Illinois Department of Transportation

To:	Diane M. O'Keefe	Attn: District One
From:	John D. Baranzelli	John D. Baranzelli
Subject:	Pavement Design	
Date:	April 5, 2012	

FAP Route 577 (IL Route 171)
Will County
From Long Run Creek to 135th Street

We have reviewed the pavement selection for the project, which was submitted to BDE by memo dated March 30, 2012. The design meets the warrants for a "high stress" intersection, with the grade > 3.5% at the signalized intersection. The life cycle costs favor the rigid pavement design. The approved pavement design for this project is as follows:

IL Route 171 (Pavement Reconstruction)

9 inches of Jointed PCC Pavement with Tied PCC Shoulder
4.5 inches of Stabilized Sub-Base
12 inches of Aggregate Subgrade Improvement

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

Illinois Department of Transportation

Memorandum

To: John D. Baranzelli, PE

Attn: Paul R. Niedernhofer

From: Diane O'Keefe

By: Jose Dominguez

Subject: Pavement Analysis*

Date: March 30, 2012

*Route: FAP 577 (IL 171)
Limits: Long Run Creek to 135th St.
Contract No.: 60H21
Letting: 06CY13

Section: C-1-B
County: Will
Job No.: P-91-118-09

We are submitting the pavement analysis for the above captioned location for your review and approval. Please note that the total pavement area for reconstruction exceeds 4,750 Square Yards. The improvement involves the following scope of work:

a.) Pavement reconstruction of IL 171 in order to raise the roadway over Long Run Creek through 135th Street to meet geometric and hydraulic requirements.

A 20 year pavement analysis was performed for the pavement reconstruction of IL 171 since the pavement reconstruction is less than 25,000 square yards. The intersection of IL 171 and 135th Street is considered "high stress" as approach grade of IL 171 is greater than 3.5% at the signalized intersection. The recommended pavement is:

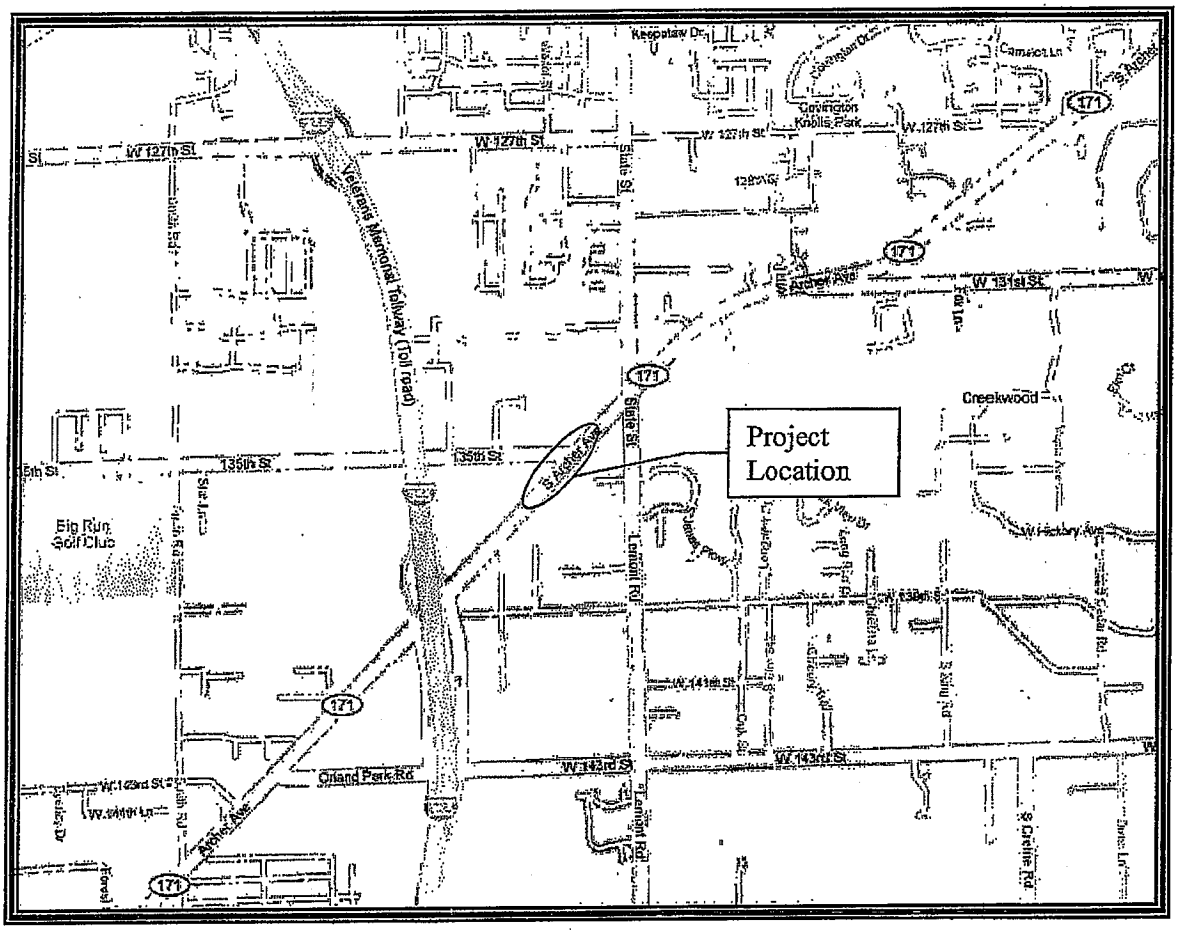
a.) IL 171
Pavement Reconstruction
PCC Shoulder (tied)
- 9" PCC Pavement (Jointed) *
- 4 ½" Stabilized Subbase
- 12" Aggregate Subgrade Improvement

The life cycle cost analysis favors PCC pavement by 15.8%.

*Designer Note 1: To be paid as pay item #42000401, **PORTLAND CEMENT CONCRETE PAVEMENT 9" (JOINTED)**, paid in square yards.

If you have any questions or need additional information, please contact Mr. Tom Matousek at (847)705-4255.

