



Illinois Department of Transportation

To: John Fortman Attn: District One
From: John D. Baranzelli
Subject: Pavement Design
Date: March 7, 2013

A handwritten signature in black ink, appearing to be 'J.D. Baranzelli', enclosed in a hand-drawn oval.

IL Route 83
Lake County
From south of Rollins Road to north of Hook Drive

We have reviewed the pavement design for the above captioned section, which was submitted to BDE on January 23, 2013. LCCA favors the rigid pavement design and does not require alternate bidding.

The approved pavement design is as follows:

IL 83 [Reconstruction]

9 inches of PCC Jointed Pavement with Tied PCC Curb & Gutter
12 inches Aggregate Subgrade Improvement

IL 83 [Widening]

9.75 inches of Full-Depth HMA Pavement with PCC Curb & Gutter
1.75 inches HMA Polymerized Surface Course, Mix "F", N90
0.75 inches HMA Polymerized Leveling Binder, IL-4.75, N50
7.25 inches HMA Binder Course, IL-19.0, N90
12 inches Aggregate Subgrade Improvement

IL 83 [Resurfacing]

2.5 inches of Cold Milling of Existing HMA Pavement
1.75 inches HMA Polymerized Surface Course, Mix "F", N90
0.75 inches HMA Polymerized Leveling Binder, IL-4.75, N50

If you have any questions, please contact Paul Niedernhofer at (217) 524-1651.

b) IL 83 (North of STA 2030+50)

PCC Curb and Gutter

Widening

9 ¾" Full Depth Hot-Mix Asphalt Pavement

1 ¾" Polymerized Hot-Mix Asphalt Surface Course, Mix "F" N90²

¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50³

7 ¼" Hot-Mix Asphalt Binder Course, IL-19.0, N90⁴

12" Aggregate Subgrade Improvement⁵

Existing Pavement Resurfacing

2 ½" Cold Milling of Existing Hot-Mix Asphalt Pavement

1 ¾" Polymerized Hot-Mix Asphalt Surface Course, Mix "F" N90²

¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50³

¹ Designer Note 1: Use pay item #42000401, "PORTLAND CEMENT CONCRETE PAVEMENT 9" (JOINTED)" paid for in square yards.

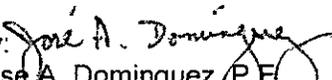
² Designer Note 2: Use pay item #40603595, "POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "F", N90" paid for in tons.

