PRE-TREATMENT FOR REDUCTION OF ASPHALT ABSORPTION IN POROUS AGGREGATE

Iowa Highway Research Board
Project TR-422

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Final Report

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8. ABSTRACT

The objective of this research was to evaluate the performance of the product Ultracote® (a polymer based additive produced by Ultrapave, a division of Goodyear) as an aggregate pre-treatment for the reduction of asphalt binder absorption in hot mix asphalt (HMA). The product was tested with a paving project in Louisa county, Iowa with aggregate that had historically shown very high asphalt binder absorption.

Results of the testing did not provide any evidence of reduction in binder absorption.

9. KEY WORDS

HMA
Asphalt Binder
Absorption

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23

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Disclaimer

The contents of this report reflect the views of the author and do not necessarily reflect the official views or policy of the Iowa Department of Transportation. This report does not constitute a standard, specification or regulation.

Research Objective

The objective of this research was to evaluate the performance and economics of using the product Ultracote® (a polymer based additive produced by Ultrapave, a division of Goodyear) as an aggregate pre-treatment for the reduction of asphalt binder absorption in hot mix asphalt (HMA).

Introduction

HMA paving in Iowa is often hampered by the highly absorptive nature of some of the aggregates. It is possible to find HMA mixtures requiring as much as seven percent binder in some areas compared with a statewide average of approximately five percent. The manufacturer of this product wanted to determine if it would be effective in blocking some of the pores in the aggregate, thus reducing asphalt binder demand. Ultracote® is usually marketed as an anti-stripping agent for use in place of lime. This research focused on its possible use for reducing binder absorption.

Project Location and Description

This project was performed in conjunction with another IHRB research project, TR-414 Superpave Mix Designs for Low Volume Roads. Both involved paving on the same road - county road X-17 in Louisa county from the junction with county road G-62 north to just inside the corporate limits of Columbus City (see map in Figure 1). The total project extended approximately 6 miles and consisted of a 3-inch HMA overlay placed in two lifts over cold-in-place recycled asphalt. The Ultracote®-treated aggregate was used in the far south end of the project.

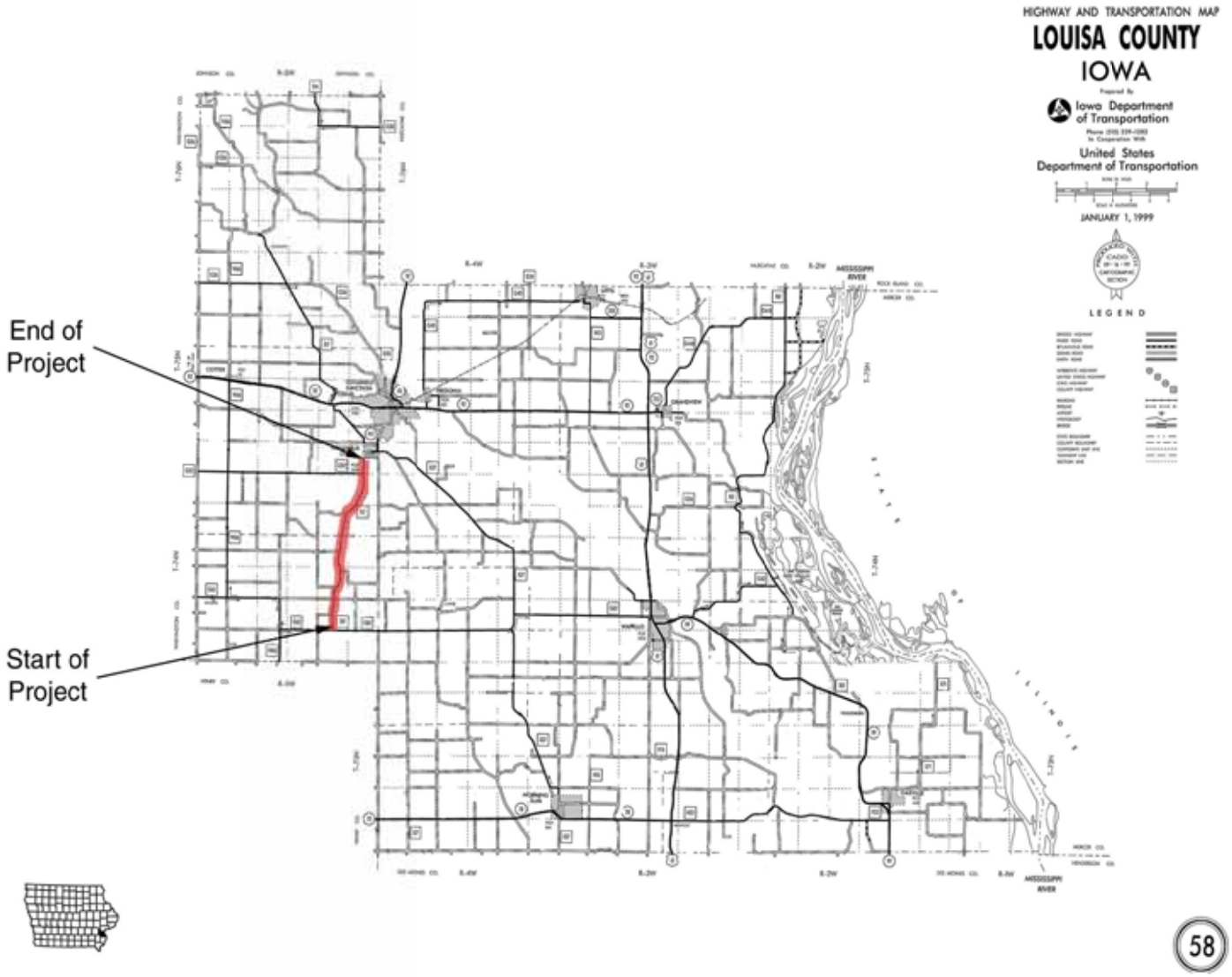

Figure 1. Louisa County map showing project location.

Materials

The HMA mix used in this project was designed under a gyratory mix design Special Provision. Mix design documentation is included in Appendix A.

Crushed aggregate and manufactured sand were from Columbus Junction (Iowa Aggregate Source Number A58002) and natural sand was from Fredonia (A58504). There was a problem initially with coarse aggregate originating from an incorrect bed, but this was corrected prior to the beginning of paving.

Construction

The project consisted of cold-in-place recycling followed by a three-inch HMA overlay. In the last half mile or so of the north end of the project, inside the city limits, there was just an overlay over the existing pavement.

The plant was located at the Columbus Junction mine approximately one mile west of the project road on county highway G 52.

