

## SPECIAL SPECIFICATION

5880

### Ride Quality for Pavement Surfaces

1. **Description.** Measure and evaluate the ride quality of pavement surfaces. Upon request before the project letting, the Engineer will provide the Contractor the most recent international roughness index (IRI) values stored in the Department's Pavement Management Information System database.

2. **Equipment.**

(1) **Type A.** Provide a 10-ft. straightedge.

(2) **Type B.** Provide a high speed or lightweight inertial profiler, certified by the Department at the Texas Transportation Institute Ride Facility located at the Riverside Campus near Bryan, Texas. Provide the Engineer equipment certification documentation. Display a current decal on the equipment indicating the certification expiration date.

Provide a certified profiler operator. Verify certification by checking the approved provider list maintained by the Department's Construction Division (CST). Furnish the Engineer documentation for the person certified to operate the profiler.

3. **Work Methods.** Measure and evaluate profiles using Surface Test Types A and B on surfaces as described below or as shown on the plans.

(1) **Transverse Profile.** Measure the transverse profile of the finished riding surface in accordance with Surface Test Type A.

(2) **Longitudinal Profile.** Measure the longitudinal profile of the surface, including horizontal curves.

(a) Use Surface Test Type B on the finished riding surface of all travel lanes except as follows:

- Use Surface Test Type A on service roads and ramps unless Surface Test Type B is shown on the plans.
- Use surface Test Type A when project pavement limits are less than 2,500 ft., unless otherwise shown on the plans.
- Use Surface Test Type A on all other areas.

(b) Use Surface Test Type A for shoulders and all other areas including intermediate pavement layers.

(c) Use Surface Test Type A on the first and last 25 ft. of projects that require Surface Test Type B.

(3) **Profile Measurements.** Measure the finished surface in accordance with Surface Test Type A or B as required.

(a) **Surface Test Type A.** Test the surface with a 10-ft. straightedge at locations selected by the Engineer.

(b) **Surface Test Type B.**

(i) **Quality Control (QC) Testing.** Perform QC tests on a daily basis throughout the duration of the project. To perform QC tests, use a 10-ft. straightedge, inertial profiler, profilograph, or any other means.

(ii) **Quality Assurance (QA) Testing.** Perform QA tests using either a high speed or lightweight inertial profiler. Perform QA tests on the finished surface of the completed project or at the completion of a major stage of construction as approved by the Engineer. Exclude the first and last 25 ft. of the project from QA testing.

Coordinate with and receive authorization from the Engineer before starting QA testing. The Engineer may require QA testing to be performed at off peak times for traffic flow. Operate the inertial profiler in a manner that does not unduly disrupt traffic flow as determined by the Engineer. When using a lightweight inertial profiler to measure a surface that is open to traffic, use a moving traffic control plan in accordance with Part 6 of the Manual of Uniform Traffic Control Devices. Traffic control for QA testing is at the expense of the Contractor. Perform QA tests within 7 days after receiving authorization.

In accordance with Test Method Tex-1001-S, operate the inertial profiler and deliver test results to the Engineer. Submit QA results to the Engineer within 24 hr. of testing. Provide all profile measurements to the Engineer in electronic data files with the format specified in Test Method Tex-1001-S.

Bridge structures, approach slabs, or both not overlaid under this project will not be subjected to Surface Test Type B.

(a) **Verification Testing.** Within 10 working days after the Contractor's QA testing is completed, the Engineer may perform ride quality verification testing using a Department-certified inertial profiler. The Engineer will determine a resolution when the results from the Department's profiler produce an overall average IRI value that is 6.0 in./mi. or more higher than the value calculated using Contractor data. Referee testing may be requested if the differences cannot be resolved.

(b) **Referee Testing.** CST will conduct all referee testing using a certified inertial profiler and results are final. CST will determine whether either or both inertial profilers in dispute must be recertified. The cost for recertification will be at the owner's expense.

**(4) Acceptance Plan and Pay Adjustments.** The Engineer will evaluate profiles for acceptance, bonus, penalty, or corrective action. All corrective work and reprofiling required under this Item are at the Contractor's expense.

**(a) Surface Test Type A.** There are no pay adjustments when Surface Test Type A is specified. In a manner approved by the Engineer, correct surface areas that have more than 1/8-in. variation between any 2 contacts on the straightedge. Following correction, retest the area to verify compliance with this Item.

**(b) Surface Test Type B.** The Engineer will use the QA test results to determine pay adjustments for ride quality using Department software. In addition to the pay adjustment for each 0.1-mi. section, penalties for deficient 0.1-mi. sections, localized roughness, or both may apply as described in this Item. When taking corrective actions to improve a deficient 0.1-mi. section, base pay adjustments on the data obtained from reprofiling the corrected area.

