Illinois Department of Transportation

To:	Kensil Garnett	Attn: District Four
From:	Maureen M. Addis	
Subject:	Pavement Design	
Date:	January 4, 2016	

FAP Route 317A/622 (US24/IL 97/IL 100)
Section (129,20)N
Fulton County
With Main Street in Lewistown

We have reviewed the revised pavement selection for the above captioned section, which was submitted with by email dated December 8, 2015. The district has reconsidered the composite design, and has decided to not pursue it. The project is less than 2 lane-miles, and is not subject to alternate bidding. The LCCA favors a rigid design by more than 10%.

The approved pavement design is as follows:

US 24/IL 97/IL 100 (Pavement Reconstruction)

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

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

COVER

ILLINOIS DEPARTMENT OF TRANSPORTATION

REGION 3, DISTRICT 4

PAVEMENT DESIGN
(LEWISTOWN INTERSECTION)

ROUTE:	FAP 317A/622
SECTION:	(129,20)N
COUNTY:	FULTON
CATALOG:	034922-00P
JOB NO:	P-94-017-13
CONTRACT:	68B45

SUBMITTED BY:

GEORGE ELIAS
(DESIGNER)

CHRISTOPHER MAUSHARD
(PROJECT ENGINEER)

06/10/2015
(DATE)

REVIEWED AND APPROVED BY:

(ENGINEER)

(DATE)

RECOMMENDATION

The proposed improvements consist of the construction of new intersection approximately 5,295 square yards of new pavement on Route US 24 / IL 100 & IL 97 in Lewistown, IL in Fulton County. According to Chapter 54 of the BDE Manual a mechanistic design of jointed PCC pavement shall be compared with mechanistic full-depth HMA pavement. This segment of roadway is within an urban area so use of lime modified soils are not advised. Also, the staging of pavement construction will require short segments to be placed at intersections and driveways. The typical sections indicate the edge of pavement will be supported by B-6.24 CCC&G which will require the installation of a storm sewer system.

The result of the rigid pavement design was a 9.0" jointed PCC pavement placed on 12" aggregate subgrade. The full-depth HMA design yielded a 10.75" HMA pavement on 12" aggregate subgrade.

According to the life cycle cost analysis, the present cost per mile per year for the 9.0"

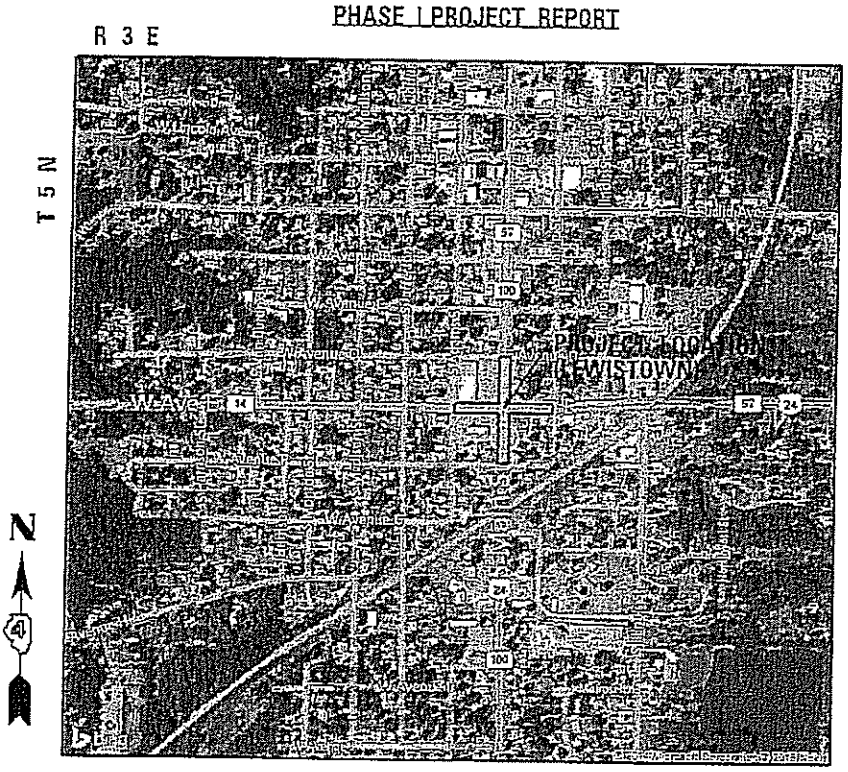
Rigid PCC pavement is **$ 59,929**, and the present cost per mile per year for the 10.75" flexible HMA pavement is **$ 68,190** this is a difference of about **13.8 %.** According to section 54-1.04 this project is not required to be an alternate bid.

