



Illinois Department of Transportation

To: Anthony J. Quigley Attn: John Baczek
From: Jack A. Elston By: Michael Brand *MOB*
Subject: Pavement Design Approval
Date: July 15, 2019

Route: Chicago Road Job No.: D-91-354-18
Section: 2018-055-CR Contract No.: 62G92
County: Cook Target Letting: Nov. 2019
Limits: at Thorn Creek Tributary

We have reviewed the pavement design for the above referenced project which was submitted on May 23, 2019. The scope of the project involves replacement of the culvert carrying Chicago Road over the Thorn Creek Tributary and reconstruction of approximately 1,170 feet of Chicago Road.

The pavement design resulted in two pavement options: 8.25" Full-Depth HMA and 8" PCC. The life-cycle cost analysis of those options resulted in the HMA pavement being 15% less expensive (\$115,005/mile compared to PCC's cost of \$132,309/mile).

In summary, the approved pavement design is as follows:

Chicago Road
8.25" Full-Depth HMA Pavement w/ 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: May 23, 2019

*Route: Chicago Road
Limits: at Thorn Creek Tributary
Section: 2018-055-CR
Current target: 11CY19

County: Cook
Contract No.: 62G92
Job No.: D-91-354-18

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:

Replacement of culvert over Thorn Creek Tributary and reconstruction of approximately 1,170 feet of Chicago Road.

A 20-year pavement analysis was performed on the above segment. We recommend a mechanistic flexible pavement design based on the life cycle cost analysis which favors HMA pavement by 15%.

Chicago Road

Pavement Reconstruction³

PCC Curb and Gutter

8 ¼" Full Depth HMA¹

2" HMA Surface Course, Mix "D", N50

6 ¼" HMA Base Course, IL-19.0, N50

12" Aggregate Subgrade Improvement²

J. Elston
May 23, 2019
Page Two

¹Designer Note 1: Use pay item **40701846, HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 8 1/4"**, paid for in square yards.

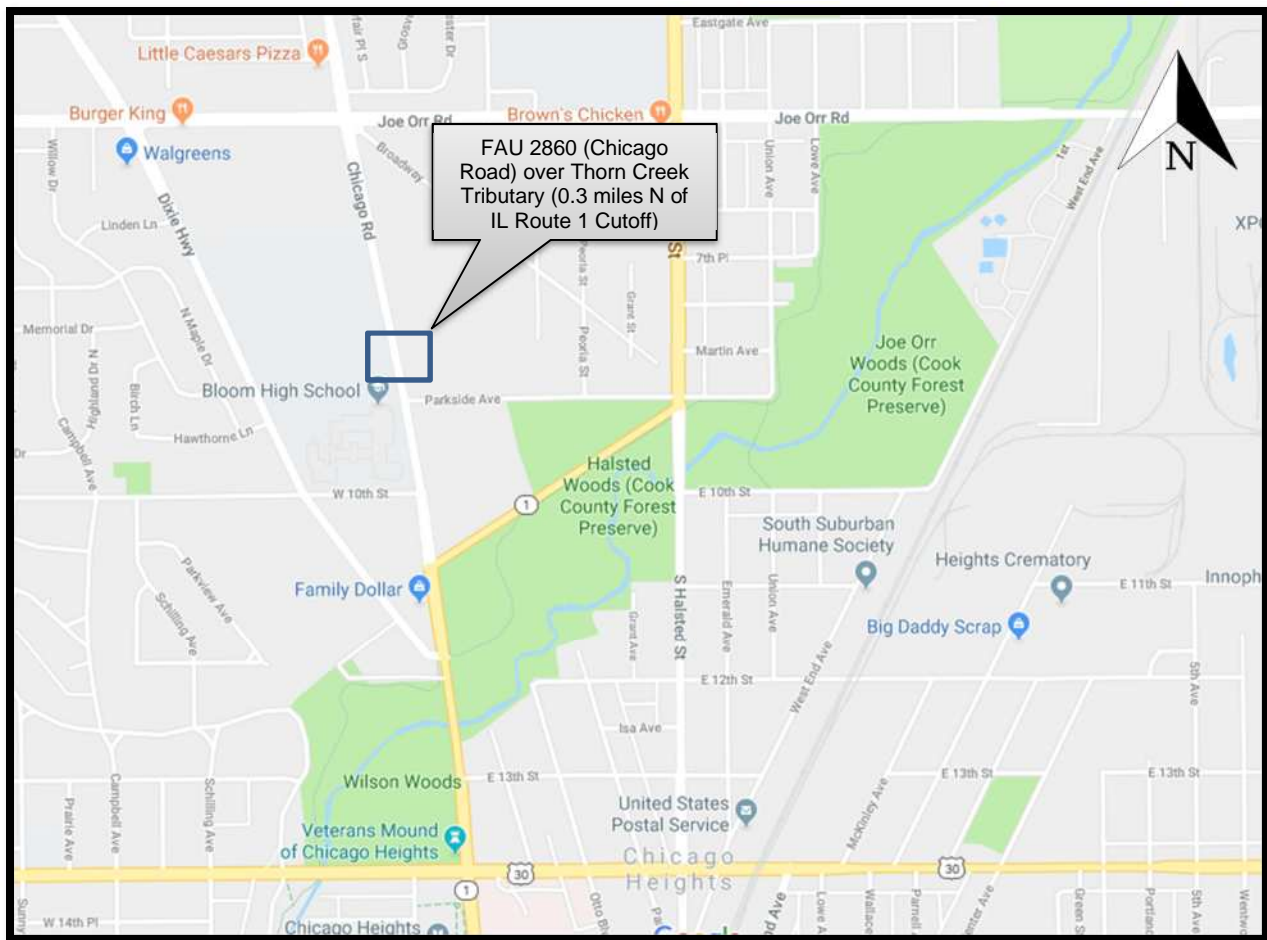
²Designer Note 2: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"** paid for in square yards.