**(i) Pay Adjustment for 0.1-Mi. Sections.** Unless Pay Adjustment Schedule 1 or 2 is shown on the plans, Pay Adjustment Schedule 3 from Table 1 will be used to determine the level of bonus or penalty for each 0.1-mi. section on the project. Prorate sections less than 0.1-mi. and greater than 50 ft. in accordance with Test Method Tex-1001-S.

Bonuses will apply and penalties will be waived for sections that include bridge structures and/or approach slabs overlaid under this project including 100 ft. on either side of the bridge structure, approach slab, or both.

When the plans or specifications waive the \$500 penalty for localized roughness, no associated bonuses will be paid for any 0.1-mi. section that contains localized roughness.

**(ii) Deficient 0.1-Mi. Sections.** Correct any 0.1-mi. section having an average IRI of over 95.0 in./mi. to an IRI of 65 in./mi. or less for asphalt pavement surfaces or to an IRI of 75 in./mi. or less for concrete pavement surfaces. On asphalt pavement surfaces, when requested by the Contractor, the Engineer may assess a \$3,000 penalty per 0.1-mi. section instead of requiring corrective action. Receive approval from the Engineer for the proposed method of corrective work. After making corrections, reprofile the pavement section to verify that corrections have produced the required improvements. If the corrective action does not produce the required improvement, the Engineer may assess the \$3,000 penalty, require, or allow continued corrective action. Associated bonuses apply when successful corrective action improves the IRI of a deficient 0.1-mi. section.

**(iii) Localized Roughness.** A localized roughness penalty of \$500 per occurrence will not be assessed unless otherwise shown on the plans. The Engineer will use the inertial profile data to identify localized roughness in accordance with the methodology provided in Test Method Tex-1001-S. The Engineer will determine areas of localized roughness using the average profile from both wheel paths. If corrective action for localized roughness is required, reprofile

the corrected area and provide the Engineer the results that show the corrective action was successful.

- (a) When a localized roughness penalty of \$500 per occurrence is specified in the plans, the Engineer will either assess the penalty or require corrective action. If the corrective action is not successful, the Engineer will assess the \$500 penalty or require or allow continued corrective action.
- (b) The Engineer may require corrective action be taken to remove localized roughness when the penalty for localized roughness is waived by the specifications or the plans.

**4. Measurement and Payment.** The work performed, materials furnished, equipment, labor, tools, and incidentals will not be measured or paid for directly, but will be subsidiary to bid Items of the Contract. The pay adjustments described in this Item will be paid or deducted separately.

**Table 1**  
**Pay Adjustment Schedule for Ride Quality**

IRI for each 0.10-mi. of Traffic Lane In./Mi.	Pay Adjustment \$/0.10-mi. of Traffic Lane		
	Schedule 1	Schedule 2	Schedule 3
< 30	600	600	600
30	600	600	600
31	580	580	580
32	560	560	560
33	540	540	540
34	520	520	520
35	500	500	500
36	480	480	480
37	460	460	460
38	440	440	440
39	420	420	420
40	400	400	400
41	380	380	380
42	360	360	360
43	340	340	340
44	320	320	320
45	300	300	300
46	280	280	280
47	260	260	260
48	240	240	240
49	220	220	220
50	200	200	200
51	180	180	180
52	160	160	160
53	140	140	140
54	120	120	120
55	100	100	100
56	80	80	80
57	60	60	60
58	40	40	40
59	20	20	20

<b>IRI for each 0.10-mi. of Traffic Lane</b>	<b>Pay Adjustment \$/0.10-mi. of Traffic Lane</b>		
60	0	0	0
61	0	0	0
62	0	0	0
63	0	0	0
64	0	0	0
65	0	0	0
66	-20	0	0
67	-40	0	0
68	-60	0	0
69	-80	0	0
70	-100	0	0
71	-120	0	0
72	-140	0	0
73	-160	0	0
74	-180	0	0
75	-200	0	0
76	-220	-20	0
77	-240	-40	0
78	-260	-60	0
79	-280	-80	0
80	-300	-100	0
81	-320	-120	0
82	-340	-140	0
83	-360	-160	0
84	-380	-180	0
85	-400	-200	0
86	-420	-220	0
87	-440	-240	0
88	-460	-260	0
89	-480	-280	0
90	-500	-300	0
91	-520	-320	0
92	-540	-340	0
93	-560	-360	0
94	-580	-380	0
95	-600	-400	0
>95	*Corrective Action	*Corrective Action	Not Applicable