

1. RIDE SPECIFICATIONS FOR FLEXIBLE PAVEMENT [401] (REVISED XX-XX-2010)

A. Construction Requirements. Construct all surfacing courses to provide completed plant mix bituminous pavements that meet surface smoothness levels derived from the International Roughness Index (IRI) for a Category (I, II, or III) project and that meet the surface profile requirements for the finished surface. Surface smoothness and surface profile will be analyzed from data collected by the Department using a Class I Laser Road Profiler following Department procedures for profiler operations. The IRI will be measured in inches/mile, regardless of the unit of measure used on the contract. The eighth paragraph of Subsection 401.03.2 (F) (1) is hereby rescinded for those roadway sections subject to ride evaluation.

1) Surface Smoothness. Target IRI values are determined by project category based on the opportunities for improving the ride, by the pre-paving IRI value, paving constraints, or by a combination of these as follows:

Category I Projects:

Target IRI Values - 45 to 55 inches per mile

- Projects with two or more opportunities for improving the ride.
- Single lift overlays with a pre-paving IRI value less than 110 in/mi

Category II Projects:

Target IRI Values - 55 to 60 inches per mile

- Single lift overlays with a pre-paving IRI greater than or equal to 110 in/mi and less than 190 in/mi

Category III Projects:

Target IRI Values – 55 to 70 inches per mile

- Urban projects with a posted speed limit of 55 MPH or less and curb and gutter controlling one or more edges of the paving.

Projects with High Pre-Paving IRI value:

- Projects with an average pre-paving IRI value greater than or equal to 190 in/mi and two or more opportunities to improve the ride are considered a Category I Project.
- Projects with an average pre-paving IRI value greater than or equal to 190 in/mi and one opportunity to improve the ride must have a post-paving IRI less than or equal to 50 percent of the pre-paving IRI. There is no pay adjustment factor based on smoothness; corrective action is required to produce a post-paving IRI less than or equal to 50 percent of the pre-paving IRI at Contractor expense.

Each opportunity to improve the ride is one of the following:

- Placing a gravel base or surfacing course,
- Placing plant mix bituminous base,
- Placing cement treated base,
- Placing pulverized plant mix surfacing,
- Milling,
- Cold recycling (milling and laydown),
- Each full 0.10 foot (30 mm) increment for 3/8 inch aggregate mix, 0.13 foot (39 mm) increment for 1/2 inch aggregate mix, and 0.15 foot (45 mm) increment for 3/4 inch aggregate mix of new plant mix surfacing.
- Leveling and isolation lifts are not included as an opportunity to improve the ride.

2) Surface Profile. Correct surface profile defects greater than 0.40 inches (10mm) in a distance of 25 feet (7.62 meters) within 30 calendar days of notification but prior to seal and cover or plant mix seal operations. Correct surface profile defects by milling and filling deficient pavement depths or by diamond grinding excess pavement depths. Corrected surface profile defects will be retested and evaluated. Pavement thickness will be measured after profile corrections are made. Ensure corrected pavements do not create a transverse height difference between adjacent lanes exceeding 1/8 inch (3 mm). Fog seal corrected areas if the roadway is not chip sealed prior to winter shutdown.

3) Testing and acceptance. The Department will test for surface smoothness and surface profile prior to the placement of seal and cover or plant mix seal on the final lift of plant mix bituminous surfacing pavement. Testing will consist of a single pass measurement in each travel lane. Data collected for each wheel path will be averaged for that lane. Tests will be performed within ten working days (extended by rain or other inclement weather conditions) of completion of all mainline paving. The Department will test divided highways within ten working days (extended by rain or other inclement weather conditions) of completion of mainline paving for each direction of travel. Ensure that the entire finished lane width to be tested is not impeded and is available to Department personnel at the time of testing. Test results will be furnished within two working days.

If the entire final lift of pavement cannot be completed before winter shutdown, data will be collected for all roadway sections paved through the final lift. Evaluation of the remaining pavement will be performed once the paving is completed.

4) Surface Smoothness. The surface smoothness analysis will be used to determine the actual IRI for calculating pay factors for the surfacing section placed in this contract.

Actual IRI values will be determined on all mainline travel lanes including climbing lanes, passing lanes, and ramps that are 0.2 miles (0.30 km) or longer. Bridge decks will be included only if they are paved as part of the project.

