Illinois Department of Transportation

To:	John Fortmann	Attn: District One
From:	John D. Baranzelli	
Subject:	Pavement Design	
Date:	February 2, 2015	

FAU Route 297 (US 6)
Will County
At Parker Road

The project, submitted to BDE by memo dated September 24, 2014, will reconstruct US 6 at Parker Road. The LCCA favored a flexible design for US 6 by 5.8%, and the local jurisdiction, Parker Road, by 17.9%. The project is not subject to alternate bidding, and was discussed by the Pavement Selection Committee. Due to the LCCA favoring both roadways utilizing flexible pavement, the Committee agreed with the district's request to build this project utilizing HMA pavement.

The approved pavement design is as follows:

US 6 (Pavement Reconstruction)

10 inches of Full Depth HMA Pavement with HMA Shoulder
- 2 inches of Polymerized HMA Surface Course, Mix "F", N90
- 2.25 inches of Polymerized HMA Binder Course, IL-19.0, N90
- 5.75 inches of HMA Base Course, IL-19.0, N70

12 inches of Aggregate Subgrade Improvement

Parker Road (Pavement Reconstruction)

7.75 inches of Full Depth HMA Pavement with HMA Shoulder
- 2 inches of HMA Surface Course, Mix "D", N70
- 5.75 inches of HMA Base Course, IL-19.0, N70

12 inches of Aggregate Subgrade Improvement

US 6 (Temporary Pavement)

Option 1
10 inches of Full Depth Temporary HMA Pavement
    10 inches of HMA Binder Course, IL-19.0, N50
4 inches of Subgrade Granular Material Type B

Option 2
8 inches of Temporary PCC Pavement
4 inches of Subgrade Granular Material Type B

Parker Road (Temporary Pavement)

Option 1
8 inches of Full Depth Temporary HMA Pavement
    8 inches of HMA Binder Course, IL-19.0, N50
4 inches of Subgrade Granular Material Type B

Option 2
8 inches of Temporary PCC Pavement
4 inches of Subgrade Granular Material Type B

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: Jose A. Dominguez | By: Melchor Mangoba / Ojas Patel

Subject: Pavement Analysis*

Date: September 24, 2014

*Route: US 6
Limits: at Parker Road
Section: 33X-N(11)
Current target: 03CY15

County: Will
Contract No.: 60T08
Job No.: D-91-284-12

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. Review is not required for Parker Road as it is under local jurisdiction. The following is the scope of the project:

US 6 @ Parker Road – Reconstruction of the intersection to provide left turn lanes on all legs and right turn lanes on the west and south legs of the intersection.

The intersection of US 6 at Parker Road is approaching a "High Stress Intersection" since the profile grade on US 6 is 3.1%. District 1 recommends Mix "F" N90 at "High Stress" intersections to be built at a minimum 150 feet back from the location of the stop bar. A 20-year pavement analysis was performed on the above segments. The life cycle cost analysis does not favor either pavement by more than 10%. However, since the scope of work of the project is "less than 2 lane-miles in length" an alternate bid does not need to be considered according to section 1.04-1a of Chapter 54 of the BDE manual. Thus, a mechanistic flexible pavement design is recommended since the life cycle cost analysis does favor HMA by 5.8% for US 6 and by 17.9% for Parker Road. The recommended pavement is:

US 6
Pavement Reconstruction
HMA Shoulder[10]
10" Full Depth HMA[6]
- 2" Polymerized HMA Surface Course, Mix "F", N90[1]
- 2 ¼" Polymerized HMA Binder Course, IL-19.0, N90[2]
- 5 ¾" HMA Base Course, IL-19.0, N70[3]

12" Aggregate Subgrade Improvement[5]

Parker Road[11]
Pavement Reconstruction
HMA Shoulder[10]
7 ¾" Full Depth HMA[6]
2" HMA Surface Course, Mix "D", N70[4]
5 ¾" HMA Base Course, IL-19.0, N70[3]
12" Aggregate Subgrade Improvement[5]

TEMPORARY PAVEMENT

US 6
Option 1[7]
Temporary Pavement
10" Full Depth Temporary HMA Pavement[8]
10" HMA Binder Course, IL-19.0, N50
4" Subbase Granular Material Type B (CA-6)[9]

Option 2[7]
Temporary Pavement
8" Temporary PCC Pavement[8]
4" Subbase Granular Material Type B (CA-6)[9]

Parker Road
Option 1[7]
Temporary Pavement
8" Full Depth Temporary HMA Pavement[8]
8" HMA Binder Course, IL-19.0, N50
4" Subbase Granular Material Type B (CA-6)[9]

Option 2[7]
Temporary Pavement
8" Temporary PCC Pavement[8]
4" Subbase Granular Material Type B (CA-6)[9]

[1]Designer Note 1: Use pay item **40603595, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "F", N90** paid for in tons.

[2]Designer Note 2: Use pay item **40603240, POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N90** paid for in tons.

[3]Designer Note 3: Use pay item **35501307, HOT-MIX ASPHALT BASE COURSE, 5 ¾"** paid for in square yards.

[4]Designer Note 4: Use pay item **40603340, HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70** paid for in tons.

[5]Designer Note 5: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

[6]Designer Note 6: 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.

[7]Designer Note 7: The contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans. For quantity estimation purposes, excavation quantities should be estimated assuming the thicker design if both options are shown in the plans.

[8]Designer Note 8: Use pay item **Z0062456, TEMPORARY PAVEMENT**, paid in square yards.

The HMA temporary pavement shall consist of two items, HMA binder course and HMA surface course. Include both items in the HMA mix table requirements.

When PC Temp Pavement is used as an option, the following note shall appear on the plans adjacent to the HMA mix table: "PC Concrete temporary pavement shall consist of Class PV Concrete meeting the requirements of Art.1020 of the Standard Specifications. Temporary PCC pavement does not require dowel bars.

