Illinois Department of Transportation

Memorandum

To:	Jeffrey Keirn	Attn: District Eight
From:	John Baranzelli	
Subject:	Pavement Design	
Date:	October 22, 2015	

FAP Route 10 (IL 111)
Jersey County
David Lane/Humbert Road/Albrite Acres/Woodgate Court

We have reviewed the pavement selection for the above captioned section, which was submitted with your memorandum dated September 10, 2015. This project will realign IL 111 to accommodate an additional high speed rail track. The project does not qualify for alternate bid, and the LCCA favors a flexible design by more than 10%.

The approved pavement design for IL 111 is as follows:

IL 111 [Pavement Reconstruction]

10.75 inches of Full-Depth HMA Pavement with HMA Shoulder
- 2 inches of HMA Surface Course, Mix "D" N70
- 8.75 inches of HMA Binder Course, IL-19.0 N70

8 inches of Aggregate Subgrade Improvement

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

Illinois Department of Transportation

Memorandum

To:	John Baranzelli	Attn.:	Paul Niedenhofer
From:	Jeffrey Keirn	By:	Kirk Brown/ Billie Owen
Subject:	Pavement Design Review		
Date:	September 10, 2015		

FAP 10 (IL Route 111)
David Lane / Humbert Road / Albrite Acres / Woodgate Court
Piasa Township / Jersey County

Realignment of IL 111 to accommodate the additional high speed rail track.

This project consists of realigning and reconstructing 2,890' of IL Route 111. The proposed pavement consists of one 12' lane in each direction with a 4' paved shoulder and a 6' aggregate shoulder.

Since the roadway will be constructed on a new alignment, a Mechanistic Rigid and Mechanistic Flexible pavement designs were evaluated. A Life-Cycle Cost Analysis comparing PCC pavement and HMA pavement was performed on the new pavement. The estimated Total Life-Cycle Cost of the PCC pavement is $1,760,905 and the estimated Total Life-Cycle Cost of the HMA pavement is $1,480,631. The PCC pavement cost is over 10% higher than the HMA pavement cost. Therefore, the Pavement Type and Design with the lowest Life-Cycle Cost has been selected.

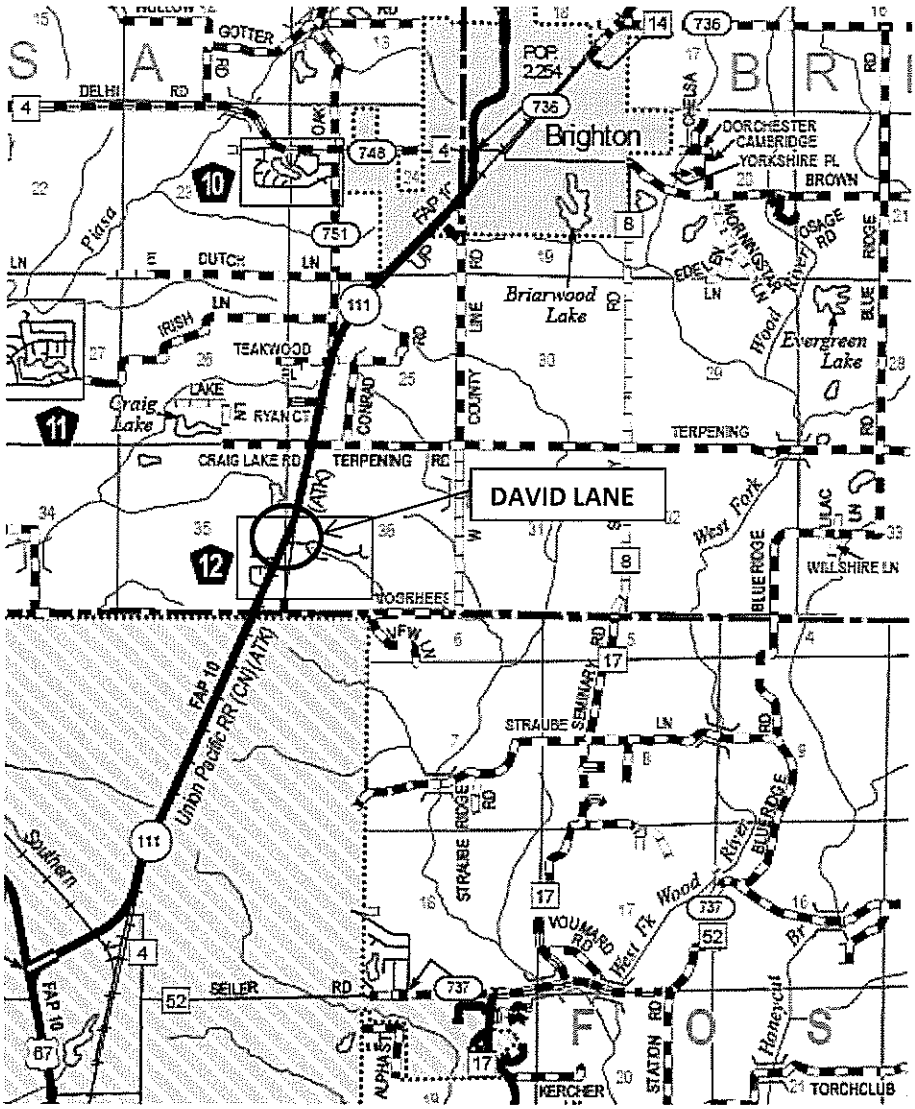
The District is recommending the following pavement design:

- 10 ¾" Full-Depth HMA Pavement
  - 2" HMA Surface Course, Mix "D" N50
  - 8 ¾" HMA Binder Course, IL-19.0 N
- 8" Subbase Granular Material, Type A

If you have any questions or comments, please contact Rob Harbaugh at (618) 346-3195.

Kirk H. Brown, P.E.
Program Development Engineer

Attachments

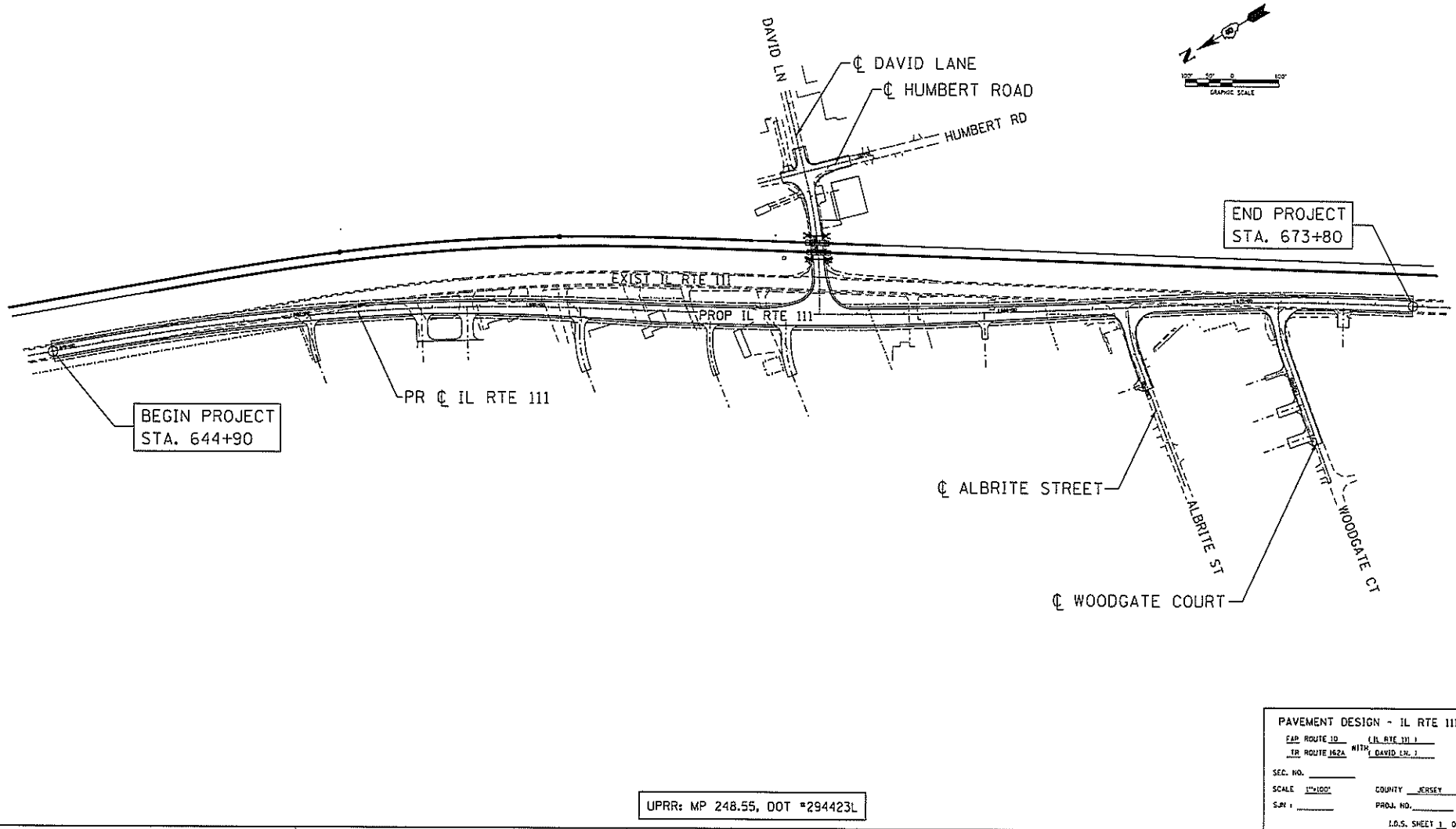


LOCATION MAP

DOT# 294423L

DAVID LANE

MP 248.55



UPRR: MP 248.55, DOT #294423L

PAVEMENT DESIGN - IL RTE 111

FAP ROUTE 10 (IL RTE 111)

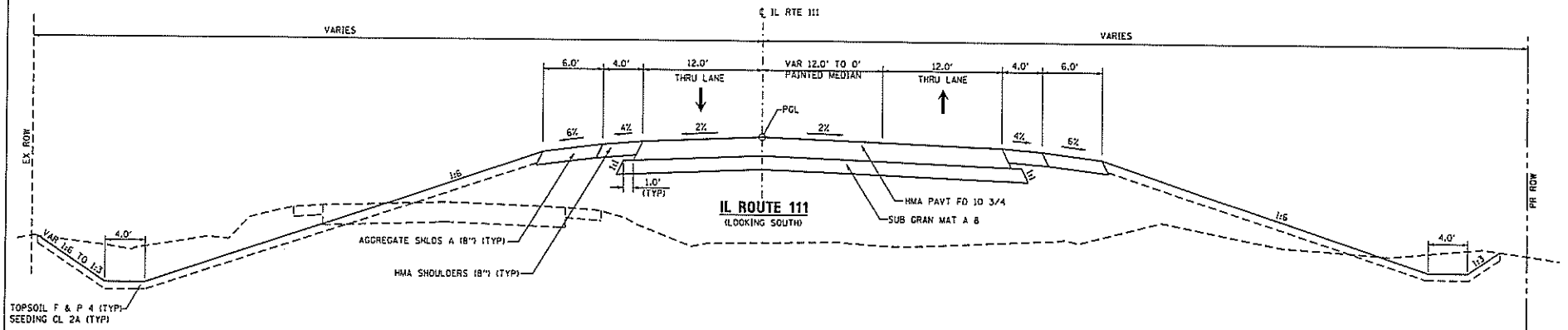
TR ROUTE 162A WITH (DAVID LN.)

