

**Michigan Department of
Transportation**



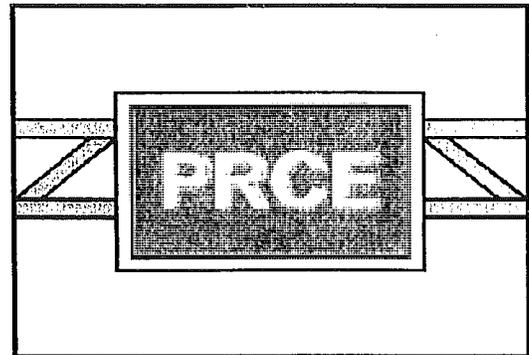
**DETECTING AND QUANTIFYING
SEGREGATION IN
BITUMINOUS PAVEMENTS AND
RELATING ITS EFFECT TO CONDITION**

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CONSTRUCTION & TECHNOLOGY
DIVISION**

Appendix E

Field and Laboratory Data (Sites 1-14)

**Michigan State University
Pavement Research Center of Excellence
Department of Civil and Environmental
Engineering
East Lansing, Michigan 48824-1226**



**TESTING AND RESEARCH SECTION
CONSTRUCTION AND TECHNOLOGY DIVISION
RESEARCH PROJECT NO. RC-1421
APPENDIX E**

March 2000

**Michigan Department of
Transportation**

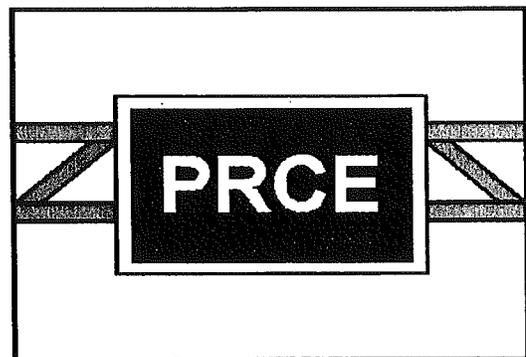


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March 2000

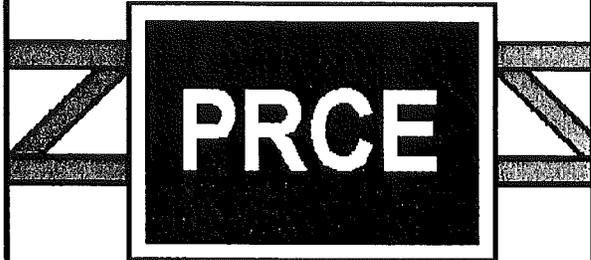
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**PAVEMENT RESEARCH
CENTER OF EXCELLENCE**

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Department of Civil and Environmental
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Final Report

Report Number MDOT - PRCE - MSU - 2000 - 210		Contract Number 94-1699	
Title and Subtitle Detecting and Quantifying Segregation in Bituminous Pavements and Relating Its Effect to Condition		Final Report Date March 2000	
Authors Thomas F. Wolff, Ph.D., P.E. Gilbert Y. Baladi, Ph.D., P.E. Chieh-Min Chang, M.S.		TAG Chairperson Michael Frankhouse	
Sponsoring Agency Name and Address Michigan Department of Transportation Construction and Technology Division		TAG members Dave Bradley Gary Mayes Jeff Click David Smiley Craig Kelso Tom Ziegler	
<p>Abstract</p> <p>This report describes a follow-up project to the previous project titled "Test Method to Determine the Existence of Segregation in Bituminous Mixtures". To better correlate nuclear-measured density with segregation, procedures were developed to incorporate mapping of apparently segregated areas and apparently non-segregated control areas. Statistical comparison tests were then performed on data from both segregated and non-segregated areas to assess whether there were significant differences in nuclear-measured density and gradation parameters.</p> <p>It was found that statistically significant differences in nuclear density will usually be present where medium or heavy segregated areas are identified visually and these areas have aggregate gradation differences from non-segregated areas. The proposed criteria were the nuclear density differences with p-values less than 10^{-3}. The criteria were further verified by the gradation differences of p-values less than 10^{-2}. The conditional probability of finding medium or heavy segregation based on visual identification and nuclear density measurements is approximately 86%; the conditional probability of finding light through medium segregation drops to 63%.</p> <p>The occurrence of segregation deteriorates pavements. Raveling and cracking were the most common distresses at segregation sites. Growth rate of distresses depends on the degree of segregation.</p>			
<p>Key Words : segregation, nuclear density, asphalt pavements, statistical methods, quality control, bituminous mixtures, pavement performance</p>			

Conversion Factors

English	Metric
1 inch, in	25.44 mm = 2.544 cm = 0.0254 m
1 foot, ft	304.8 mm = 30.48 cm = 0.3048 m
1 yard, yd	914.4 mm = 91.44 cm = 0.9144 m
1 mile (U.S.)	1,609 m = 1.609 km
1 mil	0.0254 mm = 0.0000254 m = 25.4 micron
1 inch square, in ²	645.2 mm ² = 6.45 cm ² = 6.452 m ²
1 foot square, ft ²	0.0929 m ² = 929.03 cm ²
1 yard square, yd ²	0.836 m ² = 8361.3 cm ²
1 square mile (U.S.)	2.590 km ²
1 pound mass, lbm or lb	0.4536 kg
1 ton = 2000 lbm	907.2 kg
1 slug (1 lb-force/ft/s ²)	14.59 kg
1 pound-force, lbf	4.448 N
1 ton-force	8.896 x 10 ³ N = 8.896 kN
1 pound per square inch, psi	6.895 kPa = 6.895 x 10 ³ Pa
1 kip per square inch, ksi	6896 kPa = 6.895 x 10 ⁶ Pa
1 pound-force/square foot, psf	47.88 Pa
1 pound-mass per cubic foot, pcf	16.018 kg/m ³
For asphalt overlays	
100 pounds per square yard \cong 0.9 in	54.25 kg/m ² \cong 23.1 mm
170 pounds per square yard \cong 1.5 in	92.22 kg/m ² \cong 39.2 mm

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Site 1

Segregation Survey

Date of Survey: Dec. 3, 1997

Surveyor: _____ (your name)
 Control Section Number: J 38000 Route: MAOT Special Cruis garage Direction: Parking lot West
 Region: Univ. Mile Post: from _____ to _____
 Section Number: _____ Test Site Number: 1 ADT: _____

Definition of Segregation:

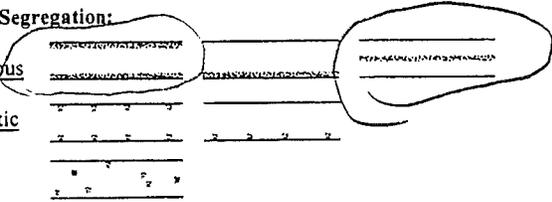
Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous

Systematic

Random



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Med

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

Low Moderate High

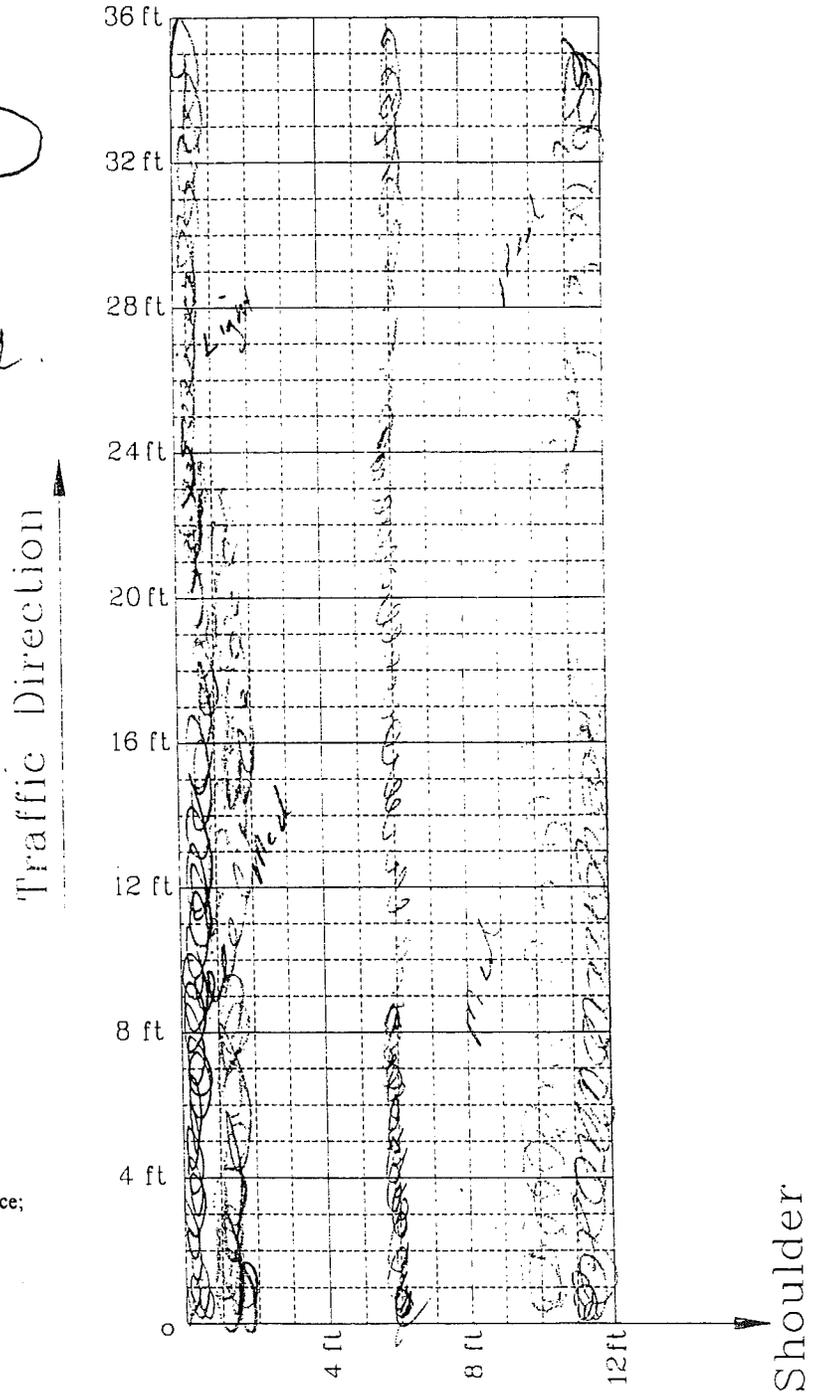
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)
 Control Section Number: 38000 Route: Spauldine Rd Direction: West
 Region: Unat Mile Post: from _____ to _____
 Section Number: 1 Test Site Number: 1 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

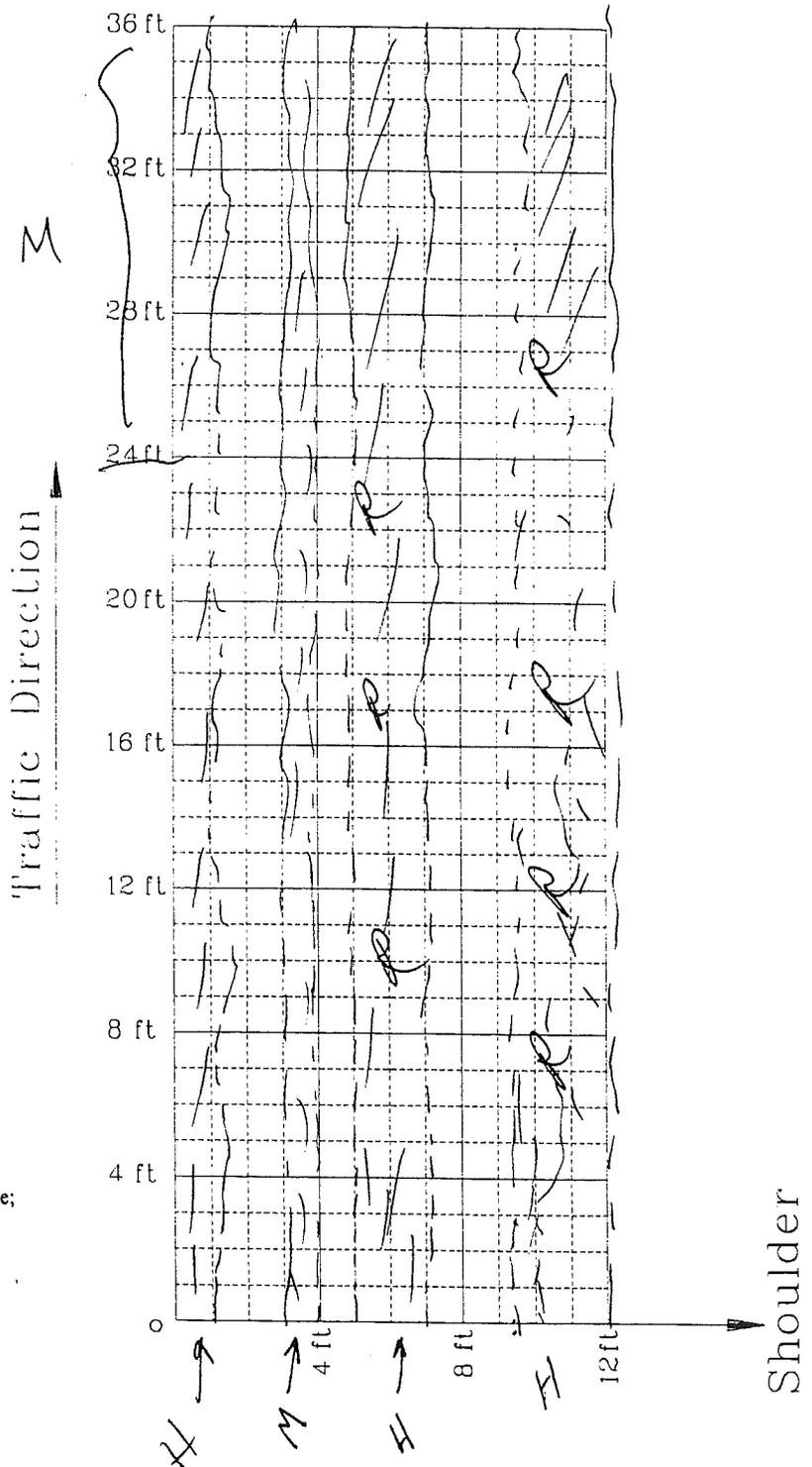
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Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)
 Control Section Number: 38000 Route: Special Direction: W
 Region: UNIVERSITY Mile Post: from _____ to 35
 Section Number: 1 Test Site Number: 1 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous

Systematic

Random

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in. or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

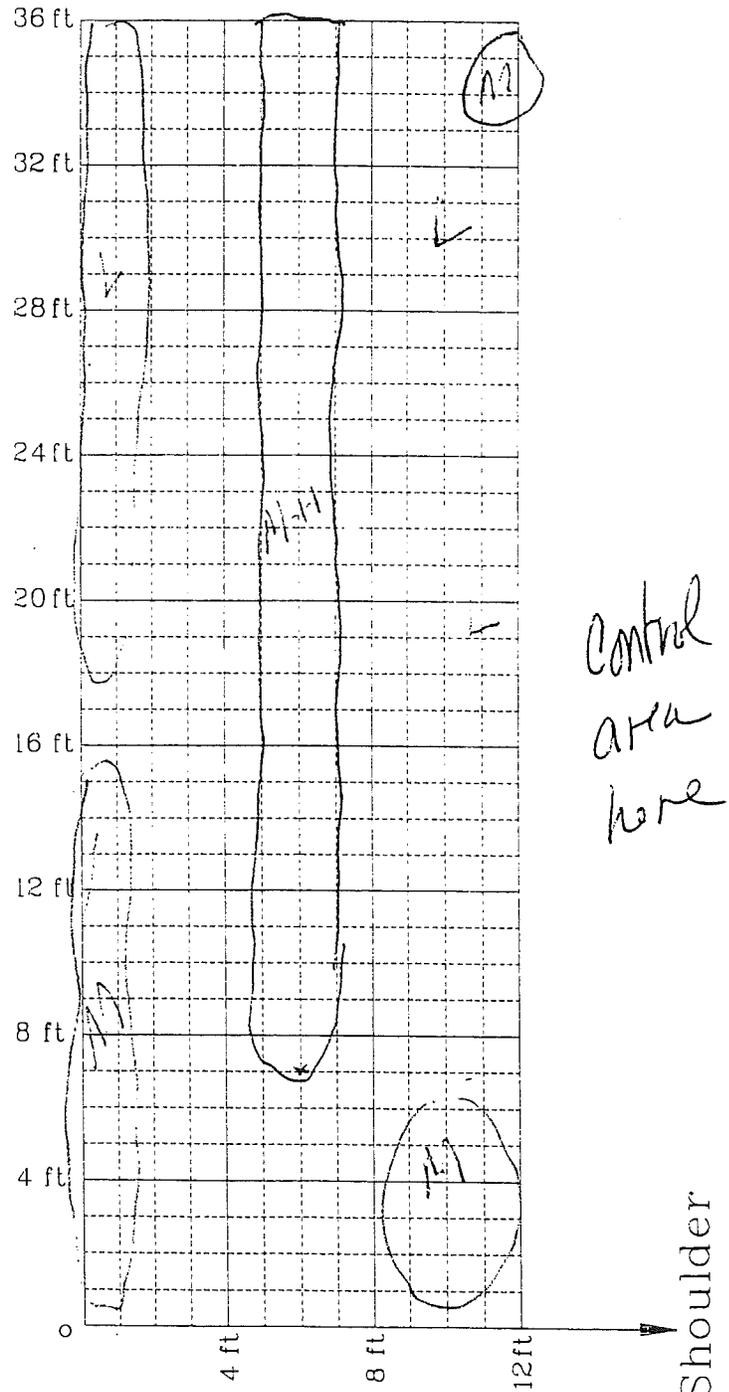
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COMMENTS

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Segregation Survey

Date of Survey: Dec. 3, 1997

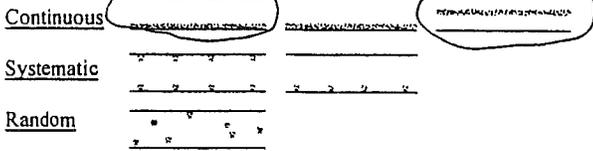
Weather:

Surveyor: _____ (your name)
 Control Section Number: 138000 Route: Sp. Crews Lot Direction: West
 Region: University Mile Post: from N/A to N/A
 Section Number: 1 Test Site Number: 1 ADT: N/A

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth N.A.

4. Flushing

Low Moderate High

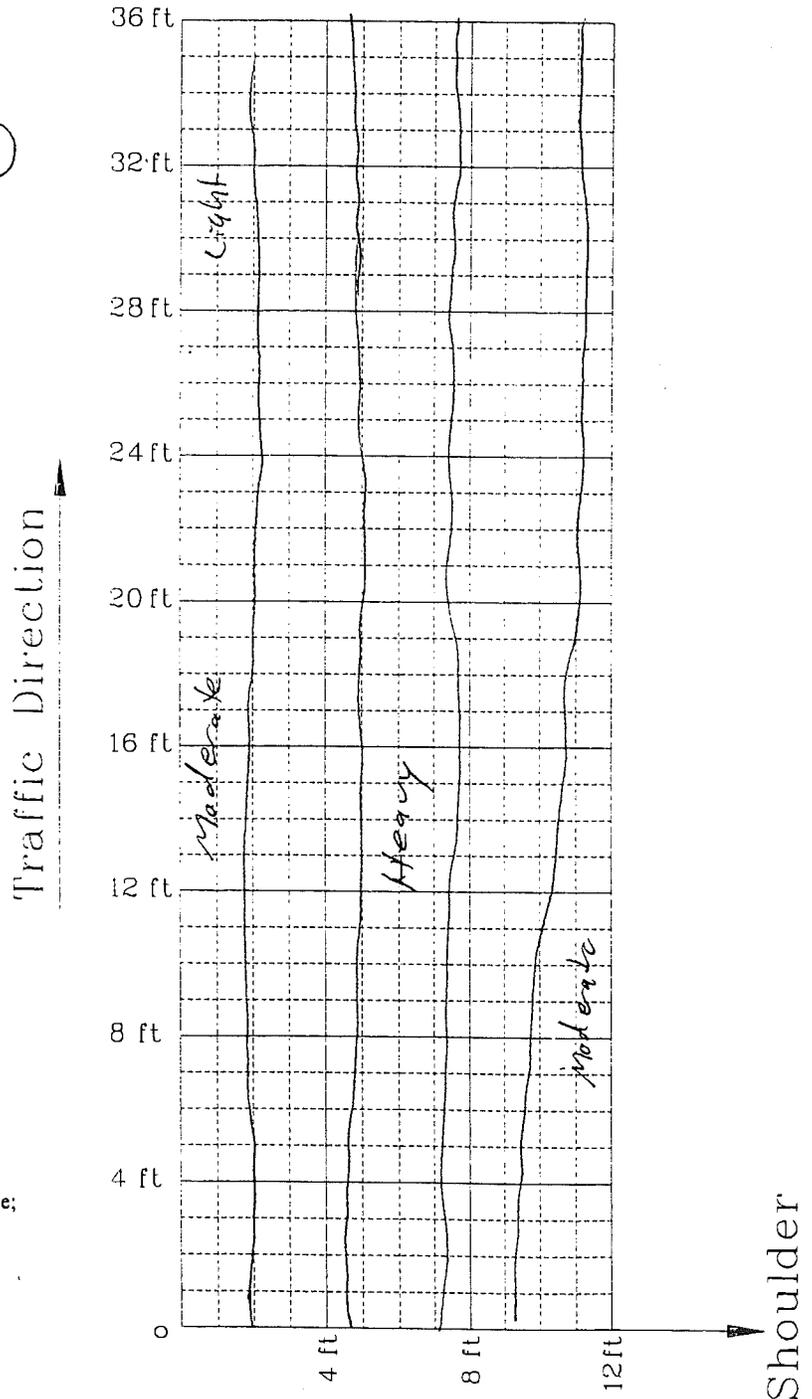
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High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

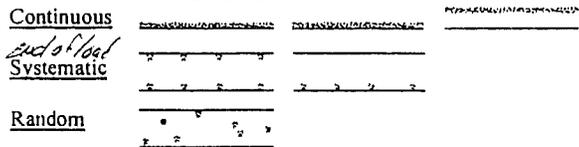
Weather:

Surveyor: _____ (your name) *mod / special lot crew*
 Control Section Number: 38000 Route: _____ Direction: West
 Region: UNIVERSITY Mile Post: from _____ to _____
 Section Number: 1 Test Site Number: 1 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

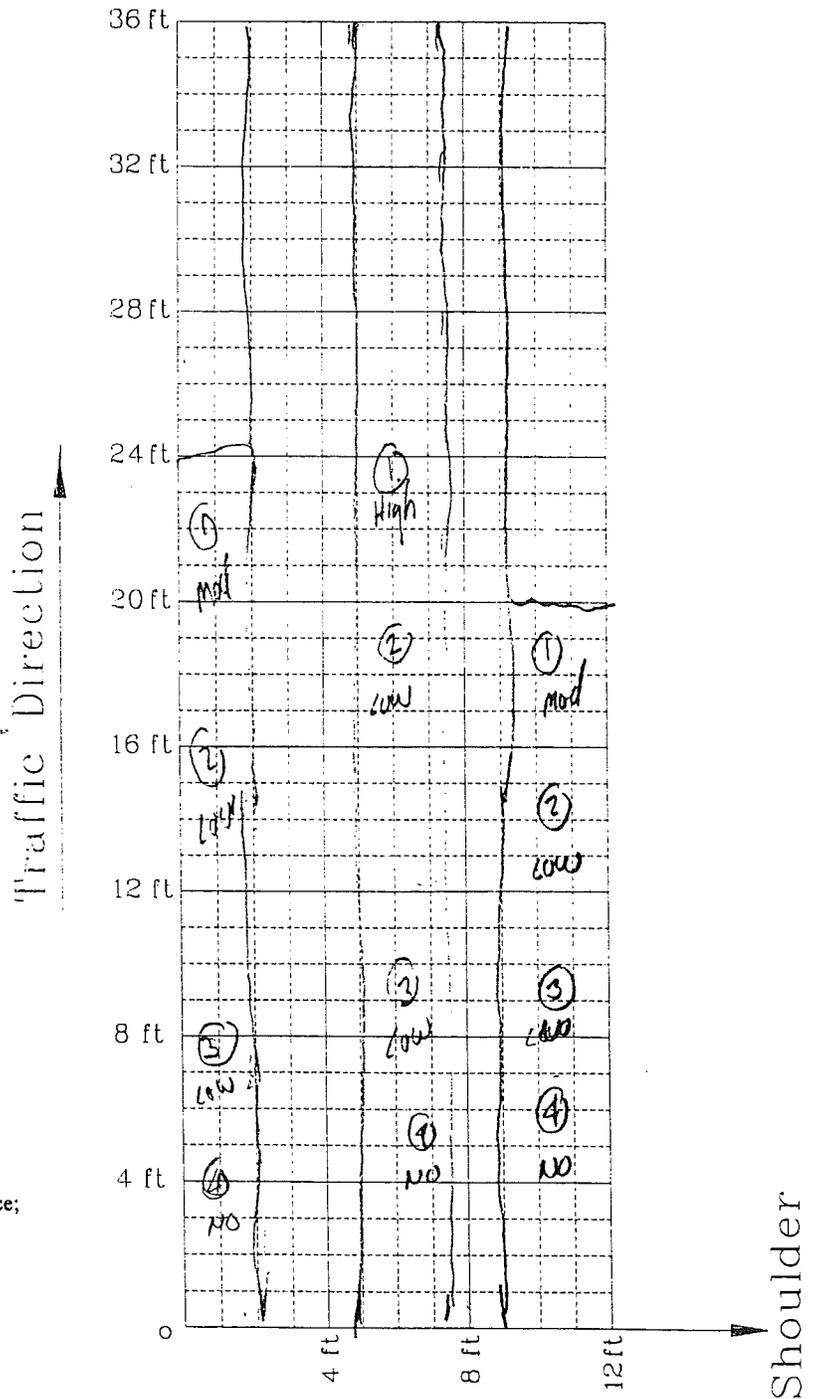
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Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

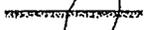
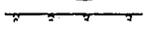
Weather:

Surveyor: 1 (your name)
 Control Section Number: 38000 Route: Spec. Gravel ^{Lot} Direction: West
 Region: University Mile Post: from _____ to _____
 Section Number: 1 Test Site Number: 2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous 
Systematic 
Random 

