



State of Utah

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DEPARTMENT OF TRANSPORTATION

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Executive Director

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Deputy Director

November 30, 2015

TO ALL BIDDERS CONCERNED:

SUBJECT: S-I15-8(151)349/10491  
I-15, 2700 N (Farr West) to 1100 S (Brigham City)  
Addendum No. 1

To Whom It May Concern:

We are submitting the following changes to the subject project.

- I. Special Provision 01452S "Pavement Smoothness" has been revised. (Existing Roughness (IRI) data collected by the Department for the project has been posted and is available for download for information only. The data was collected August 2015).

Please consider these revisions before submitting your bid.

\*\*\* ADDENDUM IS AVAILABLE AND MAY BE DOWNLOADED FROM THE UDOT WEBSITE AT  
<http://eprpw.dot.utah.gov>

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED WHEN YOU SUBMIT YOUR BID.  
YOUR BID WILL BE DECLARED NON-RESPONSIVE IF YOU DO NOT ACKNOWLEDGE THIS  
ADDENDUM.

Sincerely,

Rodney Terry  
UDOT Project Manager

**SPECIAL PROVISION**

**Project S-I15-8(151)349  
PIN 10491**

**SECTION 01452S**

**PAVEMENT SMOOTHNESS**  
(International Roughness Index Specification)

**Delete Section 01452 and replace with the following:**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Process and procedures for acceptance testing and determination of a minimum International Roughness Index (IRI) and Incentive/Disincentive for smoothness of Hot Mix Asphalt (HMA), Open Graded Surface Course (OGSC), Bonded Wearing Course (BWC), Stone Matrix Asphalt (SMA), Micro-Surfacing, Portland Cement Concrete Pavement (PCCP) and Portland Cement Concrete Pavement (PCCP) rehabilitation using a profiler approved and certified by the Department.

**1.2 RELATED SECTIONS**

- A. Section 02735: Micro-Surfacing
- B. Section 02741: Hot Mix Asphalt
- C. Section 02742S: Project Specific Surfacing Requirements
- D. Section 02744S: Stone Matrix Asphalt
- E. Section 02752: Portland Cement Concrete Pavement
- F. Section 02786: Open Graded Surface Course
- G. Section 02787: Bonded Wearing Course
- H. Section 02981: Grinding Pavements

### 1.3 REFERENCES

- A. AASHTO R 43: Quantifying Roughness of Pavements
- B. AASHTO R 54: Standard Practice for Accepting Pavement Ride Quality When Measured Using Inertial Profiling Systems
- C. Materials Manual of Instruction
- D. Department IRI Wheel-path Measurements
  - 1. Measurements taken in August 2015 in the existing inside and outside lanes are available for information only on the UDOT bid-letting website. These raw data files may be evaluated using the free AASHTO ProVal software.

### 1.4 DEFINITIONS

- A. Category 1
  - 1. Newly constructed pavement surfaces having two or more opportunities for improving the ride.
- B. Category 2
  - 1. Newly constructed pavement surfaces without two or more opportunities for improving the ride.
- C. Opportunity to Improve Ride
  - 1. Placing Granular Borrow, Untreated Base Course, Treated Base Course, Open-Graded Surface Course (OGSC), Bonded Wearing Course (BWC), Stone Matrix Asphalt (SMA), Rotomilling, Profile Rotomilling, Cold-In-Place Recycling, Hot-In-Place Recycling, and each lift of paving.
  - 2. Lane leveling is not considered an opportunity to improve the ride.
- D. Pavement Section
  - 1. Each travel lane or median, 0.1 mile long, meeting the requirements specified in this Section, article 1.8, paragraph A.
  - 2. Each pavement section is laid out consecutively from the start of the project.
  - 3. Localized Roughness Criteria also applies to bike lanes and shoulders.
- E. Wheel Path
  - 1. A continuous parallel line 2.5 ft inside the lane or median lines.

- F. MRI (Mean Roughness Index)
  - 1. Average of two wheel path IRIs taken from each pavement section.

## **1.5 SUBMITTALS**

- A. Certifications for Profilers and Operators. Refer to this Section, article 1.6, paragraph A.
- B. Summary report of acceptance profile testing for the project. Refer to this Section, article 3.1, paragraph E2.
- C. Original raw data files compatible with the AASHTO ProVal software.

## **1.6 GENERAL REQUIREMENTS**

- A. Certify operators and equipment according to UDOT Materials Manual of Instruction 995.
- B. Determine pavement smoothness using a profiler.
- C. All work necessary to prepare the pavement for testing, including sweeping, is incidental to the work and is not measured for payment.
  - 1. Include all costs and resources for smoothness testing, preparation, and correction, including traffic control, temporary pavement markings, grinding or milling, disposal of waste material, and flush coat for ground areas in the surfacing bid items.
- D. Perform Independent Assurance testing with the Department as directed by the Engineer according to AASHTO R 54 *Verification Testing*.

## **1.7 ACCEPTANCE**

- A. The Department evaluates longitudinal deviations for all roadways based on acceptance profiles performed by the Contractor.
  - 1. The IRI is determined using the most recent version Profile Viewer and Analysis (ProVAL) software according to AASHTO R 54.
- B. Limit transverse pavement deviations to less than 3/16 inch from the lower edge of a 10-foot straightedge.
- C. Smoothness is evaluated before and after corrective work is complete. Acceptance is based on the final profile.

