



# Illinois Department of Transportation

## Memorandum

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To: Jeffrey Keirn Attn: District Eight  
From: Maureen M. Addis *mm*  
Subject: Pavement Design  
Date: February 28, 2017

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IL 143 over Indian Creek  
Madison County  
Structure Replacement

We have reviewed the pavement selection for the above captioned section, which was submitted with your memorandum dated July 27, 2016. The project is less than 2 lane-miles and is not subject to alternate bidding. This project will replace the structure over Indian Creek and provide a profile raise. The LCCA for IL 143 favored a flexible design by 9.4%. Because the difference between a flexible and rigid design is less than 10%, this project was discussed by the Pavement Selection Committee. Due to the lower cost and constructability, a flexible design was requested by the district. The PSC concurred with the district's request to use the HMA option.

The approved pavement design for IL 413 over Indian Creek is as follows:

IL 143 over Indian Creek [Pavement Reconstruction]

11 inches of HMA Pavement with HMA Shoulders  
2 inches of HMA Surface Course, Mix "D", N90  
9 inches of HMA Binder Course, IL-90 N70  
12 inches of Aggregate Subgrade Improvement

If you have any questions, please contact Paul Niedernhofer at (217) 785-0345.



# Illinois Department of Transportation

## Memorandum

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To: Herve Gelin Attn: Rob Harbaugh  
From: Tim Padgett  
Subject: Pavement Design Report  
Date: July 27, 2016

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FAP 789 (IL 143)  
Section 125B-2  
Madison County  
Job No.: D-98-008-16  
76G56

Bridge replacement along IL 143 over Indian Creek 0.3 mile east of Wanda Road

The attached pavement design was prepared for the grade raise along IL 143 at Indian Creek

Per BDE Section 54-8.01, pavement designs requiring more than 4,750 square yards of pavement must be submitted to BDE for final approval. Since this project only has 3127 square yards, we will only need the District's approval.

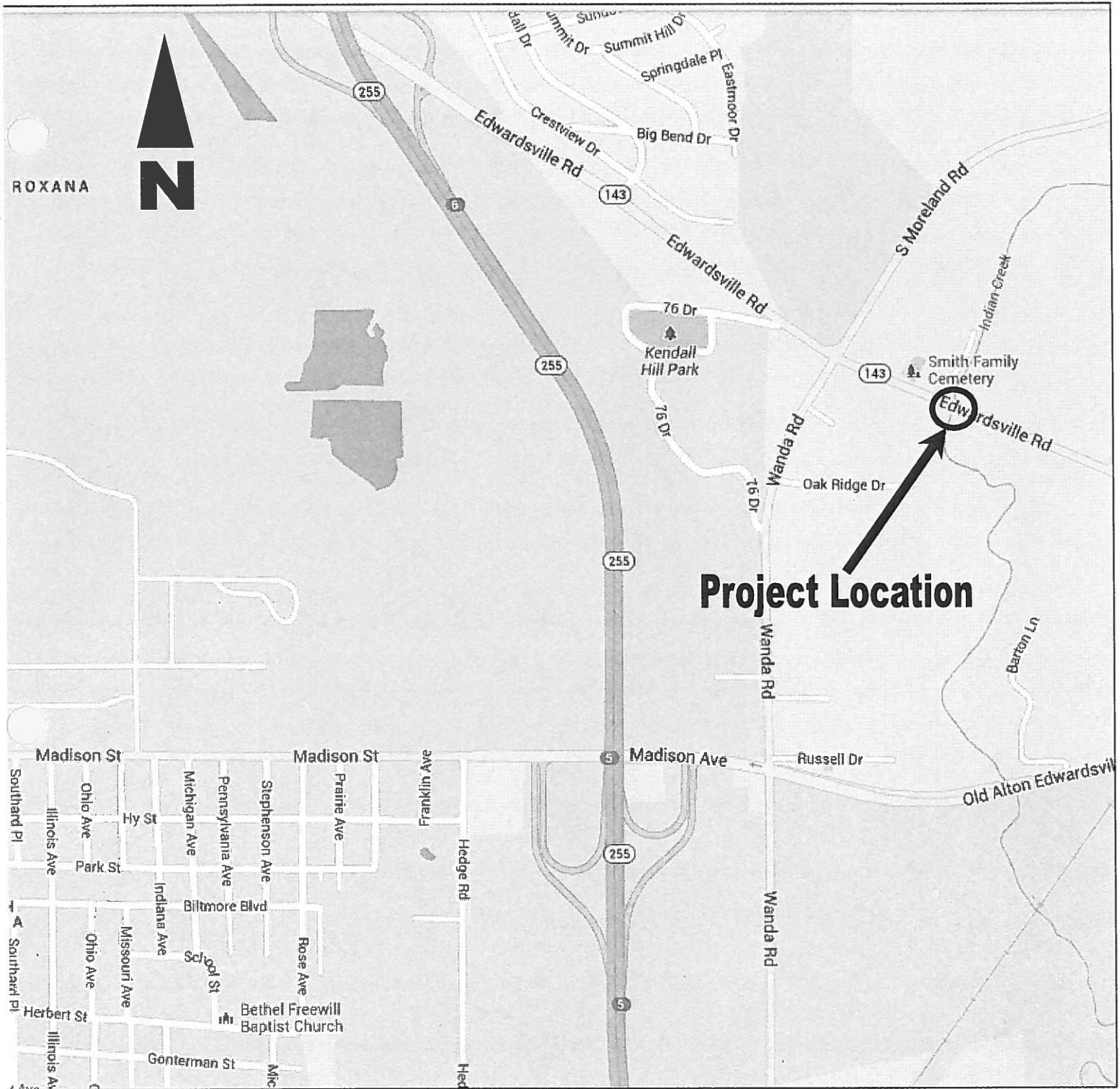
The existing pavement is PCC (9"-7"-9") with HMA overlay. The design requires the proposed thickness be a minimum of 11" HMA pavement (surface course – 2" and binder course – 9") and 12" subbase granular material to meet the current BDE pavement design criteria.

