

North Dakota Department of Transportation

Certification Renewal Program

2010-2011

**Flexible Pavement Smoothness
Tolerance**

Special Provision Status

Flexible Pavement Surface Tolerance

In Addition to Standard Specifications: 408.04L

Class 1 Profiler (ASTM E-90)

NDDOT Measures for Acceptance & Pay Adjustment

Unit: IRI (in./mile) = International Roughness Index

Average of Right/Left Wheelpaths

Flexible Pavement Surface Tolerance



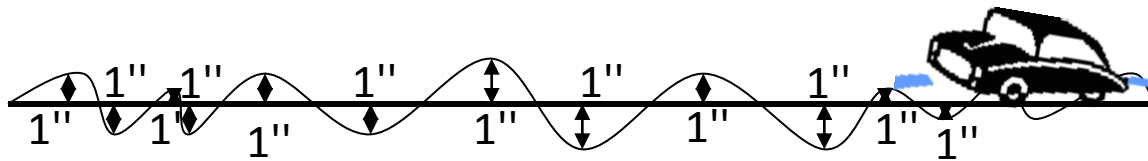
Ames Engineering Website

Flexible Pavement Surface Tolerance

IRI and Profiling

– IRI – International Roughness Index (in/mi)

- Measures variance over a specified distance and performs a summation



$$1+1+1+....=12 \text{ IRI}$$

- Profiling distance (lot) is 0.1 miles or 528', short sections (< 370.0 ft.) will be added to previous section.

Flexible Pavement Surface Tolerance

Specification Overview

Exclusions

- Start or End 150' from the following:
 - Bridge Decks and/or Approach Slabs
 - Side Roads & Approaches
 - Shoulders, Ramps and Gore Areas
 - At-Grade Railroad Crossings

Flexible Pavement Surface Tolerance

Specification Overview

Exclusions

- Start or End 50' from the following:
 - Beginning and End of Project
 - Where the Contractor is not responsible for the adjoining pavement.
- Where Safe and Roadway Geometrics don't allow proper operation of the profiler...speed limit
- As Determined by the Engineer

Flexible Pavement Surface Tolerance

Specification Overview

Incentive

0 Adjustment

Disincentive

- Thin Lift Overlay
 - Selected Projects
 - Variable Targets
- Structural Overlay
 - Multiple Lifts (2)
- FDR/M&B/Base and Surfacing
 - Bonus Below 42 IRI (\$100-\$400)
 - Disincentive Above 50 IRI (-\$100 - -\$400)

Flexible Pavement Surface Tolerance

Specification Overview

- Fixed Lot Payments
- Two Week Notice/5-day Processing-Final Lift Only
- Traffic Control/Sweeping
- 40-degree F. Ambient Temp. Minimum
- Dry & Favorable Conditions
- Corrective Actions for Non-Specification: M&O/Milling
- Bump Grinds (>0.25 in./16 ft.)
 - 3/16 in./16 ft. ~ Discretion of Engr.

Flexible Pavement Surface Tolerance

Year	Construction Type	Length (Miles)	Lane	Average IRI (inches/mile)	Incentive/Disincentive	Cost/Lane-Mile	Total
2006	Structural Overlay	9.942	Drive	35.2	\$24,375	\$2,452	\$45,750
			Pass	37.4	\$21,375	\$2,150	
2006	Mine & Blend/Reconstruction	11.940	Drive	33.1	\$37,000	\$3,099	\$50,300
			Pass	41.7	\$13,300	\$1,114	
2006	Mine & Blend/Reconstruction	11.942	Drive	34.1	\$37,000	\$3,098	\$40,700
			Pass	45.4	\$3,700	\$310	
2006	Mine & Blend/Reconstruction	3.425	WB	40.6	\$4,200	\$1,226	\$6,100
			EB	44.0	\$1,900	\$555	
2006	Structural Overlay	12.671	WB	38.8	\$24,150	\$1,906	\$49,425
			EB	38.4	\$25,275	\$1,995	
2006	Mine & Blend/Reconstruction	3.819	NB	55.9	-\$18,600	-\$4,870	-\$32,700
			SB	53.9	-\$14,100	-\$3,692	
2006	Structural Overlay	13.003	Drive	43.7	\$15,075	\$1,159	\$25,500
			Pass	46.3	\$10,425	\$802	
2006	Structural Overlay	10.147	Drive	39.1	\$19,650	\$1,937	\$21,150
			Pass	50.9	\$1,500	\$148	
2006	Thin Lift Overlay	14.469	WB	55.9	\$9,150	\$632	\$20,750
			EB	53.9	\$11,600	\$802	
2006	Thin Lift Overlay	15.130	WB	57.2	\$9,500	\$628	\$21,500
			EB	56.2	\$12,000	\$793	
2006	Thin Lift Overlay	16.023	NB	42.0	\$19,550	\$1,220	\$35,250
			SB	45.9	\$15,700	\$980	

