



# Oklahoma Department of Transportation Mix Design Report

Asphalt Concrete, Type S4 (PG 64-22 OK) Mat'l. Code: asco012  
 (Material Full Name and Material Code)  
 J & R Sand Co P/S # m00560  
 (Producer/Supplier Name and Producer/Supplier Code)  
 J & R Sand #AP 40 (Portable) - 400TPH PLANT ID # m00560-03  
 (Plant Name and Plant ID)

Insoluble ID: I1  
 (Design Type and Design Type ID)  
 WS4qc0611800300  
 (Mix ID)

Aggregate	Producer/Supplier	% USED
3/4" Chips	Klotz Sand and Gravel (Lakin, KS) P/S # m008758021	14
Crusher Run	Klotz Sand and Gravel (Lakin, KS) P/S # m008758021	39
3/4" 3A Chips	Prowers Aggregate West Farm Pit (Lamar, CO) P/S # m010578112	32
Sand	J & R Sand Co, Winchell Pit (Beaver Co., OK) P/S # m002050402	15
Warm Mix Asphalt (WMA) Technology: EVOTHERM (Chem. Add.) qual028 Ingevity m00941 (Product Name, Material Code, Producer/Supplier Name, Producer/Supplier Code)		
Asphalt Cement: Asphaltic Cement Type PG 64-22 OK, acem003, Valero Mckee (Sunray, TX), m00311 (Material Full Name, Material Code, Producer/Supplier Name, Producer/Supplier Code)		

Sieve Size	Producer/Supplier:				Comb. Agg.	% Tol. (±)			
	3/4" Chips	Crusher Run	3/4" 3A Chips	Sand		JMF	Min.	Max.	% Tol. (±)
3/4 in (19 mm)	100	100	100	100	100	100	100	100	0
1/2 in (12.5 mm)	53	98	91	100	90	90	83	97	7
3/8 in (9.5 mm)	29	92	80	100	81	81	74	88	7
#4 (4.75 mm)	6	69	54	99	60	60	53	67	7
#8 (2.36 mm)	4	47	40	88	45	45	40	50	5
#16 (1.18 mm)	3	32	31	60	32	32	28	36	4
#30 (.600 mm)	3	21	25	36	22	22	18	26	4
#50 (.300 mm)	2	14	20	14	14	14	10	18	4
#100 (.150 mm)	2	9	14	3	9	9	6	12	3
#200 (.075 mm)	1.3	5.9	8.0	2.0	5.3	5.3	3.3	7.3	2
AC Content %					5.0	5.0	4.6	5.4	0.4

Requires Form 93-E0 signed by the Department for production use. -Oklahoma D.O.T. Materials-

Warm Mix Asphalt (WMA) Additive % 0.5

Mix temperature @ discharge from mixer: 285 (141) °F (°C) Required ± 20 °F (± 10 °C)  
 Optimum roadway compaction temperature: 245 (118)  
 Laboratory mixing temperature: 275 (135)  
 Laboratory compaction temperature: 235 (113)

Tests on Asphalt Cement	Found
Specific Gravity @ 77 ° F	1.0100

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Tests on Compressed Mixtures (@ Design AC)			
	# Gyr.	% Density of Gmm	% Density Required
Nini	6	90.3	85.5 - 91.5
Ndes	50		96.0

Tests on Aggregates	Required	Units
Durability Index	96	40 min. %
F.A.A. %U		N/A %
Flat and Elongated	0	10 max. %
Fractured Faces	96/91	85/80 min. %
Insoluble Residue	94.9	30 min. %
LA Abrasion	30	40 max. %
Micro-Deval	6.7	N/A %
Permeability	2.3	12.5 max. 10 <sup>-5</sup> cm/s
Sand Equivalent	78	40 min. %
Pba	0.22	
IOC	0.23	%
Gse	2.628	
Gsb	2.613	
Specimen Weight	4750	g

Tests on Compressed Mixtures								
%AC	Gmb	Gmm	% Density		% VMA	% VMA Required		% VFA
			of Gmm	% Density Required		Design / Field	Design / Field	
4.5	2.330	2.451	95.1	Design / Field	14.8	Design / Field	66.9	% VFA Required
5.0	2.345	2.433	96.4	96.0 / 94.5 - 97.4	14.7	14.5 / 14.0	75.5	72 - 77
5.5	2.368	2.415	98.1		14.4		86.8	

ITS (PSI) 460.4 N/A min.  
 TSR 0.83 0.80 / 0.75 min. (Design / Field)  
 Compacted Wt. (lbs/sy/1" thick) = 107.0 @ 5.0 % Asphalt Cement

Hamburg Rut Test Depth (mm) 2.30 12.50 max. @ 10,000 cycles

MEETS SPECIFICATION REQUIREMENTS PER SPECIAL PROVISION 708-26(a-f) 09

Comments: \_\_\_\_\_

Last Modified By: Smith, Jerry D. jsmith  
 (User Name and User ID)

Date: 3/22/2018  
 (mm/dd/yyyy)