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

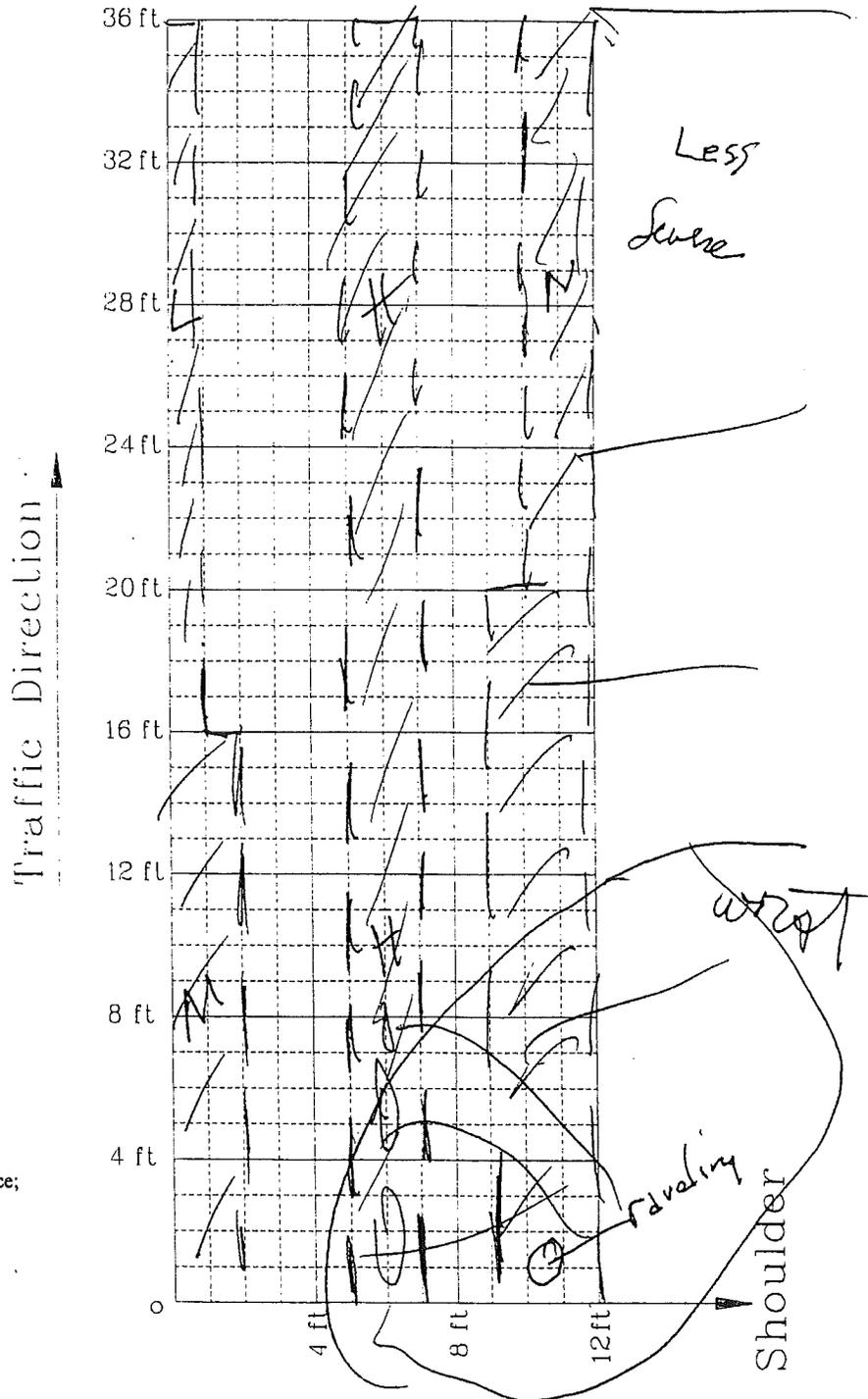
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High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997
Weather: cloudy mid 30's

Surveyor: _____ (your name)
Control Section Number: Bridge Forestry Route: 38000 Direction: _____
Region: University Mile Post: from _____ to _____
Section Number: # 1 Test Site Number: # 1 ADT: N/A

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

- Continuous _____
Systematic _____
Random _____

Degree of Segregation

- Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

- Low Moderate *SOME AREAS* High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

- Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

- Low Moderate High

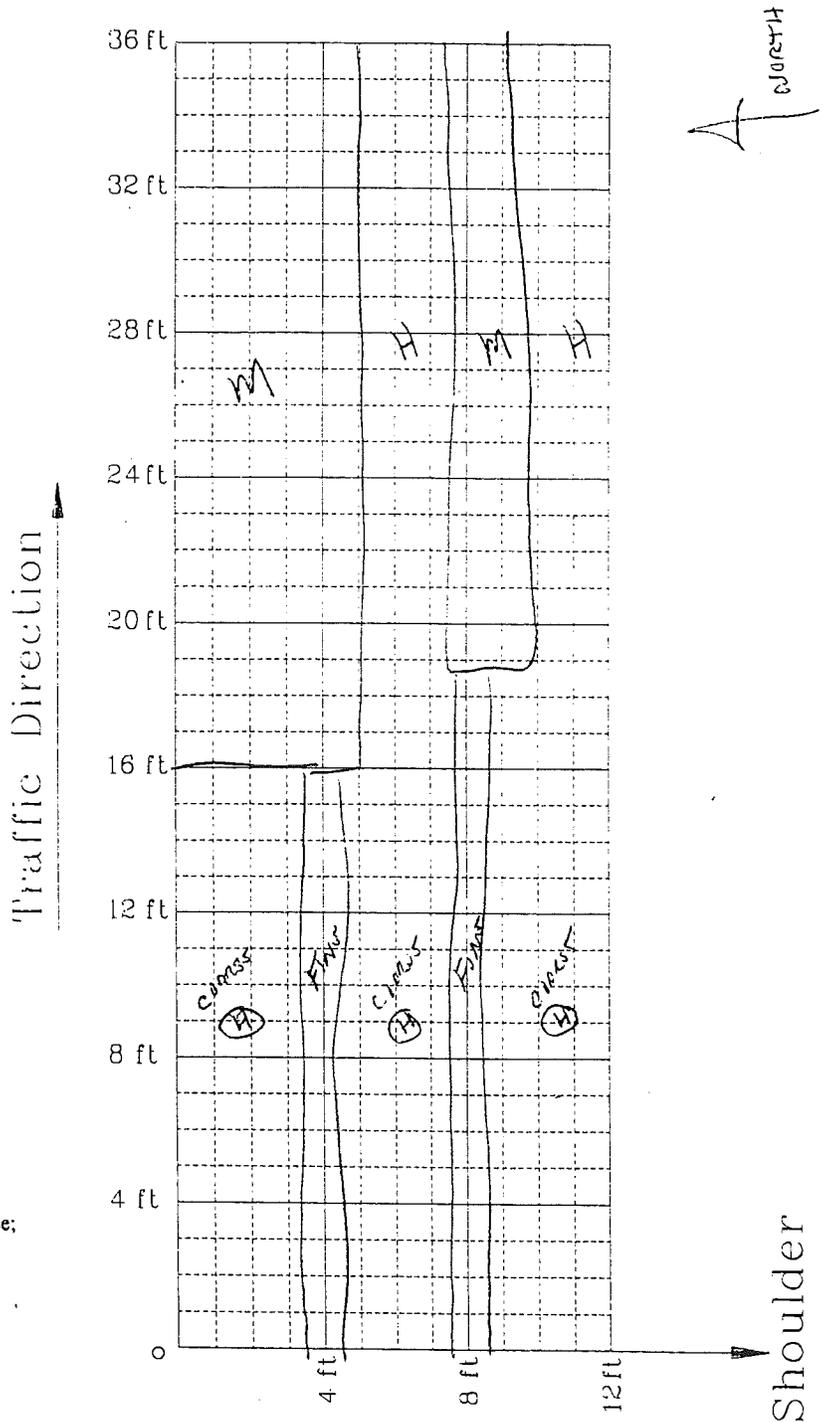
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Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

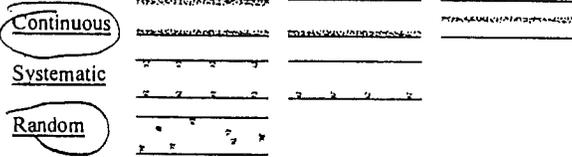
Weather:

Surveyor: _____ (your name)
 Control Section Number: 38000 Route: SPEC Grews Direction: West Bd.
 Region: Univ. Mile Post: from 0 to 0
 Section Number: 1 Test Site Number: 1 ADT: 10

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly
Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

None

4. Flushing

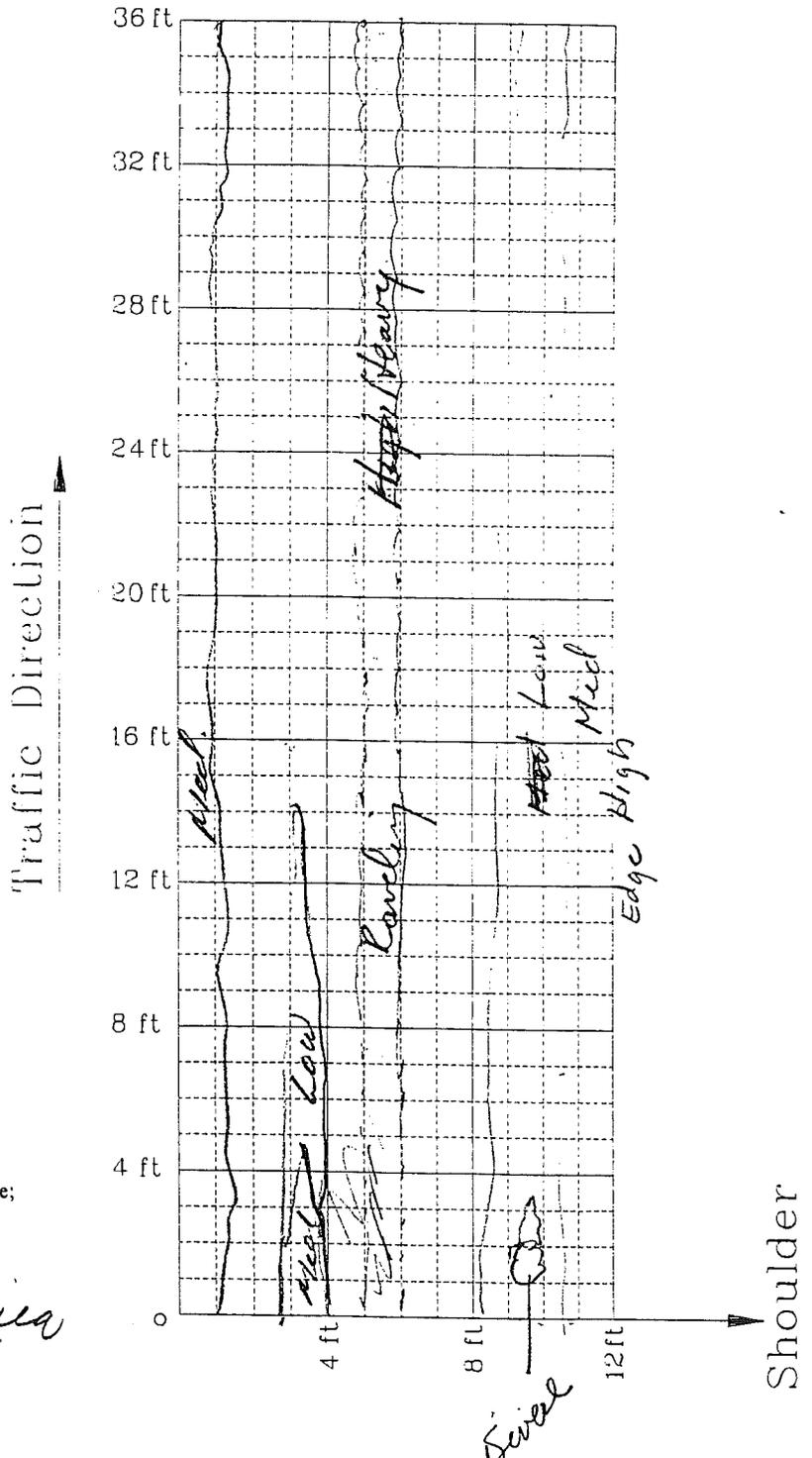
Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Loss of mat east of test area

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

35° E.

9:50 A.M.

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather: cloudy

Surveyor: _____ (your name)

Control Section Number: _____ Route: _____ Direction: _____

Region: _____ Mile Post: from _____ to _____

Section Number: 5401 Test Site Number: _____ ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous

Systematic

Random

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

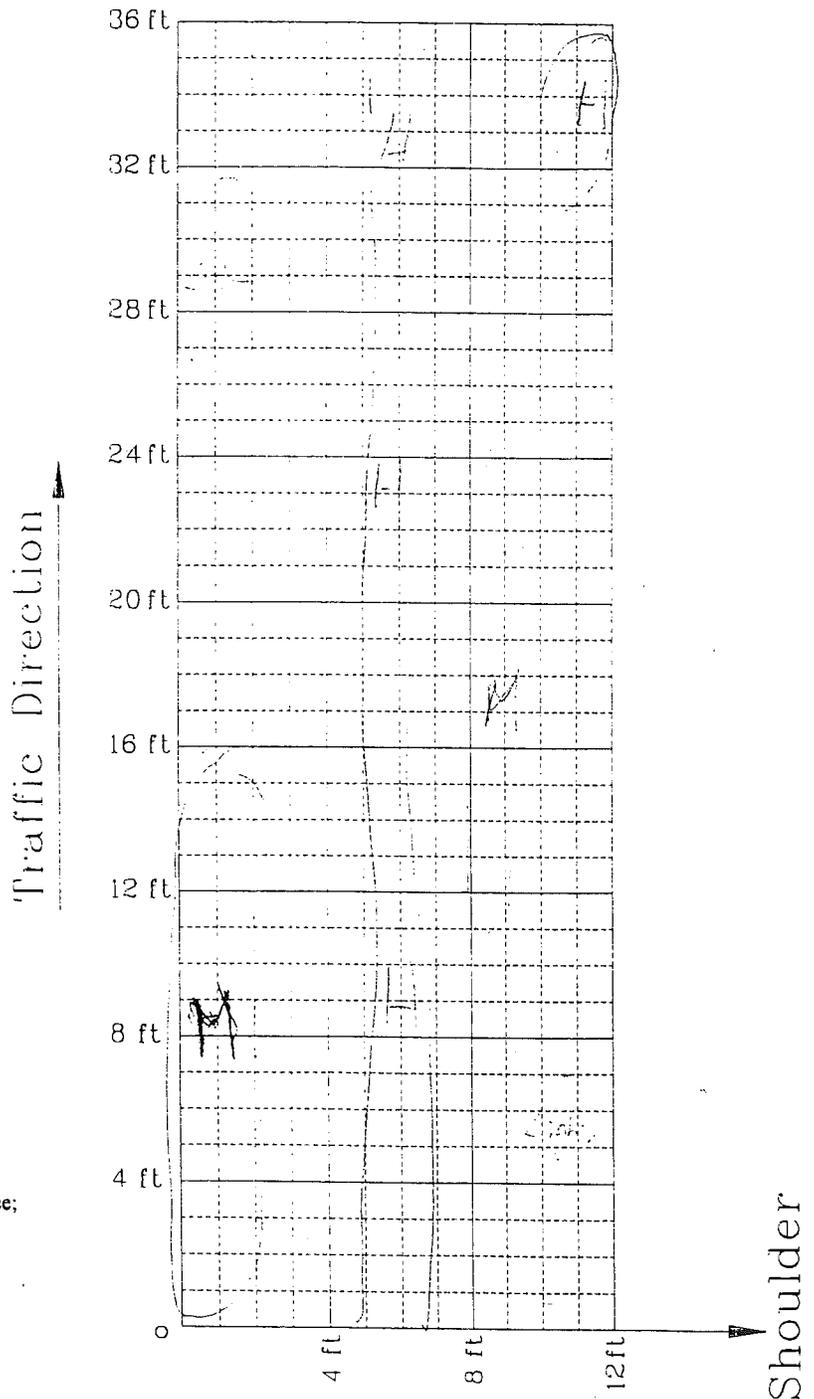
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Nuclear Density Sampling Data (Jan. 16, 1998)

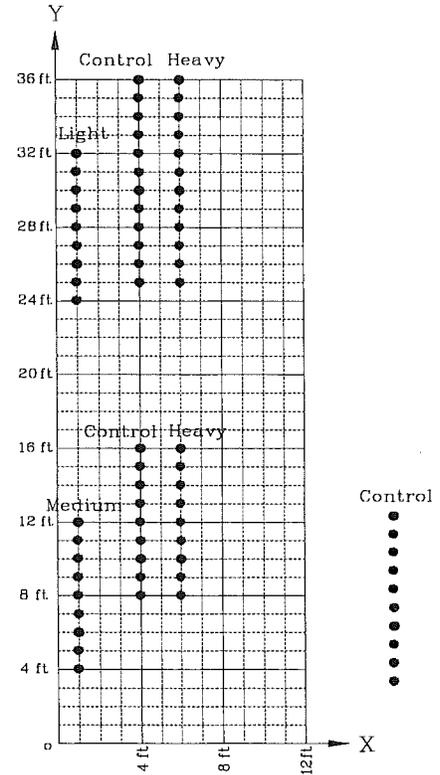
SITE 1

Parking Lot of MDOT Special Crews Building, Jackson

Chart Standard	Density	2853
	Moisture	660
Operating Standard	Density	2850
	Moisture	670

Gauge No.	99398
Model	Troxler 3440
Inspector	Joe Badgley

Sample 1		Sample 2		Sample 3	
Light		Control		Heavy	
0132	135.9	0436	140.2	0636	132.7
0131	136.0	0435	143.3	0635	134.5
0130	136.2	0434	140.4	0634	133.3
0129	137.5	0433	140.6	0633	134.1
0128	136.3	0432	140.7	0632	133.2
0127	135.0	0431	141.6	0631	131.4
0126	135.4	0430	139.6	0630	134.5
0125	135.5	0429	138.1	0629	132.1
0124	135.9	0428	138.1	0628	131.9
mean	136.0	0427	138.9	0627	132.5
std.	0.76	0426	139.6	0626	135.1
		0425	139.4	0625	134.6
		mean	140.0	mean	133.3
		std.	1.46	std.	1.22



Sample 4		Sample 5		Sample 6	
Medium		Control		Heavy	
0112	133.1	0416	138.4	0616	132.7
0111	133.5	0415	137.7	0615	132.5
0110	133.0	0414	140.9	0614	132.9
0109	129.8	0413	138.7	0613	131.9
0108	131.8	0412	138.0	0612	131.9
0107	130.9	0411	139.6	0611	130.9
0106	131.7	0410	138.9	0610	131.7
0105	133.0	0409	136.7	0609	131.9
0104	133.0	0408	139.9	0608	129.8
mean	132.2	mean	138.8	mean	131.8
std.	1.24	std.	1.26	std.	0.96

Control	
Outside	
Control 10	136.9
Control 9	136.4
Control 8	136.6
Control 7	138.6
Control 6	138.9
Control 5	138.7
Control 4	140.0
Control 3	138.1
Control 2	137.8
Control 1	139.3
mean	138.1
std.	1.20

Nuclear Density Sampling Data (April 9, 1998)

SITE 1

Parking Lot of MDOT Special Crews Building, Jackson

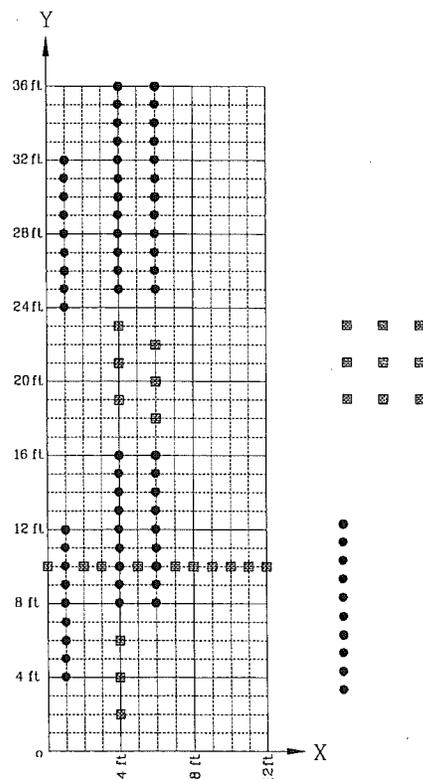
Chart Standard	Density	2863
	Moisture	652
Operating Standard	Density	2870
	Moisture	658

Gauge No.	1E+05
Model	Troxler 3440
Inspector	Joe

Control		Heavy	
0423	138.4	0622	124.4
0421	138.8	0620	129.4
0419	134.7	0618	129.4

Control	
0406	138.9
0404	138.0
0402	138.1

Transverse		Control	
0010	133.3	New C9	135.5
0210	134.1	New C8	132.6
0310	135.1	New C7	135.1
0510	135.1	New C6	136.9
0710	136.2	New C5	135.1
0810	138.6	New C4	135.2
0910	135.2	New C3	138.2
1010	138.3	New C2	138.2
1110	133.4	New C1	134.1
1210	136.8	mean	135.7
		std.	1.84



Sieve Analysis

Weight of empty bags 17.5

Weight of bags & soil	1516.7
Weight of soil	1499.2

Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent retained	
Site 1 Control 2	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	42.9	2.86	2.86	97.14	
	3/8 inch	9.50	2.754	149.3	9.96	12.83	87.17	
	No. 4	4.75	2.016	331.5	22.12	34.95	65.05	
	No. 8	2.37	1.474	190.6	12.72	47.66	52.34	
	No. 16	1.18	1.077	139.1	9.28	56.95	43.05	
	No. 30	0.60	0.795	145.6	9.72	66.66	33.34	
	No. 50	0.30	0.582	219.3	14.63	81.30	18.70	
	No. 100	0.15	0.426	162.1	10.82	92.11	7.89	
	No. 200	0.08	0.312	57.8	3.86	95.97	4.03	
		Pan			60.4	4.03	100.00	0.00
				Total	1498.6	100.00		
				weight				

Operator	Joel Davenport	Weight of tear & soil	2398.8
Date	5/14/98	Weight of tear	900.1
Remarks		Weight of soil	1498.7

Sieve Analysis

Weight of bags & soil	1446.8
Weight of soil	1429.6

Weight of empty bags	17.2
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 Control 6	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	23.2	1.62	1.62	98.38	
	3/8 inch	9.50	2.754	111.8	7.82	9.45	90.55	
	No. 4	4.75	2.016	321.6	22.51	31.95	68.05	
	No. 8	2.37	1.474	195.8	13.70	45.65	54.35	
	No. 16	1.18	1.077	156.0	10.92	56.57	43.43	
	No. 30	0.60	0.795	134.9	9.44	66.01	33.99	
	No. 50	0.30	0.582	204.5	14.31	80.32	19.68	
	No. 100	0.15	0.426	162.6	11.38	91.70	8.30	
	No. 200	0.08	0.312	58.2	4.07	95.77	4.23	
				Total weight	1429.00	100.00	100.00	0.00

Operator	Joel Davenport	Weight of tear & soil	2329.2
Date	5/12/98	Weight of tear	900.1
Remarks		Weight of soil	1429.1

Sieve Analysis

Weight of bags & soil	1363.3
Weight of soil	1345.9

Weight of empty bags	17.4
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
Control 8	1/2 inch	12.50	3.116	36.7	2.73	2.73	97.27
	3/8 inch	9.50	2.754	118.2	8.79	11.52	88.48
	No. 4	4.75	2.016	298.1	22.17	33.69	66.31
	No. 8	2.37	1.474	184.1	13.69	47.38	52.62
	No. 16	1.18	1.077	123.7	9.20	56.58	43.42
	No. 30	0.60	0.795	129.6	9.64	66.22	33.78
	No. 50	0.30	0.582	197.4	14.68	80.90	19.10
	No. 100	0.15	0.426	148.8	11.07	91.97	8.03
	No. 200	0.08	0.312	52.6	3.91	95.88	4.12
		Pan			55.4	4.12	100.00
			Total	1344.6	100.00		
			weight				

Operator	Joel Davenport
Date	5/14/98
Remarks	
	Weight of tear & soil
	2244.7
	Weight of tear
	900.0
	Weight of soil
	1344.7

Sieve Analysis

Weight of bags & soil	907.3
Weight of soil	890.2

Weight of empty bags	17.1
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
105	1/2 inch	12.50	3.116	79.8	8.96	8.96	91.04
	3/8 inch	9.50	2.754	184.3	20.70	29.67	70.33
	No. 4	4.75	2.016	266.5	29.94	59.60	40.40
	No. 8	2.37	1.474	81.5	9.16	68.76	31.24
	No. 16	1.18	1.077	41.9	4.71	73.47	26.53
	No. 30	0.60	0.795	39.2	4.40	77.87	22.13
	No. 50	0.30	0.582	69.8	7.84	85.71	14.29
	No. 100	0.15	0.426	69.1	7.76	93.47	6.53
	No. 200	0.08	0.312	27.5	3.09	96.56	3.44
	Pan			30.6	3.44	100.00	0.00
			Total weight	890.2	100.00		

Operator	Joel Davenport	Weight of tear & soil	1790.1
Date	5/20/98	Weight of tear	899.9
Remarks		Weight of soil	890.2

Sieve Analysis

Weight of empty bags	17.1
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Weight of bags & soil	912.6
Weight of soil	895.5

Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent retained	
Site 1 106	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	60.9	6.80	6.80	93.20	
	3/8 inch	9.50	2.754	176.6	19.72	26.52	73.48	
	No. 4	4.75	2.016	285.8	31.92	58.44	41.56	
	No. 8	2.37	1.474	87.9	9.82	68.26	31.74	
	No. 16	1.18	1.077	45.7	5.10	73.36	26.64	
	No. 30	0.60	0.795	40.2	4.49	77.85	22.15	
	No. 50	0.30	0.582	72.6	8.11	85.96	14.04	
	No. 100	0.15	0.426	71.6	8.00	93.96	6.04	
	No. 200	0.08	0.312	26.8	2.99	96.95	3.05	
		Pan			27.3	3.05	100.00	0.00
			Total weight	895.4	100.00			

Operator	Joel Davenport	Weight of tear & soil	1795.5
Date	5/26/98	Weight of tear	900.0
Remarks		Weight of soil	895.5

Sieve Analysis

Weight of bags & soil	977.4
Weight of soil	960.2

Weight of empty bags	17.2
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 107	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	56.7	5.91	5.91	94.09	
	3/8 inch	9.50	2.754	179.0	18.64	24.55	75.45	
	No. 4	4.75	2.016	297.8	31.01	55.56	44.44	
	No. 8	2.37	1.474	92.4	9.62	65.18	34.82	
	No. 16	1.18	1.077	55.6	5.79	70.97	29.03	
	No. 30	0.60	0.795	51.7	5.38	76.36	23.64	
	No. 50	0.30	0.582	86.7	9.03	85.39	14.61	
	No. 100	0.15	0.426	79.3	8.26	93.65	6.35	
	No. 200	0.08	0.312	29.8	3.10	96.75	3.25	
		Pan			31.2	3.25	100.00	0.00
			Total weight	960.2	100.00			

Operator	Joel Davenport	Weight of tear & soil	1860.2
Date	5/26/98	Weight of tear	900.0
Remarks		Weight of soil	960.2

Sieve Analysis

Weight of empty bags 17.3

Weight of bags & soil	992.6
Weight of soil	975.3

Sample number	Sieve size	Sieve opening		Field data - total weight =				
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 108	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	71.6	7.34	7.34	92.66	
	3/8 inch	9.50	2.754	223.6	22.93	30.27	69.73	
	No. 4	4.75	2.016	271.6	27.85	58.12	41.88	
	No. 8	2.37	1.474	92.3	9.46	67.59	32.41	
	No. 16	1.18	1.077	49.0	5.02	72.61	27.39	
	No. 30	0.60	0.795	43.8	4.49	77.10	22.90	
	No. 50	0.30	0.582	81.8	8.39	85.49	14.51	
	No. 100	0.15	0.426	76.8	7.88	93.37	6.63	
	No. 200	0.08	0.312	30.7	3.15	96.51	3.49	
		Pan			34.0	3.49	100.00	0.00
				Total weight	975.2	100.00		

Operator	Joel Davenport	Weight of tear & soil	1875.2
Date	5/18/98	Weight of tear	900.0
Remarks		Weight of soil	975.2

