



Illinois Department of Transportation

Office of Highways Project Implementation / Region 3 / District 5
13473 IL Highway 133 / P.O. Box 610 / Paris, Illinois 61944

September 24, 2020

PROGRAM DEVELOPMENT

Pavement Design Submittal
Route FAP 693 (ILL 9)
Section 109 RS-4
McLean County
Contract No. 70F20
Job No. D-95-015-21

Mr. Michael Brand
IDOT BDE
2300 S. Dirksen Parkway
Room 326
Springfield, IL 62764

Dear Mr. Brand:

The purpose of this letter is to transmit a pavement design for FAP 693 (ILL 9 / E. Empire Street) from Towanda Avenue to Center Street in Bloomington for your approval.

We are proposing to replace the existing pavement with a 9-inch Jointed Portland Concrete Pavement (JPCP) with a 12-inch Aggregate Subgrade Improvement. This design was chosen over an 11-inch Full Depth Hot-Mix Asphalt (FD-HMA) pavement because the Life Cycle Cost Analysis showed that the cost of the FD-HMA would be more than 10% higher than the cost of the JPCP. The Aggregate Subgrade Improvement was chosen over a Lime Modified Soil to keep the dust pollution to a minimum because of the urban nature of the job. This rehabilitation strategy was presented to the TAMP committee and their concurrence was given on April 6, 2020.

The Pavement Designs and Life Cycle Cost Analysis were calculated using the *IDOT Mechanistic Pavement Design* spreadsheet. The 4-inch stabilized subbase was removed from the design per comments from Mr. Brand.

Included in this submittal are the following: Location Map, Typical Sections, Design Calculations, Life Cycle Cost Analysis, and various Emails. A Subgrade Stability Chart was not included because after consultation with our Geotechnical Engineer we assumed that the subgrade stability was poor.

If you have any questions or require additional information, please contact Mr. Brian Hogan, P.E., at 217-466-7302.

Sincerely,

A handwritten signature in blue ink that reads "Kensil A. Garnett" followed by a stylized flourish.

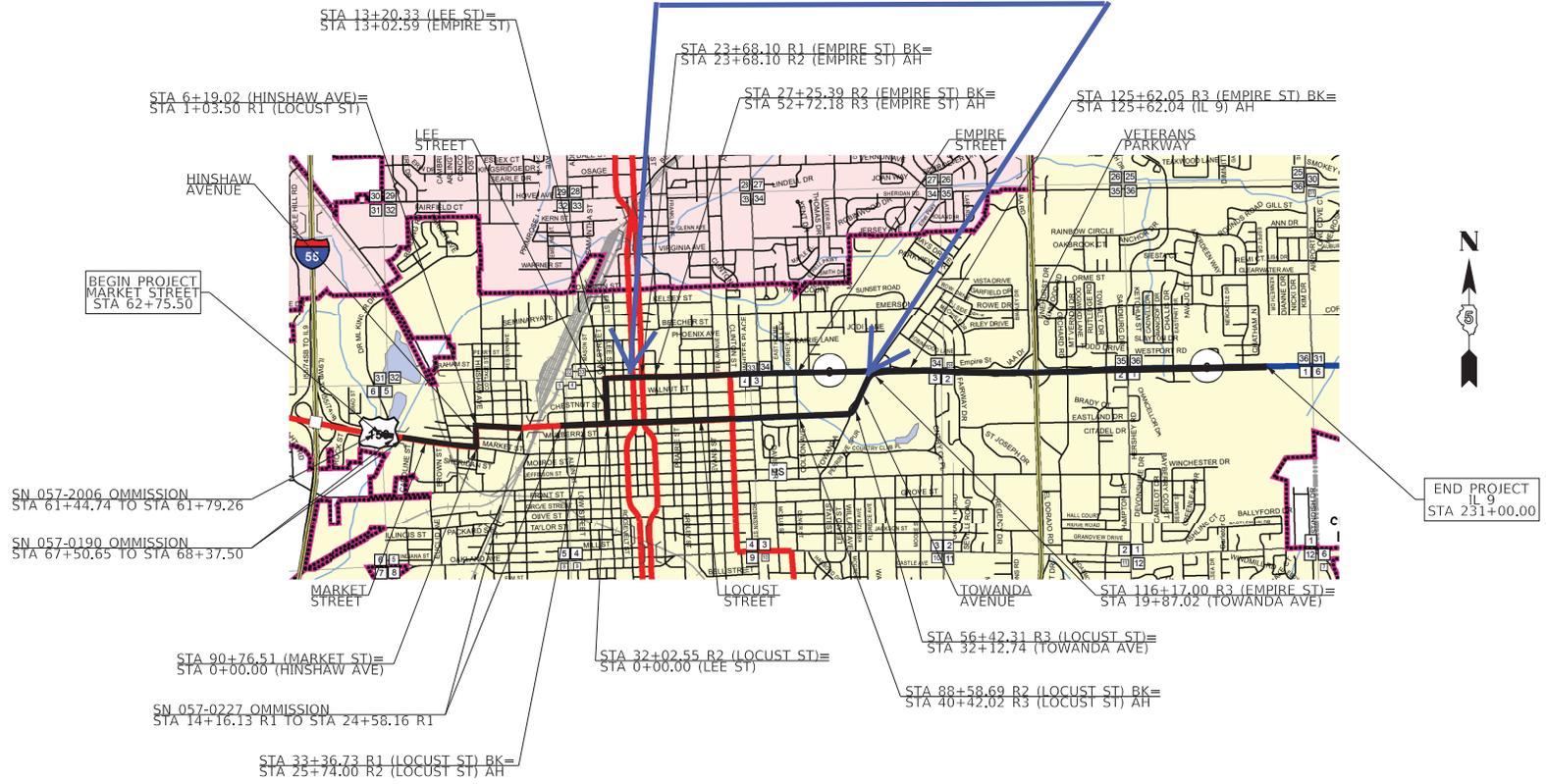
Kensil A. Garnett, P.E.
Region Three Engineer

