



Illinois Department of Transportation

To: Anthony J. Quigley Attn: John Baczek
From: Maureen M. Addis *MA mos*
Subject: Pavement Design Approval
Date: November 17, 2017

Route: IL 47
Section: Section 106X-R-4
County: Kane
Limits: at Plato Road

Job No.: D-91-251-17
Contract No.: 62F16
Target Letting: June 2018

We have reviewed the pavement design for the above referenced project which was submitted on August 29, 2017. The scope of the project is to reconstruct the existing intersection to provide a single-lane, four-legged roundabout.

The pavement design resulted in two reconstruction options: 11.25" Full-Depth HMA and 9.75" Jointed PCC. The life-cycle cost analysis of those two options resulted in the HMA pavement being 11.4% less expensive (\$96,261 per mile as opposed to PCC's \$107,256) and thus the preferred option.

In summary, the approved pavement design is as follows:

IL 47

11.25" Full-Depth HMA Pavement with HMA Shoulder/PCC Curb & Gutter
12" Aggregate Subgrade Improvement

Plato Road

9.5" Full-Depth HMA Pavement with HMA Shoulder/PCC Curb & Gutter
12" Aggregate Subgrade Improvement

If you have any questions, please contact Mike Brand at (217) 782-7651.



Illinois Department of Transportation

Memorandum

To: Maureen Addis

Attn: Michael Brand

From: Jose A. Dominguez

By: Ojas Patel

Subject: Pavement Analysis*

Date: August 29, 2017

*Route: Illinois Route 47

County: Kane

Limits: at Plato Road

Contract No.: 62F16

Section: 106X-R-4

Job No.: D-91-251-17

Current target: 06CY18

We have completed the pavement analysis for the above captioned location. Review by the Central Office is required since the total pavement area for reconstruction exceeds 4,750 Square Yards. NOTE: Review is only required for Illinois Route 47 as Plato Road is under local jurisdiction. The following is the scope of the project:

Reconstruction of the existing stop controlled intersection of IL 47 at Plato Road to provide a single-lane four-legged roundabout.

A 20-year pavement analysis was performed on the above segments. We recommend a mechanistic flexible pavement design based on the life cycle cost analysis which favors HMA pavement by 11.4%.

IL 47

Reconstruction

HMA Shoulder⁸ / PCC Curb and Gutter

11 ¼" Full Depth HMA⁷

2" Polymerized HMA Surface Course, Mix "E", N70¹

2 ¼" Polymerized HMA Binder Course, IL-19.0, N90²

7" HMA Base Course, IL-19.0, N90³

12" Aggregate Subgrade Improvement⁵

Plato Road⁹

Reconstruction

HMA Shoulder⁸ / PCC Curb and Gutter

9 ½" Full Depth HMA⁷

2" Polymerized HMA Surface Course, Mix "E", N70¹

2 ¼" Polymerized HMA Binder Course, IL-19.0, N90²

5 ¼" HMA Base Course, IL-19.0, N70⁴

12" Aggregate Subgrade Improvement⁵

IL 47 and Plato Road Pavement Resurfacing⁷

Cold Milling of HMA Pavement

2 ¾" minimum (more if necessary)

2" HMA Surface Course, Mix "E", N70¹

¾" Leveling Binder (Machine Method), N70⁶

¹**Designer Note 1:** Use pay item 40603565, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "E", N70 paid for in tons.

²**Designer Note 2:** Use pay item 40603240, POLYMERIZED HMA BINDER COURSE, IL-19.0, N90 paid for in tons.

³**Designer Note 3:** Use pay item 35501312, HOT-MIX ASPHALT BASE COURSE, 7", paid for in square yards.

⁴**Designer Note 4:** Use pay item 35501305, HOT-MIX ASPHALT BASE COURSE, 5 1/4", paid for in square yards.

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

⁶**Designer Note 6:** Use pay item 40600635, LEVELING BINDER (MACHINE METHOD), N70 paid for in tons.

⁷**Designer Note 7:** Refer to the District One, Bureau of Materials' "Hot-Mix Asphalt – Mix Selection" tables to determine the corresponding HMA mix table requirements for the plans.

⁸**Designer Note 8:** The designer shall utilize IDOT Highway Standards in conjunction with guidelines in BDE Manual 34-2.02 if necessary for shoulder thicknesses.