Sieve Analysis

Weight of empty bags 17.1

Weight of bags & soil 953.7
 Weight of soil 936.6

Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained		
Site 1 109	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	78.3	8.36	8.36	91.64	
	3/8 inch	9.50	2.754	198.4	21.19	29.55	70.45	
	No. 4	4.75	2.016	286.5	30.59	60.14	39.86	
	No. 8	2.37	1.474	79.7	8.51	68.65	31.35	
	No. 16	1.18	1.077	48.8	5.21	73.86	26.14	
	No. 30	0.60	0.795	42.5	4.54	78.40	21.60	
	No. 50	0.30	0.582	73.5	7.85	86.25	13.75	
	No. 100	0.15	0.426	70.6	7.54	93.79	6.21	
	No. 200	0.08	0.312	27.8	2.97	96.75	3.25	
		Pan			30.4	3.25	100.00	0.00
			Total weight	936.5	100.00			

Operator	Joel Davenport	Weight of tear & soil	1836.4
Date	5/26/98	Weight of tear	899.9
Remarks		Weight of soil	936.5

Sieve Analysis

Weight of empty bags 17.2

Weight of bags & soil	1010.9
Weight of soil	993.7

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 110	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	90.0	9.06	9.06	90.94
	3/8 inch	9.50	2.754	209.3	21.06	30.12	69.88
	No. 4	4.75	2.016	263.5	26.52	56.64	43.36
	No. 8	2.37	1.474	90.4	9.10	65.73	34.27
	No. 16	1.18	1.077	55.5	5.59	71.32	28.68
	No. 30	0.60	0.795	52.2	5.25	76.57	23.43
	No. 50	0.30	0.582	88.3	8.89	85.46	14.54
	No. 100	0.15	0.426	80.1	8.06	93.52	6.48
	No. 200	0.08	0.312	31.0	3.12	96.64	3.36
	Pan			33.4	3.36	100.00	0.00
			993.7	100.00			

Operator	Joel Davenport	Weight of tear & soil	1893.7
Date	5/26/98	Weight of tear	900.0
Remarks		Weight of soil	993.7

Sieve Analysis

Weight of bags & soil	1315.5
Weight of soil	1298.4
Weight of empty bags	17.1

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
125	1/2 inch	12.50	3.116	54.6	4.21	4.21	95.79
	3/8 inch	9.50	2.754	169.1	13.02	17.23	82.77
	No. 4	4.75	2.016	373.5	28.77	46.00	54.00
	No. 8	2.37	1.474	144.9	11.16	57.16	42.84
	No. 16	1.18	1.077	93.8	7.22	64.38	35.62
	No. 30	0.60	0.795	93.3	7.19	71.57	28.43
	No. 50	0.30	0.582	151.4	11.66	83.23	16.77
	No. 100	0.15	0.426	125.7	9.68	92.91	7.09
	No. 200	0.08	0.312	45.0	3.47	96.38	3.62
	Pan			47.0	3.62	100.00	0.00
			Total weight	1298.3	100.00		

Operator	Joel Davenport	Weight of tear & soil	2198.1
Date	5/26/98	Weight of tear	899.9
Remarks		Weight of soil	1298.2

Sieve Analysis

Weight of bags & soil	1417.6
Weight of soil	1400

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =			Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	
Site 1 126	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	106.2	7.59	7.59	92.41
	3/8 inch	9.50	2.754	168.7	12.05	19.64	80.36
	No. 4	4.75	2.016	345.1	24.65	44.29	55.71
	No. 8	2.37	1.474	156.5	11.18	55.46	44.54
	No. 16	1.18	1.077	106.7	7.62	63.09	36.91
	No. 30	0.60	0.795	104.9	7.49	70.58	29.42
	No. 50	0.30	0.582	169.0	12.07	82.65	17.35
	No. 100	0.15	0.426	137.6	9.83	92.48	7.52
	No. 200	0.08	0.312	50.2	3.59	96.06	3.94
		Pan			55.1	3.94	100.00
			Total	1400.0	100.00		
			weight				

Operator	Joel Davenport	Weight of tear & soil	2299.9
Date	5/18/98	Weight of tear	900.0
Remarks		Weight of soil	1399.9

Sieve Analysis

Weight of bags & soil	1329.2
Weight of soil	1311.8

Weight of empty bags	17.4
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 127	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	115.0	8.77	8.77	91.23
	3/8 inch	9.50	2.754	154.3	11.76	20.53	79.47
	No. 4	4.75	2.016	357.8	27.28	47.80	52.20
	No. 8	2.37	1.474	141.5	10.79	58.59	41.41
	No. 16	1.18	1.077	90.7	6.91	65.51	34.49
	No. 30	0.60	0.795	90.2	6.88	72.38	27.62
	No. 50	0.30	0.582	148.9	11.35	83.73	16.27
	No. 100	0.15	0.426	122.2	9.32	93.05	6.95
	No. 200	0.08	0.312	45.3	3.45	96.50	3.50
		Pan			45.9	3.50	100.00
			Total weight	1311.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2211.8
Date	5/14/98	Weight of tear	900.1
Remarks		Weight of soil	1311.7

Sieve Analysis

Weight of bags & soil	1384
Weight of soil	1366.4

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 130	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	97.0	7.10	7.10	92.90	
	3/8 inch	9.50	2.754	147.3	10.78	17.89	82.11	
	No. 4	4.75	2.016	342.1	25.05	42.93	57.07	
	No. 8	2.37	1.474	153.1	11.21	54.14	45.86	
	No. 16	1.18	1.077	105.7	7.74	61.88	38.12	
	No. 30	0.60	0.795	106.5	7.80	69.68	30.32	
	No. 50	0.30	0.582	176.8	12.94	82.62	17.38	
	No. 100	0.15	0.426	136.6	10.00	92.62	7.38	
	No. 200	0.08	0.312	49.3	3.61	96.23	3.77	
	Pan			51.5	3.77	100.00	0.00	
				Total weight	1365.9	100.00		

Operator	Joel Davenport	Weight of tear & soil	2266.2
Date	5/14/98	Weight of tear	900.1
Remarks		Weight of soil	1366.1

Sieve Analysis

Weight of bags & soil	1354.7
Weight of soil	1337.6

Weight of empty bags	17.1
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
131	1/2 inch	12.50	3.116	50.7	3.79	3.79	96.21	
	3/8 inch	9.50	2.754	168.8	12.62	16.41	83.59	
	No. 4	4.75	2.016	309.5	23.14	39.55	60.45	
	No. 8	2.37	1.474	158.0	11.81	51.36	48.64	
	No. 16	1.18	1.077	113.6	8.49	59.86	40.14	
	No. 30	0.60	0.795	115.0	8.60	68.46	31.54	
	No. 50	0.30	0.582	179.3	13.41	81.86	18.14	
	No. 100	0.15	0.426	143.3	10.71	92.58	7.42	
	No. 200	0.08	0.312	48.9	3.66	96.23	3.77	
	Pan			50.4	3.77	100.00	0.00	
			Total weight	1337.5	100.00			

Operator	Joel Davenport	Weight of tear & soil	2237.4
Date	5/28/98	Weight of tear	900.0
Remarks		Weight of soil	1337.4

Sieve Analysis

Weight of empty bags 17.1

Weight of bags & soil 1359.4
Weight of soil 1342.3

Sample number	Sieve size	Sieve opening		Field data - total weight =			Percent passing	
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained		
Site 1 132	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	62.9	4.69	4.69	95.31	
	3/8 inch	9.50	2.754	175.4	13.07	17.76	82.24	
	No. 4	4.75	2.016	333.0	24.82	42.57	57.43	
	No. 8	2.37	1.474	155.3	11.57	54.15	45.85	
	No. 16	1.18	1.077	103.5	7.71	61.86	38.14	
	No. 30	0.60	0.795	103.7	7.73	69.59	30.41	
	No. 50	0.30	0.582	169.0	12.59	82.18	17.82	
	No. 100	0.15	0.426	138.9	10.35	92.53	7.47	
	No. 200	0.08	0.312	49.2	3.67	96.20	3.80	
		Pan			51.0	3.80	100.00	0.00
				Total weight	1341.9	100.00		

Operator	Joel Davenport	Weight of tear & soil	2241.7
Date	5/18/98	Weight of tear	899.9
Remarks		Weight of soil	1341.8

Sieve Analysis

Weight of bags & soil	1325
Weight of soil	1307.8

Weight of empty bags	17.2
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 410	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	28.6	2.19	2.19	97.81
	3/8 inch	9.50	2.754	101.4	7.75	9.94	90.06
	No. 4	4.75	2.016	307.7	23.53	33.47	66.53
	No. 8	2.37	1.474	176.5	13.50	46.96	53.04
	No. 16	1.18	1.077	125.0	9.56	56.52	43.48
	No. 30	0.60	0.795	122.0	9.33	65.85	34.15
	No. 50	0.30	0.582	193.5	14.80	80.65	19.35
	No. 100	0.15	0.426	151.0	11.55	92.19	7.81
	No. 200	0.08	0.312	51.2	3.91	96.11	3.89
		Pan			50.9	3.89	100.00
			Total weight	1307.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2207.8
Date	5/28/98	Weight of tear	900.0
Remarks		Weight of soil	1307.8

Sieve Analysis

Weight of bags & soil	1295.6
Weight of soil	1277.9

Weight of empty bags	17.7
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 411	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	21.9	1.72	1.72	98.28
	3/8 inch	9.50	2.754	118.8	9.30	11.02	88.98
	No. 4	4.75	2.016	289.8	22.70	33.71	66.29
	No. 8	2.37	1.474	177.1	13.87	47.58	52.42
	No. 16	1.18	1.077	118.3	9.26	56.85	43.15
	No. 30	0.60	0.795	118.2	9.26	66.11	33.89
	No. 50	0.30	0.582	189.8	14.86	80.97	19.03
	No. 100	0.15	0.426	143.2	11.21	92.18	7.82
	No. 200	0.08	0.312	50.6	3.96	96.15	3.85
		Pan			49.2	3.85	100.00
			Total weight	1276.9	100.00		

Operator	Joel Davenport	Weight of tear & soil	2177.1
Date	5/14/98	Weight of tear	900.1
Remarks		Weight of soil	1277.0

Sieve Analysis

Weight of bags & soil	1465.4
Weight of soil	1446.8

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 412	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	32.8	2.27	2.27	97.73	
	3/8 inch	9.50	2.754	95.7	6.62	8.88	91.12	
	No. 4	4.75	2.016	343.7	23.76	32.64	67.36	
	No. 8	2.37	1.474	202.2	13.98	46.62	53.38	
	No. 16	1.18	1.077	138.7	9.59	56.20	43.80	
	No. 30	0.60	0.795	140.9	9.74	65.94	34.06	
	No. 50	0.30	0.582	223.1	15.42	81.36	18.64	
	No. 100	0.15	0.426	160.1	11.07	92.43	7.57	
	No. 200	0.08	0.312	56.9	3.93	96.36	3.64	
		Pan			52.6	3.64	100.00	0.00
				Total weight	1446.7	100.00		

Operator	Joel Davenport	Weight of tear & soil	2346.9
Date	5/14/98	Weight of tear	900.1
Remarks		Weight of soil	1446.8

Sieve Analysis

Weight of bags & soil	1412.8
Weight of soil	1395.2

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =			Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	
Site 1 414	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	29.0	2.08	2.08	97.92
	3/8 inch	9.50	2.754	112.7	8.08	10.16	89.84
	No. 4	4.75	2.016	300.4	21.54	31.70	68.30
	No. 8	2.37	1.474	186.1	13.34	45.04	54.96
	No. 16	1.18	1.077	136.7	9.80	54.84	45.16
	No. 30	0.60	0.795	136.6	9.79	64.63	35.37
	No. 50	0.30	0.582	212.3	15.22	79.85	20.15
	No. 100	0.15	0.426	166.6	11.94	91.80	8.20
	No. 200	0.08	0.312	55.1	3.95	95.75	4.25
		Pan			59.3	4.25	100.00
			Total weight	1394.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2294.8
Date	5/18/98	Weight of tear	900.0
Remarks		Weight of soil	1394.8

Sieve Analysis

Weight of bags & soil	1373
Weight of soil	1355.9

Weight of empty bags	17.1
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 415	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	35.8	2.64	2.64	97.36
	3/8 inch	9.50	2.754	119.2	8.79	11.43	88.57
	No. 4	4.75	2.016	309.7	22.84	34.27	65.73
	No. 8	2.37	1.474	171.0	12.61	46.88	53.12
	No. 16	1.18	1.077	126.5	9.33	56.21	43.79
	No. 30	0.60	0.795	128.0	9.44	65.65	34.35
	No. 50	0.30	0.582	195.4	14.41	80.06	19.94
	No. 100	0.15	0.426	157.0	11.58	91.64	8.36
	No. 200	0.08	0.312	54.3	4.00	95.64	4.36
		Pan			59.1	4.36	100.00
			Total weight	1356.0	100.00		

Operator	Joel Davenport	Weight of tear & soil	2255.6
Date	5/20/98	Weight of tear	899.8
Remarks		Weight of soil	1355.8

Sieve Analysis

Weight of empty bags 17.1

Weight of bags & soil 1378
Weight of soil 1360.9

Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 416	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	26.7	1.96	1.96	98.04	
	3/8 inch	9.50	2.754	118.5	8.71	10.67	89.33	
	No. 4	4.75	2.016	279.5	20.54	31.21	68.79	
	No. 8	2.37	1.474	185.0	13.59	44.80	55.20	
	No. 16	1.18	1.077	133.9	9.84	54.64	45.36	
	No. 30	0.60	0.795	136.8	10.05	64.69	35.31	
	No. 50	0.30	0.582	207.0	15.21	79.90	20.10	
	No. 100	0.15	0.426	162.1	11.91	91.81	8.19	
	No. 200	0.08	0.312	54.7	4.02	95.83	4.17	
		Pan			56.7	4.17	100.00	0.00
			Total weight	1360.9	100.00			

Operator	Joel Davenport	Weight of tear & soil	2260.8
Date	5/28/98	Weight of tear	899.9
Remarks		Weight of soil	1360.9

Sieve Analysis

Weight of bags & soil 1561.5
 Weight of soil 1543.7

Weight of empty bags 17.8

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 432	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	33.5	2.17	2.17	97.83
	3/8 inch	9.50	2.754	144.0	9.33	11.51	88.49
	No. 4	4.75	2.016	337.2	21.86	33.36	66.64
	No. 8	2.37	1.474	199.6	12.94	46.30	53.70
	No. 16	1.18	1.077	147.4	9.55	55.85	44.15
	No. 30	0.60	0.795	149.1	9.66	65.52	34.48
	No. 50	0.30	0.582	232.4	15.06	80.58	19.42
	No. 100	0.15	0.426	175.6	11.38	91.96	8.04
	No. 200	0.08	0.312	61.3	3.97	95.94	4.06
		Pan			62.7	4.06	100.00
			Total weight	1542.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2442.8
Date	5/14/98	Weight of tear	900.1
Remarks		Weight of soil	1542.7

Sieve Analysis

Weight of empty bags 17.1

Weight of bags & soil 1509.7
Weight of soil 1492.6

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 433	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	50.8	3.40	3.40	96.60
	3/8 inch	9.50	2.754	148.3	9.94	13.34	86.66
	No. 4	4.75	2.016	330.2	22.12	35.46	64.54
	No. 8	2.37	1.474	180.7	12.11	47.57	52.43
	No. 16	1.18	1.077	137.8	9.23	56.80	43.20
	No. 30	0.60	0.795	139.0	9.31	66.11	33.89
	No. 50	0.30	0.582	214.2	14.35	80.46	19.54
	No. 100	0.15	0.426	169.6	11.36	91.83	8.17
	No. 200	0.08	0.312	58.4	3.91	95.74	4.26
		Pan			63.6	4.26	100.00
			Total weight	1492.6	100.00		

Operator	Joel Davenport	Weight of tear & soil	2392.5
Date	5/20/98	Weight of tear	899.9
Remarks		Weight of soil	1492.6

Sieve Analysis

Weight of bags & soil	1499.1
Weight of soil	1482
Weight of empty bags	17.1

Sample number	Sieve size	Sieve opening		Field data - total weight =				
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 1 434	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	24.5	1.65	1.65	98.35	
	3/8 inch	9.50	2.754	139.4	9.41	11.06	88.94	
	No. 4	4.75	2.016	346.5	23.38	34.44	65.56	
	No. 8	2.37	1.474	191.6	12.93	47.37	52.63	
	No. 16	1.18	1.077	142.4	9.61	56.98	43.02	
	No. 30	0.60	0.795	133.3	9.00	65.98	34.02	
	No. 50	0.30	0.582	214.7	14.49	80.47	19.53	
	No. 100	0.15	0.426	167.9	11.33	91.80	8.20	
	No. 200	0.08	0.312	58.8	3.97	95.77	4.23	
		Pan			62.7	4.23	100.00	0.00
				Total weight	1481.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2381.8
Date	5/18/98	Weight of tear	900.0
Remarks		Weight of soil	1481.8

Sieve Analysis

Weight of empty bags 17.1

Weight of bags & soil 1015.9
 Weight of soil 998.8

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 611	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	82.7	8.28	8.28	91.72
	3/8 inch	9.50	2.754	216.8	21.71	29.99	70.01
	No. 4	4.75	2.016	291.6	29.20	59.20	40.80
	No. 8	2.37	1.474	94.9	9.50	68.70	31.30
	No. 16	1.18	1.077	51.1	5.12	73.82	26.18
	No. 30	0.60	0.795	42.8	4.29	78.11	21.89
	No. 50	0.30	0.582	80.3	8.04	86.15	13.85
	No. 100	0.15	0.426	75.5	7.56	93.71	6.29
	No. 200	0.08	0.312	29.3	2.93	96.64	3.36
		Pan			33.5	3.36	100.00
			Total weight	998.5	100.00		

Operator	Joel Davenport	Weight of tear & soil	1898.5
Date	5/18/98	Weight of tear	900.1
Remarks		Weight of soil	998.4

Sieve Analysis

Weight of empty bags 16.9

Weight of bags & soil 965.3
 Weight of soil 948.4

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site I 613	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	62.3	6.57	6.57	93.43
	3/8 inch	9.50	2.754	188.5	19.88	26.45	73.55
	No. 4	4.75	2.016	296.9	31.31	57.76	42.24
	No. 8	2.37	1.474	90.3	9.52	67.28	32.72
	No. 16	1.18	1.077	49.7	5.24	72.52	27.48
	No. 30	0.60	0.795	46.1	4.86	77.38	22.62
	No. 50	0.30	0.582	80.5	8.49	85.87	14.13
	No. 100	0.15	0.426	75.0	7.91	93.78	6.22
	No. 200	0.08	0.312	28.5	3.01	96.78	3.22
		Pan			30.5	3.22	100.00
			Total weight	948.3	100.00		

Operator	Joel Davenport	Weight of tear & soil	1848.2
Date	5/28/98	Weight of tear	899.9
Remarks		Weight of soil	948.3

Sieve Analysis

Weight of empty bags 17.2

Weight of bags & soil	1176
Weight of soil	1158.8

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 632	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	119.4	10.30	10.30	89.70
	3/8 inch	9.50	2.754	262.7	22.67	32.97	67.03
	No. 4	4.75	2.016	335.6	28.96	61.93	38.07
	No. 8	2.37	1.474	94.0	8.11	70.05	29.95
	No. 16	1.18	1.077	49.7	4.29	74.34	25.66
	No. 30	0.60	0.795	48.2	4.16	78.49	21.51
	No. 50	0.30	0.582	88.3	7.62	86.11	13.89
	No. 100	0.15	0.426	87.5	7.55	93.67	6.33
	No. 200	0.08	0.312	34.1	2.94	96.61	3.39
	Pan			39.3	3.39	100.00	0.00
				Total weight	1158.8	100.00	

Operator	Joel Davenport	Weight of tear & soil	2058.7
Date	5/20/98	Weight of tear	899.9
Remarks	Weight of soil 1158.8		

Sieve Analysis

Weight of bags & soil	1163.9
Weight of soil	1146.8

Weight of empty bags	17.1
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 633	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	100.2	8.74	8.74	91.26
	3/8 inch	9.50	2.754	257.4	22.45	31.18	68.82
	No. 4	4.75	2.016	310.4	27.07	58.25	41.75
	No. 8	2.37	1.474	100.0	8.72	66.97	33.03
	No. 16	1.18	1.077	55.0	4.80	71.76	28.24
	No. 30	0.60	0.795	57.8	5.04	76.81	23.19
	No. 50	0.30	0.582	98.3	8.57	85.38	14.62
	No. 100	0.15	0.426	94.2	8.21	93.59	6.41
	No. 200	0.08	0.312	35.9	3.13	96.72	3.28
		Pan			37.6	3.28	100.00
			Total weight	1146.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2046.7
Date	5/18/98	Weight of tear	900.0
Remarks		Weight of soil	1146.7

Sieve Analysis

Weight of empty bags 17.5

Weight of bags & soil	1289
Weight of soil	1271.5

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 634	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	94.4	7.42	7.42	92.58
	3/8 inch	9.50	2.754	249.5	19.62	27.05	72.95
	No. 4	4.75	2.016	373.2	29.35	56.40	43.60
	No. 8	2.37	1.474	114.6	9.01	65.41	34.59
	No. 16	1.18	1.077	65.2	5.13	70.54	29.46
	No. 30	0.60	0.795	70.3	5.53	76.07	23.93
	No. 50	0.30	0.582	117.8	9.26	85.33	14.67
	No. 100	0.15	0.426	105.9	8.33	93.66	6.34
	No. 200	0.08	0.312	39.3	3.09	96.75	3.25
		Pan		41.3	3.25	100.00	0.00
	Total		1271.5	100.00			

Operator	Joel Davenport	Weight of tear & soil	2171.5
Date	5/28/98	Weight of tear	900.0
Remarks		Weight of soil	1271.5

Sieve Analysis

Weight of bags & soil	1261.7
Weight of soil	1244.6

Weight of empty bags	17.1
----------------------	------

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 635	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	148.3	11.92	11.92	88.08
	3/8 inch	9.50	2.754	257.3	20.67	32.59	67.41
	No. 4	4.75	2.016	341.4	27.43	60.02	39.98
	No. 8	2.37	1.474	103.1	8.28	68.30	31.70
	No. 16	1.18	1.077	58.0	4.66	72.96	27.04
	No. 30	0.60	0.795	57.8	4.64	77.61	22.39
	No. 50	0.30	0.582	104.5	8.40	86.00	14.00
	No. 100	0.15	0.426	98.2	7.89	93.89	6.11
	No. 200	0.08	0.312	38.0	3.05	96.95	3.05
		Pan			38.0	3.05	100.00
			Total weight	1244.6	100.00		

Operator	Joel Davenport	Weight of tear & soil	2144.6
Date	5/28/98	Weight of tear	900.0
Remarks		Weight of soil	1244.6

Sieve Analysis

Weight of empty bags	17.1
----------------------	------

Weight of bags & soil	1183.8
Weight of soil	1166.7

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 1 636	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	88.6	7.60	7.60	92.40
	3/8 inch	9.50	2.754	259.8	22.27	29.87	70.13
	No. 4	4.75	2.016	350.1	30.01	59.88	40.12
	No. 8	2.37	1.474	99.8	8.56	68.44	31.56
	No. 16	1.18	1.077	53.4	4.58	73.01	26.99
	No. 30	0.60	0.795	54.2	4.65	77.66	22.34
	No. 50	0.30	0.582	97.2	8.33	85.99	14.01
	No. 100	0.15	0.426	88.9	7.62	93.61	6.39
	No. 200	0.08	0.312	34.7	2.97	96.59	3.41
		Pan			39.8	3.41	100.00
			Total weight	1166.5	100.00		

Operator	Joel Davenport	Weight of tear & soil	2066.6
Date	5/18/98	Weight of tear	900.1
Remarks	Weight of soil 1166.5		

Site 2

Segregation Survey

Date of Survey: Dec. 3, 1997

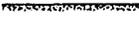
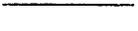
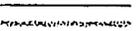
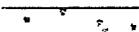
Weather:

Surveyor: _____ (your name)
 Control Section Number: _____ Route: B 94 Direction: West
 Region: Utah Mile Post: from West of Ellery Intersectio
 Section Number: 1 Test Site Number: 2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous   
Systematic   
Random   

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

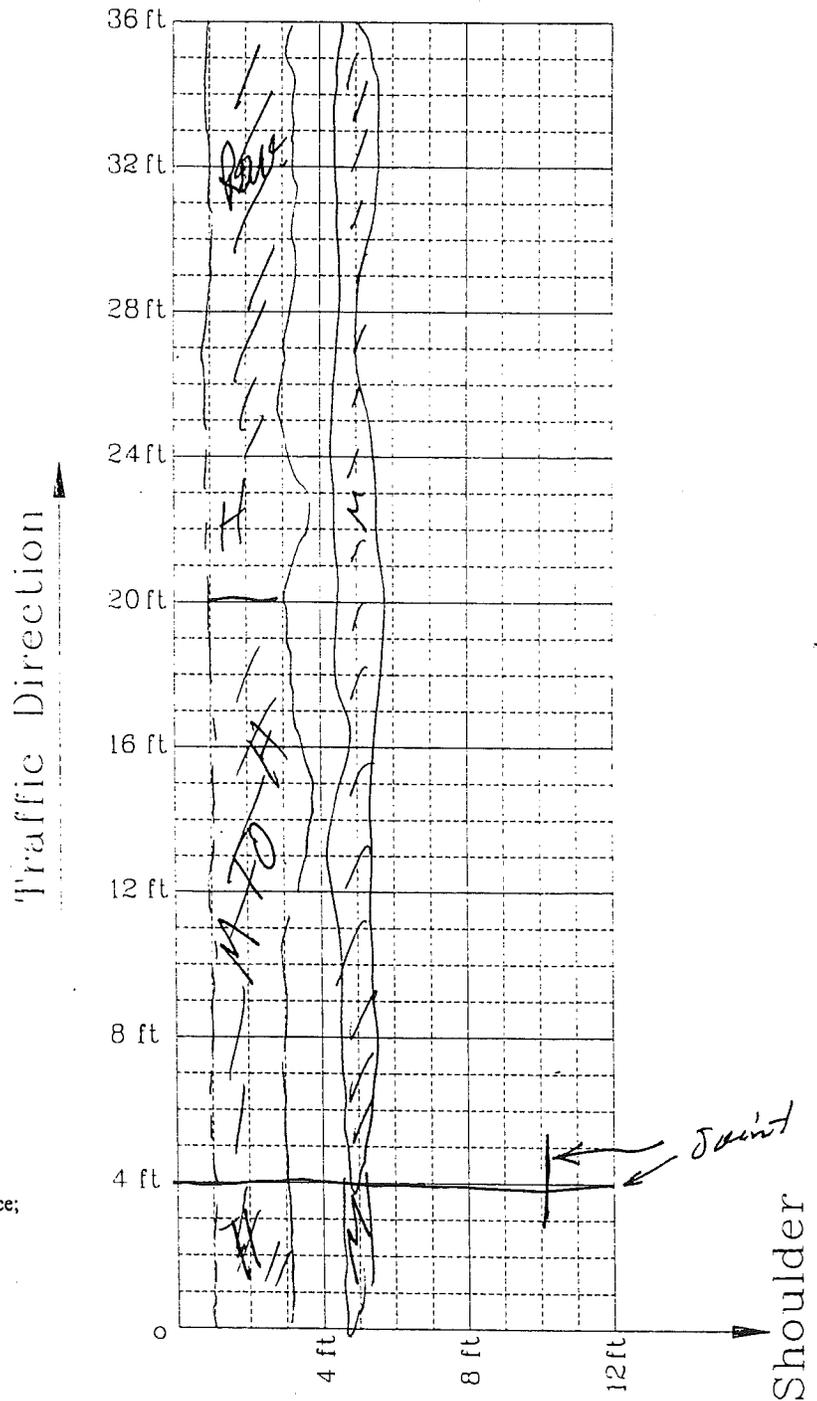
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Temp. 36°F