[9]Designer Note 9: Use pay item **31101200, SUBBASE GRANULAR MATERIAL, TYPE B 4"**, paid in square yards

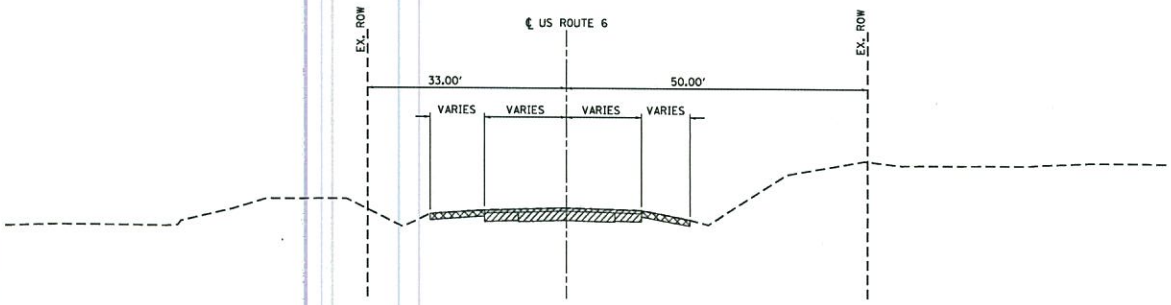
[10] Designer Note 10: The designer shall utilize IDOT Highway Standards in conjunction with guidelines in BDE Manual 34-2.02 for shoulder thicknesses.

[11]Designer Note 11: Parker Road is subject to local jurisdictional approval and concurrence.

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

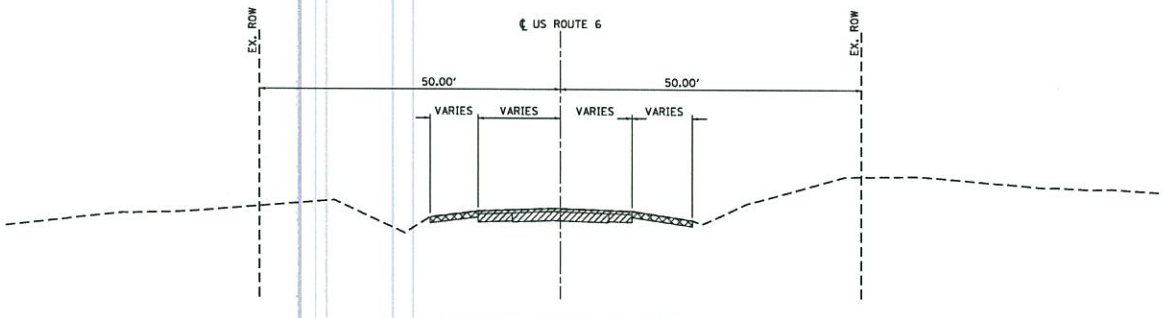
By: José A. Dominguez
Jose A. Dominguez, P.E.
Project Support Engineer

Traffic, Transit, Bicycling, Terrain, Directions
Directions from here
Directions to here
What's here?
Search nearby
Measure distance
Bruce Road
Veterans Memorial Tollways (Tollroad)
Gougar Rd
W Chicago Bloomington Trail
Larkspur Dr
S Meader Rd
Blodgett Rd
185th St
Hadley Valley - Gougar Road Access
Cascade Ln
Spring Creek St
Silver Cross Blvd
Blandford Ave
Coventry Rd
Woodruff Golf Course
Laura Ln
Michael Ln
Edmonds Ave
S Regan Rd
London Rd
Parker Rd
Marley Creek
Lenox St
Lila's Ct
N Cedar Rd
Gordon St
Green St
Maple Ln
N Vine St
N Elm Dr
W Wood St
N Cooper Rd
Sanctuary Golf Course
Old Hickory Rd
Oak St
Bayhill Dr
Grand Prairie Dr
Joela Dr
Ferro Dr
Moss Ln
Highland Park Dr
Erskine Rd
Dougal Rd
Lancaster Dr
Sheffield Dr
Sonoma Rd
Essex Ln
Winnee Ln
Kingston Dr
Basil Dr
Cagwin Dr
Lanfear Dr
Atta Dr
W Oak Ave
Primrose Ln
Mueller Ave
Bruce Rd
S Crystal Lake Dr
W Hunt Club Dr
Conlee Dr
Virginia Ln
S Buckberry Ln
Map data ©2015 Google
2000 ft



EXISTING TYPICAL SECTION
US ROUTE 6

STA 492+14 (BEGIN IMPROVEMENTS) TO STA 499+66



EXISTING TYPICAL SECTION
US ROUTE 6

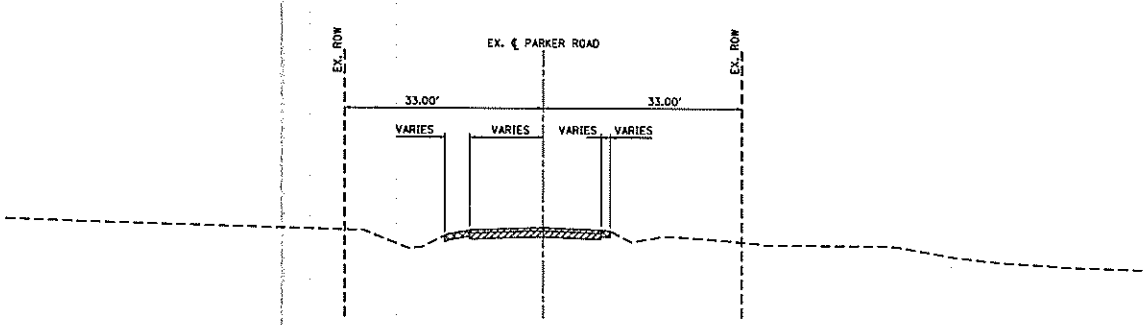
STA 500+40 TO 509+65 (END OF IMPROVEMENTS)

