Illinois Department of Transportation

To:	Kensil A. Garnett	Attn:	Ryan T. Carroll
From:	Jack A. Elston	By:	Michael Brand MDB
Subject:	Pavement Design Approval		
Date:	August 22, 2019		

Route:	I-55	Job No.:	
Section:	D5 NHFP 2020-1	Contract No.:	70D73
County:	McLean	Target Letting:	April 2020
Limits:	Funks Grove Rest Area		

We have reviewed the pavement design for the above referenced project which was submitted on July 23, 2019. The scope of the project is to expand the northbound truck parking area.

We concur with the District's determination this is a "special design" due to it being "high-stress" and we also concur with the District's selection of PCC pavement to match existing.

In summary, the approved pavement design is as follows:

Funks Grove Rest Area Truck Parking - I-55 Northbound
10.5" PCC
4" Stabilized Subbase
12" Aggregate Subgrade Improvement

If you have any questions, please contact Mike Brand at (217) 782-7651.

Illinois Department of Transportation

Memorandum

To:	Jack Elston	Attn:	Michael Brand
From:	Kensil A. Garnett	By:	Ryan T. Carroll
Subject:	Pavement Analysis*		
Date:	August 22, 2019		

*Route: FAI 55 (I-55)
Section: D5 NHFP 2020-1
County: McLean
Contract: 70D73
Location: Funks Grove Rest Area
Improvement Type: NB Truck Parking Expansion
Letting: April 2020

The District has completed the pavement analysis for the above-mentioned project. Review by BDE is required since the total pavement area for construction exceeds 4,750 Square Yards.

The following is the scope of the project:

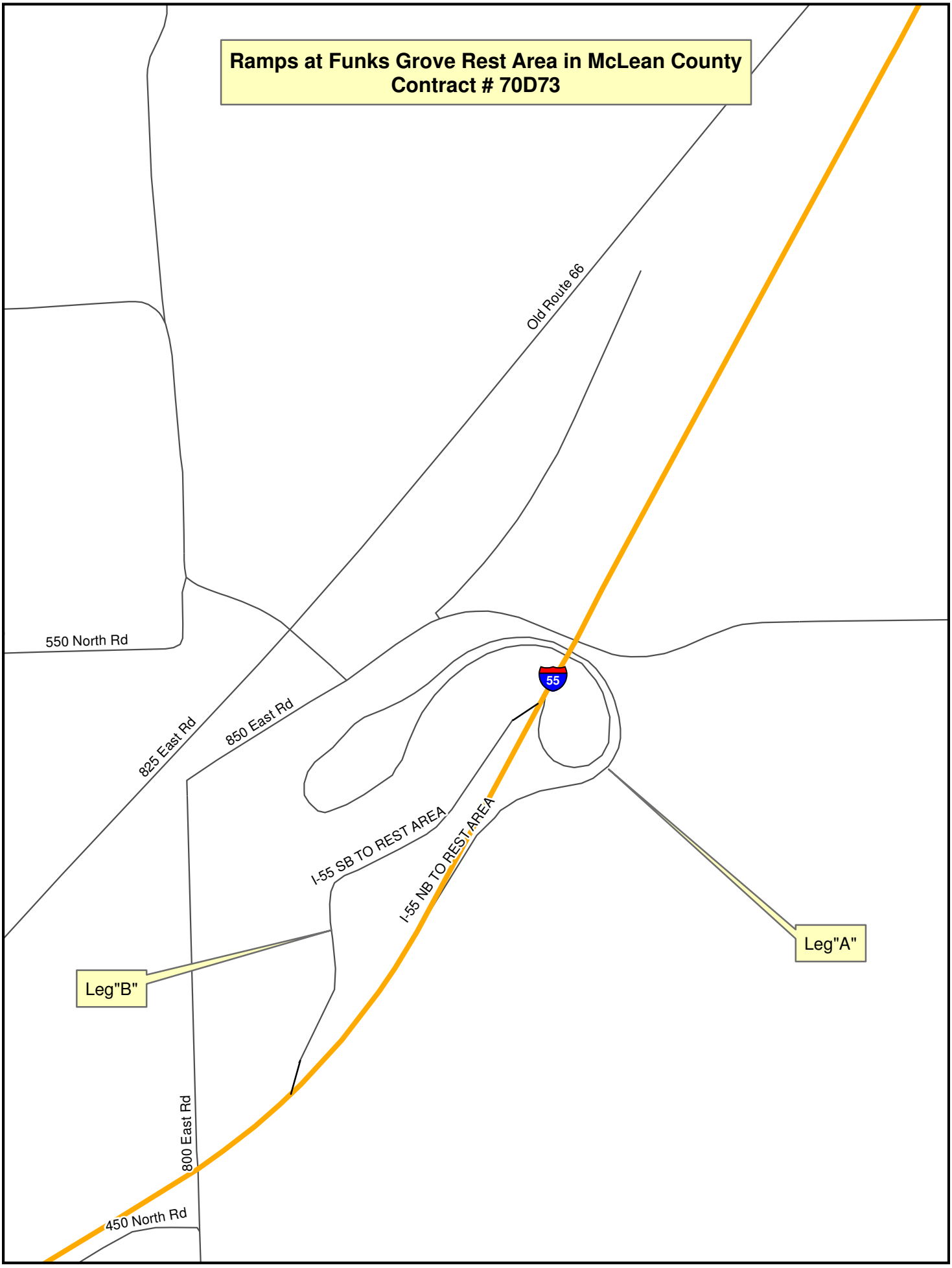
Northbound truck parking expansion at the Funks Grove Rest Area.