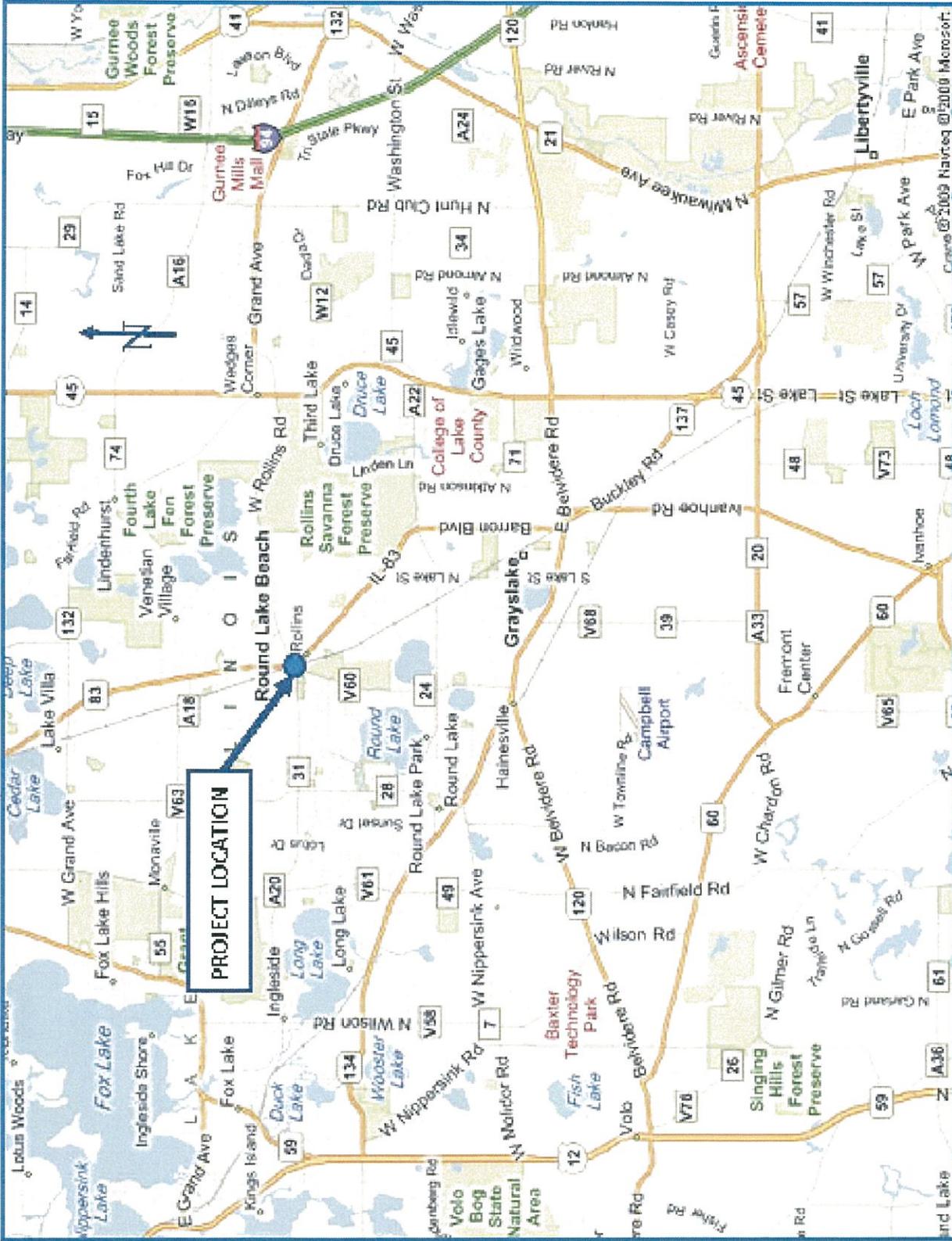
³ Designer Note 3: Use pay item #40600827, "POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50" paid for in tons.

⁴ Designer Note 4: For widening of six feet or less use pay item "HOT-MIX ASPHALT BASE COURSE WIDENING, 7 1/4" " paid for in square yards. For widening of greater than six feet use pay item # 35501326 "HOT-MIX ASPHALT BASE COURSE, 7 1/4" " paid for in square yards.

⁵ Designer Note 5: Use pay item #30300112, "AGGREGATE SUBGRADE IMPROVEMENT, 12" " paid for in square yards.

If you have any questions or need additional information, please contact Jenpai Chang, Acting Pavement Design Engineer, at (847)705-4432.