Flexible Pavement Surface Tolerance

Year	Construction Type	Length (Miles)	Lane	Average IRI (inches/mile)	Incentive/Disincentive	Cost/Lane-Mile	Total
2007	Mine & Blend/Reconstruction	1.040	WB	58.8	-\$1,600	-\$1,538	-\$3,300
			EB	68.4	-\$1,700	-\$1,635	
2007	Mine & Blend/Reconstruction	7.239	WB	39.2	\$10,300	\$1,423	\$14,300
			EB	43.1	\$4,000	\$553	
2007	Mine & Blend/Reconstruction	19.250	WB	39.4	\$29,000	\$1,506	\$67,500
			EB	38.1	\$38,500	\$2,000	
2007	Mine & Blend/Reconstruction	18.778	NB	33.6	\$53,500	\$2,849	\$110,000
			SB	33.2	\$56,500	\$3,009	
2007	Mine & Blend/Reconstruction	10.267	Drive	35.1	\$23,600	\$2,299	\$45,100
			Pass	36.6	\$21,500	\$2,094	
2007	Mine & Blend/Reconstruction	9.941	Drive	31.4	\$33,300	\$3,350	\$64,300
			Pass	32.7	\$31,000	\$3,119	
2007	Thin Lift Overlay	10.000	Drive	37.8	\$11,150	\$1,115	\$24,100
			Pass	32.6	\$12,950	\$1,295	
2007	Thin Lift Overlay	21.344	NB	44.5	\$12,050	\$565	\$26,150
			SB	43.7	\$14,100	\$661	
2007	Structural Overlay	7.735	Drive	50.7	\$1,575	\$204	\$1,875
			Pass	52.0	\$300	\$39	
2007	Structural Overlay	7.754	Drive	46.5	\$6,225	\$803	\$9,225
			Pass	49.3	\$3,000	\$387	

Flexible Pavement Surface Tolerance

Year	Construction Type	Length (Miles)	Lane	Average IRI (inches/mile)	Incentive/ Disincentive	Cost/Lane-Mile	Total
2008	Mine & Blend/ Reconstruction	12.116	Drive	37.5	\$23,500	\$1,940	\$50,000
			Pass	37.2	\$26,500	\$2,187	
2008	Mine & Blend/ Reconstruction	5.916	Drive	36.9	\$12,700	\$2,147	\$24,800
			Pass	36.9	\$12,100	\$2,045	
2008	Mine & Blend/ Reconstruction	8.800	NB	41.0	\$10,600	\$1,205	\$21,400
			SB	40.9	\$10,800	\$1,227	
2008	Mine & Blend/ Reconstruction	12.665	NB	37.5	\$26,700	\$2,108	\$57,900
			SB	36.1	\$31,200	\$2,464	
2008	Mine & Blend/ Reconstruction	6.576	WB	61.9	-\$8,500	-\$1,293	-\$11,000
			EB	53.6	-\$2,500	-\$380	
2008	Mine & Blend/ Reconstruction	11.360	Drive	37.8	\$16,100	\$1,417	\$35,900
			Pass	35.7	\$19,800	\$1,743	
2008	Structural Overlay	16.746	EB	42.5	\$23,175	\$1,384	\$44,475
			WB	43.4	\$21,300	\$1,272	
2008	Structural Overlay	12.900	Pass	41.8	\$19,050	\$1,477	\$45,000
			Drive	37.9	\$25,950	\$2,012	
2008	Structural Overlay	8.300	Drive	48.6	\$750	\$90	-\$3,600
			Pass	53.1	-\$4,350	-\$524	
2008	Thin Lift Overlay	12.950	WB	36.3	\$15,350	\$1,185	\$29,900
			EB	38.0	\$14,550	\$1,124	
2008	Thin Lift Overlay	12.6426	Drive	41.4	\$10,650	\$842	\$12,750
			Pass	49.3	\$2,100	\$166	