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



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Location Map

Proposed Improvement:

IL Route 171 over Long Run Creek

Municipality: Homer Township

County: Will/Cook

Route: FAP 0577

Project No: P- 91-118-09

Structure No.: 099-0080

(USE FOR TF ONLY)

Spreadsheet by Uehle - Rev. 11/02

MECHANISTIC PAVEMENT DESIGN

Date: 3/29/12

INPUT (Enter Data in Gray Shaded Cells)

Route: FAP 577 (IL 171)
Section: C-1-B
County: Will
Location: IL 171 over Long Run Creek

Comments: Traffic Data for IL 171 over Long Run Creek

Designer: TMC

	ADT	Year
Current:	12000	2009
Future:	15000	2040

Facility Type: Other Marked State Route

# of Lanes = 2 or 3

Part of future 4 lanes or more ? Yes

Road Class: I

Subgrade Support Rating (SSR): Poor

Construction Year: 2013

Design Period (DP) = 20 years

	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
				Structural Design Traffic
PV =	0	11,970	86.7%	P = 50%
SU =	250	1,491	10.8%	S = 50%
MU =	750	345	2.5%	M = 50%

Struct. Design ADT = 13806 (2023)

FLEXIBLE & RIGID PAVEMENT CALCULATIONS AND ADDITIONAL INPUT

Flexible Pavement

Cpv =	0.15	
Csu =	133	
Cmu =	483	
TF flexible (Actual)=	3.66	(Actual ADT)
TF flexible (Min)=	3.95	(Min ADT Fig 54-2C)
Use TF flexible =	3.95	
AC Type =	2D	
AC Mixture Tempurature =	80.0	deg. F (Figure 54-5C)
Design AC Mixture Modulus (Eac)=	550	ksi (Figure 54-5D)
Design Asphalt Concrete Microstrain =	67.9	(Figure 54-5E)
Asphalt Concrete Thickness =	13.25	in. (Figure 54-5F)

Rigid Pavement

Cpv =	0.15	
Csu =	144	
Cmu =	696	
TF rigid (Actual)=	4.57	(Actual ADT)
TF rigid (Min)=	5.58	(Min ADT Fig 54-2C)
Use TF rigid =	5.58	
Tied		Shoulder or C. &G.
Rigid Pavt. Thick =	9.50	in. (Figure 54-4B)

DESIGN TABLES FROM BD&E PAVEMENT DESIGN CH. 54 AND PAVEMENT DESIGN MANUAL

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 54-2C)		
Facility Type	PV	SU	MU
Interstate or Supplemental Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	No Min	No Min	No Min

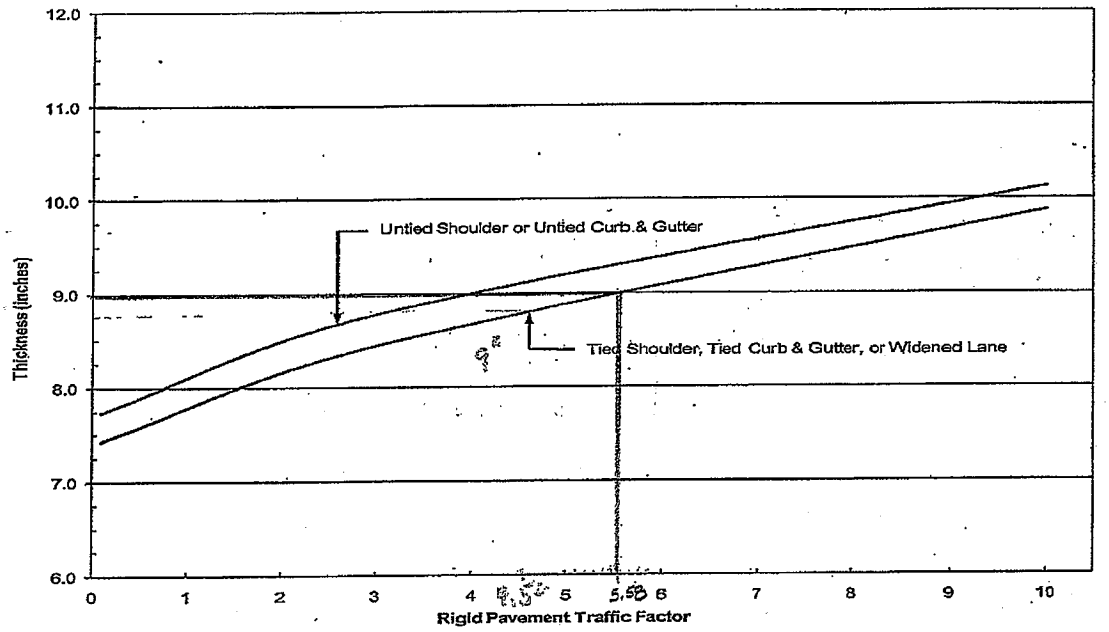
Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

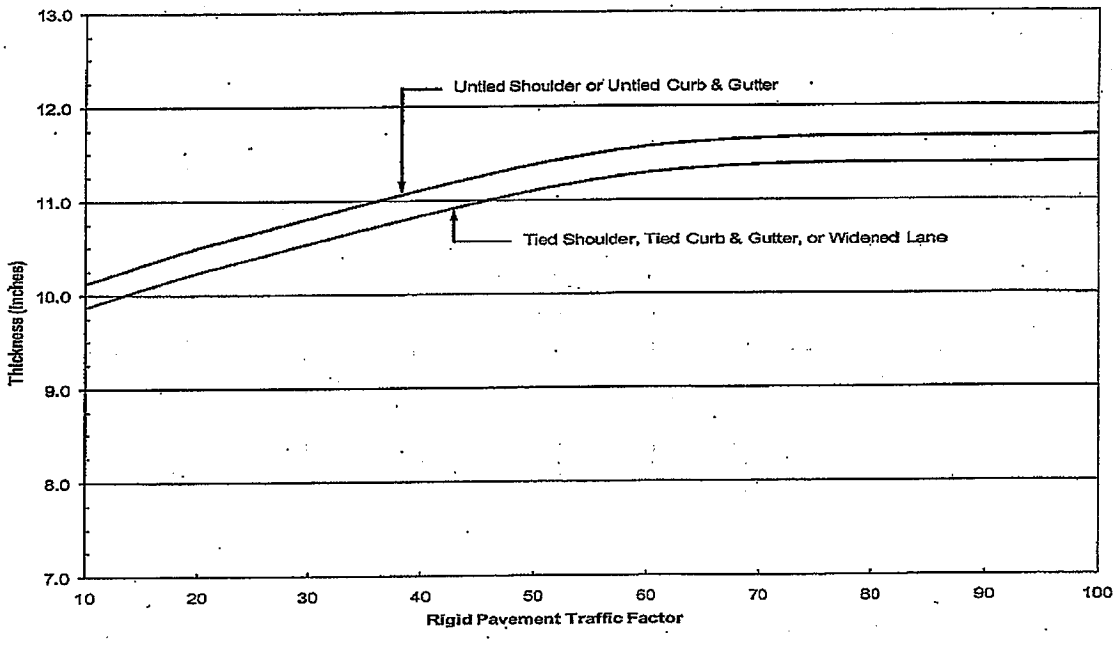
	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4C)		Flexible (Fig. 54-5B)	
Class	Csu	Cmu	Csu	Cmu
I	143.81	696.26	132.50	482.56
II	135.78	567.21	112.06	385.44
III	129.58	562.47	109.14	384.35
IV(ADT>400)	127.75	555.90	109.14	384.35
IV(ADT<=400)	127.75	555.90	9.86	78.84

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

	Figure 54-2B Percentage of ADT in Design Lane					
	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%

