

The Standard Specifications are revised as follows:

SECTION 501, DELETE LINES 375 THROUGH 483.

SECTION 501, AFTER LINE 483, INSERT AS FOLLOWS:

501.25 Pavement Smoothness

Pavement smoothness will be accepted by means of an inertial profiler, a 16 ft long straightedge, or a 10 ft long straightedge as described below.

(a) Inertial Profiler with Smoothness Pay Adjustments

When a pay item for Inertial Profiler, PCCP is included in the contract, the Contractor shall furnish, calibrate, and operate an approved inertial profiler in accordance with ITM 917 for the acceptance of longitudinal smoothness on the mainline traveled way and ramps, including adjacent acceleration or deceleration lane, where both of the following conditions are met:

- 1. The design speed is greater than 45 mph.*
- 2. The traveled way or ramp lane width and slope are constant and is 0.5 mi in length or longer.*

The profiles International Roughness Index, IRI, results including smoothness histograms and areas of localized roughness, and fixed interval IRI results shall become the property of the Department. The inertial profiler shall remain the property of the Contractor.

The paving exceptions and areas exempt from inertial profiler operation will be in accordance with ITM 917.

If the posted speed limit for an entire smoothness section is less than or equal to 45 mph, the section will be exempt from inertial profiler operation and the smoothness within the section will be accepted by a 16 ft straightedge.

If the posted speed limit is greater than 45 mph for a portion of a smoothness section and is less than or equal to 45 mph for the remainder, the section smoothness acceptance will be as follows:

- 1. By inertial profiler for the portion of the section with a posted speed limit greater than 45 mph.*
- 2. In accordance with 501.25(b) or (c) for the portion of the section with a posted speed limit less than or equal to 45 mph.*

At locations where the inertial profiler is required, all high or low point deviations with an IRI greater than 150 in./mile, utilizing a 25 ft window, shall be corrected. Corrections shall be made in accordance with 501.25(d).

(b) Inertial Profiler without Smoothness Pay Adjustments

For contracts which include the Inertial Profiler, PCCP pay item, the inertial profiler shall be used to simulate the 16 ft long straightedge to accept longitudinal smoothness at the following locations:

- 1. All mainline traveled way lanes longer than 0.1 mi and shorter than 0.5 mi.*
- 2. All mainline traveled way lanes within smoothness sections with posted speed limits less than or equal to 45 mph throughout the entire section length.*
- 3. All turn lanes, including bi-directional left turn lanes longer than 0.1 mi.*
- 4. All ramps.*
- 5. All acceleration and deceleration lanes associated with ramps with design speeds of 45 mph or less and longer than 0.1 mi.*

(c) 16 ft Straightedge and 10 ft Straightedge

The Department will furnish and operate 16 ft and 10 ft straightedges as described below. The 16 ft straightedge is used to accept smoothness along the direction of mainline traffic and the 10 ft straightedge is used to accept smoothness transverse to the direction of mainline traffic. This includes longitudinal smoothness on public road approaches and median crossovers.

For contracts which include the Inertial Profiler, PCCP pay item, the 16 ft long straightedge will be used to accept longitudinal smoothness at the following locations:

- 1. All mainline traveled way lanes shorter than 0.1 mi.*
- 2. All mainline traveled way lanes at locations exempted from inertial profiler operation in accordance with ITM 917.*
- 3. All tapers.*
- 4. All turn lanes, including bi-directional left turn lanes shorter than 0.1 mi.*
- 5. All acceleration and deceleration lanes associated with ramps with design speeds of 45 mph or less and shorter than 0.1 mi.*
- 6. All shoulders.*

For contracts where the inertial profiler is not used for smoothness acceptance, the 16 ft straightedge will be used to accept longitudinal smoothness at the above locations and on all mainline traveled way lanes and ramps with design speeds greater than 45 mph. Smoothness acceptance on ramp acceleration or deceleration lanes will also be based on the 16 ft straightedge.

The 10 ft long straightedge shall be used for transverse slopes, approaches, and crossovers.

As soon as the PCCP has cured sufficiently, the smoothness may be checked. The Department may direct that the pavement profile be evaluated within 24 h following placement. When profile testing is consistently outside pavement surface tolerances the paving operation shall be discontinued until an amended QCP is submitted.

(d) Smoothness Correction

Pavement smoothness variations outside specified tolerances shall be corrected by grinding with a groove type cutter or by replacement. Grinding will not be allowed until the PCCP is 10 days old or the flexural strength test is 550 psi or greater. The grinding of the pavement to correct the profile shall be accomplished in either the longitudinal or the transverse direction. The PCCP texture after grinding shall be uniform. If the grinding operation reduces the tining grooves to a depth of less than 1/16 in. and the longitudinal length of the removal area exceeds 15 ft, or two or more areas are within 30 ft of each other, the PCCP shall be re-textured in accordance with 504.03.