³Designer 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.

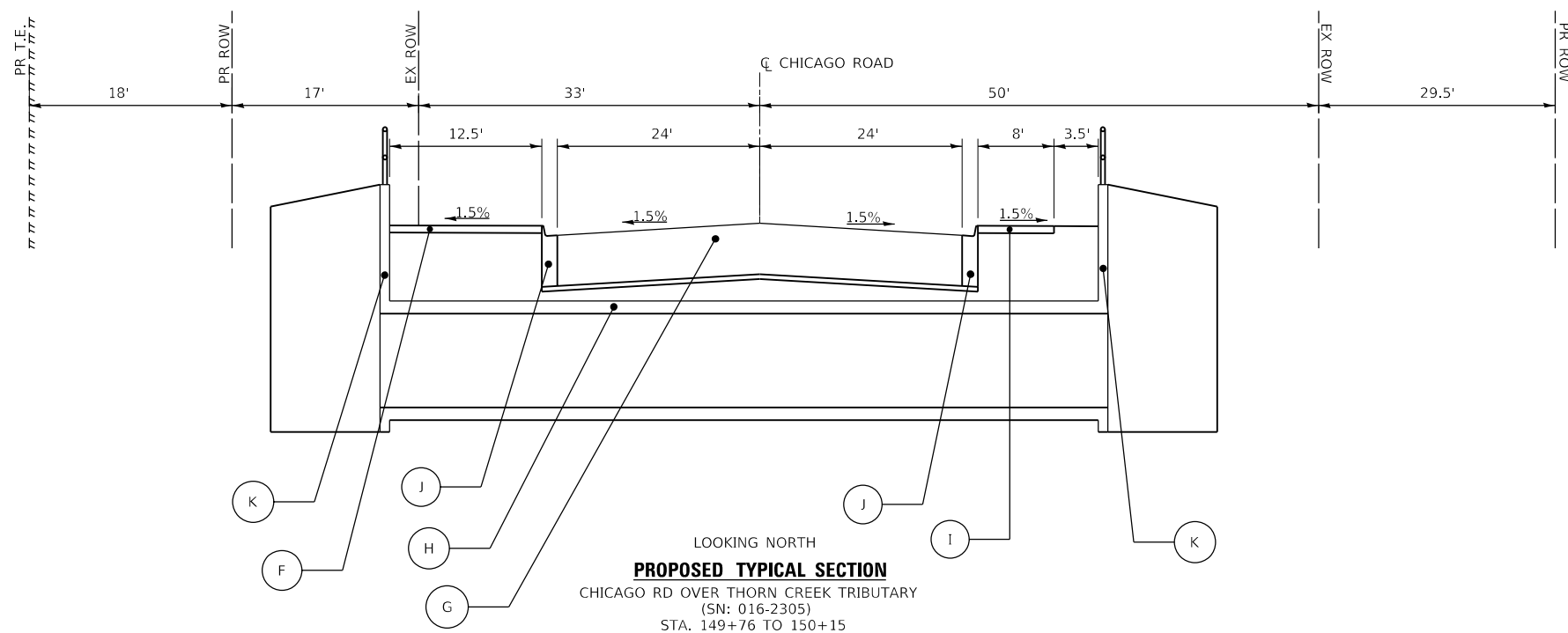
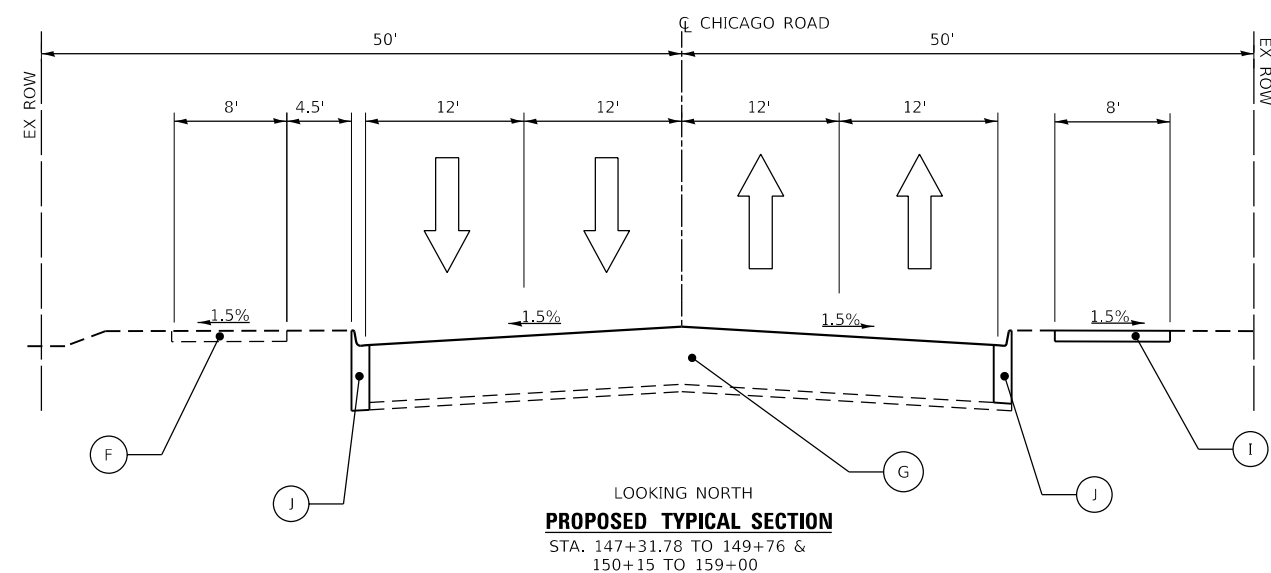