By: 
José A. Dominguez, P.E.
Project Support Engineer



Location Map

Rollins Road at IL Route 83

PROJECT AND TRAFFIC INPUTS				(Enter Data in Gray Shaded Cells)																															
Route: IL 83	Comments: RECONSTRUCTION																																		
Section: NA																																			
County: LAKE	Design Date: 01/18/2012	JK.	<table border="1" style="float: right; border-collapse: collapse;"> <tr> <td><-- BY</td> <td>ADT</td> <td>Year</td> </tr> <tr> <td>Current:</td> <td style="text-align: center;">21,000</td> <td style="text-align: center;">2009</td> </tr> <tr> <td>Future:</td> <td style="text-align: center;">25,000</td> <td style="text-align: center;">2030</td> </tr> </table>					<-- BY	ADT	Year	Current:	21,000	2009	Future:	25,000	2030																			
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Current:	21,000	2009																																	
Future:	25,000	2030																																	
Location: AT ROLLINS ROAD	Modify Date:																																		
Facility Type: Other Marked State Route	# of Lanes = 4																																		
Road Class: I	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Structural Design Traffic</th> </tr> <tr> <th></th> <th>Minimum ADT</th> <th>Actual ADT</th> <th>Actual % of Total ADT</th> <th>% of ADT in Design Lane</th> </tr> </thead> <tbody> <tr> <td>PV =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">22,199</td> <td style="text-align: center;">93.8%</td> <td style="text-align: center;">P = 32%</td> </tr> <tr> <td>SU =</td> <td style="text-align: center;">250</td> <td style="text-align: center;">1,160</td> <td style="text-align: center;">4.9%</td> <td style="text-align: center;">S = 45%</td> </tr> <tr> <td>MU =</td> <td style="text-align: center;">750</td> <td style="text-align: center;">308</td> <td style="text-align: center;">1.3%</td> <td style="text-align: center;">M = 45%</td> </tr> <tr> <td>Struct. Design ADT =</td> <td colspan="2" style="text-align: center;">23,667</td> <td colspan="2" style="text-align: center;">(2023)</td> </tr> </tbody> </table>						Structural Design Traffic					Minimum ADT	Actual ADT	Actual % of Total ADT	% of ADT in Design Lane	PV =	0	22,199	93.8%	P = 32%	SU =	250	1,160	4.9%	S = 45%	MU =	750	308	1.3%	M = 45%	Struct. Design ADT =	23,667		(2023)	
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Struct. Design ADT =	23,667		(2023)																																
Subgrade Support Rating (SSR): Poor																																			
Construction Year: 2013																																			
Design Period (DP) = 20 years																																			
TRAFFIC FACTOR CALCULATION																																			
FLEXIBLE PAVEMENT				RIGID PAVEMENT																															
Cpv = 0.15	Csu = 132.5	Cmu = 482.53	TF flexible (Actual) = 2.74 (Actual ADT)	Cpv = 0.15	Csu = 143.81	Cmu = 696.42																													
TF flexible (Min) = 3.56 (Min ADT Fig. 54-2.C)				TF rigid (Actual) = 3.45 (Actual ADT)	TF rigid (Min) = 5.02 (Min ADT Fig. 54-2.C)																														

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS			
Full-Depth HMA Pavement		JPC Pavement	
Use TF flexible = 3.56	PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)	Use TF rigid = 5.02	Edge Support = Tied Shoulder or C.&G.
Goto Map	HMA Mixture Temp. = 73.0 deg. F (Fig. 54-5.C)	Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)	
Design HMA Mixture Modulus (E _{HMA}) = 760 ksi (Fig. 54-5.D)	Design HMA Strain (ε _{HMA}) = 84 (Fig. 54-5.E)	CRC Pavement	
Goto Map	Full Depth HMA Design Thickness = 9.75 in. (Fig. 54-5.F)	Use TF rigid = 5.02	IBR value = 2
Limiting Strain Criterion Thickness = 14.25 in. (Fig. 54-5.I)	Use Full-Depth HMA Thickness = 9.75 inches	CRCP Thickness = 8.25 in. (Fig. 54-4.M)	
TF MUST BE > 60 FOR CRCP			

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS			
HMA Overlay of Rubblized PCC		Unbonded Concrete Overlay	
Use TF flexible = 3.56	District = 3,4,5,6	Review 54-4.03 for limitations and special considerations.	
HMA Overlay Design Thickness = 8.00 in. (Fig. 54-5.U)		JPCP Thickness = NA inches	
CONTACT BMPR FOR ASSISTANCE			