At locations where the inertial profiler is used, all areas having a localized roughness in excess of 150 in./mi. in 25 ft window shall be corrected. The width of the corrected area may be partial or full lane width, depending on the respective wheel path profiles. After the corrective action is complete, the inertial profiler shall be operated throughout the entire affected smoothness section to verify the adequacy of the corrective action.

At locations where the 16 ft straightedge is used, the pavement variations shall be corrected to 1/4 in. or less. At locations where the 10 ft straightedge is used, the pavement variations shall be corrected to 1/8 in. or less.

SECTION 501, DELETE LINES 619 THROUGH 648.

SECTION 501, AFTER LINE 648, INSERT AS FOLLOWS:

(e) Smoothness

When the pavement smoothness is tested with an inertial profiler, payment will be based on continuous IRI smoothness histograms. The continuous pavement section length will be based on construction phases and will be subject to approval by the Engineer. A Quality Assurance Pay Factor, PF, for smoothness will apply to the planned thickness of the PCCP. The quality assurance adjustment for each section will include the total area of each pavement lane measured by the inertial profiler represented by the IRI histograms calculated by the following formula:

$$Q_s = K \times 0.5 \sum_{i=1}^n [(PF_i^S - 1)(Y_i + Z_i)]$$

where:

$$K = A \times U$$

Q_s = quality assurance adjustment for smoothness

PF_i^S = pay factor for smoothness for histogram cell i

n = number of cells

A = area of the section, sq yd
 U_j = unit price for the material, \$/sq yd
 Y_i = percentage of left wheel path IRI in histogram cell i
 Z_i = percentage of right wheel path IRI in histogram cell i

When smoothness is measured by an inertial profiler, payment adjustments will be made on the IRI in accordance with the following table. The IRI will be determined prior to any required smoothness correction in accordance with 510.25(d).

<i>PAY FACTORS FOR SMOOTHNESS</i>	
<i>Design Speed greater than 45 mph</i>	
<i>IRI, in./mi.</i>	<i>Pay Factor, PF</i>
<i>over 0 to 35</i>	<i>1.08</i>
<i>over 35 to 40</i>	<i>1.07</i>
<i>over 40 to 45</i>	<i>1.05</i>
<i>Over 45 to 50</i>	<i>1.03</i>
<i>over 50 to 55</i>	<i>1.02</i>
<i>over 55 to 60</i>	<i>1.01</i>
<i>over 60 to 70</i>	<i>1.00</i>
<i>over 70 to 75</i>	<i>0.99</i>
<i>over 75 to 80</i>	<i>0.98</i>
<i>over 80 to 85</i>	<i>0.96</i>
<i>over 85 to 90</i>	<i>0.95</i>
<i>over 90</i>	<i>*</i>
<i>*The IRI will be verified and shall be corrected to less than or equal to 90, if necessary.</i>	

SECTION 501, BEGIN LINE 716, DELETE AND INSERT AS FOLLOWS:

501.31 Basis of Payment

The accepted quantities of QC/QA-PCCP will be paid for at the contract unit price per square yard for the thickness specified, complete in place.

Payment for furnishing, calibrating, and operating the ~~profilograph~~ *inertial profiler*, and furnishing ~~profile~~ *IRI* information will be made at the contract lump sum price for ~~profilograph~~ *inertial profiler, PCCP*.

SECTION 501, BEGIN LINE 743, DELETE AND INSERT AS FOLLOWS:

~~Profilograph~~ *Inertial Profiler, PCCP*.....LS

SECTION 501, BEGIN LINE 749, DELETE AND INSERT AS FOLLOWS:

The price of ~~profilograph~~ *Inertial Profiler, PCCP* will be full compensation regardless of how often the ~~profilograph~~ *inertial profiler* is used or how ~~many profilographs are produced~~ *often the IRI is determined*.

SECTION 502, BEGIN LINE 364, DELETE AND INSERT AS FOLLOWS:

502.20 Pavement Smoothness

~~Pavement smoothness will be in accordance with 501.25 except profilograph requirements will not apply.~~ *A straightedge in accordance with 508.09(d) and (e) will be used to determine smoothness. The 16 ft straightedge will be used to accept smoothness along the direction of mainline traffic and the 10 ft straightedge will be used to accept*

smoothness transverse to the direction of mainline traffic. Smoothness correction shall be in accordance with 501.25(d).