Locations were tracked by stationing. The project stretched from station 3000+90, at the junction with county highway G-62, north approximately six miles to station 3329+41.2 with a few minor equations along the way. Latex was applied to aggregate in both lifts of HMA from approximately station 3030+00 to 3100+00. That is, it started approximately 0.55 mile north of the junction with G-62 and extended approximately 1.33 miles. There are signs posted to show the beginning and ending points of the test area.

Construction was routine throughout the project. Several minor changes were made to the mix during the course of paving, mostly involving the target binder content of the HMA. At the north end of the project, a scratch coat was placed prior to the HMA lift to provide some additional strength to the non-recycled portion of the project.

The asphalt binder used was PG58-28 from Amoco, Davenport.

Latex Addition

Latex was added to the aggregate under the control of a manufacturer representative at a rate of one pound per ton of aggregate. The aggregate pre-treatment did not noticeably change the behavior of the mix during paving.

Figures 2 to 6 show various aspects of addition of the latex to the mix at the plant.

Figure 2. Mixing unit for combining concentrated latex with water prior to dispensing.

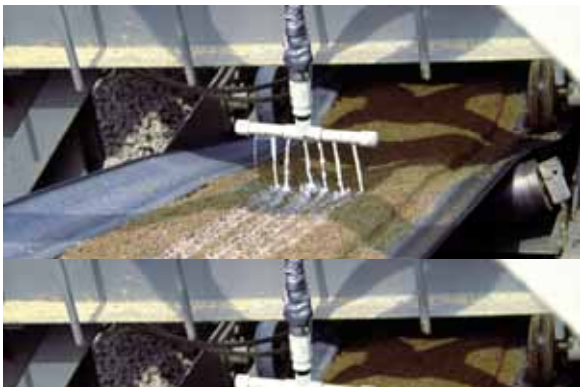

Figure 3. Dispensing the latex onto the aggregate stream on its way into the plant.

Figure 4. Coated aggregate moving up conveyor.

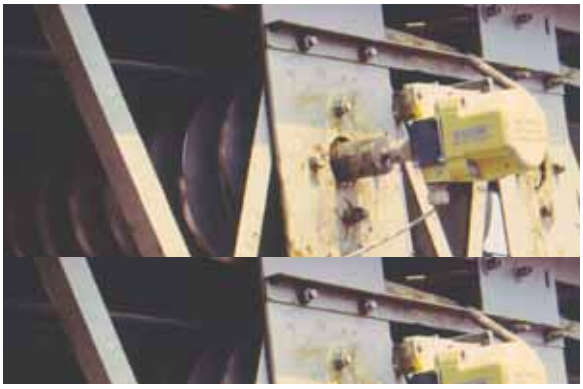

Figure 5. Conveyer scale used to meter latex mixture.

Figure 6. Aggregate and asphalt entering the plant.

Evaluation

The difference between HMA that has had aggregate treated and untreated with latex was determined by calculating the percent binder absorbed. The data was obtained from the daily plant reports (provided in Appendix B). The calculation requires subtracting the *Effective percent binder* value from the *Actual Added percent binder* value. Calculation of the *Effective percent binder* value is described in detail in Iowa DOT Materials I.M. 501, *Asphaltic Terminology, Equations and Example Calculations*.

Results of these calculations are shown graphically in Figure 7. This is a small sample size and the absorbed binder value calculations introduce some significant variation. As a result, within experimental error, there is no indication that the latex coating has decreased the amount of absorbed binder.

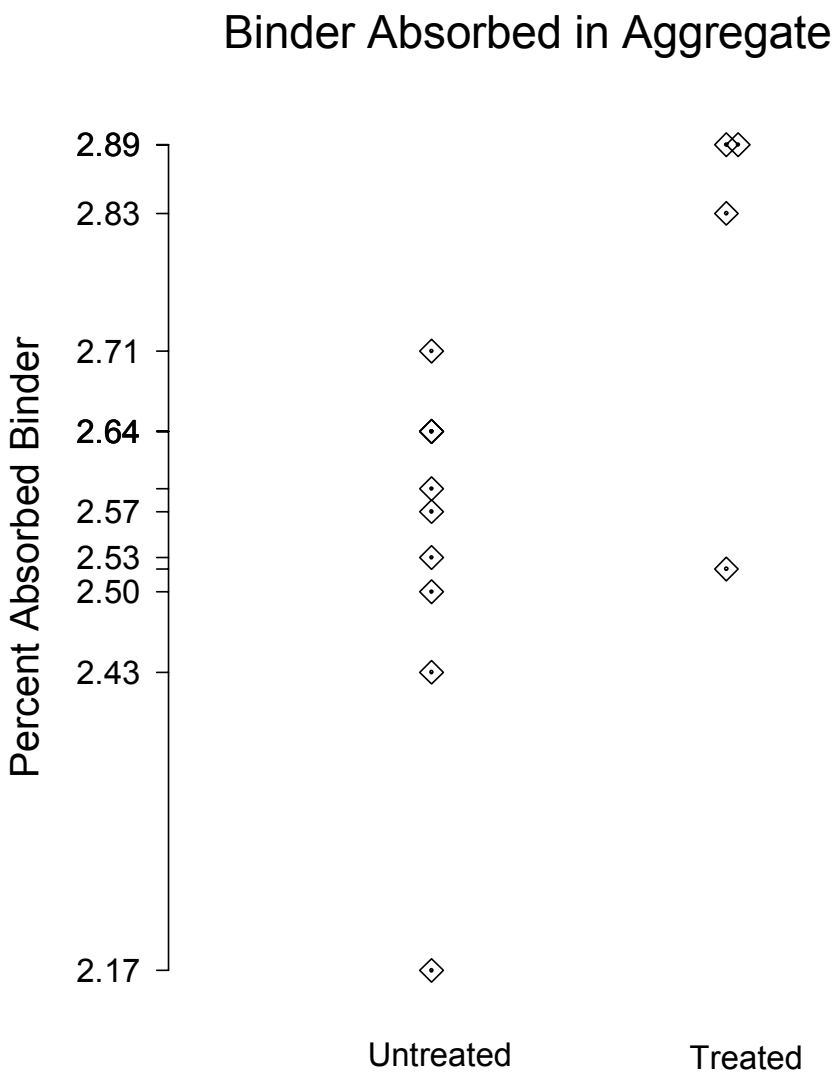

Figure 7

Acknowledgement

The author would like to thank the Iowa Highway Research Board, the Louisa County Board of Supervisors and County Engineer, Norris Asphalt Paving Co., and Jebro Inc., for their support and participation in this project.