Composite Pavement

A waiver is requested to use composite pavement instead of rigid pavement due to the difficulty of constructability of concrete joints for the full depth PCC pavement option or the difficulty of placing the full depth HMA pavement with the traffic staging which will require various sections of pavement to be constructed in order to maintain traffic through the work zone during construction. Using the composite pavement as a method for constructing the project will be

Illinois Department of Transportation

PHASE I PROJECT REPORT



FAP 317A /630 ROUTE US 24 /IL 100, IL 97

COUNTY FULTON

PHASE I JOB NO: P-94-017-13

CATALOG NO: 034922-00D

CONTRACT NO: 68B45

PREPARED BY:

M. HUDELSON & G. ELIAS

STUDIES & PLANS

PROGRAM DEVELOPMENT

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

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 01/04/2016

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: US24 / IL 100
Section: (129,20)N
County: FULTON
Location: LEWISTOWN, IL
Comments: INTERSECTION IMPROVEMENT
Design Date: 06/10/2015
Modify Date:

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

<-- BY
<-- BY

	ADT	Year
Current:	6,050	2013
Future:	7,342	2026

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	6,828	93.0%	P = 50%
SU =	250	235	3.2%	S = 50%
MU =	750	279	3.8%	M = 50%
Struct. Design ADT =		7,342	(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) =	1.35	(Actual ADT)	TF rigid (Actual) =	1.91	(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. = 78.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 610 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 = 16.00 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
HMA Overlay Design Thickness = 7.75 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = 11.50 in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 7.75 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: 01/04/2016

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	US24 / IL 100
SECTION	(129,20)N
COUNTY	FULTON
LOCATION	LEWISTOWN, IL
FACILITY TYPE	NON-INTERSTATE

PROJECT LENGTH			1324 FT	= = > 0.25 Miles
# OF CENTERLINES			1 CL	
# OF LANES			3 LANES	
# OF EDGES			2 EP	
LANE WIDTH - AVERAGE			12 FT	
SHOULDER WIDTH	HMA	Left	0 FT	
	HMA	Right	0 FT	
	Total Width of Paved Shoulders		0 FT	

PAVEMENT THICKNESS (FLEXIBLE)	10.75 IN	16.00 IN MAX	
SHOULDER THICKNESS	0.00 IN	HMA_SS	Standard Design
POLICY OVERLAY THICKNESS	2.25 IN		

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	3.17	1.35	3.17

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	$105.64	/ TON
HMA TOP BINDER	$86.31	/ TON
HMA LOWER BINDER	$85.85	/ TON
HMA BINDER (LEVELING)	$0.00	/ TON
HMA SHOULDER	$0.00	/ TON

INITIAL COSTS

ITEM	THICKNESS		100% QUANTITY	UNIT	UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(10.75")	0.2292	5,296	SQ YD	$55.25	/ SQ YD	$292,621	~
HMA SURFACE COURSE	(2.00")	1.0046	596	TONS	$105.64	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	1.0145	677	TONS	$86.31	/ TON	$0	
HMA LOWER BINDER COURSE	(6.50")	1.0347	1,995	TONS	$85.85	/ TON	$0	
HMA SHOULDER	(0.00")	0	0	TONS	$0.00	/ TON	$0	~
CURB & GUTTER			0	LIN FT	$30.00	/ LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)			87	TONS	$29.61	/ TON	$2,576	
IMPROVED SUBGRADE:	Modified Soil	Width = 39.5'	5,707	SQ YD	$0.00	/ SQ YD	$0	
Reserved For User Supplied Item			0	UNITS	$0.00	/ UNITS	$0	
Reserved For User Supplied Item			0	UNITS	$0.00	/ UNITS	$0	
PAVEMENT REMOVAL			5,296	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	$295,197
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$48,013