### Project Information

- Estimated area of 4019 square yards of pavement. Life-Cycle Cost Analysis are over \$500,000, therefore, BDE approval is required.
- Pavement widths vary from 24' to 36' with 6' shoulders.
- The subgrade support ratio (SSR) for this location is poor.

The preliminary pavement design was tentatively approved on April 21, 2016. Also provided in this report is the Life Cycle Cost Analysis for the pavement design.

Please review the pavement design report and provide your comments and/or final approval. If you have any questions, please contact Liz Burnside (3280).



# IL 143 over Indian Creek Location Map

**PROJECT AND TRAFFIC INPUTS**

(Enter Data in Gray Shaded Cells)

Route: <b>FAP 789 (IL 143)</b>	Comments:		
Section: <b>125B-2</b>	Design Date: <b>Liz Burnside</b>	<- BY	
County: <b>Madison</b>	Modify Date:	<- BY	
Location: <b>Over Indian Creek 0.3 mi E of Wanda Rd</b>		ADT	Year
		Current:	<b>10,000</b> <b>2015</b>
		Future:	<b>11,700</b> <b>2037</b>
Facility Type: <b>Other Marked State Route</b>		<b>Structural Design Traffic</b>	
# of Lanes = <b>2 or 3</b>		Minimum ADT	Actual ADT
Part of future 4 lanes or more ? <b>No</b>			Actual %of Total ADT
One Way Street ? <b>No</b>			% of ADT in Design Lane
Road Class: <b>II</b>		PV = <b>0</b>	9,835    90.0%
Subgrade Support Rating (SSR): <b>Poor</b>		SU = <b>250</b>	273 <b>2.5%</b>
Construction Year: <b>2017</b>		MU = <b>750</b>	820 <b>7.5%</b>
Design Period (DP) = <b>20</b> years		Struct. Design ADT = <b>10,927</b>	(2027)

<b>TRAFFIC FACTOR CALCULATION</b>			
<b>FLEXIBLE PAVEMENT</b>		<b>RIGID PAVEMENT</b>	
Cpv =	0.15	Cpv =	0.15
Csu =	<b>112.06</b>	Csu =	<b>135.78</b>
Cmu =	<b>385.44</b>	Cmu =	<b>567.21</b>
TF flexible (Actual) =	3.48 (Actual ADT)	TF rigid (Actual) =	5.03 (Actual ADT)
TF flexible (Min) =	3.17 (Min ADT Fig. 54-2.C)	TF rigid (Min) =	4.59 (Min ADT Fig. 54-2.C)