Appendix A
Mix Design Special Provision

Louisa County
Highway X-17

Form 956

Iowa Department of Transportation
Project Development Division - Office of Materials
ACC Superpave Mix Design

County :	Louisa	Project :	FM-58(17)--55-58	Lab No. :	ABD8-29
Size :	12.5mm	Contracter :	Norris Asphalt	Contract No. :	
Mix Type:	B	Design Life ESAL's :	290,000	Date Reported :	
Intended Use :	Surface	Proj. Location :	Louisa Co. X-17 N&E to IA 70		

Agg. Sources :	1/2"	A58002	R.P. Col. Jct. W. Beds 16-19 5CJ8-001	@ 30.0%
	3/8 Chip	A58002	R.P. Col. Jct. W. Beds 16-19 5CJ8-003	@ 20.0%
	Man Sand	A58002	R.P. Col. Jct. W. Beds 16-19 5CJ8-002	@ 30.0%
	Nat Sand	A58504	R.Prod. Fredonia 5FR8-001	@ 20.0%

Job Mix Formula - Combined Gradation (Sieve Size mm)

25	19	12.5	9.5	4.75	2.36	1.18	600µ	300µ	150µ	75µ
Upper Tolerance										
100	100	100			58					10
100	100	95	88	63	43	32	22	9.2	6.2	4.8
100	100	90			39.1	31.6	23.1	15.5		2
Lower Tolerance										

Asphalt Source and Grade: Amoco Davenport PG58-28

	Gyratory Data			Interpolated	
% Asphalt		7.60		7.21	
Corrected Density @ N-Design		2.310		2.298	Avg. Design High Air Temp. C
Max. Sp.Gr. (Gmm)		2.382		2.393	<39
% Gmm @ N- Initial		89.50		88.52	
% Gmm @ N-Max		98.13		97.15	mm from Surface
% Air Voids		3.02		4.00	0
% VMA		16.23		16.33	
% VFA		81.39		75.35	Number of Gyrations
Film Thickness		11.58		10.79	N-Initial
Filler Bit. Ratio		0.82		0.88	7
Gsb		2.548		2.548	N-Design
Gse		2.671		2.671	68
Pbe		5.88		5.48	N-Max
Pba		1.86		1.86	104
% New AC		100.00		100.00	
AC Sp.Gr. @ 25c		1.029		1.029	Gsb for Angularity
% Water Abs		3.42		3.42	Method A
S.A. m^2 / Kg.		5.08		5.08	2.638
% +4.75mm Friction Agg.		0.0		0.0	
Angularity-method A					Slope of Compaction
% Flat & Elongated					Curve
Coarse Agg. Angularity		0		0	13.58
Sand Equivalent					

Minimum % AC for this aggregate combination is 6.15%
Disposition : An asphalt content of 7.21% is recommended to start this project.
Data shown in 7.21% column is interpolated from test data.

Comments : Verification of mix NAP8-022

Copies to : Norris Asphalt John Hinrichsen Cent. Lab. SEITC
Jim Webb

Signed : _____

Louisa County
Highway X-17

Form 956

Iowa Department of Transportation
Project Development Division - Office of Materials
ACC Superpave Mix Design

County :	Louisa	Project :	FM-58(17)--55-58	Lab No. :	ABD8-30
Size :	12.5mm	Contracter :	Norris Asphalt	Contract No. :	
Mix Type:	B	Design Life ESAL's :	290,000	Date Reported :	08/18/98
Intended Use :	Surface	Proj. Location :	Louisa Co. X-17 N&E to IA 70		

Agg. Sources :	1/2"	A58002	R.P. Col. Jct. W. Beds 16-19 5CJ8-001	@ 30.0%
	3/8 Chip	A58002	R.P. Col. Jct. W. Beds 16-19 5CJ8-003	@ 20.0%
	Man Sand	A58002	R.P. Col. Jct. W. Beds 16-19 5CJ8-002	@ 30.0%
	Nat Sand	A58504	R.Prod. Fredonia 5FR8-001	@ 20.0%

Job Mix Formula - Combined Gradation (Sieve Size mm)

25	19	12.5	9.5	4.75	2.36	1.18	600μ	300μ	150μ	75μ
					Upper Tolerance					
100	100	100			58					10
100	100	95	88	63	43	32	22	9.2	6.2	4.8
100	100	90			39.1	31.6	23.1	15.5		2
					Lower Tolerance					

Asphalt Source and Grade: Amoco Davenport PG58-28

	Gyratory Data				Interpolated	
% Asphalt	6.60	7.10	7.60		6.66	
Corrected Density @ N-Design	2.314	2.339	2.326		2.317	Avg. Design High Air Temp. C
Max. Sp.Gr. (Gmm)	2.415	2.403	2.390		2.414	<39
% Gmm @ N- Initial	88.82	90.52	89.93		89.03	
% Gmm @ N-Max	96.87	98.38	98.43		97.05	mm from Surface
% Air Voids	4.18	2.66	2.68		4.00	0
% VMA	15.18	14.72	15.65		15.12	
% VFA	72.46	81.93	82.88		73.60	Number of Gyrations
Film Thickness	9.63	10.44	11.29		9.72	N-Initial
Filler Bit. Ratio	0.98	0.90	0.84		0.97	7
Gsb	2.548	2.548	2.548		2.548	N-Design
Gse	2.669	2.676	2.682		2.676	68
Pbe	4.89	5.31	5.74		4.94	N-Max
Pba	1.83	1.93	2.02		1.93	104
% New AC	100.00	100.00	100.00		100.00	
AC Sp.Gr. @ 25c	1.029	1.029	1.029		1.029	Gsb for Angularity
% Water Abs	3.42	3.42	3.42		3.42	Method A
S.A. m^2 / Kg.	5.08	5.08	5.08		5.08	2.638
% +4.75mm Friction Agg.	0.0	0.0	0.0		0.0	
Angularity-method A	N/A	N/A	N/A		N/A	Slope of Compaction
% Flat & Elongated	N/A	N/A	N/A		N/A	Curve
Coarse Agg. Angularity	100/100	100/100	100/100		100/100	14.60
Sand Equivalent	85	85	85		85	

Minimum % AC for this aggregate combination is 6.21%
Disposition : An asphalt content of 6.66% is recommended to start this project.
Data shown in 6.66% column is interpolated from test data.