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY						$0.00	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	1.0046	Surface Mix	2.00	$11.89	/ SQ YD
HMA OVERLAY PVMT		(2.25")	1.0092		2.25	$8.90	/ SQ YD
HMA SURFACE MIX		(1.50")	1.0035	Surface Mix	1.50	$8.90	/ SQ YD
HMA BINDER MIX		(0.75")	1.0035	eling Binder Mix	0.75	$0.00	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(2.25")		Shoulder Mix	2.25	$0.00	/ SQ YD
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	$0.00	/ SQ YD
MILLING (2.00 IN)					2.00	$3.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	$81.83	/ SQ YD
PARTIAL DEPTH SHLD PATCH		(Mill & Fill Surf)		Shoulder Mix	2.00	$70.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill +2.00 ")		Leveling Binder Mix	2.00	$70.00	/ SQ YD
PARTIAL DEPTH SHLD PATCH		(Mill & Fill +2.00 ")		Shoulder Mix	2.00	$70.00	/ 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	$421,825
FLEXIBLE TOTAL ANNUAL COST PER MILE	$68,609

HMA_SD

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE 01/04/16

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%	2,648	LIN FT	$2.00		$5,296	
	CNTR LINE JOINT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RNDM / THRM CRACK R&S	50.00%	2,185	LIN FT	$2.00		$4,370	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$81.83		$409	
	PWFn =	0.8626		PW =	0.8626	X	$12,723	$10,975
YEAR 10								
	LONG SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CNTR LINE JOINT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RNDM / THRM CRACK R&S	50.00%	2,185	LIN FT	$2.00		$4,370	
	PD PVMT PATCH M&F SURF	0.50%	26	SQ YD	$81.83		$2,128	
	PWFn =	0.7441		PW =	0.7441	X	$14,442	$10,746
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	5,296	SQ YD	$3.00		$15,888	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	53	SQ YD	$70.00		$3,710	
	HMA OVERLAY PVMT 2.00"	100.00%	5,296	SQ YD	$11.89		$62,951	
	HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	$0.00		$0	
	PWFn =	0.6419		PW =	0.6419	X	$82,549	$52,985
YEAR 20								
	LONG SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CNTR LINE JOINT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RNDM / THRM CRACK R&S	50.00%	2,185	LIN FT	$2.00		$4,370	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$81.83		$409	
	PWFn =	0.5537		PW =	0.5537	X	$12,723	$7,044
YEAR 25								
	LONG SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CNTR LINE JOINT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RNDM / THRM CRACK R&S	50.00%	2,185	LIN FT	$2.00		$4,370	
	PD PVMT PATCH M&F SURF	0.50%	26	SQ YD	$81.83		$2,128	
	PWFn =	0.4776		PW =	0.4776	X	$14,442	$6,898
HMA_SD								
YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	5,296	SQ YD	$3.00		$15,888	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	106	SQ YD	$70.00		$7,420	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	$70.00		$0	
	HMA OVERLAY PVMT 2.25 "	100.00%	5,296	SQ YD	$8.90		$47,159	
	HMA OVERLAY SHLD 2.25 "	100.00%	0	SQ YD	$0.00		$0	
	PWFn =	0.4120		PW =	0.4120	X	$70,467	$29,031
YEAR 35								
	LONG SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CNTR LINE JOINT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RNDM / THRM CRACK R&S	50.00%	2,185	LIN FT	$2.00		$4,370	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$81.83		$409	
	PWFn =	0.3554		PW =	0.3554	X	$12,723	$4,522
YEAR 40								
	LONG SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CNTR LINE JOINT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RNDM / THRM CRACK R&S	50.00%	2,185	LIN FT	$2.00		$4,370	
	PD PVMT PATCH M&F SURF	0.50%	26	SQ YD	$81.83		$2,128	
	PWFn =	0.3066		PW =	0.3066	X	$14,442	$4,427
								$126,628
	ROUTINE MAINTENANCE ACTIVITY		0.75	Lane Miles	0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$126,628
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$20,596

