Illinois Department of Transportation

To:	Anthony J. Quigley	Attn: John Baczek	
From:	Jack A. Elston	By: Michael Brand	Michael Brand
Subject:	Pavement Design Approval		
Date:	May 5, 2020		

Route:	IL 53	Job No.:	D-91-402-11
Section:	533-R	Contract No.:	
County:	DuPage	Target Letting:	Nov 2020
Limits:	over Great Western Trail		

The Pavement Selection Committee has reviewed the pavement design for the above referenced project which was submitted on April 15, 2020. The project will replace the structure carrying IL 53 over the Great Western Trail in Lombard and reconstruct approximately 1000 feet of IL 53. There is also an ultimate improvement to reconstruct about 1.64 miles of IL 53 but that is not currently funded and the condition of the structure has moved this smaller, interim improvement forward in the program.

The pavement design was performed for the ultimate improvement and resulted in two options: 11.75” Full-Depth HMA and 10” JPCP. The life-cycle cost analysis of those options resulted in the HMA pavement being 0.8% less expensive. In lieu of alternative bidding, the District recommended the HMA option due to its lower cost and to provide uniformity with the adjoining sections of IL 53 which have an HMA overlay. The Committee concurred with the District.

In summary, the approved pavement design is as follows:

<u>IL 53 - Reconstruction</u>
11.75” Full-Depth HMA with 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: Jack Elston — Attn: Michael Brand

From: Jose A. Dominguez — By: Ojas Patel

Subject: Pavement Analysis*

Date: April 15, 2020

*Route: Illinois Route 53
Limits: over Great Western Trail
Section: 533-R
Current target: 11CY20

County: DuPage
Contract No.: TBD
Job No.: D-91-402-11

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. The following is the scope of the project:

Reconstruction of Illinois Route 53 over Great Western Trail as an interim improvement to the planned overall Illinois Route 53 reconstruction from Illinois Route 64 to St. Charles Road.

A 20-year pavement analysis and life-cycle cost analysis was performed for the overall IL 53 reconstruction for determination of pavement type for this contract. For the overall IL 53 reconstruction, the life-cycle cost analysis does not favor HMA or PCC pavement by more than 10% for IL 53. Review by pavement selection committee will be required according to the flowchart in Figure 54-1.A of Chapter 54 of the BDE Manual. District One recommends HMA pavement as the life-cycle cost analysis favors HMA pavement by 0.8% and IL 53 existing pavement is HMA surfaced at the project limits and would provide for uniformity and consolidated future maintenance needs. The recommended pavement is:

IL 53
Reconstruction
PCC Curb and Gutter
11 ¾" Full Depth HMA[1, 3]
- 2" Polymerized HMA Surface Course, Mix "E", IL-9.5, N70
- 2 ¼" Polymerized HMA Binder Course, IL-19.0, N90
- 7 ½" HMA Base Course, IL-19.0, N90

12" Aggregate Subgrade Improvement[2]