A 20-year pavement analysis was performed for the above parking expansion. The location is considered a “High Stress” location and will be classified as a “Special Design” per BDE Figure 54-1.A. A mechanistic-rigid pavement design is recommended to match the existing adjacent truck parking pavement type.

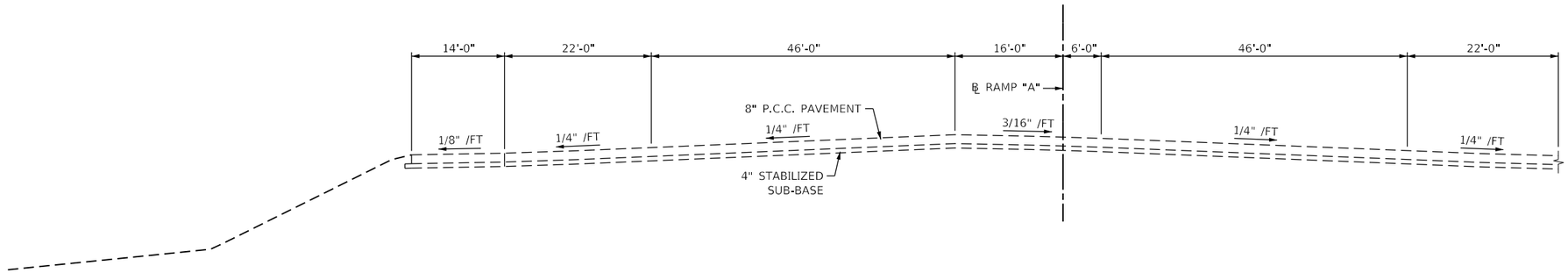
The pavement design consists of the following:

- 10.50” JPC
- 4” Stabilized Subbase
- 12” Aggregate Subgrade Improvement

If you have any questions or need additional information, please contact Ryan Carroll at (217)466-7225.

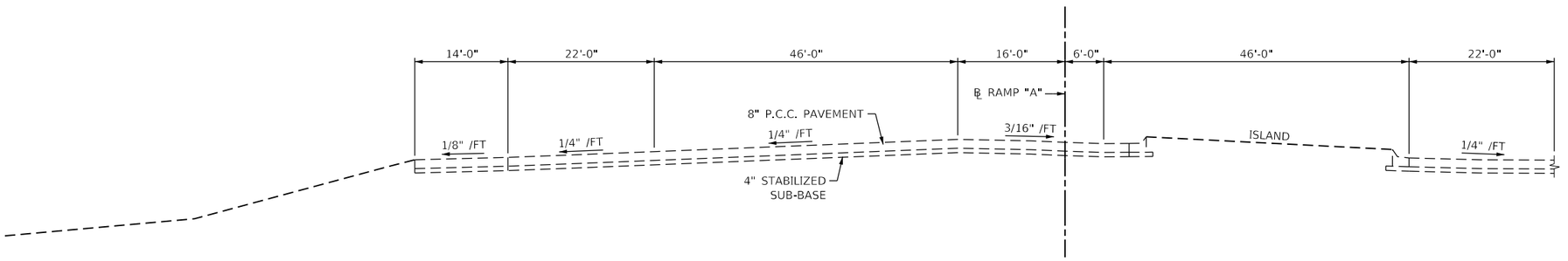

Ramps at Funks Grove Rest Area in McLean County
Contract # 70D73
Old Route 66
550 North Rd
825 East Rd
850 East Rd
55
I-55 SB TO REST AREA
I-55 NB TO REST AREA
Leg"A"
Leg"B"
800 East Rd
450 North Rd


