ITEM 402.00004118 PAVEMENT RIDE QUALITY ADJUSTMENT LEVEL 1
ITEM 402.00005118 PAVEMENT RIDE QUALITY ADJUSTMENT LEVEL 2

DESCRIPTION

Measure the ride quality of the finished riding surface using a verified and properly calibrated inertial profiler. Report test results to the Engineer as an average International Roughness Index (IRI) for the right wheelpath of each pavement-ride-quality (PRQ) lot.

For the purposes of this specification, the following terms are defined below.

Calibration. All procedures contained in Materials Method 24.1 shall be followed to ensure that each individual data collection device is operating properly.

International Roughness Index (IRI). An index computed from a longitudinal profile measurement reported in m/km. IRI is computed according to the quarter-car model which indicates the amount of suspension travel that one wheel of a standard vehicle would experience when traveling over a longitudinal profile.

Measurement. A single determination of IRI along the reference line for the entire length of a single PRQ lot in the direction of traffic.

Multiple-Course. Two or more paving courses, excluding truing and leveling.

Pavement Ride Quality (PRQ) Lot. A PRQ lot is a continuous 200 m section of pavement one lane wide, in areas shown in the contract documents as requiring pavement ride quality testing. Ride Quality testing is performed and payment adjustments are made separately for each PRQ lot.

Quarter-car Model. A mathematical model of one wheel (one quarter) of a car of a standard weight with a standard tire, standard spring rate, and standard damping as established in NCHRP Report 228.

Reference Line. The imaginary line the noncontact-height sensor traces along the pavement surface. The intended reference line for all Quality Control (QC) and Quality Assurance (QA) tests is located 0.9 m to the left of the right edge of the PRQ lot (right wheelpath). The closer all tests are taken to the same reference line, the less variability will occur between the results.

Single-Course. One paving course, excluding truing and leveling.

Test. The average of three consecutive measurements taken on the same day in the same PRQ lot by the same inertial profiler and operator.

Verification. All procedures contained in Materials Method 24.1 to be followed to ensure the test results produced by a profiler are within an acceptable variation of the true profile.

MATERIALS None Specified

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CONSTRUCTION DETAILS

Test and report the ride quality of all new flexible pavement and HMA overlays of pavement and bridge decks except: shoulders, gore areas, ramps shorter than 400 m, turn-outs, turn-arounds, driveways, parking areas, and other similar miscellaneous paving.

A. Inertial Profiler Requirements. A self-powered test vehicle conforming to ASTM E950 Class I and AASHTO PP 50-02 containing automated test initiation and data recording systems capable of providing the following information to the on-board display, on-board data storage device, and on-board printer.

- The date, time, contract number, route, location, test direction, lane, and operator for each test.
- The equipment parameters related to calibration.
- A general profile, using a scale of 1:300 horizontal and 1:1 vertical.
- The average IRI and range for the specified wheelpath for each PRQ lot.

Alternative equipment types may be used as approved by the Director, Materials Bureau. Submit requests to use alternative equipment at least 14 days prior to the start of QC testing. Alternative equipment must meet the inertial profiler requirements to be approved.

B. Equipment Verification, Calibration, and Daily Control Section Testing.

1. **Verification.** Prior to using an inertial profiler on a Department contract, verify the profiler according to Materials Method 24.1.

2. **Calibration.** Calibrate the inertial profiler according to frequency and procedures given in Materials Method 24.1.

3. **Daily Control Section Testing.** Create a control section at or near the contract site according to the procedures of Materials Method 24.1. Each day of quality control testing, perform one measurement on the control section. Record the results and track the performance of the inertial profiler according to the procedures of Materials Method 24.1.

C. Quality Control (QC) Measurements.

1. **Layout PRQ Lots.** Divide the surface-course pavement areas designated in the contract documents as requiring pavement ride quality testing into PRQ lots according to the following:
   - Divide pavement constructed into PRQ lots 200 m long and one lane wide. PRQ lots may include pavement placed on more than one day.
   - Each PRQ lot must be continuous. PRQ lots may not straddle areas not designated for ride quality testing.
   - Include pavement sections shorter than 100 m located between a PRQ lot and an area not designated for ride quality testing or the end of the contract in the adjacent PRQ lot.

