

INTEROFFICE COMMUNICATION

TO: Pavement Selection Committee
FROM: Craig Landefeld, Administrator, Office of Pavement Engineering
BY: Bill Feehan, Pavement Standards Engineer
DATE: August 7, 2023
SUBJECT: LOR-90-10.76; (PID 107714) Pavement Type Selection

The subject project consists of complete replacement of 7.45 miles of urban interstate. The unbonded concrete overlay and rubblize and roll designs were eliminated due to the number of mainline and overhead bridges. This project is adding a lane in both directions for the majority of the project length resulting in an amount of new pavement of around 55% of the total pavement area.

The pavement design and quantity calculations were performed by this office based on subgrade recommendations determined by the district. Unit price estimates were provided by the Office of Estimating. An earlier version of this package was sent to the district and both industries for review. Applicable corrections were made based on the comments received.

The life-cycle cost does not include costs which are the same for the two pavement types such as subgrade preparation. Nothing in this pavement selection alters any subgrade recommendations.

Based on the life-cycle cost, the flexible pavement design has the lowest life-cycle cost and the rigid pavement design is not within 10%. In accordance with the Pavement Design Manual, the rigid pavement design is eliminated from consideration. Please sign on the last page indicating approval of the flexible pavement design.

If you have any questions, please contact Bill Feehan.

CEL:WJF

C: File

Pavement Selection Information

Project: LOR-90-10.76
Length: 7.45
Sale Date: July 1, 2024

Date: August 7, 2023
PID: 107714
Construction Estimate: \$104,296,000

Pavement Designs

- **Flexible Pavement**

1.5"	442	Asphalt Concrete Surface Course, 12.5mm, Type A (447)
1.75"	442	Asphalt Concrete Intermediate Course, 12.5mm, Type A (446)
10"	302	Asphalt Concrete Base
6"	304	Aggregate Base

- **Rigid Pavement**

11.5"	452	Non-Reinforced Concrete Pavement, Class QC1P with QC/QA
6"	304	Aggregate Base

Anticipated Future Maintenance for Analysis

- **Flexible Pavement**

@ 14 Years: 1.5" overlay with planing (driving lanes only);
@ 24 Years: 3.25" overlay with planing (full width of driving lanes and shoulders), 1% patching planed surface (percent of planed area); and
@ 34 Years: 1.5" overlay with planing (driving lanes only).

- **Rigid Pavement**

@ 22 Years: Full depth repair 4% of mainline surface area, diamond grind driving lanes plus one foot of shoulders; and
@ 32 Years: Full depth repair 2% of mainline surface area, 3.25" asphalt overlay.

Project Summary

- **Historical Data**

Original Project Numbers	524(65), 173(66), 781(66), 457(73)
SLM	10.76
Major Rehabilitation Length	7.45 miles
Pavement Buildup	~5" Asphalt 10.76-13.01: 9" Jointed Rein. Concrete 13.01-18.61: 10" Jointed Rein. Concrete 6" Subbase
Joint Spacing	60' (except 457(73) – 40')
Drainage	Pipe Underdrains
Rehabilitations to Date	406(92), 3015(00), 570(10), 129(10), 422(19)
PCR/Structural Deduct	10.69-11.95: 72/5.92 – 77/5.92 11.95-12.55: 75/5.92 – 73/7.84 12.55-13.09: 73/5.92 – 69/6.84 13.54-14.25: 72/5.92 – 66/8.92 14.25-17.19: 74/6.84 – 66/8.92 17.19-18.60: 72/4.92 – 63/9.92

- **Physical Attributes**

Signalized Intersections	None
Interchanges	Three
Overhead Structures	Four
<u>Structure SLM</u>	<u>Clearance</u>
14.729	17.3'
15.654	14.9'
16.983	17.3'
17.507	16.5'
Mainline Structures	Seven Pairs

- **Design Information**

20-year Design ESAL's	30 million (Rigid) 20 million (Flexible)
ADT (2019)	67,541
% Trucks (2019)	11%
Functional Classification	Interstate, urban
Subgrade CBR	6

