



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)
 Cummins Const Co P/S # m00556
 (Producer/Supplier Name and Producer/Supplier Code)
 Cummins Const Co (Ada, OK) - 300TPH PLANT ID # m00556-05
 (Plant Name and Plant ID)

Insoluble ID: 11
 (Design Type and Design Type ID)
 WS4qc0101361300
 (Mix ID)

| Aggregate | Producer/Supplier | % USED |
|--|---|--------|
| 5/8" Chips | Martin-Marietta (Mill Creek, OK) P/S # m002303502 | 20 |
| 'D' Rock | Martin-Marietta (North Troy, OK) P/S # m007003506 | 20 |
| Man. Sand | TXI Mill Creek Stone Plant P/S # m005253504 | 30 |
| 'D' Sand | Martin-Marietta (Mill Creek, OK) P/S # m002303502 | 20 |
| Sand (Unlisted Source) | Cummins Sand (Ada, OK) | 10 |
| 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 64-22 OK, acem003, Lion Oil Co. (Muskogee, OK), m00511 (Material Full Name, Material Code, Producer/Supplier Name, Producer/Supplier Code) | | |

| Sieve Size | Producer/Supplier: | | | | | | Comb. Agg. | Tol. (%) | | | |
|------------------|--------------------|----------|-----------|----------|------------------------|-----|------------|----------|------|------|-----|
| | 5/8" Chips | 'D' Rock | Man. Sand | 'D' Sand | Sand (Unlisted Source) | | | JMF | Min. | Max. | (±) |
| 3/4 in (19 mm) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 0 | |
| 1/2 in (12.5 mm) | 75 | 100 | 100 | 100 | 100 | 95 | 95 | 88 | 100 | 7 | |
| 3/8 in (9.5 mm) | 40 | 95 | 100 | 100 | 100 | 87 | 87 | 80 | 94 | 7 | |
| #4 (4.75 mm) | 9 | 18 | 95 | 97 | 100 | 63 | 63 | 56 | 70 | 7 | |
| #8 (2.36 mm) | 3 | 5 | 82 | 76 | 100 | 51 | 51 | 46 | 56 | 5 | |
| #16 (1.18 mm) | 2 | 4 | 58 | 52 | 100 | 39 | 39 | 35 | 43 | 4 | |
| #30 (.600 mm) | 1 | 3 | 39 | 35 | 99 | 29 | 29 | 25 | 33 | 4 | |
| #50 (.300 mm) | 1 | 2 | 25 | 22 | 87 | 21 | 21 | 17 | 25 | 4 | |
| #100 (.150 mm) | 1 | 1 | 10 | 13 | 50 | 11 | 11 | 8 | 14 | 3 | |
| #200 (.075 mm) | 0.8 | 0.6 | 5.2 | 8.4 | 16.2 | 5.1 | 5.1 | 3.1 | 7.1 | 2 | |
| AC Content % | | | | | | 4.9 | 4.9 | 4.5 | 5.3 | 0.4 | |

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

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 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 | 6 | 89.8 | 85.5 - 91.5 |
| Ndes | 50 | | 96.0 |

| Tests on Aggregates | Required | Units |
|---------------------|----------|---------------------------------|
| Durability Index | 67 | 40 min. % |
| F.A.A. %U | | N/A % |
| Flat and Elongated | 10 | max. % |
| Fractured Faces | 100/100 | 85/80 min. % |
| Insoluble Residue | 50.6 | 30 min. % |
| LA Abrasion | 23 | 40 max. % |
| Micro-Deval | 13.2 | N/A % |
| Permeability | 2.1 | 12.5 max. 10 ⁻⁵ cm/s |
| Sand Equivalent | 78 | 40 min. % |
| Pba | 0.46 | |
| IOC | 0.50 | % |
| Gse | 2.741 | |
| Gsb | 2.707 | |
| Specimen Weight | 4850 | g |

| Tests on Compressed Mixtures | | | | | | | |
|------------------------------|-------|-------|-----------|--------------------|-------|----------------|----------------|
| %AC | Gmb | Gmm | % Density | | % VMA | % VMA Required | % VFA |
| | | | of Gmm | % Density Required | | Design / Field | Design / Field |
| 4.4 | 2.377 | 2.549 | 93.3 | Design / Field | 16.1 | Design / Field | 58.4 |
| 4.9 | 2.427 | 2.529 | 96.0 | 96.0 / 94.5 - 97.4 | 14.7 | 14.5 / 14.0 | 72.8 |
| 5.4 | 2.433 | 2.509 | 97.0 | | 15.0 | | 80.0 |

ITS (PSI) 210.9 N/A min.
 TSR 0.86 0.80 / 0.75 min. (Design / Field)
 Compacted Wt. (lbs/sy/1" thick) = 111.2 @ 4.9 % Asphalt Cement

Hamburg Rut Test Depth (mm) 2.80 12.50 max. @ 10,000 cycles

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

Comments: _____

Last Modified By: Vivanco, David dvivanco
 (User Name and User ID)

Date: 8/6/2018
 (mm/dd/yyyy)