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN								
Class I Roads 4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500		Class II Roads 2 lanes with ADT > 2000 One way Street with ADT <= 3500		Class III Roads 2 Lanes (ADT 750 -2000)		Class IV Roads 2 Lanes (ADT < 750)		
		Min. Str. Design Traffic (Fig 54-2.C)			Class Table for One-Way Streets			
Facility Type		PV	SU	MU	ADT		Class	
Interstate or Supplemental 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				
		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)		ADT		Class
Class		Csu	Cmu	Csu	Cmu	0 - 749		IV
I		143.81	696.42	132.50	482.53	750 - 2000		III
II		135.78	567.21	112.06	385.44	>2000		II
III		129.58	562.47	109.14	384.35			
IV		129.58	562.47	109.14	384.35			
		Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)						
		Rural			Urban			
Number of Lanes		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 IL 83
 SECTION NA
 COUNTY LAKE
 LOCATION AT ROLLINS ROAD

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2560 FT ==> 0.48 Miles
 # OF CENTERLINES 2 CL
 # OF LANES 4 LANES
 # OF EDGES 4 EP
 LANE WIDTH - AVERAGE 12 FT
 SHOULDER WIDTH HMA Inside 0 FT
 HMA Outside 0 FT

PAVEMENT THICKNESS (FLEXIBLE) 9.75 IN 14.25 IN MAX
 SHOULDER THICKNESS IN HMA STD Standard Design
 POLICY OVERLAY THICKNESS 2.25 IN

FLEX PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		3.56	2.01	3.56

Read Me!

HMA	COST PER TON	UNIT PRICE
HMA SURFACE		\$95.00 / TON
HMA TOP BINDER		\$90.00 / TON
HMA LOWER BINDER		\$85.00 / TON
HMA BINDER (LEVELING)		\$95.00 / TON
HMA SHOULDER		\$85.00 / TON

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT (FULL-DEPTH)	(9.75")	12,526	SQ YD	\$49.75 / SQ YD	\$0
HMA SURFACE COURSE	(2.00")	12,526	SQ YD	\$9.65 / SQ YD	\$120,876 ~
HMA TOP BINDER COURSE	(2.25")	12,526	SQ YD	\$9.20 / SQ YD	\$115,239 ~
HMA LOWER BINDER COURSE	(5.50")	12,526	SQ YD	\$22.62 / SQ YD	\$283,338 ~
HMA SHOULDER	(0.00")	0	SQ YD	\$0.00 / SQ YD	\$0 ~
CURB & GUTTER		10,240	LIN FT	\$30.00 / LIN FT	\$307,200
SUBBASE GRAN MATL TY C (TONS)		305	TONS	\$25.00 / TON	\$7,625
IMPROVED SUBGRADE:	Aggregate (150% + 4.75")	12,526	SQ YD	\$10.00 / SQ YD	\$125,260
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		13,653	SQ YD	\$0.00 / SQ YD	\$0
SHOULDER REMOVAL		0	SQ YD	\$0.00 / SQ YD	\$0

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST \$959,538
 FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE \$80,716

MAINTENANCE COSTS:

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	(2.00")	Surface Mix	\$9.65 / SQ YD
HMA OVERLAY PVMT	(2.25")	Surface Mix	\$10.86 / SQ YD
HMA SURFACE MIX	(1.50")	Surface Mix	\$7.24 / SQ YD
HMA BINDER MIX	(0.75")	Leveling Binder Mix	\$3.62 / SQ YD
HMA OVERLAY SHLD (Year 30)	(2.25")	Shoulder Mix	\$10.86 / SQ YD
HMA OVERLAY SHLD	(2.00")	Shoulder Mix	\$9.65 / SQ YD
MILLING (2.00 IN)			\$2.50 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill Surf)		Surface Mix	\$90.83 / SQ YD
PARTIAL DEPTH SHLD PATCH (Mill & Fill Surf)		Shoulder Mix	\$89.71 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill +2.00")		Leveling Binder Mix	\$90.83 / SQ YD
PARTIAL DEPTH SHLD PATCH (Mill & Fill +2.00")		Shoulder Mix	\$89.71 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL (100% Rehab = 110.00' / Station / Lane)			\$2.00 / LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST \$1,292,211
 FLEXIBLE TOTAL ANNUAL COST PER MILE \$108,700

