



MATHY CONSTRUCTION CO.

GENERAL CONTRACTORS

920 10TH AVE N POST OFFICE BOX 189 ONALASKA, WI 54650
 PHONE 608-781-4683 FAX 608-781-4694

Report of Bituminous Mix Design

Project Name	Tomah - Necedah STH 21
Date	June 16, 2016
Project #	7010-01-61
Test#	15-16-1175-3MT 58-28S(R) 250-0058-2014
County	Juneau
Specifications	3 MT 58-28S design
Course/Layer	



Aggregate Sources

	Percent	Material	Location / Source	G _{sb}
1	19	1 X 3/8 Bit Gravel(5208)	Manthey East Pit 26,17,7E Adams	2.729
2	7	Washed CA 14 Bit Rock(3244)	Tork/1,22,5E Wood	2.689
3	26	3/8" Washed Gravel Man Sand(5400)	Manthey East Pit 26,17,7E Adams	2.736
4	8	5/8" Screened Sand(5501)	Manthey East Pit 26,17,7E Adams	2.676
5	17	1/4" Washed Man Sand(3402)	Rock Springs/28,12,5E Sauk	2.651
6	23	RAP(5.2%AC)(7302)	Manthey East Pit/26/35,17,7E Adams	2.693
7				
8				
Total		1 2 3 4 5 6 7 8	Comb G _{sb}	2.702
Virgin Agg Blend		24.68 9.09 33.77 10.39 22.08	Comb G _{se}	2.762

Aggregate Gradations

Sieve		Material								Job Mix	Spec	
(Std)	(mm)	1	2	3	4	5	6	7	8		High	Low
2"	50	100.0	100.0	100.0	100.0	100.0	100.0			100.0		
1.5"	37.5	100.0	100.0	100.0	100.0	100.0	100.0			100.0		
1"	25	100.0	100.0	100.0	100.0	100.0	100.0			100.0		
3/4"	19	98.0	100.0	100.0	100.0	100.0	100.0			99.6		
1/2"	12.5	51.0	88.0	100.0	98.0	100.0	99.0			89.5		
3/8"	9.5	24.0	38.0	100.0	94.0	100.0	94.0			79.4		
#4	4.75	3.8	3.5	72.0	84.0	97.0	79.0			61.1		
#8	2.36	3.0	1.5	43.0	76.0	76.0	60.0			44.7		
#16	1.18	2.9	1.3	26.0	71.0	51.0	46.0			32.3		
#30	0.6	2.8	1.2	17.0	55.0	31.0	36.0			23.0		
#50	0.3	2.5	1.1	9.7	22.0	16.0	23.0			12.8		
#100	0.15	2.0	1.0	3.4	6.0	3.7	14.0			5.7		
#200	0.075	1.5	0.9	1.4	2.5	1.8	9.0			3.3		
Soundness		225-133	225-20	225-133	225-133	225-127					12 Max	
LAR 100/500 Rev		2016	2014	2016	2016	2015					13 & 45 Max	
Crush 1 Face (%)		88.0	100.0	100.0	34.0	100.0	91.0			91.1	75 Min	
Crush 2 Face (%)		87.0	100.0	100.0	31.0	100.0	86.0			89.9	60 Min	
Sand Equiv.										88	40 Min	
Flat & Elong (%)		1.9	0.5	1.4	1.2	3.6	0.7			1.4	5 Max	
Fine Agg Ang										44	43 Min	
Water Abs.		1.3	0.2	1.1	0.6	0.2	1.0			0.9		

Test Methods: D312, T176/D2419, T11/C117, T27/C136, D4791, D5821, T304/C1252, T96/C131, T209/D2041, T166/D2726



MATHY CONSTRUCTION CO.

GENERAL CONTRACTORS

920 10TH AVE N POST OFFICE BOX 189 ONALASKA, WI 54650
 PHONE 608-781-4683 FAX 608-781-4694

Report of Bituminous Mix Design

Project Name	Tomah - Necedah STH 21
Date	June 16, 2016
Project #	7010-01-61
Test #	15-16-1175-3MT 58-28S(R)
County	Juneau
Specifications	3 MT 58-28S design
Course/Layer	



Mix Properties

Trial #	1	2	3	4	5	6
AC Content (% by Wt)	4.5	5.0	5.5	6.0		4.9
Compaction Level	Design	Design	Design	Design		Max
Air Voids V_a (%)	5.4	3.8	2.5	1.3		4.1
% G_{mm} @ N_i	88.8	90.0	91.4	92.0		89.7
% G_{mm} @ N_{final}	94.6	96.2	97.5	98.7		96.7
VMA (%)	14.1	13.8	13.8	13.9		13.1
VFA (%)	62.0	72.6	81.9	90.3		68.6
Density (kg/m^3)	2429	2450	2464	2474		2468
G_{mb}	2.429	2.450	2.464	2.474		2.468
G_{mm}	2.567	2.547	2.527	2.508		2.551

Gyrations	
N_i	7
N_d	75
N_m	115

Antistrip
None

Mix Design

Property	Value	Specification
Design P_b	4.9	
Added P_b	3.7	
V_a	4.0	4.0
VMA	13.8	13.0 Min
VFA	71.1	65 - 75
G_{mm}	2.551	
G_{mb}	2.449	
P_{be}	4.1	
P_{ba}	0.8	
Dust/Binder Ratio	0.8	0.6 - 1.2
% G_{mm} @ N_i	90.0	< 89.0 Rec
% G_{mm} @ N_d	95.9	~ 96.0
% G_{mm} @ N_m	96.7	98.0 Max
TSR Ratio	88.6	75 Minimum
Rec. Mix Temp.	275-300	

Primary AC Source	AC Type	G_b
MIA - La Crosse	PG 58-28	1.028
Alternate Sources		
MIA - La Crosse	PG 64-28	1.030
MIA - La Crosse	PG 52-34	1.023
MIA - La Crosse	PG 58-34	1.023
MIA - La Crosse	PG 64-28P	1.030

% Binder Replacement

24.4%

Average # of Gyrations	29
------------------------	----

Since this design is material specific, the conclusions and recommendations contained within are obtained from material submitted to and subjected to observations under laboratory conditions. Adjustments may become necessary when field laboratory data is obtained from plant produced mix. No guarantee or warranty is implied or offered.

Signature *John E. Jungman* Cert. No. 361 Date: 6/16/2016

Tomah - Necedah STH 21

Design # 15-16-1175-3MT 58-28S(R) -- 19 mm Mix -- Blend 1

