APPENDIX A

SOLVENT-FREE EMULSION SPECIAL PROVISIONS

12-22-00

SOLVENT-FREE EMULSION RESEARCH TEST SECTIONS
SPECIAL PROVISIONS

Instruction to spec writers - The following are additions to the 00735 boilerplate.

Some subsections, such as 00735.01, are already modified in the current boilerplate and therefore do not need a subsection heading added. A bold subsection heading is included here so you will know where the new text goes.

Others, such as 00735.02, are not modified by the current boilerplate, so you will have to include the subsection heading and the instruction to the reader.

In this document, bold text is instructions to *you* and should be deleted. If no bold instruction appears, just place the text in the appropriate subsection.

(00735.01 Abbreviations - Add the following.)

SFEAC - Solvent-Free Emulsified Asphalt Concrete

(Add the following.)

00735.02 Definitions - Add the following:

Solvent-Free Emulsified Asphalt Concrete (SFEAC) - A plant-mixed, uniformly coated mixture of solvent-free emulsified asphalt cement and graded aggregates.

Add the following subsection:

00735.04 SFEAC Test Section - ODOT is currently conducting a research project to evaluate the constructability and performance of EAC mixtures incorporating a solvent-free emulsified asphalt. This project includes a test section of approximately 2000 Mg of EAC mixture incorporating a solvent-free emulsified asphalt that will be compared with the standard EAC mixture placed on the remainder of the project. The SFEAC mixture will use the same aggregates and gradation as the standard EAC mixture. All other requirements for EAC apply to SFEAC except as noted in these special provisions.

Special handling, equipment modifications, and construction practices may be necessary during production and placement of the test section to provide a thorough evaluation of the SFEAC mixture. Lower than normal production rates should be anticipated for the SFEAC mixture. Have a representative of the emulsion supplier present during construction of the test section.

If directed, remove SFEAC mixture determined by the Engineer to be unsuitable for permanent pavement and replace with standard EAC.

Construct the test section in the wearing course at a time and location mutually agreed upon by the Engineer and Contractor.

(00735.11 Emulsified Asphalt) - Add the following:

Provide a solvent-free emulsified asphalt (SFCMS-2) for the SFEAC Test Section meeting the requirements in the table below:

	SFCMS-2	
TESTS ON EMULSION	Min	Max
Saybolt Viscosity @ 50°C, SFS	50	450
Settlement, % (5 days)		5
Storage Stability, % (1 day)		1
Coating Ability and Water Resistance Coating, dry aggregate Coating, after spraying Coating, wet aggregate Coating, after spraying	 Good Fair Fair Fair	
Particle charge test	Positive	
Sieve test, % [1]		0.10
Distillation to 260°C Oil Distillate, % (by volume of emulsion) Residue, % (by weight)	65	1 [2]
TESTS ON RESIDUE FROM DISTILLATION		
Penetration @25°C, 100g, 5s, dmm	100	250
Ductility @25°C, cm	40	
Solubility in Trichloroethylene, %	97.5	

[1] This test requirement on representative samples is waived if successful application of the material has been achieved in the field according to AASHTO M-140

[2] As required under Oregon Administrative Rules, Chapter 340, Division 22 – Department of Environmental Quality.

00735.13 Job Mix Formula (JMF) - In the second paragraph add “and SFEAC” after “EAC”.

Add the following line to the first table:

SFCMS-2 4 L in 1 L plastic containers

Replace the heading of the second table with the following:

EAC Mixture and SFEAC Mixture.

Add the following paragraph:

Provide all SFEAC JMF documentation to the emulsion supplier for review prior to paving the SFEAC test section.

00735.21 EAC Mixing Plant - Add the following paragraph to the end of this subsection:

The EAC mixing plant shall be capable of pumping emulsion directly from a delivery tanker, so as to allow the introduction of SFCMS-2 without the possibility of contamination from the standard emulsion in the Contractor's emulsion storage tank.

Add the following subsection:

00735.83 SFEAC Test Section - The quantities of SFEAC accepted will be measured on the mass basis according to 00190.10(b). No deduction will be made for the mass of SFCMS-2 used in the SFEAC.

There will be no separate measurement for removing unsuitable SFEAC when directed according to 00735.04.

EAC used to replace unsuitable SFEAC removed at the Engineer's direction, according to 00735.04, will be measured according to 00735.80.

(Add the following pay items under 00735.90. Re-letter if needed, depending on other added pay items.)

	Pay Item	Unit of Measurement
(g)	Solvent-Free Emulsified Asphalt Concrete Mixture	Mg
(h)	SFCMS-2 in Mixture	Mg

Items (g) and (h) will include payment for all special handling, equipment modifications, or construction procedures required to construct SFEAC test sections, and for any lost production due to construction of the test section.

EAC used to replace unsuitable SFEAC removed at the Engineer's direction, according to 00735.04, will be paid for according to 00735.90.

There will be no separate payment for removing SFEAC determined by the Engineer to be unsuitable according to 00735.04, as this removal work will be considered incidental to the replacement material.

APPENDIX B

SOLVENT-FREE MIX DESIGN

** COPY ** OREGON DEPARTMENT OF TRANSPORTATION ** COPY **
MATERIALS LABORATORY (503)986-3100
800 AIRPORT RD. SE SALEM, OR 97301-4798 FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-001779**
Project: TYGH VALLEY - JCT HWY 197 & OR-216
Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: NONE**
Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)
Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: NONE
Material Source: 33-083-4 DAVIS PIT Qty Represented: T
Sampled At: N/A Sampled By: N/A Witnessed By: N/A
DATE-Sampled: N/A Received: Tested: 01/ 5/31 Reported:
Type of Test: Contr. Cold Mix Design **Use: LEVEL 2 COARSE EAC MIX**

CONTRACTOR BITUMINOUS MIX DESIGN REVIEW

Mix Design Lab : Chris Hardwick & Assoc. CMD Technician : Chris Hardwick
HMAC Supplier : McCafferty - Whittle
Asphalt Brand : ALBINA Asphalt Grade : SF-CMS-2**Original Mix Design No. : 01-01779**

This mix design is for use in a 2000 MG test section. This mix design incorporates solvent free CMS-2. It is identical in gradation and emulsion content to mix design 01-1683 with conventional CMS-2 emulsion. Chris Hardwick, the CMDT, commented that the mix took more effort to get coating with SF-CMS-2 and took about twice as long to cure. The IRS stripping tests were lower than with the conventionial CMS-2 (64 vs. 75) but that is still well above the minimum acceptable test value of 40.

STOCKPILE PERCENTS

Aggregate Size : 12.5-2.0
Percent Comb. : 100

JOB MIX FORMULA

Sieve	% Pass	Paving Course	% Emulsion by Wt. of Dry Agg. (Pb)	Max. Specific Gravity (Gmm)
31.5 mm	100	Wearing Course	5.0	2.592
25.0	100			
19.0	100			
12.5	73			
6.3	23			
2.0	2			
425 µm	1			
75	0.9			

% Mix Moisture : 1.00

Approved: Bruce M. Patterson 5-31-01

TM 301 =$ 0.
$

REMARKS:

Mix design **DOES** comply with mix design criteria.