<b>NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS</b>			
<b>Full-Depth HMA Pavement</b>		<b>JPC Pavement</b>	
Use TF flexible =	3.48	Use TF rigid =	5.03
PG Grade Lower Binder Lifts =	<b>PG 64-22</b> (Fig. 53-4.R)	Edge Support =	<b>Tied</b> Shoulder or C.&G.
HMA Mixture Temp. =	<b>79.0</b> deg. F (Fig. 54-5.C)	<b>Rigid Pavt Thick. =</b>	<b>9.00</b> in. (Fig. 54-4.E)
Design HMA Mixture Modulus (E <sub>HMA</sub> ) =	580 ksi (Fig. 54-5.D)		
Design HMA Strain (ε <sub>HMA</sub> ) =	84 (Fig. 54-5.E)	<b>CRCP Pavement</b>	
Full Depth HMA Design Thickness =	11.00 in. (Fig. 54-5.F)	Use TF rigid =	5.03
Limiting Strain Criterion Thickness =	<b>16.25</b> in. (Fig. 54-5.I)	IBR value =	<b>3</b>
<b>Use Full-Depth HMA Thickness =</b>	<b>11.00</b> inches	<b>CRCP Thickness =</b>	<b>7.75</b> in. (Fig. 54-4.N)

**TF MUST BE > 60 FOR CRCP**

<b>RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS</b>			
<b>HMA Overlay of Rubblized PCC</b>		<b>Unbonded Concrete Overlay</b>	
Use TF flexible =	3.48	Review 54-4.03 for limitations and special considerations.	
HMA Overlay Design Thickness =	8.00 in. (Fig. 54-5.U)		
Limiting Strain Criterion Thickness =	<b>11.45</b> in. (Fig. 54-5.V)		
<b>Use HMA Overlay Thickness =</b>	<b>8.00</b> inches	<b>JPCP Thickness =</b>	<b>NA</b> inches

**CONTACT BMPR FOR ASSISTANCE**

<b>DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN</b>								
<b>Class I Roads</b>		<b>Class II Roads</b>		<b>Class III Roads</b>		<b>Class IV Roads</b>		
4 lanes or more		2 lanes with ADT > 2000		2 Lanes		2 Lanes		
Part of a future 4 lanes or more		One way Street with ADT <= 3500		(ADT 750 -2000)		(ADT < 750)		
One-way Streets with ADT > 3500								
Facility Type		Min. Str. Design Traffic (Fig 54-2.C)				Class Table for One-Way Streets		
		PV	SU	MU			ADT	Class
Interstate or Freeway		0	500	1500			0 - 3500	II
Other Marked State Route		0	250	750			>3501	I
Unmarked State Route		No Min	No Min	No Min				
Class		Traffic Factor ESAL Coefficients				Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)		
		Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)				
		Csu	Cmu	Csu	Cmu			
I		143.81	696.42	132.50	482.53			
II		135.78	567.21	112.06	385.44			
III		129.58	562.47	109.14	384.35			
IV		129.58	562.47	109.14	384.35			
Number of Lanes		Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)						
		Rural			Urban			
		P	S	M	P	S	M	
1 Lane Ramp		100%	100%	100%	100%	100%	100%	
2 or 3		50%	50%	50%	50%	50%	50%	
4		32%	45%	45%	32%	45%	45%	
6 or more		20%	40%	40%	8%	37%	37%	

# LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

## FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE **FAP 789 (IL 143)**  
 SECTION **125B-2**  
 COUNTY **Madison**  
 LOCATION **Over Indian Creek 0.3 mi E of Wanda Rd**

FACILITY TYPE **NON-INTERSTATE**

PROJECT LENGTH **1120 FT == >** 0.21 Miles  
 # OF CENTERLINES **2 CL**  
 # OF LANES **3 LANES**  
 # OF EDGES **2 EP**  
 LANE WIDTH - AVERAGE **12 FT**  
 SHOULDER WIDTH HMA Left **6 FT**  
 HMA Right **6 FT**  
 Total Width of Paved Shoulders **12 FT**

PAVEMENT THICKNESS (FLEXIBLE) **11.00 IN** **16.25 IN MAX**  
 SHOULDER THICKNESS **8.00 IN** HMA\_SD **Standard Design**  
 POLICY OVERLAY THICKNESS **2.25 IN**

FLEX PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		<b>3.17</b>	<b>3.48</b>	<b>3.48</b>

