SECTION 402 - PLANTMIX BITUMINOUS SURFACE

Use this paragraph for straightedge only (no pavement smoothness type)

402.03.05 Surface Tolerances. The profilograph measurement for smoothness is not required.

Use the next two Subsections for pavement smoothness type

402.03.03 Equipment. The second paragraph of this Subsection of the Standard Specifications is hereby deleted and the following substituted therefore:

Furnish a vehicle-mounted inertial profiling system meeting the applicable requirements of AASHTO M328, R56, and R57.

A minimum of 7 working days prior to beginning collection of profile data, submit a copy of the operator's manual for the profiler that is to be used and documentation that the inertial profiler and operator are certified according to the requirements of AASHTO R56 or other equivalent Department-accepted certification program. The profiler operator shall be certified to operate the actual profiler that is to be used.

Calibrate the following components of the inertial profiling system according to the manufacturer's recommendations at the intervals specified in the operator's manual for the inertial profiler that is furnished or at any time deemed necessary:

1. Accelerometer Calibration (if specified by the manufacturer) or Accelerometer Verification.
2. Longitudinal Distance Calibration or DMI Calibration Test.
3. Vertical Height Calibration (if specified by the manufacturer) or Vertical Height Verification.
4. Any other test as recommended by the manufacturer of the inertial profiler.

If calibration procedures are not indicated by the manufacturer, submit a proposed procedure for calibration and/or verification of calibration for approval.

The calibration shall be observed by and approved at the discretion of the Engineer.

Use an inertial profiling system capable of measuring the left and right wheel paths of a travel lane and determining the smoothness of the pavement surface using the International Roughness Index (IRI) format.

The inertial profiling system shall have a printer capable of providing the calculated IRI for each wheel path and MRI in inches per mile for each 0.1 mile section. The printer shall also be capable of printing station numbers, distances, and comments entered by the operator via keypad while measuring the profiles.

The laser height referencing transducer may consist of a single point or spot laser, or a line laser with a minimum 4 inch wide footprint when measuring the plantmix bituminous surface.

402.03.05 Surface Tolerances. This Subsection of the Standard Specifications is hereby deleted and the following substituted therefore:

Type XXX pavement smoothness is required.

Produce completed surfacing which is smooth and free from ruts, humps, depressions or irregularities. Eliminate ridges, indentations, or other objectionable marks left in the surface by rolling or other means. Discontinue the use of equipment that leaves ridges, indentations, or other objectionable marks in the bituminous surface, or does not consistently produce a surface meeting straightedge and inertial profiler requirements.

After final rolling, the smoothness of the final dense-graded surface course shall meet the straightedge and inertial profiler requirements. Furnish the specified inertial profiler and perform the profile measurement.

(a) Straightedge Measurement. The Engineer will perform this measurement. When a straightedge 12 feet long is laid on the finished surface both perpendicular and parallel with the centerline of the highway, the surface shall not vary by more than 0.25 inch from the lower edge of the straightedge.

Correct defective areas by approved methods.

(b) Inertial Profiler Measurement. Measure the pavement with the inertial profiling system according to Test Method No. Nev. T448. Give notification at least 2 working days prior to beginning the measurement process.

Carded 11/25/15

Operate the inertial profiler within the operational range as recommended by the manufacturer.

Perform the profile measurement in the direction of traffic.

Measure the profiles of the left and right wheel paths within each traffic lane at 3 feet from and parallel to the respective left or right traffic lane line. The spacing between sensor paths shall be between 66 and 72 inches. Measure profiles for the entire length of each traffic lane placed within 48 hours after each day's placement of plantmix bituminous mixture.

Mark areas of localized roughness in excess of the specified limit after the initial run of the inertial profiler.

Do not measure pavement within 25 feet of a cattle guard or some other break in the continuous pavement. Do not measure pavement within 25 feet of a concrete bridge deck (including approach slabs) unless the bridge deck is to receive a plantmix overlay.

Pavement within 25 feet of a bridge deck or approach slab shall meet the profile requirements set forth in Subsection 502.03.16.

Complete the initial runs of the inertial profiler before opening the new pavement to public traffic whenever practical. Only flagging costs for the traffic control required for the initial running of the inertial profiler will be paid for according to Section 624.

Calculate a Mean Roughness Index (MRI) for each 0.100 mile of traffic lane measured.

Submit the measured profile data in an approved unfiltered electronic format within 24 hours of the completion of the measurement. The submitted format shall be compatible with Profile Viewing and Analysis (ProVAL) software. In addition to the electronic format file, provide a printout of the report of calibration for the profiler and a printed summary report within 24 hours of the completion of a measurement run. The required elements of the printed report shall be as shown in Test Method No. Nev. T448.