SEC. NO. _____

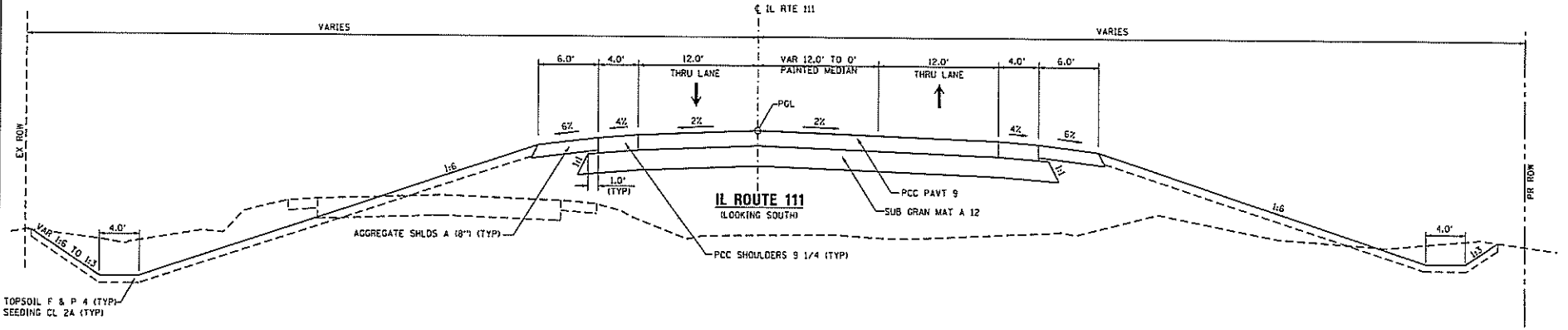
SCALE 1"=100' COUNTY JERSEY

SJH : _____ PROJ. NO. _____

I.D.S. SHEET 1 OF 1



FULL-DEPTH HMA PAVEMENT



PCC PAVEMENT

FILE NAME = #FILE#	USER NAME = #USER#	DESIGNED - JAC	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PROPOSED TYPICAL SECTIONS IL RTE 111
#MODELNAME#	PLOT SCALE = #SCALE#	DRAWN - SRS	REVISED -		
	PLOT DATE = #DATE#	CHECKED - JAC	REVISED -		
		DATE -	REVISED -		SCALE: NTS | SHEET 1 OF 1 SHEETS | STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
10	08 HSRR 2015-xxx	JERSEY	210	#SHT#
		CONTRACT NO. xxxxx		
	ILLINOIS FED. AID PROJECT			

BDE 5401 Template (Rev. 09/05/2013)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 10/21/2015

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: FAP 10 (IL Route 111)
Section:
County: Jersey
Location: Piasa Township
Comments:
Design Date: 09/08/2015 JAC <-- BY
Modify Date: 09/08/2015 <-- BY

	ADT	Year
Current:	9,289	2015
Future:	11,300	2035

Facility Type: Other Marked State Route
# of Lanes = 2 or 3
Part of future 4 lanes or more ? No
One Way Street ? No
Road Class: II

Subgrade Support Rating (SSR): Poor
Construction Year: 2016
Design Period (DP) = 20 years

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	9,459	91.0%	P = 50%
SU =	250	468	4.5%	S = 50%
MU =	750	468	4.5%	M = 50%
Struct. Design ADT =		10,395	(2026)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	112.06		Csu =	135.78	
Cmu =	385.44		Cmu =	567.21	
TF flexible (Actual) =	2.34	(Actual ADT)	TF rigid (Actual) =	3.30	(Actual ADT)
TF flexible (Min) =	3.17	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	4.59	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 3.17
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map — HMA Mixture Temp. = 78.7 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 590 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 86 (Fig. 54-5.E)
Goto Map — Full Depth HMA Design Thickness = 10.75 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 16.14 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 10.75 inches

JPC Pavement

Use TF rigid = 4.59
Edge Support = Tied Shoulder or C.&G.

Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 4.59
IBR value = 3

CRCP Thickness = 7.75 in. (Fig. 54-4.N)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible = 3.17
Goto Map — HMA Overlay Design Thickness = 7.75 in. (Fig. 54-5.U)
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 999.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT BMPR FOR ASSISTANCE

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN

Class I Roads	Class II Roads	Class III Roads	Class IV Roads
4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500	2 lanes with ADT > 2000 One way Street with ADT <= 3500	2 Lanes (ADT 750 -2000)	2 Lanes (ADT < 750)

	Min. Str. Design Traffic (Fig 54-2.C)		
Facility Type	PV	SU	MU
Interstate or Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	No Min	No Min	No Min

Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
Class	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

Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	IV
750 - 2000	III
>2000	II

	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%

BDE 5401 Template (Rev. 09/05/2013) Printed: 10/22/2015

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	FAP 10 [IL Route 111]
SECTION	
COUNTY	Jersey
LOCATION	Piasa Township [at David Lane]

FACILITY TYPE: NON-INTERSTATE

PROJECT LENGTH			2890 FT	= = > 0.55 Miles
# OF CENTERLINES			1 CL	
# OF LANES			2 LANES	
# OF EDGES			2 EP	
LANE WIDTH - AVERAGE			12 FT	
SHOULDER WIDTH	HMA	Left	4 FT	
	HMA	Right	4 FT	
	Total Width of Paved Shoulders		8 FT	

PAVEMENT THICKNESS (FLEXIBLE)	10.75 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
	3.17	2.34	3.17

Read Me!