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather: 36°

Surveyor: _____ (your name)

Control Section Number: _____ Route: BL 94 Direction: WEST

Region: UNIVERSITY Mile Post: from _____ to _____

Section Number: _____ Test Site Number: 2 ADT: _____

W of ELLERY AVE
Segregation Map

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

<u>Continuous</u>			
<u>Systematic</u>			
<u>Random</u>			

Degree of Segregation

- Heavy: stone against stone, little or no matrix (fine)
- Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
- Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

- Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

- Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

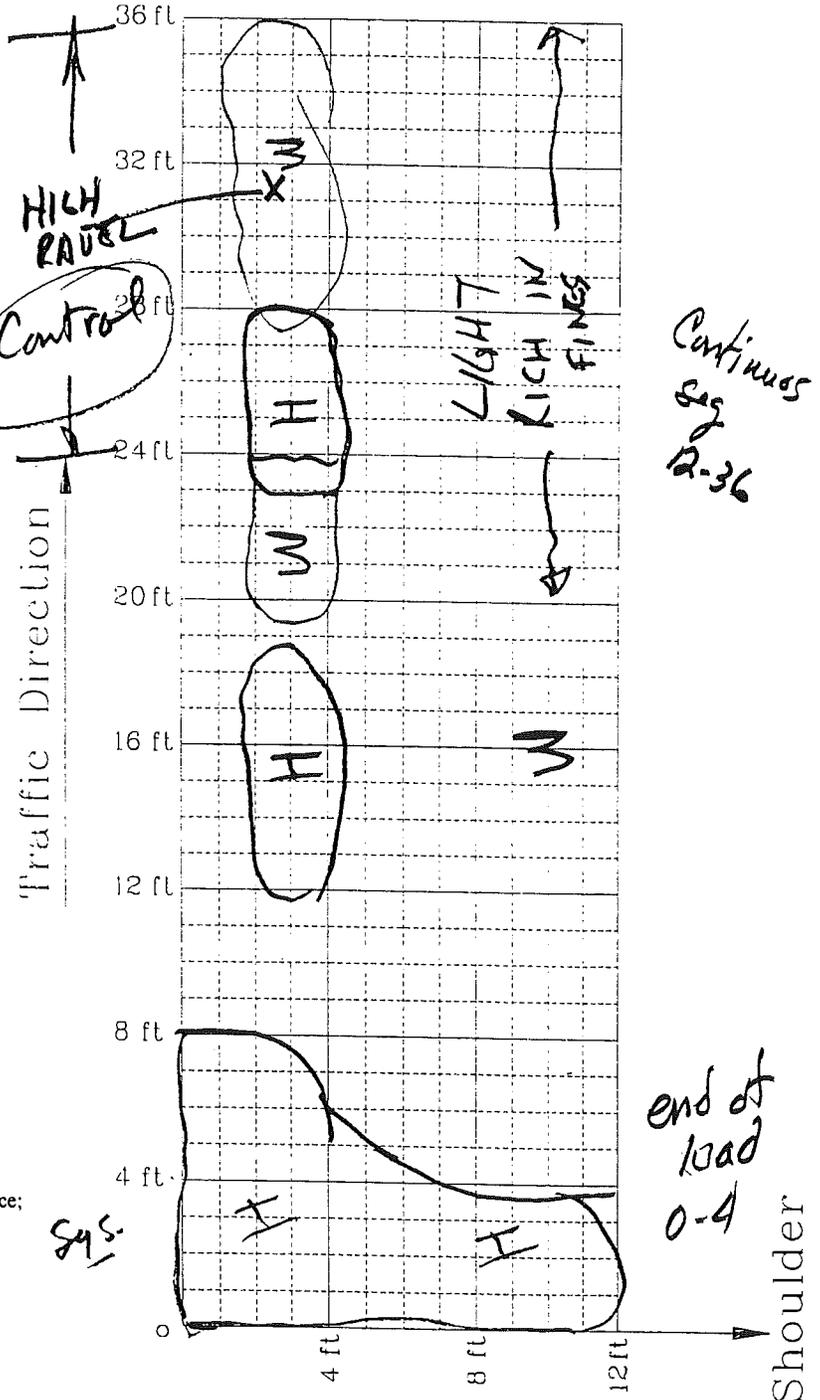
- Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

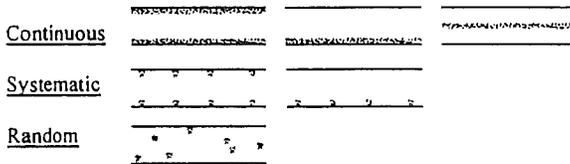
Weather:

Surveyor: _____ (your name)
 Control Section Number: 138 Route: BL-94 Direction: West
 Region: Univ. Mile Post: from E. Mch to Elroy
 Section Number: 1 Test Site Number: 2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

- Heavy:** stone against stone, little or no matrix (fine)
- Medium:** lack of surrounding matrix (fine), significantly more stone than surrounding mat
- Light:** matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

- Low Moderate High
- Low:** aggregate or binder has started to wear away, but not progressed significantly
- Moderate:** aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
- High:** aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

- Low Moderate High
- Low:** a crack with a mean width ≤ 0.25 in.
- Moderate:** a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
- High:** any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

None

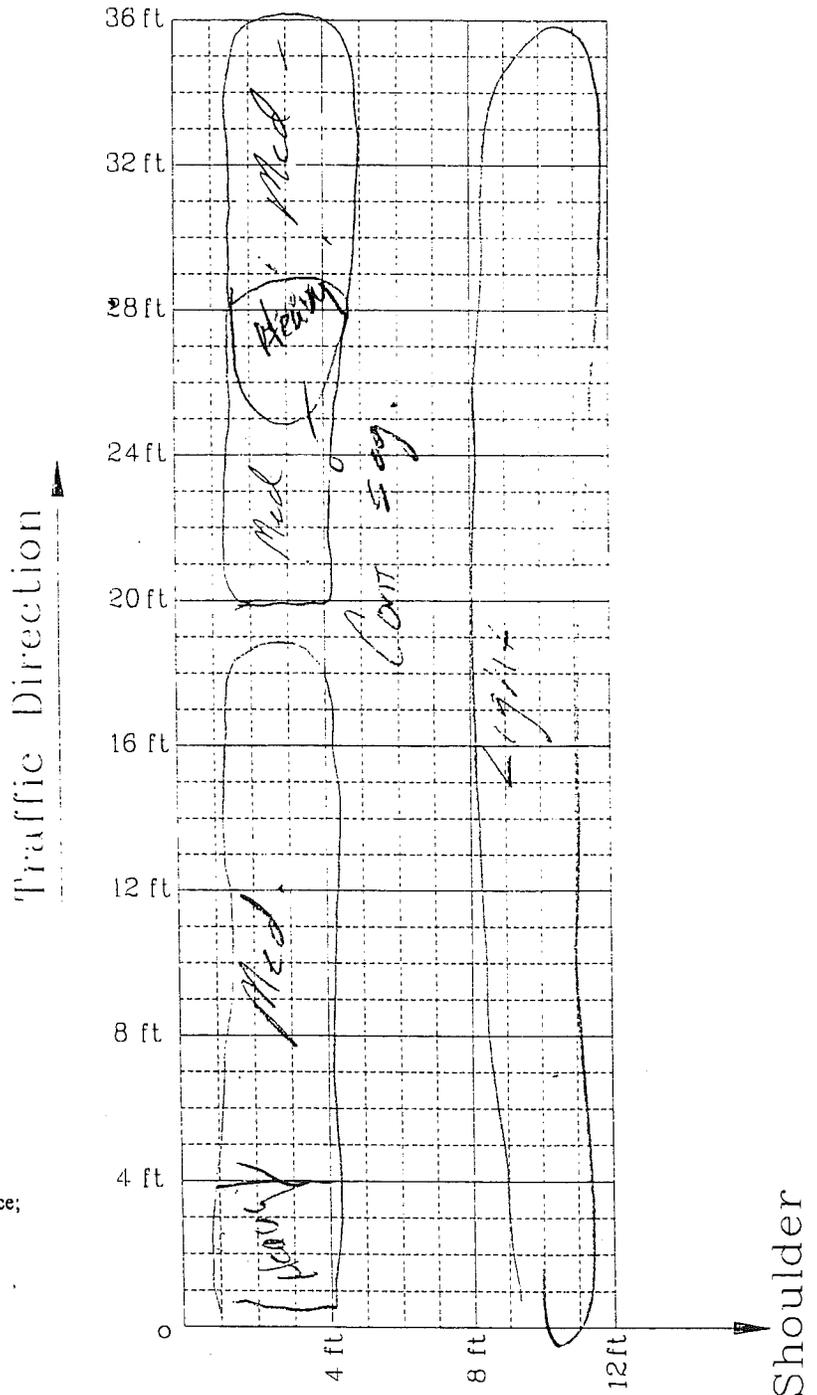
4. Flushing

- Low Moderate High
- Low:** an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
- Moderate:** an area of pavement surface that is losing surface texture due to excess asphalt
- High:** excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

High potential for IFAE being

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

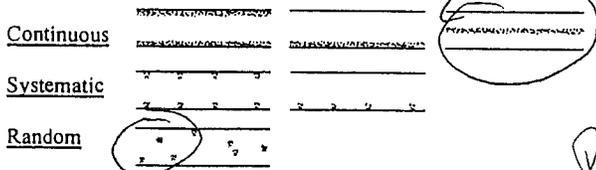
Weather:

Surveyor: L (your name)
 Control Section Number: _____ Route: B4 94 Direction: West
 Region: University Mile Post: from ELLeRY Rd to _____
 Section Number: 1 Test Site Number: 2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

- Heavy:** stone against stone, little or no matrix (fine)
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- Light:** matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

- Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

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2. Cracking

- Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

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High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

- Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

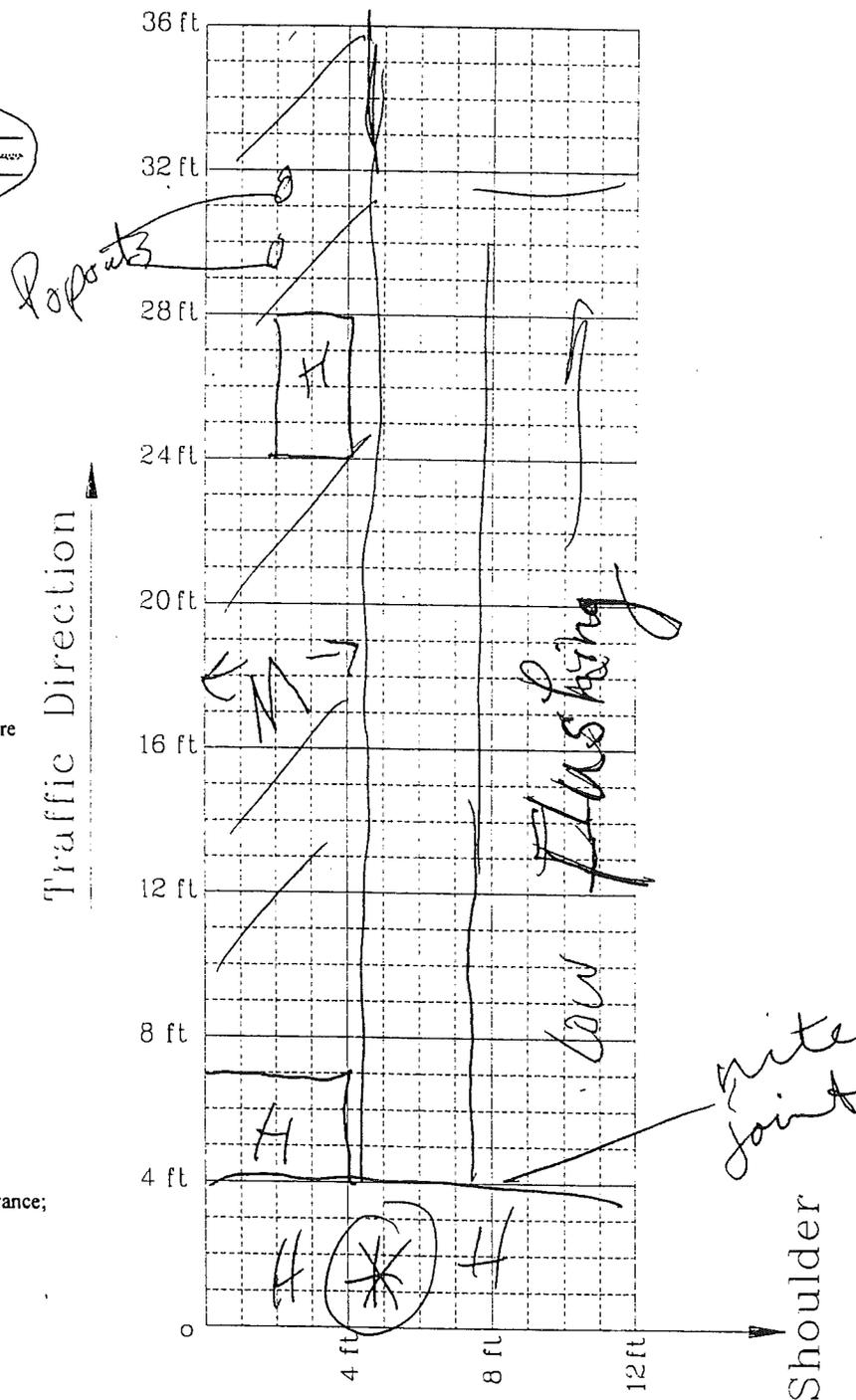
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

*end of load **

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

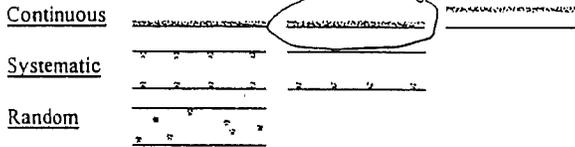
Weather: cloudy 30°

Surveyor: _____ (your name)
 Control Section Number: 1 Route: BL-94 Direction: Westbd.
 Region: University Mile Post: from Elbery Rd to _____
 Section Number: 1 Test Site Number: 2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

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Distress to be Identified

1. Raveling

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Low Moderate High
Low: a crack with a mean width ≤ 0.25 in.
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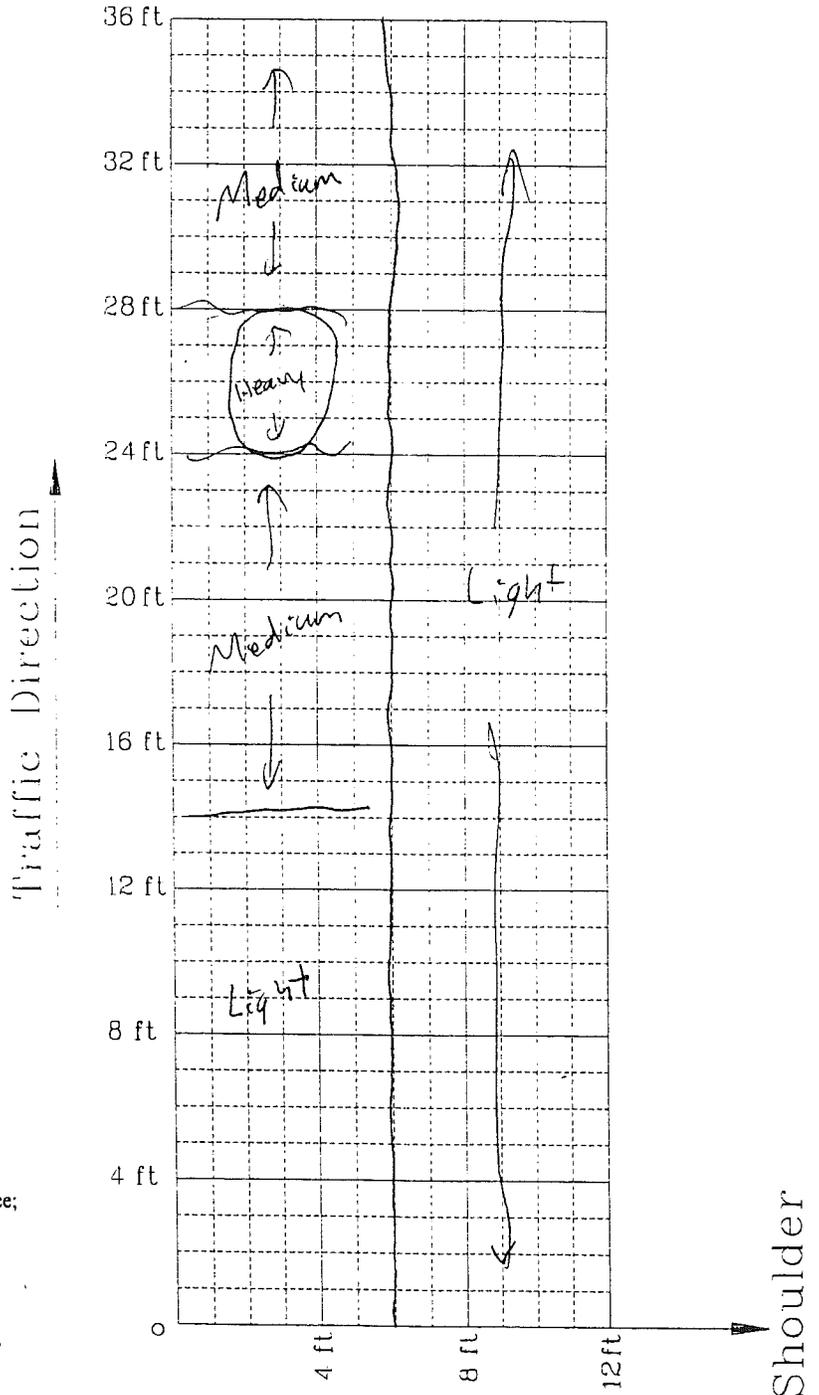
3. Rut Depth

4. Flushing

Low Moderate High
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name) *ELC*
 Control Section Number: _____ Route: *94* Direction: *WEST*
 Region: *UNIVERSITY* Mile Post: from _____ to _____
 Section Number: *1* Test Site Number: *2* ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
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Distress to be Identified

1. Raveling

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Low Moderate High
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High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

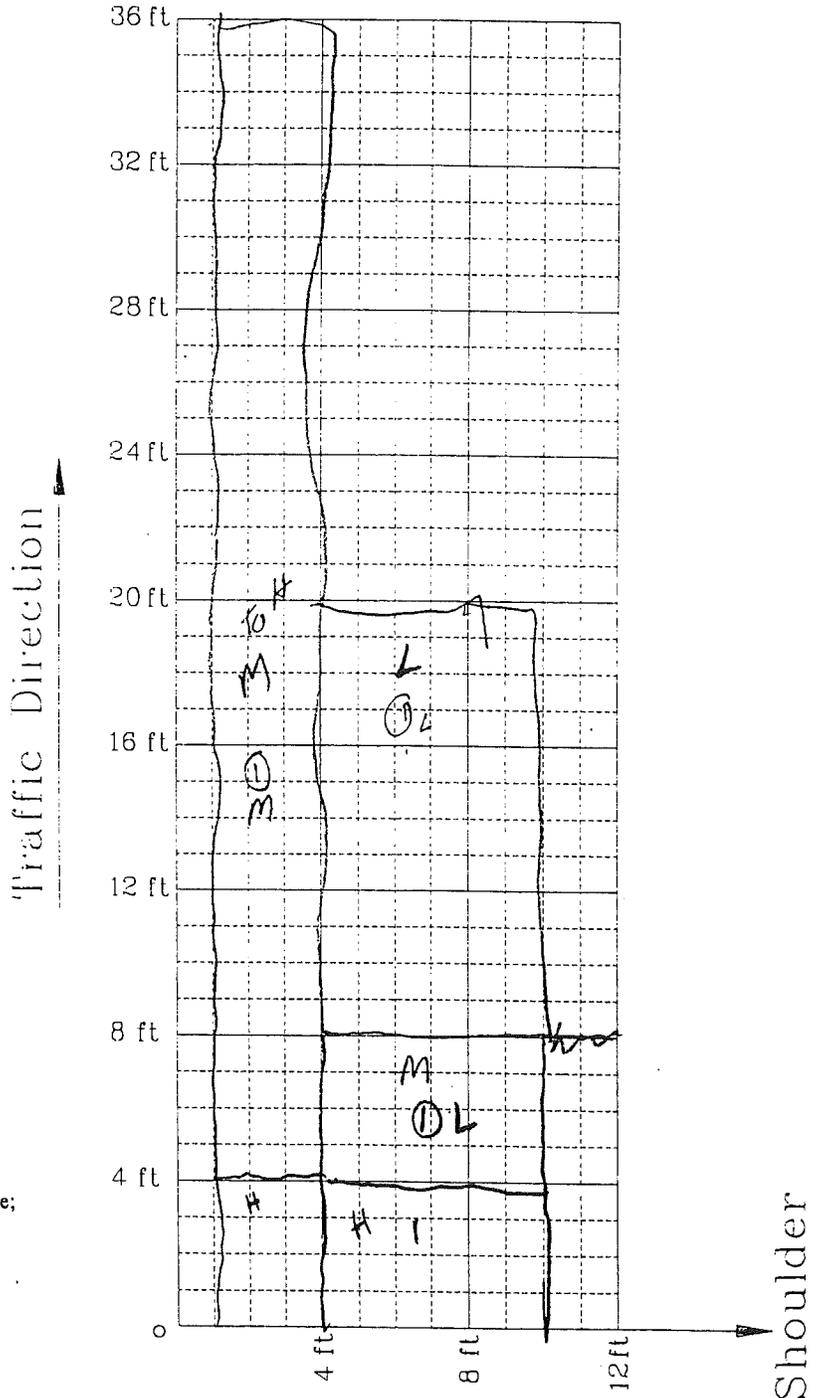
3. Rut Depth

4. Flushing

Low Moderate High
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

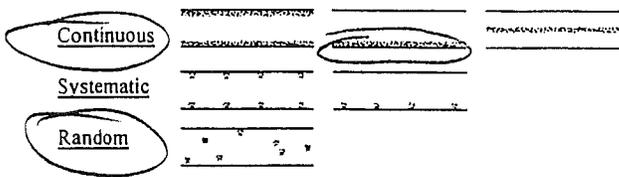
Weather: *60° overcast*

Surveyor: _____ (your name)
 Control Section Number: _____ Route: B 94 Direction: West
 Region: University 8 Mile Post: from Elley, West to _____
 Section Number: 1 ~~2~~ Test Site Number: 2 ADT: _____
 Comm

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

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High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

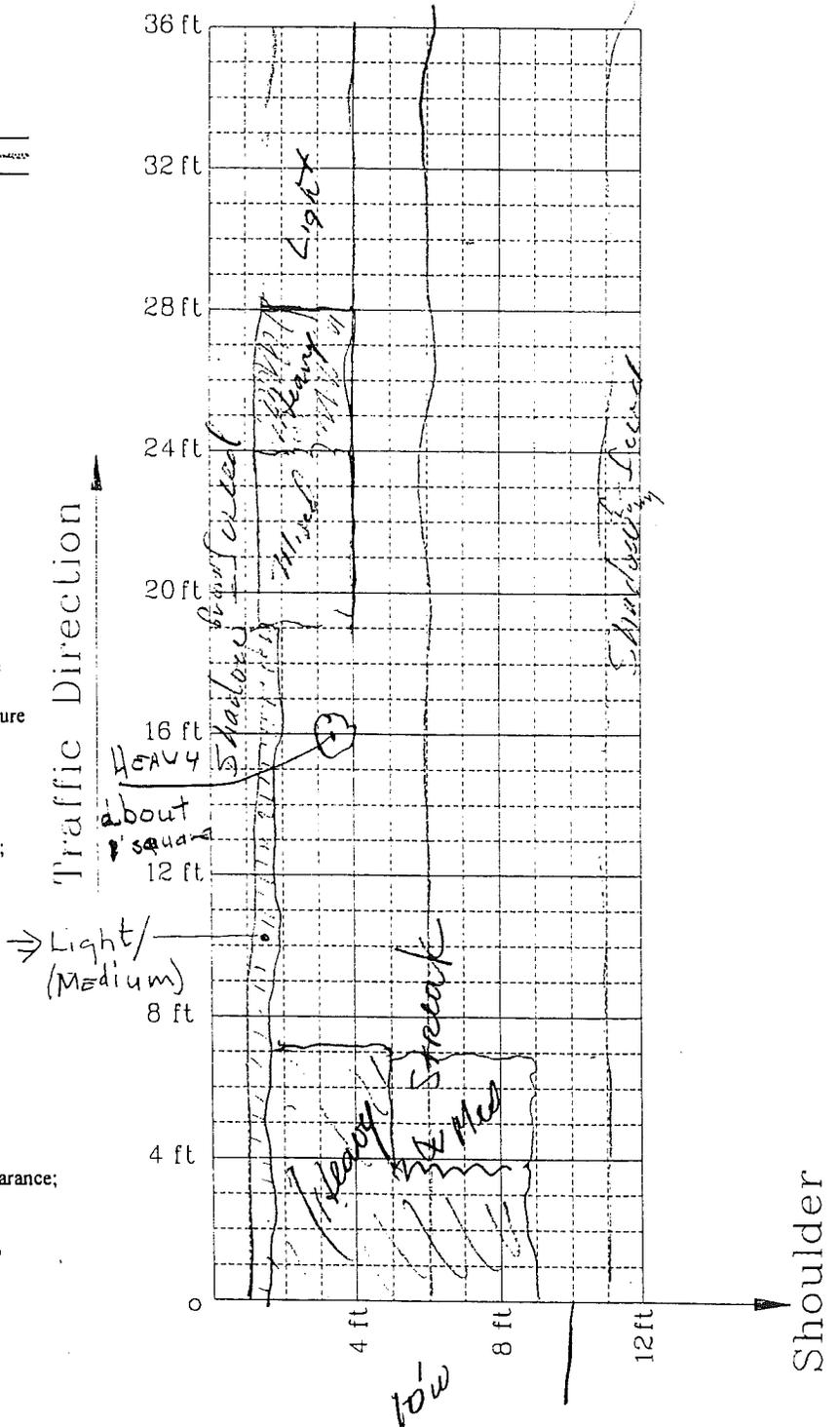
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS *W. 11 ravel over winter*

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997
 Weather: cloudy mid 30's

Surveyor: _____ (your name)
 Control Section Number: 38 Route: I-94 BL Direction: WB
 Region: UNIVERSITY Mile Post: from Ellery to _____
 Section Number: _____ Test Site Number: #2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
 Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
 Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