IL 171



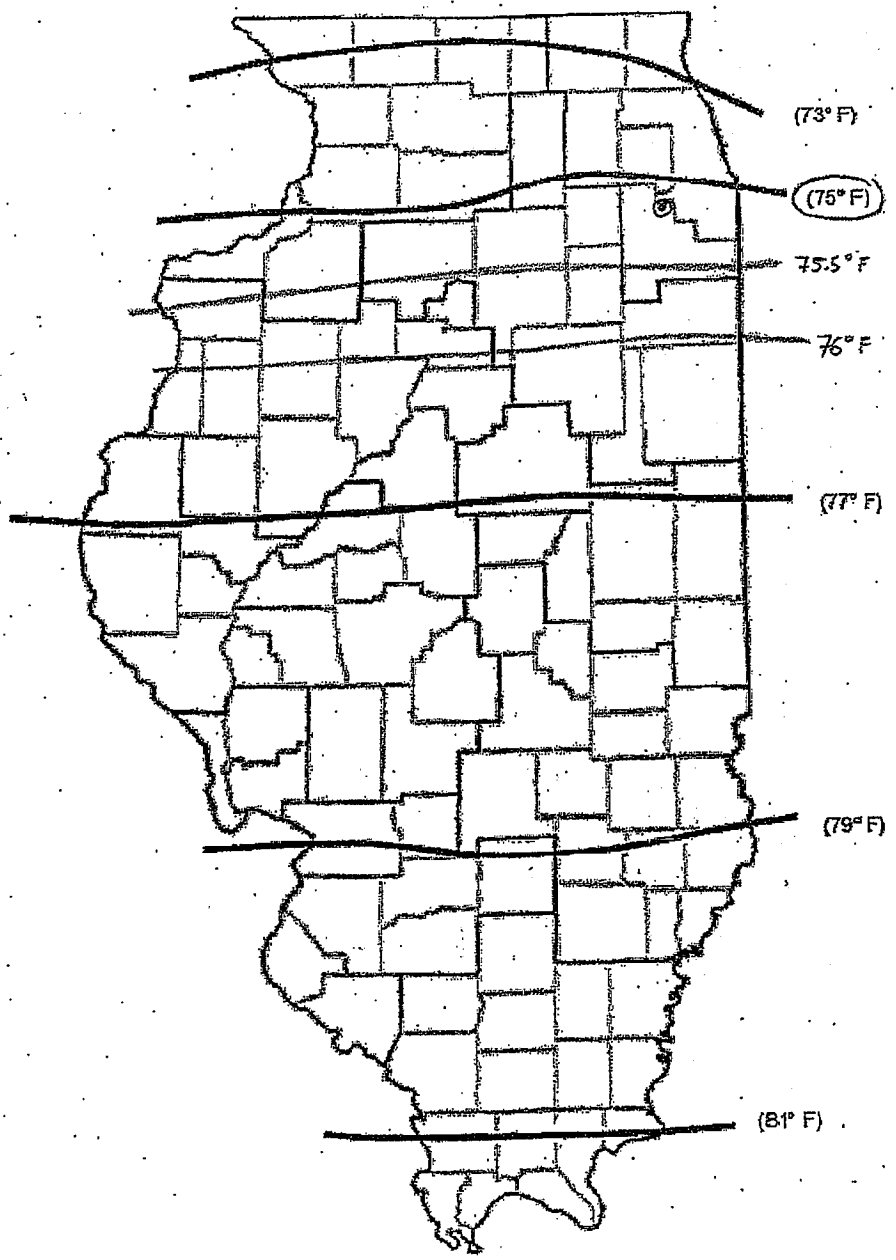


Note: Use of untied shoulder design requires BDE approval.

RIGID PAVEMENT DESIGN CHART
(Mechanistic Design: SSR = Poor)

9" JOINTED PCC PAVEMENT

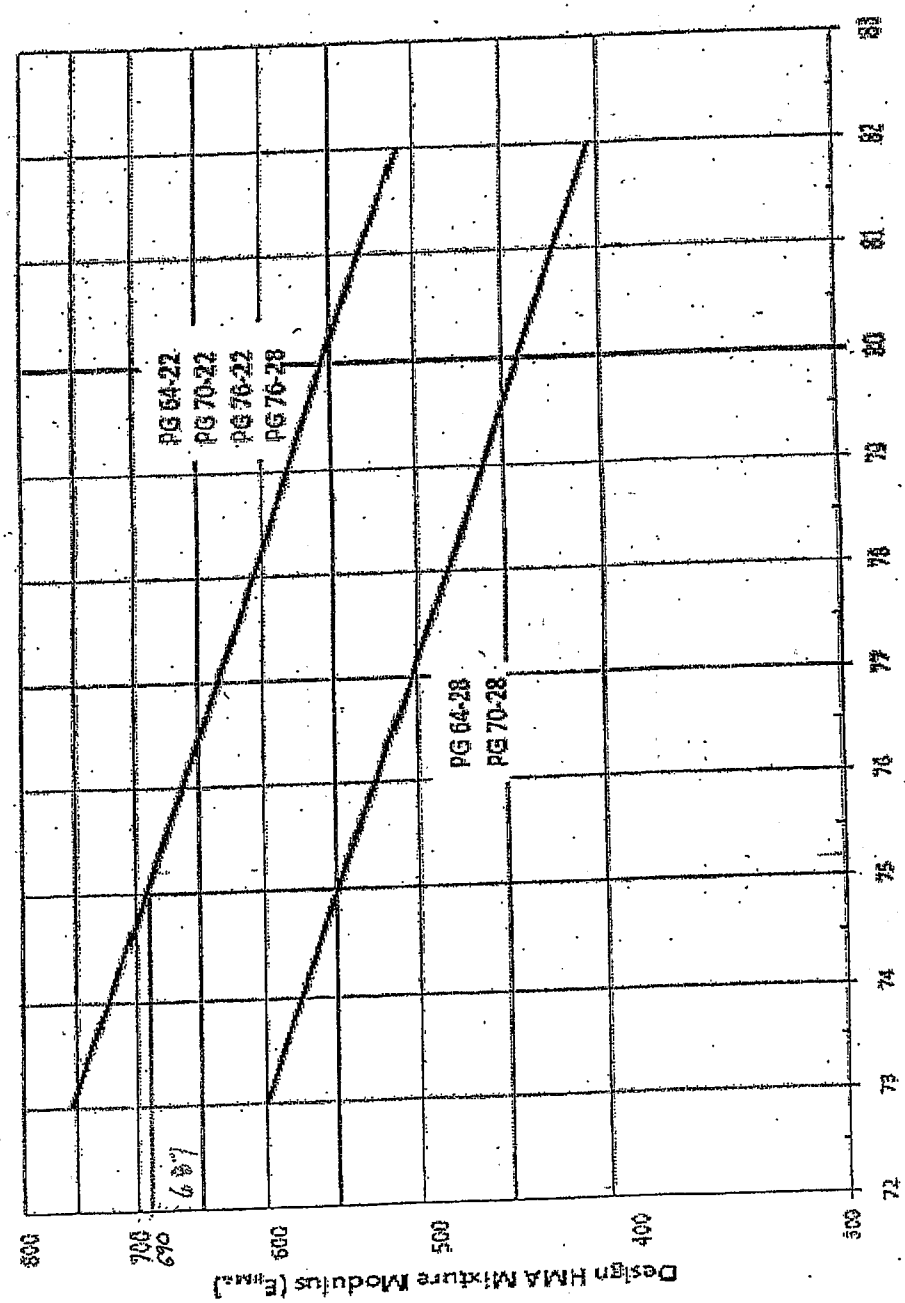
Figure 54-4.E



Note: The minimum design HMA mixture temperature will be 73°F.

