIONAL CLASS	Coll
DATE	8 Nov 84	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL LOW	MEDIUM	HIGH	EXTENT LEVEL OCC	FREQ	EXT	DEDUCT POINTS (SEE BELOW)
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A	AGG/BIT	FREE BIT	<10%A	10%-30%	>30%	
		.8	.8	1.0	.6	.9	1.0	0
BLOW-UP	5	<1/2" BUMP	1/2"-1" BUMP	>1" BUMP	1/MI	2-4/MI	>4/MI	
		.4	.6	1.0	.5	.8	1.0	0
LONGITUDINAL CRACKING	10	<1/8"	1/8"-1"	>1"	<50' STA	50-100' STA	>100' STA	
		.2	.6	1.0	.4	.8	1.0	0
PATCHING	10	SMALL	MEDIUM	LARGE	<10%L	10%-30%	>30%	
		.6	.8	1.0	.6	.8	1.0	0
PUMPING	10	STAIN	STAIN	FAULT	<10%L	10%-25%	>25%	
		.7	.7	1.0	.3	.7	1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT	MOD.	SEVERE	<20%A	20%-50%	>50%	
		.3	.6	1.0	.5	.8	1.0	0
RUTTING	10	<1/4"D	1/4"-3/4"	>3/4"	<20%L	20%-50%	>50%	
.15 .15 .15 .15 .15		.3	.7	1.0	.6	.8	1.0	3
SETTLEMENT	10	NOTC. RIDE	DIS-COMFORT	DIP>6"	1/MI	2-4/MI	>4/MI	
		.4	.7	1.0	.6	.8	1.0	0
SHATTERED SLAB	10	TIGHT CRACKS	CRACKS >1/8"W	SLAB IN PIECES	> 2 AREAS	2-5 AREAS	> 5 AREAS	
		.6	.8	1.0	.7	.9	1.0	0
DE-BONDING	5	<1"D <1SY	>1"D & <1SY	>1"D >1SY	<20%L	20%-50%	>50%	
		.3	.6	1.0	.6	.8	1.0	0
TRANSERVSE CRACKING	(R) 10 (I) 5	<1/8" CRACK	1/8"-1"	> 1"	<20%L	20%-50%	>50%	
		.2	.6	1.0	.4	.8	1.0	0

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3

100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.25

MRR = (MAYS PSI) X 5 3.8 = 19.0

URBAN ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 5 =

MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 43.25

REMARKS :

Loc 2
10#/yd²

SPRINKLE TREATMENT

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION WB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 0.6 FUNCTIONAL CLASS Coll
DATE 8 Nov 84 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.1 .1 .1 .1 .1								
SETTLEMENT	10	NOTC. RIDE .4	DIS- COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS >1/8"W .8	SLAB IN PIECES 1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3
100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.25
MRR = (MAYS PSI) X 5 3.2 = 16

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.25

REMARKS :

SPRINKLE TREATMENT

Loc 3
10#/yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION WB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 1.96 FUNCTIONAL CLASS Coll
DATE 8 Nov 84 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL LOW	MEDIUM	HIGH	EXTENT LEVEL OCC	FREQ	EXT	DEDUCT POINTS (SEE BELOW)
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.1 .1 .1 .1 .1								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY .6	>1"D & >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3
100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.25
MRR = (MAYS PSI) X 5 3.2 = 16.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.25

REMARKS :

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL ~~244-01-30~~ SECTION WB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 2.83 FUNCTIONAL CLASS Coll
DATE ~~8 Nov 84~~ RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.1 .15 .15 .1 .1								
SETTLEMENT	10	NOTC. RIDE .4	DIS- COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3
100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.25
MRR = (MAYS PSI) x 5 3.2 = 16.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) x 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.25

REMARKS :

SPRINKLE TREATMENT

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION EB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 3.1 FUNCTIONAL CLASS Coll
DATE 8 Nov 84 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL (WEIGHT FACTOR)			EXTENT LEVEL (WEIGHT FACTOR)			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.15 .10 .10 .10 .15								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY >1"D <1SY >1"D & <1SY .6	>1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3
100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.27
MRR = (MAYS PSI) X 5 3.8 = 19.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 43.25

REMARKS :