- Create separate PRQ lot for pavement sections at least 100 m long, but less than 200 m, located between a PRQ lot and an area not designated for ride quality testing or the end of the contract.
- Remaining areas at the end of a day's paving which are less than 200 m long will be added to and tested with the adjacent pavement after it is constructed.

2. **Perform QC Testing.** Perform one test in every PRQ lot according to Test Method NY 402-01F. Perform QC testing after the final surface course has been paved and compacted.

   If any pavement repair is made in a PRQ lot under the provisions of §105-04 Conformity with Plans and Specifications or under the provisions for corrective action in this specification, repeat the QC testing for that PRQ lot after the repair. If repairs are made in the left wheelpath and not in the right wheelpath, establish the reference line and perform the repeat tests in the left wheelpath. The final tests will be used for payment.

3. **Report Results.** Provide the following information to the Engineer by the end of the next work day.

   a. **IRI Testing Summary Report.** Provide an IRI testing summary report, consisting of a header and results table, to the Engineer as a printout and a computer file. The computer file may be in spreadsheet or ASCII format.

      1. **Header.** Include the following information in the report header.
         - Contract D-number
         - Date
         - Filter Settings

      2. **Results Table.** Provide a table consisting of 9 columns labeled as shown below and one row for each PRQ lot tested. Report all results in units of m/km calculated to the nearest 0.01 m/km.

PRQ lot #	Direction	Lane/ Ramp	Begin Station	End Station	Measurement 1	Measurement 2	Measurement 3	Test

   b. **Profile Data.** Provide a copy of each profile in the electronic format specified in Test Method NY 402-01F. Name each file according to the following format.

      "XXXXXX_YYY_Z.ERD"

      XXXXXX - Reserve first six characters for the numerical portion of the contract number.
      YYY - Separated from the first six characters by an underscore. Reserve the next three characters for the first lot number represented by the file.
      Z - Separated from the previous three characters by an underscore. Reserve the last character for the number of the measurement (1, 2, or 3) represented by the file.
      .ERD - Denotes the file as being in the proper format for evaluation.

D. Corrective Action.

Present the proposed repair procedures to the Engineer for approval at least 48 hours before beginning the repair work. Pavement thickness, location of repair, level of ride quality, and effectiveness of a proposed procedure will be primary considerations in determining the proposed procedure's acceptability.

METHOD OF MEASUREMENT

Quality payment adjustments will be measured in Quality Units.

- Determine Quality Units for each PRQ lot by using Table 1.
- For PRQ lots of a length different from 200 m, adjust the number of Quality Units as follows:

$$\text{Quality Units} = \text{Quality Units from Table 1} \times \left(\frac{\text{length of PRQ lot (m)}}{200 \text{ m}} \right)$$

- Determine the total number of Quality Units by summing the Quality Units from all PRQ lots.
- Contract Quality Units will be rounded to the nearest whole unit.

Table 1
Determination of Quality Units

LEVEL 1		LEVEL 2		
PRQ lot IRI (m/km)	Quality Units	PRQ lot IRI (m/km)	Quality Units for Multiple-Course	Quality Units for Single-Course
< 0.60	10	< 0.75	10	5
0.61 – 0.85	5	0.76 – 1.00	5	2.5
0.86 - 1.10	0	1.01 - 1.25	0	0
1.11 - 1.30	-5	1.26 - 1.45	-5	-2.5
1.31 - 1.50	-10	1.46 - 1.65	-10	-5
> 1.50 (1)	-20	> 1.65 (1)	-20	-10

(1) The Department will evaluate the lot to determine if it will remain in place. The level of ride quality, location, traffic volume, and speed limit will be primary considerations in determining if the pavement will remain in place. If the pavement cannot remain in place, repair it according to the procedures under Corrective Action in this specification. If the pavement can remain in place, the Raw Quality Units will be calculated according to Table 1.

BASIS OF PAYMENT

Payment of Quality Units will be made based on the Index Price listed in the contract documents. The index price shown in the itemized proposal for each Quality Unit is considered the price bid. The unit (index) price is NOT to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figure will be disregarded and the original price will be used to determine the total amount bid for the Contract.

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Include the cost for all labor, equipment and material to satisfactorily complete the work in the unit price bid for the appropriate surface course HMA Item.

Payment will be made under:

Item No.	Item	Pay Unit
402.00004118	Pavement Ride Quality Adjustment Level 1	Quality Units
402.00005118	Pavement Ride Quality Adjustment Level 2	Quality Units