



# Illinois Department of Transportation

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To: John Fortmann                      Attn: Ken Eng  
From: Maureen M. Addis  
Subject: Pavement Design Approval      *mma*  
Date: December 22, 2016

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Route: IL 53                                      Job No.: D-91-612-11  
Limits: South of IL 56 to Park Blvd.      Contract No.: 62B30  
Section: 534X-R-2                              Target Letting: June 2017  
County: DuPage

We have reviewed the pavement design for the above referenced project which was submitted on December 2, 2016. The scope of the project is reconstruction of 0.46 miles of IL 53's existing two-lane cross section to provide four through lanes.

The pavement design resulted in two pavement options: a 10.75" Full-Depth HMA and a 9.25" PCC. The life-cycle cost analysis of those options resulted in the PCC pavement being 12.1% less expensive (\$1,428,341 compared to HMA's total cost of \$1,600,736) and thus the preferred option.

In summary, the approved pavement design is as follows:

9.25" PCC Pavement w/ tied Curb & Gutter  
12" Aggregate Subgrade Improvement

If you have any questions, please contact Mike Brand at (217) 782-7651 or [Michael.brand@illinois.gov](mailto:Michael.brand@illinois.gov).



# Illinois Department of Transportation

## Memorandum

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To: Maureen Addis

Attn: Mike Brand

From: Jose A. Dominguez

By: Melchor Mangoba / Ojas Patel

Subject: Pavement Analysis\*

Date: December 2, 2016

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\*Route: Illinois Route 53  
Limits: South of IL 56 to Park Blvd  
Section: 534X-R-2  
Current target: 06CY17

County: DuPage  
Contract No.: 62B30  
Job No.: D-91-612-11

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 IL 53 to provide four through lanes from south of IL 56 to Park Boulevard. This contract will tie into work done on the south leg of IL 53 at the intersection with IL 56 as part of Contract 60P75.***

A 20-year pavement analysis was performed on the above segments. We recommend a mechanistic-rigid pavement design based on the life cycle cost analysis which favors PCC pavement by 12%.

### **IL 53**

Reconstruction

PCC Curb and Gutter (Tied)

9 ¼" PCC Pavement<sup>1</sup>

12" Aggregate Subgrade Improvement<sup>2</sup>

M. Addis  
December 2, 2016  
Page Two

<sup>1</sup>Designer Note 1: Use pay item **42000401, PORTLAND CEMENT CONCRETE PAVEMENT, 9 1/4" (JOINTED)**, paid in square yards. Transverse contraction joints should be reduced to a maximum of 14.5 foot spacing for 9 1/4" PCC pavement.

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

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 LOCATION MAP

Proposed Improvement:  
IL Route 53  
At  
South of IL Route 56 to Park Blvd

Municipality: Unincorporated DuPage County  
County: DuPage  
Route: FAP 870  
Job No.: D-91-612-11  
Section No.: 534X-R-2



**PROJECT AND TRAFFIC INPUTS**

(Enter Data in Gray Shaded Cells)

Route: <b>IL 53</b>	Comments: <b>IL 53 (IL 56 to Park Blvd)</b>		
Section:	Design Date: <b>11/09/2016</b>	<b>ONP</b>	<-- BY
County: <b>DuPage</b>	Modify Date:		<-- BY
Location: <b>s/o IL 56</b>			ADT
			Year
		Current:	<b>36,400</b> <b>2011</b>
		Future:	<b>40,000</b> <b>2040</b>
Facility Type: <b>Other Marked State Route</b>	# of Lanes = <b>4</b>		
Road Class: <b>I</b>		<b>Structural Design Traffic</b>	
Subgrade Support Rating (SSR): <b>Poor</b>		Minimum ADT	Actual ADT
Construction Year: <b>2018</b>			Actual % of Total ADT
Design Period (DP) = <b>20</b> years			% of ADT in Design Lane
		PV = <b>0</b>	37,008    96.1%
		SU = <b>250</b>	578    1.5%
		MU = <b>750</b>	924    2.4%
		Struct. Design ADT = <b>38,510</b>	(2028)
			P = <b>32%</b>
			S = <b>45%</b>
			M = <b>45%</b>

**TRAFFIC FACTOR CALCULATION**

**FLEXIBLE PAVEMENT**

Cpv = 0.15  
 Csu = **132.5**  
 Cmu = **482.53**  
 TF flexible (Actual) = 4.74 (Actual ADT)  
 TF flexible (Min) = 3.56 (Min ADT Fig. 54-2.C)

**RIGID PAVEMENT**

Cpv = 0.15  
 Csu = **143.81**  
 Cmu = **696.42**  
 TF rigid (Actual) = 6.58 (Actual ADT)  
 TF rigid (Min) = 5.02 (Min ADT Fig. 54-2.C)

**NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS**

Full-Depth HMA Pavement	JPC Pavement
Use TF flexible = 4.74	Use TF rigid = 6.58
PG Grade Lower Binder Lifts = <b>PG 64-22</b> (Fig. 53-4.R)	Edge Support = <b>Tied</b> Shoulder or C.&G.
HMA Mixture Temp. = <b>75.0</b> deg. F (Fig. 54-5.C)	<b>Rigid Pavt Thick. = 9.25 in. (Fig. 54-4.E)</b>
Design HMA Mixture Modulus (E <sub>HMA</sub> ) = 690 ksi (Fig. 54-5.D)	
Design HMA Strain (ε <sub>HMA</sub> ) = 77 (Fig. 54-5.E)	<b>CRCP Pavement</b>
Full Depth HMA Design Thickness = 10.75 in. (Fig. 54-5.F)	Use TF rigid = 6.58
Limiting Strain Criterion Thickness = <b>14.75</b> in. (Fig. 54-5.I)	IBR value = <b>3</b>
<b>Use Full-Depth HMA Thickness = 10.75 inches</b>	<b>CRCP Thickness = 8.25 in. (Fig. 54-4.M)</b>

**TF MUST BE > 60 FOR CRCP**

**RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS**

HMA Overlay of Rubblized PCC	Unbonded Concrete Overlay
Use TF flexible = 4.74	Review 54-4.03 for limitations and special considerations.
HMA Overlay Design Thickness = 8.00 in. (Fig. 54-5.U)	
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)	
<b>Use HMA Overlay Thickness = 999.00 inches</b>	<b>JPCP Thickness = NA inches</b>