LOR-90-10.76

PID 107714

Initial Construction				Quantities		Unit	Costs	
Item	Description	Unit	Amt	Flexible	Rigid	Price	Flexible	Rigid
302	AC Base	CY	10	145,467		\$135.00	\$19,638,007	
304	Aggregate Base	CY	6	89,618	87,020	\$70.00	\$6,273,253	\$6,091,419
407	Non-Tracking Tack Coat	GAL	0.055	84,607		\$3.00	\$253,821	
442	AC Surface, 12.5mm, Type A (447)	CY	1.5	21,365		\$215.00	\$4,593,566	
442	AC Intermediate, 12.5mm (446)	CY	1.75	24,926		\$170.00	\$4,237,475	
442	Anti-Segregation Equipment	CY		28,104		\$5.00	\$140,521	
452	Non-Reinforced Concrete Pavement	SY	11.5		512,770	\$102.50		\$52,558,939
Total Cost of Initial Construction							\$35,136,643	\$58,650,357

Future Maintenance				Quantities		Unit	Costs	
Item	Description	Unit	Amt	Flexible	Rigid	Price	Flexible	Rigid
@ Year 14								
254	Pavement Planing	SY	1.5	311,309		\$1.65	\$389,290	
407	Non-Tracking Tack Coat	Gal	0.085	26,461		\$3.00	\$60,163	
442	AC Surface, 12.5mm, Type A (447)	CY	1.5	12,971		\$215.00	\$2,113,568	
442	Anti-Segregation Equipment	CY		12,971		\$6.00	\$58,983	
@ Year 22								
255	Rigid Repairs, Class QC MS	SY	4%		12,452	\$185.00		\$1,490,113
255	Pavement Sawing	LF			31,863	\$3.00		\$61,831
257	Diamond Grinding	SY			330,012	\$4.00		\$853,858
@ Year 24								
254	Pavement Planing	SY	1.5	512,770		\$1.65	\$526,020	
254	Patching Planed Surface	SY	1%	5,128		\$4.00	\$12,752	
407	Non-Tracking Tack Coat	Gal		71,788		\$3.00	\$133,896	
442	AC Surface, 12.5mm, Type A (447)	CY	1.5	21,365		\$215.00	\$2,855,919	
442	AC Intermediate, 12.5mm (446)	CY	1.75	24,926		\$170.00	\$2,634,530	
442	Anti-Segregation Equipment	CY		28,104		\$5.00	\$87,365	
@ Year 32								
255	Rigid Repairs, Class QC MS	SY	2%		6,226	\$190.00		\$627,725
255	Pavement Sawing	LF			15,932	\$3.00		\$25,362
407	Tack Coat, 702.13	Gal	0.065		33,330	\$4.00		\$70,744
407	Non-Tracking Tack Coat	Gal	0.055		28,202	\$3.00		\$44,895
442	AC Surface, 12.5mm, Type A (447)	CY	1.5		21,365	\$215.00		\$2,437,499
442	AC Intermediate, 12.5mm (446)	CY	1.75		24,926	\$170.00		\$2,248,546
442	Anti-Segregation Equipment	CY			28,104	\$5.00		\$74,565
@ Year 34								
254	Pavement Planing	SY	1.5	311,309		\$1.65	\$261,981	
407	Non-Tracking Tack Coat	Gal	0.085	26,461		\$3.00	\$40,488	
442	AC Surface, 12.5mm, Type A (447)	CY	1.5	12,971		\$215.00	\$1,422,371	
442	Anti-Segregation Equipment	CY		12,971		\$6.00	\$39,694	
Total Cost of Future Maintenance @ 2% Discount Rate							\$10,637,019	\$7,935,139
Total Life-Cycle Cost of Alternative @ 2% Discount Rate							\$45,773,662	\$66,585,496
% Greater than Lowest								45.47%

PRINCIPAL FACTORS WORKSHEET

Project: LOR-90-10.76	PID No.: 107714	Date: 7/10/2023
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Principal Factors	Narrative (Project Specific Summaries)
Research	No specific research is being considered.
Adjacent Existing Sections	The section to the west is the Ohio Turnpike and the section to the east is a flexible buildup. Neither section has any bearing on this selection.
Geotechnical Concerns	None
Geometrics	There are four overhead and seven mainline bridges, any significant increase in elevation would require pavement removal to maintain clearance.
Amount of New Pavement	One lane is being added in both directions on LOR-90 except from 10.76 to 12.04. This additional new pavement amounts to around 55% of the total area.

Pavement Designs Selected for LCCA	
Complete replacement - Flexible	Yes
Complete replacement - Rigid	Yes
Rubblize and Roll	No
Unbonded Concrete Overlay	No
Crack and Seat	n/a
Whitetopping	n/a
Other _____	n/a

