Illinois Department of Transportation

To:	John Fortman	Attn: District One
From:	John D. Baranzelli	
Subject:	Pavement Design	
Date:	September 4, 2012	

Ramps G5, G6 and K4
Section 03-96-0021
Du Page County
At Elgin-O'Hare Expressway

We have reviewed the pavement selection for the project, which was submitted to BDE by email dated August 20, 2012. The project will reconstruct these ramps at the Elgin-O'Hare Expressway. The life cycle cost analysis for ramp G5 favored the rigid design by19%. The approved pavement design for this project is as follows:

Ramps G5, G6 and K4 [Pavement Reconstruction]

10 inches of PCC Jointed Pavement with Tied PCC Shoulders
4.5 HMA Stabilized Subbase
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	Attn: Paul Niedernhofer
From:	John Fortmann	By: Jose Dominguez
Subject:	Pavement Analysis*	
Date:	August 20, 2012	

*Route: Ramps G5, G6, and K4
Limits: at Elgin-O'Hare Expressway
Contract No.: 11838
Letting: By ISTHA

Section: 03-96-0021
County: Cook
Job No.: P-91-443-06

We have completed the pavement analysis for the above captioned locations. Review by the Central Office is required for Ramp G5 since the total pavement area for new construction exceeds 4,750 Square Yards. The following is the scope of the project:

a.) New construction of Ramp G5 at the Elgin-O'Hare for approximately 5,157 feet.

b.) New construction of Ramp G6 at the Elgin-O'Hare for approximately 2,310 feet.

c.) New construction of Ramp K4 at the Elgin-O'Hare for approximately 2,181 feet.

A 20 year pavement analysis was performed on Ramp G5 since the pavement new construction is less than 25,000 square yards. We recommend a mechanistic-rigid pavement design based on the life cycle cost analysis which favors PCC pavement by 19%.

A segmental pavement analysis was performed on both Ramps G6 and K4 and it is recommended to match Ramp G5 and use a rigid pavement design. Our recommendation is as follows.

a.) Ramp G5, G6 K4

Pavement New Construction
- Tied PCC Shoulders
- 10" PCC Pavement Jointed [1]
- 4 ½" HMA Stabilized Subbase [2]
- 12" Aggregate Subgrade Improvement [3]

