WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT: _____

FEDERAL PROJECT: _____

FOR

SECTION 720

RIDE QUALITY FOR PAVEMENT SURFACES

720.1 DESCRIPTION

Measure and evaluate the ride quality of pavement surfaces.

720.2 EQUIPMENT

720.2.1 Surface Test Type A. Provide a 10-ft. straightedge.

720.2.2 Surface Test Type B. Provide a high-speed or lightweight inertial profiler, certified at the facility approved by Materials Division. Provide the Engineer with equipment certification documentation. Display a current decal on the equipment indicating the certification lab number and expiration date. Use a certified profiler operator from the Materials Division's approved list. Furnish the Engineer documentation for the person certified to operate the profiler.

720.3 WORK METHODS

Measure and evaluate profiles using Surface Test Types A and B on surfaces as described below unless otherwise shown on the plans.

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

720.3.2 **Longitudinal Profile. Measure the longitudinal profile of the surface, including horizontal curves.**

720.3.2.1 **Travel Lanes. Unless otherwise shown on the plans, use Surface Test Type B on the finished riding surface of all travel lanes except as follows:**

720.3.2.1.1 **Service Roads and Ramps. Use surface Test Type A on service roads and ramps unless Surface Test Type B is shown on the plans.**

720.3.2.1.2 **Short Projects. Use Surface Test Type A when project pavement length is less than 1100 ft., unless otherwise shown on the plans.**

720.3.2.1.3 **Bridge Structures. For span type bridge structures, approach slabs, and the 200 ft. leading into and away from such structures, measure the profile in accordance with the pertinent item or use Surface Test Type A.**

720.3.2.1.4 **Leave-Out Sections. Use Surface Test Type A for areas listed on the plans as leave-out sections.**

720.3.2.1.5 **Ends. Use Surface Test Type A on the first and last 100 ft. of the project pavement length.**

720.3.2.2 **Shoulder Use. Surface Test Type A.**

720.3.3 **Profile Measurements. Measure the finished surface in accordance with Surface Test Type A or B in accordance with Section 720.3.1, "Transverse Profile", Section 720.3.2, "Longitudinal Profile", and the plans.**

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

720.3.3.2 **Surface Test Type B.**

720.3.3.2.1 **Quality Control (QC) Testing. Perform QC tests throughout the duration of the project. Use a 10-ft. straightedge, inertial profiler, profilograph, or any other means to perform QC tests.**

720.3.3.2.2 Quality Assurance (QA) Testing. Perform QA tests using either a high-speed or lightweight inertial profiler. Coordinate with and obtain authorization from the Engineer before starting QA testing. Perform QA tests on the finished surface of the completed project or at the completion of a major state of construction as approved by the Engineer. Perform QA tests within 7 days after receiving authorization.

The Engineer may require QA testing to be performed at times of off-peak 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 the current West Virginia Division of Highways Traffic Control Manual for Streets and Highway Construction and Maintenance Operations, and the plans.

Operate the inertial profiler in accordance with the manufacturer's directions and deliver test results to the Engineer within 24 hours of testing. Provide all profile measurements to the Engineer in electronic data files using the format specified in AASHTO PP50.

720.3.3.2.3 Verification Testing. Within 10 working days after the Contractor's QA testing is completed for the project or major stage of construction, the Department will perform ride quality verification testing. When the Department's profiler produces an overall average International Roughness Index (IRI) value that is more than 3.0 inches per mile higher than the value calculated using Contractor data, use the Department's data, use an average of both party's data, or request a referee test. Referee testing is mandatory if the difference is greater than 6.0 inches per mile.

720.3.3.2.4 Referee Testing. The Materials Division will conduct referee testing, and their results are final. The Materials Division may require recertification for the Contractor's or Department's inertial profiler.

720.3.4 Acceptance Plan and Pay Adjustments. The Engineer will evaluate profiles for determining acceptance, bonus, penalty, and corrective action.

720.3.4.1 **Surface Test Type A. Use diamond grinding or other methods approved by the Engineer to correct surface areas that have more than 1/8 inch variation between any two contacts on a 10-ft. straightedge. Following correction, retest the area to verify compliance with this Item.**

720.3.4.2 **Surface Test Type B. The Engineer will use the QA test results and the corresponding values in Table 1 to determine pay adjustments for ride quality using Department software. IRI values will be calculated using the average of both wheel paths. When taking corrective actions to improve a deficient 0.1 mile section, pay adjustments will be based on the data obtained from reprofiling the corrected area.**

720.3.4.2.1 **IRI Pay Adjustment for 0.1 mile sections. Pay adjustments will be in accordance with Table 1. Use Schedule 1 (65 in/mile IRI) or Schedule 2 (81 in/mile IRI). Schedule 3 from Table 1 will be used to determine the level of bonus for each 0.1 mile section of the pavement resurfacing.**

When Schedule 3 is specified, no associated bonuses will be paid for any 0.1 mile section that contains localized roughness.

