



Iowa Department of Transportation

DEVELOPMENTAL SPECIFICATIONS FOR BRIDGE DECK SMOOTHNESS

Effective Date
September 20, 2005

THE STANDARD SPECIFICATIONS, SERIES 2001, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE DEVELOPMENTAL SPECIFICATIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

Replace all of Section 2317 with the following:

01066.01 GENERAL.

Smoothness will be evaluated for all bridge decks, new approaches and bridge deck overlays, and overlaid approaches, except when specifically excluded by the contract documents.

01066.02 MEASUREMENT.

Smoothness will be measured with California type profilograph, which produces a profilogram (profile trace) of the surface tested, in accordance with Materials I.M. 341. Other types of profilographs or profilers that produce compatible results and meet the requirements of Materials I.M. 341 may be used. The testing and evaluation will be done by a trained and certified person. A 10 foot (3 m) straight edge may be used to measure any area not covered by the profilograph. Deviations over 1/8 inch in 10 feet (3 mm in 3 m) shall be corrected.

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.

The Engineer will perform testing and furnish the profilogram results to the Contractor. Bridge decks and approaches, when part of the contract, will be tested in the wheel paths of all lanes.

Bridge decks, and bridge deck overlays will be treated as one section. Traffic lanes 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).

The profilogram will include a minimum of 16 feet (5 m) beyond the section when there is adjoining pavement.

01066.03 PROFILE INDEX.

An individual index will be calculated for each segment from the profilograms in accordance with Materials I.M. 341 except for:

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.
5. The 16 feet (5 m) at the ends of the section when the Contractor is not responsible for the adjoining surface.
6. The 16 feet (5 m) on each side of the expansion joints not adjusted.

Tests in both wheel paths will be averaged for each lane.

01066.04 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 of the Standard Specifications, 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.

01066.05 SMOOTHNESS.

On bridge decks, new bridge approaches, bridge deck overlays and overlays of approaches the segments 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, except for areas identified in Article 01066.04.

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.

Bumps and dips, including those at headers, on all surfaces for which smoothness is designated will be evaluated. Correction work will be required in accordance with the following criteria. Areas excluded from profilograph testing shall be corrected for deviations exceeding 1/8 inch in 10 feet (3 mm in 3 m).

A. Bumps.

All bumps exceeding 0.5 inch (13 mm) within a 25 foot (7.6 m) span, as indicated on the profilogram, shall be corrected except as stated in Article 01066.06, C.

Corrected bumps will be considered satisfactory when measurement by the profilograph shows that the bumps are 0.3 inch (8 mm) or less in a 25 foot (7.6 m) span.

B. Dips.

All dips exceeding 0.5 inch (13 mm) in a 25 foot (7.6 m) span, as indicated on the profilogram, shall be corrected only when required by the Engineer except as stated in Article 01066.06, C. The Contractor will be assessed a price adjustment of \$900 for each dip exceeding 0.5 inch (13 mm) that is not corrected except as stated in Article 01066.06, C. A dip in both wheel paths at a lane location will be considered a single dip when assessing a price adjustment. Corrected dips will be considered satisfactory when the profilogram shows the dips are less than 0.3 inch (8 mm) in a 25 foot (7.6 m) span.

C. Exceptions.

When the Contractor is not responsible for the adjoining surface, bumps and dips exceeding 0.5 inches (13 mm) located within 16 feet (5 m) either side of the end of a section will be evaluated by the Engineer. The Contractor will not receive a price adjustment for bumps and dips in this area. When instructed by the Engineer, the Contractor will be paid to repair these bumps and dips in accordance with Article 1109.03, B, of the Standard Specifications.

01066.06 SCHEDULE OF PAYMENT.

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 testing shall be evaluated for price reduction assessment using the final profile index, the number of segments, and the number of dips greater than 0.5 inches. A price adjustment of \$900 shall be assessed for each dip greater than 0.5 inches (13 mm) or greater in each traffic lane.

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. Correction of dips greater than 0.5 inches (13 mm) will not be permitted unless approved by the Engineer.

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 01066.06 in lieu of a price reduction.