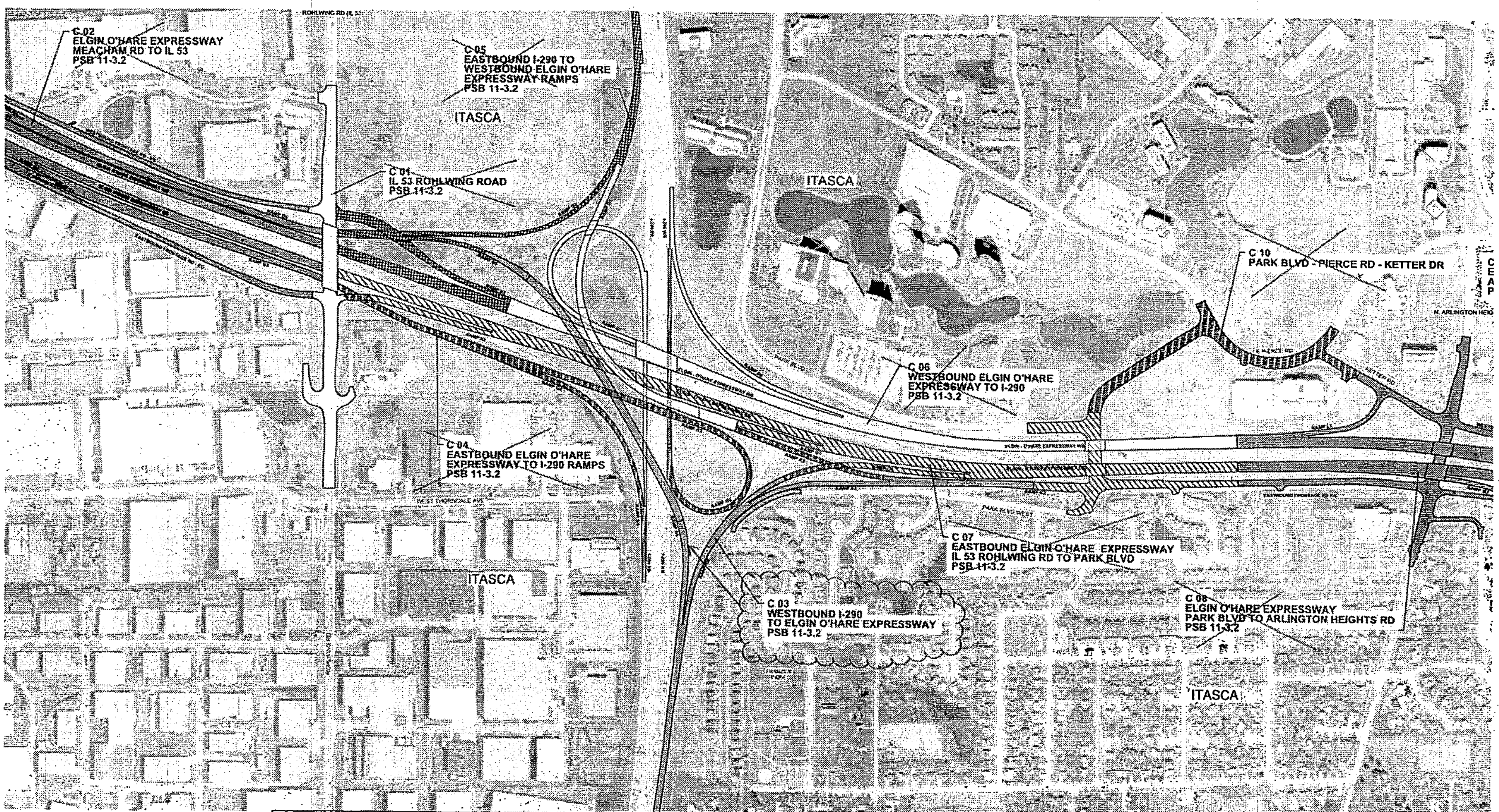
[1] Designer Note 1: Use pay item **#42000501, "PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)"**, paid in square yards.

[2] Designer Note 2: Use pay item **#31200502, "STABILIZED SUBBASE - HOT-MIX ASPHALT, 4 ½" "**, paid in square yards.

[3] Designer Note 3: Use pay item **#30300112, "AGGREGATE SUBGRADE IMPROVEMENT, 12" "**, paid in square yards.

If you have any questions or need additional information, please contact Jenpai Chang, Acting Pavement Design Engineer, at (847)705-4432.

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



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SCALE IN FEET

FILE NAME : DIEOWB-PRI-ehc-Staging.Contracts.01.dgn	USER NAME : klesko	DESIGNED - CH2MHILL	REVISED -
CH2MHILL		DRAWN - CH2MHILL	REVISED -
	PLOT SCALE : 400.0000 ' / in.	CHECKED - CH2MHILL	REVISED -
	PLOT DATE : 7/20/2012	DATE -	REVISED -

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
2700 OGDEN AVENUE
DOWNERS GROVE, ILLINOIS 60515

CONTRACT PACKAGING
ELGIN O'HARE EXPRESSWAY

SCALE:	SHEET NO.	OF	SHEETS	STA.	TO STA.