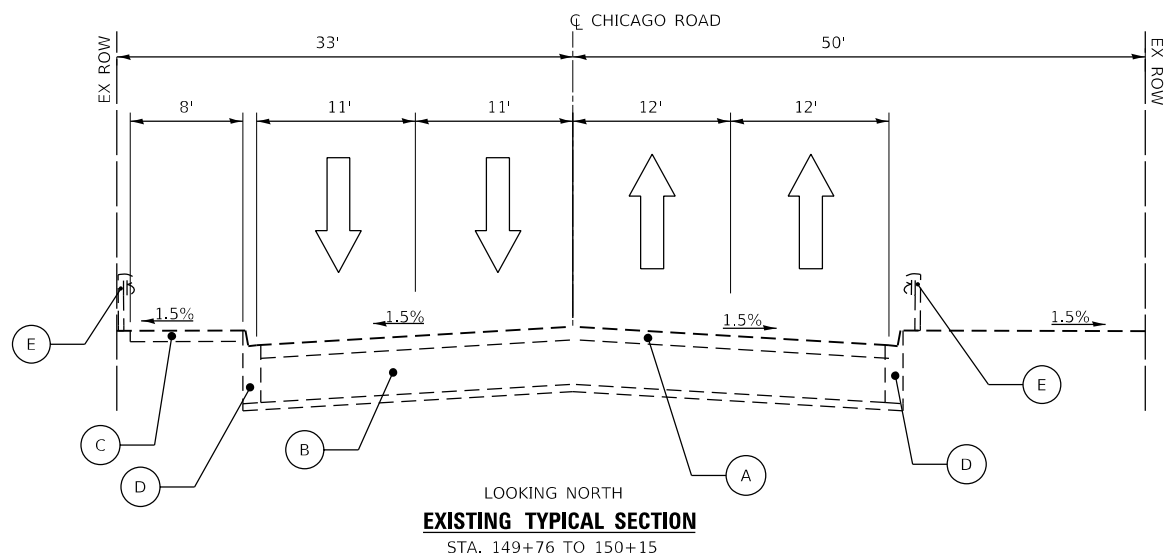
If you have any questions or need additional information, please contact Ojas Patel, Pavement Engineer, at (847) 705-4550.

