

Section 2317. Smoothness of Bridge Decks and Bridge Deck Overlays .

2317.01 GENERAL.

Smoothness shall be evaluated for all Interstate, Primary, and non-Primary bridge decks, new approaches and bridge deck overlays, and overlaid approaches included in the project, except when specifically excluded by the contract documents.

A. Exclusions are as follows:

1. Bridge decks less than 100 feet (30 m) in length.
2. New bridge approach sections less than 100 feet (30 m) in length.
3. Bridge deck overlays including overlay of approaches less than 100 feet (30 m) in length.
4. Bridge decks for new concrete slab bridges.

All excluded areas will be checked for 1/2 inch (13 mm) bumps on the bridge, and for 1/2 inch (13 mm) bumps and dips on the approach pavement, respectively.

If this specification is required by contract documents on non-Primary projects let by the Department, it will be added in its entirety. Selected portions of the specification will not be deleted.

2317.02 MEASUREMENT.

Smoothness shall be measured with California type profilograph, which produces a profilogram (profile trace) of the surface tested, in accordance with [Materials I.M. 341](#).

All objects and foreign material on the deck surface, including protective covers, if used, shall be removed by the Contractor prior to testing, and if appropriate, protective covers shall be properly replaced by the Contractor after testing.

A profilogram will be made by a test in each wheel path of each traffic lane. Bridge decks, and bridge deck overlays will be treated as one section. Each traffic lane will be divided into segments not exceeding 0.1 mile (160 m) if the bridge exceeds 778 feet (240 m) in length. On a bridge less than 778 feet (240 m) in length, each traffic lane of the bridge shall be considered as one segment.

Bridge deck overlays on which expansion joints are not adjusted will be divided into segments beginning and ending at the expansion joints unless the distance between expansion joints exceeds 778 feet (240 m). If the distance between expansion joints exceeds 778 feet (240 m), the distance shall be divided into segments not to exceed 0.1 mile (160 m) nor less than 250 feet (80 m).

2317.03 PROFILOGRAPH TESTING.

The Contractor shall perform testing and furnish the profilogram results to the Engineer. The testing and evaluation shall be done by a trained and certified person, and the evaluation shall be certified in accordance with [Materials I.M. 341](#).

The Engineer may perform monitor testing. Any portion of the project may be tested if the Engineer determines that the Contractor certified test results are inaccurate. If the test results are inaccurate, the Contractor will be charged for this work at a rate of \$150 per lane per mile (kilometer), with a minimum charge of \$500. In addition, furnishing inaccurate test results could result in decertification.

If the placements are less than 100 feet (30 m), each lane shall be tested and evaluated. The final trace and index and the final evaluation shall be received by the Engineer within 14 calendar days of the completion of the deck.

On deck placements of 100 feet (30 m) and greater, the initial profile trace and index for each lane shall be received by the Engineer by noon of the fifth working day following each of the first two placements. On subsequent placements, the trace and index shall be submitted following every third placement until completion of the deck. On single-pour bridges, the final profile trace and index and the final evaluation shall be submitted to the Engineer within 2 weeks of the completion of the deck.

2317.04 PROFILE INDEX.

An individual index shall be calculated for each segment. A distance of 15 feet (5 m) from the end of the bridge, or overlay approach if part of the contract, and 15 feet (5 m) on each side of the expansion joints not adjusted will be blanked out on the profilogram and will not be considered in the calculation of the index. Tests in both wheel paths will be averaged for

each lane. These areas will be checked for 1/2 inch (13 mm) bumps on the bridge, and for 1/2 inch (13 mm) bumps and dips on the approach pavement, respectively.

2317.05 SURFACE CORRECTION.

Surface correction work shall be for the full segment width of the paved surface.

All correction work shall be subject to the approval by the Engineer. After all required correction work is completed, the final profile index shall be determined.

Surface correction shall be accomplished by grinding or by other methods approved by the Engineer. This work shall be as identified in [Section 2532](#), Pavement Surface Repair (Diamond Grinding), except the cutting head shall have a minimum width of 24 inches (600 mm). Surface correction shall be performed parallel to lane lines or edge lines as directed by the Engineer and each pass shall be parallel to the previous passes. The ground surface shall be of uniform texture.

Adjacent passes shall not overlap more than 1 inch (25 mm) and they shall not have a vertical difference of more than 1/8 inch (3 mm) as measured from bottom of groove to bottom of groove. Smoothness correction shall begin and end at lines normal to the lane lines or edge lines within any one corrected area. The grinding shall proceed from the center line or lane line toward the edge to maintain cross slope.

