



# Illinois Department of Transportation

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To: Anthony J. Quigley Attn: John Baczek

From: Jack A. Elston

By: Michael Brand *MDB*

Subject: Pavement Design Approval

Date: February 16, 2019

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Route: IL 47

Job No.: D-91-309-12

Section: 107N-4

Contract No.: 60T21

County: Kane

Target Letting: 01-2019

Limits: at Main Street

We have reviewed the pavement design for the above referenced project which was submitted on December 3, 2018, with supplemental information provided on January 15, 2019. The scope of the project is to reconstruct IL 47 and Main Street to accommodate additional channelization and raise the profile of the intersection approximately 5 feet to improve sight distance.

We concur with the District's determination this is a "special design" as the intersection is "high-stress"; and as such, a life cycle cost analysis is not required. We also concur with the District's selection of full-depth HMA.

In summary, the approved pavement designs are as follows:

IL 47

12.25" Full-Depth HMA Pavement with HMA Shoulders (some PCC C&G)  
12" Aggregate Subgrade Improvement

Main Street

11.25" Full-Depth HMA Pavement with HMA Shoulders (some PCC C&G)  
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: Jose A. Dominguez

By: Ojas Patel

Subject: Pavement Analysis\*

Date: December 3, 2018

\*Route: Illinois Route 47

County: Kane

Limits: at Main Street

Contract No.: 60T21

Section: 107N-4

Job No.: D-91-309-12

Current target: 01CY19

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 47 and Main Street to accommodate additional channelization and raise the profile of the intersection.***

A 20-year pavement analysis was performed for the above roadway segments. This intersection is a "High Stress" location since the design lane MU ADT exceeds 200 vehicles and the approach grade of the south leg of IL 47 exceeds 3.5%. As such, this pavement design will be classified as a "Special Design" per BDE Figure 54-1.A. A mechanistic-flexible pavement design is recommended for ease of construction due to the complexity of construction staging as the profile is being raised by over 5 feet. In addition, Stone Matrix Asphalt is recommended for this high stress location. The recommended pavement is:

**IL 47**

HMA Shoulder/Portions PCC Curb and Gutter

12 ¼" Full Depth HMA<sup>1,4</sup>

2" Polymerized HMA Surface Course, SMA, 9.5, N80

2 ¼" Polymerized HMA Binder Course, IL-19.0, N90

8" HMA Base Course, IL-19.0, N90

12" Aggregate Subgrade Improvement<sup>3</sup>

**Main Street<sup>5</sup>**

HMA Shoulder/Portions PCC Curb and Gutter

11 ¼" Full Depth HMA<sup>2,4</sup>

2" Polymerized HMA Surface Course, SMA, 9.5, N80

2 ¼" Polymerized HMA Binder Course, IL-19.0, N90

7" HMA Base Course, IL-19.0, N90

12" Aggregate Subgrade Improvement<sup>3</sup>

J. Elston  
December 3, 2018  
Page Two

<sup>1</sup>Designer Note 1: Use pay item **40701926, HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 12 ¼"** paid for in square yards.

<sup>2</sup>Designer Note 2: Use pay item **40701906, HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 11 ¼"** paid for in square yards.

<sup>3</sup>Designer Note 3: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

<sup>4</sup>Designer Note 4: 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.

<sup>5</sup>Designer Note 5: Main Street 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:   
Jose A. Dominguez, P.E.  
Project Support Engineer

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326	107N-4	KANE	275	1
		ILLINOIS	CONTRACT NO. 60T21	

FOR INDEX OF SHEETS, SEE SHEET NO. 2

PROJECT LOCATED IN  
UNINCORPORATED KANE COUNTY

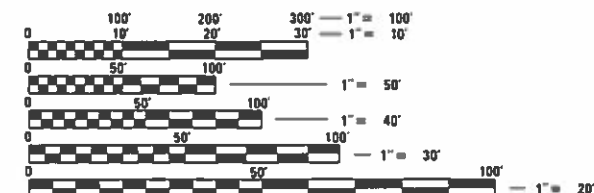
**TRAFFIC DATA**

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IL RTE. 47  
CLASS: OTHER PRINCIPAL ARTERIAL  
EXISTING ADT: 8,200 (2010)  
DESIGN ADT: 15,000 (2040)  
TRUCK TRAFFIC: 20.8%  
DESIGN SPEED: 60 MPH  
POSTED SPEED: 55 MPH

F.A.S. 107  
MAIN STREET  
CLASS: OTHER PRINCIPAL ARTERIAL  
EXISTING ADT: 3,700 (2010)  
DESIGN ADT: 7,000 (2040)  
TRUCK TRAFFIC: 25.3%  
DESIGN SPEED: 60 MPH  
POSTED SPEED: 55 MPH

STRUCTURAL DESIGN TRAFFIC: 2040  
PV=12015 SU=855 MU=2130  
ROAD/STREET CLASS: II  
PERCENTAGE OF STRUCTURAL DESIGN  
TRAFFIC IN DESIGN LANE:  
PV=50% SU=50% MU=50%  
TRAFFIC FACTOR:  
ACTUAL TF=13.26  
MINIMUM TF=9.2  
SUBGRADE SUPPORT RATING: POOR

*Abbrenated set plans  
Revised 1/09/19*



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD  
ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT  
CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS  
ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.  
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION  
1-800-892-0123  
OR 811