**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)

Facility Type	Min. Str. Design Traffic (Fig 54-2.C)		
	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	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
	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 One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

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)						
Number of Lanes	Rural			Urban		
	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 53  
 SECTION  
 COUNTY DuPage  
 LOCATION s/o IL 56

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2425 FT == > 0.46 Miles  
 # OF CENTERLINES 2 CL  
 # OF LANES 4 LANES  
 # OF EDGES 4 EP  
 LANE WIDTH - AVERAGE 12 FT  
 SHOULDER WIDTH HMA Inside 0 FT  
 HMA Outside 0 FT  
 Total Width of Paved Shoulders 0 FT

PAVEMENT THICKNESS (FLEXIBLE) 10.75 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
		3.56	4.74	4.74

[Read Me!](#)

HMA	COST PER TON	UNIT PRICE
HMA SURFACE		\$101.00 / TON
HMA TOP BINDER		\$89.45 / TON
HMA LOWER BINDER		\$75.78 / TON
HMA BINDER (LEVELING)		\$89.45 / TON
HMA SHOULDER		\$72.00 / TON

### INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT ( FULL-DEPTH )	( 10.75" )	12933	12,933 SQ YD *	\$50.67 / SQ YD	\$655,332 ~
HMA SURFACE COURSE	( 2.00" )	1.0069	1,459 TONS	\$101.00 / TON	\$0
HMA TOP BINDER COURSE	( 2.25" )	1.0217	1,665 TONS	\$89.45 / TON	\$0
HMA LOWER BINDER COURSE	( 6.50" )	1.0521	4,953 TONS	\$75.78 / TON	\$0

HMA SHOULDER	( 8.00" )	0	0 TONS	\$72.00 / TON	\$0 ~
CURB & GUTTER			9,700 LIN FT *	\$30.00 / LIN FT	\$291,000

SUBBASE GRAN MATL TY C (TONS)			73 TONS	\$25.00 / TON	\$1,825
IMPROVED SUBGRADE:	Modified Soil Width = 53.6'	14,438	SQ YD	\$7.00 / SQ YD	\$101,066

Reserved For User Supplied Item			0 UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item			0 UNITS	\$0.00 / UNITS	\$0

PAVEMENT REMOVAL		12,933	SQ YD	\$15.00 / SQ YD	\$193,995
SHOULDER REMOVAL		0	SQ YD	\$10.00 / SQ YD	\$0

Note: \* Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	\$1,243,218
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	\$110,401

### MAINTENANCE COSTS:

ITEM	THICKNESS	MATERIAL	T	UNIT COST
ROUTINE MAINTENANCE ACTIVITY				\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	( 2.00" )	1.0069	Surface Mix 2.00	\$11.39 / SQ YD
HMA OVERLAY PVMT	( 2.25" )	1.0078	Surface Mix 2.25	\$12.33 / SQ YD
HMA SURFACE MIX	( 1.50" )	1.0052	Surface Mix 1.50	\$8.53 / SQ YD
HMA BINDER MIX	( 0.75" )	1.0130	aling Binder Mix 0.75	\$3.81 / 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	\$81.31 / SQ YD

PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	2.00	<b>\$78.06</b> / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00 ")	Leveling Binder Mix	2.00	<b>\$80.02</b> / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00 ")	Shoulder Mix	2.00	<b>\$78.06</b> / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL				<b>\$2.00</b> / LIN FT
CENTERLINE JOINT ROUT & SEAL				<b>\$2.00</b> / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)			<b>\$2.00</b> / LIN FT

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FLEXIBLE TOTAL LIFE-CYCLE COST	\$1,600,736
FLEXIBLE TOTAL ANNUAL COST PER MILE	\$142,149



**PCC PAVEMENT**

**JPCP**

ROUTE IL 53  
 SECTION 0  
 COUNTY DuPage  
 LOCATION s/o IL 56

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2425 FT == > 0.46 Miles  
 # OF CENTERLINES 2 CL  
 # OF LANES 4 LANES  
 # OF EDGES 4 EP  
 LANE WIDTH - AVERAGE 12 FT  
 SHOULDER WIDTH PCC Inside 0 FT  
 PCC Outside 0 FT  
 Total Width of Paved Shoulders 0 FT

PAVEMENT THICKNESS (RIGID) JPCP 9.25 IN TIED SHLD  
 SHOULDER THICKNESS 9.25 IN

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	5.02	6.58	JPCP

Worksheet Construction Type is Reconstruction The Pavement Type is JPCP

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	( 9.25" )	12,933	SQ YD	\$49.44 / SQ YD	\$639,408
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		9,700	LIN FT	\$30.00 / LIN FT	\$291,000
SUBBASE GRAN MATL TY C	( ~ 0.00" )	0	TONS	\$25.00 / TON	\$0
IMPROVED SUBGRADE:	Modified Soil Width = 50.0'	13,472	SQ YD	\$7.00 / SQ YD	\$94,304
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		12,933	SQ YD	\$15.00 / SQ YD	\$193,995
SHOULDER REMOVAL		0	SQ YD	\$10.00 / SQ YD	\$0

Note: \* Denotes User Supplied Quantity  
 RIGID CONSTRUCTION INITIAL COST \$1,218,707  
 RIGID CONSTRUCTION ANNUAL COST PER MILE \$108,224

**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" )	1.0087	2.50	\$13.61 / SQ YD
HMA SURFACE MIX	( 1.50" )	1.0052	1.50	\$8.53 / SQ YD
HMA BINDER MIX	( 1.00" )	1.0139	1.00	\$5.08 / SQ YD
HMA POLICY OVERLAY SHLD	( 2.50" )		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	\$78.48 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	2.50	\$84.14 / 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 \$1,428,341  
 RIGID TOTAL ANNUAL COST PER MILE \$126,840



## LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 12/2/16 9:16 AM

				JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH		\$1,218,707	\$1,243,218
		ANNUAL COST PER MILE		\$108,224	\$110,401
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH		\$209,634	\$357,518
		ANNUAL COST PER MILE		\$18,616	\$31,748
TOTAL	LIFE-CYCLE COST	PRESENT WORTH		\$1,428,341	\$1,600,736
		ANNUAL COST PER MILE		\$126,840	\$142,149

## LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	=====>	JPCP	\$126,840	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	HMA	\$142,149	12.1%