TOTAL LAB CHARGES: $ 0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

C: FILES ; FHWA ; PROJ MGR: CARL MICKELSON ; RAS 4 ; MC CAFFERTY-WHITTLE CONSTR. ; D. DOMINICK - PAVEMENTS BITUMINOUS ; REG 4 Q.A. COORDINATOR

01-1779

Project:	Tygh Valley - Junction Hwy197 & OR 216	Lab. No.	01-0052
Contract:	C 12,514	Brand	Albina
Source:	Davis Pit - #33-083-4	Grade	**SF-CMS-2**
Mix Class	EAC - 19 mm to 0	Percent	5.0%

Sample #			**5 A**	5.5 A
Agg. weight			**1720.0**	1720.6
Water %			**1.0%**	1.0%
Water weight			**17.2**	17.2
Emulsion %			**5.0%**	5.5%
Emulsion wt.			**86.0**	94.6
Total weight			**1823.2**	1832.4
Coating			**95%**	100% +
Height			**101.4**	100.8
Weight			**1752.8**	1769.5
Bulk Sp Gr			**2.131**	2.164
Strength/dry			**85**	85
Sample #			**5 B**	5.5 B
Agg. weight			**1719.7**	1720.2
Water %			**1.0%**	1.0%
Water weight			**17.2**	17.2
Emulsion %			**5.0%**	5.5%
Emulsion wt.			**86.0**	94.6
Total weight			**1822.9**	1832.0
Coating			**95%**	100% +
Height			**101.5**	100.3
Weight			**1759.7**	1767.9
Bulk Sp Gr			**2.138**	2.173
Strength/wet			**54**	48
IRS =			**64%**	56%
Date: 5/26/01	**Rice & voids**	**2.592**	**18%**	Tested by: Chris Hardwick

APPENDIX C

SOLVENT-LOADED MIX DESIGN

** COPY ** OREGON DEPARTMENT OF TRANSPORTATION ** COPY **

MATERIALS LABORATORY
800 AIRPORT RD. SE SALEM, OR 97301-4798
(503)986-3100
FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-001683**

Project: TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: NONE**

Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)

Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: NONE

Material Source: 33-083-4 DAVIS PIT Qty Represented: T

Sampled At: N/A Sampled By: N/A Witnessed By: N/A

DATE-Sampled: N/A Received: Tested: 01/ 5/23 Reported:

Type of Test: Contr. Cold Mix Design **Use: LEVEL 2 COARSE EAC MIX**

CONTRACTOR BITUMINOUS MIX DESIGN REVIEW

Mix Design Lab : Chris Hardwick & Assoc. CMD Technician : Chris Hardwick

HMAC Supplier : McCafferty-Whittle

Asphalt Brand : ALBINA Asphalt Grade : CMS-2S **Original Mix Design No. : 01-01683**

No apparent risk with the use of this mix design if the mix is produced and placed according to specifications. There is a 2000 MG test section on this project using mix from the same aggregate source and a solvent free emulsion.

STOCKPILE PERCENTS

Aggregate Size : 12.5-2.0

Percent Comb. : 100

JOB MIX FORMULA

Sieve	% Pass
31.5 mm	100
25.0	100
19.0	100
12.5	73
6.3	23
2.0	2
425 µm	1
75	0.9

Paving Course	% Emulsion by Wt. of Dry Agg. (Pb)	Max. Specific Gravity (Gmm)
Wearing Course	5.0	2.588

% Mix Moisture : 1.00

Approved: Bruce M. Patterson 5-24-01

=
TM 301 =$ 0.
$

REMARKS:

Mix design **DOES** comply with mix design criteria.

TOTAL LAB CHARGES: $ 0.00

REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THIS LABORATORY.

C: FILES ; FHWA ; PROJ MGR: CARL MICKELSON ; RAS 4 ; MC CAFFERTY-WHITTLE CONSTR. ; D. DOMINICK - PAVEMENTS BITUMINOUS ; REG 4 Q.A. COORDINATOR

01-1683

McCafferty Whittle Construction Company

EAC

JOB MIX FORMULA FOR AN OREGON DEPARTMENT OF TRANSPORTATION EMULSIFIED ASPHALT CONCRETE

JOB MIX CONSTITUENT	METRIC SIZES	JOB MIX FORMULA TARGET VALUES	CRUSHING BAND LIMITS
One inch sieve	25.0 mm	100%	100% to100%
3/4 inch sieve	19.0 mm	100%	95% to 100%
1/2 inch sieve	12.5 mm	73%	70% to 90%
1/4 inch sieve	6.3 mm	23%	15% to 30%
Number 10 sieve	2.0 mm	2%	0% to 7%
Number 200 sieve	0.075	0.9%	0% to 2%
			DESIGN CRITERIA
CMS-2S Asphalt Content		5.0%	
AIR VOIDS		16%	15% to 30%
PERCENT COATING		95%	90% Minimum
INDEX OF RETAINED STRENGTH		75 %	40% Recommended

SECTION: Tygh Valley - Jct Hwy 197 & OR 216 CONTRACT NO. C 12,514

PROJECT MANAGER: Carl Mickelson SPEC NO.

Date:	Job Mix Formula No.	Name & Card # of Certified Mix Design Technician	
May 21, 2001	01-0051	Chris Hardwick	Card Number 397

Project:	Tygh Valley - Junction Hwy197 & OR 216			Lab. No.	01-0051
Contract:	C 12,514			Brand	Albina
Source:	Davis Pit - #33-083-4			Grade	CMS-2s
Mix Class	EAC - 19 mm to 0			Percent	5.0%
Sample #	4 A	4.5 A	**5 A**	5.5 A	5.0 Aw
Agg. weight	1750.0	1750.2	**1750.1**	1750.2	1750.0
Water %	1.0%	1.0%	**1.0%**	1.0%	1.5%
Water weight	17.5	17.5	**17.5**	17.5	26.3
Emulsion %	4.0%	4.5%	**5.0%**	5.5%	5.0%
Emulsion wt.	70.0	78.8	**87.5**	96.3	87.5
Total weight	1837.5	1846.5	**1855.1**	1864.0	1863.8
Coating	80%	90%	**95%**	100% +	955%
Height	100.2	99.4	**101.9**	101.8	100.7
Weight	1718.4	1738.2	**1773.2**	1820.1	1767.5
Bulk Sp Gr	2.115	2.156	**2.146**	2.205	2.164
Strength/dry	90	92	**122**	108	98
Sample #	4 B	4.5 B	**5 B**	5.5 B	5 Bw
Agg. weight	1752.2	1750.7	**1750.0**	1751.4	1750.5
Water %	1.0%	1.0%	**1.0%**	1.0%	1.5%
Water weight	17.5	17.5	**17.5**	17.5	26.3
Emulsion %	4.0%	4.5%	**5.0%**	5.5%	5.0%
Emulsion wt.	70.1	78.8	**87.5**	96.3	87.5
Total weight	1839.8	1847.0	**1855.0**	1865.2	1864.3
Coating	80%	85%	**90%**	100% +	95%
Height	102.7	101.1	**102.5**	102.1	98.7
Weight	1788.3	1794.8	**1816.8**	1851.2	1784.4
Bulk Sp Gr	2.147	2.189	**2.185**	2.236	2.229
Strength/wet	38	76	**92**	104	88
IRS =	42%	83%	**75%**	96%	90%
Date: 5/20/01	**Rice & voids**	**2.588**	**16%**	Tested by: Chris Hardwick	