Smoothness data will not be evaluated for the following roadway sections:

- a) Climbing lanes and passing lanes, less than 0.2 miles (0.30 km) long.
- b) Turning Lanes, less than 0.2 miles long.
- c) Acceleration and deceleration lanes, less than 0.2 miles long.
- d) Shoulders and gore areas.
- e) Road approaches.
- f) Horizontal curves 900 feet (275 m) or less in centerline radius, and pavement within the superelevation transitions of these short radius curves.
- g) Pavement within 50 feet (15 m) of bridge decks, approach slabs, and the terminal paving points of the project.

5) Surface Profile. Areas requiring corrective work will be identified using the surface profile measurements of the finished surface.

All areas not tested for surface profile under this provision are to meet Subsection 401.03.14 Surface Tolerance requirements.

B. Method of Measurement. The surface smoothness will be measured using the International Roughness Index (IRI). The surface smoothness will be evaluated by lane. The following project category pay factors will be applied to each lane:

<u>Project Category</u>	<u>Actual IRI (Inches/mi)</u>	<u>Pay Factor</u>
Category I	< 35	1.25
	35 – 45	2.125– 25/1000 * IRI
	> 45 – < 55	1.00
	55 – 75	1.825 – 3/200 * IRI
	> 75 – 90	0.70
	> 90	Corrective Action (Initially assumed zero pay)
Category II	< 50	1.10
	50 – 55	2.100 – 1/50 * IRI
	> 55 – < 60	1.00
	60 – 95	1.343 – 1/175 * IRI
	> 95	Corrective Action (Initially assumed zero pay)
Category III	<40	1.25
	40 – 55	1.918 – 1.67/100 * IRI
	>55 - <70	1.00
	70 – 100	1.700 – 1/100 * IRI
	>100	Corrective Action (Initially assumed zero pay)

Note: The pay factor is the same whether the plant mix is measured in English or metric units. Final pay factors are rounded to two decimals and used in calculating the value of the incentive/disincentive.

C. Basis of Payment. This is a Category project. The incentive or disincentive will be calculated based on the ride category and length of each travel lane or measured section using the following equation. The calculated value will be applied as a line item adjustment to the plant mix item on the estimate. Calculate the pay adjustment as follows:

$$\text{Pay adjustment} = (\text{Pay Factor} - 1) \times L \times \text{Unit Cost}$$

Pay Factor = Calculate using the formulas for the appropriate project category

L = Length of the lane measured

Unit Cost = Use appropriate value from the table below

Category	Description	Unit Cost/ft
I or III	Reconstruction or rehabilitation section with 0.3 ft or greater plant mix surfacing or wearing course	\$6.425
I, II, or III	Reconstruction, rehabilitation, or overlay section with 0.2 to 0.29 ft plant mix surfacing or wearing course	\$4.283
I, II, or III	0.15 ft or less thin lift overlay	\$3.213
	Note: Isolation lifts are not considered to be part of the surfacing section when determining the appropriate	

	overlay depth	
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Incentives will be reduced based on the percentage of density tests that do not meet minimum plant mix pavement density requirements as determined by Table 401-4 Ride Incentive Reduction.

TABLE 401-4
RIDE INCENTIVE REDUCTION TABLE

Project Size	Percent of Density Tests not Meeting Specifications		
	No Reduction of Ride Incentive	Incentive Reduced	No incentive Allowed
0 to 25,000 Tons	0 to 10 %	% Failing Tests * 6.667-66.67	25 %
> 25,000 Tons	0 to 5 %	% Failing Tests * 6.667-33.34	20 %

Note: Final incentive reductions are rounded to two decimals.

Correction of profile defects will not be cause to reevaluate any section for surface smoothness except for locations identified as remove and replace as described below. Quality incentive allowances will be used to offset any price reductions on progress estimates.

Remove and replace any 0.5 miles (0.8 kilometer) segment of roadway requiring corrective action. Remove and replace the segment by milling 0.15 feet (45 mm) or to the lift line if within 0.02 ft, whichever is greater, and replacing with new material meeting the contract requirements. Remove and replace sections of roadway less than 0.5 miles (0.8 kilometers) that do not meet the applicable IRI requirements for the project category unless other corrective action is approved by the Engineer. Sections requiring removal and replacement or other corrective action will be rerun once the corrective work has been performed. The maximum pay adjustment factor for the affected segment after corrective action is 1.00. Disincentives will be applied if applicable.

All work to prepare the roadway for testing, including sweeping, grinding and traffic control prior to the ride test, is incidental to the work and is not measured for payment. All work to complete any corrective action and re-testing, including but not limited to sweeping and traffic control, is incidental to the work and is not measured for payment. Include all costs and resources to prepare the roadway for surface tolerance testing in the plant mix bituminous surfacing bid item. Requests for additional compensation by reason of this provision will not be considered nor allowed.