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

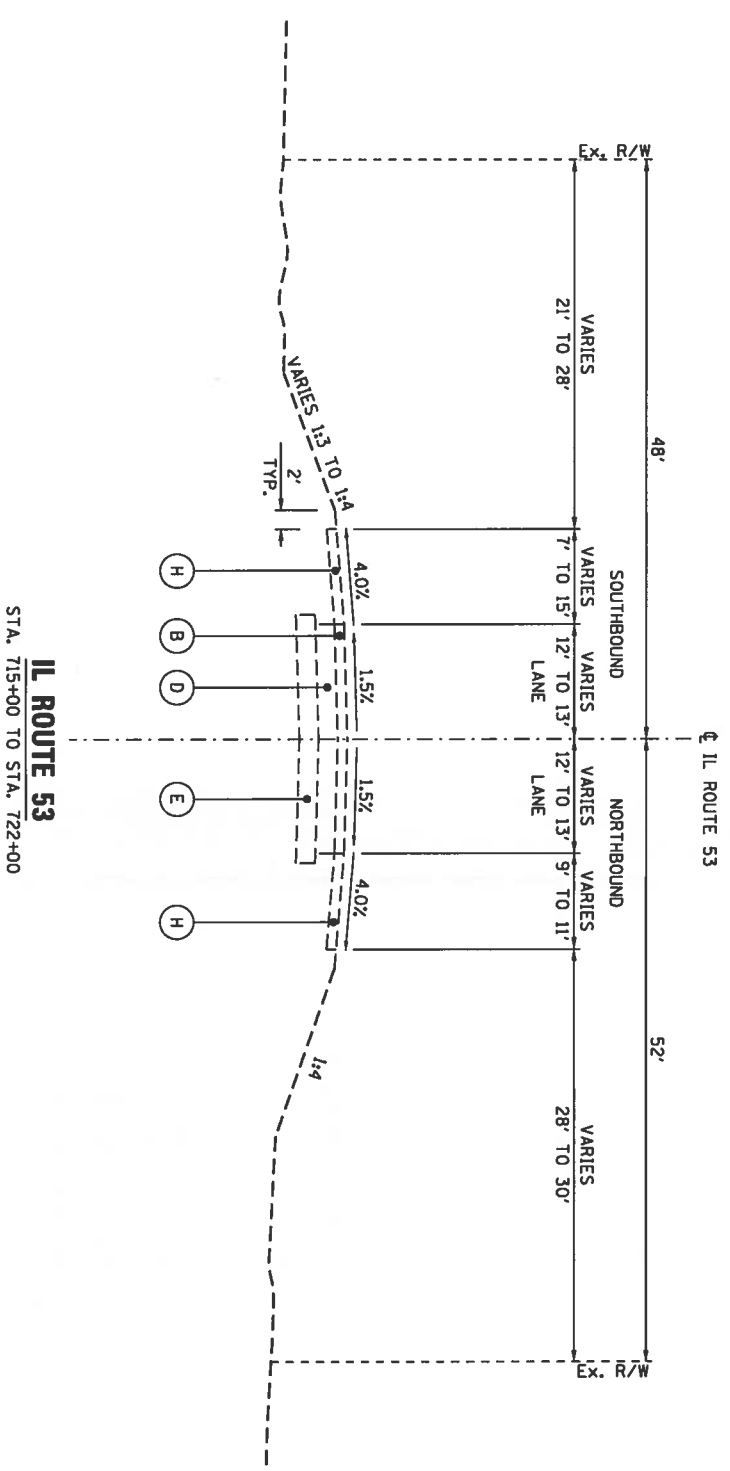
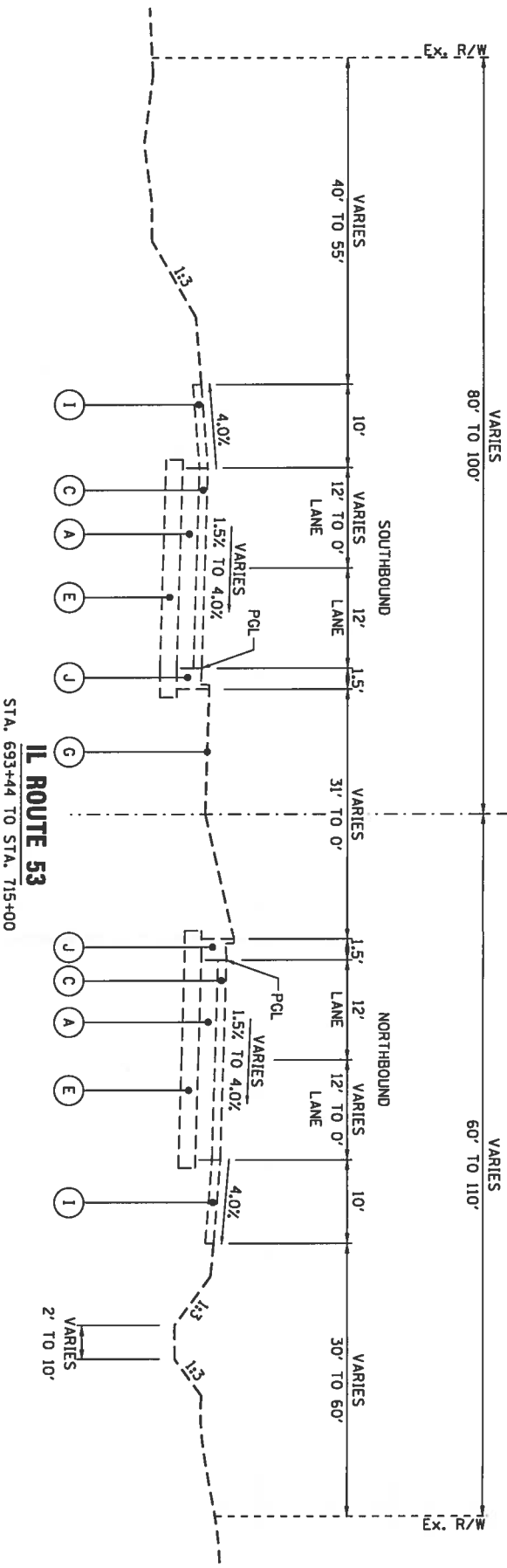
MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
<b>YEAR 5</b>							
	LONG SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400	
	CNTR LINE JOINT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700	
	RNDM / THRM CRACK R&S	50.00%	5,335	LIN FT	\$2.00	\$10,670	
	PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$81.31	\$1,057	
	PWFn =	0.8626		PW =	0.8626 X	\$40,827	\$35,218
<b>YEAR 10</b>							
	LONG SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400	
	CNTR LINE JOINT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700	
	RNDM / THRM CRACK R&S	50.00%	5,335	LIN FT	\$2.00	\$10,670	
	PD PVMT PATCH M&F SURF	0.50%	65	SQ YD	\$81.31	\$5,285	
	PWFn =	0.7441		PW =	0.7441 X	\$45,055	\$33,525
<b>YEAR 15</b>							
	MILL PVMT & SHLD 2.00"	100.00%	12,933	SQ YD	\$3.00	\$38,799	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	129	SQ YD	\$80.02	\$10,322	
	HMA OVERLAY PVMT 2.00"	100.00%	12,933	SQ YD	\$11.39	\$147,318	
	HMA OVERLAY SHLD 2.00 "	100.00%	0	SQ YD	\$8.06	\$0	
	PWFn =	0.6419		PW =	0.6419 X	\$196,439	\$126,087
<b>YEAR 20</b>							
	LONG SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400	
	CNTR LINE JOINT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700	
	RNDM / THRM CRACK R&S	50.00%	5,335	LIN FT	\$2.00	\$10,670	
	PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$81.31	\$1,057	
	PWFn =	0.5537		PW =	0.5537 X	\$40,827	\$22,605
<b>YEAR 25</b>							
	LONG SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400	
	CNTR LINE JOINT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700	
	RNDM / THRM CRACK R&S	50.00%	5,335	LIN FT	\$2.00	\$10,670	
	PD PVMT PATCH M&F SURF	0.50%	65	SQ YD	\$81.31	\$5,285	
	PWFn =	0.4776		PW =	0.4776 X	\$45,055	\$21,519
<b>HMA SD</b>							
<b>YEAR 30</b>							
	NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	12,933	SQ YD	\$3.00	\$38,799	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	259	SQ YD	\$80.02	\$20,725	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	0	SQ YD	\$78.06	\$0	
	HMA OVERLAY PVMT 2.25 "	100.00%	12,933	SQ YD	\$12.33	\$159,520	
	HMA OVERLAY SHLD 2.25 "	100.00%	0	SQ YD	\$9.07	\$0	
	PWFn =	0.4120		PW =	0.4120 X	\$219,044	\$90,243
<b>YEAR 35</b>							
	LONG SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400	
	CNTR LINE JOINT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700	
	RNDM / THRM CRACK R&S	50.00%	5,335	LIN FT	\$2.00	\$10,670	
	PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$81.31	\$1,057	
	PWFn =	0.3554		PW =	0.3554 X	\$40,827	\$14,509
<b>YEAR 40</b>							
	LONG SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400	
	CNTR LINE JOINT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700	
	RNDM / THRM CRACK R&S	50.00%	5,335	LIN FT	\$2.00	\$10,670	
	PD PVMT PATCH M&F SURF	0.50%	65	SQ YD	\$81.31	\$5,285	
	PWFn =	0.3066		PW =	0.3066 X	\$45,055	\$13,812
							\$357,518
ROUTINE MAINTENANCE ACTIVITY				1.84 Lane Miles	0.00	\$0	\$0
						MAINTENANCE LIFE-CYCLE COST	\$357,518
45	YEAR LIFE CYCLE	CRFn = 0.0407852				MAINTENANCE ANNUAL COST PER MILE	\$31,748