APPENDIX D

LABORATORY TEST RESULTS OF THE CORE SAMPLES

Solvent Loaded Emulsion Core Sampling - Wheel Path

	Sample	Mass in Air (g)	Weight (lbs)	Thickness (in)				Average Thickness (in)	Average Thickness (ft)	Diameter (in)	Diameter (ft)	Diameter^2/4 (sq ft)	Geometric Gmb	Load (lbs)	Indirect Tensile Strength (psi)	Core Appearance
14 Day	1	1109.80	2.45	3.10	3.05	3.00	3.10	3.06	0.26	3.96	0.33	0.03	1.80	159.00	8.35	Good
	2	1106.70	2.44	3.10	3.10	3.10	3.10	3.10	0.26	3.96	0.33	0.03	1.77	197.00	10.21	Good
	3	1130.40	2.49	3.10	3.10	3.15	3.10	3.11	0.26	3.96	0.33	0.03	1.80	220.00	11.36	Good
	4	1089.60	2.40	3.10	3.10	3.10	3.10	3.10	0.26	3.96	0.33	0.03	1.74	265.00	13.74	Good
	5	1146.00	2.53	3.15	3.20	3.20	3.15	3.18	0.26	3.96	0.33	0.03	1.79	189.00	9.57	Good
	6	852.50	1.88	3.00	2.75	2.00	1.75	2.38	0.20	3.96	0.33	0.03	1.78	197.00	13.33	Broken horizontally
30 Day	1	1579.80	3.48	4.10	4.24	4.24	4.08	4.17	0.35	3.96	0.33	0.03	1.88	537.00	20.72	Some Voids
	2	1232.90	2.72	3.24	3.32	3.33	3.36	3.31	0.28	3.96	0.33	0.03	1.85	265.00	12.86	Good
	3	1613.60	3.56	4.05	4.28	4.20	4.12	4.16	0.35	3.96	0.33	0.03	1.92	611.00	23.59	Good
	4	1528.70	3.37	3.88	3.90	3.95	3.99	3.93	0.33	3.96	0.33	0.03	1.93	257.00	10.51	Some Voids, pop-out on top
	5	1242.80	2.74	3.22	3.19	3.26	3.30	3.24	0.27	3.96	0.33	0.03	1.90	167.00	8.28	Horizontal crack near bottom
	6	1568.80	3.46	4.08	4.02	3.98	3.98	4.02	0.33	3.96	0.33	0.03	1.94	280.00	11.21	Voids on one side at mid-depth
60 Day	1	1219.40	2.69	3.23	3.35	3.21	3.28	3.27	0.27	3.96	0.33	0.03	1.85	379.00	18.64	Some small voids
	2	1249.70	2.76	3.19	3.31	3.35	3.3	3.29	0.27	3.96	0.33	0.03	1.88	447.00	21.86	Good
	3	1242.90	2.74	3.27	3.3	3.32	3.29	3.30	0.27	3.96	0.33	0.03	1.87	394.00	19.22	Small piece missing from the bottom
	4	1245.90	2.75	3.31	3.23	3.31	3.24	3.27	0.27	3.96	0.33	0.03	1.89	409.00	20.09	Oily on bottom
	5	1225.00	2.70	3.33	3.31	3.36	3.29	3.32	0.28	3.96	0.33	0.03	1.83	295.00	14.27	Lower half, vertical separation
	6	1236.70	2.73	3.22	3.27	3.24	3.21	3.24	0.27	3.96	0.33	0.03	1.90	371.00	18.43	Good
180 Day	1	1116.60	2.46	2.83	2.89	3.00	2.91	2.91	0.24	3.96	0.33	0.03	1.90	989	54.68	Fair
	2	721.40	1.59	1.87	1.84	1.79	1.85	1.84	0.15	3.96	0.33	0.03	1.95	604	52.84	Broke (uniform)
	3	1101.50	2.43	2.75	2.85	2.90	2.75	2.81	0.23	3.96	0.33	0.03	1.94	1033	59.04	Good
	4	1227.30	2.71	3.20	3.16	3.19	3.17	3.18	0.27	3.96	0.33	0.03	1.91	1159	58.58	Fair
	5	1140.10	2.51	3.08	3.09	3.06	2.69	2.98	0.25	3.96	0.33	0.03	1.90	1026	55.34	Chipped on bottom
	6	1253.00	2.76	3.24	3.29	2.96	3.23	3.18	0.27	3.96	0.33	0.03	1.95	959	48.48	Chipped on bottom
360 Day	1	1280.6	2.82	3.36	3.27	3.33	3.29	3.31	0.28	3.96	0.33	0.03	1.92	792.3	38.46	Good
	2	1212.6	2.67	3.29	3.14	3.29	3.22	3.23	0.27	3.96	0.33	0.03	1.86	792.3	39.39	Bottom was falling apart
	3	1154.5	2.55	3.29	3.50	3.33	3.35	3.37	0.28	3.96	0.33	0.03	1.70	750.6	35.85	Bottom was missing some aggregate
	4	1294.8	2.86	3.30	3.25	3.23	3.24	3.25	0.27	3.96	0.33	0.03	1.97	959.1	47.37	Good
	5	1353.8	2.99	3.47	3.46	3.47	3.41	3.45	0.29	3.96	0.33	0.03	1.94	695.0	32.34	Good
	6	1248.7	2.75	3.17	3.24	3.20	3.22	3.21	0.27	3.96	0.33	0.03	1.93	597.7	29.95	Good