[Read Me!](#)

HMA	COST PER TON	UNIT PRICE
HMA SURFACE		<b>\$91.00</b> / TON
HMA TOP BINDER		<b>\$86.00</b> / TON
HMA LOWER BINDER		<b>\$81.25</b> / TON
HMA BINDER (LEVELING)		<b>\$85.00</b> / TON
HMA SHOULDER		<b>\$76.50</b> / TON

### INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT ( FULL-DEPTH )	( 11.00" )	4480	4,480 SQ YD	<b>\$53.03</b> / SQ YD	\$237,568 ~
HMA SURFACE COURSE	( 2.00" )	1.0046	504 TONS	<b>\$91.00</b> / TON	\$0
HMA TOP BINDER COURSE	( 2.25" )	1.0145	573 TONS	<b>\$86.00</b> / TON	\$0
HMA LOWER BINDER COURSE	( 6.75" )	1.0353	1,753 TONS	<b>\$81.25</b> / TON	\$0

HMA SHOULDER	( 8.00" )	1493	669 TONS	<b>\$76.50</b> / TON	\$51,180 ~
CURB & GUTTER			0 LIN FT	<b>\$30.00</b> / LIN FT	\$0

SUBBASE GRAN MATL TY C (TONS)			158 TONS	<b>\$0.00</b> / TON	\$0
IMPROVED SUBGRADE:	Modified Soil Width = 50.8'		6,326 SQ YD	<b>\$0.00</b> / SQ YD	\$0

<b>Sub-base Granular Material Ty A 12"</b>			5,400 SQ YD	<b>\$15.00</b> / SQ YD	\$81,000
<b>Reserved For User Supplied Item</b>			0 UNITS	<b>\$0.00</b> / UNITS	\$0

PAVEMENT REMOVAL			4,480 SQ YD	<b>\$10.00</b> / SQ YD	\$44,800
SHOULDER REMOVAL			1,493 SQ YD	<b>\$12.00</b> / SQ YD	\$17,916

Note: \* Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	\$432,464
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	\$83,151

### MAINTENANCE COSTS:

ITEM	THICKNESS	MATERIAL	T	UNIT COST
ROUTINE MAINTENANCE ACTIVITY				<b>\$0.00</b> LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	( 2.00" )	1.0046	Surface Mix 2.00	<b>\$10.24</b> / SQ YD
HMA OVERLAY PVMT	( 2.25" )	1.0052	Surface Mix 2.25	<b>\$11.27</b> / SQ YD
HMA SURFACE MIX	( 1.50" )	1.0035	Surface Mix 1.50	<b>\$7.67</b> / SQ YD
HMA BINDER MIX	( 0.75" )	1.0087	aling Binder Mix 0.75	<b>\$3.60</b> / SQ YD
HMA OVERLAY SHLD (Year 30)	( 2.25" )		Shoulder Mix 2.25	<b>\$9.64</b> / SQ YD
HMA OVERLAY SHLD	( 2.00" )		Shoulder Mix 2.00	<b>\$8.57</b> / SQ YD
MILLING (2.00 IN)			2.00	<b>\$3.00</b> / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill Surf)		Surface Mix	2.00	<b>\$80.19</b> / SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	<b>\$78.57</b> / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	<b>\$79.52</b> / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	<b>\$78.57</b> / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				<b>\$2.00</b> / LIN FT
CENTERLINE JOINT ROUT & SEAL				<b>\$2.00</b> / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)			<b>\$2.00</b> / LIN FT

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FLEXIBLE TOTAL LIFE-CYCLE COST	\$566,498
FLEXIBLE TOTAL ANNUAL COST PER MILE	\$108,922

**PCC PAVEMENT**

**JPCP**

ROUTE **FAP 789 (IL 143)**  
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PROJECT LENGTH **1120 FT == >** 0.21 Miles  
 # OF CENTERLINES **2 CL**  
 # OF LANES **3 LANES**  
 # OF EDGES **2 EP**  
 LANE WIDTH - AVERAGE **12 FT**  
 SHOULDER WIDTH PCC Left **6 FT**  
 PCC Right **6 FT**  
 Total Width of Paved Shoulders **12 FT**