PROJECT MANAGER: SERIN KELLER (847) 705-4556

CONTRACT NO. 60T21

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

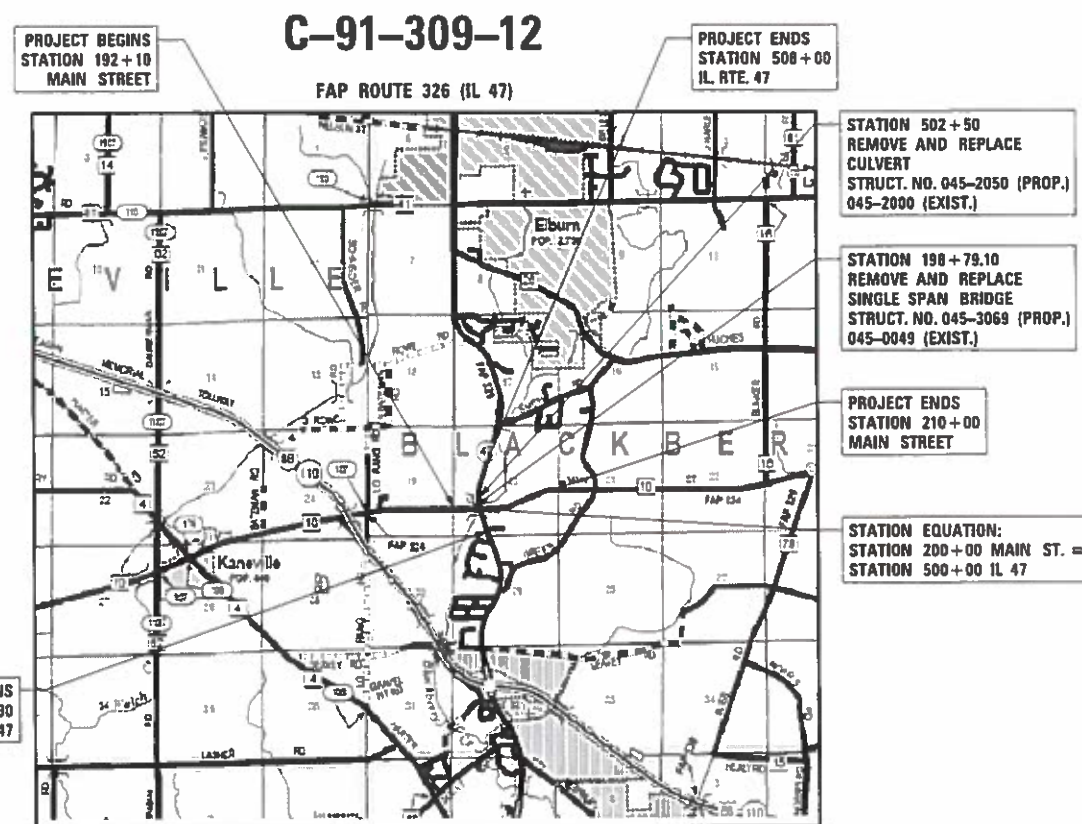
**PROPOSED  
HIGHWAY PLANS**

FAP ROUTE 326 (IL 47)  
SECTION 107N-4  
AT MAIN STREET (C.H. 10)  
PROJECT NO.: EKJD(697)  
INTERSECTION IMPROVEMENT, TRAFFIC  
SIGNAL INSTALLATION, BRIDGE REPLACEMENT  
KANE COUNTY

D-91-309-12



LOCATION OF SECTION INDICATED THUS: - [shaded box] -



PROJECT BEGINS  
STATION 492+30  
IL RTE. 47

S20 T39N R7E  
BLACKBERRY TOWNSHIP

LOCATION MAP TO SCALE  
1" = 5000'

GROSS LENGTH = 3360 FT = 0.64 MILE  
NET LENGTH = 3360 FT = 0.64 MILE

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

SUBMITTED \_\_\_\_\_ 20 \_\_\_\_\_

\_\_\_\_\_ REGIONAL ENGINEER

\_\_\_\_\_ 20 \_\_\_\_\_

\_\_\_\_\_ ENGINEER OF DESIGN AND ENVIRONMENT

\_\_\_\_\_ 20 \_\_\_\_\_

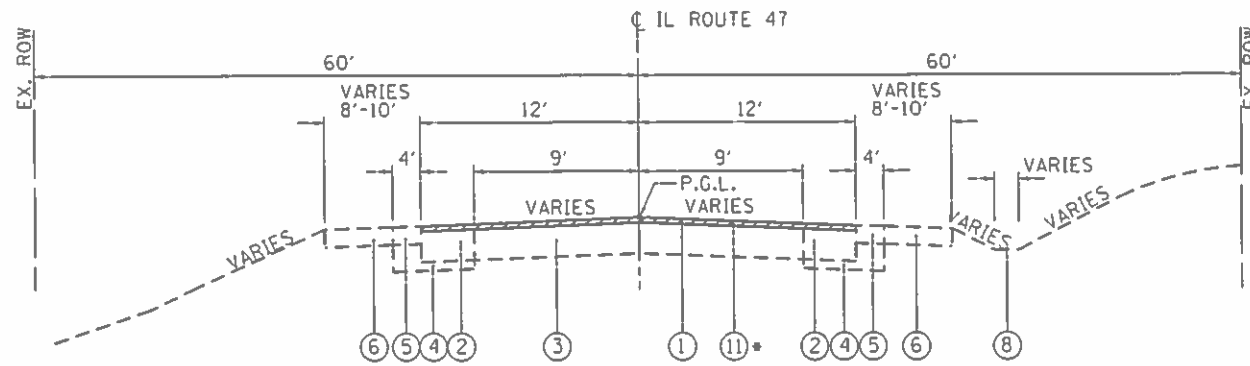
\_\_\_\_\_ DIRECTOR OF PROGRAM DEVELOPMENT