LOCATION MAP

F.A.P. 693 (IL 9/US 150)
SECTION (129, 109)R53(16,4,1)CS(10FR)RS
MCLEAN COUNTY

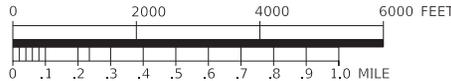
EAST OF I-74 TO
WEST OF CARNAHAN DRIVE
IN BLOOMINGTON, ILLINOIS

LIMITS OF PAVEMENT REPLACEMENT

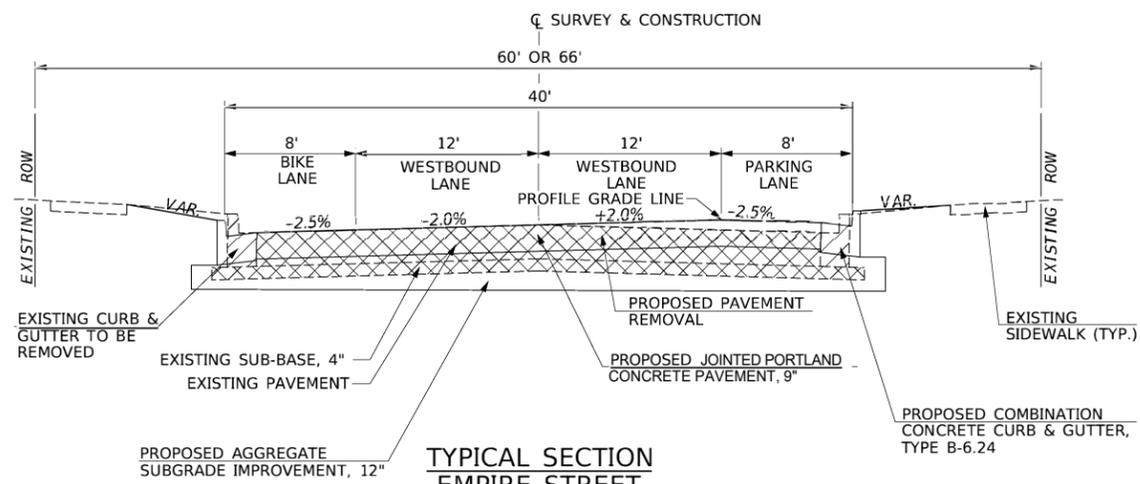


JOB LIMITS

SCALE



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**TYPICAL SECTION
 EMPIRE STREET**
 CENTER ST TO CLINTON ST
 STA 20+57.54 R1 TO STA 23+72.13 R1
 STA 23+72.13 R1 BK = STA 23+68.10 R2 AH
 STA 23+68.10 R2 TO STA 27+25.39 R2
 STA 27+25.39 R2 BK = STA 52+72.18 R3 AH
 STA 52+72.18 R3 TO STA 74+50.00 R3

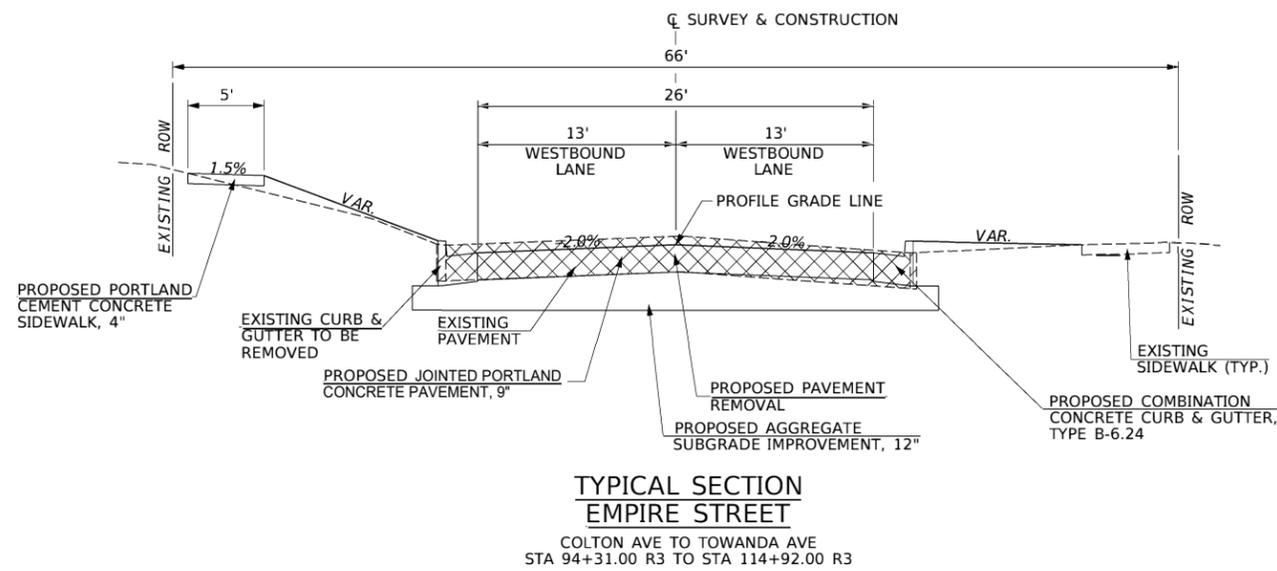
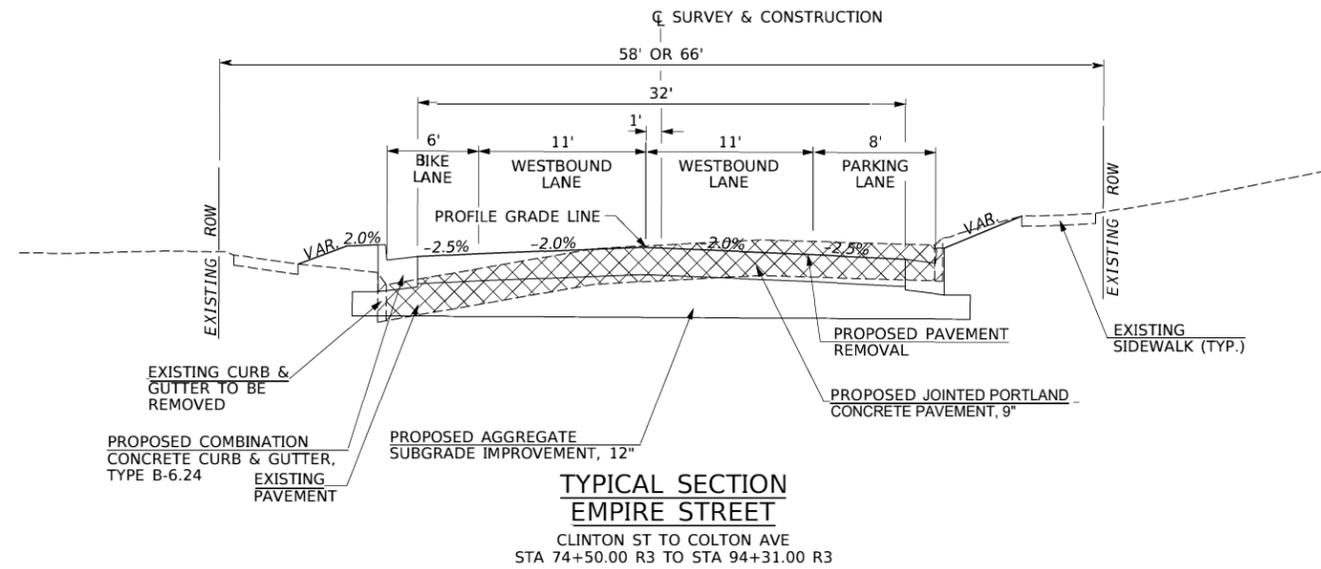
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	DRAWN - JCW	REVISED -
PLOT SCALE = 2.0000' / in.	CHECKED - AWM	REVISED -
PLOT DATE = 7/23/2020	DATE -	REVISED -