REMOVAL LEGEND

PAVEMENT REMOVAL

AGGREGATE SHOULDER REMOVAL

FILE NAME = SHT-TSEC-01.dgn	USER NAME = state	DESIGNED - TJT	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	US ROUTE 6 AT PARKER ROAD EXISTING TYPICAL SECTIONS – US ROUTE 6	F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN - TJT	REVISED -			297	33X-N(11)	WILL	76	12
Defaults	PLOT SCALE = 20.0000 ' / in.	CHECKED - OIU	REVISED -					CONTRACT NO. 60T08		
	PLOT DATE = 8/21/2014	DATE - 8/19/2014	REVISED -		SCALE: NTS / SHEET 12 OF 76 SHEETS / STA. TO STA.		ILLINOIS FED. AID PROJECT			



EXISTING TYPICAL SECTION
PARKER ROAD

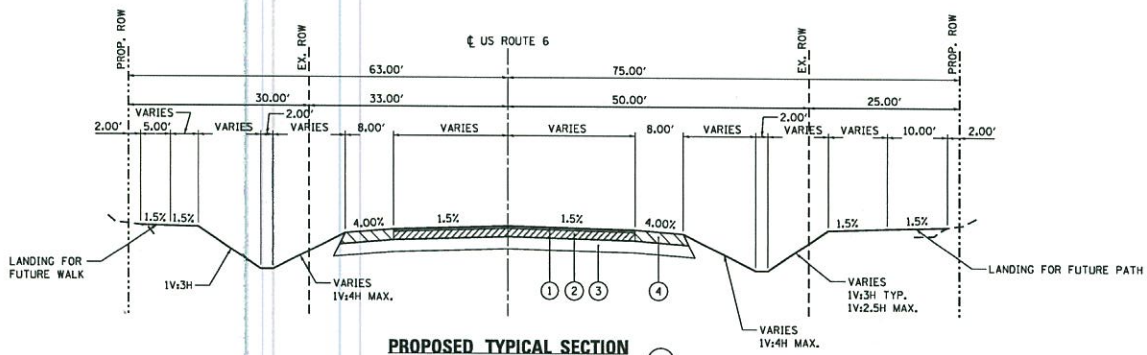
EX. STA 193+70 (BEGIN IMPROVEMENTS) TO EX. STA 206+08 (END OF IMPROVEMENTS)

REMOVAL LEGEND

PAVEMENT REMOVAL

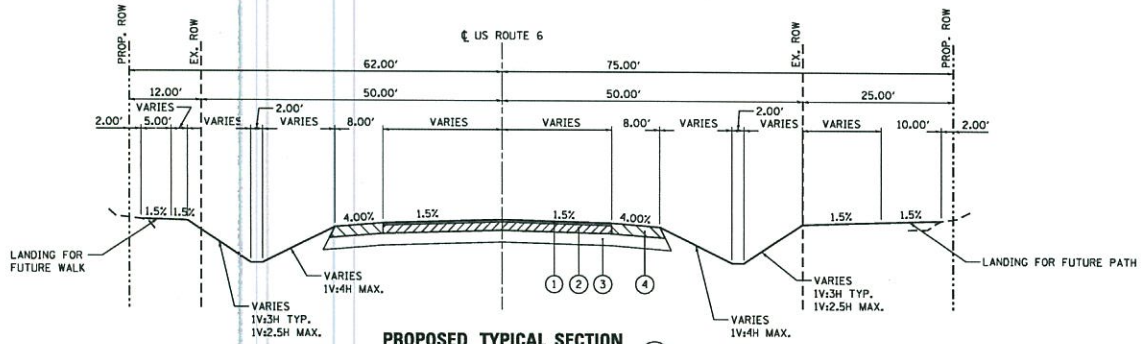
AGGREGATE SHOULDER REMOVAL

FILE NAME = SHT-TSEC-02.dgn	USER NAME = tiate	DESIGNED - TJT	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	US ROUTE 6 AT PARKER ROAD EXISTING TYPICAL SECTIONS – PARKER ROAD	F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN - TJT	REVISED -			297	33X-N(1)	WILL	76	13
	PLOT SCALE = 20.0000 ' / in.	CHECKED - OIU	REVISED -					CONTRACT NO. 60T08		
Default	PLOT DATE = 8/21/2014	DATE - 8/19/2014	REVISED -		SCALE: NTS / SHEET 13 OF 76 SHEETS / STA. TO STA.			ILLINOIS FED. AID PROJECT		



PROPOSED TYPICAL SECTION
US ROUTE 6 (A)

STA 492+14 (BEGIN IMPROVEMENTS) TO STA 498+10



PROPOSED TYPICAL SECTION
US ROUTE 6 (B)

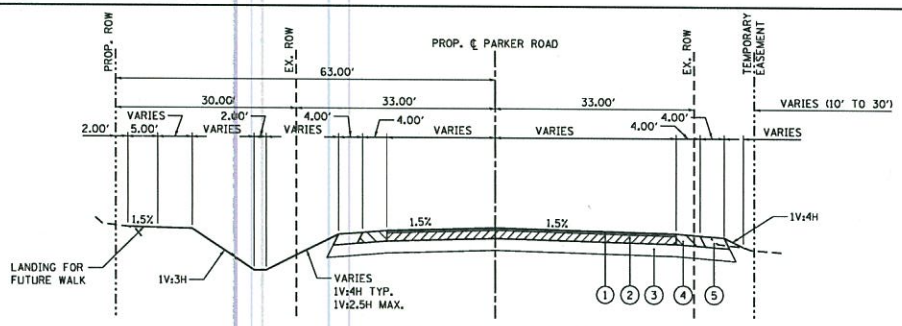
STA 501+70 TO STA 509+65 (END OF IMPROVEMENTS)