⁹**Designer Note 9:** Plato Road is subject to local jurisdictional approval and concurrence.

If you have any questions or need additional information, please contact Ojas Patel, Pavement Design Engineer, at (847)705-4550.

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

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: IL 47	Comments: IL 47 at Plato Rd (Roundabout)		
Section: 106X-R-4	Design Date: 08/10/2017	ONP	
County: Kane	Modify Date:		
Location: at Plato Road			
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: 2018			
Design Period (DP) = 20 years			

<-- BY	ADT	Year
Current:	6,900	2016
Future:	15,000	2040

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	8,213	75.0%	P = 50%
SU =	250	1,588	14.5%	S = 50%
MU =	750	1,150	10.5%	M = 50%
Struct. Design ADT =	10,950			(2028)

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) =	6.22 (Actual ADT)	TF rigid (Actual) =	8.69 (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		JPC Pavement	
Use TF flexible =	6.22	Use TF rigid =	8.69
PG Grade Lower Binder Lifts =	PG 64-22 (Fig. 53-4.R)	Edge Support =	Tied Shoulder or C.&G.
HMA Mixture Temp. =	74.5 deg. F (Fig. 54-5.C)	Rigid Pavt Thick. =	9.75 in. (Fig. 54-4.E)
Design HMA Mixture Modulus (E _{HMA}) =	710 ksi (Fig. 54-5.D)		
Design HMA Strain (ε _{HMA}) =	71 (Fig. 54-5.E)	CRCP Pavement	
Full Depth HMA Design Thickness =	11.25 in. (Fig. 54-5.F)	Use TF rigid =	8.69
Limiting Strain Criterion Thickness =	14.50 in. (Fig. 54-5.I)	IBR value =	3
Use Full-Depth HMA Thickness =	11.25 inches	CRCP Thickness =	8.50 in. (Fig. 54-4.N)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC		Unbonded Concrete Overlay	
Use TF flexible =	6.22	Review 54-4.03 for limitations and special considerations.	
HMA Overlay Design Thickness =	8.50 in. (Fig. 54-5.U)	JPCP Thickness =	NA inches
Limiting Strain Criterion Thickness =	in. (Fig. 54-5.V)		
Use HMA Overlay Thickness =	999.00 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%

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE IL 47
 SECTION 106X-R-4
 COUNTY Kane
 LOCATION at Plato Road

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2000 FT == > 0.38 Miles
 # OF CENTERLINES 0 CL
 # OF LANES 2 LANES
 # OF EDGES 4 EP
 LANE WIDTH - AVERAGE 12 FT
 SHOULDER WIDTH HMA Inside 0 FT
 HMA Outside 10 FT
 Total Width of Paved Shoulders 20 FT

PAVEMENT THICKNESS (FLEXIBLE) 11.25 IN 14.50 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	6.22	6.22

[Read Me!](#)

HMA COST PER TON	UNIT PRICE
HMA SURFACE	\$103.80 / TON
HMA TOP BINDER	\$102.91 / TON
HMA LOWER BINDER	\$88.57 / TON
HMA BINDER (LEVELING)	\$102.91 / TON
HMA SHOULDER	\$72.00 / TON

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT (FULL-DEPTH)	(11.25")	5333	5,333 SQ YD *	\$59.95 / SQ YD	\$319,733 ~
HMA SURFACE COURSE	(2.00")	1.0139	606 TONS	\$103.80 / TON	\$0
HMA TOP BINDER COURSE	(2.25")	1.0434	701 TONS	\$102.91 / TON	\$0
HMA LOWER BINDER COURSE	(7.00")	1.1076	2,316 TONS	\$88.57 / TON	\$0
HMA SHOULDER	(8.00")	4444	1,991 TONS	\$72.00 / TON	\$143,360 ~
CURB & GUTTER			0 LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C (TONS)			397 TONS	\$25.00 / TON	\$9,925
IMPROVED SUBGRADE:	Aggregate Width = 49.8'	11,056	SQ YD	\$7.00 / SQ YD	\$77,392
Reserved For User Supplied Item			0 UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item			0 UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		5,333	SQ YD	\$15.00 / SQ YD	\$79,995
SHOULDER REMOVAL		4,444	SQ YD	\$10.00 / SQ YD	\$44,440
Note: * Denotes User Supplied Quantity				FLEXIBLE CONSTRUCTION INITIAL COST	\$674,845
				FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	\$72,662