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

**FAP 693 (IL RTE 9)
 PROPOSED TYPICAL SECTIONS**

SCALE: SHEET 7 OF 9 SHEETS STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
693	109 RS-4	MCLEAN	-	-
			CONTRACT NO. 70F20	
ILLINOIS FED. AID PROJECT				



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USER NAME =	DESIGNED - BMB	REVISED -
	DRAWN - JCW	REVISED -
PLOT SCALE = 2:0000' / in.	CHECKED - AWM	REVISED -
PLOT DATE = 7/23/2020	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**FAP 693 (IL RTE 9)
PROPOSED TYPICAL SECTIONS**

SCALE: SHEET 8 OF 9 SHEETS STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
693	109 RS-4	MCLEAN	-	-
CONTRACT NO. 70F20				
ILLINOIS FED. AID PROJECT				

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: **FAP 693 (ILL 9)** Comments: **USING MIN TRAFFIC FACTOR**
 Section: **109 RS-4**
 County: **McLean** Design Date: **12/30/2019** **BJH** <-- BY
 Location: **E Empire from Towanda to Center** Modify Date: <-- BY

	ADT	Year
Current:	7,500	2019
Future:	8,300	2039

Facility Type: **Other Marked State Route**
 # of Lanes = **2 or 3**
 Part of future 4 lanes or more? **No**
 One Way Street? **Yes**
 Road Class: **I**
 Subgrade Support Rating (SSR): **Poor**
 Construction Year: **2022**
 Design Period (DP) = **20** years

	Structural Design Traffic			% of ADT in Design Lane
	Minimum ADT	Actual ADT	Actual % of Total ADT	
PV =	0	7,571	94.4%	P = 50%
SU =	250	265	3.3%	S = 50%
MU =	750	184	2.3%	M = 50%
Struct. Design ADT =	8,020 (2032)			

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT

Cpv = 0.15
 Csu = **132.5**
 Cmu = **482.53**
 TF flexible (Actual) = 1.25 (Actual ADT)
 TF flexible (Min) = 3.95 (Min ADT Fig. 54-2.C)

RIGID PAVEMENT

Cpv = 0.15
 Csu = **143.81**
 Cmu = **696.42**
 TF rigid (Actual) = 1.68 (Actual ADT)
 TF rigid (Min) = 5.58 (Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 3.95
 PG Grade Lower Binder Lifts = **PG 64-22** (Fig. 53-4.O)
 HMA Mixture Temp. = **77.0** deg. F (Fig. 54-5.C)
 Design HMA Mixture Modulus (E_{HMA}) = 630 ksi (Fig. 54-5.D)
 Design HMA Strain (ε_{HMA}) = 81 (Fig. 54-5.E)
 Full Depth HMA Design Thickness = 11.00 in. (Fig. 54-5.F)
 Limiting Strain Criterion Thickness = **15.50** in. (Fig. 54-5.I)

Goto Map

Goto Map

Use Full-Depth HMA Thickness = 11.00 inches

JPC Pavement

Use TF rigid = 5.58
 Edge Support = **Tied** Shoulder or C&G
Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 5.58
 IBR value = **3**
CRCP Thickness = 8.25 in. (Fig. 54-4.M)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Pavement Over Rubblized PCC

Use TF flexible = 3.95
 HMA Overlay Design Thickness = 8.00 in. (Fig. 54-5.U)
 Limiting Strain Criterion Thickness = **11.25** in. (Fig. 54-5.V)

Goto Map

Use HMA Overlay Thickness = 8.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT RESEARCH 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)

Facility Type	Min. Str. Design Traffic (Fig 54-2.C)		
	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

Class	Traffic Factor ESAL Coefficients			
	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

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

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%

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE FAP 693 (ILL 9)
 SECTION (129,109)RS3(16,4,1)CS(10FR)RS
 COUNTY McLean
 LOCATION E Empire from Towanda to Center

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 7000 FT ==> 1.33 Miles
 # OF CENTERLINES 2 CL
 # OF LANES 2 LANES
 # OF EDGES 4 EP
 LANE WIDTH - AVERAGE 17.41 FT
 SHOULDER WIDTH HMA Inside 0 FT
 HMA Outside 0 FT
 Total Width of Paved Shoulders 0 FT

PAVEMENT THICKNESS (FLEXIBLE) 11.00 IN 15.50 IN MAX
 SHOULDER THICKNESS 0.00 IN HMA_SD Standard Design
 HMA OVERLAY THICKNESS 2.00 IN

FLEX PAVEMENT TRAFFIC FACTORS MINIMUM ACTUAL USE
 3.95 1.25 3.95

Read Me!

HMA COST PER TON UNIT PRICE
 HMA SURFACE \$130.00 / TON
 HMA TOP BINDER \$110.00 / TON
 HMA LOWER BINDER \$85.00 / TON
 HMA BINDER (IL-9.5FG or IL-4.75) \$85.00 / TON
 HMA SHOULDER \$90.00 / TON

INITIAL COSTS ITEM	THICKNESS	100% QUANTITY	UNIT PRICE	COST
HMA PAVEMENT (FULL-DEPTH)	(11.00")	27082 27,082 SQ YD	\$63.45 / SQ YD	\$0
HMA SURFACE COURSE	(2.00")	1.0096 3,062 TONS *	\$128.81 / TON	\$394,448 ~
HMA TOP BINDER COURSE	(2.25")	1.0299 3,514 TONS *	\$107.95 / TON	\$379,384 ~
HMA LOWER BINDER COURSE	(6.75")	1.0730 10,984 TONS *	\$86.70 / TON	\$952,341 ~
HMA SHOULDER	(0.00")	0 0 TONS *	\$90.00 / TON	\$0 ~
CURB & GUTTER		14,000 LIN FT *	\$30.56 / LIN FT	\$427,840
SUBBASE GRAN MATL TY C (TONS)		942 TONS	\$29.47 / TON	\$27,761
IMPROVED SUBGRADE:	Aggregate Width = 40.5	31,490 SQ YD	\$20.52 / SQ YD	\$646,175
Prime		25,000 POUND * 0 UNITS	\$0.95 / POUND \$0.00 / UNITS	\$23,750 \$0
PAVEMENT REMOVAL		27,082 SQ YD	\$12.08 / SQ YD	\$327,151
SHOULDER REMOVAL		0 SQ YD	\$10.00 / SQ YD	\$0

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION \$3,178,850
 FLEXIBLE CONSTRUCTION \$97,793

