EQUIPMENT CHECKED: MICRO DEVAL ABRASION MACHINE AND APPARATUS (Tex-461-A, ASTM D 6928, AASHTO T 327)

1. SCOPE

1.1 This procedure provides instructions for verifying the critical elements and calibration of the micro deval abrasion machine, micro deval rolling mill (revolution verification), stainless steel ball (dimensional verification), stainless steel jar (dimensional verification), and the timer verification (Tex-461-A).

2. APPARATUS

2.1 Inspection Equipment Required

1. Gauges, calipers, or other measuring devices with a precision of at least 2.5 μm or 10% of the tolerances listed in AASHTO M-92, Table 1, Column 4.
2. Calibrated timer with an accuracy of ± one (1) second per 120 minutes.
3. Balance with a minimum capacity of 10,000g, accuracy of 0.1 g or 0.01% of the test sample, whichever is greater.
4. Steel Ruler readable to 0.1 mm
5. *Laboratory Reference Aggregate*—A supply of standard "Brechin Quarry No. 2" coarse aggregate available from the Soils and Aggregates Section, Materials Engineering Materials Office, Ministry of Transportation, 1201 Wilson Avenue, Downsview, Ontario, Canada M3M1J8. Fax: 1-416-235-4101.
6. *Calibration Aggregate*—An adequate supply of aggregate, established by the Laboratory to use for calibration of the test method (see ASTM D 6928, Section 11).

Tolerance:
The equipment shall meet the tolerances specified in test procedure Tex-461-A.

3. PROCEDURE

3.1 Micro Deval Rolling Mill – Revolution Requirement:

1. Measure revolutions at one (1) minute with a requirement of 100 ± 5 RPM; record the results on the worksheet.
2. Measure revolutions at 120 minutes with a requirement of 12,000 ± 600 RPM; record the results on the worksheet.

3.2 Micro Deval Machine – Calibration Requirement

1. **Read all of Section 11 in ASTM D 6928 before continuing**.

2. Produce (per machine) 10 samples of the Reference Aggregate ("Brechin Quarry No. 2"). Save any unused Reference Aggregate. (**NOTE:** produce all samples in accordance to the Concrete Aggregate Gradation – Table 2, Tex-461-A).

3. Produce (per machine) 31 samples (**NOTE:** produce all samples in accordance to the Concrete Aggregate Gradation – Table 2, Tex-461-A) of the Calibration Aggregate (chosen local aggregate) which meet the criterion set in ASTM D 6928, Section 11.1. Save 10 samples to use the following year as the reference aggregate and 11 samples to test, one per month, between calibration periods. (**NOTE**: See ASTM D 6928, Section 11.2; the local (Calibration) aggregate will need to meet this standard before reducing the testing to once a month.)

4. Perform the series of tests in accordance to Tex-461-A, for 10 Reference Aggregate and 10 Calibration Aggregate together so that one set of samples tested includes one Reference Aggregate and one Calibration Aggregate sample. Throughout the process, alternate the two aggregate types on the tiers from one testing session to the other. For example, if the current set places the Calibration Aggregate on the top tier and Reference Aggregate on the bottom tier, the Calibration Aggregate alternates to the bottom tier and the Reference Aggregate to the top tier for the next set.

5. Record all the data (revolutions, machine # and tier, initial weight, final dry weight, percentage loss) on a spreadsheet. Separate the results for the Calibration Aggregate from the Reference Aggregate and calculate the average loss (percentage) and standard deviation.

6. Graph the individual percentage losses for the Calibration Aggregate and Reference Aggregate on the same chart. This correlates the Calibration Aggregate to the Reference Aggregate.

7. Once the Reference Aggregate has been correlated to the Calibration Aggregate, the Calibration Aggregate (extra 10 samples) can be used as the Reference Aggregate the following year.

3.3 Stainless Steel Ball - Dimension Verification:

1. Measure 10 stainless steel spheres at random with a dimension verification requirement of 0.3750 ± 0.02 in. (9.5 ± 0.5 mm); record each measured diameter on the worksheet.

2. Verify all the stainless steel spheres DO NOT PASS the 9.0 mm machined gauge sieve provided by CST/M&P. Discard all spheres passing the 9.0 mm gauge. Replace spheres as needed to meet the testing requirements in Tex-461-A.

3.4 Stainless Steel Jar Dimension Verification:

1. Measure the internal diameter of the stainless steel jar with a requirement of 7.6 ± 0.1 in. (193 ± 2.5 mm); record the measured dimension on the worksheet.
2. Measure the internal height of the stainless steel jar with a requirement of 6.7 ± 0.1 in. (170 ± 2.5 mm); record the measured dimension on the worksheet.

3.5 Timer Verification:

1. Conduct run time of 120 minutes (7,200 seconds) for the micro deval timer; record the reading in seconds. (**NOTE**: Run 3.5 Steps 1 and 2 simultaneously).
2. Conduct run time of 120 minutes (7,200 seconds) for the standard timer; record the reading in seconds.
3. Compare the results of both runs and note any variation on the worksheet.