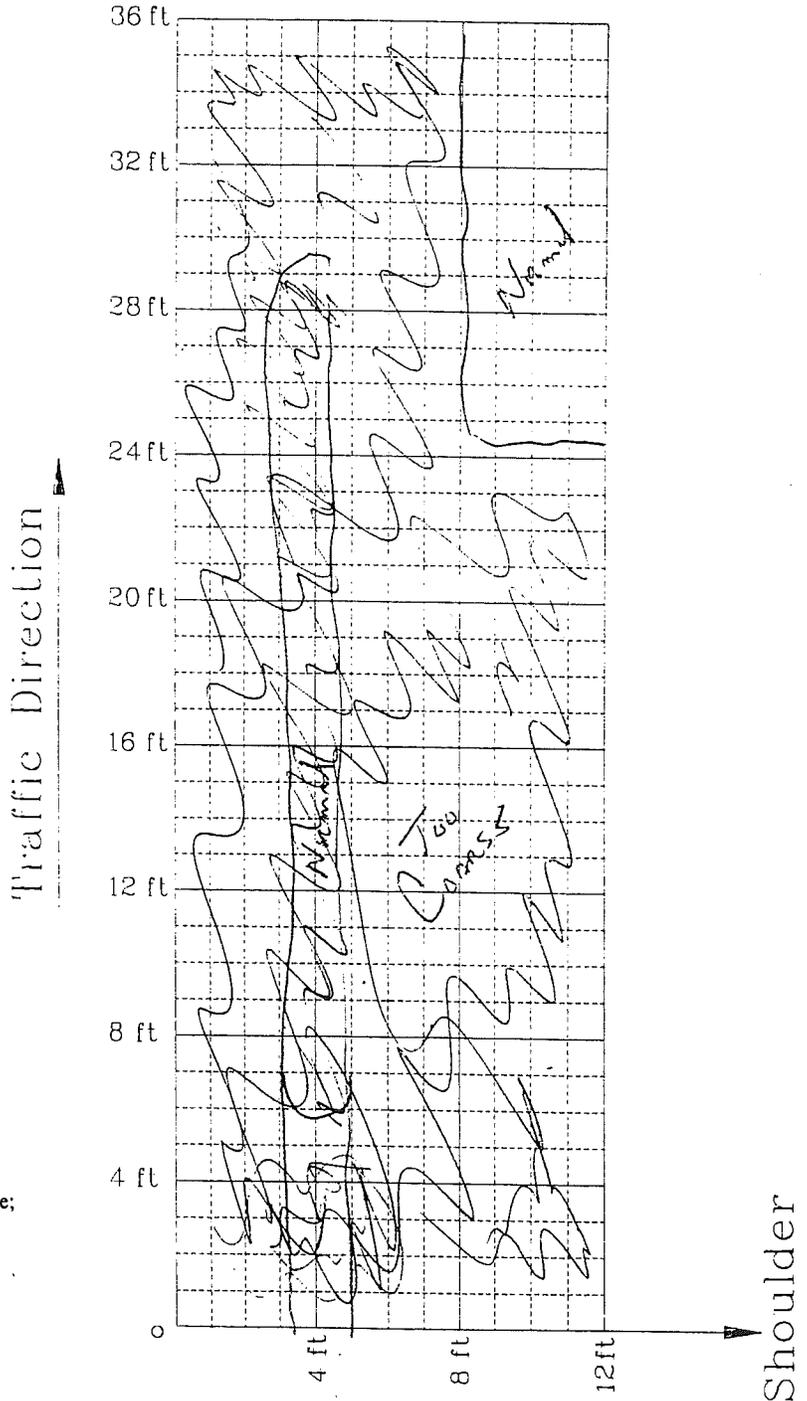
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

MIX APPEARS TOO COARSE
 SCREED TEARING SURFACE

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Nuclear Density Sampling Data (Jan. 16, 1998)

SITE 2

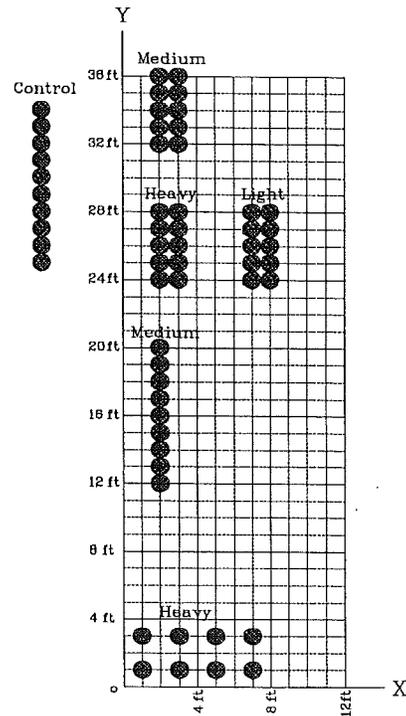
Michigan Ave. W.Bound (in front of Foote Hospital), Jackso

Chart Standard	Density	2853
	Moisture	660
Operating Standard	Density	2850
	Moisture	670

Gauge No.	99398
Model	Troxler 3440
Inspector	Joe Badgley

Control		Sample 1		Sample 2		Sample 3	
Outside		Medium		Heavy		Light (Fine)	
Control 1	136.2	0236	136.5	0228	137.5	0728	146.3
Control 2	139.5	0235	136.8	0227	137.6	0727	146.5
Control 3	139.4	0234	131.7	0226	137.4	0726	146.7
Control 4	134.8	0233	135.0	0225	138.6	0725	146.1
Control 5	136.8	0232	135.8	0224	137.4	0724	147.0
Control 6	136.8	0336	137.5	0328	140.0	0828	145.4
Control 7	139.0	0335	137.7	0327	140.7	0827	147.1
Control 8	138.5	0334	140.3	0326	138.2	0826	144.2
Control 9	141.4	0333	133.3 (14	0325	139.2	0825	146.8
Control 10	140.3	0332	141.4	0324	138.3	0824	146.5
mean	138.3	mean	137.0	mean	138.5	mean	146.3
std.	2.05	std.	2.85	std.	1.15	std.	0.87

Sample 4		Sample 5	
Medium		Heavy	
0220	139.8	0103	136.3
0219	138.7	0303	135.9
0218	137.8	0503	145.5
0217	133.8	0703	138.7
0216	132.7	0101	134.6
0215	132.4	0301	139.3
0214	135.9	0501	142.9
0213	134.7	0701	143.1
0212	137.5	mean	139.5
mean	135.9	std.	3.94
std.	2.68		



Site 3

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)

Control Section Number: _____ Route: BL 94 Direction: East

Region: Unit Mile Post: from East of Ellington ~~to~~ ADT: Av. Intersected

Section Number: 1 Test Site Number: 3

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

- Continuous
- Systematic
- Random

Degree of Segregation

- Heavy: stone against stone, little or no matrix (fine)
- Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
- Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

- Low Moderate High
- Low: aggregate or binder has started to wear away, but not progressed significantly
- Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
- High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

- Low Moderate High
- Low: a crack with a mean width ≤ 0.25 in.
- Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
- High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

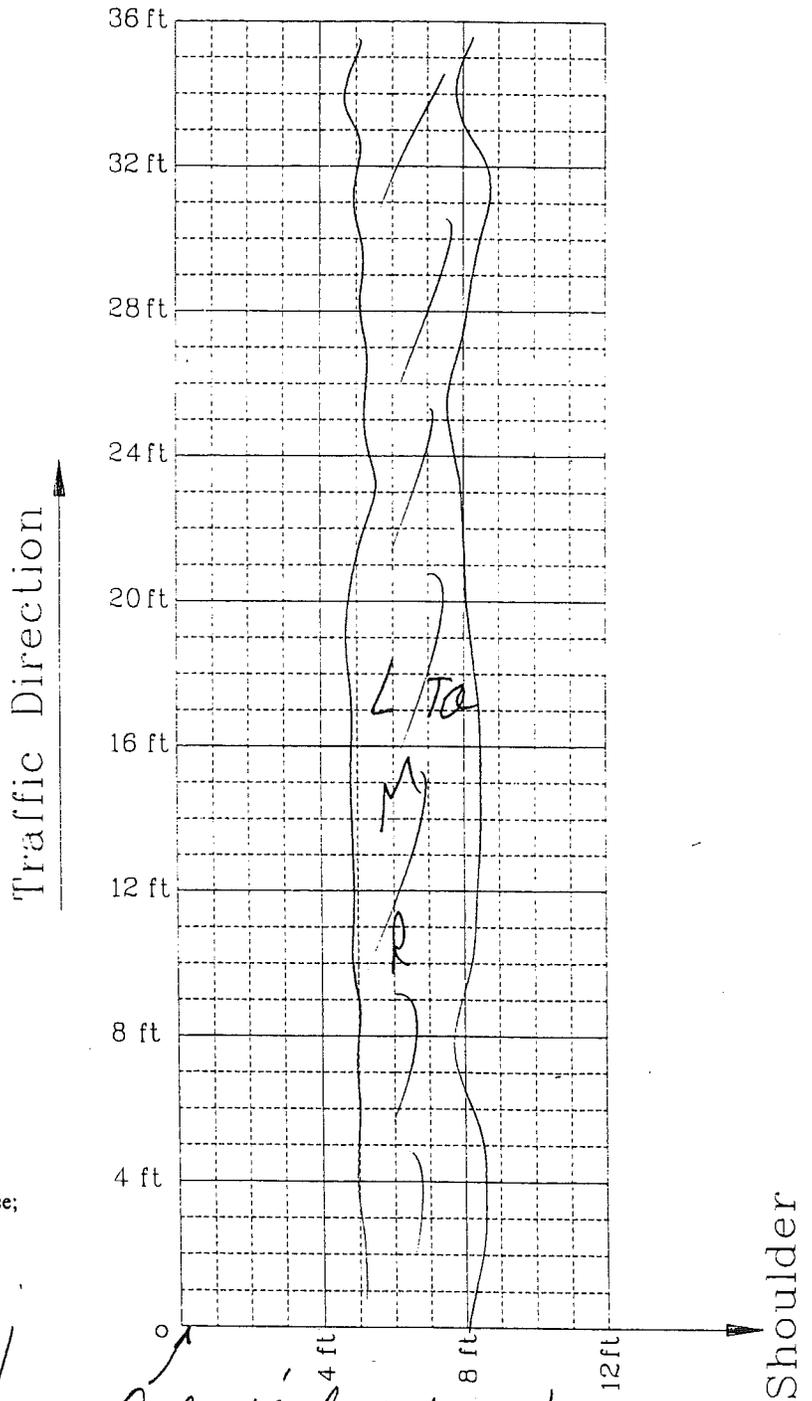
- Low Moderate High
- Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
- Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
- High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

*light to med. seg
Potential for future rav.*

@ a 10' long young tree

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)
 Control Section Number: _____ Route: BL 94 Direction: East
 Region: UNIVERSITY Mile Post: from East of Page
 Section Number: _____ Test Site Number: 23 ADT: _____

East of ~~Page~~ Page.
 Segregation Map

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High
Low: aggregate or binder has started to wear away, but not progressed significantly
Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

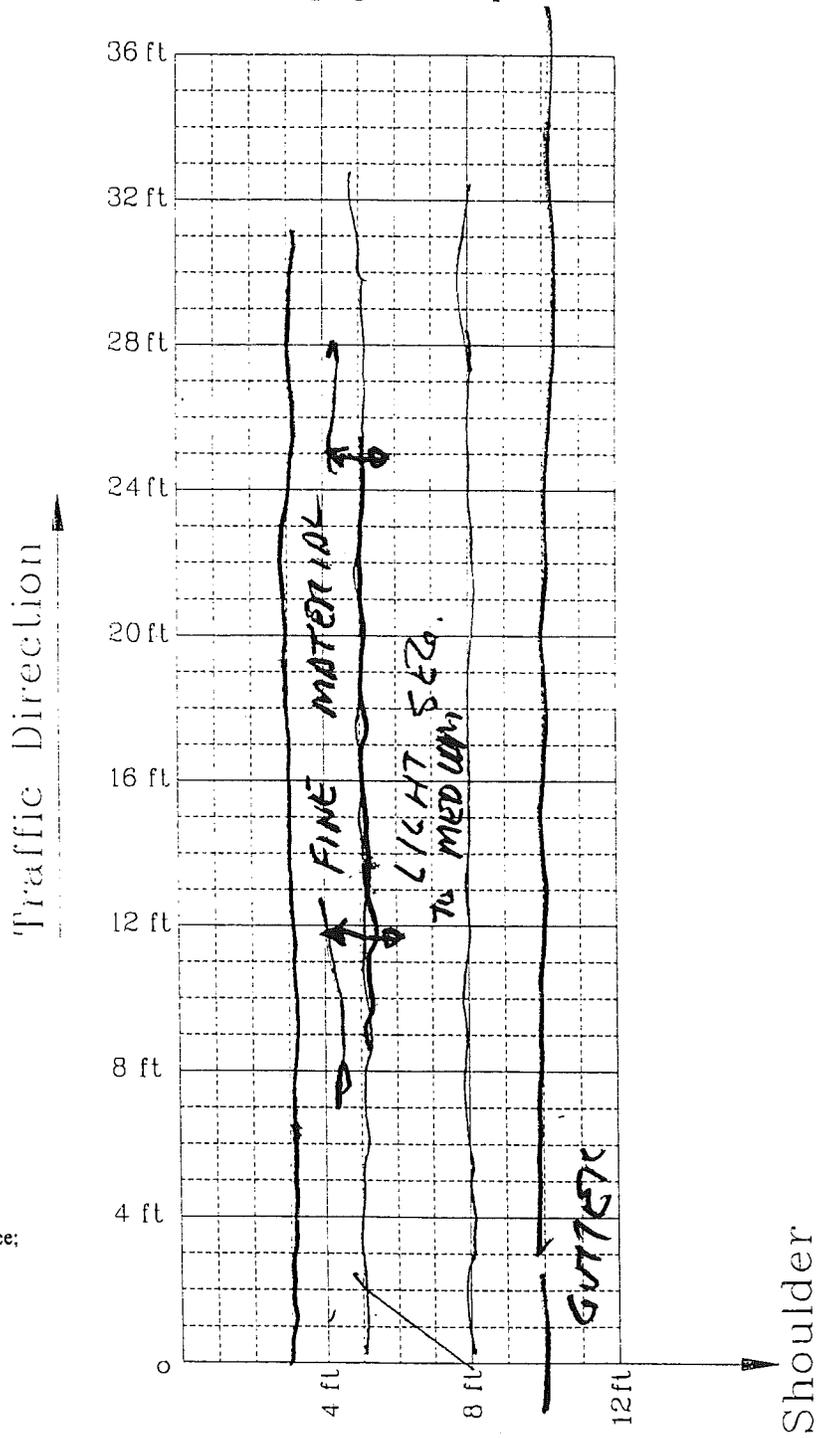
Low Moderate High
Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name) BC
 Control Section Number: _____ Route: 94 Direction: EAST of page
 Region: UNIVERSITY Mile Post: from _____ to _____
 Section Number: 2 Test Site Number: 3 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
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Distress to be Identified

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Low Moderate High
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Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High
Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low-severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

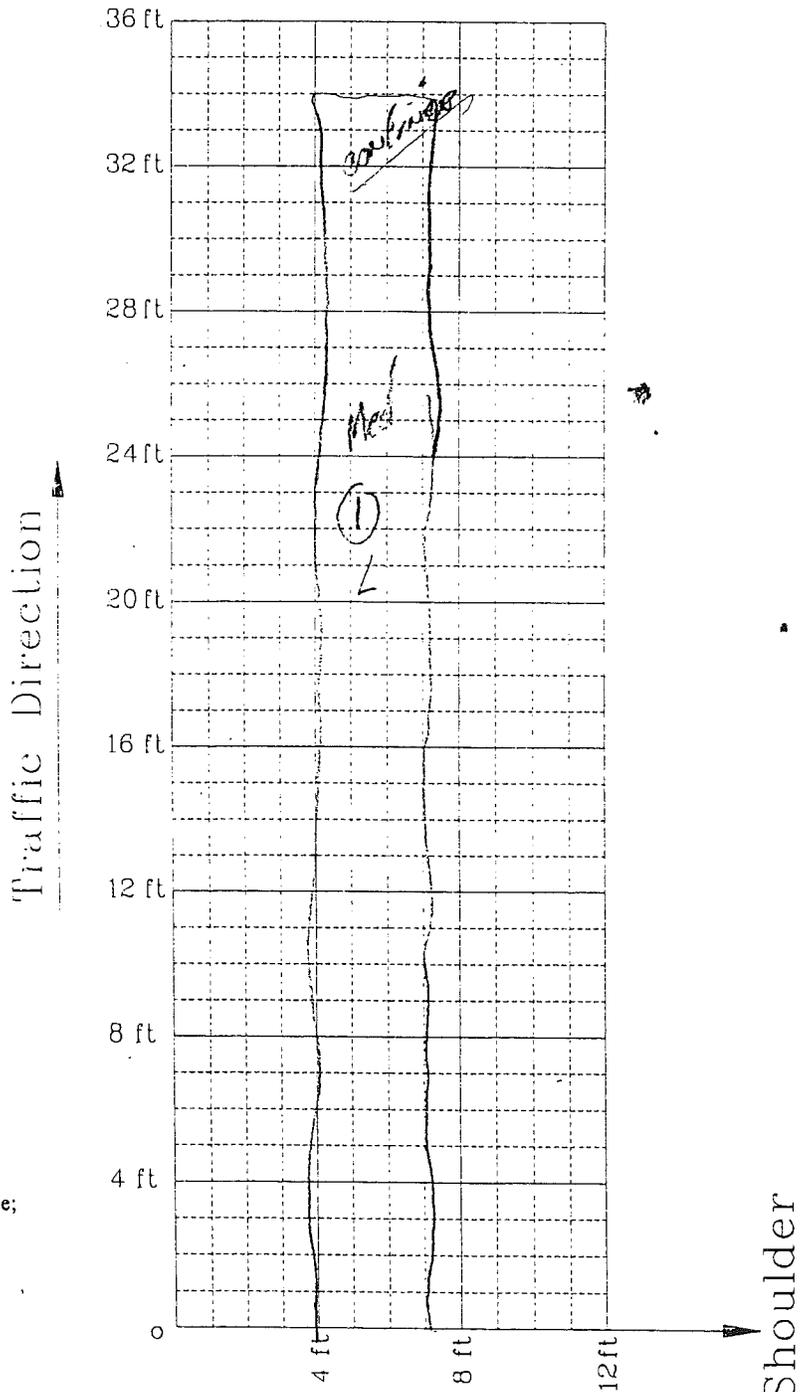
3. Rut Depth

4. Flushing

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COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

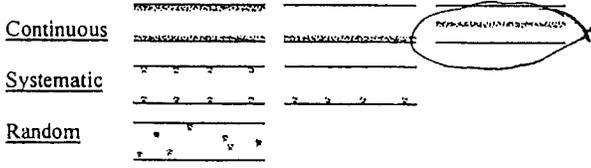
Weather:

Surveyor: _____ (your name)
 Control Section Number: _____ Route: BL-94 Direction: Eastbd.
 Region: University Mile Post: from Page Ave to Summit
 Section Number: 2 Test Site Number: 3 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
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Distress to be Identified

1. Raveling

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Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

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High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

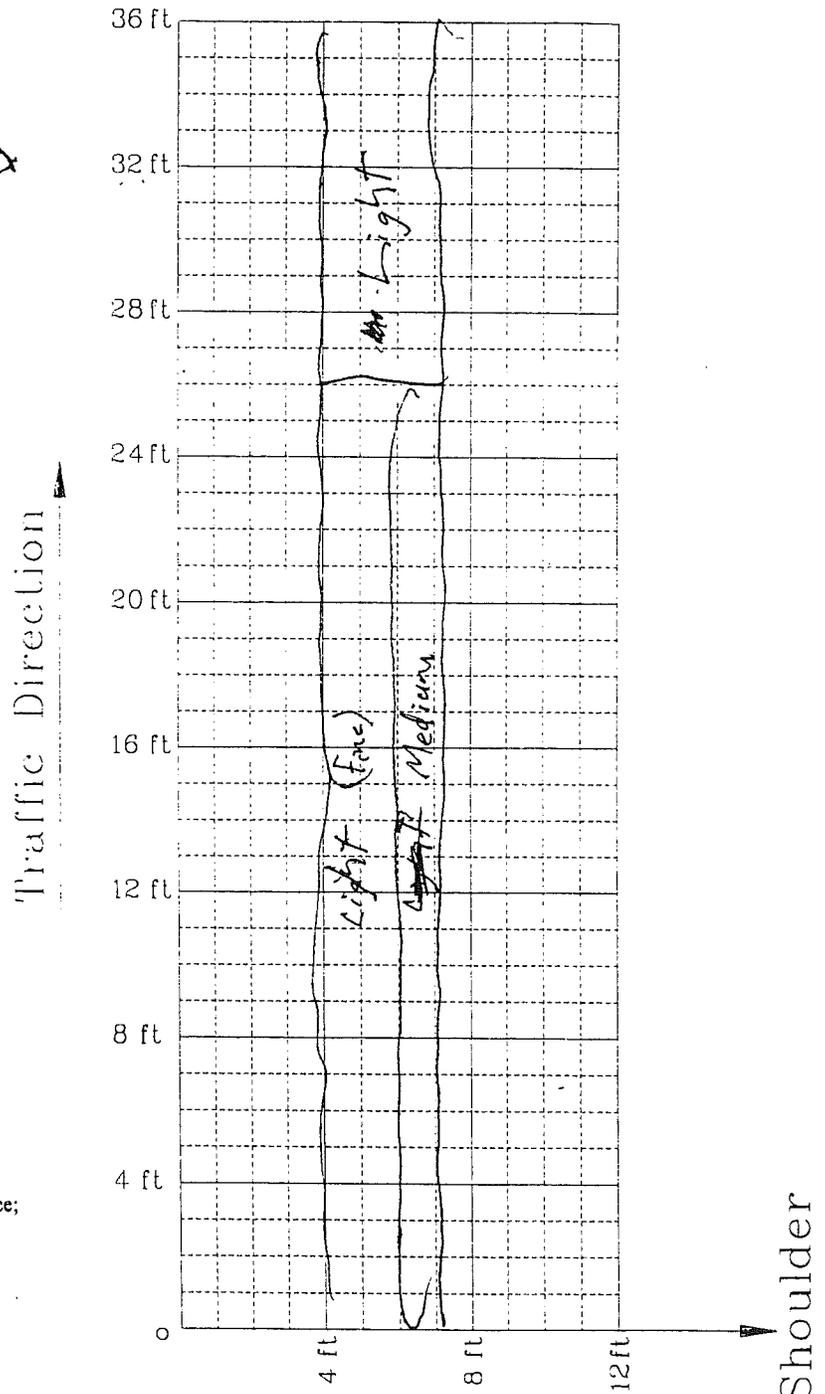
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)
 Control Section Number: 1 Route: B1-94 Direction: East
 Region: Univ Mile Post: from Page to Summit
 Section Number: 1 Test Site Number: 3 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
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Distress to be Identified

1. Raveling

Low Moderate High

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High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth None

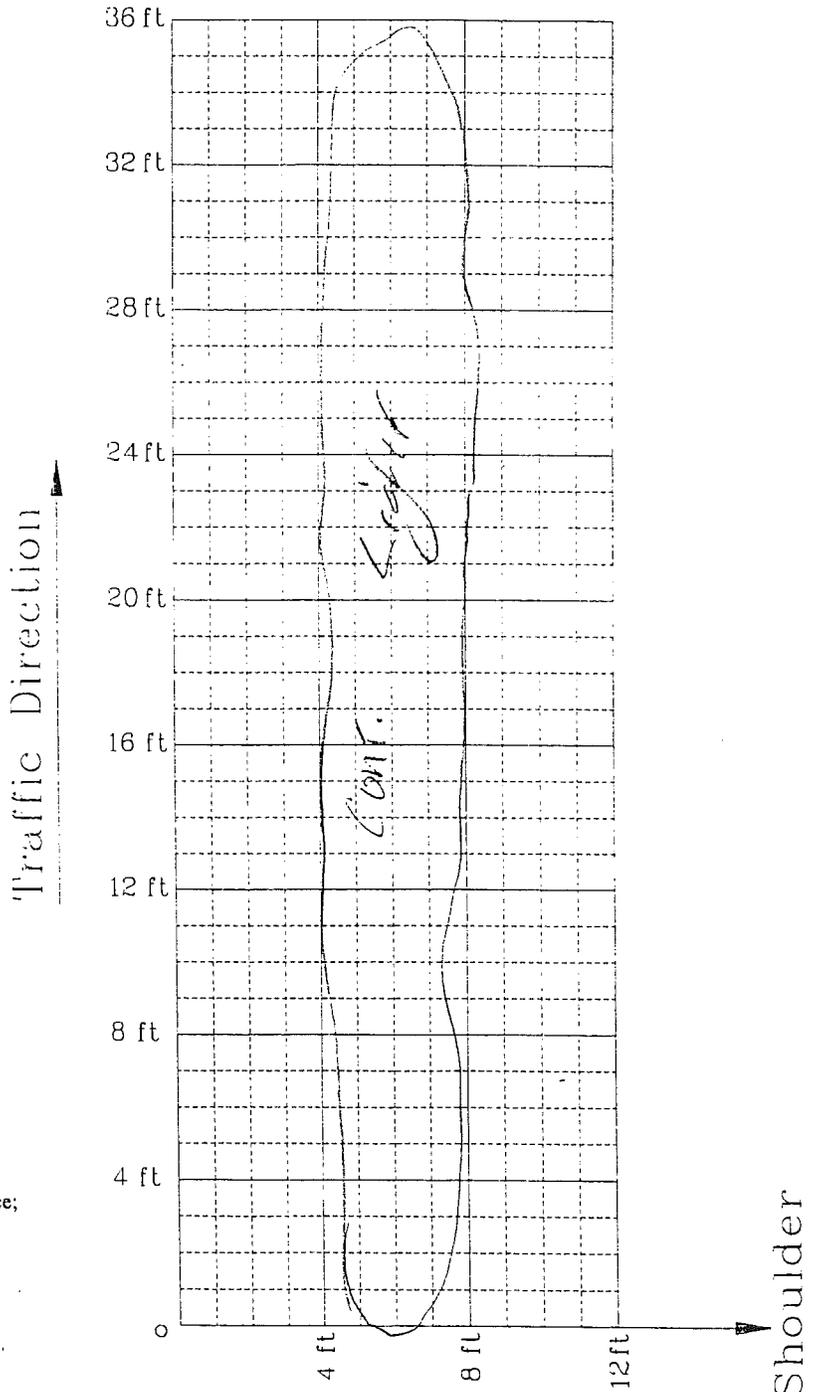
4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather: Cold, Damp

Surveyor: _____ (your name)
 Control Section Number: 38 --- Route: B-94 Direction: West
 Region: UNIVERSITY - (8) Mile Post: from ? to ?
 Section Number: 3 Test Site Number: 3 ADT: SAME AS SITE 2
EAST OF FAIGE AVE.