BDE 5401 Template (05/29/2012)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 08/22/2012

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: Elgin O'Hare-West Bypass
Section:
County: Dupage
Location: Ramp G-5

Comments: New Construction
Design Date: 08/09/2012 MR
Modified Date:

	ADT	Year
Current:	17,900	2010
Future:	16,100	2030

READ ME

Facility Type: Other Marked State Route
# of Lanes = 1 Lane Ramp
** Ramp Design Fig. 54-1.B **
Crossroad? Interstate or Supplemental Freeway
# of Lanes = 4

RESET

Road Class: I
Road Class: I

Subgrade Support Rating (SSR): Poor
Construction Year: 2013
Design Period (DP) = 20 years

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	15,542	92.9%	P = 100%
SU =	500	535	3.2%	S = 100%
MU =	1500	652	3.9%	M = 100%
Struct. Design ADT =		16,730	(2023)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	132.5	132.5	45%
Cmu =	482.53	482.53	45%
TF flexible (Actual) =	7.76	(Actual ADT)	7.11
TF flexible (Min) =	7.11	(Min ADT Fig. 54-2.C)	

RIGID PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	143.81	143.81	45%
Cmu =	696.42	696.42	45%
TF rigid (Actual) =	10.67	(Actual ADT)	10.05
TF rigid (Min) =	10.05	(Min ADT Fig. 54-2.C)	

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 7.76
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
HMA Mixture Temp. = 74.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 720 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 67 (Fig. 54-5.E)
Full Depth HMA Design Thickness = 11.50 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.50 in. (Fig. 54-5.I)
Use Full-Depth HMA Thickness = 11.50 inches

JPC Pavement

Use TF rigid = 10.67
Edge Support = Tied Shoulder or C.&G.
Rigid Pavt Thick. = 10.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 10.67
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 Overlay of Rubblized PCC

Use TF flexible = 7.76
District = 3,4,5,6
HMA Overlay Design Thickness = 9.75 in. (Fig. 54-5.U)

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA 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 Supplemental Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	0	250	750

* Use marked route minimums for unmarked routes (Fig. 54-1.B)

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 (05/29/2012)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 08/22/2012

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: Elgin O'Hare-West Bypass
Section:
County: Dupage
Location: Ramp G-6

Comments: New Construction
Design Date: 08/09/2012 MR
Modified Date:

	ADT	Year
<-- BY		
<-- BY		
Current:	10,000	2010
Future:	18,400	2030

READ ME

Facility Type: Other Marked State Route
# of Lanes = 1 Lane Ramp

** Ramp Design Fig. 54-1.B **
Crossroad? Interstate or Supplemental Freeway
# of Lanes = 4

RESET

Road Class: I
Road Class: I

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	14,022	90.7%	P = 100%
SU =	500	758	4.9%	S = 100%
MU =	1500	680	4.4%	M = 100%
		Struct. Design ADT =	15,460	(2023)

Subgrade Support Rating (SSR): Poor
Construction Year: 2013
Design Period (DP) = 20 years

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	132.5	132.5	45%
Cmu =	482.53	482.53	45%
TF flexible (Actual) =	8.61	(Actual ADT)	7.11
TF flexible (Min) =	7.11	(Min ADT Fig. 54-2.C)	

RIGID PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	143.81	143.81	45%
Cmu =	696.42	696.42	45%
TF rigid (Actual) =	11.70	(Actual ADT)	10.05
TF rigid (Min) =	10.05	(Min ADT Fig. 54-2.C)	

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 8.61
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
HMA Mixture Temp. = 74.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 720 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 65 (Fig. 54-5.E)
Full Depth HMA Design Thickness = 11.75 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.50 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 11.75 inches

JPC Pavement

Use TF rigid = 11.70
Edge Support = Tied Shoulder or C.&G.

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

CRC Pavement

Use TF rigid = 11.70
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 Overlay of Rubblized PCC

Use TF flexible = 8.61
District = 3,4,5,6

HMA Overlay Design Thickness = 10.00 in. (Fig. 54-5.U)

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA 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 Supplemental Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	0	250	750

* Use marked route minimums for unmarked routes (Fig. 54-1.B)

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 (05/29/2012)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 08/22/2012

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: Elgin O'Hare-West Bypass
Section:
County: Dupage
Location: Ramp K-4

Comments: New Construction
Design Date: 08/09/2012 MR <-- BY
Modified Date: <-- BY