720.3.4.2.2 **IRI Deficient 0.1 Mile Sections. When pay adjustment Schedule 1 or 2 is specified, use diamond grinding or other approved work methods to correct any 0.1 mile section with an average IRI over 50% above the required amount (IRI deficient). Correct the deficient section to an IRI of 65 inches per mile or less when Schedule 1 is specified and to an IRI of 81 inches per mile or less when Schedule 2 is specified. After making corrections, reprofile the pavement section to verify that corrections have produced the required improvements. Associated bonuses apply when successful corrective action improves the IRI of a deficient 0.1 mile section.**

The Engineer may assess a $3,000 penalty per 0.1 mile section instead of requiring corrective action. If corrective action does not produce the required improvement, the Engineer may require continued corrective action, assess the pertinent schedule penalty if the reprofiled IRI is less than the require IRI plus 50%, or assess the $3,000 penalty if the reprofiled IRI is greater than the required IRI plus 50%.

720.3.4.2.3 Localized Roughness. Localized roughness will be measured using an inertial profiler in accordance with AASHTO. The Engineer will determine areas of localized roughness using the average profile from both wheel paths.

The Engineer may waive localized roughness requirements for deficiencies resulting from manholes or other similar appurtenances near the wheel path.

The Engineer may assess a penalty for each occurrence of localized roughness. No more than one (1) penalty will be assessed for any 5 ft. of longitudinal distance. No localized roughness penalties will be assessed in deficient 0.1 mile sections where the Engineer elects to assess the $3,000 penalty instead of corrective action. For Schedules 1 and 2, a localized roughness penalty of $250 per occurrence will be assessed. For Schedule 3, localized roughness penalties will not be assessed.

720.4 MEASUREMENT AND PAYMENT

The work performed, materials furnished, certification and recertification, traffic control for all testing, materials and work needed for corrective action, equipment, labor, tools and incidentals will not be measured or paid for directly but will be subsidiary to pertinent Items.

Average IRI for each 0.10 mi. of Traffic Lane (in/mi)	Pay Adjustment $ / 0.10 mi. of Traffic Lane		
	Schedule 1 New Pavement 4" or more	Schedule 2 New Pavement >= 3" < 4"	Schedule 3 NHS pavement < 3"
< 30	600	600	300
30	600	600	300
31	580	600	300
32	560	600	300
33	540	600	300
34	520	600	300
35	500	600	300
36	480	600	300
37	460	600	300
38	440	600	300
39	420	600	300
40	400	600	300
41	380	600	300
42	360	600	300
43	340	600	300
44	320	600	300
45	300	600	300
46	280	600	300
47	260	580	290
48	240	560	280
49	220	540	270
50	200	520	260
51	180	500	250
52	160	480	240
53	140	460	230
54	120	440	220
55	100	420	210
56	80	400	200
57	60	380	190
58	40	360	180
59	20	340	170
60	0	320	160
61	0	300	150

Average IRI for each 0.10 mi. of Traffic Lane (in/mi)	Pay Adjustment $ / 0.10 mi. of Traffic Lane		
	Schedule 1 New Pavement 4" or more	Schedule 2 New Pavement >= 3" < 4"	Schedule 3 NHS pavement < 3"
62	0	280	140
63	0	260	130
64	0	240	120
65	0	220	110
66	-20	200	100
67	-40	180	90
68	-60	160	80
69	-80	140	70
70	-100	120	60
71	-120	100	50
72	-140	80	40
73	-160	60	30
74	-180	40	20
75	-200	20	10
76	-220	0	0
77	-240	0	0
78	-260	0	0
79	-280	0	0
80	-300	0	0
81	-320	0	0
82	-340	-20	
83	-360	-40	
84	-380	-60	
85	-400	-80	
86	-420	-100	
87	-440	-120	
88	-460	-140	
89	-480	-160	
90	-500	-180	
91	-520	-200	
92	-540	-220	
93	-560	-240	
94	-580	-260	
95	-600	-280	
96	-600	-300	

Average IRI for each 0.10 mi. of Traffic Lane (in/mi)	Pay Adjustment $ / 0.10 mi. of Traffic Lane		
	Schedule 1 New Pavement 4" or more	Schedule 2 New Pavement >= 3" < 4"	Schedule 3 NHS pavement < 3"
97	-600	-320	
98	-600	-340	
99	Corrective Action	-360	
100		-380	
101		-400	
102		-420	
103		-440	
104		-460	
105		-480	
106		-500	
107		-520	
108		-540	
109		-560	
110		-580	
111		-600	
112		-620	
> = 113		Corrective Action	