Profile data will be evaluated to determine acceptance.

Profile data will be evaluated for MRI and any areas of localized roughness with an International Roughness Index (IRI) in excess of specification requirements for the designated pavement smoothness type. An area of localized roughness is defined as any 25 foot section of roadway that contributes disproportionately to the overall roughness index value. Areas of localized roughness shall be identified using a report of short continuous IRI with a base length of 25 feet.

The maximum allowable MRI for each 0.100 mile section for the specified pavement smoothness type shall be as follows:

MEAN ROUGHNESS INDEX

Pavement Smoothness Type	inch/mile
Type A	50.000
Type B	60.000
Type C	80.000
Type D	100.000

The maximum allowable IRI for each area of localized roughness for the specified pavement smoothness type shall be as follows:

INTERNATIONAL ROUGHNESS INDEX
LOCALIZED ROUGHNESS

Pavement Smoothness Type	inch/mile
Type A	150.000
Type B	160.000
Type C and D	175.000

Pavement on horizontal curves having a centerline radius of less than 2,000 feet, and within the super elevation transition of such curves, will be evaluated as pavement smoothness Type C.

The Department will perform verification testing using an inertial profiler meeting the requirements of Subsection 402.03.03.

Carded 05/17/17

The Contractor's MRI values shall be within 5% of the Department's MRI values. Re-measure sections that exceed the 5% difference criteria. If results still exceed 5% difference, the Contractor can accept the Department's results or have referee testing performed by an independent party who shall be required to conform to all of the requirements specified herein. If all the referee testing results are within 5% of the Contractor's test results, the Department will reimburse the Contractor for the cost of the referee testing.

Correct areas exceeding the pavement smoothness requirements.

Submit the intended method of correction for approval. Do not perform corrective action until the submitted data has been evaluated and the intended method of correction has been approved.

If abrasive grinding is approved and used as a method of correction, ensure that the grinding process does not significantly reduce the pavement thickness. The Department reserves the right to obtain core samples to determine remaining pavement thickness upon completion of grinding operations. Perform additional grinding as necessary to extend the ground area laterally to the nearest lane line or edge of pavement and longitudinally to lines normal to the pavement centerline.

Re-measure repaired, replaced, or corrected areas for conformance with pavement smoothness requirements.

Upon completion of corrective work, submit the profile data and related printed summary within 24 hours of completion of corrective work. The data shall indicate corrected areas meet pavement smoothness requirements.

Apply seal coat to ground areas after the surface tolerance specifications have been met. Apply the seal coat according to Section 407. If a final wearing course is to be applied within two weeks of completion of grinding, the seal coat may be omitted.

The grinding machine for correcting pavement exceeding the profile requirements shall be power driven, self-propelled and specifically designed to remove, profile, smooth, and texture hot mix asphalt or Portland cement concrete. Use a grinding machine with an overall wheel base of not less than 12 feet, equipped with a rotating powered mandrel drum equipped with diamond blades with a cutting head not less than 3 feet wide. Equip the grinding machine with an effective means for controlling dust and other particulate matter.

Do not cause permanent strain or damage to the underlying surface of the pavement with the grinding machine. Do not use grinding and texturing equipment that causes ravels, aggregate fractures, spalls, or disturbance of joints.

Perform grinding in a longitudinal direction. Satisfactorily grind to produce a uniform textured surface over the surface areas designated for grinding.

The surface of the ground pavement shall have parallel corduroy-type texture consisting of grooves between 0.09 and 0.13 inch wide. The peaks of the ridges shall be approximately 0.0625 inch higher than the bottom of the grooves with 52 to 57 grooves per foot.

Pick up and dispose of grinding materials, including water used for the grinding operation, outside the right of way according to Subsection 107.14.

402.03.06 Compaction. Perform compaction according to "Method XXX."

The reference to Test Method No. Nev. T324 in the last sentence of the fourth paragraph on page 163 of the Standard Specifications is hereby changed to Test Method No. Nev. T325.

402.05.01 Payment. The compensation payable for the additional quantity of asphalt cement and mineral filler added at the direction of the Engineer according to Subsection 401.02.02 will be made at the following set unit prices:

Asphalt Cement, PG 64-28NV and PG 64-28NVTR ..... $XXXXXX per ton
Asphalt Cement, PG 76-22NV and PG 76-22NVTR ..... $XXXXXX per ton
Mineral Filler, Marination Method ..... $150 per ton
Carded 05/17/17