	ADT	Year
Current:	3,500	2010
Future:	6,000	2030

READ ME

Facility Type: Other Marked State Route
# of Lanes = 1 Lane Ramp

** Ramp Design Fig. 54-1.B **
Crossroad? Interstate or Supplemental Freeway
# of Lanes = 4

RESET

Road Class: I
Road Class: I

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	5,043	98.4%	P = 100%
SU =	500	36	0.7%	S = 100%
MU =	1500	46	0.9%	M = 100%

Subgrade Support Rating (SSR): Poor
Construction Year: 2013
Design Period (DP) = 20 years

Struct. Design ADT = 5,125 (2023)

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	132.5	132.5	45%
Cmu =	482.53	482.53	45%
TF flexible (Actual) =	0.56	(Actual ADT)	7.11
TF flexible (Min) =	7.11	(Min ADT Fig. 54-2.C)	

RIGID PAVEMENT		RAMP DESIGN MIN	
Cpv =	0.15	0.15	32%
Csu =	143.81	143.81	45%
Cmu =	696.42	696.42	45%
TF rigid (Actual) =	0.76	(Actual ADT)	10.05
TF rigid (Min) =	10.05	(Min ADT Fig. 54-2.C)	

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible =	7.11	
PG Grade Lower Binder Lifts =	PG 64-22	(Fig. 53-4.R)
HMA Mixture Temp. =	74.0	deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) =	720	ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) =	69	(Fig. 54-5.E)
Full Depth HMA Design Thickness =	11.25	in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness =	14.50	in. (Fig. 54-5.I)
Use Full-Depth HMA Thickness =	**11.25**	**inches**

JPC Pavement

Use TF rigid =	10.05	
Edge Support =	Tied	Shoulder or C.&G.
Rigid Pavt Thick. =	**10.00**	**in. (Fig. 54-4.E)**

CRC Pavement

Use TF rigid =	10.05	
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 Overlay of Rubblized PCC

Use TF flexible =	7.11	
District =	3,4,5,6	
HMA Overlay Design Thickness =	**9.50**	**in. (Fig. 54-5.U)**

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA 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 Supplemental Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	0	250	750

* Use marked route minimums for unmarked routes (Fig. 54-1.B)

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%

PLAIN JOINTED PCC PAVEMENT

FILENAME-	Ramp G-5	22-Aug-12	
ROUTE-	Elgin O'Hare	2:33 PM	
SECTION-	03-96-0021		
COUNTY-	Dupage		
LOCATION-	at I-290 (EO Expy)		
DATE-	16-Aug-12		
PROJECT LENGTH (FT)	5157 =	0.98	MILES
AVERAGE LANE WIDTH (FT)	19.73		
NUMBER OF LANES	1		
# OF EDGES	2		
INSIDE SHLDER WIDTH (FT)	8		
OUTSIDE SHLDER WIDTH (FT)	6		
# OF CENTERLINES	1		
RIGID THICKNESS-	10		

TRAFFIC FACTORS	MINIMUM	ACTUAL
RIGID-	10.05	10.67

TRAFFIC		Percentages
PV-	15,542	92.9%
SU-	535	3.2%
MU-	652	3.9%

INITIAL COSTS

ITEM	QUANTITY	UNIT PRICE	COST
PAVEMENT (SQ YDS)	11,305	$46.31	$523,535
STAB SUBBASE (SQ YDS)	13,024	$15.00	$195,360
SHOULDERS (SQ YDS)	8,022	$41.31	$331,389
SHOULDER SEAL (LN FT)	10,314	$2.00	$20,628
SUBBASE GRAN MATL TY C (TONS)	0		$0
CONSTRUCTION INITIAL COST (PW)			$1,070,912
TOTAL REHABILITATION COST (PW)			$192,842
TOTAL LIFE CYCLE COST (PW)			$1,263,754
ANNUAL COST PER MILE			$52,601

MAINTENANCE COSTS:

ITEM	UNIT COST
PAVEMENT PATCHING (SQ YDS) (Use Class A pricing for CRC)	$130.00
SHOULDER PATCHING (SQ YDS)	$85.00
SHLDR JT ROUT & SEAL (LF)	$1.00
CENTERLINE JT ROUT & SEAL (LF)	$1.00
POLICY HMA OVERLAY PVMT (SQ YDS)	$11.65
POLICY HMA OVERLAY SHLDR (SQ YDS)	$11.65
RANDOM CRACK ROUT & SEAL (LF)	$1.00
REFL TRANS CRACK ROUT & SEAL (LF)	$1.00
PARTIAL PVMT PATCH (SQ YDS)	$130.00

MAINTENANCE COSTS:

	ITEM	QUANTITY	UNIT PRICE	COST	PW
Activity 1 YEAR 10	PAVEMENT PATCHING 0.1% (SQ YDS)	11	$130.00	$1,430	
				$1,430	$1,064
Activity 2 YEAR 15	PAVEMENT PATCHING 0.2% (SQ YDS)	23	$130.00	$2,990	
				$2,990	$1,919
Activity 3 YEAR 20	PAVEMENT PATCHING 2.0% (SQ YDS)	226	$130.00	$29,380	
	SHOULDER PATCHING 0.5% (SQ YDS)	40	$85.00	$3,400	
	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
				$48,251	$26,717
Activity 4 YEAR 25	PAVEMENT PATCHING 3.0% (SQ YDS)	339	$130.00	$44,070	
	SHOULDER PATCHING 1.0% (SQ YDS)	80	$85.00	$6,800	
				$50,870	$24,296
Activity 5 YEAR 30	PAVEMENT PATCHING 4.0% (SQ YDS)	452	$130.00	$58,760	
	SHOULDER PATCHING 1.5% (SQ YDS)	120	$85.00	$10,200	
	POLICY HMS OVERLAY OVMT (SQ YDS)	11,305	$11.65	$131,703	
	POLICY HMA OVERLAY SHLDR (SQ YDS)	8,022	$11.65	$93,456	
				$294,119	$121,177
Activity 6 YEARS 35	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
	RANDOM CRACK ROUT & SEAL 50% (LF)	2,579	$1.00	$2,579	
	REFL TRANS CRACK ROUT & SEAL 40%	1,650	$1.00	$1,650	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	11	$130.00	$1,430	
				$21,130	$7,510
Activity 7 YEAR 40	PAVEMENT PATCHING 0.5% (SQ YDS)	57	$130.00	$7,410	
	SHOULDER PATCHING 0.5% (SQ YDS)	40	$130.00	$5,200	
	REFL TRANS CRACK ROUT & SEAL 60%	2,475	$1.00	$2,475	
	RANDOM CRACK ROUT & SEAL 50% (LF)	2,579	$1.00	$2,579	
	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
				$33,135	$10,159
			Total Rehabilitation Cost (Present Worth)		$192,842

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

FULL DEOTH FLEXIBLE PAVEMENT

ROUTE-	Elgin O'Hare	22-Aug-12
SECTION-	03-96-0021	2:33 PM
COUNTY-	Dupage	
LOCATION-	at I-290 (EO Expy)	

PROJECT LENGTH (FT)	5157	
AVERAGE LANE WIDTH (FT)	19.73	
NUMBER OF LANES	1	
# OF EDGES	2	
INSIDE SHLDER WIDTH (FT)	8	
OUTSIDE SHLDER WIDTH (FT)	6	
# OF CENTERLINES	1	
PROJECT TYPE	2	1=RURAL, 2=URBAN
PAVING WIDTH	1	1=SINGLE LANE, 2=DUAL LANE
INTERSTATE / OTHER ROUTE	OTHER ROUTE	
FLEXIBLE THICKNESS-	11.5	