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
YEAR 5							
	LONG SHLD JT R&S	100.00%	10,240	LIN FT	\$2.00	\$20,480	
	CNTR LINE JOINT R&S	100.00%	5,120	LIN FT	\$2.00	\$10,240	
	RNDM / THRM CRACK R&S	50.00%	5,632	LIN FT	\$2.00	\$11,264	
	PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$90.83	\$1,181	
	PWFn =	0.8626		PW =	0.8626 X	\$43,165	\$37,235
YEAR 10							
	LONG SHLD JT R&S	100.00%	10,240	LIN FT	\$2.00	\$20,480	
	CNTR LINE JOINT R&S	100.00%	5,120	LIN FT	\$2.00	\$10,240	
	RNDM / THRM CRACK R&S	50.00%	5,632	LIN FT	\$2.00	\$11,264	
	PD PVMT PATCH M&F SURF	0.50%	63	SQ YD	\$90.83	\$5,722	
	PWFn =	0.7441		PW =	0.7441 X	\$47,706	\$35,498
YEAR 15							
	MILL PVMT & SHLD 2.00"	100.00%	12,526	SQ YD	\$2.50	\$31,315	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	125	SQ YD	\$90.83	\$11,354	
	HMA OVERLAY PVMT 2.00"	100.00%	12,526	SQ YD	\$9.65	\$120,876	
	HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	\$9.65	\$0	
	PWFn =	0.6419		PW =	0.6419 X	\$163,545	\$104,973
YEAR 20							
	LONG SHLD JT R&S	100.00%	10,240	LIN FT	\$2.00	\$20,480	
	CNTR LINE JOINT R&S	100.00%	5,120	LIN FT	\$2.00	\$10,240	
	RNDM / THRM CRACK R&S	50.00%	5,632	LIN FT	\$2.00	\$11,264	
	PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$90.83	\$1,181	
	PWFn =	0.5537		PW =	0.5537 X	\$43,165	\$23,899
YEAR 25							
	LONG SHLD JT R&S	100.00%	10,240	LIN FT	\$2.00	\$20,480	
	CNTR LINE JOINT R&S	100.00%	5,120	LIN FT	\$2.00	\$10,240	
	RNDM / THRM CRACK R&S	50.00%	5,632	LIN FT	\$2.00	\$11,264	
	PD PVMT PATCH M&F SURF	0.50%	63	SQ YD	\$90.83	\$5,722	
	PWFn =	0.4776		PW =	0.4776 X	\$47,706	\$22,785
YEAR 30							
	HMA_SD NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	12,526	SQ YD	\$2.50	\$31,315	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	251	SQ YD	\$90.83	\$22,798	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	\$89.71	\$0	
	HMA OVERLAY PVMT 2.25 "	100.00%	12,526	SQ YD	\$10.86	\$135,985	
	HMA OVERLAY SHLD 2.25 "	100.00%	0	SQ YD	\$10.86	\$0	
	PWFn =	0.4120		PW =	0.4120 X	\$190,098	\$78,318
YEAR 35							
	LONG SHLD JT R&S	100.00%	10,240	LIN FT	\$2.00	\$20,480	
	CNTR LINE JOINT R&S	100.00%	5,120	LIN FT	\$2.00	\$10,240	
	RNDM / THRM CRACK R&S	50.00%	5,632	LIN FT	\$2.00	\$11,264	
	PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$90.83	\$1,181	
	PWFn =	0.3554		PW =	0.3554 X	\$43,165	\$15,340
YEAR 40							
	LONG SHLD JT R&S	100.00%	10,240	LIN FT	\$2.00	\$20,480	
	CNTR LINE JOINT R&S	100.00%	5,120	LIN FT	\$2.00	\$10,240	
	RNDM / THRM CRACK R&S	50.00%	5,632	LIN FT	\$2.00	\$11,264	
	PD PVMT PATCH M&F SURF	0.50%	63	SQ YD	\$90.83	\$5,722	
	PWFn =	0.3066		PW =	0.3066 X	\$47,706	\$14,625
							\$332,673
ROUTINE MAINTENANCE ACTIVITY			1.94 Lane Miles	0.00	\$0	\$0	
			MAINTENANCE LIFE-CYCLE COST			\$332,673	
45	YEAR LIFE CYCLE	CRFn = 0.0407852	MAINTENANCE ANNUAL COST PER MILE			\$27,984	