Solvent Loaded Emulsion Core Sampling - Center of Travel Lane

	Sample	Mass in Air (g)	Weight (lbs)	Thickness (in)				Average Thickness (in)	Average Thickness (ft)	Diameter (in)	Diameter (ft)	Diameter^2/ 4 (sq ft)	Geometric Gmb	Load (lbs)	Indirect Tensile Strength (psi)	Core Appearance
14 Day	1	1005.00	2.22	2.90	2.85	2.80	2.90	2.86	0.24	3.96	0.33	0.03	1.74	159.00	8.93	Good
	2	954.90	2.11	2.90	2.85	2.90	2.50	2.79	0.23	3.96	0.33	0.03	1.70	144.00	8.30	Horizontal crack - irregular core bottom
	3	825.60	1.82	2.50	2.60	2.20	2.30	2.40	0.20	3.96	0.33	0.03	1.71	129.00	8.64	Horizontal crack - irregular core bottom
	4	1058.50	2.33	3.00	2.90	2.90	2.90	2.93	0.24	3.96	0.33	0.03	1.79	121.00	6.65	Horizontal crack - irregular core bottom
	5	1116.40	2.46	3.00	3.00	3.10	3.10	3.05	0.25	3.96	0.33	0.03	1.81	204.00	10.75	Fair - Samll horizontal crack
	6	1112.70	2.45	3.00	3.00	3.05	3.00	3.01	0.25	3.96	0.33	0.03	1.83	174.00	9.28	Fair - Samll horizontal crack
30 Day	1	1432.80	3.16	3.66	3.81	3.80	3.79	3.77	0.31	3.96	0.33	0.03	1.89	492.00	21.01	Visible Voids
	2	1216.20	2.68	3.19	3.30	3.32	3.29	3.28	0.27	3.96	0.33	0.03	1.84	250.00	12.27	Good
	3	1227.20	2.71	3.13	3.18	3.29	3.28	3.22	0.27	3.96	0.33	0.03	1.89	250.00	12.48	Good
	4	1151.30	2.54	3.37	3.40	2.51	3.25	3.13	0.26	3.96	0.33	0.03	1.82	114.00	5.85	Chunk out of the lower half
	5	1249.90	2.76	3.15	3.30	3.34	3.35	3.29	0.27	3.96	0.33	0.03	1.89	174.00	8.51	Voids at mid-depth
	6	1264.10	2.79	3.27	3.28	3.35	3.33	3.31	0.28	3.96	0.33	0.03	1.89	204.00	9.91	Voids along top half
60 Day	1	656.90	1.45	1.34	2.08	2.08	2.03	1.88	0.16	3.96	0.33	0.03	1.73	326.00	27.84	Very Short
	2	1228.90	2.71	3.45	3.45	3.49	3.28	3.42	0.28	3.96	0.33	0.03	1.78	507.00	23.85	Bottom 1/2", very oily
	3	1217.00	2.68	3.35	3.24	3.14	3.26	3.25	0.27	3.96	0.33	0.03	1.86	591.00	29.25	Good
	4	1711.70	3.77	4.39	4.3	4.32	4.35	4.34	0.36	3.96	0.33	0.03	1.96	803.00	29.74	Tall Sample
	5	1256.00	2.77	3.32	3.41	3.48	3.48	3.42	0.29	3.96	0.33	0.03	1.82	507.00	23.81	Good
	6	1163.90	2.57	3.12	2.99	2.9	3.22	3.06	0.25	3.96	0.33	0.03	1.89	500.00	26.29	Good
180 Day	1	1198.20	2.64	3.11	3.24	3.32	3.27	3.24	0.27	3.96	0.33	0.03	1.84	759.00	37.71	Fair
	2	1138.30	2.51	3.03	2.81	2.85	2.93	2.91	0.24	3.96	0.33	0.03	1.94	870.00	48.14	Chipped at bottom
	3	1163.70	2.57	2.87	3.08	2.85	2.81	2.90	0.24	3.96	0.33	0.03	1.99	1003.00	55.55	Chipped at bottom
	4	1162.50	2.56	2.83	3.27	3.21	2.98	3.07	0.26	3.96	0.33	0.03	1.88	900.00	47.08	Chipped at bottom
	5	1064.70	2.35	2.81	2.89	2.85	2.78	2.83	0.24	3.96	0.33	0.03	1.86	907.00	51.47	Chipped at bottom
	6	1209.80	2.67	3.18	2.89	3.23	3.12	3.11	0.26	3.96	0.33	0.03	1.93	974.00	50.42	Fair
360 Day	1	1276.50	2.81	3.25	3.36	3.29	3.24	3.29	0.27	3.96	0.33	0.03	1.93	834.00	40.81	Good
	2	1273.30	2.81	3.36	3.32	3.28	3.35	3.33	0.28	3.96	0.33	0.03	1.90	736.70	35.60	Good
	3	1293.50	2.85	3.30	3.34	3.33	3.33	3.32	0.28	3.96	0.33	0.03	1.93	820.10	39.65	Good
	4	1324.00	2.92	3.41	3.38	3.42	3.40	3.40	0.28	3.96	0.33	0.03	1.93	861.80	40.70	Good
	5	1311.70	2.89	3.39	3.32	3.35	3.45	3.38	0.28	3.96	0.33	0.03	1.93	820.10	39.04	Good
	6	1202.30	2.65	3.33	3.26	3.18	3.34	3.28	0.27	3.96	0.33	0.03	1.82	667.20	32.72	Bottom of Core was falling apart.

