VERMONT AGENCY OF TRANSPORTATION **SP13- 631**

PROGRAM DEVELOPMENT DIVISION - MATERIALS & RESEARCH SECTION

SUPERPAVE BITUMINOUS CONCRETE MIXTURE DESIGN

January 10, 2013

Project Name: _____ Project Number: _____

Mix Type: **Superpave Type IIS w/ rap** Gyrations, Nini / Ndes / Nmax: **7/65/115**

Produced By: **COLD RIVER MATERIALS (51) - N WALPOLE, NH**

PLANT TYPE: BATCH

Stockpile Gradations - % Passing (WET Sieve Analysis)

Size (mm)	% Used	50.0	37.5	25.0	19.0	12.5	9.5	4.75	2.36	1.18	0.600	0.300	0.150	0.075	RAP % AC	
WSS	28	100	100	100	100	100	100	99	77	50	33	22	9	2.0		
NA. SA.	10	100	100	100	100	100	100	98	95	87	61	19	4	2.3		
9.5	21	100	100	100	100	100	99	30	3	2	1	1	1	1.0		
12.5	11	100	100	100	100	75	44	6	6	4	3	3	2	1.3		
19.0	15	100	100	100	98	28	4	2	1	1	1	1	1	1.0		
RAP	15	100	100	100	100	100	95	71	52	40	31	22	16	9.0	4.00	
Resultant	**100.0**	**100**	**100**	**100**	**100**	**86**	**78**	**55**	**40**	**30**	**21**	**12**	**6**	**2.6**		2.6

Hot Bin Gradation - % Passing (WET Sieve Analysis)

Bin	% Used	50.0	37.5	25.0	19.0	12.5	9.5	4.75	2.36	1.18	0.600	0.300	0.150	0.075	RAP % AC	
Sand	36.0	100	100	100	100	100	100	99	84	63	45	25	8	2.8		
2	21.0	100	100	100	100	100	99	30	3	2	2	2	2	1.0		
3	11.0	100	100	100	100	85	44	6	6	4	3	3	2	1.0		
4	16.0	100	100	100	98	25	4	2	1	1	1	1	1	1.0		
5																
Mfg. Fines	1.0	100	100	100	100	100	100	100	99	99	98	95	91	60.0		
RAP	15.0	100	100	100	100	100	95	71	52	40	31	22	16	9.0	4.00	
Resultant	**100.0**	**100**	**100**	**100**	**100**	**86**	**78**	**55**	**40**	**31**	**23**	**14**	**7**	**3.4**		3.4

Design Blend HMA Plant's Fine Adjustment Factor = 0.8

Batch Weight (Kg)	Bin - Sand	Bin No. 2	Bin No. 3	Bin No. 4	Bin No. 5	Bin Mfg. Fine	RAP	Performance Graded Binder Virgin	RAP	Total	Total
	361	204	106	143			144	42	6	48	**1000**

% PG Binder Content		Sieve (mm)	50.0	37.5	25.0	19.0	12.5	9.5	4.75	2.36	1.18	0.600	0.300	0.150	0.075
		Job Mix Formula	**100**	**100**	**100**	**99**	**86**	**78**	**55**	**40**	**31**	**23**	**14**	**7**	**3.4**
		Job Aim	100 / 100	100 / 100	100 / 100	93 / 100	80 / 92	72 / 84	49 / 61	36 / 44	27 / 35	19 / 27	10 / 18	3 / 11	2.4 / 4.4
Virgin	**Total**	Spec. Limits	100 / 100	100 / 100	100 / 100	90 / 100	--- / ≤ 90	--- / ---	--- / ---	23 / 49	/	/	/	/	2 / 8
4.2	**4.8**														

Aggregates			Performance Graded Binder		
Fine:	COLD RIVER MATERIALS PIT - N WALPOLE, N	PG Grade:	PG 58-28		
	COLD RIVER MATERIALS PIT - N WALPOLE, N	Other:			
Coarse:		Manufacturer:	TRI STATE MATERIA		
	COLD RIVER MATERIALS PIT - N WALPOLE, N	Mixing Temp.:	146 °C ± 11 °C	°C ± 11 °C	°C ± 11 °C
RAP:		Comp. Temp.:	135 °C ± 5 °C	°C ± 5 °C	°C ± 5 °C

Mixing Times: Dry: 10 Wet: 45 Total: 55

Submitted By: Drew Steele Title: QC

Company: **Cold River Materials** Date: 8-5-13

Job Mix Formula			
VMA	14.5	+/- 1%	
VFA	72.4	+/- 5%	Max 80%

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Comments: THIS DESIGN HAS BEEN APPROVED BASED ON THE SUBMITTED SUPERPAVE TESTS DATA. CONTINUED USE OF THIS DESIGN IS CONTINGENT ON PRODUCT TESTS RESULTS ABLE TO MEET ALL SPECIFICATIONS. IF DURING CONSTRUCTION, THE MIX DISPLAYS UNSATISFACTORY LAY-DOWN CHARACTERISTICS AND/OR UNCOMPACTABILITY, THE DESIGN MAY BE DISCONTINUED.