MAINTENANCE COSTS: ITEM	THICKNESS	MATERIAL	T	UNIT COST
ROUTINE MAINTENANCE ACTIVITY				\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	(2.00")	1.0096 Surface M	2.00	\$14.70 / SQ YD
HMA OVERLAY PVMT	(2.00")	1.0096	2.00	\$14.70 / SQ YD
HMA SURFACE MIX	(2.00")	1.0096 Surface M	2.00	\$14.70 / SQ YD
HMA BINDER MIX	(0.00")	1.0191 IL-9.5FG or II	0.00	\$0.00 / SQ YD
HMA OVERLAY SHLD (Year 30)	(2.00")	Shoulder I	2.00	\$10.08 / SQ YD
HMA OVERLAY SHLD	(2.00")	Shoulder I	2.00	\$10.08 / SQ YD
MILLING (2.00 IN)			2.00	\$3.00 / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill Surf)	Surface M	2.00	\$84.56 / SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder	2.00	\$80.08 / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Binder Mix	2.00	\$79.52 / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder	2.00	\$80.08 / 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% Ref		\$2.00 / LIN FT

FLEXIBLE TOTAL LIFE	\$4,065,092
FLEXIBLE TOTAL ANNI	\$125,057

PCC PAVEMENT

JPCP

ROUTE FAP 693 (ILL 9)
 SECTION (129,109)RS3(16,4,1)CS(10FR)RS
 COUNTY McLean
 LOCATION E Empire from Towanda to Center

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 7000 FT ==> 1.33 Miles
 # OF CENTERLINES 2 CL
 # OF LANES 2 LANES
 # OF EDGES 4 EP
 LANE WIDTH - AVERAGE 17.41 FT
 SHOULDER WIDTH PCC Inside 0 FT
 PCC Outside 0 FT
 Total Width of Paved Shoulders 0 FT

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

HMA OVERLAY THICKNESS 2.75 IN

RIGID PAVEMENT TRAFFIC FACTORS MINIMUM ACTUAL USE
 5.58 1.68 5.58
 Worksheet Construction Type is Reconstruction The Pavement Type is JPCP

INITIAL COSTS ITEM	THICKNESS	100% QUA UNIT	UNIT PRICE	COST
JPC PAVEMENT	(9.00")	27,082 SQ YD	\$60.03 / SQ YD	\$1,625,732
PAVEMENT REINFORCEMENT		0 SQ YD	\$35.00 / SQ YD	\$0
STABILIZED SUBBASE	(4.00")	0 SQ YD *	\$22.00 / SQ YD	\$0
PCC SHOULDERS	(9.00" to 9.00")	0 SQ YD	\$50.00 / SQ YD	\$0
CURB & GUTTER		14,000 LIN FT *	\$30.56 / LIN FT	\$427,840
SUBBASE GRAN MATL TY C IMPROVED SUBGRADE:	(~ 0.00") Aggregate Width = 36.8	0 TONS 28,638 SQ YD	\$30.00 / TON \$20.52 / SQ YD	\$0 \$587,652
Reserved For User Supplied Item		0 UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0 UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		27,082 SQ YD	\$12.08 / SQ YD	\$327,151
SHOULDER REMOVAL		0 SQ YD	\$10.00 / SQ YD	\$0

Note: * Denotes User Supplied Quantity
 RIGID CONSTRUCTION \$2,968,375
 RIGID CONSTRUCTION \$91,318

MAINTENANCE COSTS: ITEM	THICKNESS	MATERIAL T	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 / LANE-MILE / YEAR
HMA OVERLAY	(2.75")	2.75	
HMA OVERLAY PAVEMENT	(2.75")	1.0132 2.75	\$17.07 / SQ YD
HMA SURFACE MIX	(1.50")	1.0072 Surface IV 1.50	\$11.00 / SQ YD
HMA BINDER MIX	(1.25")	1.0203 IL-9.5FG or II 1.25	\$6.07 / SQ YD
HMA OVERLAY SHOULDER	(2.75")	Shoulder I 2.75	\$13.86 / SQ YD
CLASS A PAVEMENT PATCHING			\$195.00 / SQ YD
CLASS B PAVEMENT PATCHING			\$160.00 / SQ YD
CLASS C SHOULDER PATCHING			\$150.00 / SQ YD
PARTIAL DEPTH PVTM PATCH (Mill & Fill HMA Surf)		Surface IV 1.50	\$80.92 / SQ YD
PARTIAL DEPTH PVTM PATCH (Mill & Fill HMA 2.75")		Surface IV 2.75	\$90.02 / 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' /	\$2.00 / LIN FT

RIGID TOTAL LIFE-C \$3,482,237
 RIGID TOTAL ANNUAL \$107,126

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Re #####

		JPCP		HMA
CONSTRUCTION	INITIAL COST	PRESENT	\$2,968,375	\$3,178,850
		ANNUAL COST	\$91,318	\$97,793
MAINTENANCE	LIFE-CYCLE COST	PRESENT	\$513,862	\$886,242
		ANNUAL COST	\$15,808	\$27,264
TOTAL	LIFE-CYCLE COST	PRESENT	\$3,482,237	\$4,065,092
		ANNUAL COST	\$107,126	\$125,057

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	===== JPCP	\$107,126	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PEHMA	\$125,057	16.7%