Solvent Free Emulsion Core Sampling - Wheel Path

	Sample	Mass in Air (g)	Weight (lbs)	Thickness (in)				Average Thickness (in)	Average Thickness (ft)	Diameter (in)	Diameter (ft)	Diameter^2 /4 (sq ft)	Geometric Gmb	Load (lbs)	Indirect Tensile Strength (psi)	Core Appearance
14 Day	1	806.50	1.78	2.35	2.30	2.25	2.20	2.28	0.19	3.96	0.33	0.03	1.76	121	8.55	Horizontal cracking
	2	662.70	1.46	1.80	1.90	2.20	2.20	2.03	0.17	3.96	0.33	0.03	1.62	53	4.21	Vertical crack; core broke in mold
	3	822.20	1.81	2.45	2.40	2.40	2.45	2.43	0.20	3.96	0.33	0.03	1.68	148	9.81	Good
	4	797.50	1.76	2.00	2.20	2.30	2.30	2.20	0.18	3.96	0.33	0.03	1.80	167	12.20	Horizontal cracking
	5	812.20	1.79	2.25	2.30	2.30	2.30	2.29	0.19	3.96	0.33	0.03	1.76	144	10.12	Good
	6	808.00	1.78	2.30	2.30	2.20	2.25	2.26	0.19	3.96	0.33	0.03	1.77	197	14.00	Good
30 Day	1	946.60	2.09	2.55	2.51	2.49	2.44	2.50	0.21	3.96	0.33	0.03	1.88	325.7	20.96	Good
	2	952.10	2.10	2.50	2.56	2.58	2.51	2.54	0.21	3.96	0.33	0.03	1.86	355.8	22.54	Good
	3	955.60	2.11	2.61	2.58	2.57	2.54	2.58	0.21	3.96	0.33	0.03	1.84	235	14.67	Diagonal Vertical Crack
	4	920.50	2.03	2.51	2.55	2.49	2.47	2.51	0.21	3.96	0.33	0.03	1.82	204	13.09	Good
	5	946.20	2.09	2.43	2.36	2.49	2.50	2.45	0.20	3.96	0.33	0.03	1.92	136	8.94	Good
	6	947.10	2.09	2.48	2.55	2.42	2.51	2.49	0.21	3.96	0.33	0.03	1.89	182	11.75	Horizontal Crack at mid-depth
60 Day	1	942.50	2.08	2.50	2.31	2.41	2.58	2.45	0.20	3.96	0.33	0.03	1.91	288	18.90	Good
	2	960.10	2.12	2.56	2.57	2.59	2.56	2.57	0.21	3.96	0.33	0.03	1.85	424	26.52	Good
	3	915.70	2.02	2.49	2.50	2.48	2.45	2.48	0.21	3.96	0.33	0.03	1.83	295	19.12	Good
	4	940.80	2.07	2.44	2.49	2.56	2.46	2.49	0.21	3.96	0.33	0.03	1.87	356	23.00	Good
	5	938.60	2.07	2.49	2.53	2.59	2.49	2.53	0.21	3.96	0.33	0.03	1.84	348	22.15	Good
	6	931.70	2.05	2.51	2.43	2.56	2.43	2.48	0.21	3.96	0.33	0.03	1.86	379	24.54	Good
180 Day	1	956.70	2.11	2.51	2.56	2.48	2.56	2.53	0.21	3.96	0.33	0.03	1.88	863	54.88	Fair
	2	964.30	2.13	2.54	2.51	2.56	2.56	2.54	0.21	3.96	0.33	0.03	1.88	855	54.05	Fair
	3	953.10	2.10	2.47	2.48	2.46	2.53	2.49	0.21	3.96	0.33	0.03	1.90	833	53.88	Fair
	4	943.90	2.08	2.33	2.48	2.56	2.34	2.43	0.20	3.96	0.33	0.03	1.93	915	60.59	Fair
	5	959.50	2.12	2.55	2.42	2.44	2.42	2.46	0.20	3.96	0.33	0.03	1.94	907	59.33	Fair
	6	962.30	2.12	2.42	2.50	2.47	2.39	2.45	0.20	3.96	0.33	0.03	1.95	781	51.35	Good
360 Day	1	962.70	2.12	2.52	2.51	2.50	2.45	2.49	0.21	3.96	0.33	0.03	1.91	542	34.95	Good
	2	929.20	2.05	2.52	2.46	2.51	2.51	2.50	0.21	3.96	0.33	0.03	1.84	472.6	30.40	Good
	3	896.50	1.98	2.45	2.49	2.29	2.29	2.38	0.20	3.96	0.33	0.03	1.87	583.3	39.43	Good
	4	925.60	2.04	2.48	2.46	2.47	2.44	2.46	0.21	3.96	0.33	0.03	1.86	569.9	37.19	Small piece missing-botom
	5	926.70	2.04	2.36	2.48	2.51	2.38	2.43	0.20	3.96	0.33	0.03	1.89	417	27.56	Good
	6	934.90	2.06	2.43	2.42	2.36	2.51	2.43	0.20	3.96	0.33	0.03	1.91	472.6	31.25	Good

Solvent Free Emulsion Core Sampling - Center of Travel Lane

	Sample	Mass in Air (g)	Weight (lbs)	Thickness (in)				Average Thickness (in)	Average Thickness (ft)	Diameter (in)	Diameter (ft)	Diameter2/4 (sq ft)	Geometric Gmb	Load (lbs)	Indirect Tensile Strength (psi)	Core Appearance
14 Day	1	765.00	1.69	2.10	2.10	2.10	2.15	2.11	0.18	3.96	0.33	0.03	1.80	136	10.35	Fair - Small pop out on one side
	2	776.60	1.71	2.30	2.00	2.00	2.20	2.13	0.18	3.96	0.33	0.03	1.81	144	10.89	Small vertical cracks
	3	780.10	1.72	2.20	2.10	2.20	2.10	2.15	0.18	3.96	0.33	0.03	1.80	125	9.35	Fair - Small vertcal cracks
	4	795.00	1.75	2.15	2.15	2.15	2.15	2.15	0.18	3.96	0.33	0.03	1.83	178	13.31	Good
	5	797.70	1.76	2.15	2.20	2.20	2.00	2.14	0.18	3.96	0.33	0.03	1.85	204	15.34	Silghtly irregular core bottom
	6	798.50	1.76	2.10	2.10	2.00	2.10	2.08	0.17	3.96	0.33	0.03	1.91	250	19.37	Good
30 Day	1	931.00	2.05	2.50	2.65	2.70	2.55	2.60	0.22	3.96	0.33	0.03	1.78	318	19.66	Good
	2	1269.50	2.80	2.94	3.12	3.12	3.09	3.07	0.26	3.96	0.33	0.03	2.05	730	38.25	Good
	3	912.70	2.01	2.44	2.65	2.49	2.30	2.47	0.21	3.96	0.33	0.03	1.83	326	21.22	Pop-out of bottom
	4	1288.10	2.84	3.25	3.34	3.20	3.31	3.28	0.27	3.96	0.33	0.03	1.95	678	33.28	Good
	5	894.20	1.97	2.36	2.28	2.36	2.51	2.38	0.20	3.96	0.33	0.03	1.86	227	15.35	Small pop-out on bottom
	6	912.90	2.01	2.43	2.33	2.26	2.19	2.30	0.19	3.96	0.33	0.03	1.97	212	14.80	Pop-out on bottom
60 Day	1	894.5	1.97	2.49	2.42	2.32	2.30	2.38	0.20	3.96	0.33	0.03	1.86	416	28.07	Good
	2	870.8	1.92	2.46	2.49	2.55	2.46	2.49	0.21	3.96	0.33	0.03	1.73	500	32.28	Separation on bottom half
	3	956.3	2.11	2.46	2.40	2.40	2.43	2.42	0.20	3.96	0.33	0.03	1.96	538	35.70	Sample was damp
	4	954.2	2.10	2.37	2.46	2.51	2.47	2.45	0.20	3.96	0.33	0.03	1.93	575	37.69	Good, Damp on one side
	5	927.6	2.05	2.38	2.16	2.50	2.59	2.41	0.20	3.96	0.33	0.03	1.91	553	36.92	Good
	6	921	2.03	2.29	2.42	2.48	2.48	2.42	0.20	3.96	0.33	0.03	1.89	644	42.82	Half was damp
180 Day	1	1000.20	2.21	2.55	2.41	2.57	2.51	2.51	0.21	3.96	0.33	0.03	1.98	959	61.41	Good
	2	1023.70	2.26	2.50	2.46	2.53	2.59	2.52	0.21	3.96	0.33	0.03	2.01	1048	66.85	Fair
	3	983.50	2.17	2.53	2.22	2.52	2.48	2.44	0.20	3.96	0.33	0.03	2.00	893	58.89	Chipped on both sides
	4	1004.70	2.22	2.54	2.58	2.51	2.46	2.52	0.21	3.96	0.33	0.03	1.97	1077	68.63	Good
	5	990.50	2.18	2.42	2.52	2.48	2.46	2.47	0.21	3.96	0.33	0.03	1.99	841	54.73	Good
	6	1002.70	2.21	2.54	2.41	2.52	2.53	2.50	0.21	3.96	0.33	0.03	1.99	863	55.49	Fair
360 Day	1	1375.6	3.03	3.54	3.38	3.38	3.32	3.41	0.28	3.96	0.33	0.03	2.00	959.1	45.26	Good
	2	1017.1	2.24	2.59	2.49	2.59	2.55	2.55	0.21	3.96	0.33	0.03	1.97	625.5	39.36	Good
	3	1029.0	2.27	2.64	2.56	2.65	2.58	2.61	0.22	3.96	0.33	0.03	1.96	736.7	45.42	Good
	4	1018.1	2.24	2.60	2.57	2.56	2.52	2.56	0.21	3.96	0.33	0.03	1.97	667.2	41.87	Good
	5	1011.1	2.23	2.55	2.60	2.60	2.53	2.57	0.21	3.96	0.33	0.03	1.95	528.2	33.06	Good
	6	1003.0	2.21	2.55	2.57	2.54	2.43	2.52	0.21	3.96	0.33	0.03	1.97	514.3	32.79	Good