Loc 6
7#/yd^2

SPRINKLE TREATMENT

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	EB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	2.6	FUNCTIONAL CLASS	Coll
DATE	8 Nov 84	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL LOW	MEDIUM	HIGH	EXTENT LEVEL OCC	FREQ	EXT	DEDUCT POINTS (SEE BELOW)
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A	AGG/BIT	FREE BIT	<10%A	10%-30%	>30%	
		.8	.8	1.0	.6	.9	1.0	0
BLOW-UP	5	<1/2" BUMP	1/2"-1" BUMP	>1" BUMP	1/MI	2-4/MI	>4/MI	
		.4	.6	1.0	.5	.8	1.0	0
LONGITUDINAL CRACKING	10	<1/8"	1/8"-1"	>1"	<50' STA	50-100' STA	>100' STA	
		.2	.6	1.0	.4	.8	1.0	0
PATCHING	10	SMALL	MEDIUM	LARGE	<10%L	10%-30%	>30%	
		.6	.8	1.0	.6	.8	1.0	0
PUMPING	10	STAIN	STAIN	FAULT	<10%L	10%-25%	>25%	
		.7	.7	1.0	.3	.7	1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT	MOD.	SEVERE	<20%A	20%-50%	>50%	
		.3	.6	1.0	.5	.8	1.0	0
RUTTING	10	<1/4"D	1/4"-3/4"	>3.4"	<20%L	20%-50%	>50%	
.05 .1 .05 .1 .1		.3	.7	1.0	.6	.8	1.0	3
SETTLEMENT	10	NOTC. RIDE	DIS- COMFORT	DIP>6"	1/MI	2-4/MI	>4/MI	
		.4	.7	1.0	.6	.8	1.0	0
SHATTERED SLAB	10	TIGHT CRACKS	CRACKS >1/8"W	SLAB IN PIECES	> 2 AREAS	2-5 AREAS	> 5 AREAS	
		.6	.8	1.0	.7	.9	1.0	0
DE-BONDING	5	<1"D <1SY	<1"D & >1SY <1SY	>1"D >1SY	<20%L	20%-50%	>50%	
		.3	.6	1.0	.6	.8	1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK	1/8"-1"	> 1"	<20%L	20%-50%	>50%	
(I)	5	.2	.6	1.0	.4	.8	1.0	0

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3

100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS

PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.27

MRR = (MAYS PSI) X 5 3.8 = 19.0

URBAN ROADS

PDR = (100 - TOTAL DEDUCT POINTS) / 5 =

MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 43.25

REMARKS :

Loc 7
10#/yd²

SPRINKLE TREATMENT

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	EB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	1.46	FUNCTIONAL CLASS	Coll
DATE	8 Nov 84	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.05 .10 .1 .05 .05								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3

100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.27

MRR = (MAYS PSI) X 5 3.8 = 19.0

URBAN ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 5 =

MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 43.25

REMARKS :

Slag ACFC

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION EB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 0.38 FUNCTIONAL CLASS C611
DATE 8 Nov 84 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.15 .15 .1 .1 .1								
SETTLEMENT	10	NOTC. RIDE .4	DIS- COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS >1/8"W .8	SLAB IN PIECES 1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1"D & <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3
100 - TOTAL DEDUCT POINTS = 97

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.27
RRR = (MAYS PSI) X 5 3.8 = 19.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
RRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 43.25

REMARKS :

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION EB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 0.06 FUNCTIONAL CLASS Coll
DATE 8 Nov 84 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	3
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.1 .2 .2 .15 .1								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS >1/8"W .6	CRACKS SLAB IN PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY >1"D & <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 6
100 - TOTAL DEDUCT POINTS = 94

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 23.50
MRR = (MAYS PSI) X 5 3.8 = 19.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 42.50

REMARKS : Ravelling of ACFC, OWP 25'

SLAG ACFC

Loc 1
ACFC

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	WB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	0.19	FUNCTIONAL CLASS	Coll
DATE	19 Nov 85	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	6
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	1.6
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.10 .10 .10 .10 .10								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS >1/8"W .8	SLAB IN PIECES 1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	2
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 6.6

100 - TOTAL DEDUCT POINTS = 93.4

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 23.35

MRR = (MAYS PSI) X 5 3.6 = 18.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 = _____