Flexible Pavement Surface Tolerance

Year	Construction Type	Length (Miles)	Lane	Average IRI (inches/mile)	Incentive/ Disincentive	Cost/Lane-Mile	Total
2009	Thin Lift Overlay	4.953	DL	35.8	\$6,350	\$1,282	\$12,350
			PL	37.6	\$6,000	\$1,211	
2009	Thin Lift Overlay	7.7637	DL	39.2	\$8,950	\$1,153	\$19,650
			PL	32.8	\$10,700	\$1,378	
2009	Thin Lift Overlay	16.4655	NB	34.3	\$21,950	\$1,333	\$41,700
			SB	36.5	\$19,750	\$1,199	
2009	Thin Lift Overlay	30.7724	EB	42.4	\$22,850	\$743	\$47,100
			WB	42.4	\$24,250	\$788	
2009	Thin Lift Overlay	17.0871	EB	43.0	\$12,100	\$708	\$25,650
			WB	43.0	\$13,550	\$793	
2009	Thin Lift Overlay	6.5672	EB	30.8	\$9,300	\$1,416	\$18,350
			WB	34.1	\$9,050	\$1,378	
2009	Structural Overlay	10.047	Drive	37.4	\$10,200	\$1,015	\$18,600
			Pass	40.1	\$8,400	\$836	
2009	Structural Overlay	12.399	DL	30.5	\$34,800	\$2,807	\$64,200
			PL	35.1	\$29,400	\$2,371	
2009	Structural Overlay	0.9100	NB	69.4	\$150	\$165	\$0
			SB	66.3	-\$150	-\$165	
2009	Structural Overlay	42.565	NB	32.7	\$57,075	\$1,341	\$106,200
			SB	35.9	\$49,125	\$1,154	
2009	Structural Overlay	10.5800	NB	25.1	\$29,300	\$2,769	\$60,650
			SB	25.9	\$31,350	\$2,963	
2009	Structural Overlay	9.0243	SB	41.6	\$13,800	\$1,529	\$31,500
			NB	38.6	\$17,700	\$1,961	
2009	Structural Overlay	5.1000	DL	28.1	\$14,700	\$2,882	\$29,475
			PL	29.3	\$14,775	\$2,897	
2009	Structural Overlay	8.2000	DL	32.6	\$25,350	\$3,091	\$51,225
			PL	31.8	\$25,875	\$3,155	
2009	Structural Overlay	6.2014	DL	41.3	\$4,725	\$762	\$3,225
			PL	48.8	-\$1,500	-\$242	
2009	Structural Overlay	8.7547	DL	33.5	\$23,175	\$2,647	\$47,850
			PL	30.9	\$24,675	\$2,818	
2009	Structural Overlay	1.8865	EB	43.8	\$2,325	\$1,232	\$5,025
			WB	42.3	\$2,700	\$1,431	
2009	Structural Overlay	5.9526	NB	39.6	\$10,800	\$1,814	\$23,925
			SB	39.0	\$13,125	\$2,205	
2009	Mine & Blend/ Reconstruction	6.517	NB	37.4	\$15,000	\$2,302	\$32,100
			SB	40.1	\$17,100	\$2,624	
2009	Mine & Blend/ Reconstruction	31.300	NB	37.7	\$30,800	\$984	\$49,200
			SB	41.1	\$18,400	\$588	

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Total Incentive	
\$283,725	2006
\$359,250	2007
\$307,525	2008
\$687,975	2009