HMA COST PER TON	UNIT PRICE
HMA SURFACE	$132.00 / TON
HMA TOP BINDER	$99.00 / TON
HMA LOWER BINDER	$99.00 / TON
HMA BINDER (LEVELING)	$99.00 / TON
HMA SHOULDER	$102.00 / TON

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT		UNIT PRICE	COST	
HMA PAVEMENT (FULL-DEPTH)	(10.75")	10,174	SQ YD	*	$65.54 / SQ YD	$666,847	~
HMA SURFACE COURSE	(2.00")	869	TONS		$132.00 / TON	$0	
HMA TOP BINDER COURSE	(2.25")	992	TONS		$99.00 / TON	$0	
HMA LOWER BINDER COURSE	(6.50")	2,951	TONS		$99.00 / TON	$0	
HMA SHOULDER	(8.00")	1,475	TONS	*	$102.00 / TON	$150,450	~
CURB & GUTTER		0	LIN FT		$30.00 / LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)		0	TONS	*	$20.00 / TON	$0	
IMPROVED SUBGRADE:	Modified Soil	0	SQ YD	*	$20.00 / SQ YD	$0	
SUBBASE GRAN MATL TY A 8		5,221	UNITS	*	$27.00 / UNITS	$140,967	
Reserved For User Supplied Item		0	UNITS	*	$0.00 / UNITS	$0	
PAVEMENT REMOVAL		7,707	SQ YD	*	$17.00 / SQ YD	$131,019	
SHOULDER REMOVAL		3,293	SQ YD	*	$14.00 / SQ YD	$46,102	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$1,135,385
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$84,602

MAINTENANCE COSTS:

ITEM		THICKNESS	MATERIAL	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY				$0.00	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	Surface Mix	$14.89	/ SQ YD
HMA OVERLAY PVMT		(2.25")		$15.36	/ SQ YD
HMA SURFACE MIX		(1.50")	Surface Mix	$11.15	/ SQ YD
HMA BINDER MIX		(0.75")	eling Binder Mix	$4.21	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(2.25")	Shoulder Mix	$12.85	/ SQ YD
HMA OVERLAY SHLD		(2.00")	Shoulder Mix	$11.42	/ SQ YD
MILLING (2.00 IN)				$3.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)	Surface Mix	$84.78	/ SQ YD
PARTIAL DEPTH SHLD PATCH		(Mill & Fill Surf)	Shoulder Mix	$81.42	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill +2.00 ")	Leveling Binder Mix	$81.09	/ SQ YD
PARTIAL DEPTH SHLD PATCH		(Mill & Fill +2.00 ")	Shoulder Mix	$81.42	/ 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	$1,480,631
FLEXIBLE TOTAL ANNUAL COST PER MILE	$110,328