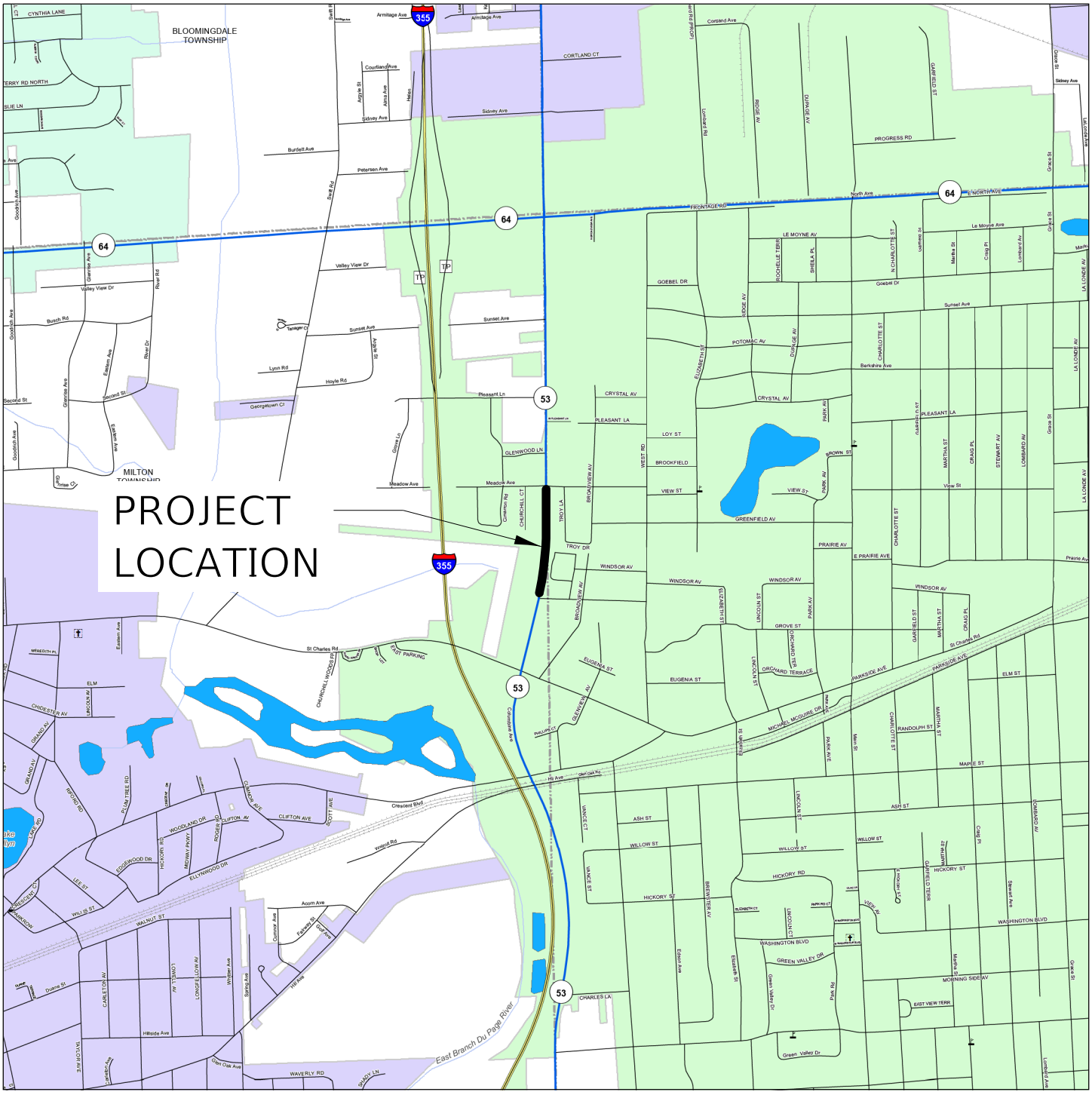
[1]Designer Note 1: Use pay item **40701916, HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 11 ¾"**, paid for in square yards.

[2]Designer Note 2: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

[3]Designer Note 3: 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.