PCC PAVEMENT

JPCP

ROUTE	US24 / IL 100
SECTION	(129,20)N
COUNTY	FULTON
LOCATION	LEWISTOWN, IL
FACILITY TYPE	NON-INTERSTATE

PROJECT LENGTH			1324 FT = = >	0.25 Miles
# OF CENTERLINES			1 CL	
# OF LANES			3 LANES	
# OF EDGES			2 EP	
LANE WIDTH - AVERAGE			12 FT	
SHOULDER WIDTH	PCC	Left	0 FT	
	PCC	Right	0 FT	
	Total Width of Paved Shoulders		0 FT	

PAVEMENT THICKNESS (RIGID)	JPCP	9.00 IN	TIED SHLD
SHOULDER THICKNESS		0.00 IN	
POLICY OVERLAY THICKNESS		2.50 IN	

RIGID PAVEMENT TRAFFIC FACTORS		MINIMUM	ACTUAL	USE
		4.59	1.91	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")	5,296	SQ YD	$56.22	/ SQ YD	$297,741
PAVEMENT REINFORCEMENT		0	SQ YD	$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	5,737	SQ YD	$0.00	/ SQ YD	$0
PCC SHOULDERS	(0.00" to 0.00")	0	SQ YD	$40.00	/ SQ YD	$0
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 5.05")	127	TONS	$28.59	/ TON	$3,631
IMPROVED SUBGRADE:	Modified Soil Width = 37.0'	5,443	SQ YD	$0.00	/ SQ YD	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		5,296	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	$301,372
RIGID CONSTRUCTION ANNUAL COST PER MILE	$49,018

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")	1.0058		2.50	$8.90	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0035	Surface Mix	1.50	$8.90	/ SQ YD
HMA BINDER MIX	(1.00")	1.0093	eling Binder Mix	1.00	$0.00	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")		Shoulder Mix	2.50	$0.00	/ 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	$78.87	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")			Surface Mix	2.50	$84.79	/ 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	$372,088
RIGID TOTAL ANNUAL COST PER MILE	$60,519

JPCP

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

01/04/16

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%	5	SQ YD	$150.00		$750	
	PWFn =	0.7441		PW =	0.7441	X	$750	$558
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	11	SQ YD	$150.00		$1,650	
	PWFn =	0.6419		PW =	0.6419	X	$1,650	$1,059
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	106	SQ YD	$150.00		$15,900	
	SHOULDER PATCH CLASS C	0.50%	0	SQ YD	$145.00		$0	
	LONGITUDINAL SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CENTERLINE JT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	PWFn =	0.5537		PW =	0.5537	X	$23,844	$13,202
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	159	SQ YD	$150.00		$23,850	
	SHOULDER PATCH CLASS C	1.00%	0	SQ YD	$145.00		$0	
	PWFn =	0.4776		PW =	0.4776	X	$23,850	$11,391
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	212	SQ YD	$150.00		$31,800	
	SHOULDER PATCH CLASS C	1.50%	0	SQ YD	$145.00		$0	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	5,296	SQ YD	$8.90		$47,159	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	0	SQ YD	$0.00		$0	
	PWFn =	0.4120		PW =	0.4120	X	$78,959	$32,530
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CENTERLINE JT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	RANDOM CRACK R&S	50.00%	1,986	LIN FT	$2.00		$3,972	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,267	LIN FT	$2.00		$2,534	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	5	SQ YD	$84.79		$424	
	PWFn =	0.3554		PW =	0.3554	X	$14,874	$5,286
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	26	SQ YD	$150.00		$3,900	
	LONGITUDINAL SHLD JT R&S	100.00%	2,648	LIN FT	$2.00		$5,296	
	CENTERLINE JT R&S	100.00%	1,324	LIN FT	$2.00		$2,648	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,901	LIN FT	$2.00		$3,802	
	RANDOM CRACK R&S	50.00%	1,986	LIN FT	$2.00		$3,972	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	26	SQ YD	$84.79		$2,205	
	PWFn =	0.3066		PW =	0.3066	X	$21,823	$6,690
								$70,716
	ROUTINE MAINTENANCE ACTIVITY		0.75	Lane Miles	$0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$70,716
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$11,502