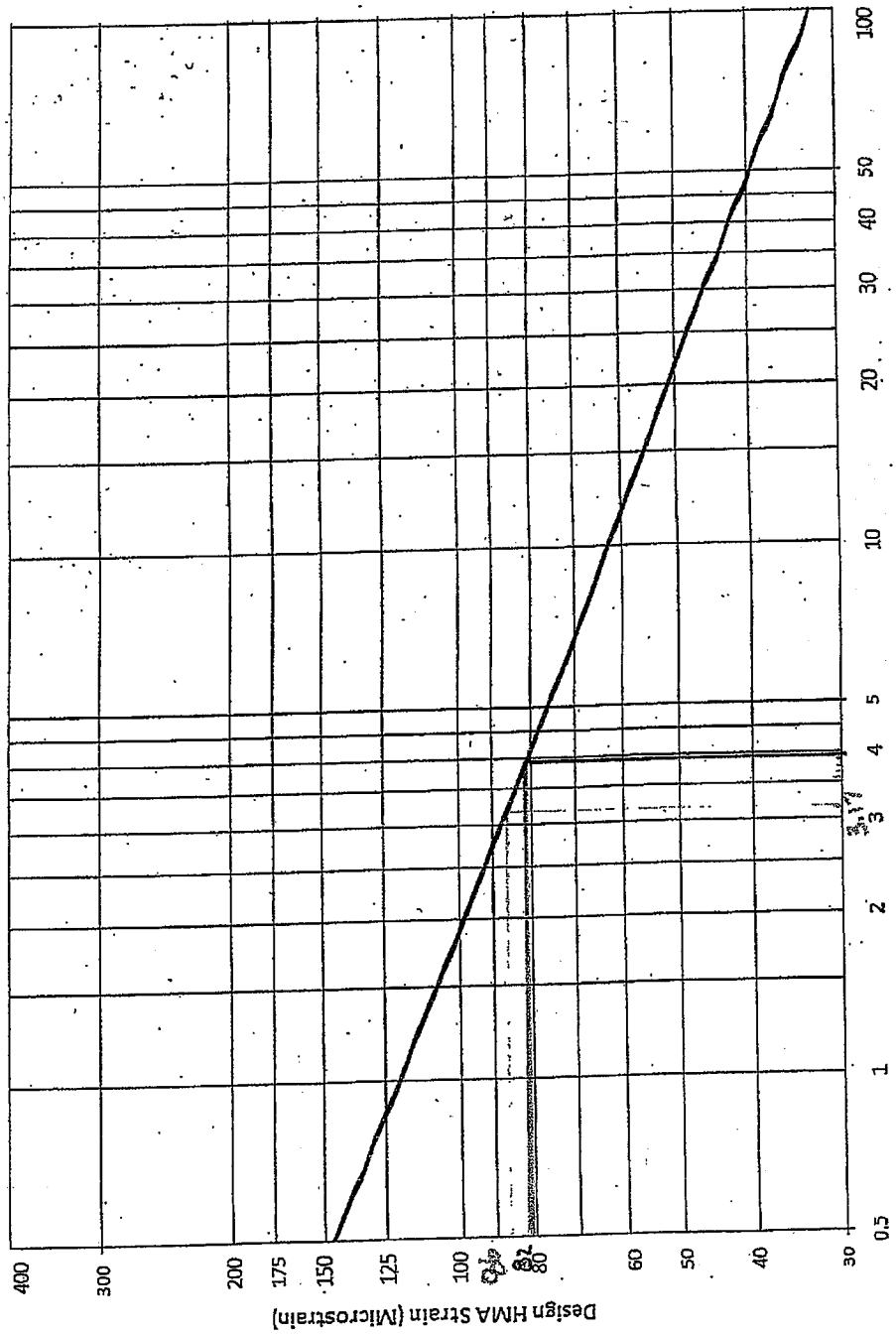
HMA MIXTURE TEMPERATURE
(Mechanistic Design: Flexible Pavement)

Figure 54-5.C



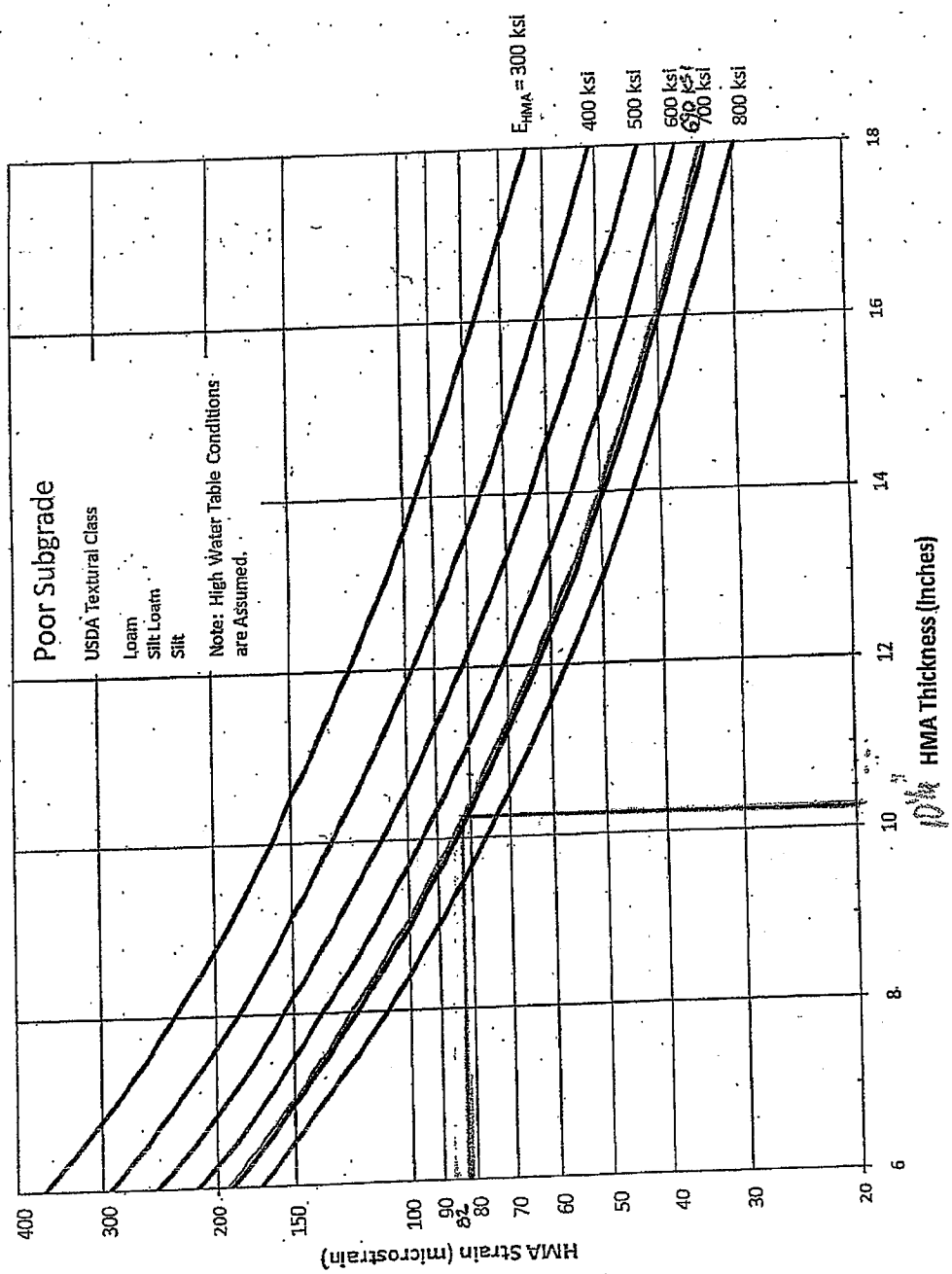
HMA MIXTURE MODULUS (E_{HMA})
(Mechanistic Design: Flexible Pavement)