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

MAINTENANCE ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 5						
LONG SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CNTR LINE JOINT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RNDM / THRM CRACK R&S	50.00%	7,700	LIN FT	\$2.00	\$15,400	
PD PVMT PATCH M&F SURF	0.10%	27	SQ YD	\$84.56	\$2,283	
PWF _n =	0.8626		PW =	0.8626 X	\$101,683	\$87,713
YEAR 10						
LONG SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CNTR LINE JOINT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RNDM / THRM CRACK R&S	50.00%	7,700	LIN FT	\$2.00	\$15,400	
PD PVMT PATCH M&F SURF	0.50%	135	SQ YD	\$84.56	\$11,416	
PWF _n =	0.7441		PW =	0.7441 X	\$110,816	\$82,458
YEAR 15						
MILL PVMT & SHLD 2.00"	100.00%	27,082	SQ YD	\$3.00	\$81,246	
PD PVMT PATCH M&F ADD'L 2.00"	1.00%	271	SQ YD	\$79.52	\$21,550	
HMA OVERLAY PVMT 2.00"	100.00%	27,082	SQ YD	\$14.70	\$398,092	
HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	\$10.08	\$0	
PWF _n =	0.6419		PW =	0.6419 X	\$500,888	\$321,501
YEAR 20						
LONG SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CNTR LINE JOINT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RNDM / THRM CRACK R&S	50.00%	7,700	LIN FT	\$2.00	\$15,400	
PD PVMT PATCH M&F SURF	0.10%	27	SQ YD	\$84.56	\$2,283	
PWF _n =	0.5537		PW =	0.5537 X	\$101,683	\$56,299
YEAR 25						
LONG SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CNTR LINE JOINT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RNDM / THRM CRACK R&S	50.00%	7,700	LIN FT	\$2.00	\$15,400	
PD PVMT PATCH M&F SURF	0.50%	135	SQ YD	\$84.56	\$11,416	
PWF _n =	0.4776		PW =	0.4776 X	\$110,816	\$52,926
YEAR 30						
NON-INTERSTATE						
MILL PVMT & SHLD 2.00"	100.00%	27,082	SQ YD	\$3.00	\$81,246	
PD PVMT PATCH M&F ADD'L 2.00"	2.00%	542	SQ YD	\$79.52	\$43,100	
PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	\$80.08	\$0	
HMA OVERLAY PVMT 2.00 "	100.00%	27,082	SQ YD	\$14.70	\$398,092	
HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	\$10.08	\$0	
PWF _n =	0.4120		PW =	0.4120 X	\$522,438	\$215,238
YEAR 35						
LONG SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CNTR LINE JOINT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RNDM / THRM CRACK R&S	50.00%	7,700	LIN FT	\$2.00	\$15,400	
PD PVMT PATCH M&F SURF	0.10%	27	SQ YD	\$84.56	\$2,283	
PWF _n =	0.3554		PW =	0.3554 X	\$101,683	\$36,136
YEAR 40						
LONG SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CNTR LINE JOINT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RNDM / THRM CRACK R&S	50.00%	7,700	LIN FT	\$2.00	\$15,400	
PD PVMT PATCH M&F SURF	0.50%	135	SQ YD	\$84.56	\$11,416	
PWF _n =	0.3066		PW =	0.3066 X	\$110,816	\$33,971
						\$886,242
ROUTINE MAINTENANCE ACTIVITY		2.65	Lane Miles	0.00	\$0	\$0
45 YEAR LIFE CYCLE	CRF _n = 0.0407852				MAINTENANCE	\$886,242
					MAINTENANCE	\$27,264

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

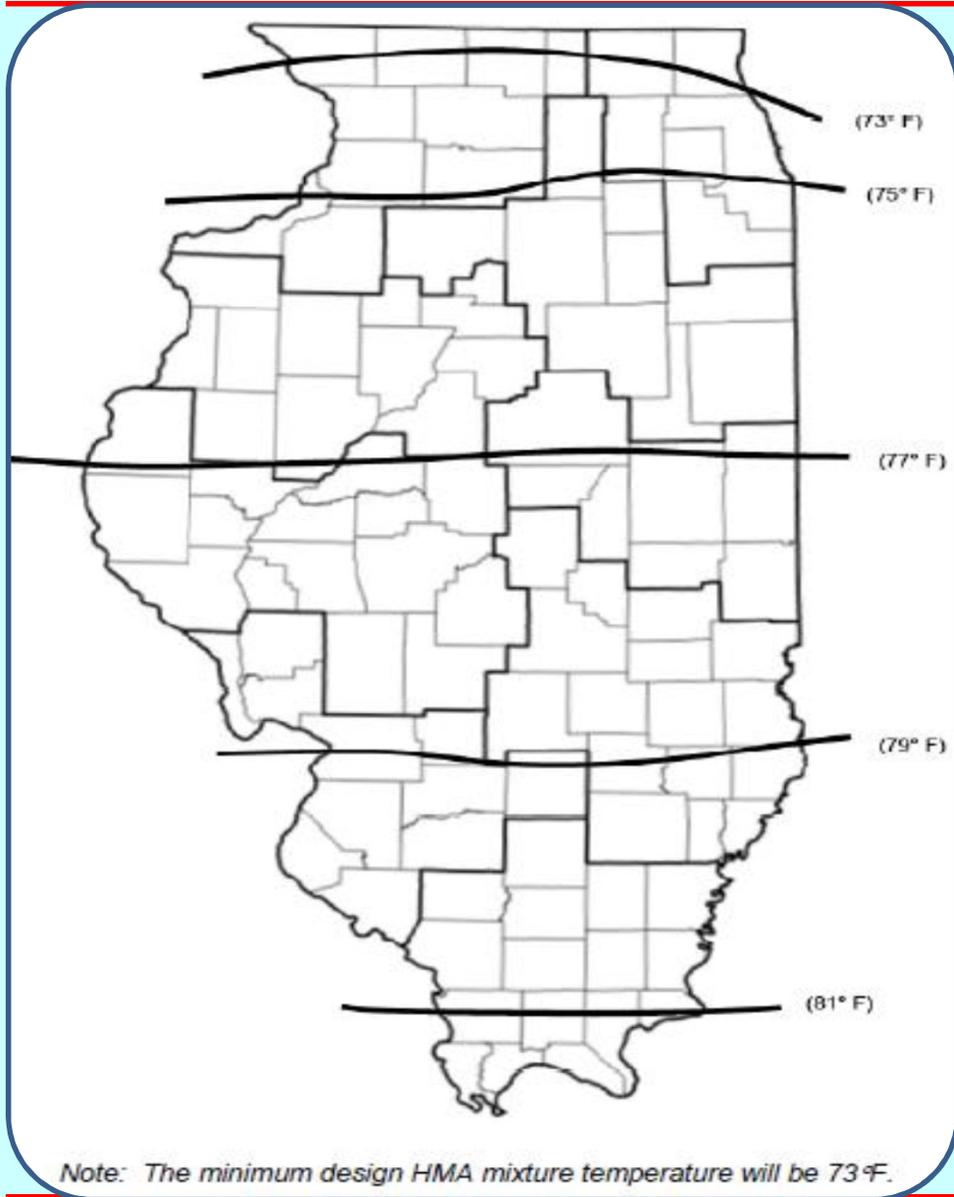
MAINTENANCE ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 10						
PAVEMENT PATCH CLASS B	0.10%	27	SQ YD	\$160.00	\$4,320	
PWF _n =	0.7441		PW =	0.7441 X	\$4,320	\$3,214
YEAR 15						
PAVEMENT PATCH CLASS B	0.20%	54	SQ YD	\$160.00	\$8,640	
PWF _n =	0.6419		PW =	0.6419 X	\$8,640	\$5,546
YEAR 20						
PAVEMENT PATCH CLASS B	2.00%	542	SQ YD	\$160.00	\$86,720	
SHOULDER PATCH CLASS C	0.50%	0	SQ YD	\$150.00	\$0	
LONGITUDINAL SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CENTERLINE JT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
PWF _n =	0.5537		PW =	0.5537 X	\$170,720	\$94,524
YEAR 25						
PAVEMENT PATCH CLASS B	3.00%	812	SQ YD	\$160.00	\$129,920	
SHOULDER PATCH CLASS C	1.00%	0	SQ YD	\$150.00	\$0	
PWF _n =	0.4776		PW =	0.4776 X	\$129,920	\$62,051
YEAR 30						
NON-INTERSTATE						
PAVEMENT PATCH CLASS B	4.00%	1,083	SQ YD	\$160.00	\$173,280	
SHOULDER PATCH CLASS C	1.50%	0	SQ YD	\$150.00	\$0	
HMA OVERLAY 2.75" (PVMT)	100.00%	27,082	SQ YD	\$17.07	\$462,278	
HMA OVERLAY 2.75" (SHLD)	100.00%	0	SQ YD	\$13.86	\$0	
PWF _n =	0.4120		PW =	0.4120 X	\$635,558	\$261,841
YEAR 35						
NON-INTERSTATE						
LONGITUDINAL SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CENTERLINE JT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
RANDOM CRACK R&S	50.00%	7,000	LIN FT	\$2.00	\$14,000	
REFLECTIVE TRANSVERSE CRACK R&S	40.00%	6,504	LIN FT	\$2.00	\$13,008	
PD PVMT PATCH M&F HMA 2.75"	0.10%	27	SQ YD	\$90.02	\$2,431	
PWF _n =	0.3554		PW =	0.3554 X	\$113,439	\$40,314
YEAR 40						
NON-INTERSTATE						
PAVEMENT PATCH CLASS B	0.50%	135	SQ YD	\$160.00	\$21,600	
LONGITUDINAL SHLD JT R&S	100.00%	28,000	LIN FT	\$2.00	\$56,000	
CENTERLINE JT R&S	100.00%	14,000	LIN FT	\$2.00	\$28,000	
REFLECTIVE TRANSVERSE CRACK R&S	60.00%	9,757	LIN FT	\$2.00	\$19,514	
RANDOM CRACK R&S	50.00%	7,000	LIN FT	\$2.00	\$14,000	
PD PVMT PATCH M&F HMA 2.75"	0.50%	135	SQ YD	\$90.02	\$12,153	
PWF _n =	0.3066		PW =	0.3066 X	\$151,267	\$46,372
						\$513,862
ROUTINE MAINTENANCE ACTIVITY		2.65	Lane Miles	\$0.00	\$0	\$0
45 YEAR LIFE CYCLE	CRF _n = 0.0407852				MAINTENANCE	\$513,862
					MAINTENANCE	\$15,808

