02/25/2025

Include if using a Section 401 pay item.

The CFL Incentives and Adjustments spreadsheet that matches the roughness calculations shown in this SCR has a revised date of 9/5/24.

## Section 401. — ASPHALT CONCRETE PAVEMENTBY GYRATORY MIX DESIGN METHOD

Enter the pavement roughness type and asphalt binder grade in the highlighted areas below. Materials will provide to the designer the following:

**Roughness type**: Use the following guidelines:

**Type I** is for 3R mill and fill ONElift. This requires before and after IRI measurement.

-Type I-A is for speeds greater than 35 mph.

-Type I-B is for speeds less than 35 mph.

**Type II** is for 3R mill and fill TWO lifts. This requires before and after IRI measurement.

-Type II-A is for speeds greater than 35 mph.

-Type II-B is for speeds less than 35 mph.

**Type III** is for 4R and 3R work with pulverization, base, or other typical section work prior to placing the asphalt.

-Type III-A is for speeds greater than 35 mph.

-Type III-B is for speeds less than 35 mph.

**Asphalt binder grade**: Binder grade is project specific.

**Pressure Aging Vessel Temperature**: The default temperature should be 212°F. If the project is in a desert environment the temperature could change to 230°F in thehighlighted area below.

**Construction Requirements**

**401.03 Composition of Mix (Job-Mix Formula).** Add the following:

A minimum of one percent antistrip additive, type 3 (lime) is required in the asphalt concrete mixture.

Pavement roughness is type <<<I-A, I-B, II-A, II-B, III-A, or III-B>>>, and IV as shown in Subsection 401.16.

Asphalt binder grade is PG <<<xx-xx>>>. The Pressure Aging Vessel test temperature is <<<212>>> °F.

Add the following after the first paragraph:

Compact specimens with the gyratory effort corresponding to the design ESAL level of 0.3 to <3 million. Use a gyratory compactor which meets the internal angle requirement according to AASHTO T 312.

If more than 1.0 percent hydrated lime is proposed in the JMF, provide AASHTO T 283 test results showing the additional lime is necessary to meet the minimum tensile strength ratio requirements in Table 401-1.

**(e) Verification.** Delete the first paragraph and substitute the following:

The verification process starts when all required job mix formula documentation and materials are received.The information supplied in the Contractor’s job mix formula must agree with the verification test results within the tolerances shown below. Do not begin asphalt concrete mix production for the control strip until the JMF has been approved.

**(e) Verification.** Delete Subsections (3) and (4) and substitute the following:

**(3) Bulk specific gravity of aggregate (Gsb).** The Contractor’s coarse and fine Gsb is verified if the CO’s results are within 0.038 for AASHTO T 85 and 0.066 for AASHTO T 84.

**(4) VMA.** The Contractor’s VMA is verified if the CO’s result is within the specification limit in Table 401-1.

**(e) Verification.** Add the following:

**(8) Hveem stabilometer value**. The Contractor’s Hveem stabilometer value is verified if the CO’s result is above the minimum specification of 30.

**Table 401-1 Gyratory Asphalt Concrete Mix Design Requirements, AASHTO R 35.** Add the following note:

(5) For AASHTO T 283, use 4-inch diameter specimens. Note that AASHTO T 283 requires a freeze-thaw cycle.

**401.15 Joints, Trimming Edges, and Cleanup.** Add the following:

Make the longitudinal joint in the top layer at the centerline of the pavement on two-lane roadways or at the lane lines of roadways with more than two lanes. Establish the centerline of the pavement from recorded data defined in Subsection 152.05(b) or construction staking data if furnished by the Government. Offset the longitudinal joint in the layer immediately below at least 6 inches from the joint.

See the plans for curve widening locations and details. For two-lane roadways make the longitudinal joint at the centerline of the pavement. Do not vary the shoulder width where curve widening exists.

At connections to existing pavements and previously placed lifts, make the transverse joints vertical to the depth of the new pavement. Form transverse joints by cutting back the previous run to expose the full depth of the course.

