Version: V03.40

# 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)*

Insoluble ID: I1
*(Design Type and Design Type ID)*

Emery Sapp & Sons, Inc. P/S # m00907
*(Producer/Supplier Name and Producer/Supplier Code)*

S4pv0441800300
*(Mix ID)*

Emery Sapp & Sons, Inc.(Joplin, MO) PLANT ID # m00907-01
*(Plant Name and Plant ID)*

| Aggregate | Producer/Supplier | % USED |
|---|---|---|
| 3/4" Chips | Anchor Stone (Jasper Co.Quarry, Joplin, MO) P/S # m002118301 | 16 |
| 1/2" Chips | Anchor Stone (Jasper Co.Quarry, Joplin, MO) P/S # m002118301 | 25 |
| Mine Chat | Mine Chat @ Tri City Area P/S # MineChat | 10 |
| Drag Sand | Mine Chat @ Tri City Area P/S # MineChat | 18 |
| Scrns. | Anchor Stone (Jasper Co.Quarry, Joplin, MO) P/S # m002118301 | 30 |
| B. H. Fines | Contractor / Project Site P/S # Contractor | 1 |

**Asphalt Cement:** Asphaltic Cement Type PG 64-22 OK, acem003, HollyFrontier (Catoosa, OK), m01028
*(Material Full Name, Material Code, Producer/Supplier Name, Producer/Supplier Code)*

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

| Producer/Supplier: | Anchor Stone (Jasper Co.Quarry, Joplin, MO) P/S # m002118301 | Anchor Stone (Jasper Co.Quarry, Joplin, MO) P/S # m002118301 | Mine Chat @ Tri City Area P/S # MineChat | Mine Chat @ Tri City Area P/S # MineChat | Anchor Stone (Jasper Co.Quarry, Joplin, MO) P/S # m002118301 | Contractor / Project Site P/S # Contractor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sieve Size | 3/4" Chips | 1/2" Chips | Mine Chat | Drag Sand | Scrns. | B. H. Fines | | | Comb. Agg. | JMF | Min. | Max. | % Tol. (±) |
| 3/4 in (19 mm) | 100 | 100 | 100 | 100 | 100 | 100 | | | 100 | 100 | 100 | 100 | 0 |
| 1/2 in (12.5 mm) | 55 | 100 | 100 | 100 | 100 | 100 | | | 93 | 93 | 86 | 100 | 7 |
| 3/8 in (9.5 mm) | 31 | 93 | 98 | 100 | 100 | 100 | | | 87 | 87 | 80 | 94 | 7 |
| #4 (4.75 mm) | 4 | 28 | 50 | 99 | 98 | 100 | | | 61 | 61 | 54 | 68 | 7 |
| #8 (2.36 mm) | 3 | 6 | 17 | 77 | 73 | 100 | | | 40 | 40 | 35 | 45 | 5 |
| #16 (1.18 mm) | 3 | 4 | 9 | 50 | 53 | 100 | | | 28 | 28 | 24 | 32 | 4 |
| #30 (.600 mm) | 3 | 4 | 5 | 29 | 39 | 100 | | | 20 | 20 | 16 | 24 | 4 |
| #50 (.300 mm) | 2 | 3 | 4 | 14 | 29 | 100 | | | 14 | 14 | 10 | 18 | 4 |
| #100 (.150 mm) | 2 | 2 | 3 | 5 | 21 | 98 | | | 9 | 9 | 6 | 12 | 3 |
| #200 (.075 mm) | 1.5 | 1.8 | 1.9 | 2.8 | 15.8 | 95.0 | | | 7.1 | 7.1 | 5.1 | 9.1 | 2 |
| AC Content % | | | | | | | | | 5.7 | 5.7 | 5.3 | 6.1 | 0.4 |

| | °F (°C) | Required |
|---|---|---|
| Mix temperature @ discharge from mixer: | 305 (152) | ± 20 °F (± 10 °C) |
| Optimum roadway compaction temperature: | 290 (143) | |
| Laboratory mixing temperature: | 325 (163) | |
| 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)**

| | # Gyr. | % Density of Gmm | % Density Required |
|---|---|---|---|
| Nini | 6 | 86.3 | 85.5 - 91.5 |
| Ndes | 50 | | 96.0 |

| Tests on Aggregates | | Required | | Units |
|---|---|---|---|---|
| Durability Index | 80 | 40 | min. | % |
| F.A.A. %U | | N/A | | % |
| Flat and Elongated | 3 | 10 | max. | % |
| Fractured Faces | 100/100 | 85/80 | min. | % |
| Insoluble Residue | 30.4 | 30 | min. | % |
| LA Abrasion | 29 | 40 | max. | % |
| Micro-Deval | 15.7 | N/A | | % |
| Permeability | 10.8 | 12.5 | max. | $10^{-5}$cm/s |
| Sand Equivalent | 81 | 40 | min. | % |
| IOC | 0.26 | | | % |
| Gse | 2.629 | | | |
| Gsb | 2.550 | | | |
| Specimen Weight | 4665 | | | g |

**Tests on Compressed Mixtures**

| %AC | Gmb | Gmm | % Density of Gmm | % Density Required Design / Field | % VMA | % VMA Required Design / Field | % VFA | % VFA Required |
|---|---|---|---|---|---|---|---|---|
| 5.5 | 2.302 | 2.416 | 95.3 | 96.0 / 94.5 - 97.4 | 14.7 | 14.5 / 14.0 | 68.0 | 72 - 77 |
| 6.0 | 2.318 | 2.398 | 96.7 | | 14.6 | | 77.4 | |
| 6.5 | 2.335 | 2.381 | 98.1 | | 14.4 | | 86.8 | |

| Dust Prop. | Dust Prop. Req. |
|---|---|
| 1.6 | 0.6 - 1.6 |
| 1.4 | |
| 1.3 | |

ITS (PSI) 99.6 N/A min.
TSR 0.81 0.80 / 0.75 min. (Design / Field)
Compacted Wt. (lbs/sy/1" thick) = 106.0 @ 5.7 % Asphalt Cement

**Hamburg Rut Test Depth (mm)** 5.13 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:** 2/8/2018
*(mm/dd/yyyy)*