Click On Map to Set Your Project Location

Help

Then Press **Set HMA Mix Temp** to Set Temp

76.62° F



Click On Map to Set Your Project Location

Help

Then Press **Set LSCD Max Thickness** to Set Max T

15.36 "

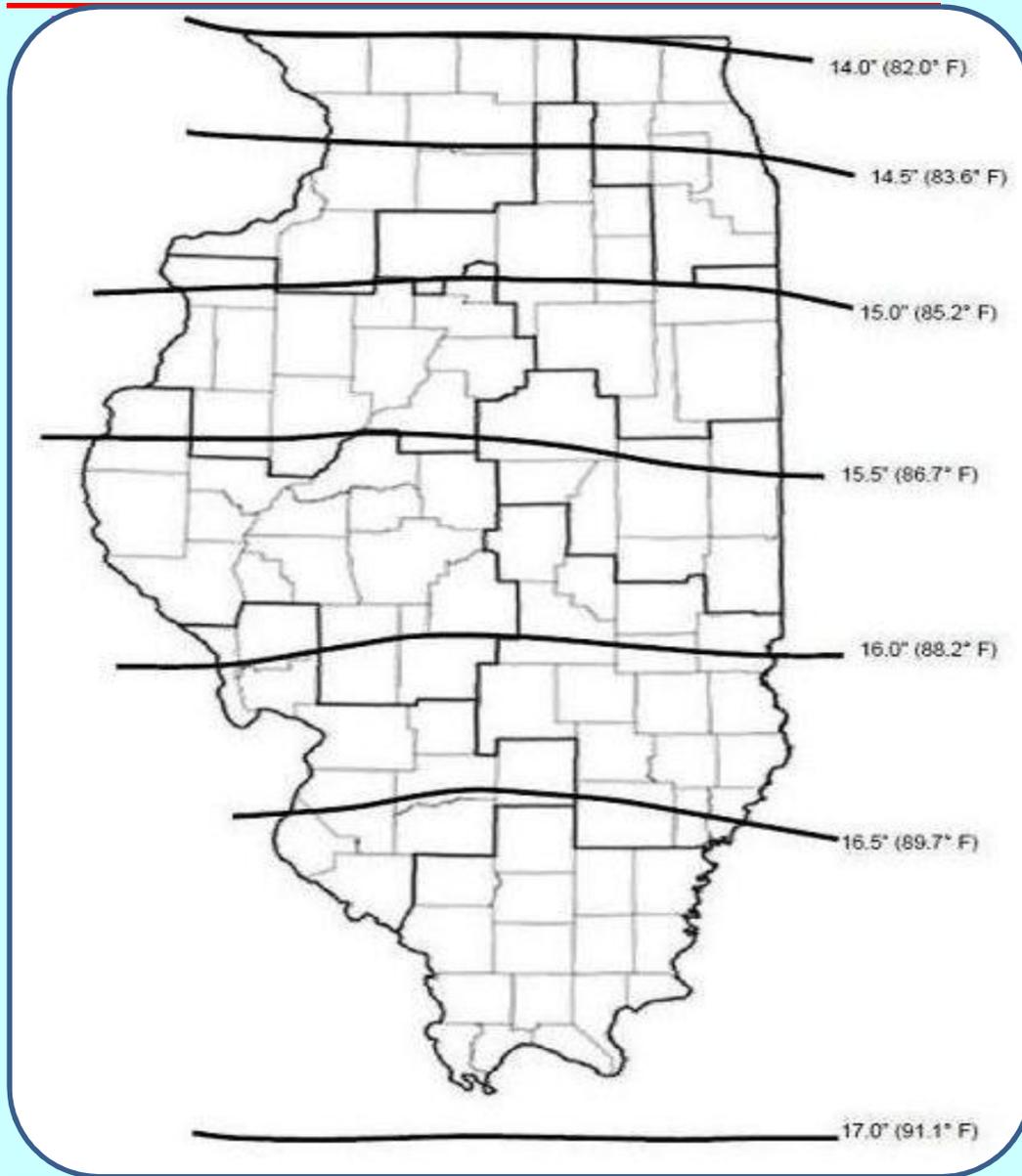


Figure 54-5. I

Click On Map to Set Your Project Location

Help

Then Press **Set LSCD Overlay Max Thickness** to Set Max T

11.05 "