APPENDIX E

LABORATORY TEST RESULTS
OF THE
LABORATORY COMPACTED SAMPLES

TYGH VALLEY EAC RESEARCH

St=2P/(3.1416*t*d) in inches

St = TENSILE STRENGTH
P = MAXIMUM LOAD
t = SPECIMEN THICKNESS
d = SPECIMEN DIAMETER

CURE TIME IN DAYS

SAMPLE NO	P	t	d	St	MASS	Ht	Gmb	Gmm	Va	CURE	Ave Va	Ave P	Ave St
1 SFCMS-2	586	2.68	4	34.80022	1116.8	68.1	2.022	2.659	23.9	7	22.4	596	35.89282
2 SFCMS-2	654	2.62	4	39.72790	1122.3	66.5	2.081	2.659	21.7	7			
3 SFCMS-2	643	2.66	4	38.47233	1122.0	67.6	2.047	2.659	23.0	7			
4 SFCMS-2	598	2.67	4	35.64586	1117.3	67.1	2.053	2.659	22.8	7			
5 SFCMS-2	553	2.60	4	33.85095	1126.2	66.0	2.104	2.659	20.9	7			
6 SFCMS-2	543	2.63	4	32.85967	1122.7	66.8	2.073	2.659	22.1	7			
F S 3 - 10	337	2.429	4	22.08114	1033.1	61.7	2.064896	2.745	24.8	30			
7 CMS-2S	427	2.68	4	25.35784	1126.7	68.1	2.040	2.639	22.7	7	23.3	447	26.46249
8 CMS-2S	450	2.71	4	26.42788	1126.3	68.8	2.019	2.639	23.5	7			
9 CMS-2S	493	2.69	4	29.16848	1120.2	68.3	2.023	2.639	23.4	7			
10 CMS-2S	416	2.69	4	24.61275	1112.7	68.3	2.009	2.639	23.9	7			
11 CMS-2S	442	2.67	4	26.34694	1122.3	67.8	2.041	2.639	22.6	7			
12 CMS-2S	454	2.69	4	26.86103	1115.7	68.3	2.015	2.639	23.7	7			
13 SFCMS-2	646	2.68	4	38.34760	1125.1	68.1	2.037	2.659	23.4	30	24.1	629.8333	37.26324
14 SFCMS-2	554	2.71	4	32.55174	1114.1	68.8	1.997	2.659	24.9	30			
15 SFCMS-2	668	2.66	4	39.94686	1113.6	67.6	2.032	2.659	23.6	30			
16 SFCMS-2	610	2.70	4	35.89434	1119.2	68.7	2.009	2.659	24.4	30			
17 SFCMS-2	700	2.69	4	41.37088	1120.3	68.4	2.020	2.659	24.0	30			
18 SFCMS-2	601	2.70	4	35.46800	1119.3	68.5	2.015	2.659	24.2	30			

19	CMS-2S	540	2.73	4	31.50020	1126.6	69.3	2.005	2.639	24.0	30	23.6	571.1667	33.62738
20	CMS-2S	534	2.71	4	31.37658	1126.5	68.8	2.019	2.639	23.5	30			
21	CMS-2S	491	2.72	4	28.68324	1119.9	69.2	1.996	2.639	24.4	30			
22	CMS-2S	617	2.70	4	36.30624	1121.0	68.7	2.012	2.639	23.7	30			
23	CMS-2S	645	2.69	4	38.17612	1124.3	68.3	2.030	2.639	23.1	30			
24	CMS-2S	600	2.67	4	35.72188	1124.8	67.9	2.043	2.639	22.6	30			
25	SFCMS-2	591	2.68	4	35.09715	1126.3	68.1	2.040	2.659	23.3	60	24.3	603.3333	35.44929
26	SFCMS-2	620	2.69	4	36.68247	1120.3	68.3	2.022	2.659	24.0	60			
27	SFCMS-2	639	2.80	4	36.32135	1124.3	71.1	1.950	2.659	26.7	60			
28	SFCMS-2	583	2.70	4	34.36560	1116.3	68.6	2.007	2.659	24.5	60			
29	SFCMS-2	614	2.69	4	36.32747	1126.1	68.3	2.033	2.659	23.6	60			
30	SFCMS-2	573	2.69	4	33.90170	1119.2	68.3	2.020	2.659	24.0	60			
31	CMS-2S	522	2.71	4	30.65634	1120.3	68.8	2.007	2.639	23.9	60	23.7	599.5	35.39099
32	CMS-2S	590	2.72	4	34.52250	1122.4	69.1	2.003	2.639	24.1	60			
33	CMS-2S	624	2.68	4	37.05689	1118.7	68.1	2.027	2.639	23.2	60			
34	CMS-2S	628	2.68	4	37.29443	1118.9	68.1	2.027	2.639	23.2	60			
35	CMS-2S	616	2.70	4	36.31082	1118.5	68.6	2.011	2.639	23.8	60			
36	CMS-2S	617	2.69	4	36.50497	1114.7	68.3	2.012	2.639	23.8	60			
37	SFCMS-2	742	2.71	4	43.57664	1121.9	68.8	2.010	2.659	24.4	180	23.6	770.3333	45.50278
38	SFCMS-2	805	2.68	4	47.80576	1122.3	68.1	2.033	2.659	23.5	180			
39	SFCMS-2	774	2.68	4	45.96479	1129.8	68.1	2.047	2.659	23.0	180			
40	SFCMS-2	681	2.71	4	39.99419	1132.7	68.8	2.029	2.659	23.7	180			
41	SFCMS-2	833	2.69	4	49.28467	1126.2	68.3	2.033	2.659	23.6	180			
42	SFCMS-2	787	2.70	4	46.39061	1131.8	68.6	2.035	2.659	23.5	180			
43	CMS-2S	801	2.67	4	47.74637	1122.6	67.8	2.041	2.639	22.6	180	23.6	742.6667	43.76925
44	CMS-2S	702	2.72	4	41.07592	1120.1	69.1	1.999	2.639	24.2	180			
45	CMS-2S	715	2.69	4	42.30317	1123.1	68.3	2.027	2.639	23.2	180			
46	CMS-2S	783	2.70	4	46.15483	1122.9	68.6	2.019	2.639	23.5	180			
47	CMS-2S	666	2.73	4	38.82672	1120.6	69.3	1.993	2.639	24.5	180			
48	CMS-2S	789	2.70	4	46.50850	1122.8	68.6	2.019	2.639	23.5	180			
49	SFCMS-2	891	2.64	4	53.71467	1126.2	67.1	2.071	2.659	22.1	360	23.0	810.6667	48.42436