PAVEMENT THICKNESS (RIGID) **JPCP 9.00 IN TIED SHLD**  
 SHOULDER THICKNESS **9.00 IN**

POLICY OVERLAY THICKNESS **2.50 IN**

RIGID PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		<b>4.59</b>	<b>5.03</b>	<b>5.03</b>
Worksheet Construction Type is	Reconstruction	The Pavement Type is		<b>JPCP</b>

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	( 9.00" )	4,480	SQ YD	<b>\$54.25</b> / SQ YD	\$243,040
PAVEMENT REINFORCEMENT		0	SQ YD	<b>\$0.00</b> / SQ YD	\$0
STABILIZED SUBBASE	( 4.00" )	4,853	SQ YD	<b>\$19.00</b> / SQ YD	\$92,207
PCC SHOULDERS		1,493	SQ YD	<b>\$41.80</b> / SQ YD	\$62,407
CURB & GUTTER		0	LIN FT	<b>\$30.00</b> / LIN FT	\$0
SUBBASE GRAN MATL TY C	( ~ 1.86" )	197	TONS	<b>\$0.00</b> / TON	\$0
IMPROVED SUBGRADE:	<b>Modified Soil</b> Width = 49.0'	6,098	SQ YD	<b>\$0.00</b> / SQ YD	\$0
<b>Sub-Base Granular Material TY A 12"</b> <b>Reserved For User Supplied Item</b>		5,400	SQ YD *	<b>\$15.00</b> / SQ YD	\$81,000
		0	UNITS	<b>\$0.00</b> / UNITS	\$0
PAVEMENT REMOVAL		4,480	SQ YD	<b>\$10.00</b> / SQ YD	\$44,800
SHOULDER REMOVAL		1,493	SQ YD	<b>\$12.00</b> / SQ YD	\$17,916

Note: \* Denotes User Supplied Quantity  
 RIGID CONSTRUCTION INITIAL COST **\$541,370**  
 RIGID CONSTRUCTION ANNUAL COST PER MILE **\$104,091**

**MAINTENANCE COSTS:**

ITEM	THICKNESS	MATERIAL	T	UNIT COST
ROUTINE MAINTENANCE ACTIVITY				<b>\$0.00</b> / LANE-MILE / YEAR
HMA POLICY OVERLAY	( 2.50" )		2.50	
HMA POLICY OVERLAY PVMT	( 2.50" )	1.0058	2.50	<b>\$12.47</b> / SQ YD
HMA SURFACE MIX	( 1.50" )	1.0035	1.50	<b>\$7.67</b> / SQ YD
HMA BINDER MIX	( 1.00" )	1.0093	1.00	<b>\$4.80</b> / SQ YD
HMA POLICY OVERLAY SHLD	( 2.50" )	Shoulder Mix	2.50	<b>\$10.71</b> / SQ YD
CLASS A PAVEMENT PATCHING				<b>\$195.00</b> / SQ YD
CLASS B PAVEMENT PATCHING				<b>\$150.00</b> / SQ YD
CLASS C SHOULDER PATCHING				<b>\$145.00</b> / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)		Surface Mix	1.50	<b>\$77.64</b> / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	2.50	<b>\$82.74</b> / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				<b>\$2.00</b> / LIN FT
CENTERLINE JOINT ROUT & SEAL				<b>\$2.00</b> / LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL				<b>\$2.00</b> / LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)			<b>\$2.00</b> / LIN FT

RIGID TOTAL LIFE-CYCLE COST **\$619,914**  
 RIGID TOTAL ANNUAL COST PER MILE **\$119,193**

**LIFE-CYCLE COST ANALYSIS: NEW DESIGN**

Calculated / Revised : **4/29/16 7:37 AM**

				JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH		\$541,370	\$432,464
		ANNUAL COST PER MILE		\$104,091	\$83,151
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH		\$78,544	\$134,034
		ANNUAL COST PER MILE		\$15,102	\$25,771
TOTAL	LIFE-CYCLE COST	PRESENT WORTH		\$619,914	\$566,498
		ANNUAL COST PER MILE		\$119,193	\$108,922

**LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY**

LOWEST COST OPTION	=====>	<b>HMA</b>	<b>\$108,922</b>	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	<b>JPCP</b>	<b>\$119,193</b>	9.4%