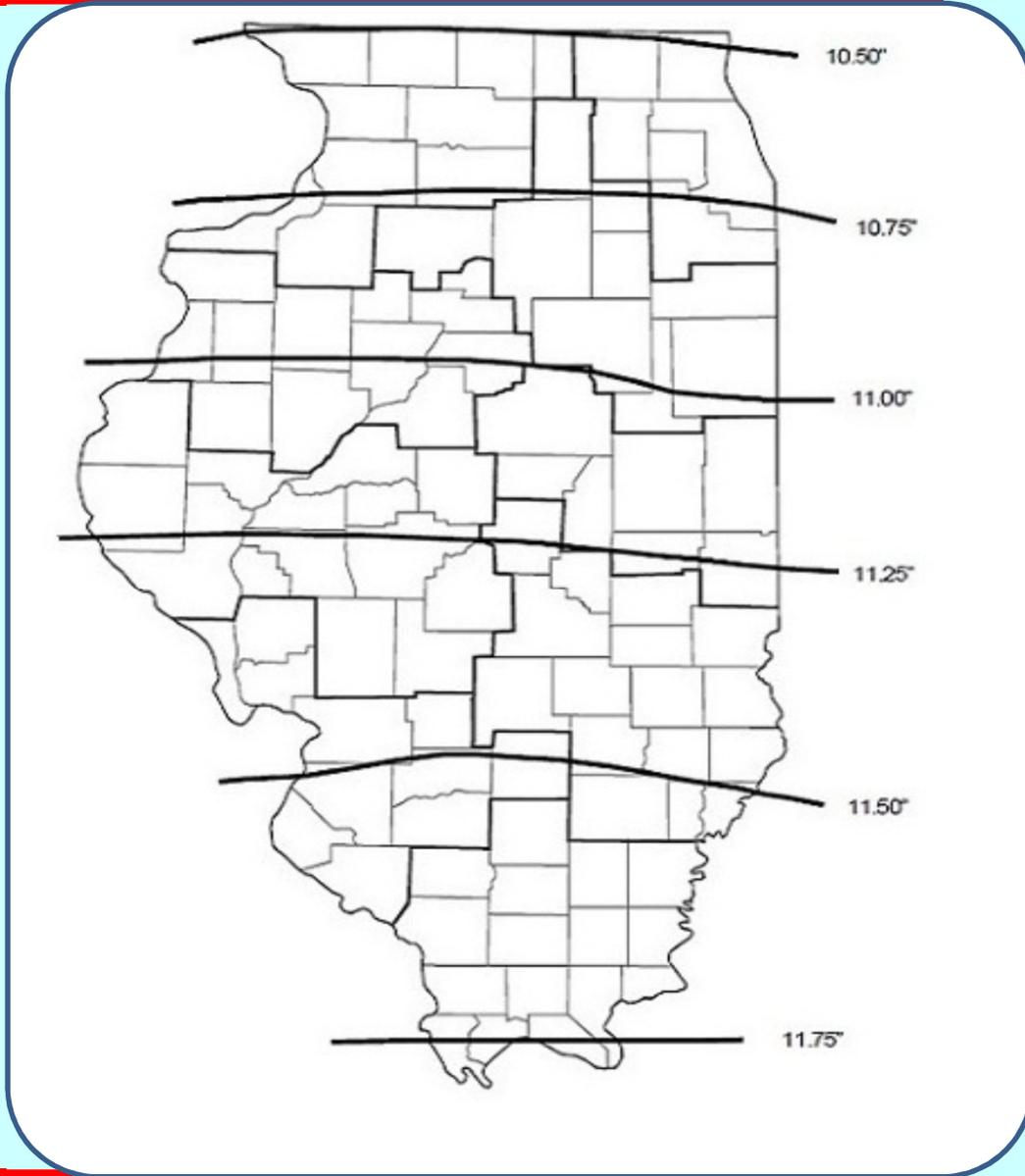


Figure 54-5. V

Illinois Department of Transportation

Memorandum

To : Studies and Plans Attn: Brian Hogan

From : Planning & Services: Mark Moreschi

Subject : Traffic Forecast for: Section: **(129,109)RS3(16,4,1)CS(10FR)RS**
 Contract: **70855**

Date : December 17, 2019

Listed below is the traffic data for the following project location.

Location: IL 9 Alt (FAP 693 Alt) from Locust St to Towanda Ave and IL 9 (FAP 693)
from Fairway Dr to Carnahan Dr in Bloomington in McLean County.

Number of Intersection Studies attached: 0

	Leg "A"	IL 9 Alt	Leg "B"	IL 9 Alt	Leg "C"	IL 9 Alt	Leg "D"	IL 9 Alt
2017	ADT =	<u>4,350</u>	<u>2,950</u>	<u>4,850</u>	<u>7,500</u>			
2027	ADT =	<u>4,550</u>	<u>3,100</u>	<u>5,100</u>	<u>7,700</u>			
2037	ADT =	<u>4,800</u>	<u>3,250</u>	<u>5,300</u>	<u>8,300</u>			
2037	AM DHV =	<u>345</u>	<u>225</u>	<u>410</u>	<u>680</u>			
2037	PM DHV =	<u>485</u>	<u>355</u>	<u>560</u>	<u>860</u>			
	P.U. & P.C.% =	<u>96.9</u>	<u>96.2</u>	<u>96.7</u>	<u>94.4</u>			
(Bus,6T, & 3A)	SU% =	<u>2.5</u>	<u>3.1</u>	<u>2.6</u>	<u>3.3</u>			
	(All Semi)MU% =	<u>0.6</u>	<u>0.7</u>	<u>0.7</u>	<u>2.3</u>			
ADT Max. Dir. Dist. =	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>				
Truck Rte. Class.=	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>				
N.H.S. Route (?)	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>				

Functional Class.= O.P.A. O.P.A. O.P.A. O.P.A.

Special Conditions: Leg "A" is IL 9 Alt (Lee St) from Locust St to Empire St.

Leg "B" is IL 9 Alt (Empire) from Lee st to Center St.

Leg "C" is IL 9 Alt (Empire) from Center St to Main St.

Leg "D" is IL 9 Alt (Empire) from Main St to Towanda Ave.

Project Code # FC19-47A

Illinois Department of Transportation

Memorandum

To : Studies and Plans Attn: Brian Hogan

From : Planning & Services: Mark Moreschi

Subject : Traffic Forecast for: Section: **(129,109)RS3(16,4,1)CS(10FR)RS**
 Contract: **70855**

Date : December 17, 2019

Listed below is the traffic data for the following project location.

Location: IL 9 Alt (FAP 693 Alt) from Locust St to Towanda Ave and IL 9 (FAP 693)
from Fairway Dr to Carnahan Dr in Bloomington in McLean County.