MRR = (MAYS PSI) X 4 = _____

PAVEMENT CONDITION RATING = PDR + RR = 41.35

REMARKS : _____

Loc 2
10#/yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	WB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	0.6	FUNCTIONAL CLASS	Coll
DATE	19 Nov 85	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL LOW / MEDIUM / HIGH — WEIGHT FACTOR	EXTENT LEVEL OCC / FREQ / EXT — WEIGHT FACTOR	DEDUCT POINTS (SEE BELOW)
BLEEDING	5	N/A .8 / AGG/BIT .8 / FREE BIT 1.0	<10%A .6 / 10%-30% .9 / >30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4 / 1/2"-1" BUMP .6 / >1" BUMP 1.0	1/MI .5 / 2-4/MI .8 / >4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2 / 1/8"-1" .6 / >1" 1.0	<50' STA .4 / 50-100' STA .8 / >100' STA 1.0	8
PATCHING	10	SMALL .6 / MEDIUM .8 / LARGE 1.0	<10%L .6 / 10%-30% .8 / >30% 1.0	0
PUMPING	10	STAIN .7 / STAIN .7 / FAULT 1.0	<10%L .3 / 10%-25% .7 / >25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3 / MOD. .6 / SEVERE 1.0	<20%A .5 / 20%-50% .8 / >50% 1.0	0
RUTTING	10	<1/4"D .3 / 1/4"-3/4" .7 / >3.4" 1.0	<20%L .6 / 20%-50% .8 / >50% 1.0	3
.05 .10 .05 .10 .10				
SETTLEMENT	10	NOTC. RIDE .4 / DIS-COMFORT .7 / DIP>6" 1.0	1/MI .6 / 2-4/MI .8 / >4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6 / CRACKS SLAB IN >1/8"W PIECES .8 / 1.0	> 2 AREAS .7 / 2-5 AREAS .9 / > 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1"D & >1SY .3 / >1"D <1SY .6 / >1"D & <1SY >1SY 1.0	<20%L .6 / 20%-50% .8 / >50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2 / 1/8"-1" .6 / > 1" 1.0	<20%L .4 / 20%-50% .8 / >50% 1.0	0
(I)	5			

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3.8

100 - TOTAL DEDUCT POINTS = 96.2

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.05

MRR = (MAYS PSI) X 5 3.0 = 15

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =

MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 39.05

REMARKS :

SPRINKLE TREATMENT

Loc 3
10#/yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION WB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 1.96 FUNCTIONAL CLASS Coll
DATE 19 Nov. 85 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL LOW / MEDIUM / HIGH — WEIGHT FACTOR	EXTENT LEVEL OCC / FREQ / EXT — WEIGHT FACTOR	DEDUCT POINTS (SEE BELOW)
BLEEDING	5	N/A .8 / AGG/BIT .8 / FREE BIT 1.0	<10%A .6 / 10%-30% .9 / >30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4 / 1/2"-1" BUMP .6 / >1" BUMP 1.0	1/MI .5 / 2-4/MI .8 / >4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2 / 1/8"-1" .6 / >1" 1.0	<50' STA .4 / 50-100' STA .8 / >100' STA 1.0	2
PATCHING	10	SMALL .6 / MEDIUM .8 / LARGE 1.0	<10%L .6 / 10%-30% .8 / >30% 1.0	0
PUMPING	10	STAIN .7 / STAIN .7 / FAULT 1.0	<10%L .3 / 10%-25% .7 / >25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3 / MOD. .6 / SEVERE 1.0	<20%A .5 / 20%-50% .8 / >50% 1.0	0
RUTTING	10	<1/4"D .3 / 1/4"-3/4" .7 / >3.4" 1.0	<20%L .6 / 20%-50% .8 / >50% 1.0	3
.10 .10 .10 .10 .10				
SETTLEMENT	10	NOTC. RIDE .4 / DIS- COMFORT .7 / DIP>6" 1.0	1/MI .6 / 2-4/MI .8 / >4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6 / CRACKS SLAB IN >1/8"W PIECES .8 / 1.0	> 2 AREAS .7 / 2-5 AREAS .9 / > 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3 / <1"D & >1SY <1SY >1"D & <1SY .6 / >1"D >1SY 1.0	<20%L .6 / 20%-50% .8 / >50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2 / 1/8"-1" .6 / > 1" 1.0	<20%L .4 / 20%-50% .8 / >50% 1.0	1.6
(I)	5			

