

# Item 8016

## Aggregates for Surface Treatments (Materials Only)



### 1. DESCRIPTION

Furnish aggregate for surface treatments in conformance to the type, grade, and Surface Aggregate Classification (SAC) shown on the plans.

### 2. MATERIALS

Furnish uncontaminated materials of uniform quality throughout that meet the requirements of the plans and specifications. Notify the Engineer of all proposed material sources and of changes to material sources. The Engineer will designate the sampling location.

- 2.1. **Aggregate.** Stockpile aggregates for each source and type separately. Do not add materials to approved stockpiles without the approval of the Engineer.

Furnish aggregate of the type shown on the plans and listed in Table 1. Use [Tex-100-E](#) material definitions.

Table 1  
Aggregate Types

Type	Material
A	Gravel, crushed slag, crushed stone, or limestone rock asphalt (LRA)
B	Crushed gravel, crushed slag, crushed stone, or LRA
C	Gravel, crushed slag, or crushed stone
D	Crushed gravel, crushed slag, or crushed stone
E	Aggregate as shown on the plans
L	Lightweight Aggregate
PA	Precoated gravel, crushed slag, crushed stone, or LRA
PB	Precoated crushed gravel, crushed slag, crushed stone, or LRA
PC	Precoated gravel, crushed slag, or crushed stone
PD	Precoated crushed gravel, crushed slag, crushed stone
PE	Precoated aggregate as shown on the plans
PL	Precoated lightweight aggregate

Ensure the aggregate gradation meets the requirements in Table 2 for the specified grade, unless otherwise approved.

Furnish aggregate that meets the requirements shown in Table 3, unless otherwise shown on the plans. Furnish LRA in accordance with [DMS-9210](#), "Limestone Rock Asphalt (LRA)," when used. Provide aggregates from sources listed in the Department's *Bituminous Rated Source Quality Catalog* (BRSQC). Use material not listed or not meeting the requirements of the BRSQC only when tested by the Engineer and approved before use. Allow 30 calendar days for testing of material from such sources.

Provide aggregates for final surfaces that meet the SAC shown on the plans. Do not blend to meet the SAC. The SAC requirement will apply only to the aggregate used on the travel lanes unless otherwise shown on the plans. The BRSQC lists the SAC for sources on the *Aggregate Quality Monitoring Program* (AQMP).

Table 2  
Aggregate Gradation Requirements (Cumulative % Retained<sup>1</sup>)

Sieve	Grade								
	1	2	3S <sup>2</sup>	3		4S <sup>2</sup>	4	5S <sup>2</sup>	5
				Non-Lightweight	Lightweight				
1"	-	-	-	-	-	-	-	-	-
7/8"	0-2	0	-	-	-	-	-	-	-
3/4"	20-35	0-2	0	0	0	-	-	-	-
5/8"	85-100	20-40	0-5	0-5	0-2	0	0	-	-
1/2"	-	80-100	55-85	20-40	10-25	0-5	0-5	0	0
3/8"	95-100	95-100	95-100	80-100	60-80	60-85	20-40	0-5	0-5
1/4"	-	-	-	95-100	95-100	-	-	65-85	-
#4	-	-	-	-	-	95-100	95-100	95-100	50-80
#8	99-100	99-100	99-100	98-100	98-100	98-100	98-100	98-100	98-100

1. Round test results to the nearest whole number.
2. Single-size gradation.

Table 3  
Aggregate Quality Requirements

Property	Test Method	Requirement <sup>1</sup>	
		Minimum	Maximum
SAC	<a href="#">AQMP</a>	As shown on the plans	
Deleterious Material <sup>2</sup> , %	<a href="#">Tex-217-F</a> , Part I	-	2.0
Decantation, %	<a href="#">Tex-406-A</a>	-	1.5
Flakiness Index, %	<a href="#">Tex-224-F</a>	-	17
Gradation	<a href="#">Tex-200-F</a> , Part I	Table 2 Requirements	
Los Angeles Abrasion, %	<a href="#">Tex-410-A</a>	-	35
Magnesium Sulfate Soundness, 5 Cycle, %	<a href="#">Tex-411-A</a>	-	25
Micro-Deval Abrasion, %	<a href="#">Tex-461-A</a>	Note 3	
Coarse Aggregate Angularity <sup>4</sup> , 2 Crushed Faces, %	<a href="#">Tex-460-A</a> , Part I	85	-
<b>Additional Requirements for Lightweight Aggregate</b>			
Dry Loose Unit Wt., lb./cu. ft.	<a href="#">Tex-404-A</a>	35	60
Pressure Slaking, %	<a href="#">Tex-431-A</a>	-	6.0
Freeze-Thaw Loss, %	<a href="#">Tex-432-A</a>	-	10.0
Water Absorption, 24hr., %	<a href="#">Tex-433-A</a>	-	12.0

1. Material requirements are listed below, unless otherwise shown on the plans.
2. Not required for lightweight aggregate.
3. Used to estimate the magnesium sulfate soundness loss in accordance with Section 2.1.1.
4. Only required for crushed gravel.

2.1.1. **Micro-Deval Abrasion.** The Engineer will perform a minimum of one Micro-Deval abrasion test in accordance with [Tex-461-A](#) for each coarse aggregate source per project that has a Rated Source Soundness Magnesium (RSSM) loss value greater than 15 as listed in the BRSQC. The Engineer may waive all Micro-Deval testing based on a satisfactory test history of the same aggregate source.

The Engineer will estimate the magnesium sulfate soundness loss for each coarse aggregate source, when tested, using the following formula.

$$Mg_{est.} = (RSSM)(MD_{act.}/RSMD)$$

where:

$Mg_{est}$  = magnesium sulfate soundness loss

$MD_{act}$  = actual Micro-Deval percent loss

$RSMD$  = Rated Source Micro-Deval

When the estimated magnesium sulfate soundness loss is greater than the maximum magnesium sulfate soundness loss specified, the coarse aggregate source will not be allowed for use unless otherwise approved by the Engineer. The Engineer may require additional testing before granting approval.