**PRINTED BY THE AUTHORITY  
OF THE STATE OF ILLINOIS**

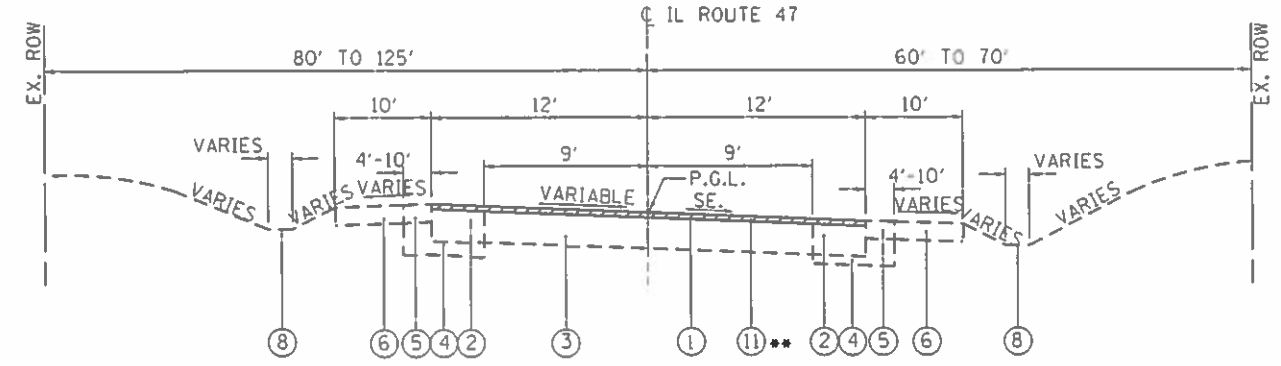
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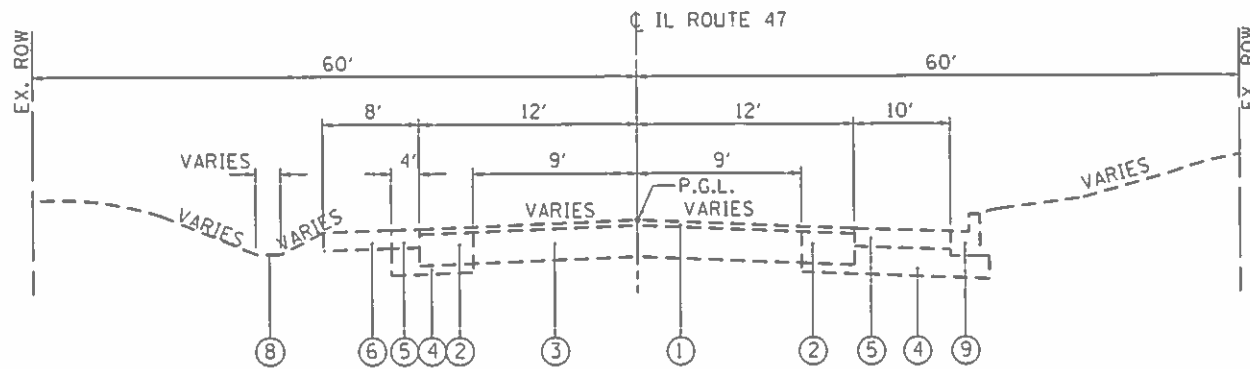
**IL 47**  
**EXISTING TYPICAL SECTION**  
STA. 492+30 TO STA. 493+95



**IL 47**  
**EXISTING TYPICAL SECTION**  
STA. 500+00 TO STA. 508+00

**LEGEND**

- ① HOT-MIX ASPHALT CONCRETE SURFACE & BINDER COURSE
- ② HOT-MIX ASPHALT CONCRETE BASE COURSE
- ③ PCC PAVEMENT
- ④ GRANULAR SUBBASE
- ⑤ HMA SHOULDER
- ⑥ AGGREGATE SHOULDER
- ⑦ AGGREGATE SHOULDER, TYPE B
- ⑧ SWALE / DITCH
- ⑨ B6.12 CURB & GUTTER
- ⑩ M6.24 CURB & GUTTER
- ⑪ HMA SURFACE COURSE REMOVAL, 2 1/4"



**IL 47**  
**EXISTING TYPICAL SECTION**  
STA. 493+95 TO STA. 500+00

- HMA SURFACE COURSE REMOVAL FROM STA. 492+30.00 TO STA. 493+30.00
- HMA SURFACE COURSE REMOVAL FROM STA. 507+00.00 TO STA. 508+00.00



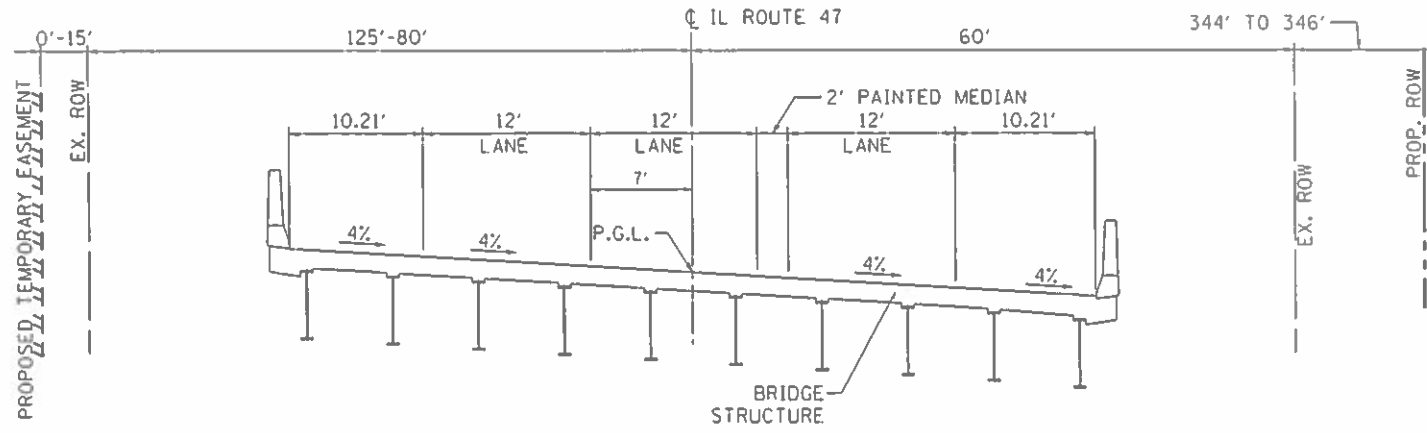
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STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

