

502.11.1.3 “Minor with Density” Requirements: For Method 1: When density is specified in Table 502-5, the roadway inspector will identify core locations to be cut by the contractor. The District Laboratory will test three cores for density every 1000 tons per mix type placed per roadway sampling procedure mentioned above and pay in accordance with Table 502-7. The District Laboratory will calculate the density of each roadway core using the G_{mb} of the core and the representative maximum specific gravity, G_{mm} , in accordance with 502.05. For Method 2: The contractor will perform acceptance test per above method. Table 502-7 is used to compute pay.

502.11.1.4 Minor Mix without Density: This minor mix shall have a neat, uniform appearance and be compacted by methods to the satisfaction of the engineer. Collect one loose mix specimen, from roadway, per project, for G_{mm} verification.

502.11.1.5 Verification: One core will be selected every 7500 linear lane feet and will be evaluated by either Method 1 or Method 2 in accordance with 502.11.1.1.

502.11.1.6 Resolution: One core from each 7500 linear lane feet of placed mix will be chosen at random and will be double sealed, signed by both contractor and Department’s certified inspectors in accordance with the Quality Assurance Manual as required or for documentation. The resolution core will be tested at a certified IA laboratory as described in the QA manual.

502.12 SURFACE TOLERANCE EQUIPMENT, QUALITY CONTROL, ACCEPTANCE, MEASUREMENT AND PAYMENT ADJUSTMENT. Measure the top two lifts of the mainline travel lanes with an approved inertial profiler. Maintain record of intermediate measures of smoothness quality as described herein. Final acceptance will be based on the last measurement taken on the final wearing course of the travel lanes. Measurement of the center two lanes will be required for airports.

Constantly monitor equipment, materials, and processes to ensure that surface tolerance requirements are met.

502.12.1 Equipment: For longitudinal surface tolerance quality control testing and acceptance testing on mainline wearing and binder courses, furnish and use a DOTD certified inertial profiler. Certified profilers will have a DOTD decal indicating the date of certification and profiler system parameter settings. Measure longitudinal surface profile in inches per mile in accordance with DOTD TR 644 and report as the International Roughness Index (IRI).

Verify the profiler system parameter settings before each run. Demonstrate the daily set up procedure and pre-operation tests in accordance with the manufacturer's procedures and DOTD TR 644. Ensure that a copy of the manufacturer's setup, pre-operation, and general operating procedures for measuring surface tolerance are available at all times during measurement.

For transverse quality control testing and for longitudinal quality control testing for wearing course on bike paths, detour roads, parking lots, and shoulders; furnish and use an approved 10-foot metal static straight-edge and electronic or static level.

Profiler system parameter settings shall be verified before and during each run by the DOTD inspector. For transverse, cross slope and grade testing, furnish a 10-foot metal static straightedge and electronic or static level for Department use.

502.12.2 Longitudinal Smoothness Quality Control: Within 7 calendar days of placement, for mainline wearing and binder courses, run the certified profiler. View the raw data with ProVAL to determine IRI and to view Profilograph Simulation for each wheelpath. Make corrections to operation and/or mixture to ensure that the overall ride and individual bump requirements are met. Correct all individual bumps which are more than 1/4 inch as identified on Profilograph Simulation or when tested with a 10-foot metal static straightedge. Ensure that the following quality requirements are met:

1. Produce IRI which meets the requirements for 100 percent pay in accordance with Table 502-8. Continued surface tolerance penalties are not allowed.

2. Correct all individual bumps which are more than 1/4 inch when tested with a 10-foot metal static straightedge. Utilize the Profilograph Simulation on ProVAL to help identify these bumps.

3. Correct ripples to the satisfaction of the engineer. Report Profilograph Simulation for areas with 12 or more small, regular bumps in a 100-foot section or for any areas in question.

Minor mixes shall comply with Table 502-5. For minor mixes, use the 10-foot metal static straightedge to check for conformance to specifications.