Definition of Segregation:

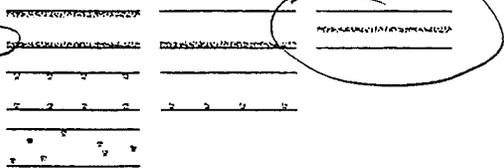
Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous

Systematic

Random



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

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Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

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High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

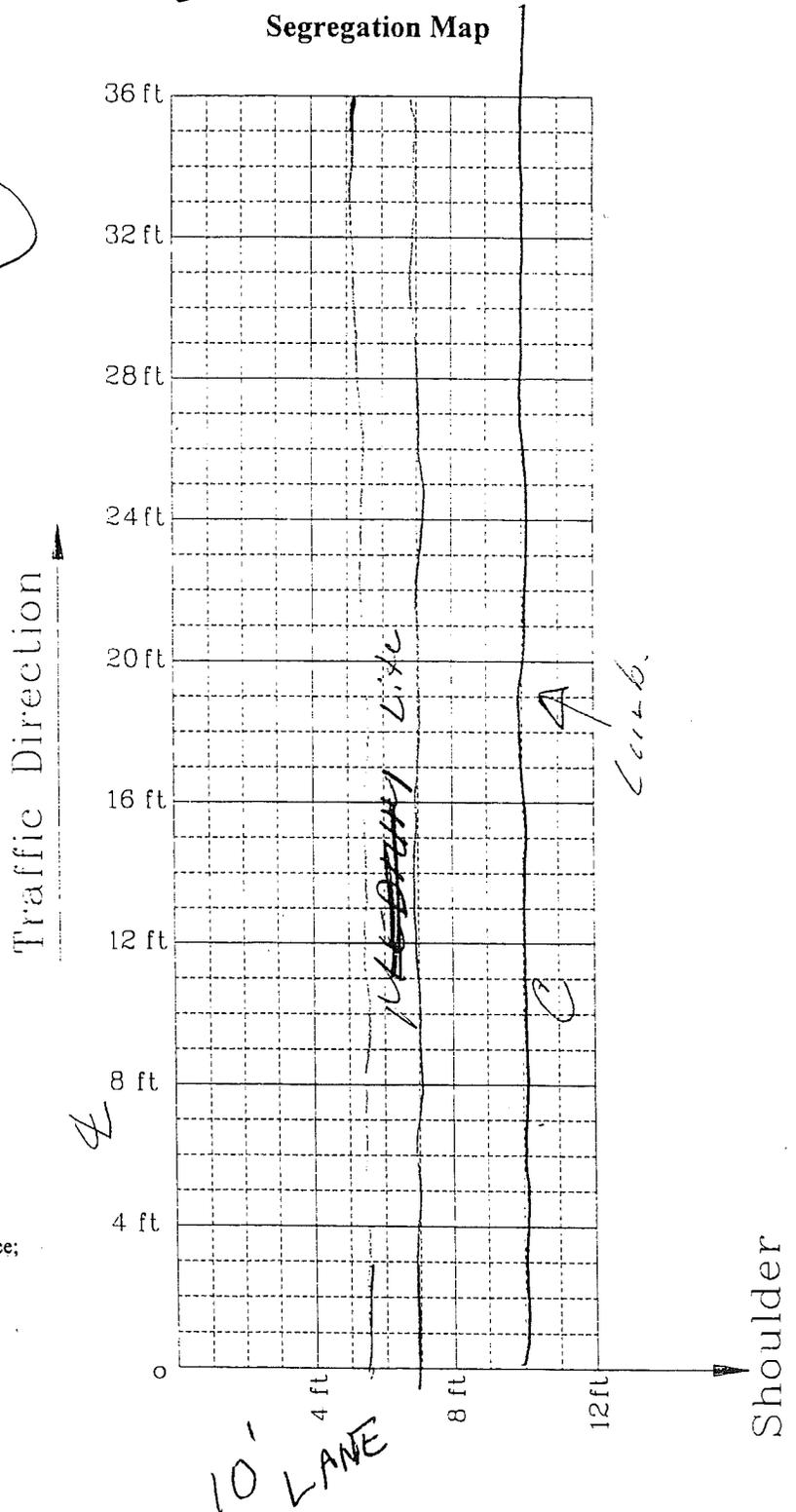
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Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



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Segregation Survey

Date of Survey: Dec. 3, 1997

Weather: cloudy 38°

Surveyor: _____ (your name)

Control Section Number: 30-2-2 Route: I-94 BL Direction: EB

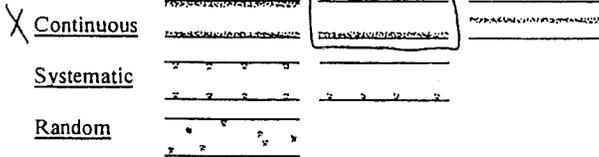
Region: UNIVERSITY Mile Post: from E. of Page to _____

Section Number: #32 Test Site Number: #A3 ADT: _____

Definition of Segregation:

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Type of Segregation:



Degree of Segregation

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Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

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3. Rut Depth

4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

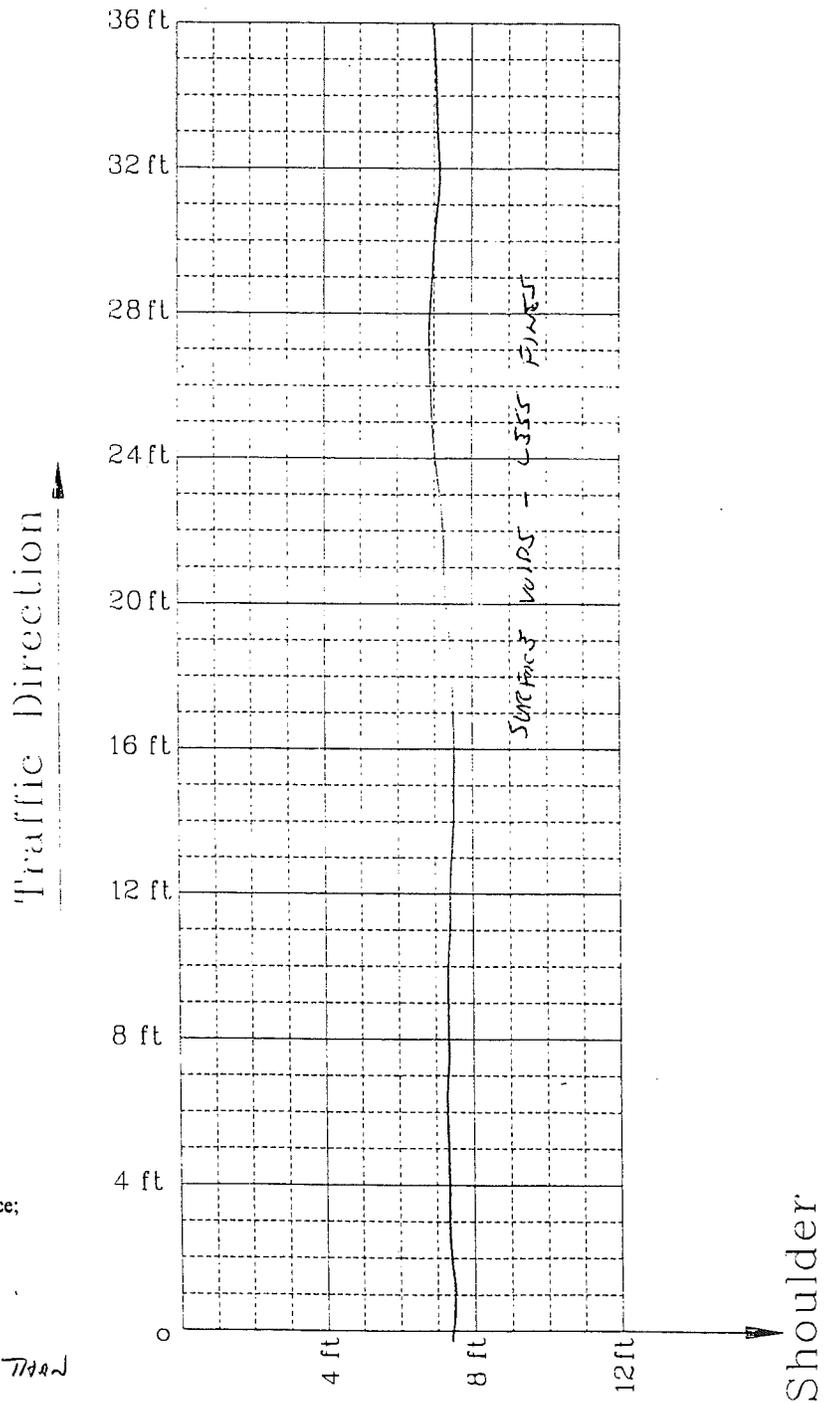
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

LESS FINES IN SURFACE OF RT WP THAN LT WP

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

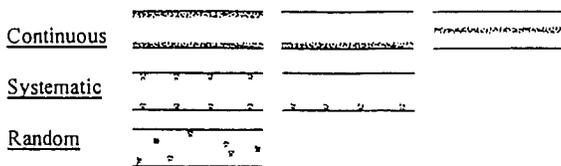
Weather:

Surveyor: _____ (your name)
 Control Section Number: _____ Route: _____ Direction: _____
 Region: University Region Mile Post: from _____ to _____
 Section Number: 24 Test Site Number: 2 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

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Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
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Distress to be Identified

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High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

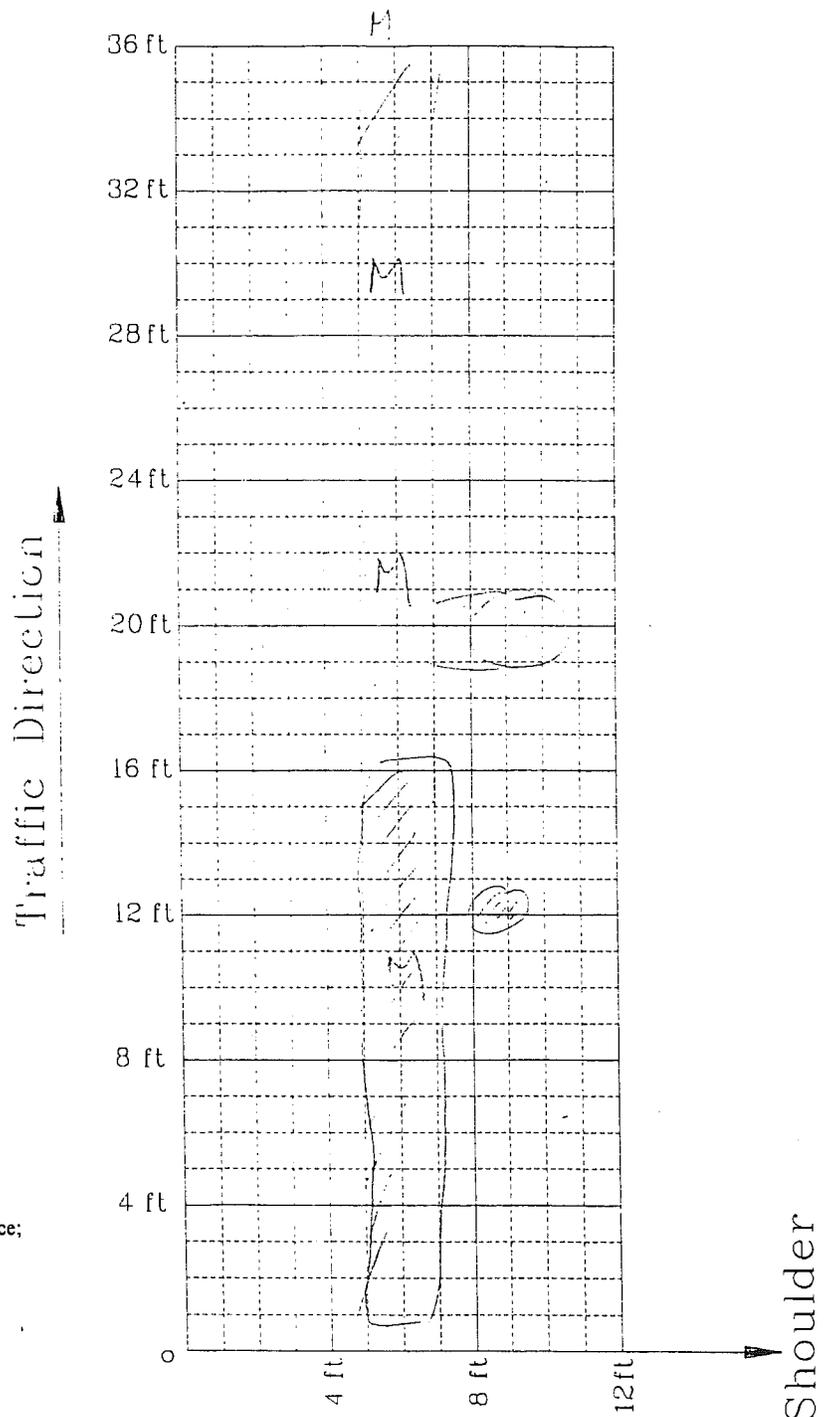
3. Rut Depth

4. Flushing

Low Moderate High
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



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Nuclear Density Sampling Data (Jan. 16, 1998)

SITE 3

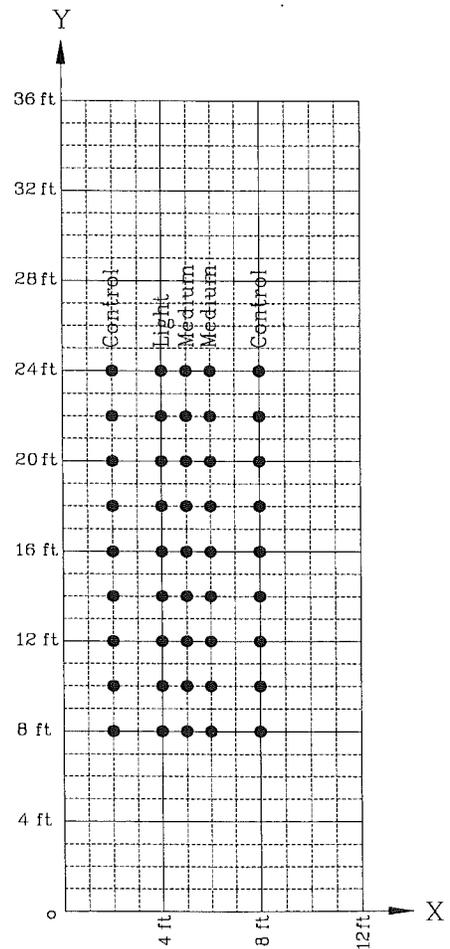
Michigan Ave. E.Bound, Jackson

Chart Standard	Density	2853
	Moisture	660
Operating Standard	Density	2850
	Moisture	670

Gauge No.	99398
Model	Troxler 3440
Inspector	Joe Badgley

Sample 1		Sample 2		Sample 3	
Control		Light		Medium	
0224	145.9	0424	144.2	0524	142.8
0222	144.8	0422	141.9	0522	142.6
0220	145.4	0420	143.5	0520	142.4
0218	148.7	0418	143.6	0518	144.2
0216	146.2	0416	144.4	0516	142.6
0214	146.3	0414	142.2	0514	142.5
0212	149.0	0412	144.3	0512	141.3
0210	148.4	0410	144.6	0510	141.0
0208	148.3	0408	144.7	0508	142.3
mean	147.0	mean	143.7	mean	142.4
std.	1.59	std.	1.03	std.	0.91

Sample 4		Sample 5	
Medium		Control	
0624	143.2	0824	141.3
0622	142.1	0822	143.2
0620	141.1	0820	143.0
0618	141.5	0818	142.5
0616	142.8	0816	143.4
0614	143.5	0814	143.5
0612	143.1	0812	143.3
0610	141.7	0810	142.7
0608	143.0	0808	143.7
mean	142.4	mean	143.0
std.	0.86	std.	0.73



Nuclear Density Sampling Data (April 9, 1998)

SITE 3

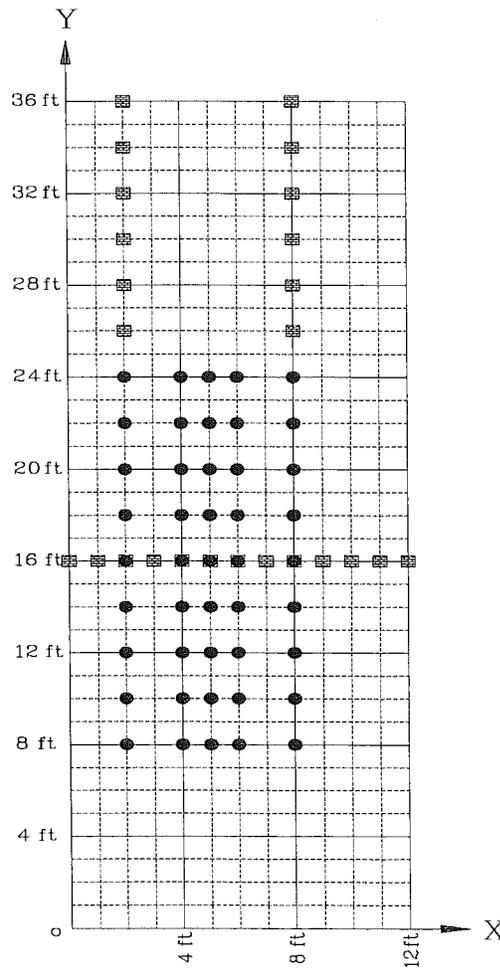
Michigan Ave. E.Bound, Jackson

Chart Standard	Density	2863
	Moisture	652
Operating Standard	Density	2870
	Moisture	658

Gauge No.	101953
Model	Troxler 3440
Inspector	Joe

Control		Control	
0236	140.4	0836	141.7
0234	141.9	0834	141.1
0232	140.5	0832	140.5
0230	144.0	0830	141.2
0228	145.3	0828	143.1
0226	143.3	0826	143.9
mean	142.6	mean	141.9
std.	1.97	std.	1.31

Transverse	
0116	141.7
0216	142.6
0316	142.7
0416	138.7
0516	140.1
0616	142.4
0716	144.7
0816	143.4
0916	137.2
mean	141.5
std.	2.39



Date 5/20/98 Highway
 Tested By Joel Davenport Site Site 3
 Checked By
 Remarks

1	2	3	4	5	6	7	8	9	10
Specimen Number	Course Description	Weight in air (g)	SSD Weight (g)	Weight in water (g)	Volume (SSD) [4-5](cm ³)	Volume (air) [3-5](cm ³)	Specific Gravity SSD [4/6]	Specific Gravity air [3/7]	Remarks
412		1583.5	1587.4	898.5	688.9	685.0	2.304	2.312	
420		1666.6	1671.1	944.6	726.5	722.0	2.300	2.308	
612		1503.3	1509.3	854.1	655.2	649.2	2.304	2.316	
622		1523.8	1529.2	873.4	655.8	650.4	2.332	2.343	
	5/27/98								
214		1692.8	1694.2	983.3	710.9	709.5	2.383	2.386	
218		1638.8	1640.1	954.3	685.8	684.5	2.392	2.394	
410		1433.6	1436.0	818.5	617.5	615.1	2.326	2.331	
414		1531.9	1535.5	873.1	662.4	658.8	2.318	2.325	
418		1619.6	1624.6	921.1	703.5	698.5	2.309	2.319	
422		1582.7	1589.9	892.7	697.2	690.0	2.280	2.294	
610		1556.3	1567.0	884.6	682.4	671.7	2.296	2.317	
614		1584.0	1589.9	904.4	685.5	679.6	2.319	2.331	
618		1561.7	1571.4	886.2	685.2	675.5	2.293	2.312	
620		1523.5	1530.5	871.9	658.6	651.6	2.324	2.338	
810		1608.4	1612.6	914.8	697.8	693.6	2.311	2.319	

Sieve Analysis

Weight of bags & soil	1555.6
Weight of soil	1537.9

Weight of empty bags	17.7
----------------------	------

Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 3 210	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	5.7	0.37	0.37	99.63	
	3/8 inch	9.50	2.754	198.1	12.88	13.25	86.75	
	No. 4	4.75	2.016	466.1	30.31	43.57	56.43	
	No. 8	2.37	1.474	303.1	19.71	63.28	36.72	
	No. 16	1.18	1.077	182.4	11.86	75.14	24.86	
	No. 30	0.60	0.795	164.0	10.67	85.80	14.20	
	No. 50	0.30	0.582	96.0	6.24	92.05	7.95	
	No. 100	0.15	0.426	60.0	3.90	95.95	4.05	
	No. 200	0.08	0.312	36.9	2.40	98.35	1.65	
		Pan			25.4	1.65	100.00	0.00
			Total weight	1537.7	100.00			

Operator	Joel Davenport	Weight of tear & soil	2437.6
Date	6/9/98	Weight of tear	900.0
Remarks		Weight of soil	1537.6

Sieve Analysis

Weight of bags & soil	1738.6
Weight of soil	1721.1

Weight of empty bags	17.5
----------------------	------

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 212	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	3.6	0.21	0.21	99.79
	3/8 inch	9.50	2.754	205.2	11.92	12.13	87.87
	No. 4	4.75	2.016	561.1	32.60	44.73	55.27
	No. 8	2.37	1.474	305.6	17.76	62.49	37.51
	No. 16	1.18	1.077	188.1	10.93	73.42	26.58
	No. 30	0.60	0.795	166.5	9.67	83.09	16.91
	No. 50	0.30	0.582	163.1	9.48	92.57	7.43
	No. 100	0.15	0.426	57.6	3.35	95.92	4.08
	No. 200	0.08	0.312	39.9	2.32	98.23	1.77
	Pan			30.4	1.77	100.00	0.00
			Total weight	1721.1	100.00		

Operator	Joel Davenport	Weight of tear & soil	2621.0
Date	6/9/98	Weight of tear	899.9
Remarks		Weight of soil	1721.1

Sieve Analysis

Weight of bags & soil	1586.3
Weight of soil	1568.8

Weight of empty bags	17.5
----------------------	------

Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
214	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00
	3/8 inch	9.50	2.754	167.5	10.68	10.68	89.32
	No. 4	4.75	2.016	477.1	30.41	41.09	58.91
	No. 8	2.37	1.474	307.7	19.61	60.70	39.30
	No. 16	1.18	1.077	171.4	10.93	71.63	28.37
	No. 30	0.60	0.795	130.6	8.32	79.95	20.05
	No. 50	0.30	0.582	127.9	8.15	88.11	11.89
	No. 100	0.15	0.426	75.5	4.81	92.92	7.08
	No. 200	0.08	0.312	47.5	3.03	95.95	4.05
	Pan			63.6	4.05	100.00	0.00
			Total	1568.8	100.00		

Operator	Joel Davenport	Weight of tear & soil	2468.7
Date	6/2/98	Weight of tear	899.9
Remarks		Weight of soil	1568.8

Sieve Analysis

Weight of bags & soil	1536.6
Weight of soil	1519.0

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =			Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	
Site 3	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
218	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00
	3/8 inch	9.50	2.754	182.8	12.04	12.04	87.96
	No. 4	4.75	2.016	477.4	31.43	43.47	56.53
	No. 8	2.37	1.474	296.4	19.51	62.98	37.02
	No. 16	1.18	1.077	152.4	10.03	73.01	26.99
	No. 30	0.60	0.795	119.0	7.83	80.85	19.15
	No. 50	0.30	0.582	119.7	7.88	88.73	11.27
	No. 100	0.15	0.426	68.5	4.51	93.24	6.76
	No. 200	0.08	0.312	42.2	2.78	96.02	3.98
	Pan			60.5	3.98	100.00	0.00
			Total	1518.9	100.00		
			weight				

Operator	Joel Davenport	Weight of tear & soil	2418.8
Date	6/2/98	Weight of tear	900.0
Remarks		Weight of soil	1518.8

Sieve Analysis

Weight of bags & soil	1613.8
Weight of soil	1596.2

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =			Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	
Site 3 220	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	4.7	0.29	0.29	99.71
	3/8 inch	9.50	2.754	218.0	13.66	13.95	86.05
	No. 4	4.75	2.016	513.4	32.16	46.12	53.88
	No. 8	2.37	1.474	288.8	18.09	64.21	35.79
	No. 16	1.18	1.077	165.6	10.37	74.58	25.42
	No. 30	0.60	0.795	139.4	8.73	83.32	16.68
	No. 50	0.30	0.582	119.5	7.49	90.80	9.20
	No. 100	0.15	0.426	66.7	4.18	94.98	5.02
	No. 200	0.08	0.312	53.2	3.33	98.31	1.69
		Pan			26.9	1.69	100.00
			Total weight	1596.2	100.00		

Operator	Joel Davenport	Weight of tear & soil	2496.1
Date	6/9/98	Weight of tear	899.9
Remarks		Weight of soil	1596.2

Sieve Analysis

Weight of bags & soil	1655.7
Weight of soil	1638.2

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 222	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	11.6	0.71	0.71	99.29
	3/8 inch	9.50	2.754	258.1	15.76	16.46	83.54
	No. 4	4.75	2.016	517.3	31.58	48.04	51.96
	No. 8	2.37	1.474	289.1	17.65	65.69	34.31
	No. 16	1.18	1.077	179.1	10.93	76.62	23.38
	No. 30	0.60	0.795	157.3	9.60	86.22	13.78
	No. 50	0.30	0.582	114.8	7.01	93.23	6.77
	No. 100	0.15	0.426	49.7	3.03	96.26	3.74
	No. 200	0.08	0.312	38.2	2.33	98.60	1.40
		Pan			23.0	1.40	100.00
			Total weight	1638.2	100.00		

Operator	Joel Davenport	Weight of tear & soil	2538.1
Date	6/9/98	Weight of tear	899.9
Remarks		Weight of soil	1638.2

Sieve Analysis

Weight of bags & soil	1356.5
Weight of soil	1338.8

Weight of empty bags	17.7
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 410	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	9.4	0.70	0.70	99.30
	3/8 inch	9.50	2.754	210.2	15.70	16.40	83.60
	No. 4	4.75	2.016	442.2	33.03	49.43	50.57
	No. 8	2.37	1.474	219.7	16.41	65.84	34.16
	No. 16	1.18	1.077	114.4	8.54	74.39	25.61
	No. 30	0.60	0.795	95.0	7.10	81.48	18.52
	No. 50	0.30	0.582	99.9	7.46	88.95	11.05
	No. 100	0.15	0.426	60.2	4.50	93.44	6.56
	No. 200	0.08	0.312	37.4	2.79	96.24	3.76
		Pan			50.4	3.76	100.00
			Total	1338.8	100.00		
			weight				

Operator	Joel Davenport	Weight of tear & soil	2238.7
Date	6/2/98	Weight of tear	899.9
Remarks		Weight of soil	1338.8

Sieve Analysis

Weight of bags & soil	1488.8
Weight of soil	1471.3

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 412	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00
	3/8 inch	9.50	2.754	221.9	15.08	15.08	84.92
	No. 4	4.75	2.016	462.9	31.47	46.55	53.45
	No. 8	2.37	1.474	247.5	16.83	63.38	36.62
	No. 16	1.18	1.077	131.1	8.91	72.29	27.71
	No. 30	0.60	0.795	109.5	7.44	79.73	20.27
	No. 50	0.30	0.582	115.9	7.88	87.61	12.39
	No. 100	0.15	0.426	75.4	5.13	92.74	7.26
	No. 200	0.08	0.312	46.8	3.18	95.92	4.08
		Pan			60.0	4.08	100.00
			Total weight	1471.0	100.00		

Operator	Joel Davenport	Weight of tear & soil	2370.9
Date	6/2/98	Weight of tear	899.9
Remarks		Weight of soil	1471.0

Sieve Analysis

Weight of bags & soil	1444.8
Weight of soil	1427.2

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 414	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	17.2	1.21	1.21	98.79
	3/8 inch	9.50	2.754	250.6	17.56	18.76	81.24
	No. 4	4.75	2.016	431.4	30.23	48.99	51.01
	No. 8	2.37	1.474	229.7	16.09	65.09	34.91
	No. 16	1.18	1.077	121.3	8.50	73.58	26.42
	No. 30	0.60	0.795	100.8	7.06	80.65	19.35
	No. 50	0.30	0.582	108.3	7.59	88.24	11.76
	No. 100	0.15	0.426	69.3	4.86	93.09	6.91
	No. 200	0.08	0.312	42.5	2.98	96.07	3.93
		Pan			56.1	3.93	100.00
			Total weight	1427.2	100.00		

Operator	Joel Davenport		
Date	6/2/98		
Remarks	Weight of tear & soil	2327.0	
	Weight of tear	899.9	
	Weight of soil	1427.1	

