## Section 309. — EMULSIFIED ASPHALT-TREATED BASE COURSE

11/08/21– FP-14

Construction Requirements

WFL Specification 04/02/21 3090010

Include the following when work is required in this Section.

### 309.03 General.

Delete the text of this Subsection and substitute the following:

Prepare the surface on which the emulsified asphalt-treated aggregate base course is placed according to Section 204 or 303 as applicable.

After a representative quantity of aggregate is produced and at least 14 days before incorporating the aggregate into the work, submit the following:

**(a)** Proposed target values for base aggregate within the gradation ranges shown in Table 703-2 for the required gradation. List the percent passing for all sieve sizes shown in Table 703-2. Target values for non-specification sieves are necessary for performing *The Humphres Method of Granular Soils*.

**(b)** A representative 400-pound (180-kilogram) aggregate sample. Submit the aggregate sample to the Vancouver Laboratory.

End placement and resubmit new target values if the calculated mean value for a sieve differs from the target value by more than the allowable deviation for that sieve.

WFL Specification 01/01/14 3090020

Include the following when aggregate (except untreated) is the same as required in Section 301.

If target values and aggregate samples have been submitted under Section 301 and the values have not been changed, use the compaction curve as established according to Subsection 301.03.

WFL Specification 11/08/21 3090030

Include the following when work is required under this Section.

### 309.04 Mixing and Spreading.

Delete the text of this Subsection and substitute the following:

Use a stationary pugmill with weighing, volumetric, or other gauging equipment capable of accurately controlling the material entering the mixer. Interlock the controls for the aggregate feed with the emulsified asphalt and water controls to ensure uniform introduction of material into the mixer. Use the optimum moisture content from the Humphres test performed by the Government.

Add the aggregate and water to the mixer before the emulsified asphalt. Add 1 percent emulsified asphalt by mass of aggregate. Adjust the total liquid content (emulsified asphalt and water), so that at the time of compaction the total liquid content is within 1 percent of the optimum moisture content. Mix until all particles are uniformly coated. Haul and place the treated aggregate immediately after mixing. Do not store emulsified asphalt treated aggregates in stockpiles.

Spread the mixture on the prepared surface in a uniform layer. Shape the mixture to the required line, grade, and cross-section. Route hauling equipment uniformly over the full width of the surface to minimize rutting or uneven compaction.

If at any time the calculated mean value for any tested sieve differs from the target value by more than the allowable deviation for that sieve, terminate placement and resubmit new target values and another aggregate sample to the Vancouver Laboratory for a new determination of the maximum density and optimum moisture according to the test procedure described on pages 92 to 98 of Highway Research Board Bulletin No. 319, dated 1962, *The Humphres Method of Granular Soils*.

### 309.05 Compacting.

Delete the text of this subsection and substitute the following:

The Government will determine the maximum density and optimum moisture according to the test procedure described on pages 92 to 98 of Highway Research Board Bulletin No. 319, dated 1962, *The Humphres Method of Granular Soils*. Use the data provided to determine the maximum density based on the gradation of field compaction samples.

Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and places not accessible to the roller, compact the material with approved tampers or compactors.

Compact each layer to at least 95.0 percent of maximum density. Determine the in-place density and moisture content according to AASHTO T310 or other approved test procedures.

Measurement

### 309.09

Delete the second paragraph and substitute the following:

When measuring emulsified asphalt-treated aggregate base by the cubic yard (cubic meter), measure in place.

WFL Specification 04/02/21 3090040

Include the following when aggregate is measured by the cuyd.

Note: Default measurement for this Section is cuyd, talk to Construction and Materials before using a different measurement.