PCC PAVEMENT

JPCP

ROUTE **IL 83**
 SECTION **NA**
 COUNTY **LAKE**
 LOCATION **AT ROLLINS ROAD**

FACILITY TYPE **NON-INTERSTATE**

PROJECT LENGTH **2560 FT ==> 0.48 Miles**
 # OF CENTERLINES **2 CL**
 # OF LANES **4 LANES**
 # OF EDGES **4 EP**
 LANE WIDTH - AVERAGE **12 FT**
 SHOULDER WIDTH **PCC Inside 0 FT**
 PCC Outside 0 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
		5.02	2.72	5.02
Worksheet Construction Type is	Reconstruction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY UNIT	UNIT PRICE	COST
JPC PAVEMENT	(9.00")	12,526 SQ YD *	\$39.04 /SQ YD	\$489,015
PAVEMENT REINFORCEMENT		0 SQ YD	\$0.00 /SQ YD	\$0
STABILIZED SUBBASE	(4.50")	0 SQ YD *	\$15.00 /SQ YD	\$0
PCC SHOULDERS	(9.00" to 9.00")	0 SQ YD	 /SQ YD	\$0
CURB & GUTTER		10,240 LIN FT *	\$30.00 /LIN FT	\$307,200
SUBBASE GRAN MATL TY C	(~ 0.00")	0 TONS	\$25.00 /TON	\$0
IMPROVED SUBGRADE:	Aggregate / 44.0'	12,526 SQ YD *	\$10.00 /SQ YD	\$125,260
Reserved For User Supplied Item		0 UNITS	\$0.00 /UNITS	\$0
Reserved For User Supplied Item		0 UNITS	\$0.00 /UNITS	\$0
PAVEMENT REMOVAL		13,653 SQ YD	\$0.00 /SQ YD	\$0
SHOULDER REMOVAL		0 SQ YD	\$0.00 /SQ YD	\$0

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	\$921,475
RIGID CONSTRUCTION ANNUAL COST PER MILE	\$77,514

MAINTENANCE COSTS:

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 /LANE-MILE /YEAR
HMA POLICY OVERLAY	(2.50")	2.50	
HMA POLICY OVERLAY PVMT	(2.50")	1.0007	\$12.06 /SQ YD
HMA SURFACE MIX	(1.50")	1.0002	\$7.24 /SQ YD
HMA BINDER MIX	(1.00")	1.0195	\$4.83 /SQ YD
HMA POLICY OVERLAY SHLD	(2.50")	Shoulder Mix 2.50	\$12.06 /SQ YD
CLASS A PAVEMENT PATCHING			\$170.00 /SQ YD
CLASS B PAVEMENT PATCHING			\$130.00 /SQ YD
CLASS C SHOULDER PATCHING			\$110.00 /SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)		Surface Mix 1.50	\$88.17 /SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix 2.50	\$93.49 /SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 /LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 /LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL			\$2.00 /LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)		\$2.00 /LIN FT