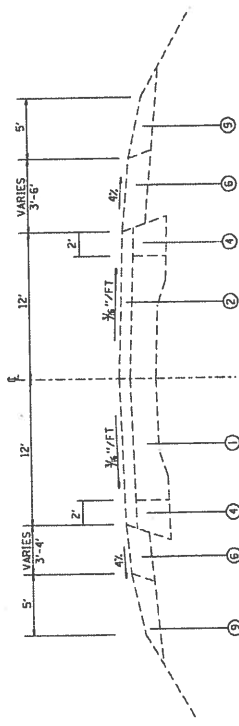


FULL-DEPTH HMA PAVEMENT  
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT  
Figure 54-7.C  
STANDARD DESIGN

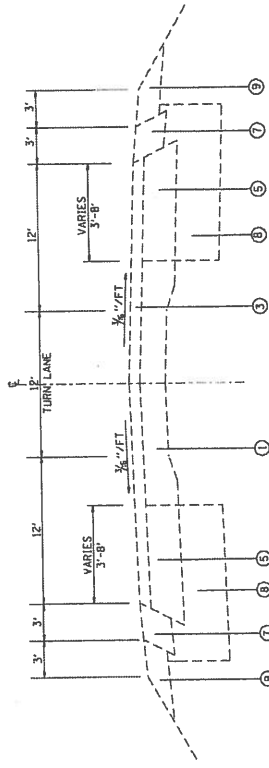
MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
<b>YEAR 5</b>							
	LONG SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	CNTR LINE JOINT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	RNDM / THRM CRACK R&S	50.00%	1,848	LIN FT	\$2.00	\$3,696	
	PD PVMT PATCH M&F SURF	0.10%	4	SQ YD	\$80.19	\$321	
	PWFn =	0.8626		PW =	0.8626 X	\$12,977	\$11,194
<b>YEAR 10</b>							
	LONG SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	CNTR LINE JOINT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	RNDM / THRM CRACK R&S	50.00%	1,848	LIN FT	\$2.00	\$3,696	
	PD PVMT PATCH M&F SURF	0.50%	22	SQ YD	\$80.19	\$1,764	
	PWFn =	0.7441		PW =	0.7441 X	\$14,420	\$10,730
<b>YEAR 15</b>							
	MILL PVMT & SHLD 2.00"	100.00%	5,973	SQ YD	\$3.00	\$17,919	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	45	SQ YD	\$79.52	\$3,578	
	HMA OVERLAY PVMT 2.00"	100.00%	4,480	SQ YD	\$10.24	\$45,872	
	HMA OVERLAY SHLD 2.00 "	100.00%	1,493	SQ YD	\$8.57	\$12,795	
	PWFn =	0.6419		PW =	0.6419 X	\$80,164	\$51,454
<b>YEAR 20</b>							
	LONG SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	CNTR LINE JOINT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	RNDM / THRM CRACK R&S	50.00%	1,848	LIN FT	\$2.00	\$3,696	
	PD PVMT PATCH M&F SURF	0.10%	4	SQ YD	\$80.19	\$321	
	PWFn =	0.5537		PW =	0.5537 X	\$12,977	\$7,185
<b>YEAR 25</b>							
	LONG SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	CNTR LINE JOINT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	RNDM / THRM CRACK R&S	50.00%	1,848	LIN FT	\$2.00	\$3,696	
	PD PVMT PATCH M&F SURF	0.50%	22	SQ YD	\$80.19	\$1,764	
	PWFn =	0.4776		PW =	0.4776 X	\$14,420	\$6,887
<b>HMA SD</b>							
<b>YEAR 30</b>							
	NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	5,973	SQ YD	\$3.00	\$17,919	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	90	SQ YD	\$79.52	\$7,157	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	15	SQ YD	\$78.57	\$1,179	
	HMA OVERLAY PVMT 2.25 "	100.00%	4,480	SQ YD	\$11.27	\$50,496	
	HMA OVERLAY SHLD 2.25 "	100.00%	1,493	SQ YD	\$9.64	\$14,394	
	PWFn =	0.4120		PW =	0.4120 X	\$91,145	\$37,551
<b>YEAR 35</b>							
	LONG SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	CNTR LINE JOINT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	RNDM / THRM CRACK R&S	50.00%	1,848	LIN FT	\$2.00	\$3,696	
	PD PVMT PATCH M&F SURF	0.10%	4	SQ YD	\$80.19	\$321	
	PWFn =	0.3554		PW =	0.3554 X	\$12,977	\$4,612
<b>YEAR 40</b>							
	LONG SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	CNTR LINE JOINT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480	
	RNDM / THRM CRACK R&S	50.00%	1,848	LIN FT	\$2.00	\$3,696	
	PD PVMT PATCH M&F SURF	0.50%	22	SQ YD	\$80.19	\$1,764	
	PWFn =	0.3066		PW =	0.3066 X	\$14,420	\$4,421
							\$134,034
ROUTINE MAINTENANCE ACTIVITY				0.64 Lane Miles	0.00	\$0	\$0
						MAINTENANCE LIFE-CYCLE COST	\$134,034
45	YEAR LIFE CYCLE	CRFn = 0.0407852	MAINTENANCE ANNUAL COST PER MILE				\$25,771

