

PN 420 - 1/21/2011 - SURFACE SMOOTHNESS REQUIREMENTS FOR PAVEMENTS

DESCRIPTION: The surface tolerance specification requirements are modified as follows for all mainline lanes and collector-distributor road pavements of constant width with 3 (75 mm) or more inches of new asphalt pavement specified or 5 (125 mm) or more inches of new concrete pavement specified. Areas not part of this specification include ramps, acceleration lanes, deceleration lanes, turn lanes including center turn lanes, shoulders, crossovers, approach slabs, and bridge decks.. Also not included are cross roads and side roads with less than 1 centerline mile (1.6 km) of continuous paving regardless of the thickness. Areas not part of this specification are subject to the requirements of the original item(s) specified.

If the pavement surface is Rubberized Open Graded Asphalt Friction Course (Supplemental Specification 803), this specification applies to the surface of the course immediately below.

MATERIALS AND EQUIPMENT: Provide smoothness measuring equipment conforming to Supplement 1058. Furnish the Department's approval letter of the profiler and the operator to the Engineer. The Engineer will verify the smoothness measuring equipment conforms to Supplement 1058. The Engineer will verify the profile operator's certification against the operator list posted on the Office of Innovation, Partnerships & Energy webpage. Furnish equipment meeting the requirements of C&MS 257.02 for performing corrective diamond grinding.

SMOOTHNESS MEASUREMENT: Measure the pavement surface smoothness in both wheel paths. Wheel paths are located parallel to the centerline of the pavement and approximately 3.0 feet (1.0 m) inside all lane edges, measured transversely. Ensure the path of the profiler is parallel to the lane edges at all times. Measure the entire length of pavement, starting and stopping the profile runs when the profile sensor(s) is within 1.0 foot (0.3 m) of any existing pavement, pressure relief joint, approach slab, or other non pavement features (i.e. manholes, valve boxes). Remove any objects such as dirt, debris, curing covers, etc., prior to performing the surface smoothness measurements. Replace any curing covers after the measurements are taken. Repair any membrane curing damaged during the measurements.

Do not perform any surface smoothness measurements until the pavement has cured sufficiently to allow measuring without damaging the pavement. When the pavement will not support the profiler on the next working day, notify the Engineer and inform the Engineer when the profile will be run. Notify the Engineer each day prior to performing any measurements.

Develop an International Roughness Index (IRI) according to ASTM E 1926 for each 0.1-mile (0.16 km) section. Submit two copies of the summary report from ProVAL conforming to Supplement 1110 and two electronic copies of all longitudinal pavement profiles in ProVAL compatible format to the Engineer. The Engineer will submit one copy of the summary report and one electronic copy of the profiles to the Office of Innovation, Partnerships & Energy.

Provide necessary traffic control and survey stationing for all surface smoothness measurements.

MANDATORY CORRECTIVE WORK: Perform corrective work for the applicable surface type as required. Do not include pavement within 40 feet (12.2 m) of a bridge deck or approach slab in any 0.1-mile (0.16 km) section evaluated for pay adjustment. These 40 feet (12.2 m) sections will be measured and evaluated for localized roughness corrections

Asphalt Concrete Surface: Correct all localized areas of roughness having deviations, high or low points, with an IRI in excess of 160 inches per mile (2.53 m/km) in 25 feet (7.6 m). Correct any 0.1-mile (0.16 km) sections having an IRI greater than 95 inches per mile (1.50 m/km). Perform corrective work by removing and replacing to the depth necessary to correct the deviations or by diamond grinding. Use asphalt concrete meeting the contract requirements for the replacement work. Apply Item 407 *Tack Coat* prior to placing the surface course. Limit the length of any one diamond grinding location to no more than 30 feet (10 m), measured longitudinally. The amount of diamond grinding per 0.1-mile (0.16 km) section is limited to no more than 10% of the section length, otherwise, remove and replace is required. The total amount of grinding is limited to no more than 5% of the lane-miles (lane-km) eligible for a pay adjustment.

Re-measure each 0.1-mile (0.16 km) section where corrective work was performed to ensure the IRI is less than 95 inches per mile (1.50 m/km) and there are no localized areas of roughness with an IRI in excess of 160 inches per mile (2.53 m/km) in 25 feet (7.6 m). Perform additional corrective work until the IRI is less than 95 inches per mile (1.50 m/km) for each 0.1 mile (0.16 km) section and any localized roughness areas have an IRI less than 160 inches per mile (2.53 m/km) in 25 feet (7.6 m).

If the final surface course is Item 803, seal any diamond ground areas with material meeting the requirements of 702.04 prior to placing the Item 803.

Portland Cement Concrete Surface: Correct all localized areas of roughness having deviations, high or low points, with an IRI in excess of 160 inches per mile (2.53 m/km) in 25 feet (7.6 m). Correct any 0.1-mile (0.16 km) section having an IRI greater than 95 inches per mile (1.50 m/km). Perform corrective work by diamond grinding or removing and replacing. Use Portland cement concrete meeting the contract requirements for the replacement work.