Number of Intersection Studies attached: 0

	Leg "E"	<u>IL 9</u>	Leg "F"	<u>IL 9</u>	<u>IL 9</u>	Leg "H"
2017	ADT =	<u>20,200</u>		<u>19,000</u>	<u>25,000</u>	<u> </u>
2027	ADT =	<u>21,200</u>		<u>20,100</u>	<u>27,500</u>	<u> </u>
2037	ADT =	<u>22,200</u>		<u>21,300</u>	<u>30,000</u>	<u> </u>
2037	AM DHV =	<u>1,555</u>		<u>1,610</u>	<u>2,165</u>	<u> </u>
2037	PM DHV =	<u>2,135</u>		<u>2,195</u>	<u>2,535</u>	<u> </u>
	P.U. & P.C.% =	<u>96.9</u>		<u>94.9</u>	<u>96.3</u>	<u> </u>
(Bus,6T, & 3A)	SU% =	<u>1.9</u>		<u>3.4</u>	<u>2.4</u>	<u> </u>
	(All Semi)MU% =	<u>1.2</u>		<u>1.7</u>	<u>1.3</u>	<u> </u>
ADT Max. Dir. Dist. =		<u>55%</u>		<u>55%</u>	<u>55%</u>	<u> </u>
Truck Rte. Class.=		<u>No</u>		<u>Class II</u>	<u>Class II</u>	<u> </u>
N.H.S. Route (?)		<u>Yes</u>		<u>Yes</u>	<u>Yes</u>	<u> </u>

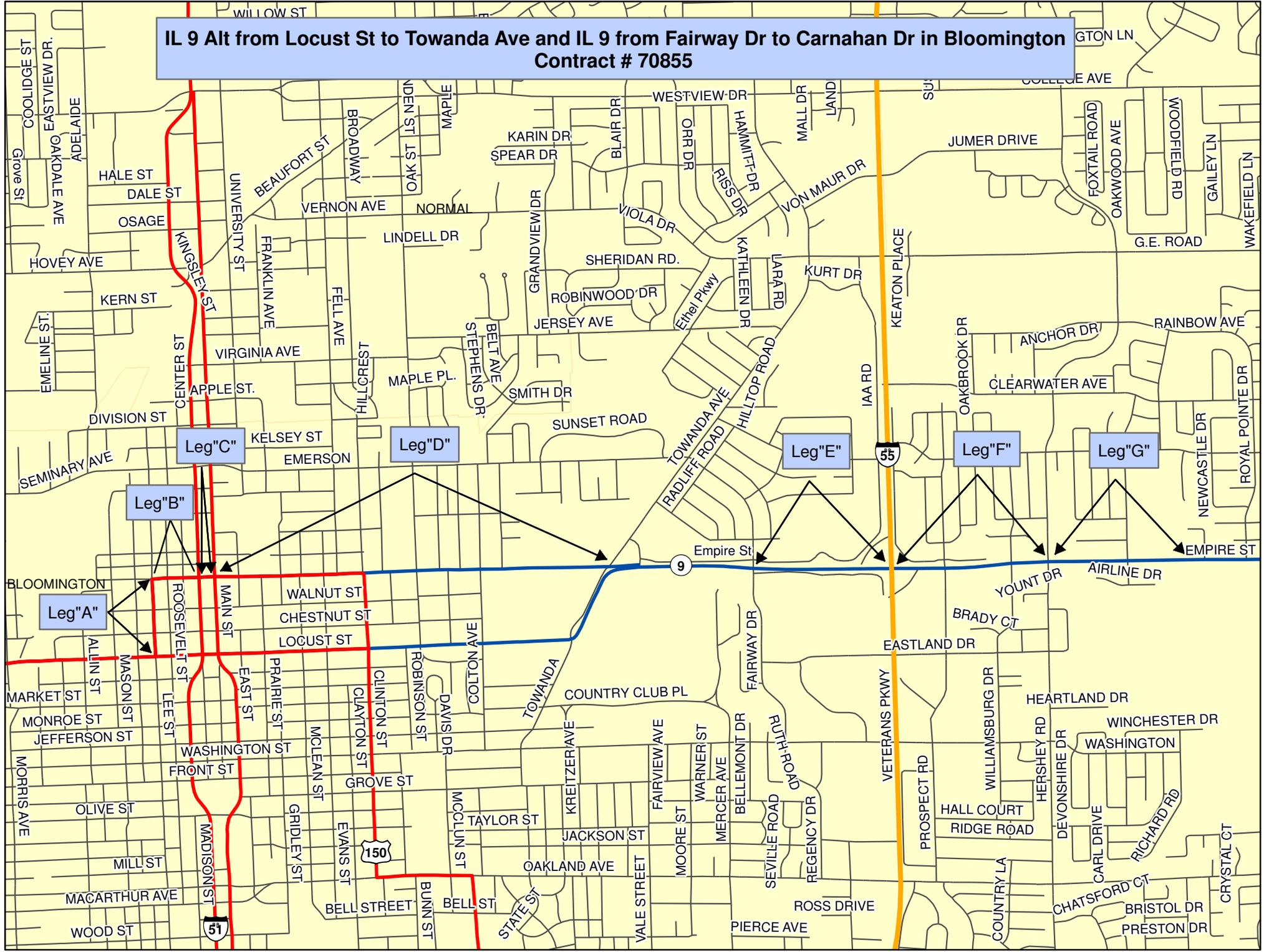
Functional Class.= O.P.A. Min. Arterial Min. Arterial

Special Conditions: Leg"E" is IL 9 (Empire) from Fairway Dr to Veteran's Pkwy.

Leg"F" is IL 9 (Empire) from Veteran's Pkwy to Hershey Rd.

Leg"G" is IL 9 (Empire) from Hershey Rd to Carnahan Dr.

IL 9 Alt from Locust St to Towanda Ave and IL 9 from Fairway Dr to Carnahan Dr in Bloomington
Contract # 70855





Illinois Department of Transportation

Memorandum

To: Scott W. Neihart Attn: Brent M. Cearlock
From: LaDonna R. Rowden By: John Senger *JS*
Subject: Pavement Design Exception Request*
Date: April 6, 2020

*WPPS No: 5-53913-0000
Route: FAP 693 (IL 9 and US 150), MM 15.31-20.36
Section: (129, 109)RS-3 (16,4,1)CS (10FR)RS
County: McLean
Contract: 70855 and 70C81
Desc.: East of I-74 to Carnahan Drive in Bloomington
Program Year: FY 2023

We have reviewed the proposed pavement rehabilitation strategy for the above referenced project which was submitted on 1/30/2020. The request is for standard overlays, designed overlays, and pavement replacement on various sections of pavement in Bloomington.

We concur with the District's request for the strategies that are detailed in the attached recommendation memo and spreadsheet. While we are offering concurrence with these strategies, the district will still be required to submit a pavement design and life-cycle cost analysis on the pavement replacement section and obtain approval through the Bureau of Design and Environment.

If you have any questions, please contact John Senger at (217) 782-8582.

JRS/LRR

cc: Mike Brand
Laura Heckel