RIGID TOTAL LIFE-CYCLE COST	\$1,109,535
RIGID TOTAL ANNUAL COST PER MILE	\$93,333

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

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH	
YEAR 10	PAVEMENT PATCH CLASS B							
		0.10%	13	SQ YD	\$130.00	\$1,690		
		PWF _n = 0.7441			PW = 0.7441 X	\$1,690	\$1,258	
YEAR 15	PAVEMENT PATCH CLASS B							
		0.20%	25	SQ YD	\$130.00	\$3,250		
		PWF _n = 0.6419			PW = 0.6419 X	\$3,250	\$2,086	
YEAR 20	PAVEMENT PATCH CLASS B							
		2.00%	251	SQ YD	\$130.00	\$32,630		
	SHOULDER PATCH CLASS C							
		0.50%	0	SQ YD	\$110.00	\$0		
	LONGITUDINAL SHLD JT R&S							
		100.00%	10,240	LIN FT	\$2.00	\$20,480		
	CENTERLINE JT R&S							
		100.00%	5,120	LIN FT	\$2.00	\$10,240		
		PWF _n = 0.5537			PW = 0.5537 X	\$63,350	\$35,075	
YEAR 25	PAVEMENT PATCH CLASS B							
		3.00%	376	SQ YD	\$130.00	\$48,880		
	SHOULDER PATCH CLASS C							
		1.00%	0	SQ YD	\$110.00	\$0		
		PWF _n = 0.4776			PW = 0.4776 X	\$48,880	\$23,345	
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B							
		4.00%	501	SQ YD	\$130.00	\$65,130		
	SHOULDER PATCH CLASS C							
		1.50%	0	SQ YD	\$110.00	\$0		
	HMA POLICY OVERLAY 2.5" (PVMT)							
		100.00%	12,526	SQ YD	\$12.06	\$151,095		
	HMA POLICY OVERLAY 2.5" (SHLD)							
		100.00%	0	SQ YD	\$12.06	\$0		
		PWF _n = 0.4120			PW = 0.4120 X	\$216,225	\$89,082	
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S							
		100.00%	10,240	LIN FT	\$2.00	\$20,480		
	CENTERLINE JT R&S							
		100.00%	5,120	LIN FT	\$2.00	\$10,240		
	RANDOM CRACK R&S							
		50.00%	5,120	LIN FT	\$2.00	\$10,240		
	REFLECTIVE TRANSVERSE CRACK R&S							
		40.00%	3,283	LIN FT	\$2.00	\$6,566		
	PD PVMT PATCH M&F HMA 2.50"							
		0.10%	13	SQ YD	\$93.49	\$1,215		
		PWF _n = 0.3554			PW = 0.3554 X	\$48,741	\$17,322	
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B							
		0.50%	63	SQ YD	\$130.00	\$8,190		
	LONGITUDINAL SHLD JT R&S							
		100.00%	10,240	LIN FT	\$2.00	\$20,480		
	CENTERLINE JT R&S							
		100.00%	5,120	LIN FT	\$2.00	\$10,240		
	REFLECTIVE TRANSVERSE CRACK R&S							
		60.00%	4,925	LIN FT	\$2.00	\$9,850		
	RANDOM CRACK R&S							
		50.00%	5,120	LIN FT	\$2.00	\$10,240		
	PD PVMT PATCH M&F HMA 2.50"							
		0.50%	63	SQ YD	\$93.49	\$5,890		
		PWF _n = 0.3066			PW = 0.3066 X	\$64,890	\$19,892	
							\$188,060	
	ROUTINE MAINTENANCE ACTIVITY				1.94 Lane Miles	\$0.00	\$0	\$0
					MAINTENANCE LIFE-CYCLE COST		\$188,060	
45	YEAR LIFE CYCLE	CRF _n = 0.0407852			MAINTENANCE ANNUAL COST PER MILE		\$15,819	

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 12/19/12 2:20 PM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	\$921,475	\$959,538
		ANNUAL COST PER MILE	\$77,514	\$80,716
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	\$188,060	\$332,673
		ANNUAL COST PER MILE	\$15,819	\$27,984
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	\$1,109,535	\$1,292,211
		ANNUAL COST PER MILE	\$93,333	\$108,700

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	=====>	JPCP	\$93,333	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	HMA	\$108,700	16.5%