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 6.6
100 - TOTAL DEDUCT POINTS = 93.4

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 23.35
RR = (MAYS PSI) X 5 3.0 = 15

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
RR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 38.35

REMARKS :

SPRINKLE TREATMENT

Loc 4
7#/yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 241-01-30 SECTION WB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 2.83 FUNCTIONAL CLASS Coll
DATE 19 Nov 85 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL — WEIGHT FACTOR			EXTENT LEVEL — WEIGHT FACTOR			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.10 .15 .15 .15 .10								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS >1/8"W .6	CRACKS SLAB IN PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY >1"D & <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	1.6
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 4.6
100 - TOTAL DEDUCT POINTS = 95.4

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 23.85
MRR = (MAYS PSI) X 5 3.0 = 15

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 = ____
MRR = (MAYS PSI) X 4 = ____

PAVEMENT CONDITION RATING = PDR + RR = 38.85

REMARKS : _____

SPRINKLE TREATMENT

Loc 5
7# /yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	EB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	3.1	FUNCTIONAL CLASS	Coll
DATE	19 Nov 85	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	.8
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.15 .10 .10 .10 .1								
SETTLEMENT	10	NOTC. RIDE .4	DIS- COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8		> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY <1"D & <1SY .3	>1"D >1SY >1"D & <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	0
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3.8

100 - TOTAL DEDUCT POINTS = 96.2

RURAL ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.05

RR = (MAYS PSI) X 5 3.3 = 16.5

URBAN ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 5 =

RR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.55

REMARKS :

SPRINKLE TREATMENT

Loc 6
7#/yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION EB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 2.6 FUNCTIONAL CLASS Coll
DATE 19 Nov 85 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.10 .10 .10 .10 .15								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS >1/8"W .8	SLAB IN PIECES 1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	.8
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3.8
100 - TOTAL DEDUCT POINTS = 96.2

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.05
MRR = (MAYS PSI) X 5 3.3 = 16.5

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.55

REMARKS :

Loc 7
10#/yd²

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT	03	PARISH	Terrebonne	ROUTE	LA 20
CONTROL	244-01-30	SECTION	EB	SUBSECTION	00
LENGTH	12.2	C.S. LOG MILE	1.46	FUNCTIONAL CLASS	Coll
DATE	19 Nov 85	RATED BY			

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL LOW	MEDIUM	HIGH	EXTENT LEVEL OCC	FREQ	EXT	DEDUCT POINTS (SEE BELOW)
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A	AGG/BIT	FREE BIT	<10%A	10%-30%	>30%	
		.8	.8	1.0	.6	.9	1.0	0
BLOW-UP	5	<1/2" BUMP	1/2"-1" BUMP	>1" BUMP	1/MI	2-4/MI	>4/MI	
		.4	.6	1.0	.5	.8	1.0	0
LONGITUDINAL CRACKING	10	<1/8"	1/8"-1"	>1"	<50' STA	50-100' STA	>100' STA	
		.2	.6	1.0	.4	.8	1.0	0
PATCHING	10	SMALL	MEDIUM	LARGE	<10%L	10%-30%	>30%	
		.6	.8	1.0	.6	.8	1.0	0
PUMPING	10	STAIN	STAIN	FAULT	<10%L	10%-25%	>25%	
		.7	.7	1.0	.3	.7	1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT	MOD.	SEVERE	<20%A	20%-50%	>50%	
		.3	.6	1.0	.5	.8	1.0	0
RUTTING	10	<1/4"D	1/4"-3/4"	>3/4"	<20%L	20%-50%	>50%	
.05 .10 .15 .10 .10		.3	.7	1.0	.6	.8	1.0	3
SETTLEMENT	10	NOTC. RIDE	DIS- COMFORT	DIP>6"	1/MI	2-4/MI	>4/MI	
		.4	.7	1.0	.6	.8	1.0	0
SHATTERED SLAB	10	TIGHT CRACKS	CRACKS >1/8"W	SLAB IN PIECES	> 2 AREAS	2-5 AREAS	> 5 AREAS	
		.6	.8	1.0	.7	.9	1.0	0
DE-BONDING	5	<1"D <1SY	<1"D & >1SY <1SY	>1"D >1SY	<20%L	20%-50%	>50%	
		.3	.6	1.0	.6	.8	1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK	1/8"-1"	> 1"	<20%L	20%-50%	>50%	
(I)	5	.2	.6	1.0	.4	.8	1.0	.4