MAINTENANCE COSTS:

ITEM	THICKNESS	MATERIAL	T	UNIT COST
ROUTINE MAINTENANCE ACTIVITY				\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	(2.00")	1.0139 Surface Mix	2.00	\$11.79 / SQ YD
HMA OVERLAY PVMT	(2.25")	1.0156 Surface Mix	2.25	\$13.24 / SQ YD
HMA SURFACE MIX	(1.50")	1.0104 Surface Mix	1.50	\$8.81 / SQ YD
HMA BINDER MIX	(0.75")	1.0260 Binding Binder Mix	0.75	\$4.43 / SQ YD
HMA OVERLAY SHLD (Year 30)	(2.25")	Shoulder Mix	2.25	\$9.07 / SQ YD
HMA OVERLAY SHLD	(2.00")	Shoulder Mix	2.00	\$8.06 / SQ YD
MILLING (2.00 IN)			2.00	\$3.00 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill Surf)		Surface Mix	2.00	\$81.63 / SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	\$78.06	/ SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	\$81.53	/ SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	\$78.06	/ 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	\$894,018
FLEXIBLE TOTAL ANNUAL COST PER MILE	\$96,261

PCC PAVEMENT

JPCP

ROUTE IL 47
 SECTION 106X-R-4
 COUNTY Kane
 LOCATION at Plato Road

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2000 FT == > 0.38 Miles
 # OF CENTERLINES 0 CL
 # OF LANES 2 LANES
 # OF EDGES 4 EP
 LANE WIDTH - AVERAGE 12 FT
 SHOULDER WIDTH PCC Inside 0 FT
 PCC Outside 10 FT
 Total Width of Paved Shoulders 20 FT

PAVEMENT THICKNESS (RIGID) JPCP 9.75 IN TIED SHLD
 SHOULDER THICKNESS 9.75 IN

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	4.59	8.69	8.69
Worksheet Construction Type is Reconstruction	The Pavement Type is		JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	(9.75")	5,333	SQ YD	\$67.98 / SQ YD	\$362,537
PAVEMENT REINFORCEMENT		0	SQ YD	\$22.00 / SQ YD	\$0
STABILIZED SUBBASE	(4.00")	6,667	SQ YD	\$19.00 / SQ YD	\$126,673
PCC SHOULDERS		4,444	SQ YD	\$40.00 / SQ YD	\$177,760
CURB & GUTTER		0	LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C	(~ 2.95")	485	TONS	\$25.00 / TON	\$12,125
IMPROVED SUBGRADE:	Aggregate Width = 46.0'	10,222	SQ YD	\$7.00 / SQ YD	\$71,554
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		5,333	SQ YD	\$15.00 / SQ YD	\$79,995
SHOULDER REMOVAL		4,444	SQ YD	\$10.00 / SQ YD	\$44,440

Note: * Denotes User Supplied Quantity
 RIGID CONSTRUCTION INITIAL COST \$875,084
 RIGID CONSTRUCTION ANNUAL COST PER MILE \$94,223

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")	1.0174	2.50	\$14.73 / SQ YD
HMA SURFACE MIX	(1.50")	1.0104	1.50	\$8.81 / SQ YD
HMA BINDER MIX	(1.00")	1.0278	1.00	\$5.92 / SQ YD
HMA POLICY OVERLAY SHLD	(2.50")	Shoulder Mix	2.50	\$10.08 / 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	\$78.72 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	2.50	\$84.53 / 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 \$996,130
 RIGID TOTAL ANNUAL COST PER MILE \$107,256

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **8/25/17 8:54 AM**

				JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH		\$875,084	\$674,845
		ANNUAL COST PER MILE		\$94,223	\$72,662
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH		\$121,046	\$219,173
		ANNUAL COST PER MILE		\$13,033	\$23,599
TOTAL	LIFE-CYCLE COST	PRESENT WORTH		\$996,130	\$894,018
		ANNUAL COST PER MILE		\$107,256	\$96,261

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	=====>	HMA	\$96,261	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	JPCP	\$107,256	11.4%