N 800 East Rd
Large Truck Parking Lot
Normal Car Parking Lot
Funk's Grove Rest Area
55



EXISTING TYPICAL SECTION

(ORIGINAL PLANS SECTION A-A, ±55+00)



EXISTING TYPICAL SECTION

(ORIGINAL PLANS SECTION B-B, ±56+25)

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MODEL: 01 Existing Typicals

Prairie Engineers, P.C.
404 N. Main Street
Columbia, IL 62236
(217) 605-0403
www.prairieengineers.com
professional design firm no. 184-005965

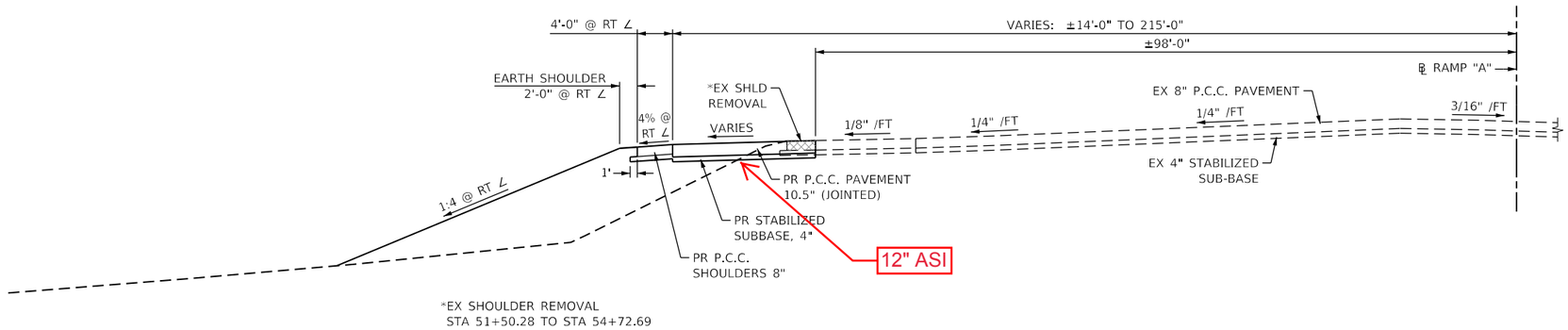
USER NAME = BBRENNAN	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 20.0000 ' / IN.	CHECKED -	REVISED -
PLOT DATE = 5/3/2019	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NB PARKING EXPANSION AT FUNKS GROVE REST AREA
TYPICAL CROSS SECTIONS

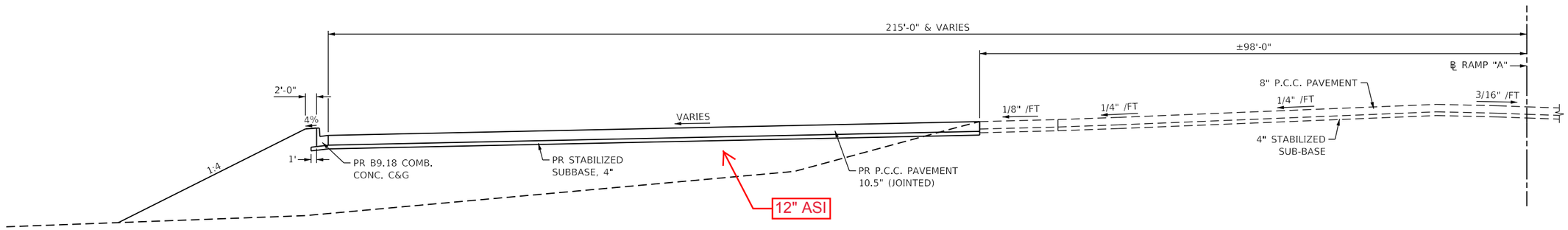
SCALE: | SHEET I OF SHEETS | STA. | TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	D5 NHFP 2020-1	MCLEAN		
		CONTRACT NO. 70D73		
	ILLINOIS	FED. AID PROJECT		



PROPOSED TYPICAL SECTION

STA 51+50.28 TO STA 55+34.88



PROPOSED TYPICAL SECTION

STA 55+34.88 TO STA 58+70.44
STA 60+00.10 (AH) TO STA 61+31.66 (AH)

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Columbia, IL 62236
(217) 605-0403
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professional design firm no. 184-005965