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

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH	
<b>YEAR 10</b>								
	PAVEMENT PATCH CLASS B	0.10%	13	SQ YD	\$150.00	\$1,950		
		PWFn = 0.7441			PW = 0.7441 X	\$1,950	\$1,451	
<b>YEAR 15</b>								
	PAVEMENT PATCH CLASS B	0.20%	26	SQ YD	\$150.00	\$3,900		
		PWFn = 0.6419			PW = 0.6419 X	\$3,900	\$2,503	
<b>YEAR 20</b>								
	PAVEMENT PATCH CLASS B	2.00%	259	SQ YD	\$150.00	\$38,850		
	SHOULDER PATCH CLASS C	0.50%	0	SQ YD	\$145.00	\$0		
	LONGITUDINAL SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400		
	CENTERLINE JT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700		
		PWFn = 0.5537			PW = 0.5537 X	\$67,950	\$37,622	
<b>YEAR 25</b>								
	PAVEMENT PATCH CLASS B	3.00%	388	SQ YD	\$150.00	\$58,200		
	SHOULDER PATCH CLASS C	1.00%	0	SQ YD	\$145.00	\$0		
		PWFn = 0.4776			PW = 0.4776 X	\$58,200	\$27,797	
<b>YEAR 30</b>								
	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	517	SQ YD	\$150.00	\$77,550		
	SHOULDER PATCH CLASS C	1.50%	0	SQ YD	\$145.00	\$0		
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	12,933	SQ YD	\$13.61	\$175,983		
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	0	SQ YD	\$10.08	\$0		
		PWFn = 0.4120			PW = 0.4120 X	\$253,533	\$104,452	
<b>YEAR 35</b>								
	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400		
	CENTERLINE JT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700		
	RANDOM CRACK R&S	50.00%	4,850	LIN FT	\$2.00	\$9,700		
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	3,110	LIN FT	\$2.00	\$6,220		
	PD PVMT PATCH M&F HMA 2.50"	0.10%	13	SQ YD	\$84.14	\$1,094		
		PWFn = 0.3554			PW = 0.3554 X	\$46,114	\$16,388	
<b>YEAR 40</b>								
	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	65	SQ YD	\$150.00	\$9,750		
	LONGITUDINAL SHLD JT R&S	100.00%	9,700	LIN FT	\$2.00	\$19,400		
	CENTERLINE JT R&S	100.00%	4,850	LIN FT	\$2.00	\$9,700		
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	4,666	LIN FT	\$2.00	\$9,332		
	RANDOM CRACK R&S	50.00%	4,850	LIN FT	\$2.00	\$9,700		
	PD PVMT PATCH M&F HMA 2.50"	0.50%	65	SQ YD	\$84.14	\$5,469		
		PWFn = 0.3066			PW = 0.3066 X	\$63,351	\$19,421	
							\$209,634	
	ROUTINE MAINTENANCE ACTIVITY				1.84 Lane Miles	\$0.00	\$0	\$0
	MAINTENANCE LIFE-CYCLE COST						\$209,634	
<b>45</b>	YEAR LIFE CYCLE	CRFn = 0.0407852	MAINTENANCE ANNUAL COST PER MILE			\$18,616		