50	SFCMS-2	772	2.68	4	45.84602	1123.3	68.1	2.035	2.659	23.5	360			
51	SFCMS-2	850	2.67	4	50.66719	1121.8	67.8	2.040	2.659	23.3	360			
52	SFCMS-2	786	2.63	4	47.56483	1118.9	66.8	2.066	2.659	22.3	360			
53	SFCMS-2	841	2.69	4	49.75799	1124.3	68.3	2.029	2.659	23.7	360			
54	SFCMS-2	724	2.68	4	42.99549	1127.4	68.1	2.042	2.659	23.2	360			
55	CMS-2S	691	2.68	4	41.03575	1127.4	68.1	2.042	2.639	22.6	360	22.7	765.8333	45.55652
56	CMS-2S	824	2.66	4	49.30202	1119.2	67.6	2.043	2.639	22.6	360			
57	CMS-2S	863	2.65	4	51.83034	1126.3	67.3	2.064	2.639	21.8	360			
58	CMS-2S	717	2.68	4	42.57979	1124.7	68.1	2.038	2.639	22.8	360			
59	CMS-2S	715	2.70	4	42.14649	1125.4	68.6	2.024	2.639	23.3	360			
60	CMS-2S	785	2.69	4	46.44474	1127.9	68.3	2.036	2.639	22.9	360			

APPENDIX F

SOLVENT-FREE EMULSION BINDER TEST RESULTS

MATERIALS LABORATORY
800 AIRPORT RD. SE SALEM, OR 97301-4798
(503)986-3100
FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-001749**

Project: TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: None**

Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)

Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: 300

Submitted By: CHRIS HARDWICK Org Unit: CHA Sample No.: 2001-1

Material Source: ALBINA ASPHALT Qty Represented:

Sampled At: PLANT Sampled By: Witnessed By:

DATE-Sampled: Received: 01/ 5/25 Tested: 01/ 5/31 Reported:

Type of Test: MIX DESIGN **Use:** SOLVENT-FREE EAC EMULSION

PETROLEUM LAB REPORT

Material Type : EMULSION

Brand : ALBINA Grade: SFCMS-2 Lot No. : Sub-Lot No. :

Method	Test Description	Results
T 49	Penetration @ 25C	140 mm/10
T 51	Ductility @ 25C	> 149 cm
T 44	Solubility	99.80 %
T 59	Emulsion Distillation @ 260C	69.5 %
T 59	Emulsion Distillation % Oil	0.4 %
T 59	Emulsion Sieve Test % Retained	Trace
T 59	Saybolt Viscosity @ 50C	630 SFS

419A =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:

Material represented by sample is for **INFORMATION ONLY.**

*

*

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C: FILES ; PROJ MGR: CARL MICKELSON ; RAS 4 ; ALBINA ASPHALT ; MC CAFFERTY-WHITTLE CONSTR.

MATERIALS LABORATORY
800 AIRPORT RD. SE SALEM, OR 97301-4798
(503)986-3100
FAX(503)986-3096

Contract No.: **EA No.: 01SRF391 000** **Lab No.: 01-002045**

Project: RESEARCH PROJECT - TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F7892 081**

Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)

Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.:

Submitted By: ANDREW GRIFFITH Org Unit: 6450 Sample No.: # 6

Material Source: ALBINA ASPHALT Qty Represented:

Sampled At: DAVIS PIT MP 32.4 Sampled By: Witnessed By:

DATE-Sampled: 01/ 6/ 1 Received: 01/ 6/ 6 Tested: 01/ 6/20 Reported:

Type of Test: COMPLIANCE **Use: SOLVENT FREE EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION

Brand : ALBINA Grade: SF CMS-2 Lot No. : Sub-Lot No. :

Method	Test Description	Results
T 59	Saybolt Viscosity @ 50C	538 SFS

419B/V =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:

Material represented by sample is for **INFORMATION ONLY**.

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*

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C: FILES ; PROJ MGR: CARL MICKELSON ; MC CAFFERTY-WHITTLE CONSTR. ; ANDREW GRIFFITH - RESEARCH UNIT ; ALBINA ASPHALT ; ANDREW GRIFFITH - RESEARCH

MATERIALS LABORATORY (503)986-3100
800 AIRPORT RD. SE SALEM, OR 97301-4798 FAX(503)986-3096

Contract No.: **EA No.: 01SRF391 000** **Lab No.: 01-002044**

Project: RESEARCH PROJECT - TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F7892 081**
Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)
Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.:
Submitted By: ANDREW GRIFFITH Org Unit: 6450 Sample No.: # 2
Material Source: ALBINA ASPHALT Qty Represented:
Sampled At: DAVIS PIT MP 32.4 Sampled By: Witnessed By:
DATE-Sampled: 01/ 6/ 1 **Received:** 01/ 6/ 6 **Tested:** 01/ 6/20 **Reported:**
Type of Test: COMPLIANCE **Use: SOLVENT FREE EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION
Brand : ALBINA Grade: SF CMS-2 Lot No. : Sub-Lot No. :

Method	Test Description	Results
T 49	Penetration @ 25C	111 mm/10
T 51	Ductility @ 25C	> 50 cm
T 59	Emulsion Distillation @ 260C	68.2 %
T 59	Emulsion Distillation % Oil	0.5 %
T 59	Emulsion Sieve Test % Retained	Trace
T 59	Saybolt Viscosity @ 50C	701 SFS

419A =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:
Material represented by sample is for **INFORMATION ONLY**.