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

LOCATION MAP



Contract No.: 62G92
FAU 2860 (Chicago Road) over Thorn Creek Tributary
(0.3 miles N of IL Route 1 Cutoff)
Replacement of culvert, new sidewalk and new shared-use path
Cook County



- LEGEND:**
- (A) EXISTING HMA BITUMINOUS PAVEMENT
 - (B) EXISTING PCC PAVEMENT
 - (D) EXISTING COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24
 - (C) EXISTING PCC SHARED PATH
 - (F) PROPOSED CONCRETE SHARED PATH
 - (G) PROPOSED HMA PAVEMENT
 - (H) PROPOSED CULVERT
 - (I) PROPOSED PCC CONCRETE SIDEWALK
 - (J) PROPOSED COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24
 - (K) PROPOSED HEADWALL & HANDRAIL

FILE NAME = Q:\Engineering\Live\Projects\13840_IDOT DUR HBM\Work Order 21-62092\CADD\CADD Sheets\Civil\0162305-shr-typical.dgn



USER NAME = lchrzasc	DESIGNED - IH	REVISED -
DRAWN - IH	REVISIONS -	
PLOT SCALE = 10.0000' / in.	CHECKED - JMT	REVISIONS -
PLOT DATE = 5/6/2019	DATE - 05/02/2019	REVISIONS -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION
CHICAGO ROAD OVER THORN CREEK TRIBUTARY

SHEET OF SHEETS TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
2860	2018-055-CR	COOK		
CONTRACT NO. 62G92				
ILLINOIS FED. AID PROJECT				

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: Chicago Road	Comments: Over Thorn Creek		
Section: 2018-055-CR	Design Date: 05/11/2016 ONP	<- BY	
County: Cook	Modify Date: 05/15/2019 ONP	<- BY	
Location: Over Thorn Creek		ADT	Year
		Current:	6,100 2014
		Future:	8,000 2040
Facility Type: Unmarked State Route	# of Lanes = 4		
Road Class: I		Structural Design Traffic	
Subgrade Support Rating (SSR): Poor		Minimum ADT	Actual ADT
Construction Year: 2020			Actual % of Total ADT
Design Period (DP) = 20 years			% of ADT in Design Lane
		PV = No Min	6,739 92.7% P = 32%
		SU = No Min	422 5.8% S = 45%
		MU = No Min	109 1.5% M = 45%
		Struct. Design ADT =	7,269 (2030)

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT

C_{pv} = 0.15
 C_{su} = **132.5**
 C_{mu} = **482.53**
 TF flexible (Actual) = 0.98 (Actual ADT)
 TF flexible (Min) = No Min (Min ADT Fig. 54-2.C)

RIGID PAVEMENT

C_{pv} = 0.15
 C_{su} = **143.81**
 C_{mu} = **696.42**
 TF rigid (Actual) = 1.24 (Actual ADT)
 TF rigid (Min) = No Min (Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement		JPC Pavement	
Use TF flexible = 0.98		Use TF rigid = 1.24	
PG Grade Lower Binder Lifts = PG.64-22 (Fig. 53-4.R)		Edge Support = Tied Shoulder or C.&G.	
HMA Mixture Temp. = 75.5 deg. F (Fig. 54-5.C)		Rigid Pavt Thick. = 8.00 in. (Fig. 54-4.E)	
Design HMA Mixture Modulus (E _{HMA}) = 680 ksi (Fig. 54-5.D)			
Design HMA Strain (ε _{HMA}) = 121 (Fig. 54-5.E)		CRC Pavement	
Full Depth HMA Design Thickness = 8.25 in. (Fig. 54-5.F)		Use TF rigid = 1.24	
Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)		IBR value = 3	
Use Full-Depth HMA Thickness = 8.25 inches		CRCP Thickness = 6.50 in. (Fig. 54-4.M)	