502.12.3 Transverse Smoothness, Cross Slope, and Grade: The Department will test the surface of the binder and wearing courses at selected locations for conformance to the surface tolerance requirements of this subsection and Table 502-5. Make corrections as directed in accordance with 502.12.4.

502.12.3.1 Transverse Smoothness: Areas with surface deviations in excess of specification limits shall be isolated and corrected in accordance with 502.12.4. Control the transverse surface finish.

502.12.3.2 Cross Slope: When the plans require the section to be constructed to a specified cross slope, take measurements at selected locations using a stringline, a slope board, an electronic or static level mounted on a 10-foot metal static straightedge, or other comparable device. Control the cross slope for each lane to comply with the tolerances shown in Table 502-5. Make corrections in accordance with 502.12.4.

502.12.3.3 Grade: When the plans require the pavement to be constructed to a specified profile grade, test for conformance at selected locations, using a stringline or other comparable device. Control grade variations so that the tolerances shown in Table 502-5 are not exceeded. Grade tolerances shall apply to only one longitudinal line, such as the centerline or outside edge of pavement. Make corrections in accordance with 502.12.4.

502.12.4 Correction of Deficient Areas: Correct areas as required in 502.12.2 and those not meeting Table 502-5, and Table 502-8. Correct wearing and binder courses by grinding. In lieu of grinding, the Project Engineer may penalize the contractor \$800 per area of small individual bumps, and/or per “Ripple” as defined in 502.12.2.

502.12.4.1 Deficiencies in Mainline Wearing Course: Correct deficiencies in the final wearing course by removing and replacing mixture, or by diamond grinding or other approved device across the lane and applying a light tack coat, or by furnishing and placing a supplemental layer of wearing course mixture at least 1 1/2 inches compacted thickness for the full width of the roadway meeting specification requirements at no direct pay. If the supplemental layer does not meet specification requirements to the satisfaction of the engineer, remove and replace or correct it by other methods approved by the engineer.

For areas that will not be improved by grinding such as minor dips, extreme vertical curves, areas with < 1/4 inch bump as measured with a 10 feet metal static straight edge, the engineer may waive the requirement to grind.

502.12.4.2 Deficiencies in Mainline Binder Courses: Correct deficiencies in binder course: longitudinal, transverse, cross slope, and grade to meet specification requirements at no direct pay. Make corrections before subsequent courses are constructed.

502.12.4.3 Deficiencies in Minor Mixes: Correct deficiencies in minor mixes by diamond grinding or approved method at the project engineer's direction.

502.12.5 Surface Tolerance Acceptance: Measure the top two lifts of the mainline travel lanes with an approved inertial profiler. Final acceptance will be based on the last measurement taken on the final wearing course of the travel lanes. Measurement of the center two lanes will be required for airports.

502.12.5.1 Longitudinal Surface Tolerance Acceptance: Measure surface tolerance at the completion of the project and after all corrections have been made or at an approved portion of the project in accordance with 502.12.2. Measure the mainline wearing course continuously from start to finish in the direction of travel. The measurement shall be performed by the contractor in the presence of a Department representative. The measurement may also be made by the Materials and Testing Section, or by a private company approved by the Department. Report one IRI measurement in inches per mile for the entire project. A stand-alone pay adjustment factor will be determined in accordance with 502.15.

Place a start and stop mark at the beginning and end of each travel lane so that measurements can be rerun by the Department if needed. Interim measurements of a portion may be allowed, with approval of the engineer, as follows:

1. For partial acceptance in accordance with 105.17.1.
2. Due to phasing or sequence of construction, this measurement may result in 100 percent pay or less. However, payment exceeding 100 percent for this section of roadway will only be allowed if the smoothness re-measured at the completion of the project meets the requirements of Table 502-8.
3. For an unavoidable lengthy delay, apply the same payment criteria as No. 2 above.

The mainline longitudinal surface tolerance IRI specification requirements are shown in Table 502-8. Perform profiler testing and submit data to the engineer before starting paving operations. To ensure that the contractor has corrected deficiencies, the Department will spot check for 1/4 inch bumps in accordance with 502.12.2. Although grinding may be waived by the engineer, the measured roughness will still contribute to the total IRI for the project.