- D. Limit profile deviations to those specified in Table 2
  - 1. Determine the MRI for each pavement section by taking the average of all profiles.
    - a. Perform a profile in each wheel path.
      - 1) Include profile deviations from bridge decks, approach slabs and transitions, manholes, valves, and other facilities in the profile when the contract requires the adjustment, new construction or reconstruction of these facilities.
      - 2) Exclude profile deviations from bridge decks, approach slabs and transitions, manholes, valves, and other facilities in the profile when the contract does not include adjustment, new construction, or reconstruction of these facilities.
    - b. Perform a longitudinal profile in the center of the paved shoulders and bike lanes. Limit profile deviations in shoulder or bike lane as specified in Table 2.
- E. The following pavements will be considered to be rejected and may be subject to removal and replacement of the associated contract work. See Section 01456.
  - 1. Category 1 final riding surfaces with an MRI greater than 90.0 after corrective action.
  - 2. HMA and SMA sections requiring grinding in excess of 100 square yards.
  - 3. OGSC, BWC, and Micro Surfacing sections requiring grinding in excess of 50 square yards.
  - 4. Pavement where grinding has reduced the paving thickness below acceptance limits.
  - 5. Pavement with localized roughness exceeding the limits of this section.

## **1.8 INCENTIVE/DISINCENTIVE**

- A. The Department applies Incentive/Disincentive to Category 1 and 2 pavements longer than 1,000 ft in length, including:
  - 1. All traffic lanes
  - 2. Ramps
  - 3. Medians 8 ft and wider
  - 4. Turn lanes
  - 5. Bridges and approach slabs with final riding surfaces placed as part of the contract
- B. The Department does not apply Incentive/Disincentive to:
  - 1. Pavements shorter than 1,000 ft

2. Shoulders
  3. Bike Lanes
  4. Medians narrower than 8 ft
  5. Horizontal curves with a centerline curvature radius less than 900 ft and areas within the superelevation transitions to these short radius curves
  6. Tapers
  7. Surfaces within 15 ft of bridge decks and approach slabs not paved as part of the contract
- C. The Department applies the incentives and disincentives for smoothness to the final riding surface of Category 1 pavements according to Table 1.
1. Amounts are prorated for partial pavement sections based on length.
  2. Take thickness measurements for acceptance after smoothness has been assessed and any corrective action taken for PCCP.
  3. Take additional measurements for thickness acceptance for asphalt pavements as directed by the Engineer.
  4. The following pavement sections do not qualify for smoothness incentives. Disincentives will still apply.
    - a. Pavement still requiring corrective action at the time of acceptance testing. Any disincentives are based on the MRI obtained at the time of final acceptance re-testing.
    - b. Pavements with an HMA final riding surface where grinding exceeds 25 yd<sup>2</sup>.
    - c. Pavements with grinding on the final surface of OGSC, BWC, and Microsurfacing.

Table 1

<b>Incentives and Disincentives for Category 1 Pavements</b>		
<b>MRI Range (inches / mile) by Pavement Section)</b>	<b>Dollars/Pavement Section</b>	
	Asphalt Pavements	Portland Cement Concrete
≤ 40.0	\$500	\$1000
40.1 - 50.0	\$300	\$500
50.1 – 60.0	\$150	\$250
60.1 – 70.0	\$0	\$0
70.1 – 80.0	-\$150	-\$250
80.1 – 90.0	-\$300	-\$500
>90.0	Corrective Action	

## **PART 2 PRODUCTS**

### **2.1 PAVEMENTS**

- A. Hot Mix Asphalt (HMA). Refer to Section 02741
- B. Open Graded Surface Course (OGSC). Refer to Section 02786
- C. Bonded Wearing Course (BWC). Refer to Section 02787
- D. Stone Matrix Asphalt (SMA). Refer to Section 02744S
- E. Micro-Surfacing. Refer to Section 02735
- F. Portland Concrete Pavement (PCCP). Refer to Section 02752

### **2.2 FLUSH COAT**

- A. As per Section 02748 for tack coat.

## **PART 3 EXECUTION**

### **3.1 PAVEMENT PROFILE CORRECTION**

- A. Construct finished pavement to meet the requirements of this section.
- B. Perform preliminary profiling and roadway smoothness evaluation to identify any defects exceeding acceptance limits.
  - 1. Correct defects before performing acceptance testing.
    - a. Measure and correct localized roughness defects in the underlying surface before placement of the final OGSC, BWC, SMA, or Micro-Surfacing surface course.
      - 1) Incentive/Disincentive determined on final pavement smoothness.
    - b. Correct localized roughness defects across lanes, medians, and shoulders in widths terminating at a lane line, edge of pavement, or center of the lane by grinding with a device approved by the Engineer, including those listed in this Section, article 1.8, paragraph B.
    - c. Taper corrected areas for smooth transverse transitions and to avoid edges that might interfere with surface drainage.
    - d. Re-profile for correction verification before acceptance testing.

- e. Seal areas in BWC, OGSC, HMA, SMA, and Micro-Surfacing that have been ground with a flush coat application.
  - 1) Apply the emulsion according to Section 02748 for tack coat.
- f. Complete all corrective work before determining pavement thickness on PCCP. Other pavements may be re-tested for thickness after grinding as directed by the Engineer.

Table 2

<b>Localized Roughness Limits</b>	
<b>Roadway</b>	<b>MRI w/base length of 25 ft. (in./mile)</b>
Interstate	≤ 140
Non-interstate	≤ 140
Urban roadways with speed limits less than 45 mph	≤ 160
Shoulders and Bike Lanes	≤ 175 (IRI for single profile)

- D. Notify the Engineer in writing after all corrective work has been performed and at least two working days before performing acceptance testing for pavement smoothness.
  - 1. Clearly define each of the pavement sections to be evaluated in the written notification.
- E. Perform acceptance testing for smoothness according AASHTO R 54 and 57.
  - 1. Perform acceptance testing with Department certified profilers, and operators.
  - 2. Submit a summary report to the Engineer within two working days that includes pavement section identification, profile results, and bump location showing localized roughness corrections by pavement section.

END OF SECTION