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

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



LOCATION MAP

LOMBARD, IL

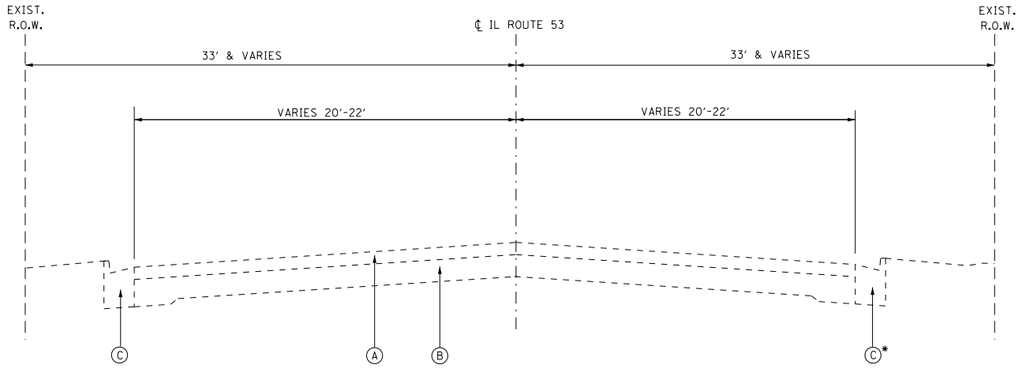
DUPAGE COUNTY

N

0 0.4 0.8

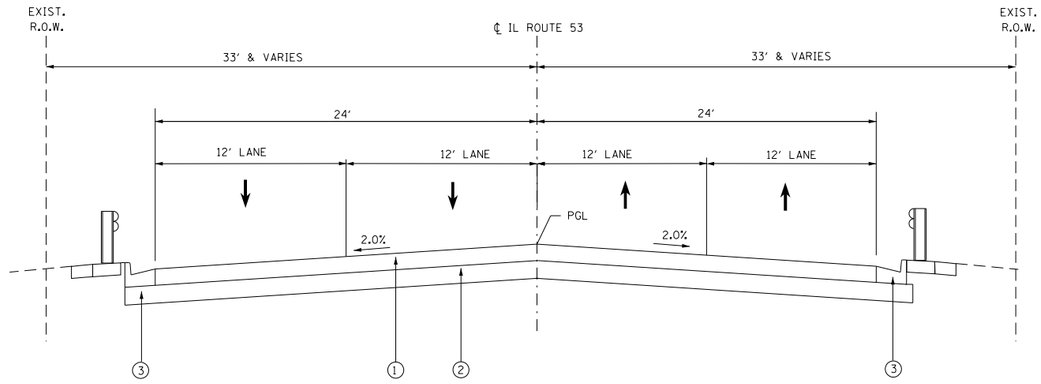
SCALE (IN MILES)

NOTES:
1. IL RT 53 EXISTING PAVEMENT SECTIONS
   ARE TAKEN FORM IDOT RECORD PLANS:
   -SBI RTE. 53 (SECS. 533, 533V, 533VB, 533SV-1,
    533VB-1), IDOT CONTRACT NO. NONE (1952)
   -SBI RTE 53 (SEC 533 & 533SV-1)RS, IDOT
    CONTRACT NO. NONE (1958)
   -FAP 870 (IL RT 53) ST. CHARLES ROAD TO
    MEADOW AVENUE, IDOT CONTRACT NO. 82155 (1991)

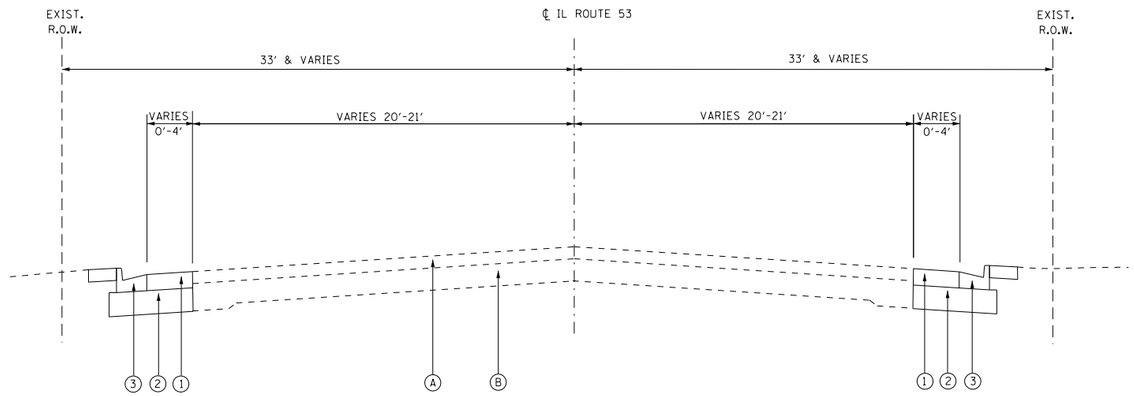


IL 53 - EXISTING TYPICAL SECTION

*NO CURB
STA. 1028+50 TO STA. 1031+30
2' BIT. SHOULDER



IL 53 - PROPOSED TYPICAL SECTION



IL 53 - PROPSED TYPICAL WIDENING SECTION

LEGEND

(A) EXISTING AGGREGATBITUMINOUS CONCRETE OVERLAY (VARIES 17"8" TO 5"1E SHOULDER
(B) EXISTING P.C.C. PAVEMENT (9")
(C) EXISTING CONCRETE CURB AND GUTTER (TYPE B6.12)
(1) PROPOSED PAVEMENT
(2) PROPOSED SUBGRADE
(3) PROPOSED CONCRETE CURB AND GUTTER (TYPE B-6.24)

MODEL: Default
FILE NAME: X:\Projects\SGFL\2011113201000D1XXXXXCADD_Sheets\D1XXXXX-sht-xPlan-StageEXHIBIT01-IL53.dgn

USER NAME = mszmelter	DESIGNED -	REVISED -	
	DRAWN -	REVISED -	
PLOT SCALE = 50.0000 ' / in.	CHECKED -	REVISED -	
PLOT DATE = 2/12/2020	DATE -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 53
TYPICAL SECTIONS

SCALE: NONE | SHEET OF SHEETS | STA. | TO STA.

