



# Oklahoma Department of Transportation Mix Design Report

Asphalt Concrete, Type S4 (PG 70-28 OK) Mat'l. Code: asco011

Insoluble ID: 11

(Material Full Name and Material Code)

(Design Type and Design Type ID)

Cummins Const Co P/S # m00556

WS4qc0101683100

(Producer/Supplier Name and Producer/Supplier Code)

(Mix ID)

Cummins Const Co (Woodward, OK) - 12000 lb Batch PLANT ID # m00556-14

(Plant Name and Plant ID)

Aggregate	Producer/Supplier	% USED
5/8" Chips	Dolese Co (Cooperton, OK) P/S # m002723801	20
'D' Rock	Martin-Marietta (Snyder, OK) P/S # m002323802	20
Man. Sand	Martin-Marietta (Snyder, OK) P/S # m002323802	25
Scrns.	Dolese Co (Cooperton, OK) P/S # m002723801	20
Sand (Unlisted Source)	Loomis Sand (Cleo Springs, OK)	15
Warm Mix Asphalt (WMA) Technology: TEREX (Foaming Process) qual028 Terex Roadbuilding m00801 (Product Name, Material Code, Producer/Supplier Name, Producer/Supplier Code)		
Asphalt Cement: Asphaltic Cement Type PG 70-28 OK, acem002, Lion Oil Frontier (Muskogee, OK), m01021 (Material Full Name, Material Code, Producer/Supplier Name, Producer/Supplier Code)		

Producer/Supplier:	Dolese Co (Cooperton, OK) P/S # m002723801	Martin-Marietta (Snyder, OK) P/S # m002323802	Martin-Marietta (Snyder, OK) P/S # m002323802	Dolese Co (Cooperton, OK) P/S # m002723801	Loomis Sand (Cleo Springs, OK)	Requires Form 93-E0 signed by the Department for production use. -Oklahoma D.O.T. Materials-				
	5/8" Chips	'D' Rock	Man. Sand	Scrns.	Sand (Unlisted Source)	Comb. Agg.	JMF	Min.	Max.	% Tol. (±)
3/4 in (19 mm)	100	100	100	100	100	100	100	100	100	0
1/2 in (12.5 mm)	90	100	100	100	100	98	98	91	100	7
3/8 in (9.5 mm)	39	92	100	100	100	86	86	79	93	7
#4 (4.75 mm)	4	30	95	91	100	64	64	57	71	7
#8 (2.36 mm)	2	6	70	59	100	46	46	41	51	5
#16 (1.18 mm)	2	2	41	37	100	33	33	29	37	4
#30 (.600 mm)	1	1	22	25	100	26	26	22	30	4
#50 (.300 mm)	1	1	10	18	80	19	19	15	23	4
#100 (.150 mm)	1	1	3	14	19	7	7	4	10	3
#200 (.075 mm)	0.9	1.3	2.6	12.1	4.5	4.2	4.2	2.2	6.2	2
AC Content %						4.9	4.9	4.5	5.3	0.4

Warm Mix Asphalt (WMA) Additive %

2.0

Mix temperature @ discharge from mixer: 275 (135) ± 20 °F (± 10 °C) **Required**  
 Optimum roadway compaction temperature: 260 (127)  
 Laboratory mixing temperature: 300 (149)  
 Laboratory compaction temperature: 300 (149)

Tests on Aggregates	Required	Units
Durability Index	80	40 min. %
F.A.A. %U	N/A	%
Flat and Elongated	0	10 max. %
Fractured Faces	100/100	95/90 min. %
Insoluble Residue	49	40 min. %
LA Abrasion	26	40 max. %
Micro-Deval	9.8	N/A %
Permeability	7.4	12.5 max. 10 <sup>-5</sup> cm/s
Sand Equivalent	75	45 min. %
Pba	0.37	%
IOC	0.17	%
Gse	2.661	
Gsb	2.635	
Specimen Weight	4800	g

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

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Tests on Compressed Mixtures (@ Design AC)			
	% Density		% Density Required
	# Gyr.	of Gmm	
Nini	7	89.5	85.5 - 90.5
Ndes	65		96.0

Tests on Compressed Mixtures							
%AC	Gmb	Gmm	% Density of Gmm	% Density Required	% VMA	% VMA Required	% VFA
4.4	2.344	2.482	94.4	Design / Field	15.0	Design / Field	62.7
4.9	2.366	2.464	96.0	96.0 / 94.5 - 97.4	14.6	14.5 / 14.0	72.6
5.4	2.414	2.445	98.7		13.3		90.2

**Dust Prop.**  
 1.1 **Dust Prop. Req.**  
 0.9 0.6 - 1.6  
 0.8

**ITS (PSI)** 99.8 N/A min.  
**TSR** 0.83 0.80 / 0.75 min. (Design / Field)  
 Compacted Wt. (lbs/sy/1" thick) = 108.4 @ 4.9 % Asphalt Cement

Hamburg Rut Test Depth (mm) 4.82 12.50 max. @ 15,000 cycles

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

Comments:

Last Modified By: Suito, Kevin ksuito (User Name and User ID)

Date: 3/13/2018 (mm/dd/yyyy)