Comments : 1.0 lbs latex to 1 ton of aggregate

Copies to : Norris Asphalt John Hinrichsen Cent. Lab. Louisa Co. Eng.
Jim Webb

Signed :

Appendix B
Daily Plant Reports

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contractor: NORRIS ASPHALT PAVING CO.
Class: 1
Report No.: 1
Contract ID:
County: LOUISA
Size: 1/2"
Design Blows:
Mix Design No.: AC08-29
Recycle Source:
Mix Type: B
Design Gyrations: 68

Hot Box I.D. No.:		HM-1A				
Date Sampled:		08/17/98				
Gradation ID:	Specs	CB-1A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	95				
9.5mm Sieve	81-88-95	89				
* 4.75mm Sieve	56-63-70	60				
* Moving Average						
* 2.36mm Sieve	37-43-49	41				
* Moving Average						
1.18mm Sieve		31				
* 600um Sieve	17-22-27	22				
* Moving Average						
300um Sieve		11				
150um Sieve		7.6				
* 75um Sieve	3.0-4.8-7.8	5.7				
* Moving Average						
Compliance (Y/N)		Y				
Intended Added, % AC	7.46					
Actual Added, % AC		7.19				
Intended Total, % AC	7.46					
Actual Total, % AC		7.19				
Gmb:		2.362				
Gmm:		2.393				
Pa:		1.3				
Moving Average	4.0					
Time		9:50 AM				
Station		3001+00				
Side		RIGHT				
Sample Mg's		272.16	656.00	1,356.00		
Sublot Mg's		285.61				
Mg's to Date		285.61				
Fines / Bitumen Ratio	.6-1.20	1.14				

Gsb: 2.515 Gb: 1.0270 Effective % AC: 5.02

Mix Change Information:

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)	22						
A.C. Temp. (°C)	184						
Mix Temp. (°C)	146						

Date Placed: 08/17/98
Date Tested: 08/18/98
Course Placed:
Tested By: VICKI WILLIAMS

Density Record

Core No.:	1	2	3	4	5	6	7
Station	3004+12	3008+10	3012+81	3016+55	3020+37	3024+86	3028+39
CL Reference	8.0 RT	3.0 RT	8.5 RT	2.0 RT	5.0 RT	3.5 RT	8.5 RT
W 1 Dry	1,837.9	1,656.2	1,498.7	1,534.1	1,043.7	1,298.7	1,647.7
W 2 in H20	1,048.9	927.6	841.1	864.5	585.9	721.0	928.3
W 3 Wet	1,838.5	1,656.5	1,499.1	1,534.8	1,044.3	1,299.2	1,648.6
Difference	789.6	728.9	658.0	670.3	458.4	578.2	720.3
Field Density	2.328	2.272	2.278	2.289	2.277	2.246	2.288
% Density	98.561	96.190	96.444	96.909	96.401	95.089	96.867
% Voids	2.7	5.1	4.8	4.3	4.8	6.1	4.4
Thickness (mm)	51	45	40	40	30	35	45

Gmb (Lot Avg.): **2.362**
Gmm (Lot Avg.): **2.393**
TC Labs Pa:
Target % RAP:
Avg. Field Density: **2.283**
Avg. % Density: **96.637**
Avg. % Field Voids: **4.6**
Specified % Density: 94

Q.I. = 96.637 -- 94.000 = **2.53**
1.042

Low Outlier: High Outlier: New Q.I. =

Film Thickness (FT): **8.9** VMA: **12.8**

Remarks: BEGINNING STATION; 3000+57 TO 3029+88 ON THE RIGHT LANE.
285.61 MEGAGRAMS WERE LAID WITH NO ROAD WASTE.

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNUNG SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-30

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 2
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-2A				
Date Sampled:		08/18/98				
Gradation ID:	Specs	CB-2A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	94				
9.5mm Sieve	81-88-95	87				
* 4.75mm Sieve	56-63-70	58				
* Moving Average						
* 2.36mm Sieve	37-43-49	40				
* Moving Average						
1.18mm Sieve		30				
* 600um Sieve	17-22-27	22				
* Moving Average						
300um Sieve		11				
150um Sieve		7				
* 75um Sieve	3.0-4.8-7.8	5.3				
* Moving Average						
Compliance (Y/N)		Y				
Intended Added, % AC	6.80					
Actual Added, % AC		6.62				
Intended Total, % AC	6.80					
Actual Total, % AC		6.62				
Gmb:		2.319				
Gmm:		2.453				
Pa:		5.5				
Moving Average	4.0					
Time		7:30 AM				
Station		3050+00				
Side		RIGHT				
Sample Mg's		127.00	856.00	1,487.00		
Sublot Mg's		500.00	189.19			
Mg's to Date		974.80				
Fines / Bitumen Ratio	.6-1.20	1.42				

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)	21	23					
A.C. Temp. (°C)	149	149					
Mix Temp. (°C)	143	146					

Date Placed: 08/18/98
Date Tested:
Course Placed: BINDER
Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): 2.319
Gmm (Lot Avg.): 2.453
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- =

Low Outlier: ERR
High Outlier: ERR
New Q.I. = ERR

Film Thickness (FT): 6.9
VMA: 13.9

Gsb: 2.515
Gb: 1.0270
Effective % AC: 3.73

Mix Change Information: WE ARE STARTING THE LATEX MIX AT 6.8% AC AND 1 LB. OF LATEX PER TON.

Remarks: WE RAN 689.19 MGS. OF THE LATEX MIX AND THEN SWITCHED TO THE REGULAR MIX. BEGINNING STATION 3029+8E ENDING STATION-3090+97
LATEX @ 1 lb. per TON

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58 | Contractor: NORRIS ASPHALT PAVING CO. | Class: 1 | Report No.: 2A

Contract ID: 88471 | County: LOUISA | Size: 1/2" | Design Blows:

Mix Design No.: ABD8-5029 | Recycle Source: | Mix Type: B | Design Gyrations: 68

Hot Box I.D. No.:		HM-2B	HM-2C	HM-2D		
Date Sampled:		08/18/98	08/18/98	08/18/98		
Gradation ID:	Specs	CB-2A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	94				
9.5mm Sieve	81-88-95	87				
* 4.75mm Sieve	56-63-70	59				
* Moving Average						
* 2.36mm Sieve	37-43-49	41				
* Moving Average						
1.18mm Sieve		31				
* 600um Sieve	17-22-27	22				
* Moving Average						
300um Sieve		11				
150um Sieve		7.6				
* 75um Sieve	3.0-4.8-7.8	5.9				
* Moving Average						
Compliance (Y/N)						
Intended Added, % AC	7.26					
Actual Added, % AC		7.03				
Intended Total, % AC	7.26					
Actual Total, % AC		7.03				
Gmb:		2.346	2.344	2.352		
Gmm:		2.420	2.419	2.407		
Pa:		3.1	3.1	2.3		
Moving Average	4.0			2.5		
Time		10:15 AM	1:00 PM	3:50 PM		
Station		3100+00	3160+00	3226+00		
Side		RIGHT	RIGHT	RIGHT		
Sample Mg's		776.00	1,142.00	2,008.00		
Sublot Mg's		500.00	750.00	637.89		
Mg's to Date				2,862.69		
Fines / Bitumen Ratio	.6-1.20	1.34				