Figure 54-5.D



DESIGN HMA STRAIN
(Mechanistic Design: Flexible Pavement)

Figure 54-5.E



HMA THICKNESS DESIGN CHART
(Mechanistic-Design: Flexible Pavement: SSR = Poor)

Figure 54-5.F

10¼" FULL DEPTH HMA PAVEMENT

MECHANISTIC PAVEMENT DESIGN

Date 3-Apr-12 | Route IL 171
Calcs by: SIP | Section C-1-B
Checked by: | Will County
Class 1 Roads and Streets | Location IL 171 over Long Run Creek
Urban | Rural X
Limits of Analysis | Station 74+24.39 to Station 95+50
Length 2126 Feet 0.40 Miles

Structural Design Traffic | Percent of S.D.T. in Design Lane
PV = 11970 | P = 86.70%
SU = 1491 | S = 10.80%
MU = 345 | U = 2.50%
MINIMUM SUBGRADE SUPPORT RATING - "POOR"

Flexible Pavement Design Actual TF_F = 3.66 Minimum TF_F = 3.95

Selected Design AC Type
Design AC Mixture Temp 75.5 °F | Design E_{AC} 690 KSI
Design AC Microstrain 82 | AC Thickness 10.25 Inch

Rigid Pavement Design Actual TF_F = 4.57 Minimum TF_F = 5.58
Extended Lane 9 Inch
15' Panel PCC Thickness for:
Tied Shoulder 9 Inch
Untied Shoulder 0 Inch

Figure 5.05

RIGID PAVEMENT

Date: 3-Apr-12 Route IL 171
Quantities by SJP Checked by: Section C-1-B
Unit Prices by TM Checked by: Will County
Net Length 2126 Lin. Ft. = 0.4 Miles
Number Lanes 2 Urban Rural X

ITEMIZED CONSTRUCTION COST

Quantity	Units	Item		Unit Cost	Total Cost
5669	Sq. Yds.	9 Inch Jointed PCC	@	$40.74	$230,955
6378	Sq. Yds.	4-Inch (Stabilized/Granular Subbase)	@	$16.00	$102,048
4,843	Sq. Yds.	9 Inch PCC Shoulder	@	$40.74	$197,304
	Lin. Ft.	Pipe Underdrains	@		
0		Subbase Gran. Mat., Type C	@	$0.00	$0
4,252	Lin. Ft.	100% Shoulder Joint Seal	@	$2.00	$8,504

Total Cost of Original Pavement Construction $538,811

ITEMIZED MAINTENANCE AND REHABILITATION ACTIVITY COST

REHABILITATION ACTIVITY 1 - YEAR 10

6	Sq. Yds.	0.1% Full Depth PCC Pavement Patching	@	$110.00	$660
		Total Cost of Rehabilitation Activity 1			$660

Figure 5.05a(1)

RIGID PAVEMENT (Cont.)

Route IL 171

Section C-1-B

Will County

REHABILITATION ACTIVITY 2 - YEAR 15

			Unit Cost	Total Cost
11 Sq. Yds.	0.2% Full Depth PCC Pavement Patching	@	$110.00	$1,210
	Total Cost of Rehabilitation Activity 2			$1,210

REHABILITATION ACTIVITY 3 - YEAR 20

			Unit Cost	Total Cost
113 Sq. Yds.	2% Full Depth PCC Pavement Patching	@	$0.00	$12,430
24 Sq. Yds.	0.5% Full Depth PCC Pavement Patching	@	$85.00	$2,040
4252 Lin. Ft.	100% Longitudunal/ Shoulder Joint Routing & Sealing	@	$0.65	$2,764
4252 Lin. Ft.	100% Centerline Joint Routing & Sealing	@	$0.70	$2,976
	Total Cost of Rehabilitation Activity 3			$20,210

FIGURE 5.05a(2)

RIGID PAVEMENT (Cont.)

Route IL 171

Section C-1-B

Will County

REHABILITATION ACTIVITY 4 - YEAR 25

			Unit Cost	Total Cost
170 Sq. Yds.	3.0% Full Depth PCC Pavement Patching	@	$110.00	$18,700
48 Sq. Yds.	1.0% Full Depth PCC Pavement Patching	@	$85.00	$4,080

Total Cost of Rehabilitation Activity 4 $22,780

REHABILITATION ACTIVITY 5 - YEAR 30

			Unit Cost	Total Cost
227 Sq. Yds.	3.0% Full Depth PCC Pavement Patching	@	$85.00	$6,205
73 Sq. Yds.	1.0% Full Depth PCC Pavement Patching	@	$12.73	$72,166
5,669 Sq. Yds.	Policy HMA Overlay - Pavement	@	$12.73	$72,166
4,843 Sq. Yds.	Policy HMA Overlay - Shoulder	@	$12.73	$61,651

Total Cost of Rehabilitation Activity 5 $164,992

REHABILITATION ACTIVITY 6 - YEAR 35

			Unit Cost	Total Cost
4,252 Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.65	$2,764
4252 Lin. Ft.	100% Centerline Joint Routing & Sealing	@	$0.70	$2,976
2,126 Lin. Ft.	50% Random Crack Routing & Sealing - Assume 100ft/station	@	$0.65	$1,382
1,361 Lin. Ft.	40% Reflective Transverse Crack Routing & Sealing	@	$0.65	$885
6 Sq. Yds.	0.1% Partial-Depth Pavement Patching (Mill & Fill Surface-Interstates; Mill & Fill 2.5in. Non-Interstates)		$110.00	$660

Total Cost of Rehabilitation Activity 6 $8,667

Figure 5.05a(3)

RIGID PAVEMENT (Cont.)