Cross slope must be maintained throughout the corrected area.

Transverse grooving shall be re-established through the corrected areas using diamond blades to provide a surface similar to that of a new deck except the area within approximately 2 feet (0.6 m) from the curb.

2317.06 SMOOTHNESS.

Correction will be required for bumps exceeding 1/2 inch (13 mm) identified on the profilogram and for smoothness, if necessary. Correction will also be required, in lengths excluded from the profilograph index analysis areas. On all bridge decks, new bridge approaches, bridge deck overlays, and overlays of approaches, which are not excluded, a price adjustment of \$900 shall be assessed for each dip of 0.5 inch (13 mm) or greater in each traffic lane. Correction of dips 0.5 inch (13 mm) or greater will not be permitted unless approved by the Engineer and will be included in the evaluation for the segment smoothness. Bumps exceeding 1/2 inch (13 mm) shall be corrected to less than 3/10 inch (8 mm) on the bridge; and bumps and dips exceeding 1/2 inch (13 mm) shall be corrected to less than 3/10 inch (8 mm) on approach pavements.

On bridge decks, new bridge approaches, bridge deck overlays and overlays of approaches which are not excluded, the surface shall be constructed to an index of not greater than 22 inches per mile (350 mm/km) for new decks and approaches and 15 inches per mile (240 mm/km) for overlay of decks and approaches.

Smoothness of new bridge approach sections or overlay of bridge approach sections will not be used in the calculations for incentive or price reduction of bridge decks or bridge deck overlays.

2317.07 SCHEDULE OF PAYMENT.

The cost of certified profilograph testing and associated traffic control shall be incidental to the contract unit price for the item for which the testing is required.

A. Incentives

New bridge decks or bridge deck overlays which are designated for smoothness shall be evaluated for incentives using the initial profile index and the number of segments on the bridge.

For any portion of a bridge to be qualified for an incentive payment, the profilogram for each segment before correction must meet the specification requirement so there is no price reduction.

For each segment of the bridge deck or bridge deck overlay, the incentive index is 12.0 inches per mile (190 mm/km) for new bridge decks, and 4.0 inches per mile (65 mm/km) for bridge deck overlays. The incentive payment will be in accordance with the following schedule:

INCENTIVES

NEW BRIDGE DECKS		BRIDGE DECK OVERLAYS	
Initial Profile Index Inches Per Mile (mm/km) Per Segment	Dollars Per Segment	Initial Profile Index Inches Per Mile (mm/km) Per Segment	Dollars Per Segment
0 - 6 (0-95)	6000	0 - 2 (0-32)	2000
6.1 - 12 (95.1-190)	3000	2.1 - 4 (32.1-65)	1000
12.1 - 22 (190.1-350)	Unit Price	4.1-15 (65.1-240)	Unit Price

B. Price Reduction

New bridge decks or bridge overlays which are designated for smoothness shall be evaluated for price reduction assessment using the final profile index and the number of segments.

The Contractor may grind the surface of the bridge deck to a final index of 22.0 inches per mile (350 mm/km) or less, or the surface of a bridge deck overlay to a final index of 15.0 inches per mile (240 mm/km) in lieu of a price reduction.

For each segment of bridge deck with a final index of 22.1 inches per mile (350.1 mm/km) or greater or bridge deck overlay with a final index of 15.1 inches per mile (240.1 mm/km) or greater, the contractor shall accept a price reduction in accordance with the following schedule:

PRICE REDUCTION

NEW BRIDGE DECKS		BRIDGE DECK OVERLAYS	
Initial Profile Index Inches Per Mile (mm/km) Per Segment	Dollars Per Segment	Initial Profile Index Inches Per Mile (mm/km) Per Segment	Dollars Per Segment
22.1 - 30 (350-470)	2000	15.1 - 20 (240.1-315)	1000
30.1 - 35 (470.1-550)	4000	20.1 - 25 (315.1-390)	2000
35.1 - 40 (550.1-630)	6000	25.1 - 30 (390.1-470)	3000
over 40 (over 630)	*	over 30 (over 470)	*
* Correction shall be required to an index of 15 inches per mile (240 mm/km) for overlays and to an index of 22 inches per mile (350 mm/km) for new decks.			

C. Bridge Approach Sections and Overlay of Bridge Approach Sections.

Bridge approach sections and overlay of bridge approach sections shall be corrected for smoothness as specified in [Article 2317.06](#) in lieu of a price reduction.