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*

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C: FILES ; PROJ MGR: CARL MICKELSON ; MC CAFFERTY-WHITTLE CONSTR. ; ANDREW GRIFFITH - RESEARCH UNIT ; ALBINA ASPHALT ; ANDREW GRIFFITH - RESEARCH

APPENDIX G

SOLVENT-LOADED EMULSION BINDER TEST RESULTS

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Contract No.: **EA No.: 01SRF391 000** **Lab No.: 01-002042**

Project: RESEARCH PROJECT - TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F7892 080**

Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)

Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.:

Submitted By: ANDREW GRIFFITH Org Unit: 6450 Sample No.: # 2

Material Source: ALBINA ASPHALT Qty Represented:

Sampled At: DAVIS PIT MP 32.4 Sampled By: Witnessed By:

DATE-Sampled: 01/ 6/ 1 Received: 01/ 6/ 6 Tested: 01/ 6/19 Reported:

Type of Test: COMPLIANCE **Use: EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION

Brand: ALBINA Grade: CMS-2S

Method	Test Description	Results
T 49	Penetration @ 25C	139 mm/10
T 59	Emulsion Distillation @ 260C	65.2 %
T 59	Emulsion Distillation % Oil	7.5 %
T 59	Emulsion Sieve Test % Retained	No Trace
T 59	Saybolt Viscosity @ 50C	203 SFS

419B =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:

Material represented by sample **DOES** comply with specifications.

*
*

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C: FILES ; PROJ MGR: CARL MICKELSON ; MC CAFFERTY-WHITTLE CONSTR. ; ANDREW GRIFFITH - RESEARCH UNIT ; ALBINA ASPHALT ; ANDREW GRIFFITH - RESEARCH

MATERIALS LABORATORY
800 AIRPORT RD. SE SALEM, OR 97301-4798
(503)986-3100
FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-002046**

Project: TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F2738 016**
Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)
Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: 280
Submitted By: CHARLES WALKER Org Unit: MTI Sample No.: EAC-1-1
Material Source: ALBINA ASPHALT Qty Represented: 4000 MG MIX
Sampled At: PLANT Sampled By: Witnessed By:
DATE-Sampled: 01/ 5/29 Received: 01/ 6/ 6 Tested: 01/ 6/19 Reported:
Type of Test: QUALITY CONTROL **Use: 19.0MM EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION
Brand : ALBINA Grade: CMS-2S Lot No. : 1 Sub-Lot No. : 1

Method	Test Description	Results
T 49	Penetration @ 25C	116 mm/10
T 59	Emulsion Distillation @ 260C	63.5 %
T 59	Emulsion Distillation % Oil	7.5 %
T 59	Emulsion Sieve Test % Retained	Trace
T 59	Saybolt Viscosity @ 50C	137 SFS

419B =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:
Material represented by sample **DOES** comply with specifications.

*
*

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C: FILES ; PROJ MGR: CARL MICKELSON ; RAS 4 ; ALBINA ASPHALT ; MC CAFFERTY-WHITTLE CONSTR.

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FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-002047**

Project: TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F2738 018**
Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)
Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: 280
Submitted By: CHARLES WALKER Org Unit: MTI Sample No.: EAC-1-5
Material Source: ALBINA ASPHALT Qty Represented: 5000 MG MIX
Sampled At: PLANT Sampled By: Witnessed By:
DATE-Sampled: 01/ 5/30 Received: 01/ 6/ 6 Tested: 01/ 6/19 Reported:
Type of Test: QUALITY CONTROL **Use: 19.0MM EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION
Brand : ALBINA Grade: CMS-2S Lot No. : 1 Sub-Lot No. : 5

Method	Test Description	Results
T 49	Penetration @ 25C	120 mm/10
T 59	Emulsion Distillation @ 260C	63.2 %
T 59	Emulsion Distillation % Oil	9.0 %
T 59	Emulsion Sieve Test % Retained	No Trace
T 59	Saybolt Viscosity @ 50C	107 SFS

419B =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:
Material represented by sample **DOES** comply with specifications.

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*

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FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-002048**

Project: TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F2738 020**
Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)
Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: 280
Submitted By: CHARLES WALKER Org Unit: MTI Sample No.: EAC-1-10
Material Source: ALBINA ASPHALT Qty Represented: 5000 MG MIX
Sampled At: PLANT Sampled By: Witnessed By:
DATE-Sampled: 01/ 6/ 1 Received: 01/ 6/ 6 Tested: 01/ 6/19 Reported:
Type of Test: QUALITY CONTROL **Use: 19.0MM EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION
Brand : ALBINA Grade: CMS-2S Lot No. : 1 Sub-Lot No. : 10

Method	Test Description	Results
T 49	Penetration @ 25C	149 mm/10
T 59	Emulsion Distillation @ 260C	65.1 %
T 59	Emulsion Distillation % Oil	8.0 %
T 59	Emulsion Sieve Test % Retained	No Trace
T 59	Saybolt Viscosity @ 50C	233 SFS

419B =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:
Material represented by sample **DOES** comply with specifications.

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*

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C: FILES ; PROJ MGR: CARL MICKELSON ; RAS 4 ; ALBINA ASPHALT ; MC CAFFERTY-WHITTLE CONSTR.

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800 AIRPORT RD. SE SALEM, OR 97301-4798
(503)986-3100
FAX(503)986-3096

Contract No.: C12514 **EA No.: CON01916** **Lab No.: 01-002027**

Project: TYGH VALLEY - JCT HWY 197 & OR-216

Highway: THE DALLES - CALIFORNIA County: WASCO **Data Sheet No.: F2738 022**
Contractor: MC CAFFERTY-WHITTLE CONSTR. FA No.: X-STP-S004(48)
Project Manager: CARL MICKELSON Org Unit: 4821 Bid Item No.: 280
Submitted By: CHARLES WALKER Org Unit: MTI Sample No.: EAC-1-15
Material Source: ALBINA ASPHALT Qty Represented: 5000 MG MIX
Sampled At: PLANT Sampled By: Witnessed By:
DATE-Sampled: 01/ 6/ 6 Received: 01/ 6/13 Tested: 01/ 6/20 Reported:
Type of Test: QUALITY CONTROL **Use: 19.0MM EAC PAVEMENT**

PETROLEUM LAB REPORT

Material Type : EMULSION
Brand : ALBINA Grade: CMS-2S Lot No. : 1 Sub-Lot No. : 15

Method	Test Description	Results
T 49	Penetration @ 25C	130 mm/10
T 59	Emulsion Distillation @ 260C	63.6 %
T 59	Emulsion Distillation % Oil	8.0 %
T 59	Emulsion Sieve Test % Retained	Trace
T 59	Saybolt Viscosity @ 50C	166 SFS

419B =$ 0.

TOTAL CHARGES: $ 0.00

REMARKS:
Material represented by sample **DOES** comply with specifications.

*
*

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