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

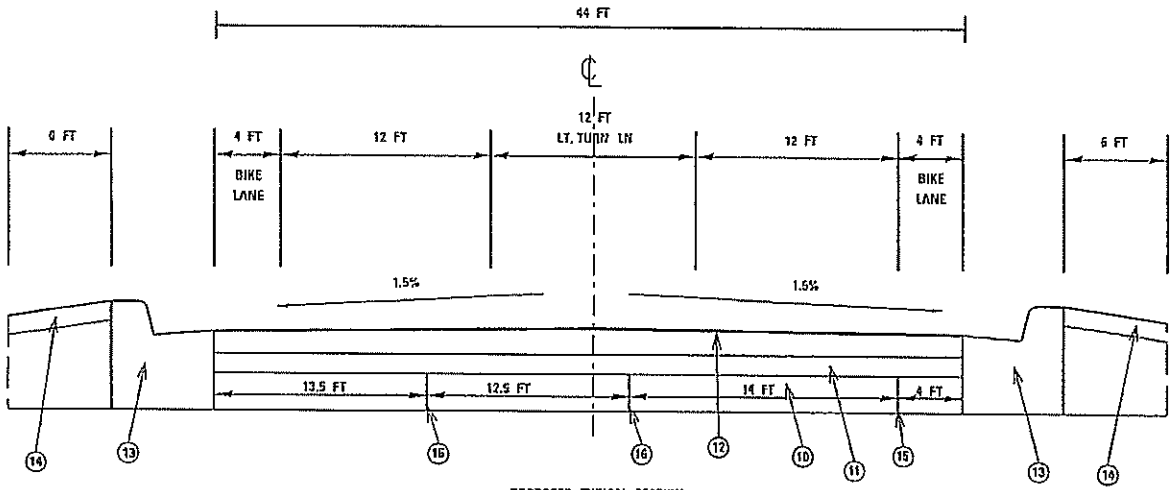
Calculated / Revised : 6/10/15 9:25 AM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$301,372	$295,197
		ANNUAL COST PER MILE	$49,018	$48,013
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$70,716	$126,628
		ANNUAL COST PER MILE	$11,502	$20,596
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$372,088	$421,825
		ANNUAL COST PER MILE	$60,519	$68,609

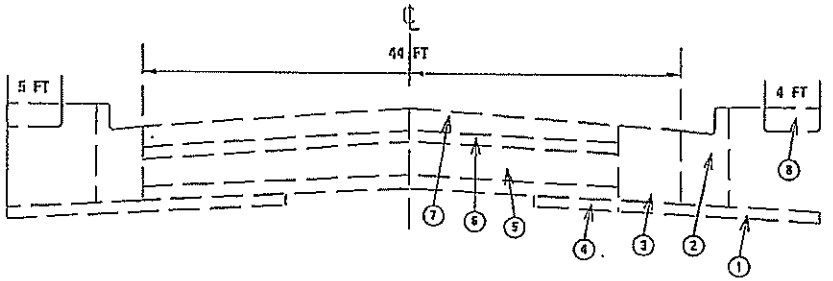
LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**JPCP**	**$60,519**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**HMA**	**$68,609**	**13.4%**

P:\Pavement Design Stuff\D-4\US 24-IL 97-IL 100 with South Main Street in Lewistown\[US 24-IL 97-IL 100 at South Main Street in Lewistown Mechanistic Pavt Desig



PROPOSED TYPICAL SECTION
SOUTH MAIN ST.
IL 100 /97 (NORTH)
STA. 100+00 TO 102+38



EXISTING TYPICAL SECTION
SOUTH MAIN ST.
IL 100 /97 (NORTH)
STA. 100+00 TO 102+38

1. Existing 4" Sub-Base Granular Material, type B
2. Existing CC&G, type B-6.12
3. Existing PCC Base Course, 8"
4. Existing Granular Sub-Base Course
5. Existing PCC or GRAVEL Base Course
6. Existing Bituminous Concrete Surface Course 8" Overlay Course
7. Existing 2" Bituminous Concrete Surface Course (Class I) Mix, " D "
8. Existing 4" PCC Sidewalk

10. Proposed PCC Base Course 7.5"
11. Proposed HMA Leveling Binder 1"
12. Proposed HMA Surface Course 1.5"
13. Proposed B-6.24 CCC&G
14. Proposed 4" PCC Sidewalk
15. Proposed Saw Cut
16. Proposed Construction Joint