Proposed section from Phase I Report

PROPOSED LEGEND

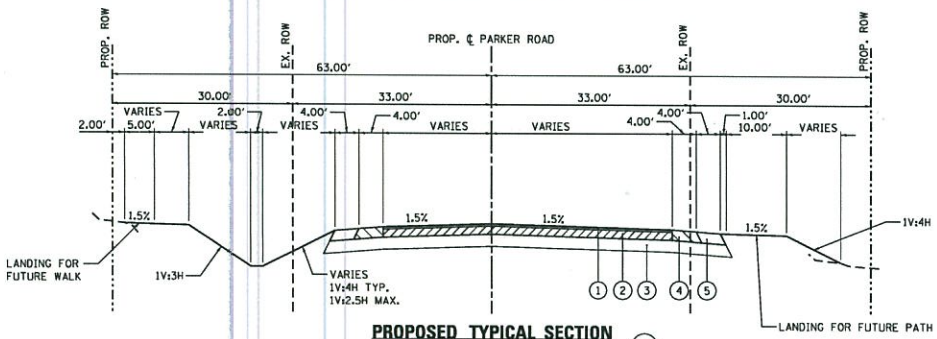
1. 2 1/2" POLYMERIZED HMA SURFACE COURSE, MIX "F", N90
2. 8" POLYMERIZED HOT-MIX ASPHALT BINDER CORUSE, IL-19.0, N90
3. 12" AGGREGATE SUBGRADE
4. 10 1/2" HMA SHOULDER

FILE NAME = SHT-TSEC-B3.dgn	USER NAME = state	DESIGNED - TJT	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	US ROUTE 6 AT PARKER ROAD PROPOSED TYPICAL SECTIONS – US ROUTE 6	F.A.U. RTE. 297	SECTION 33X-N(1)	COUNTY WILL	TOTAL SHEETS 76	SHEET NO. 14
		DRAWN - TJT	REVISED -							
	PLOT SCALE = 20.0000 ' / in.	CHECKED - OIU	REVISED -					CONTRACT NO. 60T08		
Defaults	PLOT DATE = 8/21/2014	DATE - 8/19/2014	REVISED -		SCALE: NTS SHEET 14 OF 76 SHEETS STA. TO STA.			ILLINOIS FED. AID PROJECT		



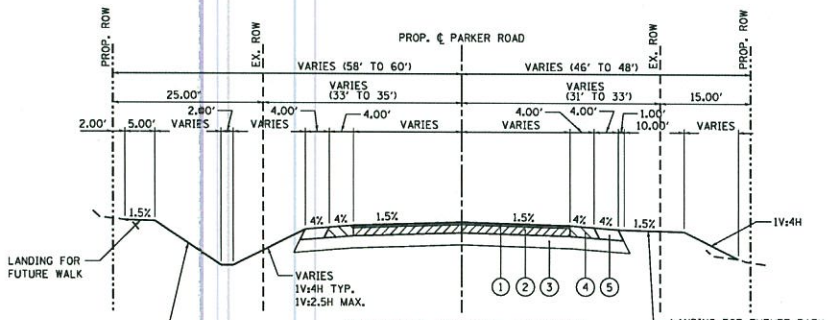
PROPOSED TYPICAL SECTION
PARKER ROAD (C)

STA 193+70 (BEGIN IMPROVEMENTS) TO STA 197+00



PROPOSED TYPICAL SECTION
PARKER ROAD (D)

STA 197+00 TO STA 198+53



PROPOSED TYPICAL SECTION
PARKER ROAD (E)

STA 201+36 TO STA 206+08 (END OF IMPROVEMENTS)

Proposed section from Phase I Report

PROPOSED LEGEND

1. 2 1/2" POLYMERIZED HMA SURFACE COURSE, MIX "F", N90
2. 8" POLYMERIZED HOT-MIX ASPHALT BINDER CORUSE, IL-19.0, N90
3. 12" AGGREGATE SUBGRADE
4. 10 1/2" HMA SHOULDER
5. AGGREGATE SHOULDER

FILE NAME = SHT-TSEC-04.dgn	USER NAME = state	DESIGNED - TJT	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	US ROUTE 6 AT PARKER ROAD PROPOSED TYPICAL SECTIONS – PARKER ROAD	F.A.U RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN - TJT	REVISED -			297	33X-N(1)	WILL	76	15
	PLOT SCALE = 20.0000 ' / in.	CHECKED - OIU	REVISED -					CONTRACT NO. 60T08		
Default	PLOT DATE = 8/21/2014	DATE - 8/19/2014	REVISED -		SCALE: NTS / SHEET 15 OF 76 SHEETS / STA. TO STA.			ILLINOIS FED. AID PROJECT		

BDE 5401 Template (Rev. 09/05/2013)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 02/02/2015

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: US 6
Section: 33X-N(11)
County: Will
Location: at Parker Road

Comments: West Leg was used for design as it has higher TF
Coordination with BDE Required

Design Date: 09/17/2014 ONP <-- BY
Modify Date: <-- BY

	ADT	Year
Current:	10,300	2011
Future:	16,000	2040

Facility Type: Other Marked State Route

# of Lanes = 2 or 3
Part of future 4 lanes or more ? No
One Way Street ? No
Road Class: II

Subgrade Support Rating (SSR): Poor
Construction Year: 2015
Design Period (DP) = 20 years

	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane	
		Structural Design Traffic			
PV =	0	11,784	90.3%	P =	50%
SU =	250	888	6.8%	S =	50%
MU =	750	380	2.9%	M =	50%
Struct. Design ADT =		13,052	(2025)		

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT

Cpv = 0.15
Csu = 112.06
Cmu = 385.44
TF flexible (Actual) = 2.48 (Actual ADT)
TF flexible (Min) = 3.17 (Min ADT Fig. 54-2.C)

RIGID PAVEMENT

Cpv = 0.15
Csu = 135.78
Cmu = 567.21
TF rigid (Actual) = 3.38 (Actual ADT)
TF rigid (Min) = 4.59 (Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 3.17
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 75.5 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 680 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 86 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 10.00 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.75 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 10.00 inches

JPC Pavement

Use TF rigid = 4.59
Edge Support = Tied Shoulder or C.&G.

Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 4.59
IBR value = 3

CRCP Thickness = 7.75 in. (Fig. 54-4.N)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible = 3.17
Goto Map
HMA Overlay Design Thickness = 7.50 in. (Fig. 54-5.U)
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 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	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. 09/05/2013) Printed: 02/02/2015

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	US 6
SECTION	33X-N(11)
COUNTY	Will
LOCATION	at Parker Road
FACILITY TYPE	NON-INTERSTATE

PROJECT LENGTH		1750 FT	==>	0.33 Miles
# OF CENTERLINES		1 CL		
# OF LANES		2 LANES		
# OF EDGES		2 EP		
LANE WIDTH - AVERAGE		12 FT		
SHOULDER WIDTH	HMA Left	8 FT		
	HMA Right	8 FT		
	Total Width of Paved Shoulders	16 FT		

PAVEMENT THICKNESS (FLEXIBLE)	10.00 IN	14.75 IN MAX
SHOULDER THICKNESS	8.00 IN	Standard Design
POLICY OVERLAY THICKNESS	2.25 IN	

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	3.17	2.48	3.17

Read Me!