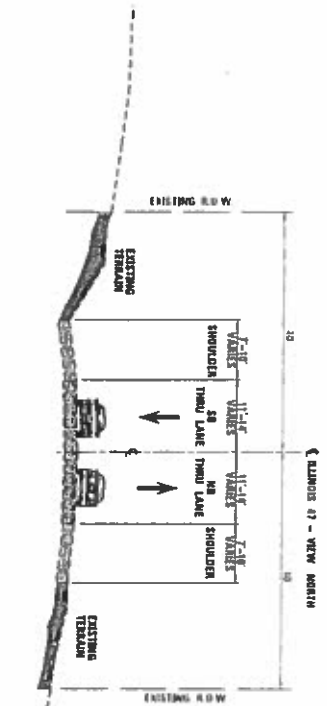
FULL-DEPTH HMA PAVEMENT
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 5							
	LONG SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000	
	CNTR LINE JOINT R&S	100.00%	0	LIN FT	\$2.00	\$0	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	\$2.00	\$4,400	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	\$81.63	\$408	
	PWFn =	0.8626		PW =	0.8626 X	\$20,808	\$17,949
YEAR 10							
	LONG SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000	
	CNTR LINE JOINT R&S	100.00%	0	LIN FT	\$2.00	\$0	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	\$2.00	\$4,400	
	PD PVMT PATCH M&F SURF	0.50%	27	SQ YD	\$81.63	\$2,204	
	PWFn =	0.7441		PW =	0.7441 X	\$22,604	\$16,819
YEAR 15							
	MILL PVMT & SHLD 2.00"	100.00%	9,778	SQ YD	\$3.00	\$29,334	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	53	SQ YD	\$81.53	\$4,321	
	HMA OVERLAY PVMT 2.00"	100.00%	5,333	SQ YD	\$11.79	\$62,864	
	HMA OVERLAY SHLD 2.00 "	100.00%	4,444	SQ YD	\$8.06	\$35,840	
	PWFn =	0.6419		PW =	0.6419 X	\$132,359	\$84,956
YEAR 20							
	LONG SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000	
	CNTR LINE JOINT R&S	100.00%	0	LIN FT	\$2.00	\$0	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	\$2.00	\$4,400	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	\$81.63	\$408	
	PWFn =	0.5537		PW =	0.5537 X	\$20,808	\$11,521
YEAR 25							
	LONG SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000	
	CNTR LINE JOINT R&S	100.00%	0	LIN FT	\$2.00	\$0	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	\$2.00	\$4,400	
	PD PVMT PATCH M&F SURF	0.50%	27	SQ YD	\$81.63	\$2,204	
	PWFn =	0.4776		PW =	0.4776 X	\$22,604	\$10,796
HMA SD							
YEAR 30 NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	9,778	SQ YD	\$3.00	\$29,334	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	107	SQ YD	\$81.53	\$8,723	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	44	SQ YD	\$78.06	\$3,435	
	HMA OVERLAY PVMT 2.25 "	100.00%	5,333	SQ YD	\$13.24	\$70,639	
	HMA OVERLAY SHLD 2.25 "	100.00%	4,444	SQ YD	\$9.07	\$40,320	
	PWFn =	0.4120		PW =	0.4120 X	\$152,451	\$62,808
YEAR 35							
	LONG SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000	
	CNTR LINE JOINT R&S	100.00%	0	LIN FT	\$2.00	\$0	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	\$2.00	\$4,400	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	\$81.63	\$408	
	PWFn =	0.3554		PW =	0.3554 X	\$20,808	\$7,395
YEAR 40							
	LONG SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000	
	CNTR LINE JOINT R&S	100.00%	0	LIN FT	\$2.00	\$0	
	RNDM / THRM CRACK R&S	50.00%	2,200	LIN FT	\$2.00	\$4,400	
	PD PVMT PATCH M&F SURF	0.50%	27	SQ YD	\$81.63	\$2,204	
	PWFn =	0.3066		PW =	0.3066 X	\$22,604	\$6,929
							\$219,173
ROUTINE MAINTENANCE ACTIVITY				0.76 Lane Miles	0.00	\$0	\$0
						MAINTENANCE LIFE-CYCLE COST	\$219,173
45	YEAR LIFE CYCLE	CRFn = 0.0407852	MAINTENANCE ANNUAL COST PER MILE				\$23,599