F.A.P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
870	533-R			
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

BDE 5401 Template (Rev. 11/22/2019)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 05/05/2020

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route:	IL 53	Comments:	IL 53 (IL 64 to Charles Rd) - FUTURE CONTRACT
Section:	533-R		Advance work at IL 53 over Great Western Trail
County:	DuPage	Design Date:	03/25/2020 ONP <-- BY
Location:	IL 64 to Charles Rd	Modify Date:	<-- BY

	ADT	Year
Current:	24,200	2000
Future:	36,000	2030

Facility Type: Other Marked State Route

# of Lanes = 4

Road Class: I

Subgrade Support Rating (SSR): Poor

Construction Year: 2022

Design Period (DP) = 20 years

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	34,579	94.0%	P = 32%
SU =	250	736	2.0%	S = 45%
MU =	750	1,471	4.0%	M = 45%
Struct. Design ADT =		36,787	(2032)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	132.5		Csu =	143.81	
Cmu =	482.53		Cmu =	696.42	
TF flexible (Actual) =	7.30	(Actual ADT)	TF rigid (Actual) =	10.21	(Actual ADT)
TF flexible (Min) =	3.56	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	5.02	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 7.30

PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.O)

Goto Map

HMA Mixture Temp. = 75.0 deg. F (Fig. 54-5.C)

Design HMA Mixture Modulus (E_{HMA}) = 690 ksi (Fig. 54-5.D)

Design HMA Strain (ε_{HMA}) = 68 (Fig. 54-5.E)

Goto Map

Full Depth HMA Design Thickness = 11.75 in. (Fig. 54-5.F)

Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 11.75 inches

JPC Pavement

Use TF rigid = 10.21

Edge Support = Tied Shoulder or C&G

Rigid Pavt Thick. = 10.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 10.21

IBR value = 3

CRCP Thickness = 9.00 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 = 7.30

HMA Overlay Design Thickness = 9.00 in. (Fig. 54-5.U)

Goto Map

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 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)

	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. 11/22/2019) Printed: 05/05/2020

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE			IL 53			
SECTION			533-R			
COUNTY			DuPage			
LOCATION			IL 64 to Charles Rd			
FACILITY TYPE			NON-INTERSTATE			
PROJECT LENGTH			8800 FT = = >	1.67 Miles		USER OVERRIDE COLUMN
# OF CENTERLINES			2 CL			
# OF LANES			4 LANES			
# OF EDGES			4 EP			
LANE WIDTH - AVERAGE			11.5 FT			
SHOULDER WIDTH	HMA	Inside	0 FT			
	HMA	Outside	0 FT			
	Total Width of Paved Shoulders		0 FT			
PAVEMENT THICKNESS (FLEXIBLE)			11.75 IN	14.75 IN MAX		
SHOULDER THICKNESS			8.00 IN	HMA_SD Standard Design		
HMA OVERLAY THICKNESS			2.00 IN			

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE	On User Override
	3.56	7.30	7.30	

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	$84.28	/ TON
HMA TOP BINDER	$95.75	/ TON
HMA LOWER BINDER	$64.52	/ TON
HMA BINDER (IL-9.5FG or IL-4.75)	$85.00	/ TON
HMA SHOULDER	$72.00	/ TON