HMA COST PER TON	UNIT PRICE
HMA SURFACE	$82.43 / TON
HMA TOP BINDER	$75.38 / TON
HMA LOWER BINDER	$57.87 / TON
HMA BINDER (LEVELING)	$75.38 / TON
HMA SHOULDER	$72.00 / TON

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT (FULL-DEPTH)	(10.00")	4,667	SQ YD *	$44.77 / SQ YD	$208,927 ~
HMA SURFACE COURSE	(2.00")	526	TONS	$82.43 / TON	$0
HMA TOP BINDER COURSE	(2.25")	601	TONS	$75.38 / TON	$0
HMA LOWER BINDER COURSE	(5.75")	1,577	TONS	$57.87 / TON	$0
HMA SHOULDER	(8.00")	1,394	TONS	$72.00 / TON	$100,352 ~
CURB & GUTTER		0	LIN FT	$30.00 / LIN FT	$0
SUBBASE GRAN MATL TY C (TONS)		83	TONS	$25.00 / TON	$2,075
IMPROVED SUBGRADE:	Modified Soil	8,296	SQ YD	$7.00 / SQ YD	$58,072
Reserved For User Supplied Item		0	UNITS	$0.00 / UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00 / UNITS	$0
PAVEMENT REMOVAL		4,667	SQ YD	$15.00 / SQ YD	$70,005
SHOULDER REMOVAL		3,111	SQ YD	$10.00 / SQ YD	$31,110

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$470,541
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$57,902

MAINTENANCE COSTS:

ITEM		THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY				$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	Surface Mix	$9.30 / SQ YD
HMA OVERLAY PVMT		(2.25")		$10.17 / SQ YD
HMA SURFACE MIX		(1.50")	Surface Mix	$6.96 / SQ YD
HMA BINDER MIX		(0.75")	eling Binder Mix	$3.21 / 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	$79.23 / 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	$78.44 / 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	$627,466
FLEXIBLE TOTAL ANNUAL COST PER MILE	$77,213

HMA_SD

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

02/02/15

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%	3,500	LIN FT	$2.00		$7,000	
	CNTR LINE JOINT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RNDM / THRM CRACK R&S	50.00%	1,925	LIN FT	$2.00		$3,850	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$79.23		$396	
	PWFn =	0.8626		PW =	0.8626	X	$14,746	$12,720
YEAR 10								
	LONG SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CNTR LINE JOINT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RNDM / THRM CRACK R&S	50.00%	1,925	LIN FT	$2.00		$3,850	
	PD PVMT PATCH M&F SURF	0.50%	23	SQ YD	$79.23		$1,822	
	PWFn =	0.7441		PW =	0.7441	X	$16,172	$12,033
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	7,778	SQ YD	$3.00		$23,334	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	47	SQ YD	$78.44		$3,687	
	HMA OVERLAY PVMT 2.00"	100.00%	4,667	SQ YD	$9.30		$43,383	
	HMA OVERLAY SHLD 2.00 "	100.00%	3,111	SQ YD	$8.06		$25,088	
	PWFn =	0.6419		PW =	0.6419	X	$95,492	$61,293
YEAR 20								
	LONG SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CNTR LINE JOINT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RNDM / THRM CRACK R&S	50.00%	1,925	LIN FT	$2.00		$3,850	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$79.23		$396	
	PWFn =	0.5537		PW =	0.5537	X	$14,746	$8,165
YEAR 25								
	LONG SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CNTR LINE JOINT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RNDM / THRM CRACK R&S	50.00%	1,925	LIN FT	$2.00		$3,850	
	PD PVMT PATCH M&F SURF	0.50%	23	SQ YD	$79.23		$1,822	
	PWFn =	0.4776		PW =	0.4776	X	$16,172	$7,724
	HMA_SD							
YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	7,778	SQ YD	$3.00		$23,334	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	93	SQ YD	$78.44		$7,295	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	31	SQ YD	$78.06		$2,420	
	HMA OVERLAY PVMT 2.25 "	100.00%	4,667	SQ YD	$10.17		$47,448	
	HMA OVERLAY SHLD 2.25 "	100.00%	3,111	SQ YD	$9.07		$28,224	
	PWFn =	0.4120		PW =	0.4120	X	$108,721	$44,792
YEAR 35								
	LONG SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CNTR LINE JOINT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RNDM / THRM CRACK R&S	50.00%	1,925	LIN FT	$2.00		$3,850	
	PD PVMT PATCH M&F SURF	0.10%	5	SQ YD	$79.23		$396	
	PWFn =	0.3554		PW =	0.3554	X	$14,746	$5,240
YEAR 40								
	LONG SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CNTR LINE JOINT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RNDM / THRM CRACK R&S	50.00%	1,925	LIN FT	$2.00		$3,850	
	PD PVMT PATCH M&F SURF	0.50%	23	SQ YD	$79.23		$1,822	
	PWFn =	0.3066		PW =	0.3066	X	$16,172	$4,958
								$156,925
	ROUTINE MAINTENANCE ACTIVITY		0.66	Lane Miles	0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$156,925
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$19,310

PCC PAVEMENT

JPCP

ROUTE	US 6
SECTION	33X-N(11)
COUNTY	Will
LOCATION	at Parker Road
FACILITY TYPE	NON-INTERSTATE

PROJECT LENGTH		1750 FT	= = >	0.33 Miles
# OF CENTERLINES		1 CL		
# OF LANES		2 LANES		
# OF EDGES		2 EP		
LANE WIDTH - AVERAGE		12 FT		
SHOULDER WIDTH	PCC Left	8 FT		
	PCC Right	8 FT		
	Total Width of Paved Shoulders	16 FT		