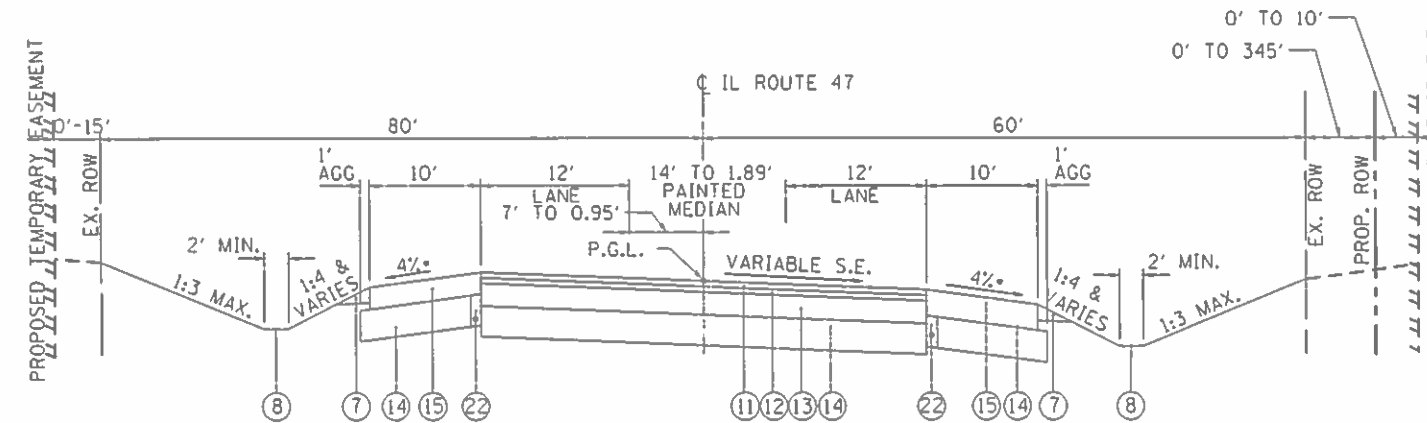
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SCALE: N.T.S.	SHEET NO. 1 OF 8 SHEETS
STA.	TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326	107N-4	KANE	249	22
CONTRACT NO. 60T21				
ILLINOIS FED. AID PROJECT				





**IL 47**  
**PROPOSED BRIDGE TYPICAL SECTION**  
 STA. 502+07.88 TO STA. 502+90.06



**IL 47**  
**PROPOSED TYPICAL SECTION**  
 STA. 503+97.34 TO 507+00.00

**LEGEND**

- ① EXISTING HOT-MIX ASPHALT CONCRETE SURFACE & BINDER COURSE
- ② EXISTING HOT-MIX ASPHALT CONCRETE BASE COURSE
- ③ EXISTING PCC PAVEMENT
- ④ EXISTING GRANULAR SUBBASE
- ⑤ EXISTING HMA SHOULDER
- ⑥ EXISTING AGGREGATE SHOULDER
- ⑦ PROPOSED AGGREGATE SHOULDER, TYPE B
- ⑧ PROPOSED SWALE / DITCH
- ⑨ PROPOSED B6.12 CURB & GUTTER
- ⑩ PROPOSED M6.24 CURB & GUTTER
- ⑪ PROPOSED POLYMERIZED HMA SURFACE COURSE, SMA, 9.5, N80, 2"
- ⑫ PROPOSED POLYMERIZED HMA BINDER COURSE, IL-19.0, N90, 2 1/4"
- ⑬ PROPOSED HMA BASE COURSE, IL-19.0, N90, 7"
- ⑭ PROPOSED AGGREGATE SUBGRADE IMPROVEMENT 12"
- ⑮ PROPOSED HMA SHOULDERS 8"
- ⑯ PROPOSED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70, 1 1/2"
- ⑰ PROPOSED LEVELING BINDER (MACHINE METHOD), N70, 3/4"
- ⑱ NOT USED
- ⑲ PROPOSED MOMENT SLAB
- ⑳ PROPOSED RETAINING WALL
- ㉑ PROPOSED STEEL RAILING, SM
- ㉒ PROPOSED PIPE UNDERDRAINS TYPE 2, 4"

\* WHEN THE SUPERELEVATION RATE OF THE PAVEMENT IS BETWEEN 0% AND 4%, THE SHOULDER SHALL BE SLOPED AT 4%. WHEN THE SUPERELEVATION RATE OF THE PAVEMENT EXCEEDS 4%, THE SHOULDER SHALL BE SLOPED SO THAT THE ALGEBRAIC DIFFERENCE BETWEEN THE PAVEMENT AND SHOULDER WILL NOT BE GREATER THAN 8%.

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STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

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STA.	TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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ILLINOIS FED. AID PROJECT				