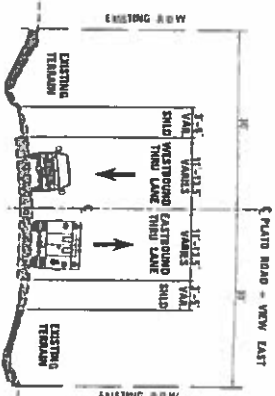
JOINTED PLAIN CONCRETE PAVEMENT
 UNBONDED JOINTED PLAIN CONCRETE OVERLAY
 Figure 54-7.A

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%	107	SQ YD	\$150.00	\$16,050		
	SHOULDER PATCH CLASS C	0.50%	22	SQ YD	\$145.00	\$3,190		
	LONGITUDINAL SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000		
	CENTERLINE JT R&S	100.00%	0	LIN FT	\$2.00	\$0		
		PWFn = 0.5537			PW = 0.5537 X	\$35,240	\$19,512	
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	160	SQ YD	\$150.00	\$24,000		
	SHOULDER PATCH CLASS C	1.00%	44	SQ YD	\$145.00	\$6,380		
		PWFn = 0.4776			PW = 0.4776 X	\$30,380	\$14,510	
YEAR 30								
	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	213	SQ YD	\$150.00	\$31,950		
	SHOULDER PATCH CLASS C	1.50%	67	SQ YD	\$145.00	\$9,715		
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	5,333	SQ YD	\$14.73	\$78,576		
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	4,444	SQ YD	\$10.08	\$44,800		
		PWFn = 0.4120			PW = 0.4120 X	\$165,041	\$67,995	
YEAR 35								
	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000		
	CENTERLINE JT R&S	100.00%	0	LIN FT	\$2.00	\$0		
	RANDOM CRACK R&S	50.00%	2,000	LIN FT	\$2.00	\$4,000		
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,277	LIN FT	\$2.00	\$2,554		
	PD PVMT PATCH M&F HMA 2.50"	0.10%	5	SQ YD	\$84.53	\$423		
		PWFn = 0.3554			PW = 0.3554 X	\$22,977	\$8,166	
YEAR 40								
	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	27	SQ YD	\$150.00	\$4,050		
	LONGITUDINAL SHLD JT R&S	100.00%	8,000	LIN FT	\$2.00	\$16,000		
	CENTERLINE JT R&S	100.00%	0	LIN FT	\$2.00	\$0		
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,915	LIN FT	\$2.00	\$3,830		
	RANDOM CRACK R&S	50.00%	2,000	LIN FT	\$2.00	\$4,000		
	PD PVMT PATCH M&F HMA 2.50"	0.50%	27	SQ YD	\$84.53	\$2,282		
		PWFn = 0.3066			PW = 0.3066 X	\$30,162	\$9,246	
							\$121,046	
	ROUTINE MAINTENANCE ACTIVITY				0.76 Lane Miles	\$0.00	\$0	\$0
	MAINTENANCE LIFE-CYCLE COST						\$121,046	
45	YEAR LIFE CYCLE	CRFn = 0.0407852	MAINTENANCE ANNUAL COST PER MILE			\$13,033		