Gsb: 2.515 | Gb: 1.0270 | Effective % AC: 4.39

Mix Change Information: WE CHANGED THE TARGET AC TO 7.26.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)			27	28	28	27	
A.C. Temp. (°C)			152	149	149	149	
Mix Temp. (°C)			143	143	143	143	

Date Placed: 08/18/98 | Date Tested: 08/19/98

Course Placed: BINDER | Tested By: VICKI WILLIAMS

Density Record

Core No.:	1	2	3	4	5	6	7
Station	3038+16	3064+49	3108+87	3144+79	3177+87	3227+48	3266+02
CL Reference	4' RT	8" RT	5" RT	6" RT	3" RT	7" RT	3.5" RT
W 1 Dry	1,731.1	1,786.4	2,307.6	1,406.6	1,452.5	1,521.3	1,458.0
W 2 in H20	970.1	987.3	1,302.2	791.3	807.1	853.5	794.8
W 3 Wet	1,732.3	1,787.3	2,308.6	1,407.4	1,453.6	1,522.4	1,461.3
Difference	762.2	800.0	1,006.4	616.1	646.5	668.9	666.5
Field Density	2.271	2.233	2.293	2.283	2.247	2.274	2.188
% Density	97.051	95.427	97.991	97.564	96.026	97.179	93.504
% Voids	6.4	7.9	5.4	5.9	7.3	6.2	9.8
Thickness (mm)							

Gmb (Lot Avg.): **2.340** | Avg. Field Density: **2.256**

Gmm (Lot Avg.): **2.425** | Avg. % Density: **96.392**

TC Labs Pa: | Avg. % Field Voids: **7.0**

Target % RAP: | Specified % Density: 94

Q.I. = 96.392 -- 94.000 = **1.54**

1.549

Low Outlier: | High Outlier: | New Q.I. =

Film Thickness (FT): **7.7** | VMA: **13.5**

Remarks: BEGINNING STATION-3090+97. ENDING STATION-3280+81.
MEGATONS TO ROAD-1887.89 WITH NO ROAD WASTE.

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.

QMA Tech: BARB DUNNING SE 145 Cert. No.

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-5029

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 3
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-3A
Date Sampled:		08/19/98
Gradation ID:	Specs	CB-3A
25mm Sieve	100	100
19mm Sieve	98-100	100
12.5mm Sieve	88-95-100	94
9.5mm Sieve	81-88-95	87
* 4.75mm Sieve	56-63-70	60
* Moving Average		
* 2.36mm Sieve	37-43-49	42
* Moving Average		
1.18mm Sieve		31
* 600um Sieve	17-22-27	23
* Moving Average		
300um Sieve		11
150um Sieve		6.9
* 75um Sieve	3.0-4.8-7.8	5.3
* Moving Average		Y
Compliance (Y/N)		
Intended Added, % AC	7.06	
Actual Added, % AC		7.01
Intended Total, % AC	7.06	
Actual Total, % AC		7.01
Gmb:		2.333
Gmm:		2.433
Pa:		4.1
Moving Average	4.0	**3.2**
Time		9:30 AM
Station		3020+00
Side		LEFT
Sample Mg's		163.00
Sublot Mg's		265.52
Mg's to Date		3,113.68
Fines / Bitumen Ratio	.6-1.20	1.25

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)		28					
A.C. Temp. (°C)		149					
Mix Temp. (°C)		143					

Date Placed: 08/19/98
Date Tested:

Course Placed: Binder
Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): **2.333**
Gmm (Lot Avg.): **2.433**
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- =

Low Outlier: ERR
High Outlier: ERR
New Q.I. = ERR

Film Thickness (FT): **7.8**
VMA: **13.7**

Gsb: 2.515
Gb: 1.0270
Effective % AC: 4.24

Remarks: BEGINNING STATION-3000+57, ENDING STATION-3026+38
250.99 MEGAGRAMS TO THE ROAD WITH NO ROAD WASTE.

Mix Change Information: AC TARGET CHANGE TO 7.06

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-30

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 3A
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-3B				
Date Sampled:		08/19/98				
Gradation ID:	Specs	CB-3A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	94				
9.5mm Sieve	81-88-95	87				
* 4.75mm Sieve	56-63-70	60				
* Moving Average						
* 2.36mm Sieve	37-43-49	42				
* Moving Average						
1.18mm Sieve		31				
* 600um Sieve	17-22-27	23				
* Moving Average						
300um Sieve		11				
150um Sieve		6.9				
* 75um Sieve	3.0-4.8-7.8	5.3				
* Moving Average						
Compliance (Y/N)						
Intended Added, % AC	6.80					
Actual Added, % AC		6.54				
Intended Total, % AC	6.80	= .1 % LATEX				
Actual Total, % AC		6.54				
Gmb:		2.320				
Gmm:		2.456				
Pa:		5.5				
Moving Average	4.0					
Time		11:55 AM				
Station		3060+00				
Side		LEFT				
Sample Mg's		526.00				
Sublot Mg's		500.00	250.85			
Mg's to Date			3,864.53			
Fines / Bitumen Ratio	.6-1.20	1.45				

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)			27	28			
A.C. Temp. (°C)			152	149			
Mix Temp. (°C)			143	143			

Date Placed: 08/19/98
Date Tested:
Course Placed: Binder
Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): 2.320
Gmm (Lot Avg.): 2.456
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- =

Low Outlier: ERR
High Outlier: ERR
New Q.I. = ERR

Film Thickness (FT): 6.7
VMA: 13.8

Remarks: BEGINNING STATION-3026+38, ENDING STATION-3101+90
750.85 MEGAGRAMS TO THE ROAD WITH NO ROAD WASTE.
w 1 lb LATEX per TON

Gsb: 2.515
Gb: 1.0270
Effective % AC: 3.65

Mix Change Information:

C.P.I.: Cert. No.
QMA Tech: Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-5029

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 3B
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-3C	HM-3D			
Date Sampled:		08/19/98	08/19/98			
Gradation ID:	Specs	CB-3A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	94				
9.5mm Sieve	81-88-95	87				
* 4.75mm Sieve	56-63-70	60				
* Moving Average						
* 2.36mm Sieve	37-43-49	42				
* Moving Average						
1.18mm Sieve		31				
* 600um Sieve	17-22-27	23				
* Moving Average						
300um Sieve		11				
150um Sieve		6.9				
* 75um Sieve	3.0-4.8-7.8	5.3				
* Moving Average						
Compliance (Y/N)		Y				
Intended Added, % AC	7.06					
Actual Added, % AC		6.88				
Intended Total, % AC	7.06					
Actual Total, % AC		6.88				
Gmb:		2.350	2.346			
Gmm:		2.431	2.416			
Pa:		3.3	2.9			
Moving Average	4.0	3.2	3.2			
Time		3:00 PM	5:45 PM			
Station		3410+00	3200+00			
Side		LEFT	LEFT			
Sample Mg's		1,066.00	1,651.00			
Sublot Mg's		500.00	750.00			
Mg's to Date			5,119.74			
Fines / Bitumen Ratio	.6-1.20	1.27				