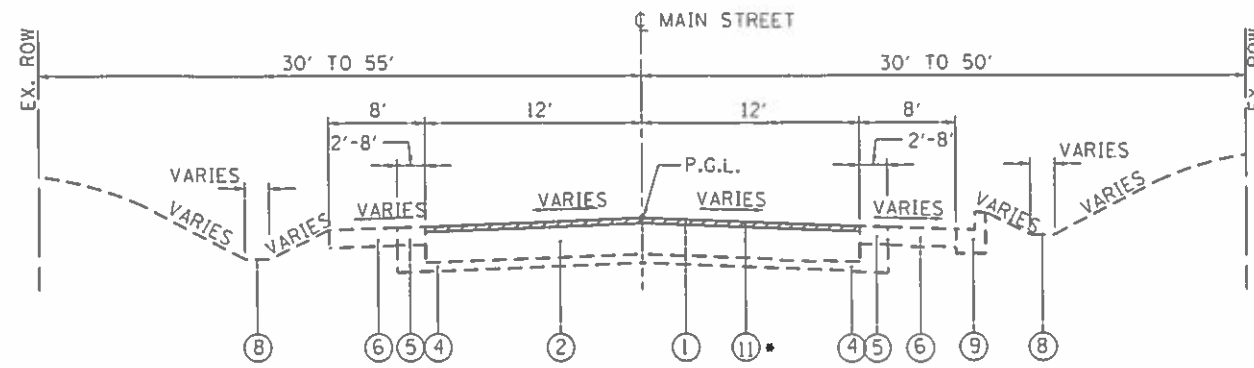




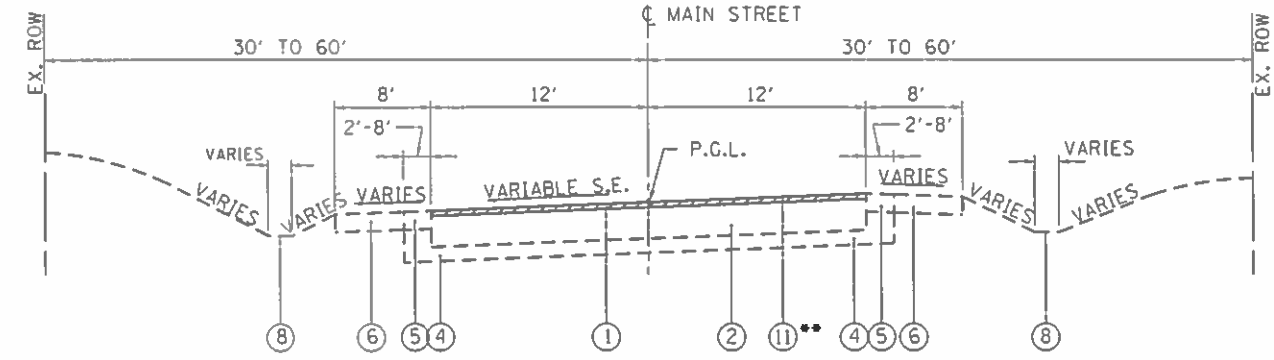
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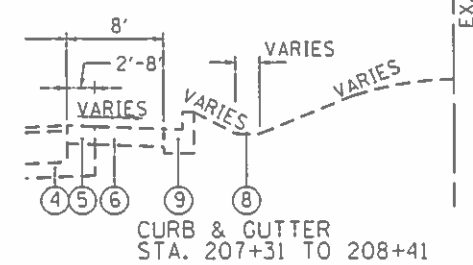
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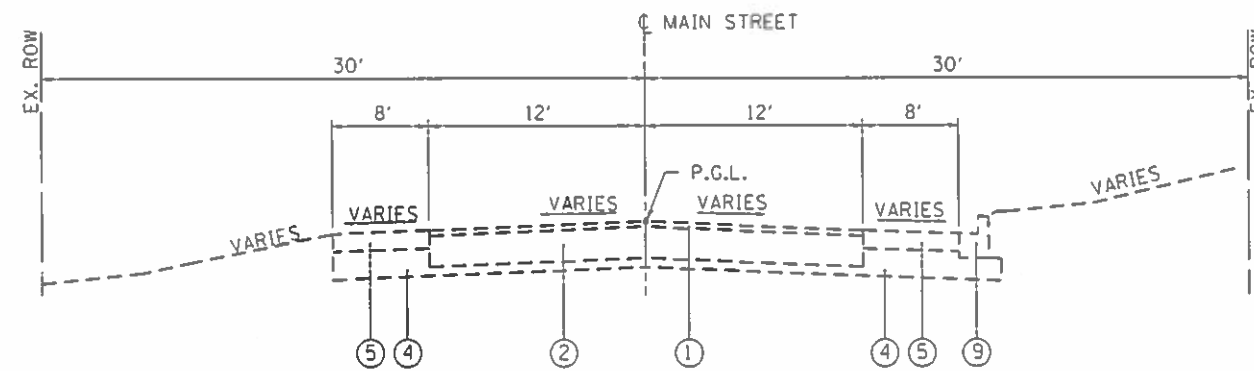


**MAIN STREET**  
**EXISTING TYPICAL SECTION**  
 STA. 207+31 TO 213+42.88



**LEGEND**

- ① HOT-MIX ASPHALT CONCRETE SURFACE & BINDER COURSE
- ② HOT-MIX ASPHALT CONCRETE BASE COURSE
- ③ PCC PAVEMENT
- ④ GRANULAR SUBBASE
- ⑤ HMA SHOULDER
- ⑥ AGGREGATE SHOULDER
- ⑦ AGGREGATE SHOULDER, TYPE B
- ⑧ SWALE / DITCH
- ⑨ B6.12 CURB & GUTTER
- ⑩ M6.24 CURB & GUTTER
- ⑪ HMA SURFACE COURSE REMOVAL, 2.25"



**MAIN STREET**  
**EXISTING TYPICAL SECTION**  
 STA. 200+00 TO 207+31

- HMA SURFACE COURSE REMOVAL FROM STA. 192+10.00 TO STA. 193+10.00
- HMA SURFACE COURSE REMOVAL FROM STA. 209+00.00 TO STA. 210+00.00



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STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

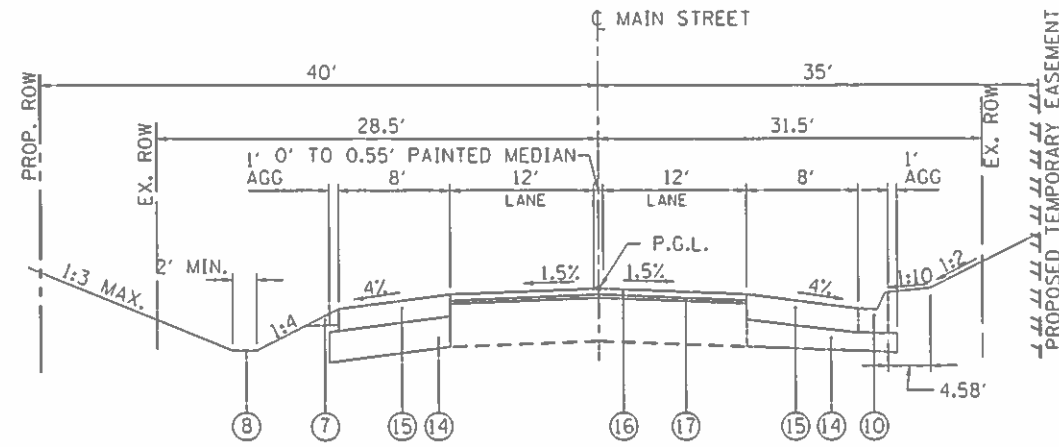
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STA.	TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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ILLINOIS FED. AID PROJECT			CONTRACT NO. 60T21	