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT		UNIT PRICE		COST	USER SUPPLIED QUANTITY	USER SUPPLIED UNIT PRICE
HMA PAVEMENT (FULL-DEPTH)	(11.75")	44978	44,978	SQ YD	* $49.08	/ SQ YD	$2,207,509	~	$49.08
HMA SURFACE COURSE	(2.00")	1.0072	5,074	TONS	$84.28	/ TON	$0		
HMA TOP BINDER COURSE	(2.25")	1.0226	5,796	TONS	$95.75	/ TON	$0		
HMA LOWER BINDER COURSE	(7.50")	1.0580	19,986	TONS	$64.52	/ TON	$0		
HMA SHOULDER	(8.00")	0	0	TONS	$72.00	/ TON	$0	~	
CURB & GUTTER			35,200	LIN FT	* $30.00	/ LIN FT	$1,056,000	35,200	
SUBBASE GRAN MATL TY C (TONS)			375	TONS	$25.00	/ TON	$9,375		
IMPROVED SUBGRADE:	Aggregate	Width = 51.9'	50,763	SQ YD	$7.00	/ SQ YD	$355,341		
Reserved For User Supplied Item			0	UNITS	$0.00	/ UNITS	$0		
Reserved For User Supplied Item			0	UNITS	$0.00	/ UNITS	$0		
PAVEMENT REMOVAL			44,978	SQ YD	$15.00	/ SQ YD	$674,670		
SHOULDER REMOVAL			0	SQ YD	$0.00	/ SQ YD	$0		

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST $4,302,895
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE $105,297

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST		Schedule Quantity	Unit Cost Override
ROUTINE MAINTENANCE ACTIVITY						$0.00	LANE-MILE / YEAR		
HMA OVERLAY PVMT SURF		(2.00")	1.0072	Surface Mix	2.00	$9.51	/ SQ YD	44978	
HMA OVERLAY PVMT		(2.00")	1.0072		2.00	$9.51	/ SQ YD	44978	
HMA SURFACE MIX		(2.00")	1.0072	Surface Mix	2.00	$9.51	/ SQ YD	44978	
HMA BINDER MIX		(0.00")	1.0145	4.75 Binder Mix	0.00	$0.00	/ SQ YD	44978	
HMA OVERLAY SHLD	(Year 30)	(2.00")		Shoulder Mix	2.00	$8.06	/ SQ YD	0	
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	$8.06	/ SQ YD	0	
MILLING (2.00 IN)					2.00	$3.00	/ SQ YD		
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	$79.44	/ 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 ")		Binder Mix	2.00	$79.52	/ 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 $5,458,110
FLEXIBLE TOTAL ANNUAL COST PER MILE $133,566

HMA_SD MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE 05/05/20

FULL-DEPTH HMA PAVEMENT
HMA PAVEMENT OVER 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%	35,200	LIN FT	$2.00		$70,400	
CNTR LINE JOINT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RNDM / THRM CRACK R&S	50.00%	19,360	LIN FT	$2.00		$38,720	
PD PVMT PATCH M&F SURF	0.10%	45	SQ YD	$79.44		$3,575	
PWFn = 0.8626			PW =	0.8626	X	$147,895	$127,576
YEAR 10							
LONG SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CNTR LINE JOINT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RNDM / THRM CRACK R&S	50.00%	19,360	LIN FT	$2.00		$38,720	
PD PVMT PATCH M&F SURF	0.50%	225	SQ YD	$79.44		$17,874	
PWFn = 0.7441			PW =	0.7441	X	$162,194	$120,688
YEAR 15							
MILL PVMT & SHLD 2.00"	100.00%	44,978	SQ YD	$3.00		$134,934	
PD PVMT PATCH M&F ADD'L 2.00"	1.00%	450	SQ YD	$79.52		$35,784	
HMA OVERLAY PVMT 2.00"	100.00%	44,978	SQ YD	$9.51		$427,638	
HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	$8.06		$0	
PWFn = 0.6419			PW =	0.6419	X	$598,356	$384,062
YEAR 20							
LONG SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CNTR LINE JOINT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RNDM / THRM CRACK R&S	50.00%	19,360	LIN FT	$2.00		$38,720	
PD PVMT PATCH M&F SURF	0.10%	45	SQ YD	$79.44		$3,575	
PWFn = 0.5537			PW =	0.5537	X	$147,895	$81,886
YEAR 25							
LONG SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CNTR LINE JOINT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RNDM / THRM CRACK R&S	50.00%	19,360	LIN FT	$2.00		$38,720	
PD PVMT PATCH M&F SURF	0.50%	225	SQ YD	$79.44		$17,874	
PWFn = 0.4776			PW =	0.4776	X	$162,194	$77,465
HMA_SD							
YEAR 30 NON-INTERSTATE							
MILL PVMT & SHLD 2.00"	100.00%	44,978	SQ YD	$3.00		$134,934	
PD PVMT PATCH M&F ADD'L 2.00"	2.00%	900	SQ YD	$79.52		$71,568	
PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	$78.06		$0	
HMA OVERLAY PVMT 2.00 "	100.00%	44,978	SQ YD	$9.51		$427,638	
HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	$8.06		$0	
PWFn = 0.4120			PW =	0.4120	X	$634,140	$261,257
YEAR 35							
LONG SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CNTR LINE JOINT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RNDM / THRM CRACK R&S	50.00%	19,360	LIN FT	$2.00		$38,720	
PD PVMT PATCH M&F SURF	0.10%	45	SQ YD	$79.44		$3,575	
PWFn = 0.3554			PW =	0.3554	X	$147,895	$52,559
YEAR 40							
LONG SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CNTR LINE JOINT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RNDM / THRM CRACK R&S	50.00%	19,360	LIN FT	$2.00		$38,720	
PD PVMT PATCH M&F SURF	0.50%	225	SQ YD	$79.44		$17,874	
PWFn = 0.3066			PW =	0.3066	X	$162,194	$49,722
							$1,155,215
ROUTINE MAINTENANCE ACTIVITY		6.67	Lane Miles	0.00		$0	$0
						MAINTENANCE LIFE-CYCLE COST	$1,155,215
45 YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$28,269