PAVEMENT THICKNESS (RIGID)	JPCP	9.00 IN	TIED SHLD
SHOULDER THICKNESS		9.00 IN	

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	4.59	3.38	4.59
Worksheet Construction Type is Reconstruction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST
JPC PAVEMENT	(9.00")	4,667	SQ YD	$39.17	/ SQ YD	$182,806
PAVEMENT REINFORCEMENT		0	SQ YD	$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	5,250	SQ YD	$19.00	/ SQ YD	$99,750
PCC SHOULDERS	(9.00" to 9.00")	3,111	SQ YD	$40.00	/ SQ YD	$124,440
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 1.80")	380	TONS	$25.00	/ TON	$9,500
IMPROVED SUBGRADE:	Modified Soil	7,972	SQ YD	$7.00	/ SQ YD	$55,804
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		4,667	SQ YD	$15.00	/ SQ YD	$70,005
SHOULDER REMOVAL		3,111	SQ YD	$10.00	/ SQ YD	$31,110

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$573,415
RIGID CONSTRUCTION ANNUAL COST PER MILE	$70,561

MAINTENANCE COSTS:

ITEM	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")		2.50	$11.24	/ SQ YD
HMA SURFACE MIX	(1.50")	Surface Mix	1.50	$6.96	/ SQ YD
HMA BINDER MIX	(1.00")	eling Binder Mix	1.00	$4.28	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")	Shoulder Mix	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	$76.92	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	2.50	$81.54	/ 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	$663,609
RIGID TOTAL ANNUAL COST PER MILE	$81,660

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE 02/02/15

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%	5	SQ YD	$150.00		$750	
	PWFn =	0.7441		PW =	0.7441	X	$750	$558
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	9	SQ YD	$150.00		$1,350	
	PWFn =	0.6419		PW =	0.6419	X	$1,350	$867
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	93	SQ YD	$150.00		$13,950	
	SHOULDER PATCH CLASS C	0.50%	16	SQ YD	$145.00		$2,320	
	LONGITUDINAL SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CENTERLINE JT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	PWFn =	0.5537		PW =	0.5537	X	$26,770	$14,822
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	140	SQ YD	$150.00		$21,000	
	SHOULDER PATCH CLASS C	1.00%	31	SQ YD	$145.00		$4,495	
	PWFn =	0.4776		PW =	0.4776	X	$25,495	$12,177
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	187	SQ YD	$150.00		$28,050	
	SHOULDER PATCH CLASS C	1.50%	47	SQ YD	$145.00		$6,815	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	4,667	SQ YD	$11.24		$52,454	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	3,111	SQ YD	$10.08		$31,360	
	PWFn =	0.4120		PW =	0.4120	X	$118,679	$48,894
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CENTERLINE JT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	RANDOM CRACK R&S	50.00%	1,750	LIN FT	$2.00		$3,500	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	1,123	LIN FT	$2.00		$2,246	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	5	SQ YD	$81.54		$408	
	PWFn =	0.3554		PW =	0.3554	X	$16,654	$5,919
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	23	SQ YD	$150.00		$3,450	
	LONGITUDINAL SHLD JT R&S	100.00%	3,500	LIN FT	$2.00		$7,000	
	CENTERLINE JT R&S	100.00%	1,750	LIN FT	$2.00		$3,500	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,685	LIN FT	$2.00		$3,370	
	RANDOM CRACK R&S	50.00%	1,750	LIN FT	$2.00		$3,500	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	23	SQ YD	$81.54		$1,875	
	PWFn =	0.3066		PW =	0.3066	X	$22,695	$6,957
								$90,194
	ROUTINE MAINTENANCE ACTIVITY		0.66	Lane Miles	$0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$90,194
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$11,099

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **9/24/14 11:10 AM**

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$573,415	$470,541
		ANNUAL COST PER MILE	$70,561	$57,902
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$90,194	$156,925
		ANNUAL COST PER MILE	$11,099	$19,310
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$663,609	$627,466
		ANNUAL COST PER MILE	$81,660	$77,213

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$77,213**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$81,660**	5.8%

P:\Pavement Design Stuff\D-1\US 6 at Parker Road 09-25-14\Pavement Design Files\[US 6 at Parker Road Mechanistic LCCA 09-25-14.xlsm]LifeCycleCost

BDE 5401 Template (Rev. 09/05/2013)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 02/02/2015

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route:	Parker Road	Comments:	South Leg was used for design as it has higher TF		
Section:	33X-N(11)		Coordination with BDE Required		
County:	Will	Design Date:	09/17/2014	ONP	<-- BY
Location:	at US 6	Modify Date:			<-- BY

	ADT	Year
Current:	6,150	2011
Future:	8,000	2040

Facility Type: Unmarked State Route

# of Lanes =	2 or 3
Part of future 4 lanes or more ?	No
One Way Street ?	No
Road Class:	II
Subgrade Support Rating (SSR):	Poor
Construction Year:	2015
Design Period (DP) =	20 years

Structural Design Traffic

	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane	
PV =	No Min	6,694	95.1%	P =	50%
SU =	No Min	247	3.5%	S =	50%
MU =	No Min	102	1.5%	M =	50%
Struct. Design ADT =		7,043	(2025)		

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT

Cpv =	0.15	
Csu =	112.06	
Cmu =	385.44	
TF flexible (Actual) =	0.68	(Actual ADT)
TF flexible (Min) =	No Min	(Min ADT Fig. 54-2.C)

RIGID PAVEMENT

Cpv =	0.15	
Csu =	135.78	
Cmu =	567.21	
TF rigid (Actual) =	0.92	(Actual ADT)
TF rigid (Min) =	No Min	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible =	0.68	
PG Grade Lower Binder Lifts =	PG 64-22	(Fig. 53-4.R)
HMA Mixture Temp. =	75.5	deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) =	680	ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) =	134	(Fig. 54-5.E)
Full Depth HMA Design Thickness =	7.75	in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness =	14.75	in. (Fig. 54-5.I)
Use Full-Depth HMA Thickness =	**7.75**	**inches**