NOT TO SCALE

FILE NAME =	USER NAME =	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTION	F.A.P. 317/630	SECTION 1129.2011	COUNTY FULTON
		DRAWN -	REVISED -				RTE. US 24/IL 100	CONTRACT NO. 60645
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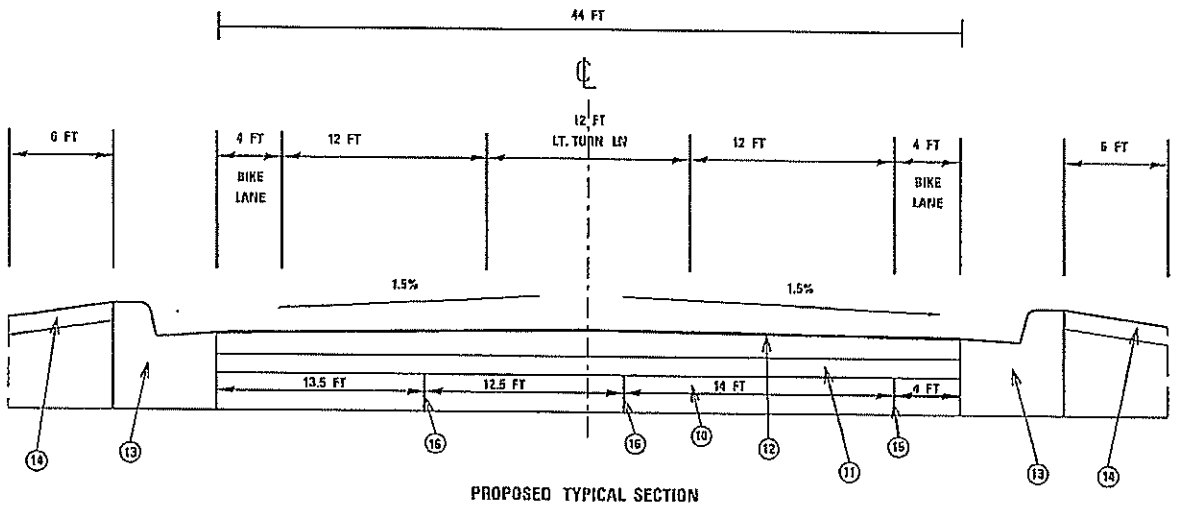
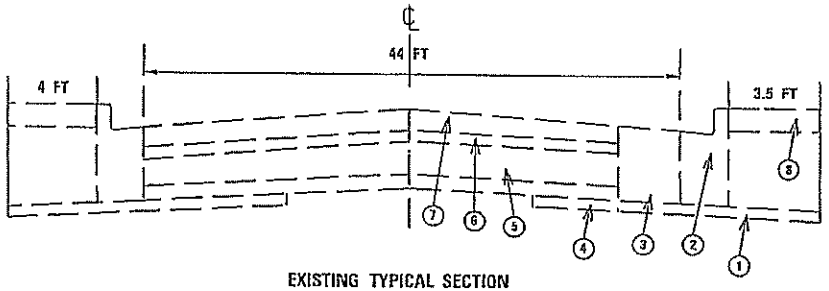
	PLOT DATE = 7/23/2015	DATE -	REVISED -		SCALE: SHEET OF SHEETS STA. TO STA.			



PROPOSED TYPICAL SECTION
SOUTH MAIN ST.
IL 100 /US 24 (SOUTH)
STA. 97+13 TO 100+00

1. Existing 4" Sub-Base Granular Material, type B
2. Existing CC&G, type B-6.12
3. Existing PCC Base Course, 8"
4. Existing Granular Sub-Base Course
5. Existing PCC or GRAVEL Base Course
6. Existing Bituminous Concrete Surface Course 8" Overlay Course
7. Existing 2" Bituminous Concrete Surface Course (Class I) Mix, " D "
8. Existing 4" PCC Sidewalk