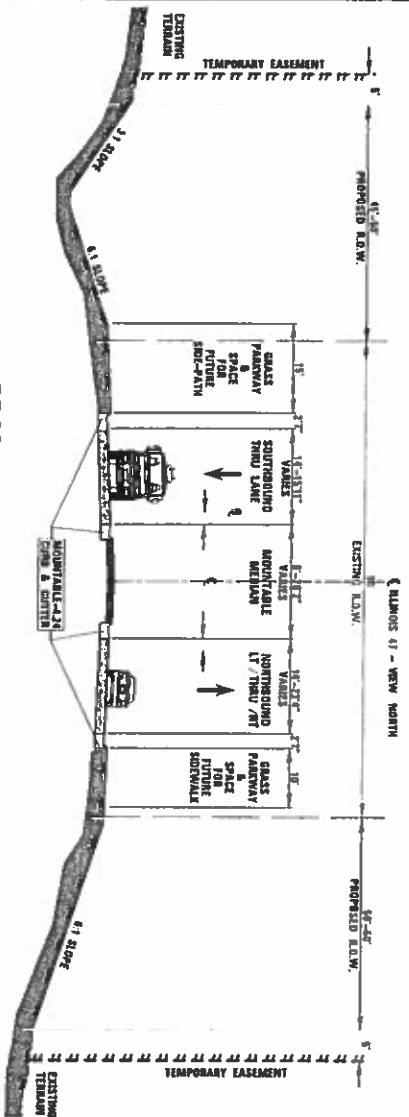
**MODERN ROUNDABOUT - ALTERNATIVE 2
APPROACH ROADWAY TYPICAL SECTIONS**



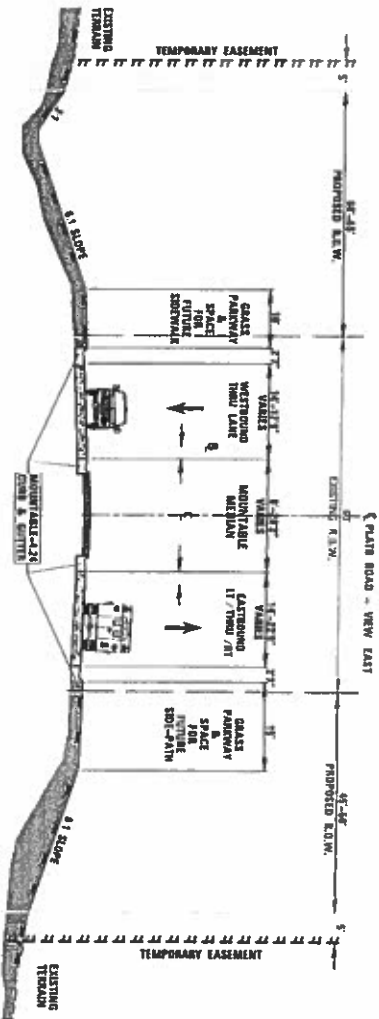
**EXISTING TYPICAL SECTION
ILLINOIS ROUTE 47**



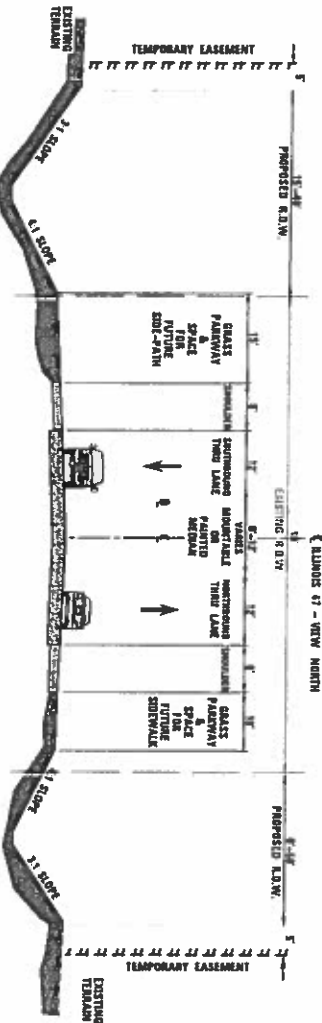
**EXISTING TYPICAL SECTION
PLATO ROAD**



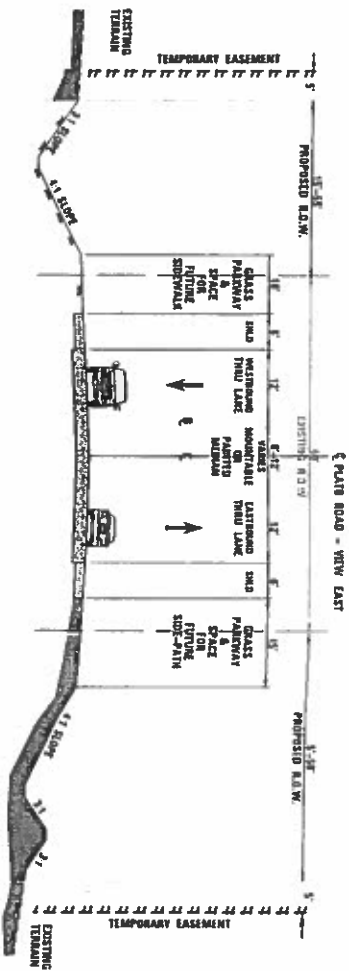
**PROPOSED TYPICAL SECTION
ILLINOIS ROUTE 47
CURB & GUTTER SECTION**



**PROPOSED TYPICAL SECTION
PLATO ROAD
CURB & GUTTER SECTION**



**PROPOSED TYPICAL SECTION
ILLINOIS ROUTE 47
SHOULDER SECTION**



**PROPOSED TYPICAL SECTION
PLATO ROAD
SHOULDER SECTION**