Gsb: 2.515 Gb: 1.0270 Effective % AC: 4.17

Mix Change Information:

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)					30	30	
A.C. Temp. (°C)					149	149	
Mix Temp. (°C)					143	143	

Date Placed: 08/19/98
Date Tested: 08/20/98
Course Placed: Binder
Tested By: VICKI WILLIAMS

Density Record

Core No.:	1	2	3	4	5	6	7
Station	3004+75	3027+97	3066+69	3092+44	3143+56	3194+09	3238+38
CL Reference	4' LT	7.5' LT	3.5' LT	8' LT	3.5' LT	6' LT	9.5' LT
W 1 Dry	1,520.2	1,558.5	1,342.1	1,605.8	1,331.8	1,461.7	1,701.9
W 2 in H20	852.2	863.6	752.0	902.1	739.1	815.5	931.5
W 3 Wet	1,520.9	1,560.1	1,342.9	1,606.4	1,332.6	1,462.3	1,705.2
Difference	668.7	696.5	590.9	704.3	593.5	646.8	773.7
Field Density	2.273	2.238	2.271	2.280	2.244	2.260	2.200
% Density	97.261	95.764	97.176	97.561	96.021	96.705	94.138
% Voids	6.6	8.1	6.7	6.3	7.8	7.1	9.6
Thickness (mm)	38	43	38	44	38	38	44

Gmb (Lot Avg.): **2.337**
Gmm (Lot Avg.): **2.434**
TC Labs Pa:
Target % RAP:

Avg. Field Density: **2.252**
Avg. % Density: **96.375**
Avg. % Field Voids: **7.5**
Specified % Density: 94

Q.I. = 96.375 -- 94.000 / 1.186 = **2.00**

Low Outlier: High Outlier: New Q.I. =

Film Thickness (FT): **7.7** VMA: **13.5**

Remarks: BEGINNING STATION 3101+90, ENDING STATION-3247+31
1255.21 MEGAGRAMS TO THE ROAD WITH NO ROAD WASTE.

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

9/0241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-53(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-5029

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 4
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-4A	HM-4B	HM-4C		
Date Sampled:		08/20/98	08/20/98	08/20/98		
Gradation ID:	Specs	CB-4A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	95				
9.5mm Sieve	81-88-95	88				
* 4.75mm Sieve	56-63-70	63				
* Moving Average		60				
* 2.36mm Sieve	37-43-49	45				
* Moving Average		42				
1.18mm Sieve		34				
* 600um Sieve	17-22-27	24				
* Moving Average		23				
300um Sieve		11				
150um Sieve		7.6				
* 75um Sieve	3.0-* 8-7.8	5.8				
* Moving Average		5.5				
Compliance (Y/N)		Y				
Intended Added, % AC	7.06					
Actual Added, % AC		6.81				
Intended Total, % AC	7.06					
Actual Total, % AC		6.81				
Gmb:		2.350	2.343	2.335		
Gmm:		2.425	2.426	2.426		
Pa:		3.1	3.4	3.8		
Moving Average	4.0	3.4	3.2	3.3		
Time		7:00 AM	9:40 AM	12:30 PM		
Station		3290+00	3280+00	3200+00		
Side		RIGHT	LEFT	RIGHT		
Sample Mg's		126.00	646.00	1,275.00	2,376.00	
Sublot Mg's		500.00	750.00	363.72		
Mg's to Date				6,733.46		
Fines / Bitumen Ratio	.6-1.20	1.36				

Gsb: 2.515 Gb: 1.0270 Effective % AC: 4.28

Mix Change Information: AT 2:00 PM WE HAVE A NEW AC TARGET OF 6.7%.

Distribution ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)	22	29	31	33			
A.C. Temp. (°C)	149	149	149	149			
Mix Temp. (°C)	143	143	143	143			

Date Placed: 08/20/98 Date Tested:

Course Placed: SURFACE Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): 2.343
Gmm (Lot Avg.): 2.426
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- = ____

Low Outlier: ERR High Outlier: ERR New Q.I. = ERR

Film Thickness (FT): 7.4 VMA: 13.2

Remarks: 1058.12 MGS. OF BINDER WERE LAID TODAY, JOB TOTAL FOR BINDER-6177.86 MGS. BEGINNING STATION FOR BINDER-3280+81 ENDING STATION-3307+95.

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

S00241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-5029

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 5
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-5A
Date Sampled:		08/21/98
Gradation ID:	Specs	CB-5A
25mm Sieve	100	100
19mm Sieve	98-100	100
12.5mm Sieve	88-95-100	94
9.5mm Sieve	81-88-95	85
* 4.75mm Sieve	56-63-70	62
* Moving Average		
* 2.36mm Sieve	37-43-49	44
* Moving Average		
1.18mm Sieve		33
* 600um Sieve	17-22-27	23
* Moving Average		
300um Sieve		11
150um Sieve		7.2
* 75um Sieve	3.0-4.8-7.8	5.4
* Moving Average		
Compliance (Y/N)		Y
Intended Added, % AC	6.70	
Actual Added, % AC		6.77
Intended Total, % AC	6.70	
Actual Total, % AC		6.77
Gmb:		2.333
Gmm:		2.426
Pa:		3.8
Moving Average	4.0	
Time		7:20 AM
Station		3020+00
Side		RIGHT
Sample Mg's		151.00
Sublot Mg's		286.34
Mg's to Date		7,868.34
Fines / Bitumen Ratio	.6-1.20	1.31

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)	22						
A.C. Temp. (°C)	157						
Mix Temp. (°C)	141						

Date Placed: 08/21/98
Date Tested:
Course Placed: SURFACE
Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): 2.333
Gmm (Lot Avg.): 2.433
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = =

Low Outlier: ERR
High Outlier: ERR
New Q.I. = ERR

Film Thickness (FT): 7.4
VMA: 13.5

Gsb: 2.515
Gb: 1.0270
Effective % AC: 4.13

Remarks: BEGINNING STATION-3000+12, ENDING STATION-3030+00.
MGMS. TO ROAD-286.33 WITH NO ROAD WASTE

Mix Change Information:

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-30

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 5A
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-5B
Date Sampled:		08/21/98
Gradation ID:	Specs	CB-5A
25mm Sieve	100	100
19mm Sieve	98-100	100
12.5mm Sieve	88-95-100	94
9.5mm Sieve	81-88-95	85
* 4.75mm Sieve	56-63-70	62
* Moving Average		
* 2.36mm Sieve	37-43-49	44
* Moving Average		
1.18mm Sieve		33
* 600um Sieve	17-22-27	23
* Moving Average		
300um Sieve		11
150um Sieve		7.2
* 75um Sieve	3.0-4.8-7.8	5.4
* Moving Average		
Compliance (Y/N)		
Intended Added, % AC	6.80	
Actual Added, % AC		6.84
Intended Total, % AC	6.80	
Actual Total, % AC		6.84
Gmb:		2.332
Gmm:		2.442
Pa:		4.5
Moving Average	4.0	
Time		9:50 AM
Station		3060+00
Side		RIGHT
Sample Mg's		539.00
Sublot Mg's		500.00 184.18
Mg's to Date		8,552.52
Fines / Bitumen Ratio	.6-1.20	1.35

Gsb: 2.515 Gb: 1.0270 Effective % AC: 4.01

Mix Change Information:

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)		27	31				
A.C. Temp. (°C)		152	152				
Mix Temp. (°C)		143	143				

Date Placed: 08/21/98 Date Tested:

Course Placed: SURFACE Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): 2.332
Gmm (Lot Avg.): 2.442
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- =

Low Outlier: ERR High Outlier: ERR New Q.I. = ERR

Film Thickness (FT): 7.2 VMA: 13.6

Remarks: BEGINNING STATION-3030+00. ENDING STATION-3269.62.
MGMS. TO ROAD-684.18 WITH NO ROAD WASTE.
WITH 1 lb. LATEX [illegible] TON

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contractor: NORRIS ASPHALT PAVING CO.
Class: 1
Report No.: 6
Contract ID: 88471
County: LOUISA
Size: 1/2"
Design Blows:
Mix Design No.: ABD8-5029
Recycle Source:
Mix Type: B
Design Gyrations: 68

Hot Box I.D. No.:		HM-6A	HM-6B			
Date Sampled:		08/24/98	08/24/98			
Gradation ID:	Specs	CB-6A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	95				
9.5mm Sieve	81-88-95	88				
* 4.75mm Sieve	56-63-70	56				
* Moving Average						
* 2.36mm Sieve	37-43-49	37				
* Moving Average						
1.18mm Sieve		28				
* 600um Sieve	17-22-27	20				
* Moving Average						
300um Sieve		9.8				
150um Sieve		6.7				
* 75um Sieve	3.0-4.8-7.8	5.2				
* Moving Average						
Compliance (Y/N)		Y				
Intended Added, % AC	6.70					
Actual Added, % AC		6.56				
Intended Total, % AC	6.70					
Actual Total, % AC		6.56				
Gmb:		2.330	2.339			
Gmm:		2.431	2.435			
Pa:		4.2	3.9			
Moving Average	4.0	**4.0**	**4.0**			
Time		7:20 AM	9:55 AM			
Station		3290+00	3190+00			
Side		LEFT	LEFT			
Sample Mg's		175.00	731.00	1,478.00	1,994.00	
Sublot Mg's		500.00	707.82			
Mg's to Date			10,857.54			
Fines / Bitumen Ratio	.6-1.20	1.28				

Gsb: 2.515 Gb: 1.0270 Effective % AC: 4.06

Mix Change Information:

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)	25	27	30				
A.C. Temp. (°C)	156	156	157				
Mix Temp. (°C)	153	156	157				

Date Placed: 08/24/98 Date Tested: 08/25/98

Course Placed: SURFACE Tested By: VICKI WILLIAMS

Density Record

Core No.:	1	2	3	4	5	6	7
Station	3267+00	3248+48	3229+20	3199+50	3180+48	3172+33	3154.67
CL Reference	7.5' LT	4' LT	8.5' LT	3' LT	5' LT	3.5' LT	9' LT
W 1 Dry	1,168.0	1,246.1	1,427.3	1,194.3	1,541.7	1,447.2	1,716.0
W 2 in H20	653.2	687.6	797.1	658.8	866.1	810.1	945.2
W 3 Wet	1,169.2	1,247.9	1,428.8	1,196.9	1,542.8	1,448.2	1,718.6
Difference	516.0	560.3	631.7	538.1	676.7	638.1	773.4
Field Density	2.264	2.224	2.259	2.219	2.278	2.268	2.219
% Density	96.959	95.246	96.745	95.032	97.559	97.131	95.032
% Voids	6.9	8.6	7.2	8.8	6.4	6.8	8.8
Thickness (mm)	32	32	38	32	40	38	45

Gmb (Lot Avg.): **2.335** Avg. Field Density: **2.247**
Gmm (Lot Avg.): **2.433** Avg. % Density: **96.243**
TC Labs Pa: Avg. % Field Voids: **7.6**
Target % RAP: Specified % Density: 94

Q.I. = 96.243 -- 94.000 = **2.05**
1.096

Low Outlier: High Outlier: New Q.I. =

Film Thickness (FT): **8.0** VMA: **13.2**

Remarks: Beginning station-3269+62, ending 3141+69. 1207.82 megagrams to road with no road waste.

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-5029

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 7
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:		HM-7A				
Date Sampled:		08/25/98				
Gradation ID:	Specs	CB-7A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	92				
9.5mm Sieve	81-88-95	84				
* 4.75mm Sieve	56-63-70	61				
* Moving Average						
* 2.36mm Sieve	37-43-49	41				
* Moving Average						
1.18mm Sieve		31				
* 600um Sieve	17-22-27	22				
* Moving Average						
300um Sieve		11				
150um Sieve		7.2				
* 75um Sieve	3.0-4.8-7.8	5.6				
* Moving Average						
Compliance (Y/N)		Y				
Intended Added, % AC	6.70					
Actual Added, % AC		6.78				
Intended Total, % AC	6.70					
Actual Total, % AC		6.78				
Gmb:		2.329				
Gmm:		2.429				
Pa:		4.1				
Moving Average	4.0	3.9				
Time		7:25 AM				
Station		3132+00				
Side		LEFT				
Sample Mg's		127.00	711.00			
Sublot Mg's		370.91				
Mg's to Date		11,228.45				
Fines / Bitumen Ratio	.6-1.20	1.33				

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)	22						
A.C. Temp. (°C)	154						
Mix Temp. (°C)	152						

Date Placed: 08/25/98
Date Tested:
Course Placed: SURFACE
Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.): 2.329
Gmm (Lot Avg.): 2.429
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- =