Sieve Analysis

Weight of bags & soil	1525.6
Weight of soil	1508.1

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 418	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00
	3/8 inch	9.50	2.754	295.1	19.57	19.57	80.43
	No. 4	4.75	2.016	471.0	31.24	50.81	49.19
	No. 8	2.37	1.474	229.4	15.21	66.02	33.98
	No. 16	1.18	1.077	125.3	8.31	74.33	25.67
	No. 30	0.60	0.795	108.7	7.21	81.54	18.46
	No. 50	0.30	0.582	117.3	7.78	89.32	10.68
	No. 100	0.15	0.426	70.4	4.67	93.99	6.01
	No. 200	0.08	0.312	43.3	2.87	96.86	3.14
		Pan			47.4	3.14	100.00
			Total weight	1507.9	100.00		

Operator	Joel Davenport	Weight of tear & soil	2407.8
Date	6/2/98	Weight of tear	899.9
Remarks		Weight of soil	1507.9

Sieve Analysis

Weight of bags & soil	1567.0
Weight of soil	1549.6

Weight of empty bags	17.4
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 420	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	16.8	1.08	1.08	98.92
	3/8 inch	9.50	2.754	292.5	18.88	19.96	80.04
	No. 4	4.75	2.016	470.3	30.35	50.31	49.69
	No. 8	2.37	1.474	247.7	15.98	66.29	33.71
	No. 16	1.18	1.077	136.1	8.78	75.08	24.92
	No. 30	0.60	0.795	116.6	7.52	82.60	17.40
	No. 50	0.30	0.582	116.5	7.52	90.12	9.88
	No. 100	0.15	0.426	65.5	4.23	94.35	5.65
	No. 200	0.08	0.312	49.1	3.17	97.52	2.48
		Pan			38.5	2.48	100.00
			Total weight	1549.6	100.00		

Operator	Joel Davenport	Weight of tear & soil	2449.7
Date	6/3/98	Weight of tear	900.1
Remarks		Weight of soil	1549.6

Sieve Analysis

Weight of bags & soil	1492.7
Weight of soil	1475.2

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 3 422	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	7.5	0.51	0.51	99.49	
	3/8 inch	9.50	2.754	257.2	17.44	17.95	82.05	
	No. 4	4.75	2.016	491.3	33.31	51.26	48.74	
	No. 8	2.37	1.474	237.1	16.08	67.33	32.67	
	No. 16	1.18	1.077	123.9	8.40	75.73	24.27	
	No. 30	0.60	0.795	109.0	7.39	83.12	16.88	
	No. 50	0.30	0.582	114.5	7.76	90.89	9.11	
	No. 100	0.15	0.426	57.9	3.93	94.81	5.19	
	No. 200	0.08	0.312	45.6	3.09	97.90	2.10	
	Pan			30.9	2.10	100.00	0.00	
			Total weight	1474.9	100.00			

Operator	Joel Davenport	Weight of tear & soil	2374.8
Date	6/3/98	Weight of tear	899.9
Remarks		Weight of soil	1474.9

Sieve Analysis

Weight of bags & soil	1468.8
Weight of soil	1451.3

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3 610	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00
	3/8 inch	9.50	2.754	316.0	21.78	21.78	78.22
	No. 4	4.75	2.016	494.2	34.06	55.84	44.16
	No. 8	2.37	1.474	195.4	13.47	69.30	30.70
	No. 16	1.18	1.077	112.3	7.74	77.04	22.96
	No. 30	0.60	0.795	110.3	7.60	84.65	15.35
	No. 50	0.30	0.582	101.7	7.01	91.65	8.35
	No. 100	0.15	0.426	52.0	3.58	95.24	4.76
	No. 200	0.08	0.312	37.6	2.59	97.83	2.17
		Pan			31.5	2.17	100.00
			Total weight	1451.0	100.00		

Operator	Joel Davenport	Weight of tear & soil	2351.0
Date	6/3/98	Weight of tear	899.9
Remarks		Weight of soil	1451.1

Sieve Analysis

Weight of bags & soil	1419.8
Weight of soil	1402.4

Weight of empty bags	17.4
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
612	1/2 inch	12.50	3.116	3.4	0.24	0.24	99.76
	3/8 inch	9.50	2.754	286.2	20.41	20.65	79.35
	No. 4	4.75	2.016	503.0	35.87	56.52	43.48
	No. 8	2.37	1.474	194.4	13.86	70.38	29.62
	No. 16	1.18	1.077	94.0	6.70	77.08	22.92
	No. 30	0.60	0.795	90.2	6.43	83.51	16.49
	No. 50	0.30	0.582	103.2	7.36	90.87	9.13
	No. 100	0.15	0.426	60.0	4.28	95.15	4.85
	No. 200	0.08	0.312	39.5	2.82	97.97	2.03
	Pan			28.5	2.03	100.00	0.00
			Total weight	1402.4	100.00		

Operator	Joel Davenport	Weight of tear & soil	2302.3
Date	6/3/98	Weight of tear	899.9
Remarks		Weight of soil	1402.4

Sieve Analysis

Weight of bags & soil	1492.7
Weight of soil	1475.1

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 3	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
614	1/2 inch	12.50	3.116	21.4	1.45	1.45	98.55	
	3/8 inch	9.50	2.754	273.4	18.54	19.99	80.01	
	No. 4	4.75	2.016	540.6	36.66	56.65	43.35	
	No. 8	2.37	1.474	200.4	13.59	70.24	29.76	
	No. 16	1.18	1.077	104.6	7.09	77.33	22.67	
	No. 30	0.60	0.795	100.6	6.82	84.15	15.85	
	No. 50	0.30	0.582	116.8	7.92	92.07	7.93	
	No. 100	0.15	0.426	57.7	3.91	95.99	4.01	
	No. 200	0.08	0.312	38.6	2.62	98.60	1.40	
	Pan			20.6	1.40	100.00	0.00	
			Total weight	1474.7	100.00			

Operator	Joel Davenport	Weight of tear & soil	2374.5
Date	6/3/98	Weight of tear	899.9
Remarks		Weight of soil	1474.6

Sieve Analysis

Weight of bags & soil	1477.4
Weight of soil	1459.9

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =			Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	
Site 3 618	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
	1/2 inch	12.50	3.116	2.6	0.18	0.18	99.82
	3/8 inch	9.50	2.754	288.5	19.76	19.94	80.06
	No. 4	4.75	2.016	538.4	36.88	56.82	43.18
	No. 8	2.37	1.474	198.3	13.58	70.40	29.60
	No. 16	1.18	1.077	92.7	6.35	76.75	23.25
	No. 30	0.60	0.795	85.3	5.84	82.59	17.41
	No. 50	0.30	0.582	101.0	6.92	89.51	10.49
	No. 100	0.15	0.426	62.7	4.29	93.81	6.19
	No. 200	0.08	0.312	39.3	2.69	96.50	3.50
		Pan			51.1	3.50	100.00
			Total weight	1459.9	100.00		

Operator	Joel Davenport	Weight of tear & soil	2359.8
Date	6/3/98	Weight of tear	899.9
Remarks		Weight of soil	1459.9

Sieve Analysis

Weight of bags & soil	1436.3
Weight of soil	1418.7

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 3 620	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00	
	3/8 inch	9.50	2.754	224.8	15.85	15.85	84.15	
	No. 4	4.75	2.016	523.0	36.87	52.71	47.29	
	No. 8	2.37	1.474	218.2	15.38	68.10	31.90	
	No. 16	1.18	1.077	115.2	8.12	76.22	23.78	
	No. 30	0.60	0.795	94.3	6.65	82.86	17.14	
	No. 50	0.30	0.582	104.2	7.35	90.21	9.79	
	No. 100	0.15	0.426	60.0	4.23	94.44	5.56	
	No. 200	0.08	0.312	39.6	2.79	97.23	2.77	
		Pan			39.3	2.77	100.00	0.00
			Total weight	1418.6	100.00			

Operator	Joel Davenport	Weight of tear & soil	2318.5
Date	6/4/98	Weight of tear	899.9
Remarks		Weight of soil	1418.6

Sieve Analysis

Weight of bags & soil	1439.9
Weight of soil	1422.4

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =			
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing
Site 3	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00
622	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00
	3/8 inch	9.50	2.754	284.4	20.00	20.00	80.00
	No. 4	4.75	2.016	518.6	36.46	56.46	43.54
	No. 8	2.37	1.474	199.4	14.02	70.48	29.52
	No. 16	1.18	1.077	95.1	6.69	77.17	22.83
	No. 30	0.60	0.795	86.6	6.09	83.26	16.74
	No. 50	0.30	0.582	101.0	7.10	90.36	9.64
	No. 100	0.15	0.426	58.7	4.13	94.49	5.51
	No. 200	0.08	0.312	41.6	2.93	97.41	2.59
	Pan			36.8	2.59	100.00	0.00
			Total weight	1422.2	100.00		

Operator	Joel Davenport	Weight of tear & soil	2322.0
Date	6/4/98	Weight of tear	899.8
Remarks		Weight of soil	1422.2

Sieve Analysis

Weight of bags & soil	1513.1
Weight of soil	1495.5

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent retained	
Site 3 810	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00	
	3/8 inch	9.50	2.754	227.6	15.22	15.22	84.78	
	No. 4	4.75	2.016	529.8	35.43	50.65	49.35	
	No. 8	2.37	1.474	248.8	16.64	67.28	32.72	
	No. 16	1.18	1.077	133.2	8.91	76.19	23.81	
	No. 30	0.60	0.795	117.7	7.87	84.06	15.94	
	No. 50	0.30	0.582	117.5	7.86	91.92	8.08	
	No. 100	0.15	0.426	53.5	3.58	95.49	4.51	
	No. 200	0.08	0.312	42.4	2.84	98.33	1.67	
		Pan			25.0	1.67	100.00	0.00
			Total weight	1495.5	100.00			

Operator	Joel Davenport	Weight of tear & soil	2395.3
Date	6/4/98	Weight of tear	899.9
Remarks		Weight of soil	1495.4

Sieve Analysis

Weight of bags & soil	1594.4
Weight of soil	1576.9

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =				
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 3 812	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	12.0	0.76	0.76	99.24	
	3/8 inch	9.50	2.754	292.9	18.57	19.34	80.66	
	No. 4	4.75	2.016	512.9	32.53	51.86	48.14	
	No. 8	2.37	1.474	243.5	15.44	67.30	32.70	
	No. 16	1.18	1.077	131.6	8.35	75.65	24.35	
	No. 30	0.60	0.795	122.5	7.77	83.42	16.58	
	No. 50	0.30	0.582	122.2	7.75	91.17	8.83	
	No. 100	0.15	0.426	64.8	4.11	95.28	4.72	
	No. 200	0.08	0.312	42.3	2.68	97.96	2.04	
		Pan			32.2	2.04	100.00	0.00
				Total weight	1576.9	100.00		

Operator	Joel Davenport	Weight of tear & soil	2476.7
Date	6/4/98	Weight of tear	899.8
Remarks		Weight of soil	1576.9

Sieve Analysis

Weight of bags & soil	1584.6
Weight of soil	1567.1

Weight of empty bags	17.5
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent retained	
Site 3 814	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	7.2	0.46	0.46	99.54	
	3/8 inch	9.50	2.754	213.7	13.64	14.10	85.90	
	No. 4	4.75	2.016	544.0	34.72	48.82	51.18	
	No. 8	2.37	1.474	273.4	17.45	66.27	33.73	
	No. 16	1.18	1.077	150.8	9.63	75.90	24.10	
	No. 30	0.60	0.795	148.7	9.49	85.39	14.61	
	No. 50	0.30	0.582	113.4	7.24	92.63	7.37	
	No. 100	0.15	0.426	55.8	3.56	96.19	3.81	
	No. 200	0.08	0.312	40.4	2.58	98.77	1.23	
		Pan			19.3	1.23	100.00	0.00
				Total weight	1566.7	100.00		

Operator	Joel Davenport	Weight of tear & soil	2466.7
Date	6/4/98	Weight of tear	899.9
Remarks		Weight of soil	1566.8

Sieve Analysis

Weight of bags & soil	1521.8
Weight of soil	1504.2

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent passing	
Site 3 818	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	0.0	0.00	0.00	100.00	
	3/8 inch	9.50	2.754	258.9	17.21	17.21	82.79	
	No. 4	4.75	2.016	503.8	33.50	50.71	49.29	
	No. 8	2.37	1.474	252.6	16.80	67.51	32.49	
	No. 16	1.18	1.077	130.5	8.68	76.18	23.82	
	No. 30	0.60	0.795	131.8	8.76	84.95	15.05	
	No. 50	0.30	0.582	126.5	8.41	93.36	6.64	
	No. 100	0.15	0.426	49.3	3.28	96.64	3.36	
	No. 200	0.08	0.312	37.3	2.48	99.12	0.88	
		Pan			13.3	0.88	100.00	0.00
			Total weight	1504.0	100.00			

Operator	Joel Davenport	Weight of tear & soil	2403.9
Date	6/4/98	Weight of tear	899.9
Remarks		Weight of soil	1504.0

Sieve Analysis

Weight of bags & soil	1667.4
Weight of soil	1649.8

Weight of empty bags	17.6
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Sample number	Sieve size	Sieve opening		Field data - total weight =				Percent passing
		(mm)	.45 power	Weight retained	Percent retained	Cum. % retained	Percent retained	
Site 3 820	3/4 inch	19.00	3.762	0.0	0.00	0.00	100.00	
	1/2 inch	12.50	3.116	7.6	0.46	0.46	99.54	
	3/8 inch	9.50	2.754	255.2	15.47	15.93	84.07	
	No. 4	4.75	2.016	546.8	33.15	49.08	50.92	
	No. 8	2.37	1.474	275.4	16.70	65.78	34.22	
	No. 16	1.18	1.077	154.7	9.38	75.16	24.84	
	No. 30	0.60	0.795	143.9	8.72	83.88	16.12	
	No. 50	0.30	0.582	139.7	8.47	92.35	7.65	
	No. 100	0.15	0.426	59.4	3.60	95.95	4.05	
	No. 200	0.08	0.312	42.9	2.60	98.55	1.45	
	Pan			23.9	1.45	100.00	0.00	
				Total weight	1649.5	100.00		

Operator	Joel Davenport	Weight of tear & soil	2549.4
Date	6/4/98	Weight of tear	899.9
Remarks		Weight of soil	1649.5

Site 5

4512 of Moscow South approach

Segregation Survey

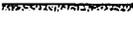
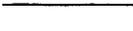
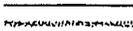
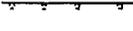
Date of Survey: Dec. 3, 1997

Surveyor: _____ (your name) *West of Moscow* ^{Weather} *road*
 Control Section Number: _____ Route: *US 12* Direction: *North West*
 Region: *Unit* Mile Post: from _____ to _____
 Section Number: *1* Test Site Number: *5* ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous   
Systematic  
Random  

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High
Low: aggregate or binder has started to wear away, but not progressed significantly
Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High
Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

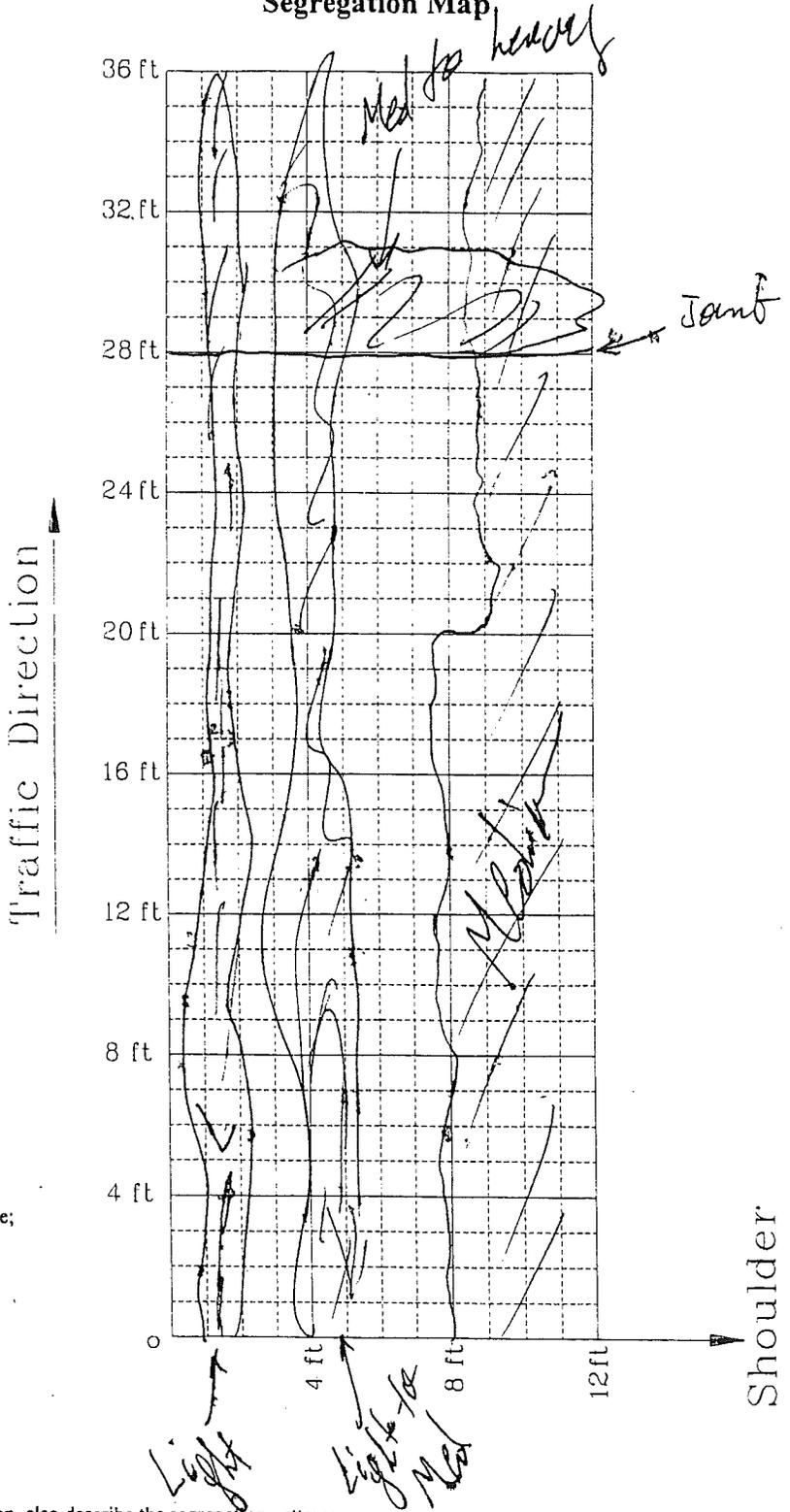
3. Rut Depth

4. Flushing

Low Moderate High
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Surveyor: _____ (your name)
 Control Section Number: _____ Route: US 12 - Moscow Rd Direction: NORTH
 Region: _____ Mile Post: from South Approach - right lane
 Section Number: _____ Test Site Number: 45 ADT: _____

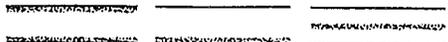
Weather: _____

Definition of Segregation:

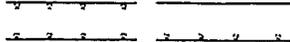
Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

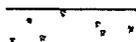
Continuous



Systematic



Random



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

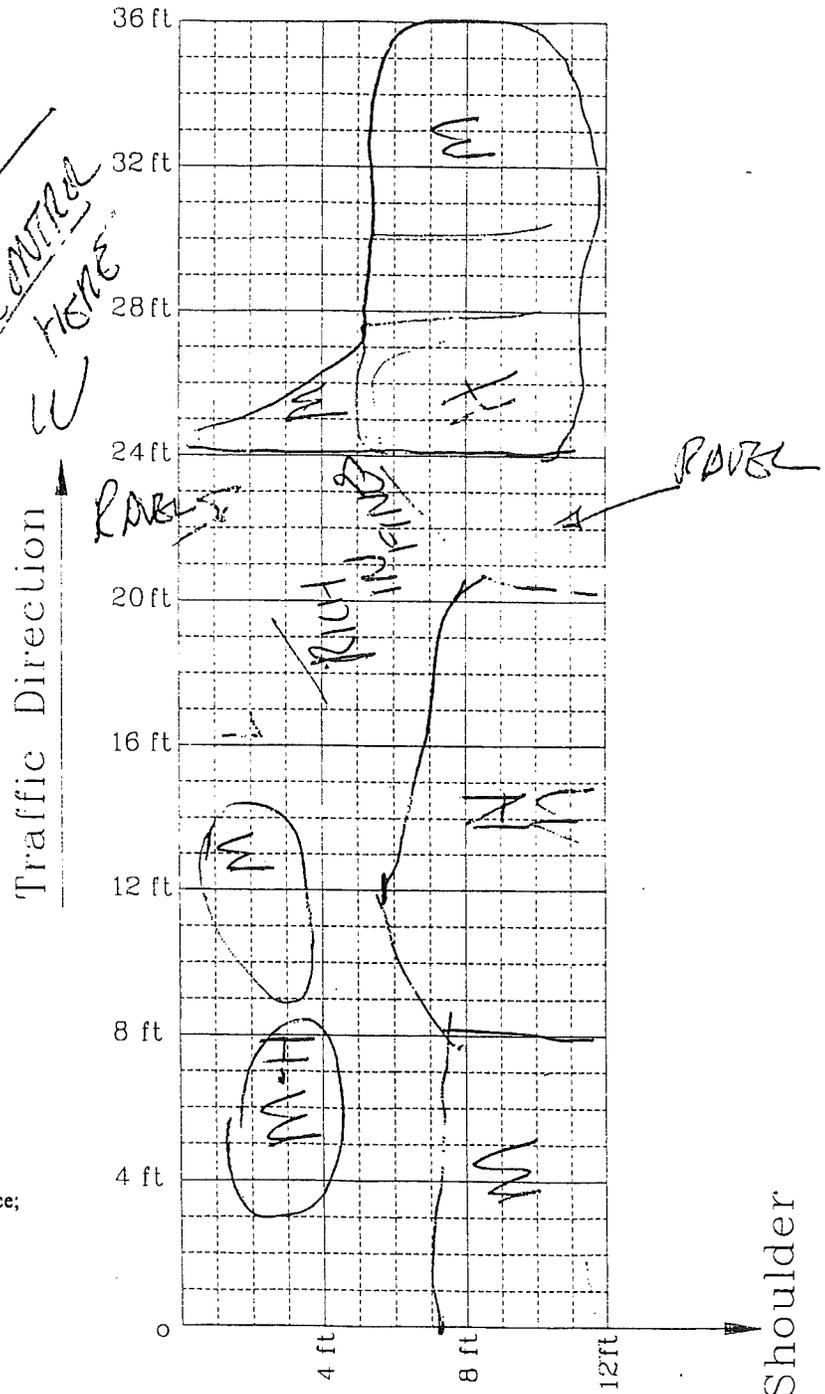
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)
 Control Section Number: _____ Route: ~~12~~ Direction: ~~W.B.~~ W.B.
 Region: University Mile Post: from _____ to _____
 Section Number: 1 Test Site Number: 5 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____
Systematic _____
Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

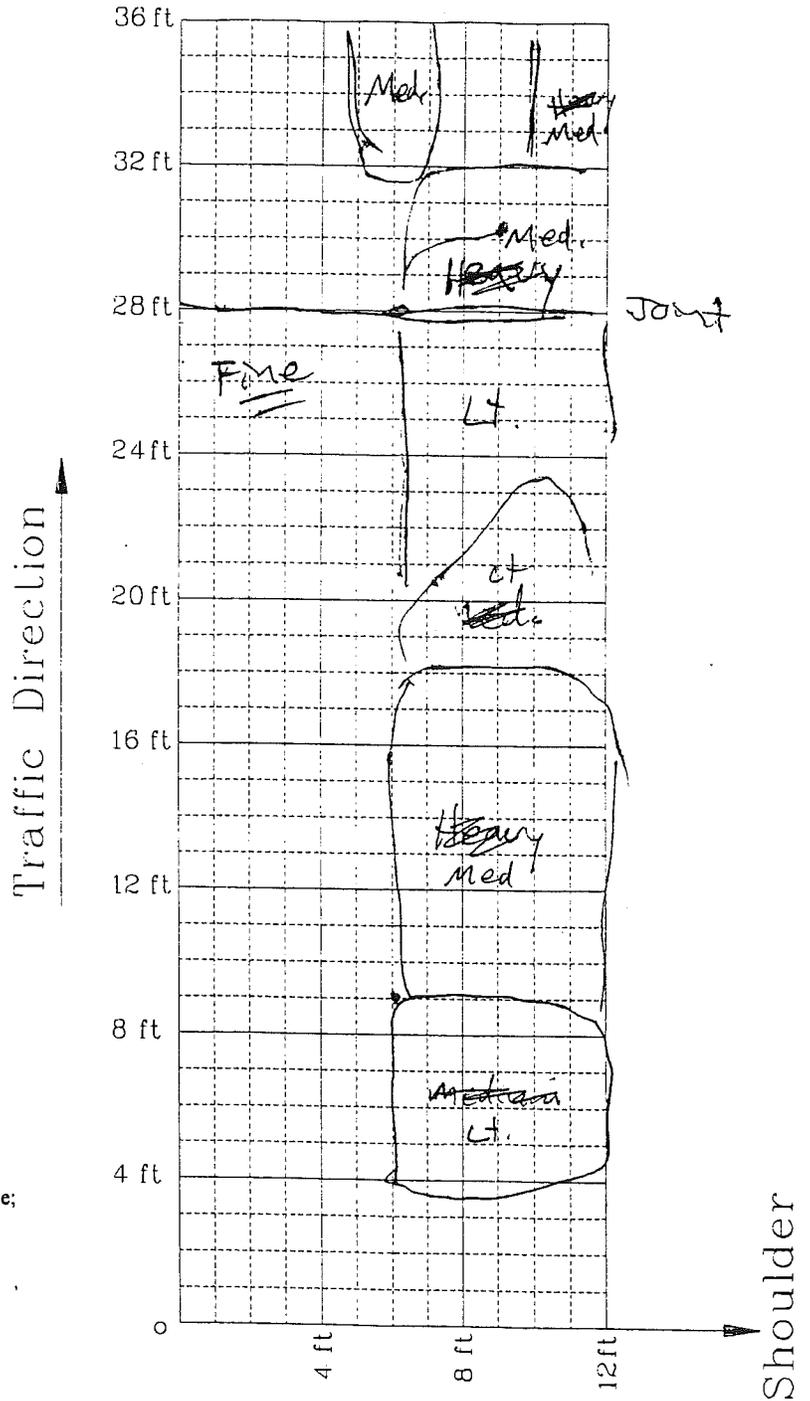
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

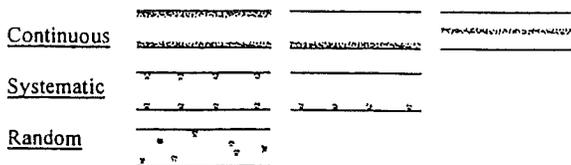
Weather:

Surveyor: _____ (your name) *# Moscow Rd*
 Control Section Number: _____ Route: *US-12* Direction: *West*
 Region: *Univ.* Mile Post: from _____ to _____
 Section Number: *1* Test Site Number: *5* ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly
Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