**LEGEND**

- (A) P.C.C. PAVEMENT
- (B) HMA SURFACE
- (C) HMA OVERLAY  
VARIES 3" - 5"
- (D) HMA BASE COURSE
- (E) GRANULAR SUBBASE
- (F) CONCRETE MEDIAN
- (G) GRASS MEDIAN
- (H) HMA SHOULDER
- (I) AGGREGATE SHOULDER
- (J) CONCRETE CURB AND GUTTER
- (K) PEDESTRIAN PATH



PLAN	SURVEYED	BY	DATE
NOTE BOOK NO.	PLOTTED		
	ALIGNMENT CHECKED		
	RT. OF WAY CHECKED		
	CADD FILE NAME		

PROFILE	SURVEYED	BY	DATE
NOTE BOOK NO.	PLOTTED		
	GRADES CHECKED		
	B.M. NOTED		
	STRUCTURE NOTATIONS CHECKED		

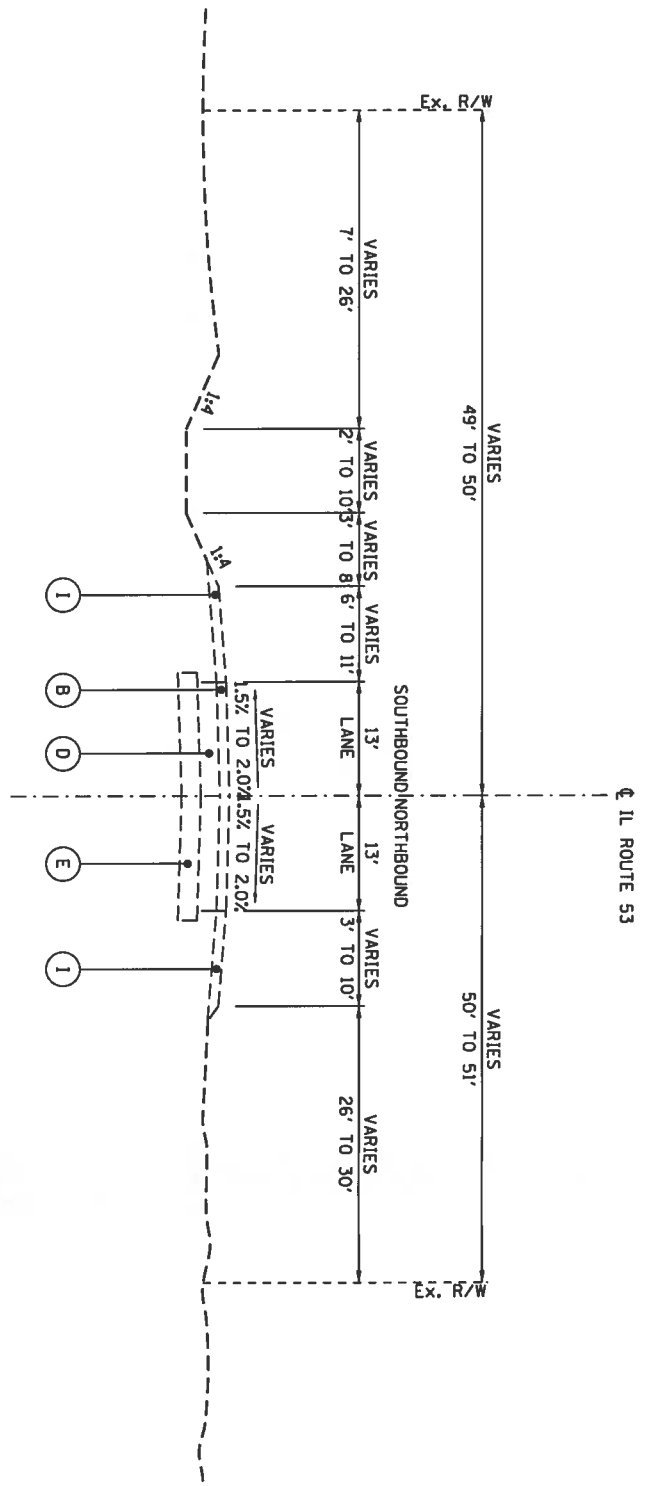
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USER NAME = jwajla	DRAWN - BZ	REVISOR	DEPARTMENT OF TRANSPORTATION	EXISTING TYPICAL CROSS SECTIONS							
PLLOT SCALE =	CHECKED - JAM	REVISOR									
PLLOT DATE = 5/18/2014	DATE	REVISOR									

IL ROUTE 53  
STA. 715+00 TO STA. 722+00

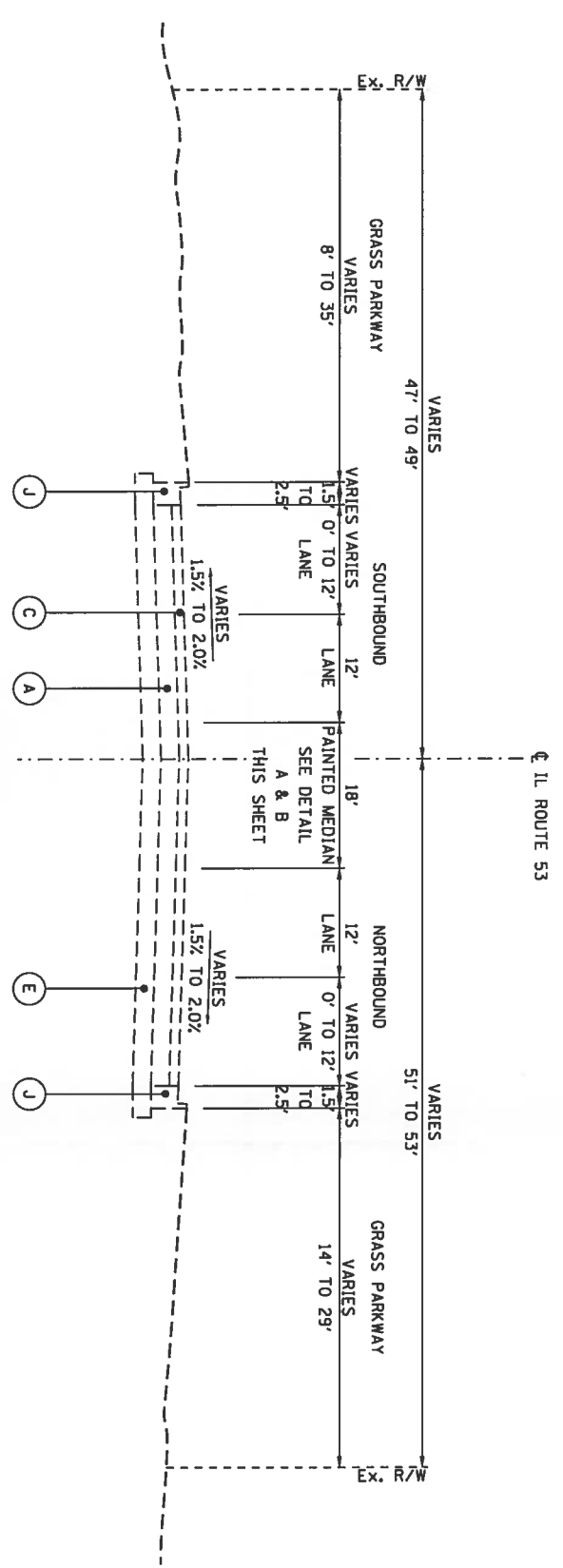
IL ROUTE 53  
STA. 693+44 TO STA. 715+00