Low Outlier: ERR
High Outlier: ERR
New Q.I. = ERR

Film Thickness (FT): 7.6
VMA: 13.7

Gsb: 2.515
Gb: 1.0270
Effective % AC: 4.21

Remarks: Stations-3141+69 to 3104+02, megagrams to road-370.91 with no road was

Mix Change Information:

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contractor: NORRIS ASPHALT PAVING CO.
Class: 1
Report No.: 7a
Contract ID: 88471
County: LOUISA
Size: 1/2"
Design Blows:
Mix Design No.: ABD8-30
Recycle Source:
Mix Type: B
Design Gyrations: 68

Hot Box I.D. No.:		HM-7B				
Date Sampled:		08/25/98				
Gradation ID:	Specs	CB-7A				
25mm Sieve	100	100				
19mm Sieve	98-100	100				
12.5mm Sieve	88-95-100	92				
9.5mm Sieve	81-88-95	84				
* 4.75mm Sieve	56-63-70	61				
* Moving Average						
* 2.36mm Sieve	37-43-49	41				
* Moving Average						
1.18mm Sieve		31				
* 600um Sieve	17-22-27	22				
* Moving Average						
300um Sieve		11				
150um Sieve		7.2				
* 75um Sieve	3.0-4.8-7.8	5.6				
* Moving Average						
Compliance (Y/N)						
Intended Added, % AC	6.80					
Actual Added, % AC		6.61				
Intended Total, % AC	6.80					
Actual Total, % AC		6.61				
Gmb:		2.327				
Gmm:		2.434				
Pa:		4.4				
Moving Average	4.0	**5.0**				
Time		10:30 AM				
Station		3086+00				
Side		LEFT		•		
Sample Mg's		607.00				
Sublot Mg's		500.00	183.71			
Mg's to Date		11,912.16				
Fines / Bitumen Ratio	.6-1.20	1.37				

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)			28				
A.C. Temp. (°C)			154				
Mix Temp. (°C)			152				

Date Placed: 08/25/98
Date Tested: 08/26/98
Course Placed: SURFACE
Tested By: VICKI WILLIAMS

Density Record

Core No.:	1	2	3	4	5	6	7
Station	3126+58	3102+60	3085+23	3026+81	3024+93	3031+98	3015+89
CL Reference	8.5 LEFT	3.0 LEFT	5.5 LEFT	2.5 LEFT	4.0 LEFT	7.0 LEFT	6.0 LEFT
W 1 Dry	1,275.4	1,374.3	1,282.2	1,427.8	1,275.2	1,452.6	1,719.0
W 2 in H20	716.2	773.1	718.2	797.5	712.8	803.1	939.4
W 3 Wet	1,276.6	1,375.2	1,283.6	1,429.3	1,276.1	1,454.6	1,725.5
Difference	560.4	602.1	565.4	631.8	563.3	651.5	786.1
Field Density	2.276	2.283	2.268	2.260	2.264	2.230	2.187
% Density	97.766	98.067	97.423	97.079	97.251	95.790	93.943
% Voids	6.4	6.1	6.7	7.1	6.9	8.3	10.1
Thickness (mm)	35	38	35	38	35	40	45

Gmb (Lot Avg.): **2.328**
Avg. Field Density: **2.253**
Gmm (Lot Avg.): **2.432**
Avg. % Density: **96.760**
TC Labs Pa:
Avg. % Field Voids: **7.4**
Target % RAP:
Specified % Density: 94

Q.I. = 96.760 -- 94.000 = **1.92**
1.436

Low Outlier:
High Outlier:
New Q.I. =

Film Thickness (FT): **7.4**
VMA: **13.6**

Gsb: 2.515
Gb: 1.0270
Effective % AC: 4.09

Mix Change Information:

Remarks: Stations-3104+02 to 3038+32, megagrams to road-683.71 with no road was
Last pg. of report represents sta.-3038+32 to3000+12 with 475.25 megagra
to road with no waste.

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant

800241M - 01/98

DAILY ACC PLANT REPORT

Project No.: FM-58(17)--55-58
Contract ID: 88471
Mix Design No.: ABD8-5029

Contractor: NORRIS ASPHALT PAVING CO.
County: LOUISA
Recycle Source:

Class: 1
Size: 1/2"
Mix Type: B

Report No.: 7B
Design Blows:
Design Gyrations: 68

Hot Box I.D. No.:						
Date Sampled:		08/25/98				
Gradation ID:	Specs					
25mm Sieve	100					
19mm Sieve	98-100					
12.5mm Sieve	88-95-100					
9.5mm Sieve	81-88-95					
* 4.75mm Sieve	56-63-70					
* Moving Average						
* 2.36mm Sieve	37-43-49					
* Moving Average						
1.18mm Sieve						
* 600um Sieve	17-22-27					
* Moving Average						
300um Sieve						
150um Sieve						
* 75um Sieve	3.0-4.8-7.8					
* Moving Average						
Compliance (Y/N)						
Intended Added, % AC	6.80					
Actual Added, % AC		6.78				
Intended Total, % AC	6.80					
Actual Total, % AC		6.78				
Gmb:						
Gmm:						
Pa:						
Moving Average	4.0					
Time						
Station						
Side						
Sample Mg's						
Sublot Mg's		475.25				
Mg's to Date		12,387.41				
Fines / Bitumen Ratio	.6-1.20					

Time	7:00	9:00	11:00	1:00	3:00	5:00	7:00
Air Temp. (°C)				30	32		
A.C. Temp. (°C)				152	152		
Mix Temp. (°C)				152	150		

Date Placed: 08/25/98
Date Tested:
Course Placed: SURFACE
Tested By:

Density Record

Core No.:	1	2	3	4	5	6	7
Station							
CL Reference							
W 1 Dry							
W 2 in H20							
W 3 Wet							
Difference							
Field Density							
% Density							
% Voids							
Thickness (mm)							

Gmb (Lot Avg.):
Gmm (Lot Avg.):
TC Labs Pa:
Target % RAP:

Avg. Field Density:
Avg. % Density:
Avg. % Field Voids:
Specified % Density:

Q.I. = -- =

Low Outlier: ERR
High Outlier: ERR
New Q.I. = ERR

Film Thickness (FT): ERR
VMA:

Gsb: 2.515
Gb: 1.0270
Effective % AC: ERR

Mix Change Information:

Remarks: This page is for the last 500 tons tank stick. The testing was done earlier in this sublot. There was a 400 ton over run from projected tons. Total binder tons-6809.93, total surface tons-6844.85, total job tons-13654.78

C.P.I.: VICKI WILLIAMS SE 126 Cert. No.
QMA Tech: BARB DUNNING SE 145 Cert. No.

Distribution: ____ Central Materials ____ TC Materials ____ Proj. Engineer ____ Contractor ____ Plant