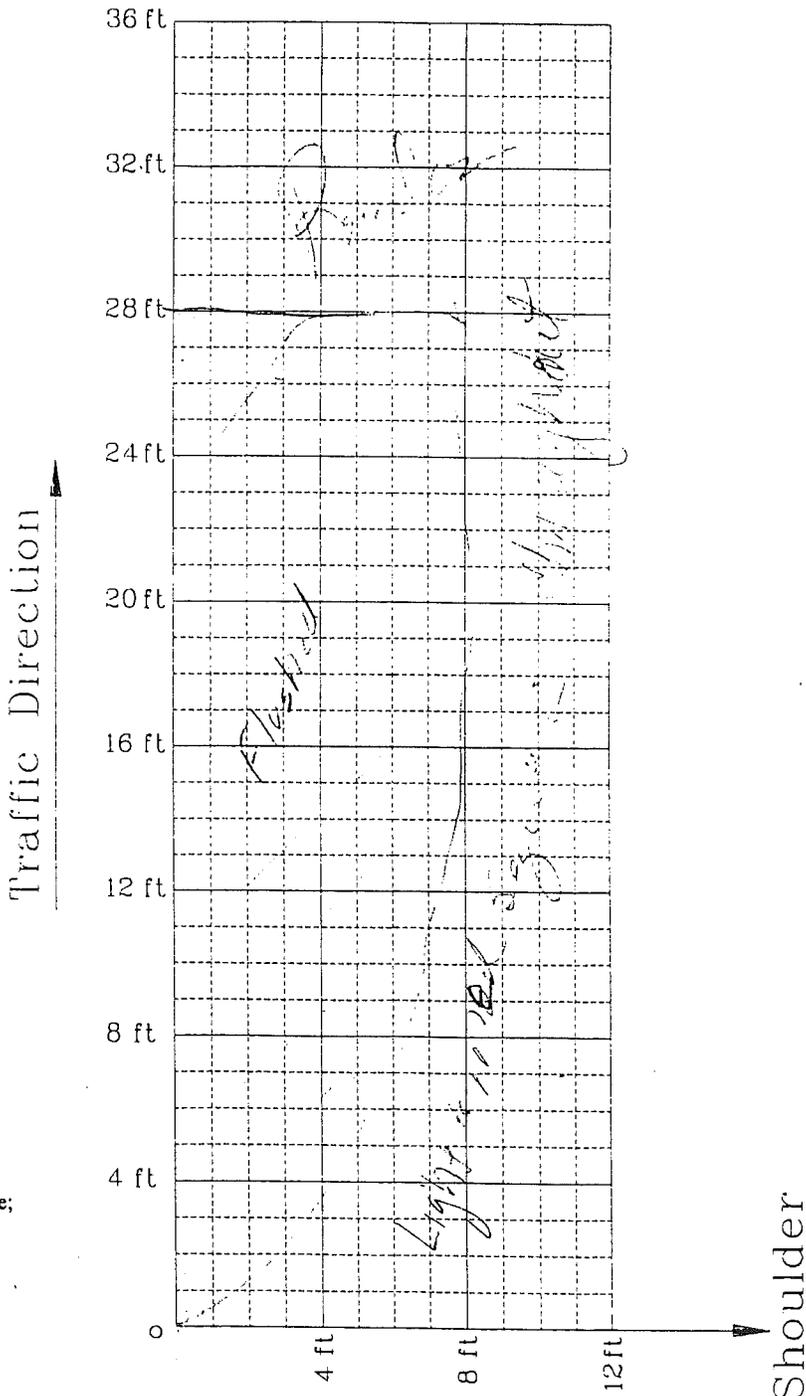
4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

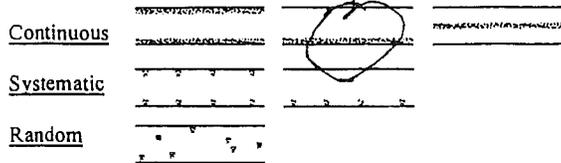
Weather:

Surveyor: _____ (your name)
 Control Section Number: _____ Route: US-12/Moscow Direction: North West
 Region: University Mile Post: from South to _____
 Section Number: _____ Test Site Number: 5 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

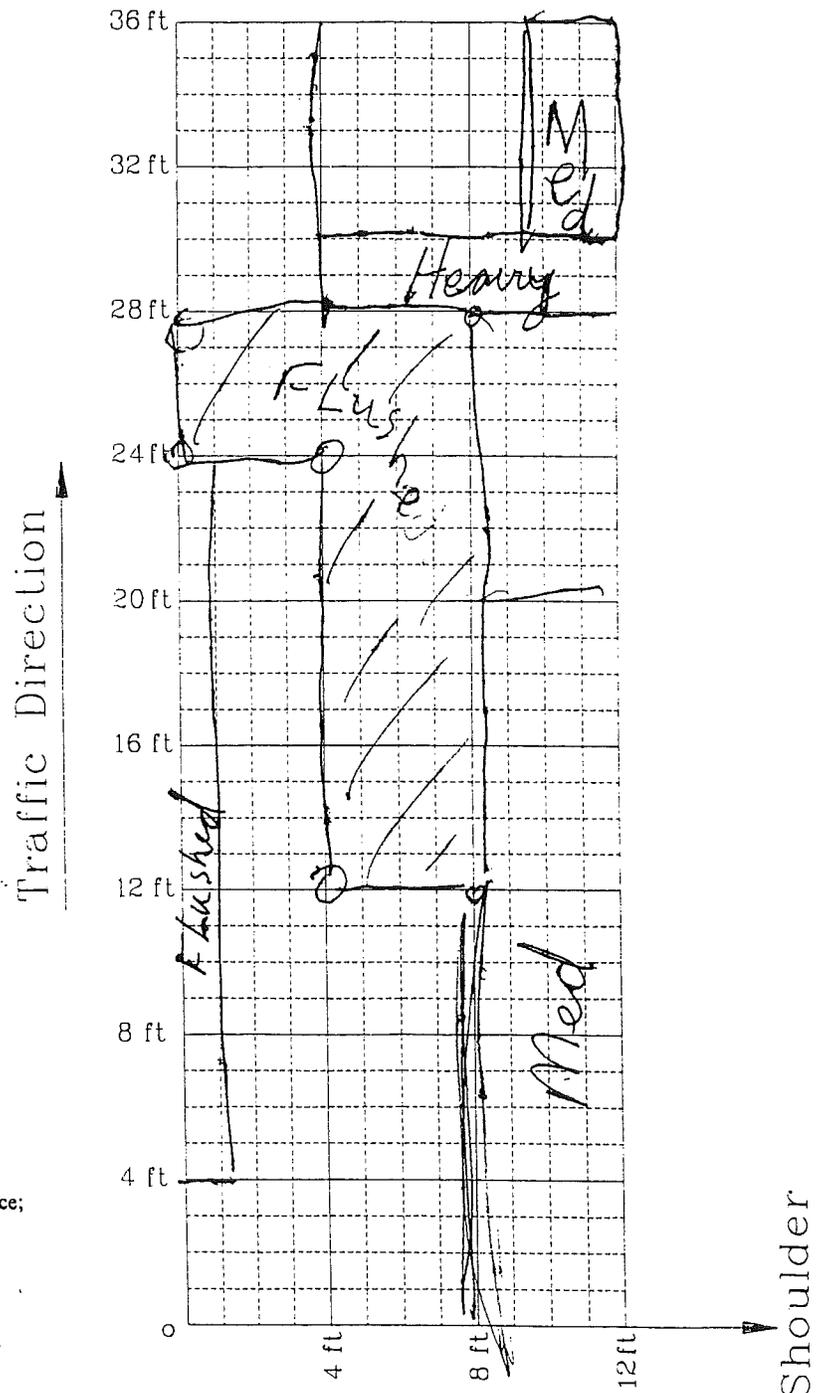
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Heavy, but still has fines in matrix

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

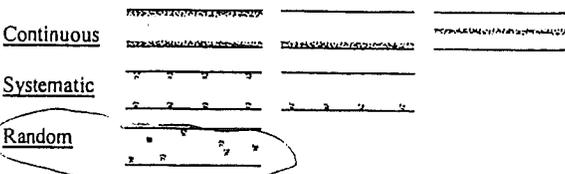
Weather: Wes

Surveyor: _____ (your name) US 12: Maxwell
 Control Section Number: _____ Route: _____ Direction: South North
 Region: University Mile Post: from _____ to _____
 Section Number: _____ Test Site Number: 45 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:



Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High
Low: aggregate or binder has started to wear away, but not progressed significantly
Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High
Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

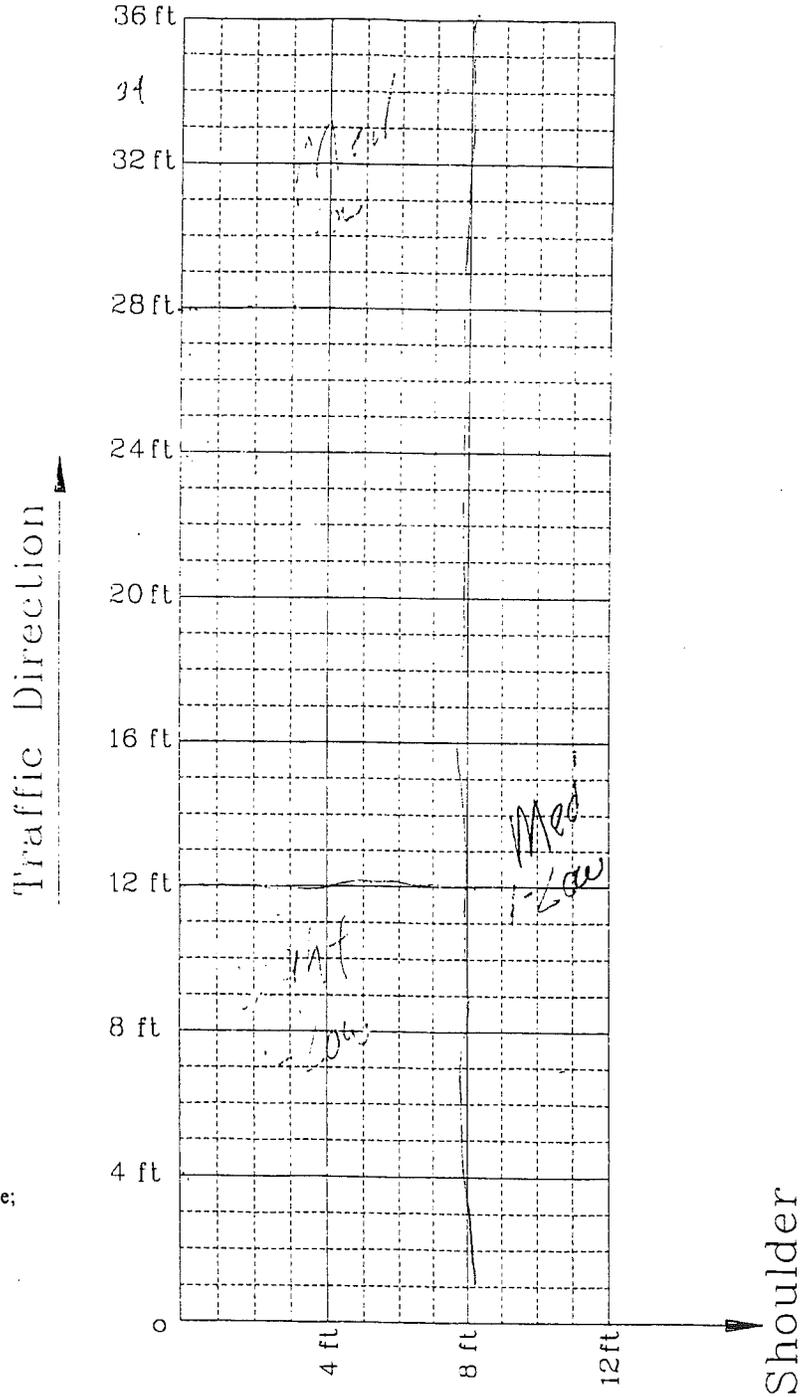
3. Rut Depth

4. Flushing

Low Moderate High
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

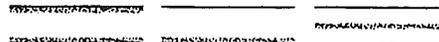
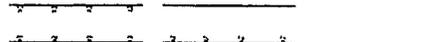
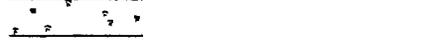
Weather: Cold, Wet, Nasty

Surveyor: _____ (your name)
 Control Section Number: _____ Route: US 12 / Moscow Rd Direction: NORTH
 Region: UNIVERSITY (8) Mile Post: from ? to ?
 Section Number: 1 Test Site Number: 5 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous 
Systematic 
Random 

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly
Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate
High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking N.A.

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.
Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking
High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth N.A.

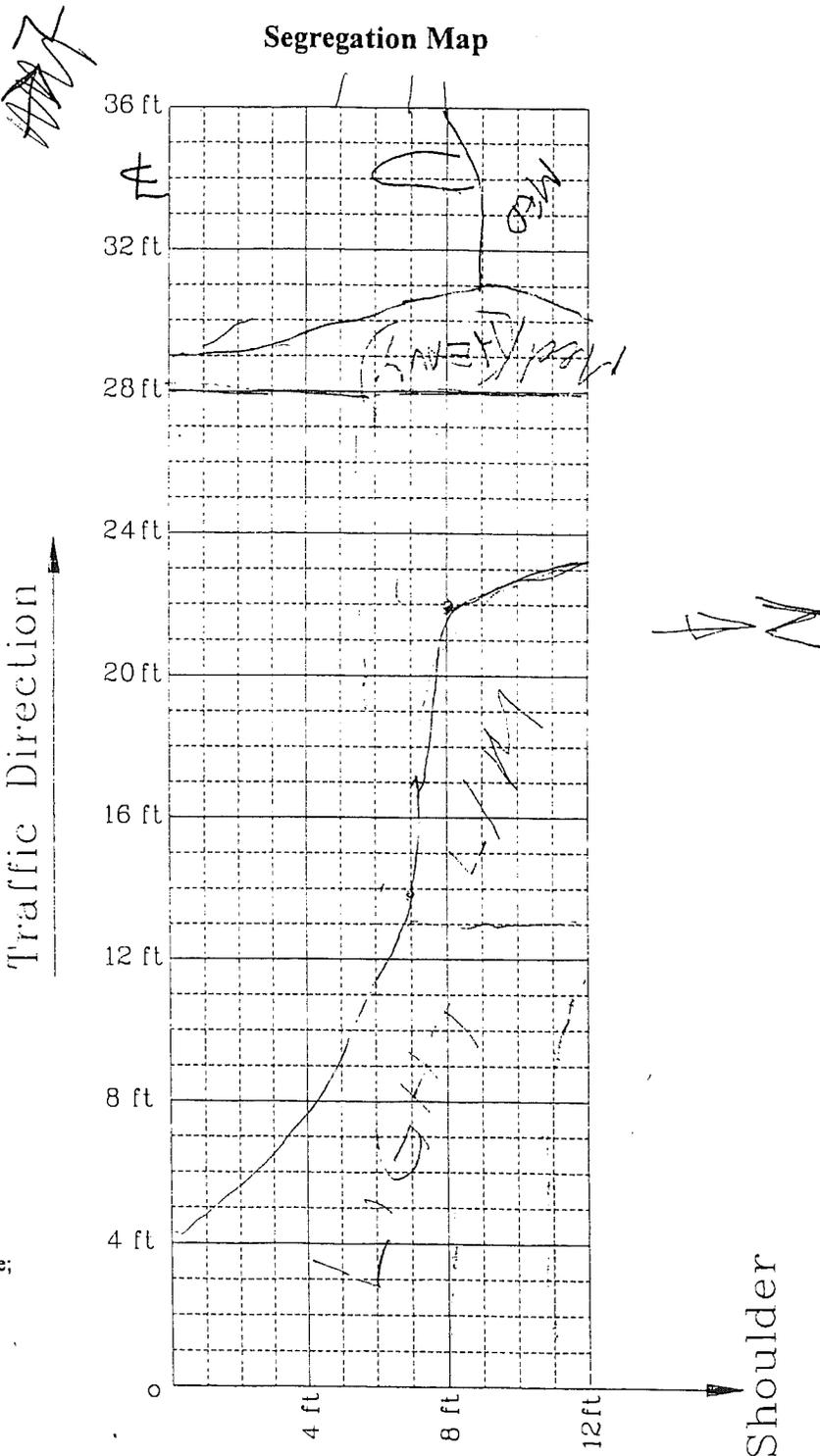
4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt
High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Segregation Survey

Date of Survey: Dec. 3, 1997

Weather:

Surveyor: _____ (your name)

Control Section Number: 30-1 Route: US-12 Direction: WB

Region: UNIVERSITY Mile Post: from S Approach to Moscow Rd.

Section Number: _____ Test Site Number: # 5 ADT: _____

West of

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous _____

Systematic _____

Random _____

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)

Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat

Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

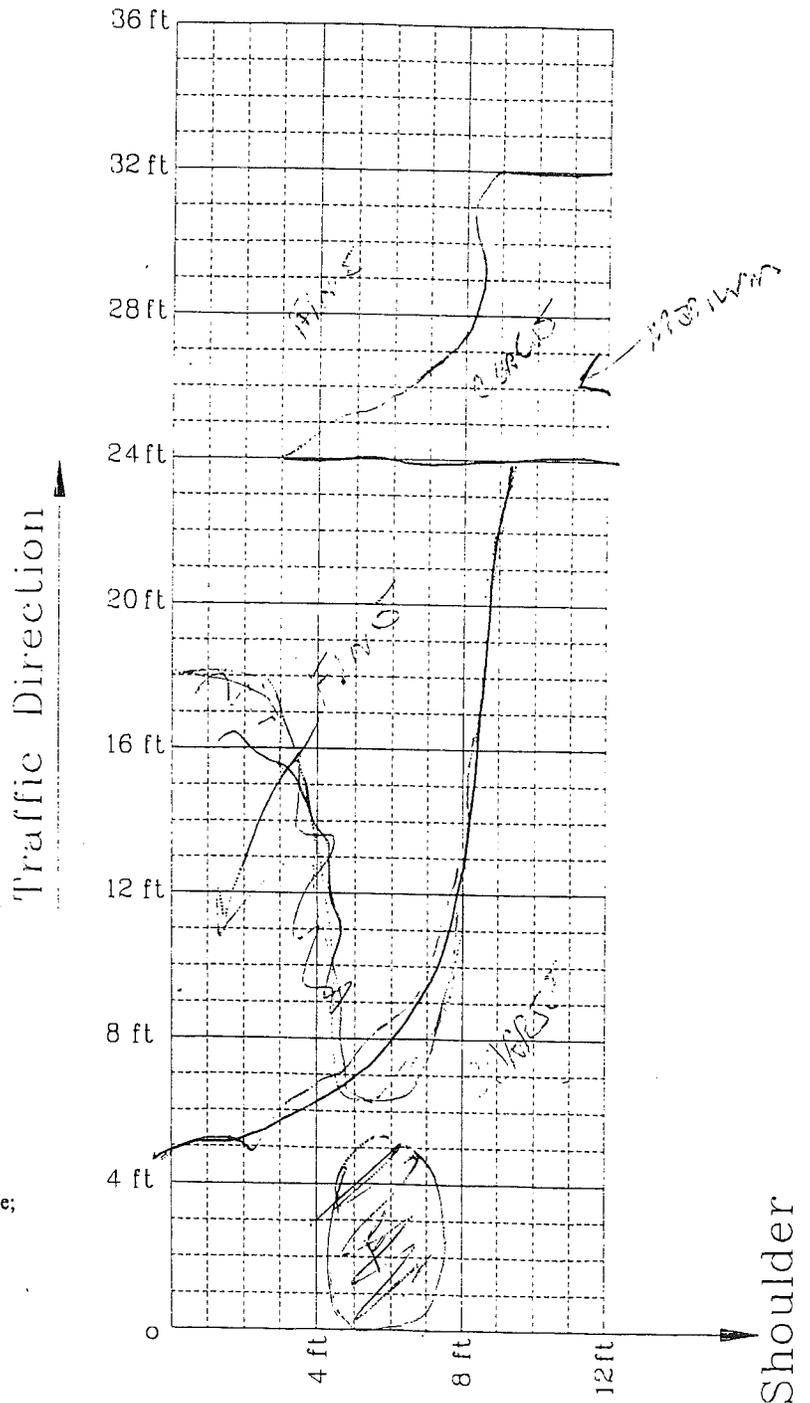
Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Not penalty

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Overlay 1.5"

35° F

across post office

Segregation Survey

Date of Survey: Dec. 3, 1997

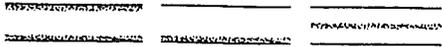
Weather:

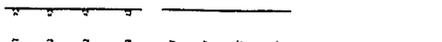
Surveyor: _____ (your name)
 Control Section Number: _____ Route: US 12 approach Direction: North
 Region: _____ Mile Post: from _____ to _____
 Section Number: _____ / _____ Test Site Number: 45 ADT: _____

Definition of Segregation:

Areas of non-uniform distribution of coarse and fine aggregate particles in a bituminous pavement that are visually identifiable or can be determined by other methods.

Type of Segregation:

Continuous 

Systematic 

Random 

Degree of Segregation

Heavy: stone against stone, little or no matrix (fine)
Medium: lack of surrounding matrix (fine), significantly more stone than surrounding mat
Light: matrix (fine) in place, more stone than surrounding mat

Distress to be Identified

1. Raveling

Low Moderate High

Low: aggregate or binder has started to wear away, but not progressed significantly

Moderate: aggregate or binder has worn away, and the surface texture becomes moderately rough and pitted; loss particles generally exist; loss of fine aggregate and some loss of coarse aggregate

High: aggregate or binder has worn away, and the surface texture is very rough and pitted; loss of coarse aggregate

2. Cracking

Low Moderate High

Low: a crack with a mean width ≤ 0.25 in.

Moderate: a crack with a mean width > 0.25 in. and ≤ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent low severity random cracking

High: any crack with a mean width ≥ 0.75 in.; or any crack with a mean width ≤ 0.75 in. and adjacent moderate to high random cracking

3. Rut Depth

4. Flushing

Low Moderate High

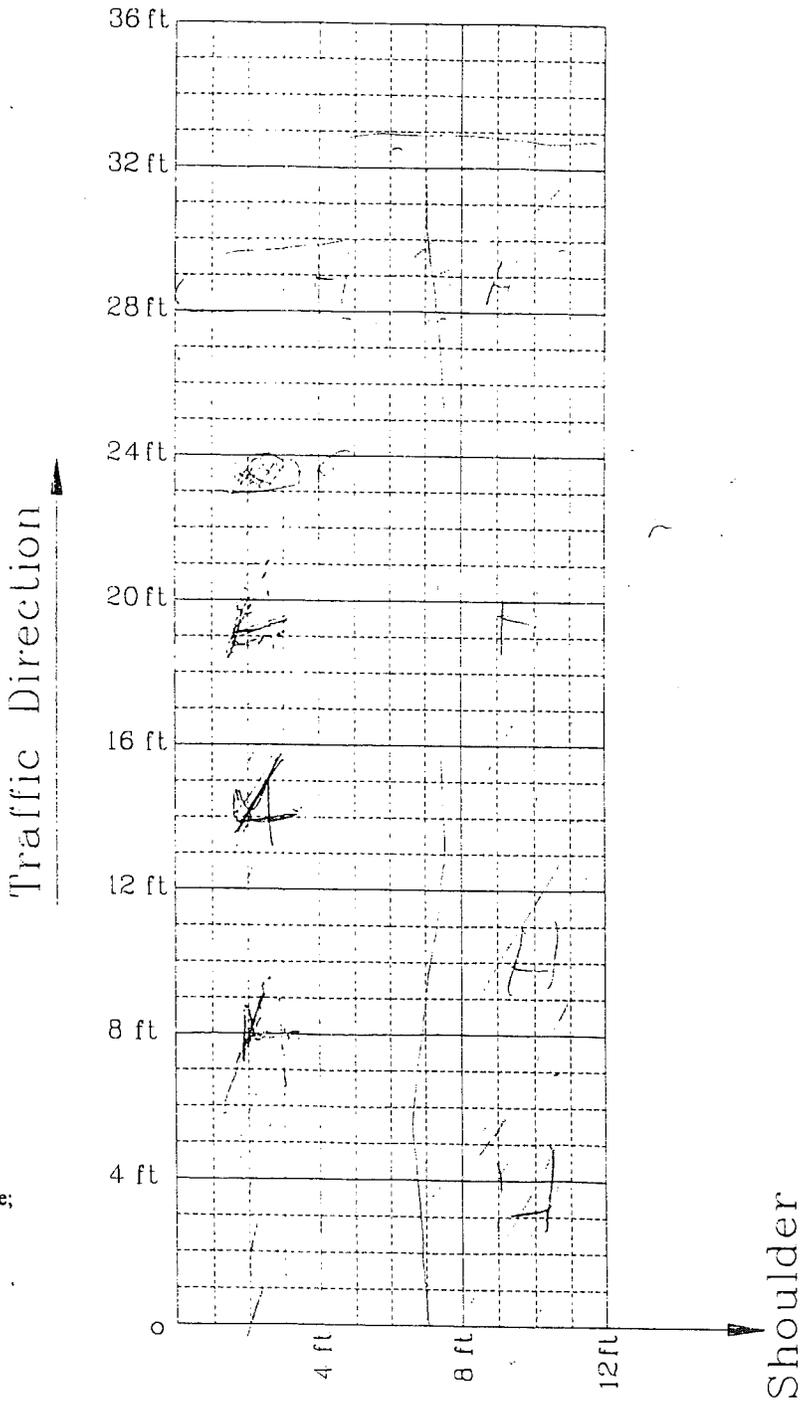
Low: an area of pavement surface discolored relative to the remainder of the pavement by excess asphalt

Moderate: an area of pavement surface that is losing surface texture due to excess asphalt

High: excess asphalt gives the pavement surface a shiny appearance; the aggregate may be obscured by excess asphalt; tire marks may be evident in warm weather

COMMENTS

Segregation Map



Please mark down the location of segregation, degree of segregation, also describe the segregation pattern; if distresses (raveling, cracking, and rutting) are identified, please provide information for the location and the severity level

Nuclear Density Sampling Data (Jan. 30, 1998)

SITE 5 US-12 W. Bound (west of Moscow road), Hillsdale County

Chart Standard	Density	2853
	Moisture	660
Operating Standard	Density	2847
	Moisture	673

Gauge No.	99398
Model	Troxler 3440
Inspector	Joe Badgley

Sample 1		mean	143.3						
Heavy		std	1.71						
0730	144.3	0830	143.3	0930	142.7	1030	144.0	1130	141.8
0729	140.6	0829	142.3	0929	143.8	1029	147.0	1129	143.2

Sample 2		mean	146.4						
Fine		std	1.51						
0626	146.9	0726	144.8	0826	149.1	0926	146.0	1026	143.9
0625	147.2	0725	146.2	0825	147.9	0925	146.4	1025	145.3

Sample 3		Sample 4		Sample 5	
Light		Medium		Medium	
0212	141.2	0820	140.6	1020	137.4
0211	141.5	0818	141.2	1018	137.1
0210	140.6	0716	140.0	1016	136.3
0209	141.7	0714	139.8	0914	138.3
0208	141.1	0712	142.9	0912	138.0
0207	135.8	0710	143.1	0910	138.2
0206	141.6	0708	137.6	0908	137.1
0205	142.1	0706	140.2	0906	139.2
0204	140.2	0704	140.0	0904	139.3
mean	140.6	mean	140.6	mean	137.9
std	1.91	std	1.67	std	1.00

Control	
Outside	
Control 10	141.7
Control 9	141.2
Control 8	142.7
Control 7	140.7
Control 6	143.2
Control 5	141.1
Control 4	142.6
Control 3	141.2
Control 2	140.0
Control 1	141.4
mean	141.6
std	0.99