USER NAME = BBRENNAN	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 20.0000 ' / IN.	CHECKED -	REVISED -
PLOT DATE = 5/3/2019	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NB PARKING EXPANSION AT FUNKS GROVE REST AREA
TYPICAL CROSS SECTIONS

SCALE: | SHEET 2 OF SHEETS | STA. | TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	D5 NHFP 2020-1	MCLEAN		
		CONTRACT NO. 70D73		
	ILLINOIS	FED. AID PROJECT		

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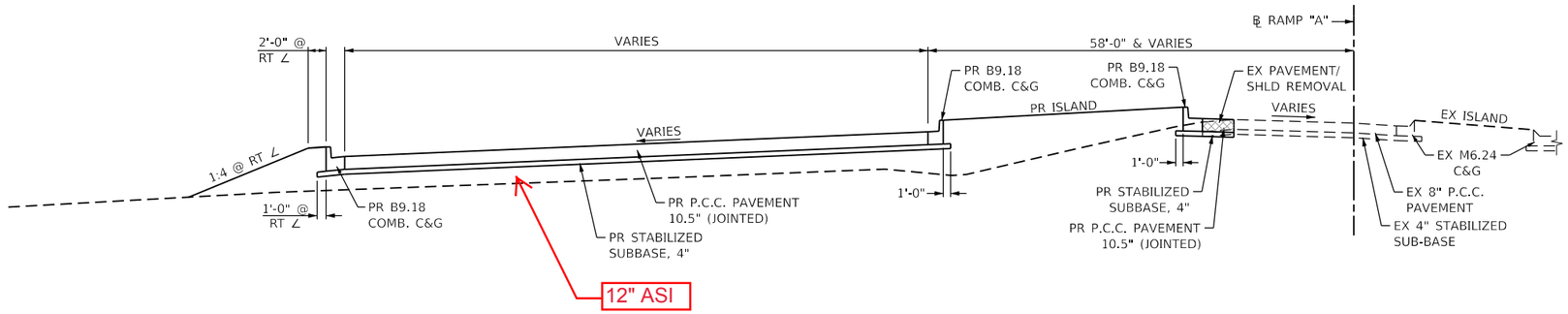

PROPOSED TYPICAL SECTION

STA 58+70.44 TO STA 60+00.10 (AH)

MODEL: 03 Proposed Typicals

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I:\Jobs\2019\91.1804 PTB 189-024 District 5 Various Phase I-IL\W0#2_Funks_Grove\CAD_Sheets\D570073-sht-typical.dgn

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USER NAME = BBRENNAN	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 20.0000 ' / IN.	CHECKED -	REVISED -
PLOT DATE = 5/3/2019	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NB PARKING EXPANSION AT FUNKS GROVE REST AREA
TYPICAL CROSS SECTIONS

SCALE: | SHEET 3 OF SHEETS | STA. | TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
55	D5 NHFP 2020-1	MCLEAN		
		CONTRACT NO. 70D73		
	ILLINOIS	FED. AID PROJECT		

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

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 06/12/2019

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: FAI 55
Section: D5 NHFP 2020-1
County: MCLEAN
Location: FUNKS GROVE NB TRUCK PARKING
Comments:
Design Date: 04/26/2019 RTC <-- BY
Modify Date: <-- BY

	ADT	Year
Current:	25,100	2018
Future:	28,100	2038

Facility Type: Interstate or Freeway
# of Lanes = 4
Road Class: I
Subgrade Support Rating (SSR): Poor
Construction Year: 2021
Design Period (DP) = 20 years

	Structural Design Traffic: Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane	
PV =	0	18,340	67.8%	P =	16%
SU =	500	974	3.6%	S =	25%
MU =	1500	7,736	28.6%	M =	25%
Struct. Design ADT =		27,050	(2031)		

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	132.5		Csu =	143.81	
Cmu =	482.53		Cmu =	696.42	
TF flexible (Actual) =	19.32	(Actual ADT)	TF rigid (Actual) =	27.65	(Actual ADT)
TF flexible (Min) =	3.95	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	5.58	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 19.32
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 76.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 660 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 52 (Fig. 54-5.E)
Full Depth HMA Design Thickness = 14.00 in. (Fig. 54-5.F)
Goto Map
Limiting Strain Criterion Thickness = 15.50 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 14.00 inches

JPC Pavement

Use TF rigid = 27.65
Edge Support = Tied Shoulder or C.&G.

Rigid Pavt Thick. = 10.50 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 27.65
IBR value = 3

CRCP Thickness = 10.25 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 = 19.32
HMA Overlay Design Thickness = 11.25 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = 11.00 in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 11.00 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%