A DOTD inspector will be present for the final test run and will immediately receive a copy of the raw data, the ".erd file" and any files with information about the project, the operator, the equipment, the settings, daily

pre-operation results, and a copy of the IRI results via USB flash drive provided by the contractor. In addition to the data transferred by USB storage device, provide to the engineer a paper copy of the IRI report. Acceptance for the project will be in accordance with Tables 502-8, based on the data. The Department may elect to perform and utilize independent ride quality test results for acceptance at any time.

502.12.5.2 Exclusions: The final IRI measurement shall be taken in entirety, without exclusions. The Department will then review the profile report obtained for each lane of the mainline wearing course. In special cases or extenuating circumstances, the engineer may isolate or exclude sections of the profile. These include the following:

1. Bridge ends, and sections that are within 150 feet of bridge ends.
2. Outside wheelpath of curb and gutter sections that require adjustment in order to maintain adequate drainage.
3. Manholes, catch basins, valve and junction boxes.
4. Street intersections or rail road crossings of a different grade.
5. Structures located in the roadway which cause abrupt deviations in the profile.
6. Transitions to and from ramps and turn lanes and sections within 200ft of the limits of the project if the limits begin or end at an intersection.
7. Sections where the project engineer determines that attaining smoothness is beyond the contractor's reasonable control.

Exclusions will not be used to simply isolate sections of road that are in poor condition when the project is let. The roughness in excluded areas will not be included in the total IRI used for payment purposes, but shall meet the requirements of 502.12.2. The quantity of asphalt represented by the length excluded will not receive a pay adjustment for surface tolerance.

502.12.6 Surface Tolerance Measurement: Measure and report the average IRI of each wheel path of each mainline lane in inches per mile and reach mainline lane prorated for the entire project.

The theoretical quantity is computed by using the total length of lanes, the plan thickness, and the plan width, excluding shoulders and minor mixes. Adjust the tons as necessary affected represented for each mainline travel lane.

502.12.7 Payment Adjustment for Surface Tolerance: Apply a percent payment adjustment for the quantity of tons represented in each lane of the mainline wearing course. This pay adjustment is in addition to pay adjustments for density as described in 502.15.2. For mainline wearing course, a separate pay adjustment for surface tolerance measured on the mainline wearing course based on Table 502-8 shall apply. Apply the adjustment to the theoretical lane quantity and contract unit price.

502.13 DIMENSIONAL REQUIREMENTS. Ensure that mixtures conform to the following dimensional requirements only. No other acceptance tests will be required for these mixtures. Over-thickness and over-width will be accepted at no direct pay.

502.13.1 Thickness: For mixture specified for payment on cubic yard or square yard basis, thickness of mixtures will be determined by the Department in accordance with DOTD TR 602. Under-thickness shall not exceed 1/4 inch.

Correct area under-thickness in excess of 1/4 inch to plan thickness at no direct pay. Furnishing and placing additional mixture in accordance with 502.12.4.1. Correct excesses of 1/2 inch for category D, Table 502-8. When grade adjustments do not permit placing additional mixture, remove the deficient under-thickness area and replace at no additional pay.

For mixtures specified for payment on a per ton basis, thickness of mixtures will be determined by the plans, Table 502-6, and that agreed to with the Project Engineer. Under thickness shall not exceed 1/2 inch. Removal and replacement of deficient under-thickness area(s) or other approved remediation agreed to by the Project Engineer will be at no direct pay.

502.13.2 Width: The width of completed courses will be determined in accordance with DOTD TR 602. Correct under-widths by furnishing and placing additional mixture to a minimum width of 1 foot and plan thickness at no direct pay.

502.14 MEASUREMENT. Measure asphalt concrete by the ton of 2,000 pounds from printed weights as provided in Section 503. Provide stamped printer tickets with each truckload of material delivered denoting JMF