Route IL 171

Section C-1-B

Will County

REHABILITATION ACTIVITY 7 - YEAR 40

			Unit Cost	Total Cost
28 Sq. Yds.	0.5% Full Depth PCC Pavement Patching	@	$110.00	$3,080
28 Sq. Yds.	0.5% Partial Depth Pavement Patching (Mill & Fill Surface-Interstates; Mill & Fill 2.5in. Non-Interstates)	@	$110.00	$3,080
2,041 Lin. Ft.	60% Reflective Transverse Crack Routing & Sealing	@	$0.65	$1,327
2,126 Lin. Ft.	50% Random Crack Routing & Sealing - Assume 100ft/station	@	$0.65	$1,382
4,252 Lin. Ft.	100% Longitudunal/ Shoulder Joint Routing & Sealing	@	$0.65	$2,764
4,252 Lin. Ft.	100% Centerline Joint Routing & Sealing	@	$0.70	$2,976
	Total Cost of Rehabilitation Activity 7			$14,609

RIGID PAVEMENT (Cont.)

Route IL 171

Section C-1-B

Will County

ANNUAL COST DETERMINATION

Present Worth Calculation:

Total Cost of Original Pavement Construction			$538,811
Present Worth of Rehab Activity 1	$660	x 0.7441 =	$491
Present Worth of Rehab Activity 2	$1,210	x 0.6419 =	$777
Present Worth of Rehab Activity 3	$20,210	x 0.5537 =	$11,190
Present Worth of Rehab Activity 4	$22,780	x 0.4776 =	$10,880
Present Worth of Rehab Activity 5	$164,992	x 0.4120 =	$67,977
Present Worth of Rehab Activity 6	$8,667	x 0.3554 =	$3,080
Present Worth of Rehab Activity 7	$14,609	x 0.3066 =	$4,479
Total Life Cycle Cost (Present Worth)			$98,874

Annual Cost Per Mile Calculation

Total PW	x CRF_n /	Length		= Annual Cost / Year-Mile
$98,874	x0.04079 /	0.4	Mi.	$65,028 per Yr.-Mi.

FLEXIBLE PAVEMENT

Date: 3-Apr-12 Route IL 171
Quantities by SJP Checked by: Section C-1-B
Unit Prices by TM Checked by: Will County
Net Length 2126 Lin. Ft. = 0.4 Miles
Number Lanes 2 Urban Rural X
Single Lane Paving X Dual Lane Paving

ITEMIZED CONSTRUCTION COST

Quantity	Units	Item		Unit Cost	Total Cost
5,669	Sq. Yds.	Class I Surface Course	@	$12.73	$72,166
5,669	Sq. Yds.	Class I Binder Course	@	$28.63	$162,303
4843	Sq. Yds.	Stabilized Shoulders	@	$47.61	$230,575
	Lin. Ft.	Pipe Underdrains	@		
0		Subbase Gran. Matl., Type C	@	$0.00	$0
5,669	Sq. Yds.	Poly Binder	@	$11.52	$65,307

Total Cost of Original Pavement Construction $530,351

ITEMIZED MAINTENANCE AND REHABILITATION ACTIVITY COST

REHABILITATION ACTIVITY 1 - YEAR 5				Unit Cost	Total Cost
1169	Lin. Ft.	50% Random/Thermal Cracking & Sealing (Assume 110ft/station)	@	$0.50	$585
4252	Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.50	$2,126
4252	Lin. Ft.	100% Centerline Joint Rounting & Sealing	@	$0.50	$2,126
6	Sq. Yds.	0.1% Partial-Depth Pavement Patching Mill & Fill Surface	@	$85.00	$510

Total Cost of Rehabilitation Activity 1 $5,347

FIGURE 5.05b(1)

FLEXIBLE PAVEMENT (Cont.)
Route IL 171
Section C-1-B
Will County

REHABILITATION ACTIVITY 2 - YEAR 10

				Unit Cost	Total Cost
28	Sq. Yds.	0.5% Partial-depth HMA Pavement Patching - Mill & Fill Surface	@	$85.00	$2,380
1169	Lin. Ft.	50% Random/ Thermal Crack Routing & Sealing (Assume 110ft/station)	@	$0.50	$585
4252	Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.50	$2,126
4252	Lin. Ft.	100% Centerline Joint Rounting & Sealing	@	$0.50	$2,126
		Total Cost of Rehabilitation Activity 2			$7,217

REHABILITATION ACTIVITY 3 - YEAR 15

				Unit Cost	Total Cost
10,512	Sq. Yds.	2.00in. Milling - Pavement & Shoulder	@	$1.65	$17,345
57	Sq. Yds.	1.0% Partial-depth Pavement Patching (Mill & Fill Addition 2.00in.)	@	$85.00	$4,845
1,177	Sq. Yds.	2.00in. HMA Overlay Pavement & Shoulder	@	$113.66	$133,779
		Total Cost of Rehabilitation Activity 3			$155,969

FIGURE 5.05b(2)

FLEXIBLE PAVEMENT (Cont.)