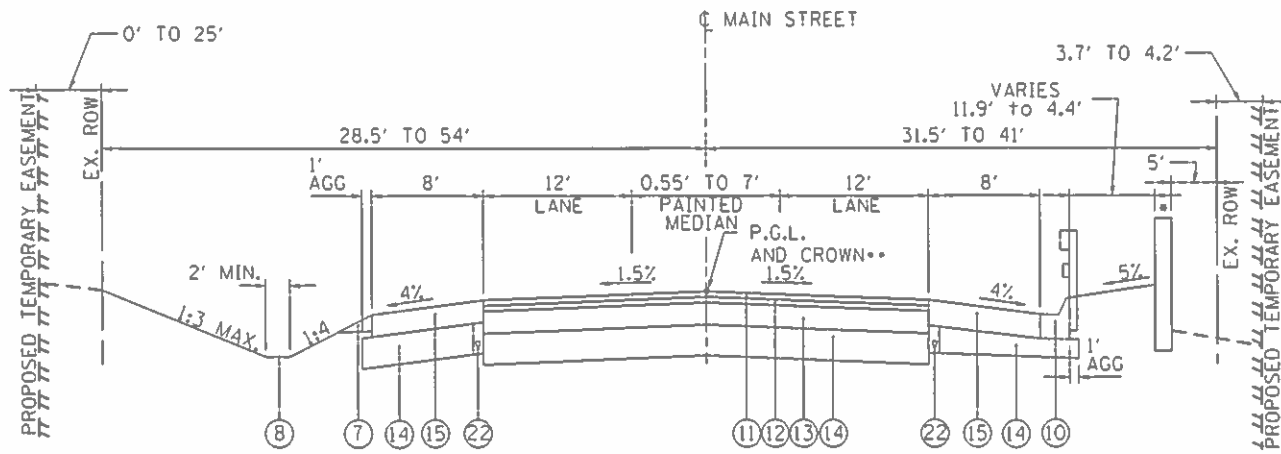
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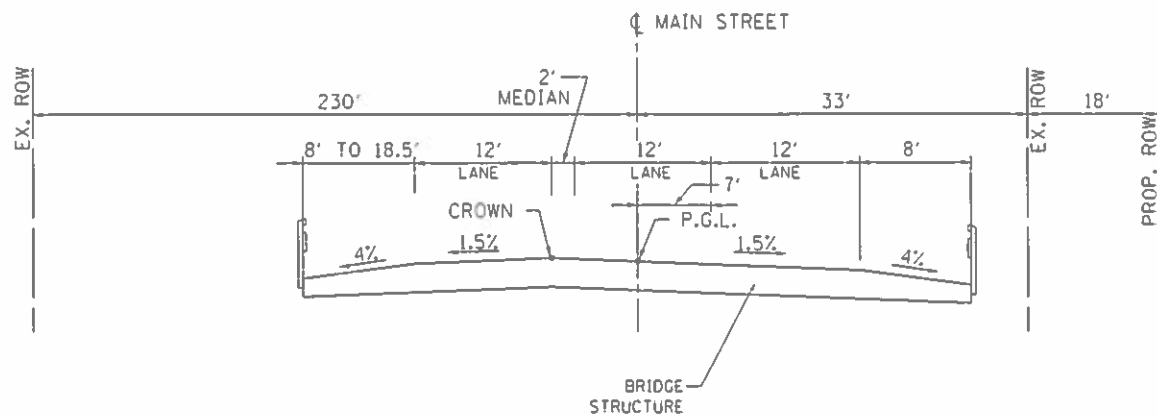
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**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
STA. 192+10.00 TO STA. 193+10.00