PLAN	SURVEYED	BY	DATE
NOTE BOOK NO.	PLOTTED		
	ALIGNMENT CHECKED		
	RT. OF WAY CHECKED		
	CADD FILE NAME		

PROFILE	SURVEYED	BY	DATE
NOTE BOOK NO.	PLOTTED		
	GRADES CHECKED		
	B.M. NOTED		
	STRUCTURE NOTATIONS CHECKED		

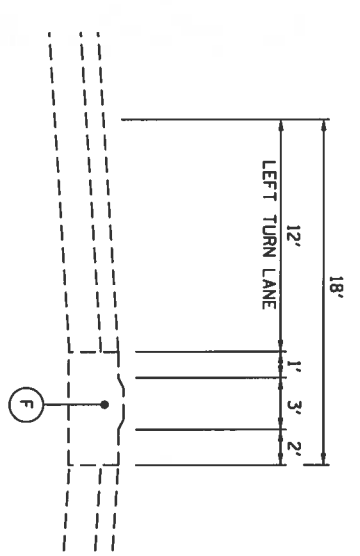
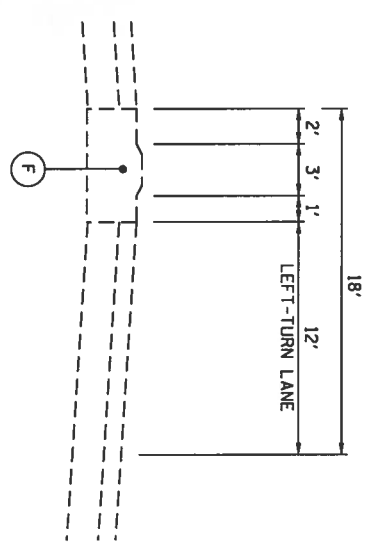


**IL ROUTE 53**  
 STA. 722+00 TO STA. 747+00  
 STA. 771+00 TO STA. 779+00



**IL ROUTE 53**  
 STA. 747+00 TO STA. 771+00

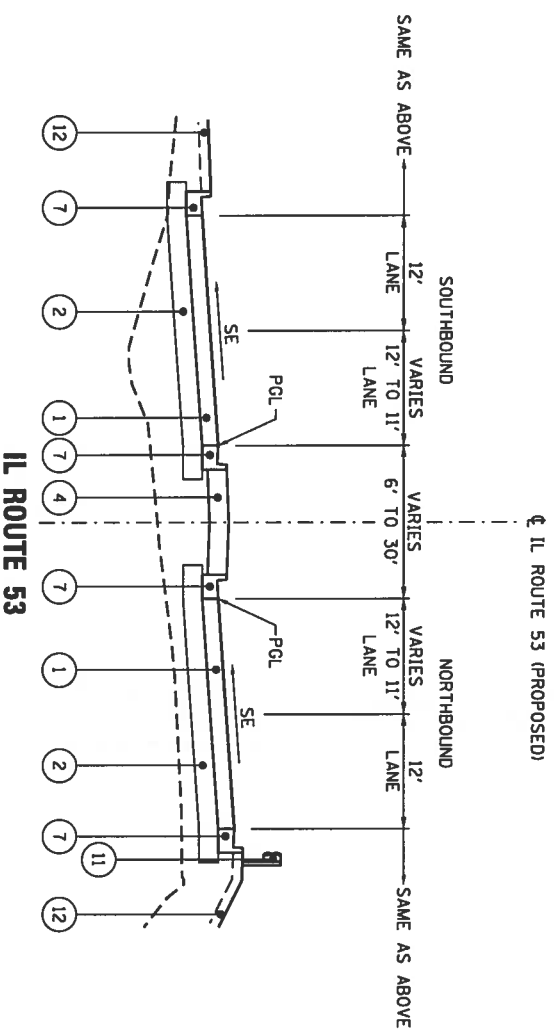
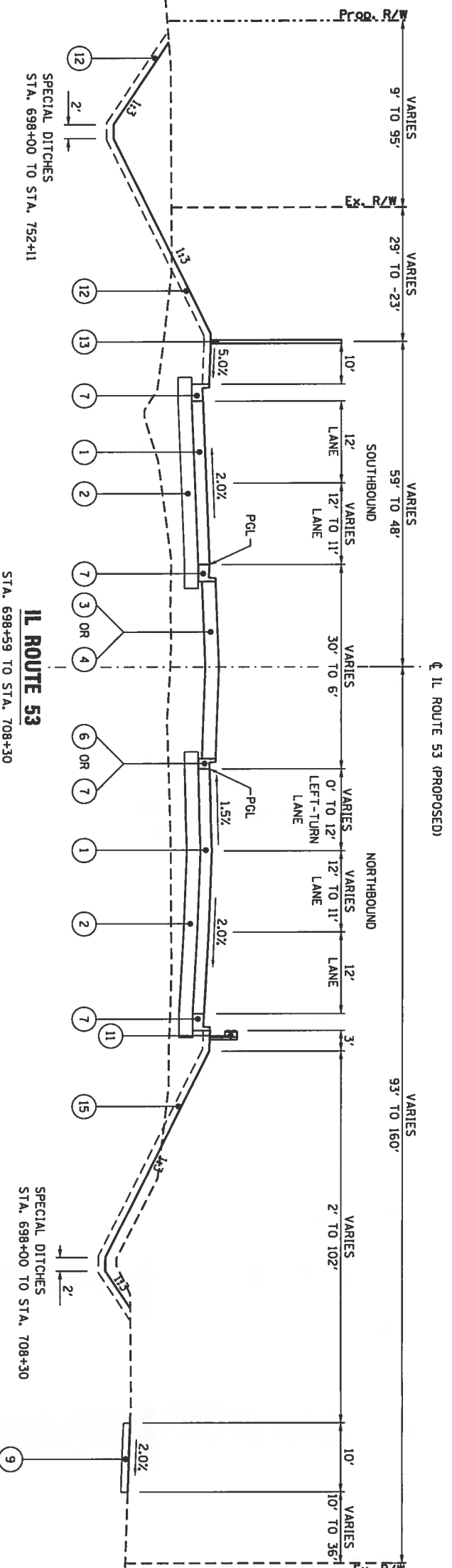
- LEGEND**
- (A) P.C.C. PAVEMENT
  - (B) HMA SURFACE
  - (C) HMA OVERLAY VARIES 3" - 5"
  - (D) HMA BASE COURSE
  - (E) GRANULAR SUBBASE
  - (F) CONCRETE MEDIAN
  - (G) GRASS MEDIAN
  - (H) HMA SHOULDER
  - (I) AGGREGATE SHOULDER
  - (J) CONCRETE CURB AND GUTTER
  - (K) PEDESTRIAN PATH