JOINTED PLAIN CONCRETE PAVEMENT  
 UNBONDED JOINTED PLAIN CONCRETE OVERLAY  
 Figure 54-7.A

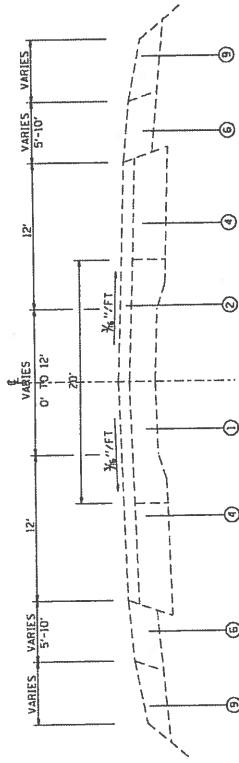
MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH	
<b>YEAR 10</b>								
	PAVEMENT PATCH CLASS B	0.10%	4	SQ YD	\$150.00	\$600		
		PWFn = 0.7441			PW = 0.7441 X	\$600	\$446	
<b>YEAR 15</b>								
	PAVEMENT PATCH CLASS B	0.20%	9	SQ YD	\$150.00	\$1,350		
		PWFn = 0.6419			PW = 0.6419 X	\$1,350	\$867	
<b>YEAR 20</b>								
	PAVEMENT PATCH CLASS B	2.00%	90	SQ YD	\$150.00	\$13,500		
	SHOULDER PATCH CLASS C	0.50%	7	SQ YD	\$145.00	\$1,015		
	LONGITUDINAL SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480		
	CENTERLINE JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480		
		PWFn = 0.5537			PW = 0.5537 X	\$23,475	\$12,998	
<b>YEAR 25</b>								
	PAVEMENT PATCH CLASS B	3.00%	134	SQ YD	\$150.00	\$20,100		
	SHOULDER PATCH CLASS C	1.00%	15	SQ YD	\$145.00	\$2,175		
		PWFn = 0.4776			PW = 0.4776 X	\$22,275	\$10,639	
<b>YEAR 30</b>								
	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	179	SQ YD	\$150.00	\$26,850		
	SHOULDER PATCH CLASS C	1.50%	22	SQ YD	\$145.00	\$3,190		
	HMA POLICY OVERLAY 2.5" ( PVMT )	100.00%	4,480	SQ YD	\$12.47	\$55,886		
	HMA POLICY OVERLAY 2.5" ( SHLD )	100.00%	1,493	SQ YD	\$10.71	\$15,994		
		PWFn = 0.4120			PW = 0.4120 X	\$101,920	\$41,990	
<b>YEAR 35</b>								
	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480		
	CENTERLINE JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480		
	RANDOM CRACK R&S	50.00%	1,680	LIN FT	\$2.00	\$3,360		
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,080	LIN FT	\$2.00	\$2,160		
	PD PVMT PATCH M&F HMA 2.50"	0.10%	4	SQ YD	\$82.74	\$331		
		PWFn = 0.3554			PW = 0.3554 X	\$14,811	\$5,264	
<b>YEAR 40</b>								
	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	22	SQ YD	\$150.00	\$3,300		
	LONGITUDINAL SHLD JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480		
	CENTERLINE JT R&S	100.00%	2,240	LIN FT	\$2.00	\$4,480		
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,620	LIN FT	\$2.00	\$3,240		
	RANDOM CRACK R&S	50.00%	1,680	LIN FT	\$2.00	\$3,360		
	PD PVMT PATCH M&F HMA 2.50"	0.50%	22	SQ YD	\$82.74	\$1,820		
		PWFn = 0.3066			PW = 0.3066 X	\$20,680	\$6,340	
							\$78,544	
	ROUTINE MAINTENANCE ACTIVITY				0.64 Lane Miles	\$0.00	\$0	\$0
	MAINTENANCE LIFE-CYCLE COST						\$78,544	
45	YEAR LIFE CYCLE	CRFn = 0.0407852	MAINTENANCE ANNUAL COST PER MILE			\$15,102		