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC		Unbonded Concrete Overlay	
Use TF flexible = 0.98		Review 54-4.03 for limitations and special considerations.	
HMA Overlay Design Thickness = 5.50 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	C _{su}	C _{mu}	C _{su}	C _{mu}
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 **Chicago Road**
 SECTION **2018-055-CR**
 COUNTY **Cook**
 LOCATION **over Thorn Creek**

FACILITY TYPE **NON-INTERSTATE**

PROJECT LENGTH **1170 FT ==> 0.22 Miles**
 # OF CENTERLINES **3 CL**
 # OF LANES **4 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) **8.25 IN 14.75 IN MAX**
 SHOULDER THICKNESS **8.00 IN HMA SD Standard Design**
 POLICY OVERLAY THICKNESS **2.25 IN**

FLEX PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		No Min	0.98	0.98

HMA COST PER TON	UNIT PRICE
HMA SURFACE	\$96.80 / TON
HMA TOP BINDER	\$83.80 / TON
HMA LOWER BINDER	\$83.80 / TON
HMA BINDER (LEVELING)	\$90.30 / TON
HMA SHOULDER	\$72.00 / TON

INITIAL COSTS	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT (FULL-DEPTH)	(8.25")	6240	6,240 SQ YD	\$40.58 / SQ YD	\$253,219 -
HMA SURFACE COURSE	(2.00")	10035	701 TONS	\$96.80 / TON	\$0
HMA TOP BINDER COURSE	(2.25")	10026	795 TONS	\$83.80 / TON	\$0
HMA LOWER BINDER COURSE	(4.00")	10217	1,428 TONS	\$83.80 / TON	\$0
HMA SHOULDER	(8.00")	0	0 TONS	\$72.00 / TON	\$0 -
CURB & GUTTER			2,350 LIN FT	\$30.00 / LIN FT	\$70,500
SUBBASE GRAN MATL TY C (TONS)			0 TONS	\$25.00 / TON	\$0
IMPROVED SUBGRADE: Aggregate	Width = 50.0'		6,549 SQ YD	\$7.00 / SQ YD	\$45,843
Reserved For User Supplied Item			0 UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item			0 UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL			6,240 SQ YD	\$15.00 / SQ YD	\$93,600
SHOULDER REMOVAL			0 SQ YD	\$0.00 / SQ YD	\$0

Note: * Denotes User Supplied Quantity
 FLEXIBLE CONSTRUCTION INITIAL COST \$463,162
 FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE \$85,248

MAINTENANCE COSTS:	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	(2.00")	Surface Mix	\$10.88 / SQ YD
HMA OVERLAY PVMT	(2.25")	Surface Mix	\$11.97 / SQ YD
HMA SURFACE MIX	(1.50")	Surface Mix	\$8.15 / SQ YD
HMA BINDER MIX	(0.75")	Bind Binder Mix	\$3.82 / SQ YD
HMA OVERLAY SHLD (Year 30)	(2.25")	Shoulder Mix	\$9.07 / SQ YD
HMA OVERLAY SHLD	(2.00")	Shoulder Mix	\$8.06 / SQ YD
MILLING (2.00 IN)			\$3.00 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill Surf)		Surface Mix	\$80.84 / SQ YD
PARTIAL DEPTH SHLD PATCH (Mill & Fill Surf)		Shoulder Mix	\$78.06 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill +2.00")		Leveling Binder Mix	\$80.11 / SQ YD
PARTIAL DEPTH SHLD PATCH (Mill & Fill +2.00")		Shoulder Mix	\$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 \$624,836
 FLEXIBLE TOTAL ANNUAL COST PER MILE \$115,005