FILE NAME :	DESIGNED - BZ	REVISOR	STATE OF ILLINOIS
USER NAME : Jteglor	DRAWN - BZ	REVISION	DEPARTMENT OF TRANSPORTATION
PLLOT SCALE :	CHECKED - JAM	REVISION	ILLINOIS ROUTE 53
PLLOT DATE : 5/18/2014	DATE	REVISION	EXISTING TYPICAL CROSS SECTIONS
			SCALE: NTS
			SHEET NO. 2 OF 10 SHEETS
			STA. TO STA.
			FED. ROAD DIST. NO. ILLINOIS/FED. AID PROJECT
			SECTION
			COUNTY
			DUPAGE
			TOTAL SHEET
			SHEETS
			NO. 2
			CONTRACT NO.

PLAN	SURVEYED	BY	DATE
NOTE BOOK NO.	PLOTTED		
	ALIGNMENT CHECKED		
	RT. OF WAY CHECKED		
	CADD FILE NAME		

PROFILE	SURVEYED	BY	DATE
NOTE BOOK NO.	PLOTTED		
	GRADES CHECKED		
	S.M. NOTED		
	STRUCTURE NOTATIONS C/P/D		



- LEGEND**
- ① P.C.C. PAVEMENT
  - ② SUB-BASE GRANULAR MATERIAL, TYPE B
  - ③ CONCRETE MEDIAN
  - ④ GRASS MEDIAN
  - ⑤ HMA SHOULDER
  - ⑥ CONCRETE CURB & GUTTER B-6.12
  - ⑦ CONCRETE CURB & GUTTER B-6.24
  - ⑧ CONCRETE SIDEWALK
  - ⑨ HMA SHARED-USE PATH  
STA. 698+59 TO STA. 708+30 RT
  - ⑩ NOT USED
  - ⑪ GUARDRAIL  
STA. 697+87 TO STA. 704+22 RT
  - ⑫ TOPSOIL AND SEEDING
  - ⑬ CRASH WORTHY NOISE ABATEMENT WALL  
STA. 700+30 TO STA. 708+30 LT
  - ⑭ RETAINING WALL
  - ⑮ TOPSOIL AND SPECIAL SEED MIX<sup>1</sup>

NOTES  
1. SEE US ARMY CORP OF ENGINEERS' EAST BRANCH DUPAGE RIVER RESTORATION PLAN

FILE NAME =	DESIGNED - BZ	REVISOR	DATE
USER NAME = jwajlwr	DRAWN - BZ	REVISION	
PLLOT SCALE =	CHECKED - JAM	REVISION	
PLLOT DATE = 5/16/2014	DATE	REVISION	

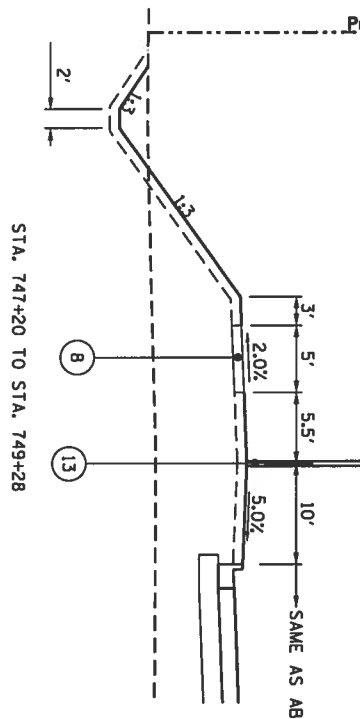
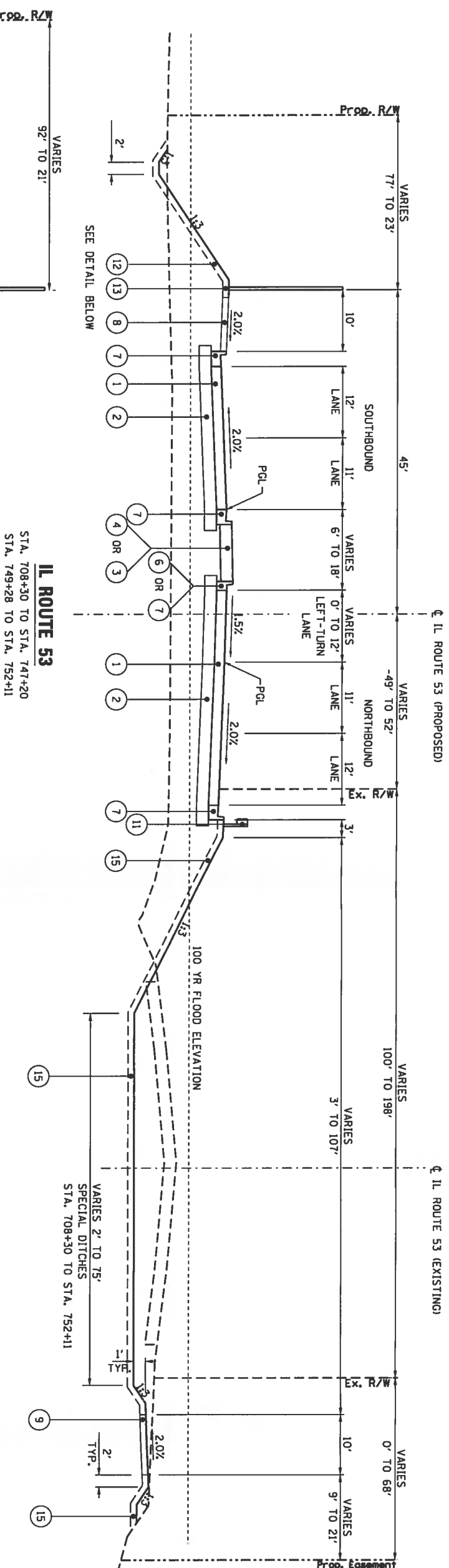
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ILLINOIS ROUTE 53  
PROPOSED TYPICAL CROSS SECTIONS