Delete Table 309-1 and substitute the following:

Table 309-1

Sampling, Testing, and Acceptance Requirements

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Remarks |  | Not required when using Government-provided sources | “ | " | “ | " | " |
| Reporting Time |  | Before using in work | “ | " | “ | 24 hours | " |
| Split Sample |  | Yes | “ | " | “ | No | " |
| Point of Sampling |  | Source of material | “ | " | “ | Crusher belt | " |
| Sampling Frequency |  | 1 per type & source of material(1) | “ | " | “ | Minimum 2 per day per stockpile | |
| Test Methods Specifications | **Source** | AASHTO T 96 | AASHTO T 210 | AASHTO T 104 | WFLHD-DMSO | AASHTO T 11 & T27 | ASTM D5821 |
| Category |  | − | − | − | − | − | − |
| Characteristic |  | LA abrasion (coarse) | Durability index | Soundness using sodium sulfate | Accelerated Weathering | Gradation | Fractured faces |
| Type of Acceptance (Subsection) |  | Measured and tested for conformance (106.04 & 105) |  |  |  | Process control (153.03) | |
| Material or Product (Subsection) |  | Aggregate quality (703.05) |  |  |  | Aggregate base, Grading C, D, & E (703.05) | |

Table 309-1 (continued)

Sampling, Testing, and Acceptance Requirements

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Remarks |  | − | − |  |  |  | − | − | − | − |
| Reporting Time |  | Before using in work | 4 hours |  |  |  | " | " | − | Before placing next layer |
| Split Sample |  | Yes | Yes |  |  |  | " | " | No | No |
| Point of Sampling |  | Stockpile or Production output | In-place, before compaction | |  |  |  | Belt feed before adding emulsified asphalt | − | In-place, after compaction |
| Sampling Frequency |  | 1 per type & source of material | 1 per 500 CUYD (400 m3) | | |  | " | " |  | 1 per 1500 SQYD per layer |
| Test Methods Specifications | **Production** | WFLHD Humphres | AASHTO T 30 |  |  |  | ASTM D5821 | AASHTO T 176, Alternate Method No. 2, Reference Method | See Note (2) | AASHTO T 310 or other approved procedures |
| Category |  | − |  | I | I | II | I |  | I | − |
| Characteristic |  | Moisture- density (max density) | Gradation | ⅜ inch (9.5 mm) | No. 4 (4.75 mm) | Other specified sieves | Fractured faces | Sand equivalent | SEP | Density |
| Type of Acceptance (Subsection) |  | Measured and tested for conformance (106.04) | Statistical (106.05) | | | | |  |  | Measured and tested for conformance (106.04) |
| Material or Product (Subsection) |  | Aggregate base, Grading C, D, & E | Emulsified asphalt-treated aggregate base, Grading C, D, & E (703.05) | | | | |  |  | Emulsified asphalt-treated aggregate base, Grading C, D, & E |

Table 309-1 (continued)

Sampling, Testing, and Acceptance Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Remarks | **Finished Product** | − | (1) Submit at least five reports, but not less than one report per rock type for each source. Submit reports dated within 1 year of intended use and include rock type and sample location. Obtain samples representative of aggregates being furnished.  (2) SEP (SE/P200 (SE/P75) Index) is a measure of a material’s ability to perform based on the quality and quantity of fines present. Quality is represented by the sand equivalent (SE) and quantity is represented by the percent passing the No. 200 (75-µm) sieve (P200 (75)). SEP is computed as follows:  For SE ≥ 29, SEP = SE/(P200 (75) + 25) and for SE < 29, SEP = (SE + 4)/(SE + P200 (75)).  Where: SE = Plastic fines in graded aggregates and soils by using the sand equivalent test. See AASHTO T 176, Alternate Method No.2, Reference Method.  P200 (75) = Material finer than the No. 200 (75 µm) sieve in mineral aggregates by washing. See AASHTO T 11. |
| Reporting Time | Before placement of next layer or as requested |
| Split Sample | No |
| Point of Sampling | Completed base surface |
| Sampling Frequency | Determined by the CO |
| Test Methods Specifications | Subsection 301.06 |
| Category | – |
| Characteristic | Surface tolerance & grade |
| Type of Acceptance (Subsection) | Measured and tested for conformance (106.04) |
| Material or Product (Subsection) | Emulsified asphalt-treated aggregate base |

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Include the following when aggregate is measured by the ton.

Note: Default measurement for this Section is cuyd, talk to Construction and Materials before using a different measurement.