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%	2,340	LIN FT	\$2.00	\$4,680	
	CNTR LINE JOINT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RNDM / THRM CRACK R&S	50.00%	2,574	LIN FT	\$2.00	\$5,148	
	PD PVMT PATCH M&F SURF	0.10%	6	SQ YD	\$80.84	\$485	
		PWF _n = 0.8626			PW = 0.8626 X	\$17,333	\$14,952
YEAR 10							
	LONG SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CNTR LINE JOINT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RNDM / THRM CRACK R&S	50.00%	2,574	LIN FT	\$2.00	\$5,148	
	PD PVMT PATCH M&F SURF	0.50%	31	SQ YD	\$80.84	\$2,506	
		PWF _n = 0.7441			PW = 0.7441 X	\$19,354	\$14,401
YEAR 15							
	MILL PVMT & SHLD 2.00"	100.00%	6,240	SQ YD	\$3.00	\$18,720	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	62	SQ YD	\$80.11	\$4,967	
	HMA OVERLAY PVMT 2.00"	100.00%	6,240	SQ YD	\$10.88	\$67,886	
	HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	\$6.06	\$0	
		PWF _n = 0.6419			PW = 0.6419 X	\$91,573	\$58,777
YEAR 20							
	LONG SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CNTR LINE JOINT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RNDM / THRM CRACK R&S	50.00%	2,574	LIN FT	\$2.00	\$5,148	
	PD PVMT PATCH M&F SURF	0.10%	6	SQ YD	\$80.84	\$485	
		PWF _n = 0.5537			PW = 0.5537 X	\$17,333	\$9,597
YEAR 25							
	LONG SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CNTR LINE JOINT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RNDM / THRM CRACK R&S	50.00%	2,574	LIN FT	\$2.00	\$5,148	
	PD PVMT PATCH M&F SURF	0.50%	31	SQ YD	\$80.84	\$2,506	
		PWF _n = 0.4776			PW = 0.4776 X	\$19,354	\$9,244
HMA SD							
YEAR 30							
	NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	6,240	SQ YD	\$3.00	\$18,720	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	125	SQ YD	\$80.11	\$10,014	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	\$78.06	\$0	
	HMA OVERLAY PVMT 2.25 "	100.00%	6,240	SQ YD	\$11.97	\$74,691	
	HMA OVERLAY SHLD 2.25 "	100.00%	0	SQ YD	\$9.07	\$0	
		PWF _n = 0.4120			PW = 0.4120 X	\$103,425	\$42,610
YEAR 35							
	LONG SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CNTR LINE JOINT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RNDM / THRM CRACK R&S	50.00%	2,574	LIN FT	\$2.00	\$5,148	
	PD PVMT PATCH M&F SURF	0.10%	6	SQ YD	\$80.84	\$485	
		PWF _n = 0.3554			PW = 0.3554 X	\$17,333	\$6,160
YEAR 40							
	LONG SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CNTR LINE JOINT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RNDM / THRM CRACK R&S	50.00%	2,574	LIN FT	\$2.00	\$5,148	
	PD PVMT PATCH M&F SURF	0.50%	31	SQ YD	\$80.84	\$2,506	
		PWF _n = 0.3066			PW = 0.3066 X	\$19,354	\$5,933
							\$161,674
	ROUTINE MAINTENANCE ACTIVITY		0.89 Lane Miles		0.00	\$0	\$0
							MAINTENANCE LIFE-CYCLE COST \$161,674
45	YEAR LIFE CYCLE	CRF _n = 0.0407852					MAINTENANCE ANNUAL COST PER MILE \$29,757

PCC PAVEMENT

JPCP

ROUTE Chicago Road
 SECTION 2018-055-CR
 COUNTY Cook
 LOCATION over Thorn Creek

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 1170 FT ==> 0.22 Miles
 # OF CENTERLINES 3 CL
 # OF LANES 4 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 8.00 IN TIED SHLD
 SHOULDER THICKNESS 8.00 IN

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
Worksheet Construction Type is Reconstruction	No Min	1.24	1.24 JPCP
The Pavement Type is			JPCP

INITIAL COSTS	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	(8.00")	6,240	SQ YD	\$66.17 / SQ YD	\$412,901
PAVEMENT REINFORCEMENT		0	SQ YD	\$22.00 / SQ YD	\$0
STABILIZED SUBBASE	(4.00")	0	SQ YD	\$19.00 / SQ YD	\$0
PCC SHOULDERS		0	SQ YD	\$40.00 / SQ YD	\$0
CURB & GUTTER		2,350	LIN FT	\$30.00 / LIN FT	\$70,500
SUBBASE GRAN MATL TY C	(- 0.00")	0	TONS	\$25.00 / TON	\$0
IMPROVED SUBGRADE: Aggregate (width = 49.0')		6,370	SQ YD	\$7.00 / SQ YD	\$44,590
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		6,240	SQ YD	\$15.00 / SQ YD	\$93,600
SHOULDER REMOVAL		0	SQ YD	\$0.00 / SQ YD	\$0