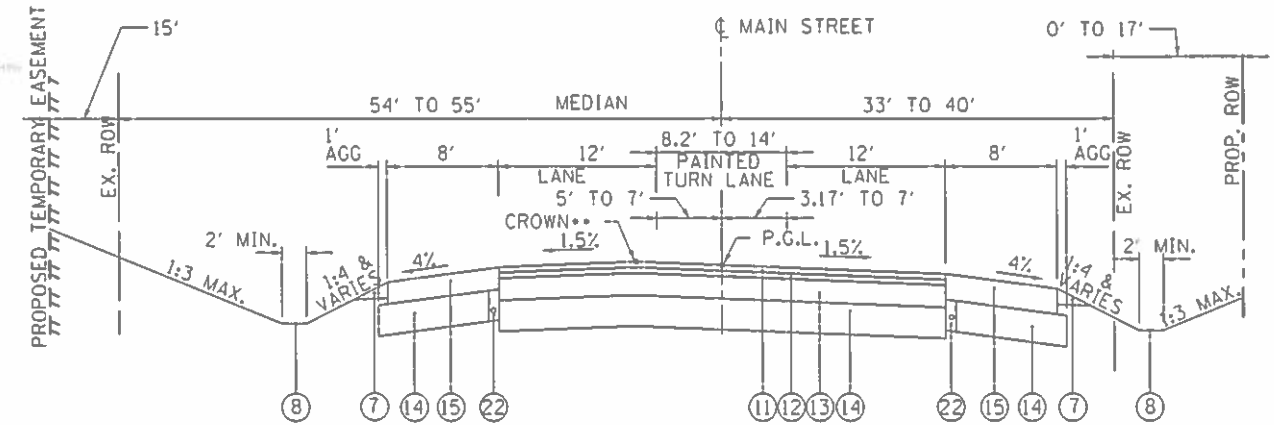


**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
STA. 193+10.00 TO STA. 195+00.00



**MAIN STREET**  
**PROPOSED BRIDGE TYPICAL SECTION**  
STA. 198+26.52 TO STA. 199+31.68

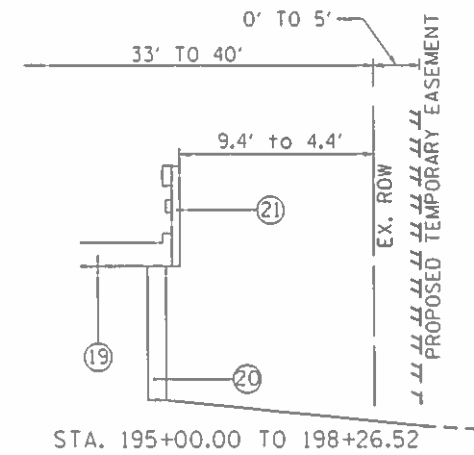
- RETAINING WALL BETWEEN STA. 193+90.00 AND STA. 196+46.45
- CROWN SHIFTS AT LEFT TURN LANE
- ADDITIONAL 6" AGGREGATE SUBGRADE IMPROVEMENT BETWEEN STA. 193+10 AND 194+40 (FULL ROADWAY WIDTH)



**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
STA. 195+00.00 TO STA. 198+26.52  
STA. 199+31.68 TO STA. 200+00.00

**LEGEND**

- EXISTING HOT-MIX ASPHALT CONCRETE SURFACE & BINDER COURSE
- EXISTING HOT-MIX ASPHALT CONCRETE BASE COURSE
- EXISTING PCC PAVEMENT
- EXISTING GRANULAR SUBBASE
- EXISTING HMA SHOULDER
- EXISTING AGGREGATE SHOULDER
- PROPOSED AGGREGATE SHOULDER, TYPE B
- PROPOSED SWALE / DITCH
- PROPOSED B6.12 CURB & GUTTER
- PROPOSED M6.24 CURB & GUTTER
- PROPOSED POLYMERIZED HMA SURFACE COURSE, SMA, 9.5, N80, 2"
- PROPOSED POLYMERIZED HMA BINDER COURSE, IL-19.0, N90, 2 1/4"
- PROPOSED HMA BASE COURSE, IL-19.0, N90, 7"
- PROPOSED AGGREGATE SUBGRADE IMPROVEMENT 12"
- PROPOSED HMA SHOULDERS 8"
- PROPOSED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70, 1 1/2"
- PROPOSED LEVELING BINDER (MACHINE METHOD), N70, 3/4"
- NOT USED
- PROPOSED MOMENT SLAB
- PROPOSED RETAINING WALL
- PROPOSED STEEL RAILING, SM
- PROPOSED PIPE UNDERDRAINS TYPE 2, 4"



STA. 195+00.00 TO 198+26.52



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STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

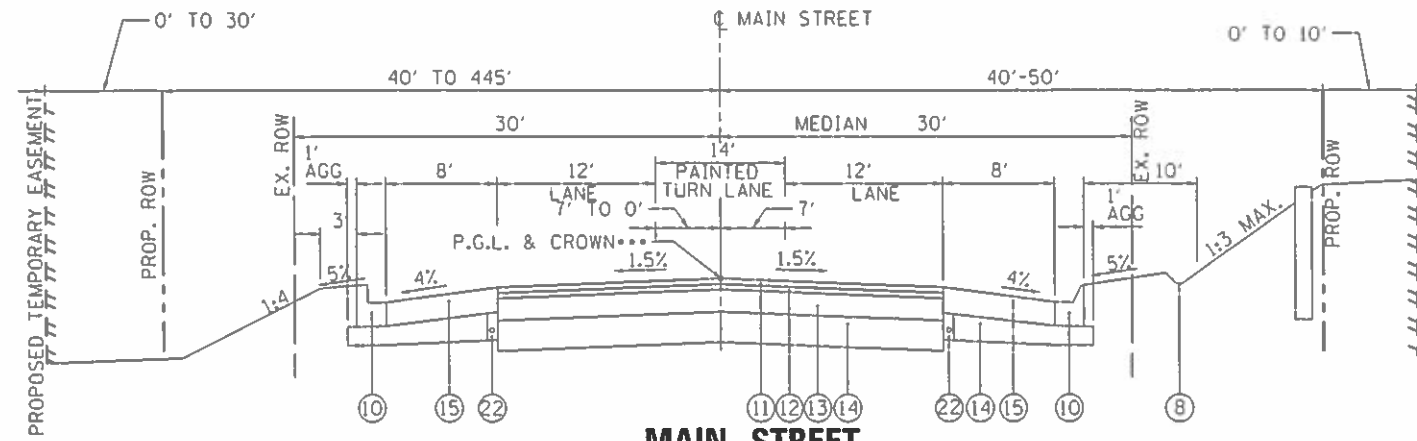
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SCALE: N.T.S.	SHEET NO. 6 OF 8 SHEETS
STA.	TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326	107N-4	KANE	249	27
				CONTRACT NO. 60T21
ILLINOIS FED. AID PROJECT				