Re-measure each 0.1-mile (0.16 km) section where corrective work was performed to ensure the IRI is less than 95 inches per mile (1.50 m/km) and there are no localized areas of roughness with an IRI in excess of 160 inches per mile (2.53 m/km) in 25 feet (7.6 m) or less. Perform additional corrective work until the IRI is less than 95 inches per mile (1.50 m/km) for each 0.1 mile (0.16 km) section and any localized roughness areas have an IRI less than 160 inches per mile (2.53 m/km) in 25 feet (7.6 m).

Complete all corrective work prior to determination of pavement thickness.

If corrective work is required the surface texture after diamond grinding is acceptable and no additional texturing is required.

EXEMPTED CORRECTIONS: Required corrective work resulting from contract requirements for maintaining traffic are considered exempted corrections. Exempted corrections occur primarily at ramps or other access points where paving must be suspended in order to maintain traffic. Required corrective work due to paving suspensions at the end of a work period, material availability, weather, or any reason other than maintaining traffic is not considered exempted corrections. No exempted corrections exist on projects where the maintenance of traffic plan does not interfere with paving operations. Perform exempted corrections according to the requirements for mandatory corrective work.

METHOD OF MEASUREMENT: Determine the IRI for each lane for each 0.1-mile (0.16 km) section of paving. The IRI for a 0.1-mile (0.16 km) section is the average of the IRI of the two wheel paths.

PAY ADJUSTMENTS: A lump sum pay adjustment will be made according to the following schedule for each lane for each 0.1-mile (0.16 km) section, regardless of lane width. Pay adjustments are based on pavement thickness. Pavement thickness is the total thickness of asphalt concrete, Portland cement concrete, or both placed as part of the contract and does not include any free draining base, aggregate base, stabilized subgrade, etc.

PAY SCHEDULE		
IRI	PAY ADJUSTMENT	
Inches per mile per 0.1 mile section (m/km per 0.16 km section)	Pavement Thickness less than 8 inches (200 mm)	Pavement Thickness 8 inches (200 mm) and greater
45 (0.71) or less	\$375.00	\$875.00
Over 45 to 50 (0.71 to 0.79)	\$225.00	\$525.00
Over 50 to 55 (0.79 to 0.87)	\$150.00	\$350.00
Over 55 to 60 (0.87 to 0.95)	\$75.00	\$175.00
Over 60 to 70 (0.95 to 1.10)	\$0.00	\$0.00
Over 70 to 75 (1.10 to 1.18)	-\$150.00	-\$350.00
Over 75 to 80 (1.18 to 1.26)	-\$300.00	-\$700.00
Over 80 to 85 (1.26 to 1.34)	-\$450.00	-\$1050.00
Over 85 to 90 (1.34 to 1.42)	-\$600.00	-\$1400.00
Over 90 to 95 (1.42 to 1.50)	-\$750.00	-\$1750.00
Over 95 (1.50)	(1)	(1)

(1) Corrective work required

Pay adjustments will be based only on the measured IRI after any mandatory corrective work or corrective work due to localized roughness, however no incentive will be paid for any 0.1-mile (0.16 km) section where mandatory corrective work was performed regardless of the resulting IRI.

Negative pay adjustments apply to sections with mandatory corrective work and exempted corrections. One-tenth mile (0.16 km) sections with exempted corrections only are eligible for incentive pay based on IRI measurements taken after completion of the exempted corrections.

At the Contractor's option, corrective work may be performed on any section with an IRI greater than 70 inches per mile (1.10 m/km) to reduce or eliminate the negative pay adjustment. however, no incentive will be paid regardless of the resulting IRI.

As an option perform corrective work in the form of diamond grinding or Item 254 pavement planing to improve the profile on any course prior to the surface course. If the final course is Item 803 do not perform corrective work on the Item 803. Only diamond grinding may be performed on the course immediately below Item 803.

Negative pay adjustments apply to sections with mandatory corrective work and exempted corrections.

No payment will be made for any 0.1-mile (0.16 km) section with an IRI greater than 95 inches per mile (1.50 m/km), until corrective work has been completed and the IRI has been reduced to less than 95 inches per mile (1.50 m/km).

BASIS OF PAYMENT: Include the cost of all labor, equipment, and materials necessary to meet this specification in the contract unit or lump sum price for the applicable pavement items.

The Department will pay for exempted corrections according to 109.04

PN 420 Designer Notes: This note should be used on all paving projects when:

1. The project is at least 1 centerline mile (1.6 km) long (both divided and undivided highways);
2. The design speed is 50 miles per hour (80 km/h) or greater; and one of the following applies:
 - (a) The total new asphalt pavement thickness is equal to or greater than 3.00 inches (75 mm) or,
 - (b) The total new concrete thickness is greater than 5" (125 mm)
3. This note should not be used for 2 lane projects that are totally within corporation limits.

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