Delete Table 309-1 and substitute the following:

Table 309-1

Sampling, Testing, and Acceptance Requirements

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Remarks |  | Not required when using Government-provided sources | “ | " | “ | " | " |
| Reporting Time |  | Before using in work | “ | " | “ | 24 hours | " |
| Split Sample |  | Yes | “ | " | “ | No | " |
| Point of Sampling |  | Source of material | “ | " | “ | Crusher belt | " |
| Sampling Frequency |  | 1 per rock type & not less than 5 per material source(1) | “ | " | “ | Minimum 2 per day per stockpile | |
| Test Methods Specifications | **Source** | AASHTO T 96 | AASHTO T 210 | AASHTO T 104 | WFLHD-DMSO | AASHTO T 11 & T27 | ASTM D5821 |
| Category |  | − | − | − | − | − | − |
| Characteristic |  | LA abrasion (coarse) | Durability index | Soundness using sodium sulfate | Accelerated Weathering | Gradation | Fractured faces |
| Type of Acceptance (Subsection) |  | Measured and tested for conformance (106.04 & 105) |  |  |  | Process control (153.03) | |
| Material or Product (Subsection) |  | Aggregate quality (703.05) |  |  |  | Aggregate base, Grading C, D, & E (703.05) | |

Table 309-1 (continued)

Sampling, Testing, and Acceptance Requirements

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Remarks |  | − | − |  |  |  | − | − | − | − |
| Reporting Time |  | Before using in work | 4 hours |  |  |  | " | " | − | Before placing next layer |
| Split Sample |  | Yes | Yes |  |  |  | " | " | No | No |
| Point of Sampling |  | Stockpile or Production output | In-place, before compaction | |  |  |  | Belt feed before adding emulsified asphalt | − | In-place, after compaction |
| Sampling Frequency |  | 1 per type & source of material | 1 per 1000 tons (900 metric tons) | | |  | " | " |  | 1 per 500 tons (450 metric tons), but not less than 1 per layer |
| Test Methods Specifications | **Production** | WFLHD Humphres | AASHTO T 30 |  |  |  | ASTM D5821 | AASHTO T 176, Alternate Method No. 2, Reference Method | See Note (2) | AASHTO T 310 or other approved procedures |
| Category |  | − |  | I | I | II | I |  | I | − |
| Characteristic |  | Moisture- density (max density) | Gradation | ⅜ inch (9.5 mm) | No. 4 (4.75 mm) | Other specified sieves | Fractured faces | Sand equivalent | SEP | Density |
| Type of Acceptance (Subsection) |  | Measured and tested for conformance (106.04) | Statistical (106.05) | | | | |  |  | Measured and tested for conformance (106.04) |
| Material or Product (Subsection) |  | Aggregate base, Grading C, D, & E | Emulsified asphalt-treated aggregate base, Grading C, D, & E (703.05) | | | | |  |  | Emulsified asphalt-treated aggregate base, Grading C, D, & E |

Table 309-1 (continued)

Sampling, Testing, and Acceptance Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| Remarks | **Finished Product** | − | (1) Submit at least five reports, but not less than one report per rock type for each source. Submit reports dated within 1 year of intended use and include rock type and sample location. Obtain samples representative of aggregates being furnished.  (2) SEP (SE/P200 (SE/P75) Index) is a measure of a material’s ability to perform based on the quality and quantity of fines present. Quality is represented by the sand equivalent (SE) and quantity is represented by the percent passing the No. 200 (75-µm) sieve (P200 (75)). SEP is computed as follows:  For SE ≥ 29, SEP = SE/(P200 (75) + 25) and for SE < 29, SEP = (SE + 4)/(SE + P200 (75)).  Where: SE = Plastic fines in graded aggregates and soils by using the sand equivalent test. See AASHTO T 176, Alternate Method No.2, Reference Method.  P200 (75) = Material finer than the No. 200 (75 µm) sieve in mineral aggregates by washing. See AASHTO T 11. |
| Reporting Time | Before placement of next layer or as requested |
| Split Sample | No |
| Point of Sampling | Completed base surface |
| Sampling Frequency | Determined by the CO |
| Test Methods Specifications | Subsection 301.06 |
| Category | – |
| Characteristic | Surface tolerance & grade |
| Type of Acceptance (Subsection) | Measured and tested for conformance (106.04) |
| Material or Product (Subsection) | Emulsified asphalt-treated aggregate base |