Route IL 171

Section C-1-B

Will County

				Unit Cost	Total Cost
REHABILITATION ACTIVITY 4 - YEAR 20					
4252	Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.50	$2,126
4252	Lin. Ft.	100% Centerline Joint Rounting & Sealing	@	$0.50	$2,126
1169	Lin. Ft.	50% Random/ Thermal Crack Routing & Sealing (Assume 110ft/station)	@	$0.50	$585
6	Sq. Yds.	0.1% Partial-Depth HMA Pavement Patching (Mill & Fill Surface)	@	$85.00	$510
		Total Cost of Rehabilitation Activity 4			$5,347
REHABILITATION ACTIVITY 5 - YEAR 25				Unit Cost	Total Cost
4252	Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.50	$2,126
4252	Lin. Ft.	100% Centerline Joint Rounting & Sealing	@	$0.50	$2,126
1169	Lin. Ft.	50% Random/ Thermal Crack Routing & Sealing (Assume 110ft/station)	@	$0.50	$585
28	Sq. Yds.	0.5% Partial-Depth Pavement Patching (Mill & Fill Surface)	@	$85.00	$2,380
		Total Cost of Rehabilitation Activity 5			$7,217
REHABILITATION ACTIVITY 6 - YEAR 30				Unit Cost	Total Cost
5,669	Sq. Yds.	2.00in. Milling (Pavement only-Std Design Pavement & Shoulder-Limiting Strain Criteria Design)	@	$1.65	$9,354
113	Sq. Yds.	2.0% Partial-Depth HMA Pavement Patching (Mill & Fill Additional 2.00in. All Designs)	@	$85.00	$9,605
48	Sq. Yds.	1.0% Full-Depth HMA Shoulder Patching (Mill & Fill Surface-Standard Design Mill & Fill Additional 2.00in.-Limiting Strain Criteria Design)	@	$85.00	$4,080
1,190	Tons	HMA Overlay Pvmt (3.75in. - Std Design 2.00in.-Limiting Strain Criterion Design)	@	$113.66	$135,256
475	Tons	HMA Overlay Shoulder (1.75in. - Standard Design; 2.00in.-Limiting Strain Criterion Design)	@	$113.66	$53,989
		Total Cost of Rehabilitation Activity 6			$212,284

FIGURE 5.05b(3)

FLEXIBLE PAVEMENT (Cont.)
Route IL 171
Section C-1-B
Will County

REHABILITATION ACTIVITY 7 - YEAR 35

				Unit Cost	Total Cost
4252	Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.50	$2,126
4252	Lin. Ft.	100% Centerline Joint Rounting & Sealing	@	$0.50	$2,126
1169	Lin. Ft.	50% Random/ Thermal Crack Routing & Sealing (Assume 110ft/station)	@	$0.50	$585
6	Sq. Yds.	0.1% Partial-Depth HMA Pavement Patching (Mill & Fill Surface)	@	$85.00	$510
		Total Cost of Rehabilitation Activity 7			$5,347

REHABILITATION ACTIVITY 8 - YEAR 40

				Unit Cost	Total Cost
4252	Lin. Ft.	100% Longitudinal Shoulder Joint Routing & Sealing	@	$0.50	$2,126
4252	Lin. Ft.	100% Centerline Joint Rounting & Sealing (Single Lane and Dual Lane Paving)	@	$0.50	$2,126
1169	Lin. Ft.	50% Random/ Thermal Crack Routing & Sealing (Assume 110ft/station)	@	$0.50	$585
28	Sq. Yds.	0.5% Partial-Depth Pavement Patching (Mill & Fill Surface)	@	$85.00	$2,380
		Total Cost of Rehabilitation Activity 8			$7,217

Figure 5.05b(4) - continued

FLEXIBLE PAVEMENT (Cont.)
Route IL 171
Section C-1-B
Will County

ANNUAL COST DETERMINATION

Present Worth Calculation:

Total Cost of Original Pavement Construction			$530,351
Present Worth of Rehab Activity 1	$5,347	x 0.7441 =	$4,612
Present Worth of Rehab Activity 2	$7,217	x 0.6419 =	$5,370
Present Worth of Rehab Activity 3	$155,969	x 0.5537 =	$100,117
Present Worth of Rehab Activity 4	$5,347	x 0.4776 =	$2,961
Present Worth of Rehab Activity 5	$7,217	x 0.4120 =	$3,447
Present Worth of Rehab Activity 6	$212,284	x 0.3554 =	$87,461
Present Worth of Rehab Activity 7	$5,347	x 0.3066 =	$1,900
Present Worth of Rehab Activity 8	$7,217	x 0.3066 =	$2,213
Total Life Cycle Cost (Present Worth)			$208,081

Annual Cost Per Mile Calculation

Total PW	x CRF_n /	Length		= Annual Cost / Year-Mile
$208,081	x0.04079 /	0.4	Mi.	$75,302 per Yr.-Mi.

MATERIAL TYPE/PERCENTAGE	PCC	15.8%

PLAIN JOINTED PCC PAVEMENT

FILENAME-	IL 171	30-Aug-12	
ROUTE-	FAP 577	7:50 AM	
SECTION-	C-1-B		
COUNTY-	Will		
LOCATION-	IL 171 over Long Run Creek		
DATE-	29-Apr-12		
PROJECT LENGTH (FT)	2126 =	0.4	MILES
AVERAGE LANE WIDTH (FT)	12		
NUMBER OF LANES	2		
# OF EDGES	2		
INSIDE SHLDER WIDTH (FT)	12.5		
OUTSIDE SHLDER WIDTH (FT)	8		
# OF CENTERLINES	2		
RIGID THICKNESS-	9		
TRAFFIC FACTORS	MINIMUM	ACTUAL	
RIGID-	5.58	4.57	

TRAFFIC		Percentages
PV-	11970	86.70%
SU-	1491	10.80%
MU-	345	2.50%

INITIAL COSTS

ITEM	QUANTITY	UNIT PRICE	COST
PAVEMENT (SQ YDS)	5,669	$40.74	$230,955
STAB SUBBASE (SQ YDS)	6,378	$16.00	$102,048
SHOULDERS (SQ YDS)	4,843	$40.74	$197,304
SHOULDER SEAL (LN FT)	4,252	$2.00	$8,504
SUBBASE GRAN MATL TY C (TONS)	0		$0
CONSTRUCTION INITIAL COST (PW)			$538,811
TOTAL REHABILITATION COST (PW)			$98,874
TOTAL LIFE CYCLE COST (PW)			$637,685
ANNUAL COST PER MILE			$65,028

MAINTENANCE COSTS:

ITEM		UNIT COST
PAVEMENT PATCHING (SQ YDS)	(Use Class A pricing for CRC)	$110.00
SHOULDER PATCHING (SQ YDS)		$85.00
SHLDR JT ROUT & SEAL (LF)		$0.65
CENTERLINE JT ROUT & SEAL (LF)		$0.70
POLICY HMA OVERLAY PVMT (SQ YDS)		$12.73
POLICY HMA OVERLAY SHLDR (SQ YDS)		$12.73
RANDOM CRACK ROUT & SEAL (LF)		$0.65
REFL TRANS CRACK ROUT & SEAL (LF)		$0.65
PARTIAL PVMT PATCH (SQ YDS)		$110.00

MAINTENANCE COSTS:

	ITEM	QUANTITY	UNIT PRICE	COST	PW
Activity 1 YEAR 10	PAVEMENT PATCHING 0.1% (SQ YDS)	6	$110.00	$660	
				$660	$491
Activity 2 YEAR 15	PAVEMENT PATCHING 0.2% (SQ YDS)	11	$110.00	$1,210	
				$1,210	$777
Activity 3 YEAR 20	PAVEMENT PATCHING 2.0% (SQ YDS)	113	$110.00	$12,430	
	SHOULDER PATCHING 0.5% (SQ YDS)	24	$85.00	$2,040	
	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.65	$2,764	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.70	$2,976	
				$20,210	$11,190
Activity 4 YEAR 25	PAVEMENT PATCHING 3.0% (SQ YDS)	170	$110.00	$18,700	
	SHOULDER PATCHING 1.0% (SQ YDS)	48	$85.00	$4,080	
				$22,780	$10,880
Activity 5 YEAR 30	PAVEMENT PATCHING 4.0% (SQ YDS)	227	$110.00	$24,970	
	SHOULDER PATCHING 1.5% (SQ YDS)	73	$85.00	$6,205	
	POLICY HMS OVERLAY OVMT (SQ YDS)	5,669	$12.73	$72,166	
	POLICY HMA OVERLAY SHLDR (SQ YDS)	4,843	$12.73	$61,651	
				$164,992	$67,977
Activity 6 YEARS 35	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.65	$2,764	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.70	$2,976	
	RANDOM CRACK ROUT & SEAL 50% (LF)	2,126	$0.65	$1,382	
	REFL TRANS CRACK ROUT & SEAL 40%	1,361	$0.65	$885	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	6	$110.00	$660	
				$8,667	$3,080
Activity 7 YEAR 40	PAVEMENT PATCHING 0.5% (SQ YDS)	28	$110.00	$3,080	
	SHOULDER PATCHING 0.5% (SQ YDS)	28	$110.00	$3,080	
	REFL TRANS CRACK ROUT & SEAL 60%	2,041	$0.65	$1,327	
	RANDOM CRACK ROUT & SEAL 50% (LF)	2,126	$0.65	$1,382	
	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.65	$2,764	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.70	$2,976	
				$14,609	$4,479
			Total Rehabilitation Cost (Present Worth)		$98,874

FULL-DEPTH FLEXIBLE
TRAFFIC FACTOR LESS THAN 15.0 (RURAL)
TRAFFIC FACTOR LESS THAN 10.0 (URBAN)

ROUTE-	FAP 577	30-Aug-12
SECTION-	C-1-B	7:50 AM
COUNTY-	Will	
LOCATION-	IL 171 over Long Run Creek	

PROJECT LENGTH (FT)	2126	
AVERAGE LANE WIDTH (FT)	12	
NUMBER OF LANES	2	
# OF EDGES	2	
INSIDE SHLDER WIDTH (FT)	12.5	
OUTSIDE SHLDER WIDTH (FT)	8	
# OF CENTERLINES	2	
PROJECT TYPE	1	1=RURAL, 2=URBAN
PAVING WIDTH	1	1=SINGLE LANE, 2=DUAL LANE
INTERSTATE / OTHER ROUTE	OTHER ROUTE	
FLEXIBLE THICKNESS-	10.25	

TRAFFIC FACTORS	MINIMUM	ACTUAL
FLEXIBLE	3.95	3.66

TRAFFIC

PV-	11970	0.867
SU-	1491	0.108
MU-	345	0.025

PAVEMENT OVERLAY THICKNESS	3.75
SHOULDER OVERLAY THICKNESS	1.75

INITIAL COSTS

ITEM	QUANTITY	UNIT PRICE	COST
SURFACE (SQ YDS)	5,669	$12.73	$72,166
POLY BINDER (SQ YDS)	5,669	$11.52	$65,307
BINDER (SQ YDS)	5,669	$28.63	$162,303
SHOULDERS (SQ YDS)	4843	$47.61	$230,575
SUBBASE GRAN MATL TY C (TONS)	0		$0

CONSTRUCTION INITIAL COST (PW)	$530,351
TOTAL REHABILITATION COST (PW)	$208,081
TOTAL LIFE CYCLE COST (PW)	$738,432
ANNUAL COST PER MILE	$75,302

MAINTENANCE COSTS:

ITEM		UNIT COST
RAND/THERM CRACK ROUT & SEAL (LF)		$0.50
SHLDR JT ROUT & SEAL (LF)		$0.50
CENTERLINE JT ROUT & SEAL (LF)		$0.50
PARTIAL PVMT PATCH (SQ YDS)		$85.00
2" MILL PVMT & SHLDR (SQ YDS)	(Use $3.00 for small quantity)	$1.65
2" OVERLAY PVMT & SHLDR (TONS)		$113.66
2" MILL PVMT ONLY (SQ YDS)	(Use $3.00 for small quantity)	$1.65
HMA SHOULDER PATCHING (SQ YDS)		$85.00
POLICY HMA OVERLAY PVMT (TONS)		$113.66
POLICY HMA OVERLAY SHLDR (TONS)		$113.66

MATERIAL TYPE/PERCENTAGE PCC 15.8%

FULL DEOTH FLEXIBLE PAVEMENT
MAINTENANCE COSTS

	ITEM	QUANTITY	UNIT PRICE	COST	PW
Activity 1					
YEAR 5	RAND/THERM CRACK ROUT & SEAL 50% (LF)	1,169	$0.50	$585	
	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	6	$85.00	$510	
				$5,347	$4,612
Activity 2					
YEAR 10	PARTIAL PVMT PATCH 0.5% (SQ YDS)	28	$85.00	$2,380	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	1,169	$0.50	$585	
	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
				$7,217	$5,370
Activity 3					
YEAR 15	2" MILL PVMT & SHLDR 100% (SQ YDS)	10,512	$1.65	$17,345	
	PARTIAL PVMT PATCH 1.0% (SQ YDS)	57	$85.00	$4,845	
	2" OVERLAY PVMT & SHLDR 100% (TONS)	1,177	$113.66	$133,779	
				$155,969	$100,117
Activity 4					
YEAR 20	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	1,169	$0.50	$585	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	6	$85.00	$510	
				$5,347	$2,961
Activity 5					
YEAR 25	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	1,169	$0.50	$585	
	PARTIAL PVMT PATCH 0.5% (SQ YDS)	28	$85.00	$2,380	
				$7,217	$3,447
Activity 6					
YEAR 30	2" MILL PVMT & SHLDR 100% (SQ YDS)	5,669	$1.65	$9,354	
	PARTIAL PVMT PATCH 2.0% (SQ YDS)	113	$85.00	$9,605	
	HMA SHLDR PATCHING 1.0% (SQ YDS)	48	$85.00	$4,080	
	POLICY HMA OVERLAY PVMT (TONS)	1,190	$113.66	$135,256	
	POLICY HMA OVERLAY SHLDR (TONS)	475	$113.66	$53,989	
				$212,284	$87,461
Activity 7					
YEAR 35	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	1,169	$0.50	$585	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	6	$85.00	$510	
				$5,347	$1,900
Activity 8					
YEAR 40	SHLDR JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	CENTERLINE JT ROUT & SEAL 100% (LF)	4,252	$0.50	$2,126	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	1,169	$0.50	$585	
	PARTIAL PVMT PATCH 0.5% (SQ YDS)	28	$85.00	$2,380	
				$7,217	$2,213

Total Rehabilitation Cost (Present Worth) $208,081