PCC PAVEMENT

JPCP

ROUTE			IL 53			
SECTION			533-R			
COUNTY			DuPage			
LOCATION			IL 64 to Charles Rd			
FACILITY TYPE			NON-INTERSTATE			
PROJECT LENGTH			8800 FT = = >	1.67 Miles		USER OVERRIDE COLUMN
# OF CENTERLINES			2 CL			
# OF LANES			4 LANES			
# OF EDGES			4 EP			
LANE WIDTH - AVERAGE			11.5 FT			
SHOULDER WIDTH	PCC	Inside	0 FT			
	PCC	Outside	0 FT			
	Total Width of Paved Shoulders		0 FT			
PAVEMENT THICKNESS (RIGID)	JPCP		10.00 IN	TIED SHLD		
SHOULDER THICKNESS			10.00 IN			
HMA OVERLAY THICKNESS			2.75 IN			

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE	On User Override
	5.02	10.21	10.21	
Worksheet Construction Type is Reconstruction		The Pavement Type is	JPCP	

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT		UNIT PRICE		COST	USER SUPPLIED QUANTITY
JPC PAVEMENT	(10.00")	44,978	SQ YD		$60.44	/ SQ YD	$2,718,470	
PAVEMENT REINFORCEMENT		0	SQ YD		$22.00	/ SQ YD	$0	
STABILIZED SUBBASE	(4.00")	0	SQ YD	*	$19.00	/ SQ YD	$0	0
PCC SHOULDERS		0	SQ YD		$40.00	/ SQ YD	$0	
CURB & GUTTER		35,200	LIN FT	*	$30.00	/ LIN FT	$1,056,000	35,200
SUBBASE GRAN MATL TY C	(~ 0.00")	0	TONS		$25.00	/ TON	$0	
IMPROVED SUBGRADE:	Aggregate	Width = 48.0'	46,933	SQ YD	$7.00	/ SQ YD	$328,531	
Reserved For User Supplied Item			0	UNITS	$0.00	/ UNITS	$0	
Reserved For User Supplied Item			0	UNITS	$0.00	/ UNITS	$0	
PAVEMENT REMOVAL			44,978	SQ YD	$15.00	/ SQ YD	$674,670	
SHOULDER REMOVAL			0	SQ YD	$0.00	/ SQ YD	$0	