F&P R/E. B70	SECTION	COUNTY	TOTAL SHEET NO.
		DUPAGE	4
FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT	CONTRACT NO.	

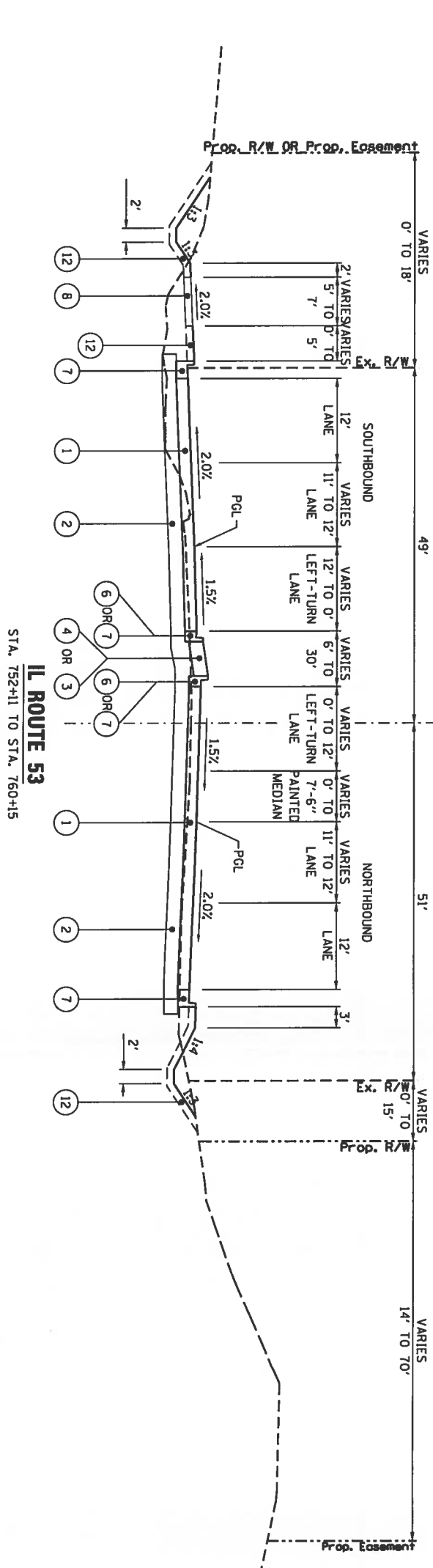
PLAN	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	ALIGNMENT CHECKED		
	RT. OF WAY CHECKED		
	CADD FILE NAME		

PROFILE	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	GRADES CHECKED		
	BY HAND		
	STRUCTURE NOTATIONS CHECKED		



- LEGEND**
- ① P.C.C. PAVEMENT
  - ② SUB-BASE GRANULAR MATERIAL, TYPE B
  - ③ CONCRETE MEDIAN
  - ④ GRASS MEDIAN
  - ⑤ HMA SHOULDER
  - ⑥ CONCRETE CURB & GUTTER B-6.12
  - ⑦ CONCRETE CURB & GUTTER B-6.24
  - ⑧ CONCRETE SIDEWALK
  - ⑨ 7' WIDE STA. 759+05 TO STA. 760+15 LT 5' WIDE STA. 747+20 TO STA. 759+05 LT
  - ⑩ HMA SHARED-USE PATH STA. 708+30 TO STA. 746+38 RT STA. 761+22 TO STA. 769+48 RT
  - ⑪ NOT USED
  - ⑫ GUARDRAIL STA. 708+30 TO STA. 716+18 RT STA. 721+52 TO STA. 723+02 RT STA. 725+44 TO STA. 726+94 RT STA. 740+02 TO STA. 741+40 RT STA. 744+13 TO STA. 747+96 RT
  - ⑬ TOPSOIL AND SEEDING
  - ⑭ CRASH WORTHY NOISE ABATEMENT WALL STA. 709+55 TO STA. 733+25 LT STA. 734+10 TO STA. 748+80 LT
  - ⑮ RETAINING WALL
  - ⑯ TOPSOIL AND SPECIAL SEED MIX<sup>1</sup>

NOTES  
 1. SEE US ARMY CORP OF ENGINEERS' EAST BRANCH DUPAGE RIVER RESTORATION PLAN



FILE NAME =	DESIGNED - BZ	REVISED -	SCALE: NTS	SHEET NO. 5 OF 10 SHEETS	STA.	TO STA.	FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT
USER NAME = Jteagle	DRAWN - BZ	REVISED -	ILLINOIS ROUTE 53 PROPOSED TYPICAL CROSS SECTIONS					
NOTE BOOK	CHECKED - JAM	REVISED -						
NO.	DATE	REVISED	DEPARTMENT OF TRANSPORTATION					
			ILLINOIS ROUTE 53 PROPOSED TYPICAL CROSS SECTIONS					
			SCALE: NTS SHEET NO. 5 OF 10 SHEETS STA. TO STA.					
			FED. ROAD DIST. NO. ILLINOIS FED. AID PROJECT					