- 2.2. **Precoating.** Precoat aggregate uniformly and adequately with asphalt material to the satisfaction of the Engineer when shown on the plans. Specific aggregates may be prohibited from being precoated when shown on the plans. Meet Table 2 and Table 3 requirements before precoating. Furnish precoated aggregate that spreads uniformly using approved mechanical spreading equipment.

The Engineer retains the right to select a target value for the desired percent by weight of residual bitumen coating on the aggregate. Furnish precoated aggregate that is within  $\pm 0.3\%$  of the target value when tested in accordance with [Tex-236-F](#). The Engineer may require trial batches to assist in selecting the target value.

The Engineer retains the right to remove precoat material from aggregate samples in accordance with [Tex-210-F](#), or as recommended by the Materials and Test Division, and test the aggregate to verify compliance with Table 2 and Table 3 requirements. Gradation testing may be performed with precoat intact.

- 2.2.1. **Asphalt Material.** Precoat the aggregates with asphalt material that meets the requirements of Item 300, "Asphalts, Oils, and Emulsions." Use any asphalt material that meets the requirements of Item 300, "Asphalts, Oils, and Emulsions," unless a specific precoat material is specified on the plans.

- 2.2.2. **Additives.** Use the type and rate of additive specified when shown on the plans. Add in accordance with Item 301, "Asphalt Antistripping Agents." Use [Tex-530-C](#) for verification during production testing unless otherwise directed.

- 2.3. **Sampling.** Personnel who conduct sampling and witnessing of sampling must be certified by the Department-approved certification program. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning construction and when personnel changes are made. At any time during the project, the Engineer may perform production tests as deemed necessary in accordance with Item 5, "Control of the Work."

The Engineer will sample aggregate from stockpiles located at the production site, intermediate distribution site, or project location in accordance with [Tex-221-F](#), Section 3.2.3. The Engineer will split each sample into 2 equal portions in accordance with [Tex-200-F](#), Section 3.3, and label these portions "Engineer" and "Contractor" or "Supplier." Witness the sampling and splitting, and take immediate possession of the samples labeled "Contractor" or "Supplier".

- 2.4. **Reporting and Responsibilities.** The Engineer will provide test results to the Contractor and Supplier within 10 working days from the date the stockpile was sampled for sources listed on the Department's Bituminous Rated Source Quality Catalog (BRSQC), unless otherwise directed. The Engineer will provide test results for the LA Abrasion ([Tex-410-A](#)) and Magnesium Sulfate Soundness ([Tex-411-A](#)) tests within 30 calendar days for sources not listed on the BRSQC, or for sources not meeting the requirements of Section 2.1.1., "Micro-Deval Abrasion." The Engineer will report to the other party within 24 hr. when any test result does not meet the requirements listed in Table 2 or Table 3.

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### 3. EQUIPMENT

Manufacture precoated aggregate in a mixing plant that produces uniformly coated aggregate.

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#### 4. QUALITY CONTROL/QUALITY ASSURANCE

Deliver aggregate to the locations shown on the plans. Prevent segregation, mixing of the various materials or sizes, and contamination with foreign materials when aggregates are stockpiled. The Engineer will reject contaminated stockpiles.

Provide adequate initial cooling of precoated aggregate to prevent asphalt or aggregate damage due to excessive heat buildup in stockpiles. Limit stockpile height to 3 ft. immediately after production when asphalt cement is the precoating material. Consolidate stockpiles after adequate cooling, as approved. The Engineer will reject stockpiles showing evidence of damage due to excessive heat buildup.

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#### 5. MEASUREMENT

5.1. Material will be measured as follows:

Material (Vehicle Pick up). The ton or cubic yard in vehicle method.

Material (Site Delivery). The ton or any cubic yard method.

A site delivery can be either on the roadway right of way or at a maintenance yard. The quantity to be paid for is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Payment will be made in the measurements defined as follows:

**Cubic Yard in Vehicle.** By the cubic yard in vehicles of uniform capacity at the point of delivery.

**Cubic Yard in Drop off.** By the cubic yard in the final drop off position by the method of average end Areas. The Department will stockpile materials for measurement.

**Ton.** By the ton of dry weight in vehicles as delivered. The dry weight is determined by deducting the weight by deducting the moisture in the material at the time of the weighing from the gross weight of the material. The Engineer will determine the moisture content in the material in accordance with Tex-103-E from samples taken at the time of weighing.

When material is measured in trucks, the weight of the material will be determined on certified scales, or the Contractor must provide a set of standard platform truck scales at a location approved by the Engineer. Scales must conform to the requirements of Item 520, "Weighing and Measuring Equipment."

When material is measured by the ton, provide a conversion rate to cubic yards on each haul ticket.

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#### 6. PAYMENT

The materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the types shown below

6.1. **Material (Vehicle Pick up).** Payment will be made for the type and grade specified. For cubic yard measurement, "In Vehicle" is required. This price is full compensation for furnishing materials, assistance provided in sampling, loading, furnishing scales and labor for weighing and measuring, and equipment, labor, tools, and incidentals.

**Material (Site Delivery).** Payment will be made for the type and grade specified. For cubic yard measurement, "In Vehicle" or "Drop Off" will be specified. This price is full compensation for furnishing materials, assistance provided in sampling, loading, hauling, delivery of materials, furnishing scales and labor for weighing and measuring, and equipment, labor, tools, and incidentals. If bid codes in the estimate indicate location numbers, each location will be shown in the plans.