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST $4,777,671
RIGID CONSTRUCTION ANNUAL COST PER MILE $116,915

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST		Schedule Quantity	Unit Cost Override
ROUTINE MAINTENANCE ACTIVITY						$0.00	/ LANE-MILE / YEAR		
HMA OVERLAY		(2.75")			2.75				
HMA OVERLAY PAVEMENT		(2.75")	1.0100		2.75	$13.16	/ SQ YD	44978	
HMA SURFACE MIX		(1.50")	1.0054	Surface Mix	1.50	$7.12	/ SQ YD	44978	
HMA BINDER MIX		(1.25")	1.0154	4.75 Binder Mix	1.25	$6.04	/ SQ YD	44978	
HMA OVERLAY SHOULDER		(2.75")		Shoulder Mix	2.75	$11.09	/ SQ YD	0	
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	$77.08	/ SQ YD		
PARTIAL DEPTH PVMT PATCH	(Mill & Fill HMA 2.75")			Surface Mix	2.75	$82.98	/ 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 $5,504,449
RIGID TOTAL ANNUAL COST PER MILE $134,700

JPCP MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE 05/05/20

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%	45	SQ YD	$150.00		$6,750	
PWFn = 0.7441			PW =	0.7441	X	$6,750	$5,023
YEAR 15							
PAVEMENT PATCH CLASS B	0.20%	90	SQ YD	$150.00		$13,500	
PWFn = 0.6419			PW =	0.6419	X	$13,500	$8,665
YEAR 20							
PAVEMENT PATCH CLASS B	2.00%	900	SQ YD	$150.00		$135,000	
SHOULDER PATCH CLASS C	0.50%	0	SQ YD	$145.00		$0	
LONGITUDINAL SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CENTERLINE JT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
PWFn = 0.5537			PW =	0.5537	X	$240,600	$133,214
YEAR 25							
PAVEMENT PATCH CLASS B	3.00%	1,349	SQ YD	$150.00		$202,350	
SHOULDER PATCH CLASS C	1.00%	0	SQ YD	$145.00		$0	
PWFn = 0.4776			PW =	0.4776	X	$202,350	$96,643
YEAR 30 NON-INTERSTATE							
PAVEMENT PATCH CLASS B	4.00%	1,799	SQ YD	$150.00		$269,850	
SHOULDER PATCH CLASS C	1.50%	0	SQ YD	$145.00		$0	
HMA OVERLAY 2.75" (PVMT)	100.00%	44,978	SQ YD	$13.16		$591,890	
HMA OVERLAY 2.75" (SHLD)	100.00%	0	SQ YD	$11.09		$0	
PWFn = 0.4120			PW =	0.4120	X	$861,740	$355,025
YEAR 35 NON-INTERSTATE							
LONGITUDINAL SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CENTERLINE JT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
RANDOM CRACK R&S	50.00%	17,600	LIN FT	$2.00		$35,200	
REFLECTIVE TRANSVERSE CRACK R&S	40.00%	10,801	LIN FT	$2.00		$21,602	
PD PVMT PATCH M&F HMA 2.75"	0.10%	45	SQ YD	$82.98		$3,734	
PWFn = 0.3554			PW =	0.3554	X	$166,136	$59,042
YEAR 40 NON-INTERSTATE							
PAVEMENT PATCH CLASS B	0.50%	225	SQ YD	$150.00		$33,750	
LONGITUDINAL SHLD JT R&S	100.00%	35,200	LIN FT	$2.00		$70,400	
CENTERLINE JT R&S	100.00%	17,600	LIN FT	$2.00		$35,200	
REFLECTIVE TRANSVERSE CRACK R&S	60.00%	16,201	LIN FT	$2.00		$32,402	
RANDOM CRACK R&S	50.00%	17,600	LIN FT	$2.00		$35,200	
PD PVMT PATCH M&F HMA 2.75"	0.50%	225	SQ YD	$82.98		$18,670	
PWFn = 0.3066			PW =	0.3066	X	$225,622	$69,166
							$726,778
ROUTINE MAINTENANCE ACTIVITY		6.67	Lane Miles	$0.00		$0	$0
						MAINTENANCE LIFE-CYCLE COST	$726,778
45 YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE	$17,785

RECONSTRUCTION - HMA OVER RUBBLIZED PAVEMENT

RECONSTRUCTION - PCC UNBONDED OVERLAY

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 4/9/20 5:35 PM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$4,777,671	$4,302,895
		ANNUAL COST PER MILE	$116,915	$105,297
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$726,778	$1,155,215
		ANNUAL COST PER MILE	$17,785	$28,269

TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$5,504,449	$5,458,110	
		ANNUAL COST PER MILE	$134,700	$133,566	

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**#NAME?**	**#NAME?**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**#NAME?**	**#NAME?**	#NAME?