Goto Map

Goto Map

JPC Pavement

Use TF rigid =	0.92	
Edge Support =	Tied	Shoulder or C.&G.
Rigid Pavt Thick. =	**7.75**	**in. (Fig. 54-4.E)**

CRC Pavement

Use TF rigid =	0.92	
IBR value =	3	
CRCP Thickness =	**6.00**	**in. (Fig. 54-4.N)**

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Overlay of Rubblized PCC

Use TF flexible =	0.68	
HMA Overlay Design Thickness =	5.25	in. (Fig. 54-5.U)
Limiting Strain Criterion Thickness =		in. (Fig. 54-5.V)
Use HMA Overlay Thickness =	**999.00**	**inches**

Goto Map

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 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. 09/05/2013) Printed: 02/02/2015

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	Parker Road
SECTION	33X-N(11)
COUNTY	Will
LOCATION	at US 6

FACILITY TYPE: NON-INTERSTATE

PROJECT LENGTH		1240	FT	==> 0.23 Miles
# OF CENTERLINES		1	CL	
# OF LANES		2	LANES	
# OF EDGES		2	EP	
LANE WIDTH - AVERAGE		12	FT	
SHOULDER WIDTH	HMA Left	4	FT	
	HMA Right	4	FT	
	Total Width of Paved Shoulders	8	FT	

PAVEMENT THICKNESS (FLEXIBLE)	7.75	IN	14.75 IN MAX
SHOULDER THICKNESS	8.00	IN	Standard Design
POLICY OVERLAY THICKNESS	2.25	IN	

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	No Min	0.68	0.68

Read Me!

HMA COST PER TON	UNIT PRICE	
HMA SURFACE	$84.28	/ TON
HMA TOP BINDER	$62.01	/ TON
HMA LOWER BINDER	$62.01	/ TON
HMA BINDER (LEVELING)	$73.14	/ TON
HMA SHOULDER	$72.00	/ TON

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(7.75")	3,307	SQ YD	* $29.41	/ SQ YD	$97,249	~
HMA SURFACE COURSE	(2.00")	373	TONS	$84.28	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	426	TONS	$62.01	/ TON	$0	
HMA LOWER BINDER COURSE	(3.50")	675	TONS	$62.01	/ TON	$0	
HMA SHOULDER	(8.00")	494	TONS	$72.00	/ TON	$35,553	~
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)		0	TONS	$25.00	/ TON	$0	
IMPROVED SUBGRADE:	Aggregate	4,725	SQ YD	$7.00	/ SQ YD	$33,075	
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0	
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0	
PAVEMENT REMOVAL		3,307	SQ YD	$15.00	/ SQ YD	$49,605	
SHOULDER REMOVAL		1,102	SQ YD	$10.00	/ SQ YD	$11,020	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$226,502
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$39,336

MAINTENANCE COSTS:

ITEM		THICKNESS	MATERIAL	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY				$0.00	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	Surface Mix	$9.50	/ SQ YD
HMA OVERLAY PVMT		(2.25")		$10.23	/ SQ YD
HMA SURFACE MIX		(1.50")	Surface Mix	$7.12	/ SQ YD
HMA BINDER MIX		(0.75")	eling Binder Mix	$3.11	/ 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	$79.44	/ 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	$78.19	/ 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	$324,548
FLEXIBLE TOTAL ANNUAL COST PER MILE	$56,363

HMA_SD

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

02/02/15

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%	2,480	LIN FT	$2.00		$4,960	
	CNTR LINE JOINT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RNDM / THRM CRACK R&S	50.00%	1,364	LIN FT	$2.00		$2,728	
	PD PVMT PATCH M&F SURF	0.10%	3	SQ YD	$79.44		$238	
	PWFn =	0.8626		PW =	0.8626	X	$10,406	$8,976
YEAR 10								
	LONG SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CNTR LINE JOINT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RNDM / THRM CRACK R&S	50.00%	1,364	LIN FT	$2.00		$2,728	
	PD PVMT PATCH M&F SURF	0.50%	17	SQ YD	$79.44		$1,350	
	PWFn =	0.7441		PW =	0.7441	X	$11,518	$8,570
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	4,409	SQ YD	$3.00		$13,227	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	33	SQ YD	$78.19		$2,580	
	HMA OVERLAY PVMT 2.00"	100.00%	3,307	SQ YD	$9.50		$31,430	
	HMA OVERLAY SHLD 2.00 "	100.00%	1,102	SQ YD	$8.06		$8,888	
	PWFn =	0.6419		PW =	0.6419	X	$56,125	$36,025
YEAR 20								
	LONG SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CNTR LINE JOINT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RNDM / THRM CRACK R&S	50.00%	1,364	LIN FT	$2.00		$2,728	
	PD PVMT PATCH M&F SURF	0.10%	3	SQ YD	$79.44		$238	
	PWFn =	0.5537		PW =	0.5537	X	$10,406	$5,762
YEAR 25								
	LONG SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CNTR LINE JOINT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RNDM / THRM CRACK R&S	50.00%	1,364	LIN FT	$2.00		$2,728	
	PD PVMT PATCH M&F SURF	0.50%	17	SQ YD	$79.44		$1,350	
	PWFn =	0.4776		PW =	0.4776	X	$11,518	$5,501
	HMA_SD							
YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	4,409	SQ YD	$3.00		$13,227	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	66	SQ YD	$78.19		$5,161	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	11	SQ YD	$78.06		$859	
	HMA OVERLAY PVMT 2.25 "	100.00%	3,307	SQ YD	$10.23		$33,821	
	HMA OVERLAY SHLD 2.25 "	100.00%	1,102	SQ YD	$9.07		$9,999	
	PWFn =	0.4120		PW =	0.4120	X	$63,067	$25,983
YEAR 35								
	LONG SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CNTR LINE JOINT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RNDM / THRM CRACK R&S	50.00%	1,364	LIN FT	$2.00		$2,728	
	PD PVMT PATCH M&F SURF	0.10%	3	SQ YD	$79.44		$238	
	PWFn =	0.3554		PW =	0.3554	X	$10,406	$3,698
YEAR 40								
	LONG SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CNTR LINE JOINT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RNDM / THRM CRACK R&S	50.00%	1,364	LIN FT	$2.00		$2,728	
	PD PVMT PATCH M&F SURF	0.50%	17	SQ YD	$79.44		$1,350	
	PWFn =	0.3066		PW =	0.3066	X	$11,518	$3,531
								$98,046
	ROUTINE MAINTENANCE ACTIVITY		0.47	Lane Miles	0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$98,046
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$17,027