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3.4

100 - TOTAL DEDUCT POINTS = 96.6

RURAL ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.15

MRR = (MAYS PSI) X 5 3.3 = 16.5

URBAN ROADS -

PDR = (100 - TOTAL DEDUCT POINTS) / 5 =

MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.65

REMARKS :

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION EB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 0.38 FUNCTIONAL CLASS Coll
DATE 19 Nov 85 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.10 .10 .10 .10 .15								
SETTLEMENT	10	NOTC. RIDE .4	DIS-COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING (R)	10	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	.8
(I)	5							

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 3.8
100 - TOTAL DEDUCT POINTS = 98.2

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 24.05
MRR = (MAYS PSI) X 5 3.4 = 17.0

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 41.05

REMARKS :

PAVEMENT CONDITION RATING FORM FOR COMPOSITE PAVEMENT

DISTRICT 03 PARISH Terrebonne ROUTE LA 20
CONTROL 244-01-30 SECTION EB SUBSECTION 00
LENGTH 12.2 C.S. LOG MILE 0.06 FUNCTIONAL CLASS Coll
DATE 19 Nov 85 RATED BY

DISTRESS TYPE	WEIGHT FACTOR	SEVERITY LEVEL			EXTENT LEVEL			DEDUCT POINTS (SEE BELOW)
		LOW	MEDIUM	HIGH	OCC	FREQ	EXT	
		WEIGHT FACTOR			WEIGHT FACTOR			
BLEEDING	5	N/A .8	AGG/BIT .8	FREE BIT 1.0	<10%A .6	10%-30% .9	>30% 1.0	0
BLOW-UP	5	<1/2" BUMP .4	1/2"-1" BUMP .6	>1" BUMP 1.0	1/MI .5	2-4/MI .8	>4/MI 1.0	0
LONGITUDINAL CRACKING	10	<1/8" .2	1/8"-1" .6	>1" 1.0	<50' STA .4	50-100' STA .8	>100' STA 1.0	0
PATCHING	10	SMALL .6	MEDIUM .8	LARGE 1.0	<10%L .6	10%-30% .8	>30% 1.0	0
PUMPING	10	STAIN .7	STAIN .7	FAULT 1.0	<10%L .3	10%-25% .7	>25% 1.0	0
RAVELING	10	AGGREGATE LOSS SLIGHT .3	MOD. .6	SEVERE 1.0	<20%A .5	20%-50% .8	>50% 1.0	0
RUTTING	10	<1/4"D .3	1/4"-3/4" .7	>3.4" 1.0	<20%L .6	20%-50% .8	>50% 1.0	3
.15 .15 .20 .15 .10								
SETTLEMENT	10	NOTC. RIDE .4	DIS- COMFORT .7	DIP>6" 1.0	1/MI .6	2-4/MI .8	>4/MI 1.0	0
SHATTERED SLAB	10	TIGHT CRACKS .6	CRACKS SLAB IN >1/8"W PIECES .8	1.0	> 2 AREAS .7	2-5 AREAS .9	> 5 AREAS 1.0	0
DE-BONDING	5	<1"D <1SY .3	<1"D & >1SY <1SY .6	>1"D >1SY 1.0	<20%L .6	20%-50% .8	>50% 1.0	0
TRANSERVSE CRACKING	(R) 10 (I) 5	<1/8" CRACK .2	1/8"-1" .6	> 1" 1.0	<20%L .4	20%-50% .8	>50% 1.0	2

DEDUCT POINTS = DISTRESS WEIGHT FACTOR X SEVERITY WEIGHT X EXTENT WEIGHT FACTOR

TOTAL DEDUCT POINTS = 5
100 - TOTAL DEDUCT POINTS = 95.0

RURAL ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 4 = 23.75
MRR = (MAYS PSI) X 5 3.4 = 17

URBAN ROADS - PDR = (100 - TOTAL DEDUCT POINTS) / 5 =
MRR = (MAYS PSI) X 4 =

PAVEMENT CONDITION RATING = PDR + RR = 40.75

REMARKS :