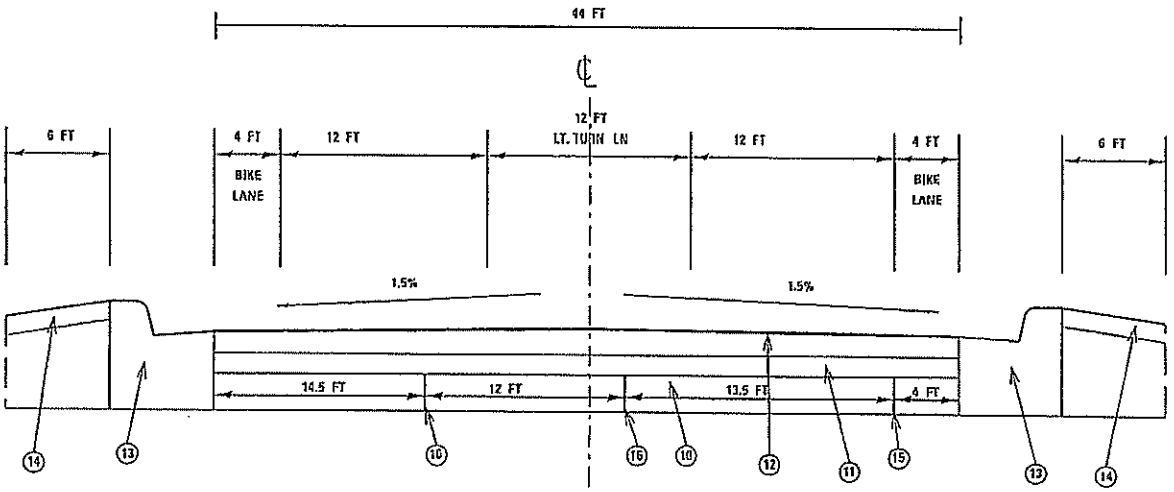
10. Proposed PCC Base Course 7.5"
11. Proposed HMA Leveling Binder 1"
12. Proposed HMA Surface Course 1.5"
13. Proposed B-6.24 CCC&G
14. Proposed 4" PCC Sidewalk
15. Proposed Saw Cut
16. Proposed Construction Joint



EXISTING TYPICAL SECTION
SOUTH MAIN ST.
IL 100 /US 24 (SOUTH)
STA. 97+13 TO 100+00

NOT TO SCALE

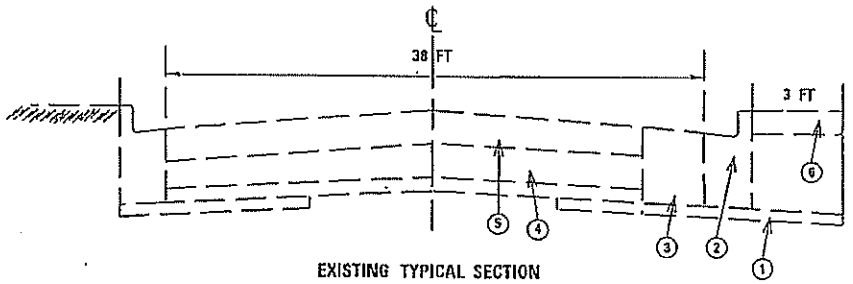
FILE NAME =	USER NAME =	DESIGNED =	REVISED =	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTION	F.A.P. 337 / 630	SECTION 1139.2WM / RTE. US 24/IL 100	COUNTY FULTON	TOTAL SHEETS	SHEET NO.
	PLOT SCALE =	DRAWN =	REVISED =		SCALE:		CONTRACT NO. 69845			
	PLOT DATE =	CHECKED =	REVISED =		SHEET OF SHEETS STA. TO STA.					
		DATE =	REVISED =							



PROPOSED TYPICAL SECTION
IL 97 /US 24
(EAST AVE. E)
1+00 TO 3+48

1. Existing 4" Sub-Base Granular Material, type B
2. Existing CC&G, type B-6.12
3. Existing PCC Base Course, 8"
4. Existing Granular Sub-Base Course
5. Existing PCC or GRAVEL Base Course
6. Existing Bituminous Concrete Surface Course 8" Overlay Course
7. Existing 2" Bituminous Concrete Surface Course (Class I) Mix, " D "
8. Existing 4" PCC Sidewalk