TRAFFIC FACTORS	MINIMUM	ACTUAL
FLEXIBLE	7.11	7.76

TRAFFIC

PV-	15542	92.9%
SU-	535	3.2%
MU-	652	3.9%

PAVEMENT OVERLAY THICKNESS	3.75
SHOULDER OVERLAY THICKNESS	1.75

INITIAL COSTS

ITEM	QUANTITY	UNIT PRICE	COST
SURFACE (SQ YDS)	11,305	$11.65	$131,703
POLY BINDER (SQ YDS)	11,305	$8.66	$97,901
BINDER (SQ YDS)	11,305	$39.03	$441,234
SHOULDERS (SQ YDS)	8022	$54.34	$435,915
SUBBASE GRAN MATL TY C (TONS)	0		$0
CONSTRUCTION INITIAL COST (PW)			$1,106,753
TOTAL REHABILITATION COST (PW)			$397,722
TOTAL LIFE CYCLE COST (PW)			$1,504,475
ANNUAL COST PER MILE			$62,620

MAINTENANCE COSTS:

ITEM		UNIT COST
RAND/THERM CRACK ROUT & SEAL (LF)		$1.00
SHLDR JT ROUT & SEAL (LF)		$1.00
CENTERLINE JT ROUT & SEAL (LF)		$1.00
PARTIAL PVMT PATCH (SQ YDS)		$90.00
2" MILL PVMT & SHLDR (SQ YDS)	(Use $3.00 for small quantity)	$1.75
2" OVERLAY PVMT & SHLDR (TONS)		$104.02
2" MILL PVMT ONLY (SQ YDS)	(Use $3.00 for small quantity)	$1.75
HMA SHOULDER PATCHING (SQ YDS)		$90.00
POLICY HMA OVERLAY PVMT (TONS)		$104.02
POLICY HMA OVERLAY SHLDR (TONS)		$104.02

MATERIAL TYPE/PERCENTAGE	PCC	19.0%

MAINTENANCE COSTS

	ITEM	QUANTITY	UNIT PRICE	COST	PW
Activity 1					
YEAR 5	RAND/THERM CRACK ROUT & SEAL 50% (LF)	2,836	$1.00	$2,836	
	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	11	$90.00	$990	
				$19,297	$16,646
Activity 2					
YEAR 10	PARTIAL PVMT PATCH 0.5% (SQ YDS)	57	$90.00	$5,130	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	2,836	$1.00	$2,836	
	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
				$23,437	$17,439
Activity 3					
YEAR 15	2" MILL PVMT & SHLDR 100% (SQ YDS)	19,327	$1.75	$33,822	
	PARTIAL PVMT PATCH 1.0% (SQ YDS)	113	$90.00	$10,170	
	2" OVERLAY PVMT & SHLDR 100% (TONS)	2,165	$104.02	$225,199	
				$269,191	$172,794
Activity 4					
YEAR 20	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	2,836	$1.00	$2,836	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	11	$90.00	$990	
				$19,297	$10,685
Activity 5					
YEAR 25	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	2,836	$1.00	$2,836	
	PARTIAL PVMT PATCH 0.5% (SQ YDS)	57	$90.00	$5,130	
				$23,437	$11,194
Activity 6					
YEAR 30	2" MILL PVMT & SHLDR 100% (SQ YDS)	11,305	$1.75	$19,784	
	PARTIAL PVMT PATCH 2.0% (SQ YDS)	226	$90.00	$20,340	
	HMA SHLDR PATCHING 1.0% (SQ YDS)	80	$90.00	$7,200	
	POLICY HMA OVERLAY PVMT (TONS)	2,374	$104.02	$246,938	
	POLICY HMA OVERLAY SHLDR (TONS)	786	$104.02	$81,758	
				$376,020	$154,920
Activity 7					
YEAR 35	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	2,836	$1.00	$2,836	
	PARTIAL PVMT PATCH 0.1% (SQ YDS)	11	$90.00	$990	
				$19,297	$6,858
Activity 8					
YEAR 40	SHLDR JT ROUT & SEAL 100% (LF)	10,314	$1.00	$10,314	
	CENTERLINE JT ROUT & SEAL 100% (LF)	5,157	$1.00	$5,157	
	RAND/THERM CRACK ROUT & SEAL 50% (LF)	2,836	$1.00	$2,836	
	PARTIAL PVMT PATCH 0.5% (SQ YDS)	57	$90.00	$5,130	
				$23,437	$7,186
	Total Rehabilitation Cost (Present Worth)				$397,722