**401.16 Pavement Roughness.** Add the following to the first paragraph:

Coordinate profiling operations with the CO. Export each profile (elevation, distance data, header, and marker information) in pavement profile format (ppf) and format specific to the profiler manufacturer to a CD or DVD and submit after profiling. Do not submit non-continuous data files.

**401.16(c) Type III pavement roughness.** Delete this Subsection and substitute the following:

Measure the profile of the final pavement surface for payment. Measure the profile before placing a surface treatment and within 21 days of completing roadway paving. No defective area corrections are allowed on the final pavement surface except at locations that do not meet Subsection 401.16(d). Submit electronic files and the analysis to the CO for analysis. Correct locations that do not meet Subsection 401.16(d) according to Subsection 401.17.

Pay factors from Table 401-5 will be used in conjunction with the long continuous histogram printout from ProVAL’s Smoothness Assurance Analysis function using a long continuous 528-foot segment length for analysis. The final PFrough is equal to the sum of the products of the individual pay factors indicated in Table 401-5 multiplied by the ratio of individual lane miles to the overall project lane miles and by ProVAL’s corresponding histogram percentages, divided by 100. The final PFrough will be determined to three decimal places.

Lower paving lifts can be profiled to locate areas of localized roughness and estimate the final profile pay factor. Defective areas can be corrected on lower paving lifts according to Subsection 401.17.

If the final roadway MRI for the entire traveled way is greater than the value shown in Table 401-5, place a minimum 1-inch overlay over the entire paved surface.

Delete Tables 401-8 and 401-9 and substitute the following:

Table 401-8

Type III Pavement Roughness Pay Factors

| **Mean Roughness Index****(MRI)****Type III-A, inch/mile** | **Mean Roughness Index****(MRI)****Type III-B, inch/mile** | **Pay Factor****(PFrough)** |
| --- | --- | --- |
| Localized roughness threshold170 inch/mile | Localized roughness threshold190 inch/mile |  |
| If MRI of entire roadwayis greater than125 inch/mile | If MRI of entire roadwayis greater than140 inch/mile | Correct with Overlay |
| Greater than 95.0 | Greater than 110.0 | 0.700 |
| 95.0 to 90.0 | 110.0 to 105.0 | 0.750 |
| 90.0 to 85.0 | 105.0 to 100.0 | 0.800 |
| 85.0 to 80.0 | 100.0 to 95.0 | 0.850 |
| 80.0 to 75.0 | 95.0 to 90.0 | 0.900 |
| 75.0 to 70.0 | 90.0 to 85.0 | 0.950 |
| 70.0 to 65.0 | 85.0 to 80.0 | 0.970 |
| 65.0 to 60.0 | 80.0 to 75.0 | 1.000 |
| 60.0 to 55.0 | 75.0 to 70.0 | 1.010 |
| 55.0 to 50.0 | 70.0 to 65.0 | 1.020 |
| 50.0 to 45.0 | 65.0 to 60.0 | 1.030 |
| 45.0 to 40.0 | 60.0 to 55.0 | 1.040 |
| 40.0 to 35.0 | 55.0 to 50.0 | 1.050 |

**Table 401-9**

**Localized Roughness and Straightedge Measurement Pay Reductions**

| **Type I** | **Type II** | **Localized****Roughness Limit****MRI** | **Localized****Roughness****Limit****MRI, inch/mile** | **Type III-A** | **Type III-B** |
| --- | --- | --- | --- | --- | --- |
| **Deduction****per****Occurrence** | **Deduction****per****Occurrence** | **Deduction****per****Occurrence** | **Deduction****per****Occurrence** |
| $200 | $300 | Computed MRI valueaccording to Subsection:401.16(b) for Types I and II401.16(c) for Type III | 170.0 to 179.9 | $200 | - |
| 180.0 to 189.9 | $400 | - |
| 190.0 to 199.9 | $600 | $300 |
| 200.0 to 209.9 | $800 | $400 |
| 210.0 to 219.9 | $1,000 | $500 |
| 220.0 to 229.9 | $1,500 | $750 |
| 230.0 to 239.9 | $2,000 | $1,000 |
| > 240.0 | $4,000 | $1,500 |