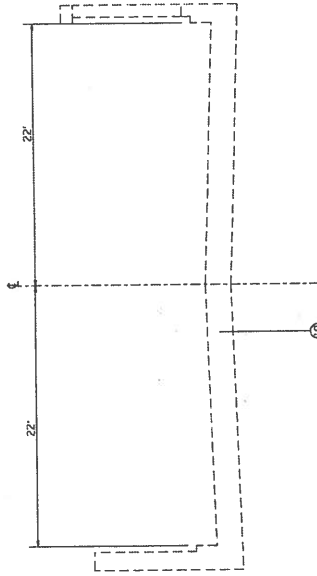
EXISTING ROADWAY SECTION  
STA. 239+44 TO STA. 240+37



EXISTING ROADWAY SECTION  
STA. 240+37 TO STA. 243+06



EXISTING ROADWAY SECTION  
STA. 230+61 TO STA. 236+32

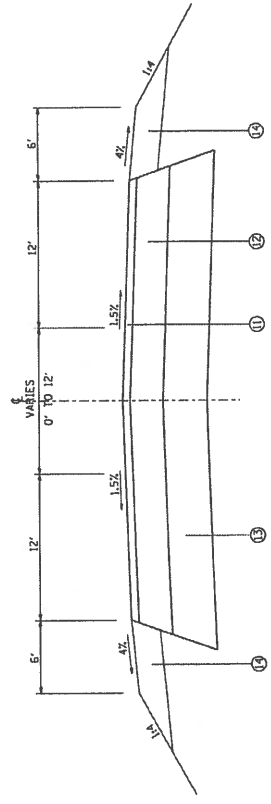


EXISTING BRIDGE SECTION  
STA. 236+32 TO STA. 239+14

LEGEND

- ① EXISTING PCC PAVEMENT (9'-7\"/>

FILE NAME	DESIGNED	REVISION
PROJECT NO.	CHECKED	DATE
STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		
TYPICAL SECTIONS - EXISTING		
SECTION	1258-2	TO STA.
SCALE	SHEET	OF SHEETS
COUNTY	MADISON	CONTRACT NO.
SHEET NO.	188	1605
PROJECT	ILLINOIS STATE HIGHWAY PROJECT	



PROPOSED ROADWAY SECTION  
 STA. 230+61 TO STA. 236+12  
 STA. 237+41 TO STA. 243+08

LEGEND

- 1 EXISTING PCC PAVEMENT 19"-7"-9"1
- 2 EXISTING RESURFACING 3"
- 3 EXISTING RESURFACING 4"
- 4 EXISTING BITUMINOUS BASE COURSE WIDENING, 9"
- 5 EXISTING BITUMINOUS BASE COURSE WIDENING SUPERPAVE, 10-3/4"
- 6 EXISTING BITUMINOUS SHOULDER, 6"
- 7 EXISTING BITUMINOUS SHOULDER SUPERPAVE, 8"
- 8 EXISTING LIME MODIFIED SOIL, 12"
- 9 EXISTING AGGREGATE SHOULDER
- 10 EXISTING BRIDGE CONCRETE SLAB, 9-1/4"
- 11 PROPOSED HMA SURFACE, 2"
- 12 PROPOSED HMA BINDER, 9"
- 13 PROPOSED SUB-BASE GRANULAR MATERIAL, 12"
- 14 PROPOSED HMA SHOULDER, 8"

FILE NO. & SHEET NO.	SECTION	COUNTY	TOTAL SHEETS
1259-2	1259-2	ILLINOIS	1603
DATE	SCALE	SHEET	TO STA.
5/2/2018	AS SHOWN	OF	1603
DESIGNED BY	CHECKED BY	DATE	
DR. J. M. ...	DR. J. M. ...	...	
STATE OF ILLINOIS	DEPARTMENT OF TRANSPORTATION		
TYPICAL SECTIONS - PROPOSED			