PCC PAVEMENT

JPCP

ROUTE	Parker Road
SECTION	33X-N(11)
COUNTY	Will
LOCATION	at US 6
FACILITY TYPE	NON-INTERSTATE

PROJECT LENGTH			1240 FT	==> 0.23 Miles
# OF CENTERLINES			1 CL	
# OF LANES			2 LANES	
# OF EDGES			2 EP	
LANE WIDTH - AVERAGE			12 FT	
SHOULDER WIDTH	PCC	Left	4 FT	
	PCC	Right	4 FT	
	Total Width of Paved Shoulders		8 FT	

PAVEMENT THICKNESS (RIGID)	JPCP	7.75 IN	TIED SHLD
SHOULDER THICKNESS		7.75 IN	

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT TRAFFIC FACTORS		MINIMUM	ACTUAL	USE
		No Min	0.92	0.92
Worksheet Construction Type is	Reconstruction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST
JPC PAVEMENT	(7.75")	3,307	SQ YD	$34.58	/ SQ YD	$114,356
PAVEMENT REINFORCEMENT		0	SQ YD	$22.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	3,720	SQ YD	$19.00	/ SQ YD	$70,680
PCC SHOULDERS	(7.75" to 7.75")	1,102	SQ YD	$40.00	/ SQ YD	$44,080
CURB & GUTTER		0	LIN FT	$30.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~1.72")	149	TONS	$25.00	/ TON	$3,725
IMPROVED SUBGRADE:	Aggregate	4,547	SQ YD	$7.00	/ SQ YD	$31,829
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		3,307	SQ YD	$15.00	/ SQ YD	$49,605
SHOULDER REMOVAL		1,102	SQ YD	$10.00	/ SQ YD	$11,020

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$325,295
RIGID CONSTRUCTION ANNUAL COST PER MILE	$56,493

MAINTENANCE COSTS:

ITEM	THICKNESS	MATERIAL	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY			$0.00	/ LANE-MILE / YEAR
HMA POLICY OVERLAY	(2.50")			
HMA POLICY OVERLAY PVMT	(2.50")		$11.27	/ SQ YD
HMA SURFACE MIX	(1.50")	Surface Mix	$7.12	/ SQ YD
HMA BINDER MIX	(1.00")	eling Binder Mix	$4.15	/ SQ YD
HMA POLICY OVERLAY SHLD	(2.50")	Shoulder Mix	$10.08	/ SQ YD
CLASS A PAVEMENT PATCHING			$195.00	/ SQ YD
CLASS B PAVEMENT PATCHING			$160.00	/ SQ YD
CLASS C SHOULDER PATCHING			$145.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)		Surface Mix	$77.08	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	$81.80	/ 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	$382,503
RIGID TOTAL ANNUAL COST PER MILE	$66,428

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE 02/02/15

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%	3	SQ YD	$150.00		$450	
	PWFn =	0.7441		PW =	0.7441	X	$450	$335
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	7	SQ YD	$150.00		$1,050	
	PWFn =	0.6419		PW =	0.6419	X	$1,050	$674
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	66	SQ YD	$150.00		$9,900	
	SHOULDER PATCH CLASS C	0.50%	6	SQ YD	$145.00		$870	
	LONGITUDINAL SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CENTERLINE JT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	PWFn =	0.5537		PW =	0.5537	X	$18,210	$10,082
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	99	SQ YD	$150.00		$14,850	
	SHOULDER PATCH CLASS C	1.00%	11	SQ YD	$145.00		$1,595	
	PWFn =	0.4776		PW =	0.4776	X	$16,445	$7,854
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	132	SQ YD	$150.00		$19,800	
	SHOULDER PATCH CLASS C	1.50%	17	SQ YD	$145.00		$2,465	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	3,307	SQ YD	$11.27		$37,263	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	1,102	SQ YD	$10.08		$11,110	
	PWFn =	0.4120		PW =	0.4120	X	$70,638	$29,102
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CENTERLINE JT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	RANDOM CRACK R&S	50.00%	1,240	LIN FT	$2.00		$2,480	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	797	LIN FT	$2.00		$1,594	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	3	SQ YD	$81.80		$245	
	PWFn =	0.3554		PW =	0.3554	X	$11,759	$4,179
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	17	SQ YD	$150.00		$2,550	
	LONGITUDINAL SHLD JT R&S	100.00%	2,480	LIN FT	$2.00		$4,960	
	CENTERLINE JT R&S	100.00%	1,240	LIN FT	$2.00		$2,480	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	1,195	LIN FT	$2.00		$2,390	
	RANDOM CRACK R&S	50.00%	1,240	LIN FT	$2.00		$2,480	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	17	SQ YD	$81.80		$1,391	
	PWFn =	0.3066		PW =	0.3066	X	$16,251	$4,982
								$57,208
	ROUTINE MAINTENANCE ACTIVITY		0.47	Lane Miles	$0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$57,208
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$9,935

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 9/24/14 11:15 AM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$325,295	$226,502
		ANNUAL COST PER MILE	$56,493	$39,336
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$57,208	$98,046
		ANNUAL COST PER MILE	$9,935	$17,027
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$382,503	$324,548
		ANNUAL COST PER MILE	$66,428	$56,363

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$56,363**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$66,428**	**17.9%**

P:\Pavement Design Stuff\D-1\US 6 at Parker Road 09-25-14\Pavement Design Files\[Parker Road at US 6 Mechanistic LCCA 09-25-14.xlsm]LifeCycleCost