Date & Time Received Stamped Below

Signature: _____

Title: **Bituminous Concrete Lab Supervisor or Designee** Date: _____

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VERMONT AGENCY OF TRANSPORTATION **SP13- 629**

PROGRAM DEVELOPMENT DIVISION - MATERIALS & RESEARCH SECTION

SUPERPAVE BITUMINOUS CONCRETE MIXTURE DESIGN

January 10, 2013

Project Name: **Master** Project Number:

Mix Type: **Superpave Type IVS w/ rap** Gyrations, Nini / Ndes / Nmax: **7/65/115**

Produced By: **COLD RIVER MATERIALS (51) - N WALPOLE, NH**

PLANT TYPE: BATCH

Stockpile Gradations - % Passing (WET Sieve Analysis)

Size (mm)	% Used	50.0	37.5	25.0	19.0	12.5	9.5	4.75	2.36	1.18	0.600	0.300	0.150	0.075	RAP % AC	
WSS	44	100	100	100	100	100	100	99	77	50	33	22	9	2.0		
DSS	5	100	100	100	100	100	100	96	75	59	48	39	26	12.0		
9.5	36	100	100	100	100	100	99	30	3	2	1	1	1	1.0		
RAP	15	100	100	100	100	100	95	71	52	40	31	22	16	9.0	4.00	
Resultant	**100.0**	**100**	**100**	**100**	**100**	**100**	**99**	**70**	**47**	**32**	**22**	**15**	**8**	**3.2**		3.2

Hot Bin Gradation - % Passing (WET Sieve Analysis)

Bin	% Used	50.0	37.5	25.0	19.0	12.5	9.5	4.75	2.36	1.18	0.600	0.300	0.150	0.075	RAP % AC	
Sand	48.0	100	100	100	100	100	100	98	78	51	33	27	10	3.0		
2	36.0	100	100	100	100	100	99	35	3	2	2	2	2	1.0		
3																
4																
5																
Mfg. Fines	1.0	100	100	100	100	100	100	99	99	98	95	9	78	60.0		
RAP	15.0	100	100	100	100	100	95	71	52	40	31	22	16	9.0	4.00	
Resultant	**100.0**	**100**	**100**	**100**	**100**	**100**	**99**	**71**	**47**	**32**	**22**	**17**	**9**	**3.8**		3.8

Design Blend HMA Plant's Fine Adjustment Factor = 0.6

Batch Weight (Kg)	Bin - Sand	Bin No. 2	Bin No. 3	Bin No. 4	Bin No. 5	Bin Mfg. Fine	RAP	Performance Graded Binder			Total
								Virgin	RAP	Total	
	461	334					150	55	6	61	**1000**

% PG Binder Content		Sieve (mm)	50.0	37.5	25.0	19.0	12.5	9.5	4.75	2.36	1.18	0.600	0.300	0.150	0.075
		Job Mix Formula	**100**	**100**	**100**	**100**	**100**	**99**	**71**	**47**	**32**	**22**	**17**	**9**	**3.8**
		Job Aim	100 / 100	100 / 100	100 / 100	100 / 100	100 / 100	93 / 100	65 / 77	43 / 51	28 / 36	18 / 26	13 / 21	5 / 13	2.8 / 4.8
Virgin	Total	Spec. Limits	100 / 100	100 / 100	100 / 100	100 / 100	100 / 100	90 / 100	--- / ≥ 90	32 / 67	/	/	/	/	2 / 10
5.5	**6.1**														

Aggregates			Performance Graded Binder		
Fine:	COLD RIVER MATERIALS PIT - N WALPOLE, N	PG Grade:	PG 58-28		
	COLD RIVER MATERIALS PIT - N WALPOLE, N	Other:			
Coarse:		Manufacturer:	TRI STATE MATERIA		
	COLD RIVER MATERIALS PIT - N WALPOLE, N	Mixing Temp.:	148 °C ± 11 °C	°C ± 11 °C	°C ± 11 °C
RAP:		Comp. Temp.:	135 °C ± 5 °C	°C ± 5 °C	°C ± 5 °C

Mixing Times: Dry: 10 Wet: 45 Total: 55

Submitted By: Drew Steele Title: QC

Company: Cold River Materials Date: 8-5-13

Job Mix Formula			
VMA	17.1	+/- 1%	
VFA	76.6	+/- 5%	Max 80%

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Signature:

Title: **Bituminous Concrete Lab Supervisor or Designee** Date:

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