Note: * Denotes User Supplied Quantity
 RIGID CONSTRUCTION INITIAL COST \$621,591
 RIGID CONSTRUCTION ANNUAL COST PER MILE \$114,408

MAINTENANCE COSTS:	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 / LANE-MILE / YEAR
HMA POLICY OVERLAY	(2.50")		2.50
HMA POLICY OVERLAY PVMT	(2.50")	1.0043	2.50 \$13.24 / SQ YD
HMA SURFACE MIX	(1.50")	1.0026	1.50 Surface Mix \$8.15 / SQ YD
HMA BINDER MIX	(1.00")	1.0069	1.00 Binding Binder Mix \$5.09 / SQ YD
HMA POLICY OVERLAY SHLD	(2.50")		2.50 Shoulder Mix \$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 \$78.13 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	2.50 \$83.55 / 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 \$718,852
 RIGID TOTAL ANNUAL COST PER MILE \$132,309

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%	6	SQ YD	\$150.00	\$900	\$670
		PWF _n = 0.7441				PW = 0.7441 X \$900	
YEAR 15							
	PAVEMENT PATCH CLASS B	0.20%	12	SQ YD	\$150.00	\$1,800	\$1,155
		PWF _n = 0.6419				PW = 0.6419 X \$1,800	
YEAR 20							
	PAVEMENT PATCH CLASS B	2.00%	125	SQ YD	\$150.00	\$18,750	\$16,859
	SHOULDER PATCH CLASS C	0.50%	0	SQ YD	\$145.00	\$0	
	LONGITUDINAL SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CENTERLINE JT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
		PWF _n = 0.5537				PW = 0.5537 X \$30,450	
YEAR 25							
	PAVEMENT PATCH CLASS B	3.00%	187	SQ YD	\$150.00	\$28,050	\$13,397
	SHOULDER PATCH CLASS C	1.00%	0	SQ YD	\$145.00	\$0	
		PWF _n = 0.4776				PW = 0.4776 X \$28,050	
YEAR 30							
	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	4.00%	250	SQ YD	\$150.00	\$37,500	\$49,498
	SHOULDER PATCH CLASS C	1.50%	0	SQ YD	\$145.00	\$0	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	6,240	SQ YD	\$13.24	\$82,644	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	0	SQ YD	\$10.08	\$0	
		PWF _n = 0.4120				PW = 0.4120 X \$120,144	
YEAR 35							
	NON-INTERSTATE						
	LONGITUDINAL SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	\$7,064
	CENTERLINE JT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	RANDOM CRACK R&S	50.00%	2,340	LIN FT	\$2.00	\$4,680	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,498	LIN FT	\$2.00	\$2,996	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	6	SQ YD	\$83.55	\$501	
		PWF _n = 0.3554				PW = 0.3554 X \$19,877	
YEAR 40							
	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	0.50%	31	SQ YD	\$150.00	\$4,650	\$8,618
	LONGITUDINAL SHLD JT R&S	100.00%	2,340	LIN FT	\$2.00	\$4,680	
	CENTERLINE JT R&S	100.00%	3,510	LIN FT	\$2.00	\$7,020	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	2,246	LIN FT	\$2.00	\$4,492	
	RANDOM CRACK R&S	50.00%	2,340	LIN FT	\$2.00	\$4,680	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	31	SQ YD	\$83.55	\$2,590	
		PWF _n = 0.3066				PW = 0.3066 X \$28,112	
						\$8,618	
						\$97,261	
	ROUTINE MAINTENANCE ACTIVITY		0.89 Lane Miles:		\$0.00	\$0	\$0
							MAINTENANCE LIFE-CYCLE COST \$97,261
45	YEAR LIFE CYCLE	CRF _n = 0.0407852					MAINTENANCE ANNUAL COST PER MILE \$17,901

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 5/23/19 10:45 AM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	\$621,591	\$463,162
		ANNUAL COST PER MILE	\$114,408	\$85,248
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	\$97,261	\$161,674
		ANNUAL COST PER MILE	\$17,901	\$29,757
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	\$718,852	\$624,836
		ANNUAL COST PER MILE	\$132,309	\$115,005

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	=====>	HMA	\$115,005	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	JPCP	\$132,309	15.0%

S:\GEN\WPDOCS\Pavement Designs\D-1\Chicago Road at Thorn Creek - 62G92\Chicago Rd-IDOT Mech Pvmt Dgn LCCA 09-05-13.xlsm]LifeCycleCost