HMA_SD

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

10/22/15

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%	5,780	LIN FT	$2.00	$11,560	
	CNTR LINE JOINT R&S	100.00%	2,890	LIN FT	$2.00	$5,780	
	RNDM / THRM CRACK R&S	50.00%	3,179	LIN FT	$2.00	$6,358	
	PD PVMT PATCH M&F SURF	0.10%	10	SQ YD	$84.78	$848	
	PWFn =	0.8626		PW =	0.8626 X	$24,546	$21,174
YEAR 10							
	LONG SHLD JT R&S	100.00%	5,780	LIN FT	$2.00	$11,560	
	CNTR LINE JOINT R&S	100.00%	2,890	LIN FT	$2.00	$5,780	
	RNDM / THRM CRACK R&S	50.00%	3,179	LIN FT	$2.00	$6,358	
	PD PVMT PATCH M&F SURF	0.50%	51	SQ YD	$84.78	$4,324	
	PWFn =	0.7441		PW =	0.7441 X	$28,022	$20,851
YEAR 15							
	MILL PVMT & SHLD 2.00"	100.00%	13,466	SQ YD	$3.00	$40,398	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	102	SQ YD	$81.09	$8,271	
	HMA OVERLAY PVMT 2.00"	100.00%	10,174	SQ YD	$14.89	$151,457	
	HMA OVERLAY SHLD 2.00 "	100.00%	3,292	SQ YD	$11.42	$37,613	
	PWFn =	0.6419		PW =	0.6419 X	$237,739	$152,596
YEAR 20							
	LONG SHLD JT R&S	100.00%	5,780	LIN FT	$2.00	$11,560	
	CNTR LINE JOINT R&S	100.00%	2,890	LIN FT	$2.00	$5,780	
	RNDM / THRM CRACK R&S	50.00%	3,179	LIN FT	$2.00	$6,358	
	PD PVMT PATCH M&F SURF	0.10%	10	SQ YD	$84.78	$848	
	PWFn =	0.5537		PW =	0.5537 X	$24,546	$13,591
YEAR 25							
	LONG SHLD JT R&S	100.00%	5,780	LIN FT	$2.00	$11,560	
	CNTR LINE JOINT R&S	100.00%	2,890	LIN FT	$2.00	$5,780	
	RNDM / THRM CRACK R&S	50.00%	3,179	LIN FT	$2.00	$6,358	
	PD PVMT PATCH M&F SURF	0.50%	51	SQ YD	$84.78	$4,324	
	PWFn =	0.4776		PW =	0.4776 X	$28,022	$13,383
HMA_SD							
YEAR 30	NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	13,466	SQ YD	$3.00	$40,398	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	203	SQ YD	$81.09	$16,461	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	33	SQ YD	$81.42	$2,687	
	HMA OVERLAY PVMT 2.25 "	100.00%	10,174	SQ YD	$15.36	$156,251	
	HMA OVERLAY SHLD 2.25 "	100.00%	3,292	SQ YD	$12.85	$42,314	
	PWFn =	0.4120		PW =	0.4120 X	$258,111	$106,338
YEAR 35							
	LONG SHLD JT R&S	100.00%	5,780	LIN FT	$2.00	$11,560	
	CNTR LINE JOINT R&S	100.00%	2,890	LIN FT	$2.00	$5,780	
	RNDM / THRM CRACK R&S	50.00%	3,179	LIN FT	$2.00	$6,358	
	PD PVMT PATCH M&F SURF	0.10%	10	SQ YD	$84.78	$848	
	PWFn =	0.3554		PW =	0.3554 X	$24,546	$8,723
YEAR 40							
	LONG SHLD JT R&S	100.00%	5,780	LIN FT	$2.00	$11,560	
	CNTR LINE JOINT R&S	100.00%	2,890	LIN FT	$2.00	$5,780	
	RNDM / THRM CRACK R&S	50.00%	3,179	LIN FT	$2.00	$6,358	
	PD PVMT PATCH M&F SURF	0.50%	51	SQ YD	$84.78	$4,324	
	PWFn =	0.3066		PW =	0.3066 X	$28,022	$8,590
							$345,246
	ROUTINE MAINTENANCE ACTIVITY		1.09	Lane Miles	0.00	$0	$0
					MAINTENANCE LIFE-CYCLE COST		$345,246
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE		$25,726

PCC PAVEMENT

JPCP

ROUTE			FAP 10 [IL Route 111]	
SECTION			0	
COUNTY			Jersey	
LOCATION			Piasa Township [at David Lane]	
FACILITY TYPE			NON-INTERSTATE	
PROJECT LENGTH			2890 FT = = >	0.55 Miles
# OF CENTERLINES			1 CL	
# OF LANES			2 LANES	
# OF EDGES			2 EP	
LANE WIDTH - AVERAGE			12 FT	
SHOULDER WIDTH	PCC	Left	4 FT	
	PCC	Right	4 FT	
	Total Width of Paved Shoulders		8 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
	4.59	3.30	4.59
Worksheet Construction Type is New Construction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT		UNIT PRICE		COST
JPC PAVEMENT	(9.00")	10,174	SQ YD	*	$79.00	/ SQ YD	$803,746
PAVEMENT REINFORCEMENT		0	SQ YD		$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	8,670	SQ YD		$20.00	/ SQ YD	$173,400
PCC SHOULDERS	(9.00" to 9.00")	3,293	SQ YD	*	$50.00	/ SQ YD	$164,650
CURB & GUTTER		0	LIN FT		$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 1.75")	0	TONS	*	$20.00	/ TON	$0
IMPROVED SUBGRADE:	Modified Soil Width = 0.0'	0	SQ YD	*	$20.00	/ SQ YD	$0
SUBBASE GRAN MATL TY A 8		9,147	UNITS	*	$27.00	/ UNITS	$246,969
Reserved For User Supplied Item		0	UNITS		$0.00	/ UNITS	$0
PAVEMENT REMOVAL		7,707	SQ YD		$17.00	/ SQ YD	$131,019
SHOULDER REMOVAL		3,293	SQ YD	*	$14.00	/ SQ YD	$46,102