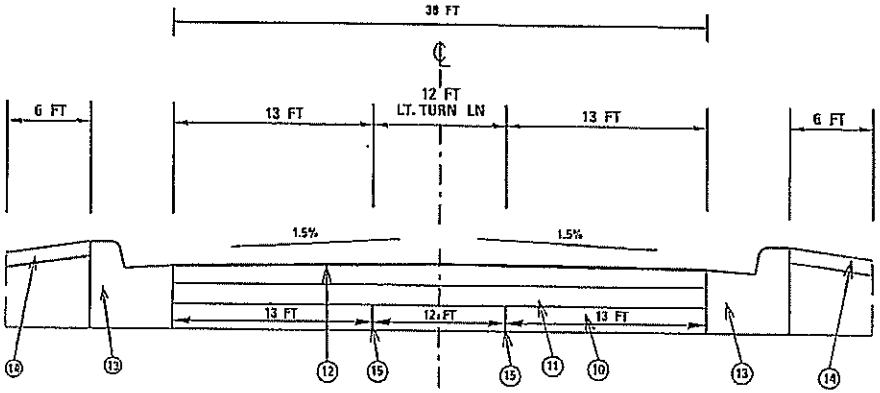
10. Proposed PCC Base Course 7.5"
11. Proposed HMA Leveling Binder 1"
12. Proposed HMA Surface Course 1.5"
13. Proposed B-6.24 CCC&G
14. Proposed 4" PCC Sidewalk
15. Proposed Saw Cut
16. Proposed Construction Joint



EXISTING TYPICAL SECTION
IL 97 /US 24
(EAST AVE. E)
1+00 TO 3+48

NOT TO SCALE

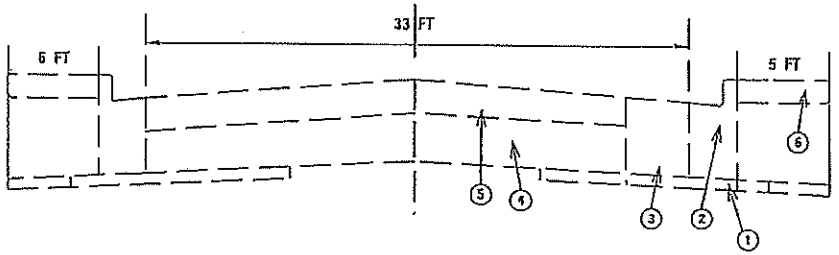
FILE NAME =	USER NAME =	DESIGNED =	REVISED =	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTION (D)	SECTION	COUNTY
		DRAWN =	REVISED =			1129.20M	FULTON
Default	PLOT SCALE = 3333.3367 ' / in.	CHECKED =	REVISED =		SCALE: SHEET OF SHEETS STA. TO STA.	US 24/IL 100	CONTRACT NO. 60845
	PLOT DATE = 7/23/2010	DATE =	REVISED =				



PROPOSED TYPICAL SECTION
(WEST AVE. E)
STA. 7+54 TO 10+00

1. Existing 4" Sub-Base Granular Material, type B
2. Existing CC&G, type B-6.12
3. Existing PCC Base Course, 8"
4. Existing Granular Sub-Base Course
5. Existing PCC or GRAVEL Base Course
6. Existing Bituminous Concrete Surface Course 8" Overlay Course
7. Existing 2" Bituminous Concrete Surface Course (Class I) Mix, " D "
8. Existing 4" PCC Sidewalk

10. Proposed PCC Base Course 7.5"
11. Proposed HMA Leveling Binder 1"
12. Proposed HMA Surface Course 1.5"
13. Proposed B-6.24 CCC&G
14. Proposed 4" PCC Sidewalk
15. Proposed Saw Cut



EXISTING TYPICAL SECTION
(WEST AVE. E)
STA. 7+54 TO 10+00

NOT TO SCALE

FILE NAME =	USER NAME =	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTION	F.A.P. 317 630	SECTION 1129,20IH
		DRAWN -	REVISED -				RTE. US 24/IL 100
	PLOT SCALE =	CHECKED -	REVISED -				COUNTY
	PLOT DATE =	DATE -	REVISED -		SCALE: SHEET OF SHEETS STA. TO STA.		FULTON
							CONTRACT NO. 60845