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$1,565,886
RIGID CONSTRUCTION ANNUAL COST PER MILE	$116,681

MAINTENANCE COSTS:

ITEM	THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY					$0.00	/ LANE-MILE / YEAR
HMA POLICY OVERLAY	(2.50")			2.50		
HMA POLICY OVERLAY PVMT	(2.50")	1.0087		2.50	$16.77	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0052	Surface Mix	1.50	$11.15	/ SQ YD
HMA BINDER MIX	(1.00")	1.0139	eling Binder Mix	1.00	$5.62	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")		Shoulder Mix	2.50	$14.28	/ SQ YD
CLASS A PAVEMENT PATCHING					$195.00	/ SQ YD
CLASS B PAVEMENT PATCHING					$150.00	/ SQ YD
CLASS C SHOULDER PATCHING					$145.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)			Surface Mix	1.50	$81.09	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")			Surface Mix	2.50	$88.48	/ 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	$1,760,905
RIGID TOTAL ANNUAL COST PER MILE	$131,212

JPCP

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

10/22/15

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%	10	SQ YD	$150.00		$1,500	
	PWFn =	0.7441		PW =	0.7441	X	$1,500	$1,116
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	20	SQ YD	$150.00		$3,000	
	PWFn =	0.6419		PW =	0.6419	X	$3,000	$1,926
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	203	SQ YD	$150.00		$30,450	
	SHOULDER PATCH CLASS C	0.50%	16	SQ YD	$145.00		$2,320	
	LONGITUDINAL SHLD JT R&S	100.00%	5,780	LIN FT	$2.00		$11,560	
	CENTERLINE JT R&S	100.00%	2,890	LIN FT	$2.00		$5,780	
	PWFn =	0.5537		PW =	0.5537	X	$50,110	$27,745
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	305	SQ YD	$150.00		$45,750	
	SHOULDER PATCH CLASS C	1.00%	33	SQ YD	$145.00		$4,785	
	PWFn =	0.4776		PW =	0.4776	X	$50,535	$24,136
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	407	SQ YD	$150.00		$61,050	
	SHOULDER PATCH CLASS C	1.50%	49	SQ YD	$145.00		$7,105	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	10,174	SQ YD	$16.77		$170,585	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	3,292	SQ YD	$14.28		$47,016	
	PWFn =	0.4120		PW =	0.4120	X	$285,756	$117,728
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	5,780	LIN FT	$2.00		$11,560	
	CENTERLINE JT R&S	100.00%	2,890	LIN FT	$2.00		$5,780	
	RANDOM CRACK R&S	50.00%	2,890	LIN FT	$2.00		$5,780	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,853	LIN FT	$2.00		$3,706	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	10	SQ YD	$88.48		$885	
	PWFn =	0.3554		PW =	0.3554	X	$27,711	$9,848
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	51	SQ YD	$150.00		$7,650	
	LONGITUDINAL SHLD JT R&S	100.00%	5,780	LIN FT	$2.00		$11,560	
	CENTERLINE JT R&S	100.00%	2,890	LIN FT	$2.00		$5,780	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	2,779	LIN FT	$2.00		$5,558	
	RANDOM CRACK R&S	50.00%	2,890	LIN FT	$2.00		$5,780	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	51	SQ YD	$88.48		$4,512	
	PWFn =	0.3066		PW =	0.3066	X	$40,840	$12,520
								$195,019
	ROUTINE MAINTENANCE ACTIVITY		1.09	Lane Miles	$0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$195,019
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$14,532

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 10/21/15 8:17 AM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$1,565,886	$1,135,385
		ANNUAL COST PER MILE	$116,681	$84,602
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$195,019	$345,246
		ANNUAL COST PER MILE	$14,532	$25,726
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$1,760,905	$1,480,631
		ANNUAL COST PER MILE	$131,212	$110,328

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$110,328**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$131,212**	**18.9%**

P:\Pavement Design Stuff\D-8\IL 111 at David Lane [HSR]\[IL 111 at David Lane Piasa Township (HSR) IDOT Mechanistic Pavement Design with LCCA.xlsm]LifeCy