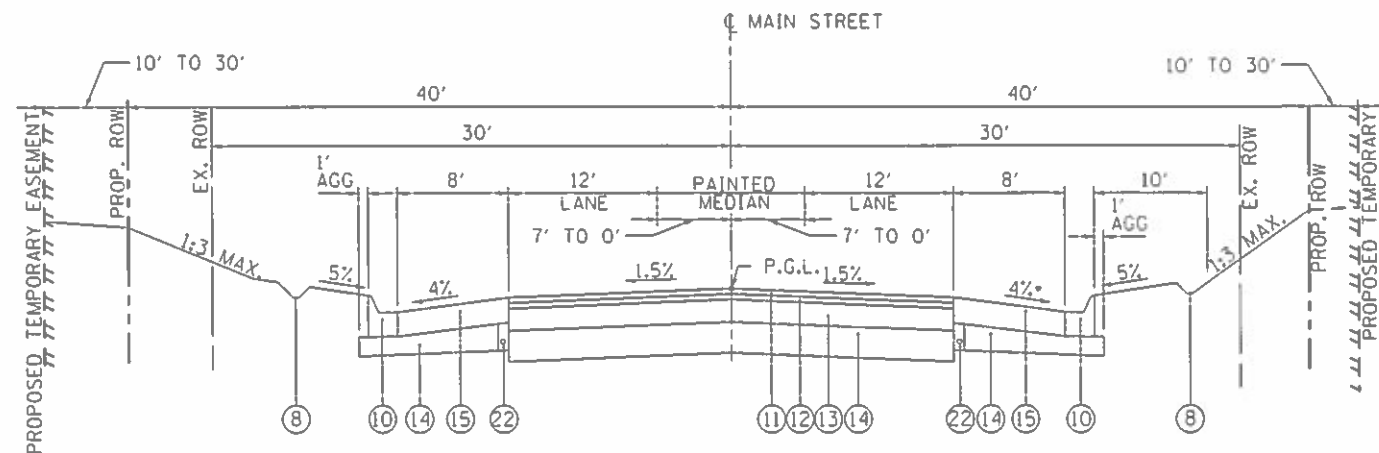
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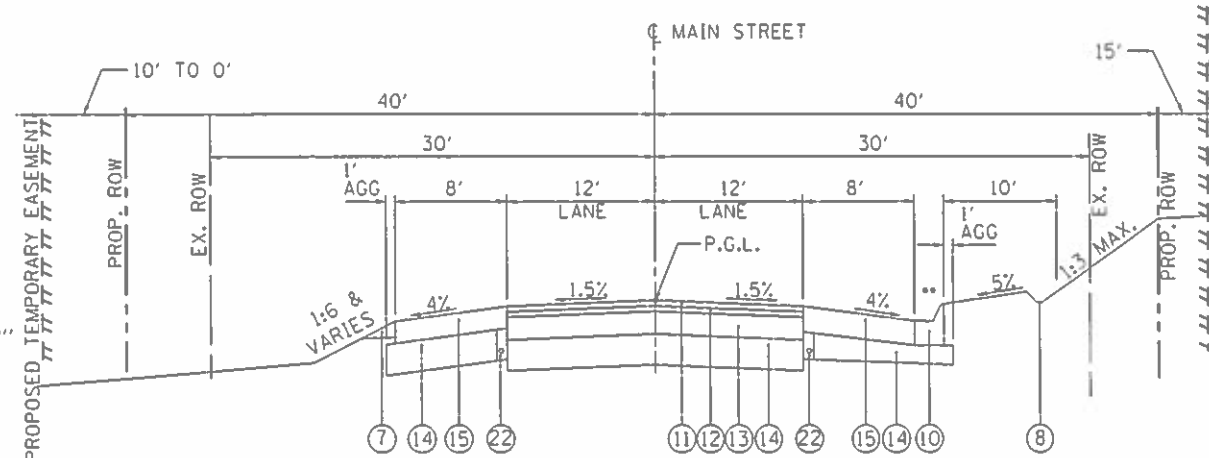
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**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
 STA. 200+00 TO STA. 203+71.82



**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
 STA. 203+71.82 TO STA. 207+21.82



**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
 STA. 207+21.82 TO STA. 207+36.50

**LEGEND**

- ① EXISTING HOT-MIX ASPHALT CONCRETE SURFACE & BINDER COURSE
- ② EXISTING HOT-MIX ASPHALT CONCRETE BASE COURSE
- ③ EXISTING PCC PAVEMENT
- ④ EXISTING GRANULAR SUBBASE
- ⑤ EXISTING HMA SHOULDER
- ⑥ EXISTING AGGREGATE SHOULDER
- ⑦ PROPOSED AGGREGATE SHOULDER, TYPE B
- ⑧ PROPOSED SWALE / DITCH
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- ⑩ PROPOSED M6.24 CURB & GUTTER
- ⑪ PROPOSED POLYMERIZED HMA SURFACE COURSE, SMA, 9.5, N80, 2"
- ⑫ PROPOSED POLYMERIZED HMA BINDER COURSE, IL-19.0, N90, 2 1/4"
- ⑬ PROPOSED HMA BASE COURSE, IL-19.0, N90, 7"
- ⑭ PROPOSED AGGREGATE SUBGRADE IMPROVEMENT 12"
- ⑮ PROPOSED HMA SHOULDERS 8"
- ⑯ PROPOSED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70, 1 1/2"
- ⑰ PROPOSED LEVELING BINDER (MACHINE METHOD), N70, 3/4"
- ⑱ NOT USED
- ⑲ PROPOSED MOMENT SLAB
- ⑳ PROPOSED RETAINING WALL
- ㉑ PROPOSED STEEL RAILING, SM
- ㉒ PROPOSED PIPE UNDERDRAINS TYPE 2, 4"

\*\* M6.24 CURB & GUTTER EXTENDS UP TO STA. 208+40 ON RIGHT SIDE.  
 ... P.G.L. CROWN SHIFTS AT LEFT TURN LANE



USER NAME	MS.USER	DESIGNED	LAB	REVISED	-
FILE NAME		DRAWN	YWA	REVISED	-
PLOT SCALE	#SCALE#	CHECKED	EJL	REVISED	-
PLOT DATE	1/18/2019	DATE	1/18/19	REVISED	-

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

MAIN ST.		TOTAL SHEETS		SHEET NO.	
TYPICAL SECTIONS		249		28	
SCALE: N.T.S.		SHEET NO. 7 OF 8 SHEETS		STA. TO STA.	

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326	107N-4	KANE	249	28
CONTRACT NO. 60T21				
ILLINOIS FED. AID PROJECT				

DATE	
BY	
REVISIONS	
PROFIT	
ALTIMETER CHECKED	
NOTE BOOK	
NO.	

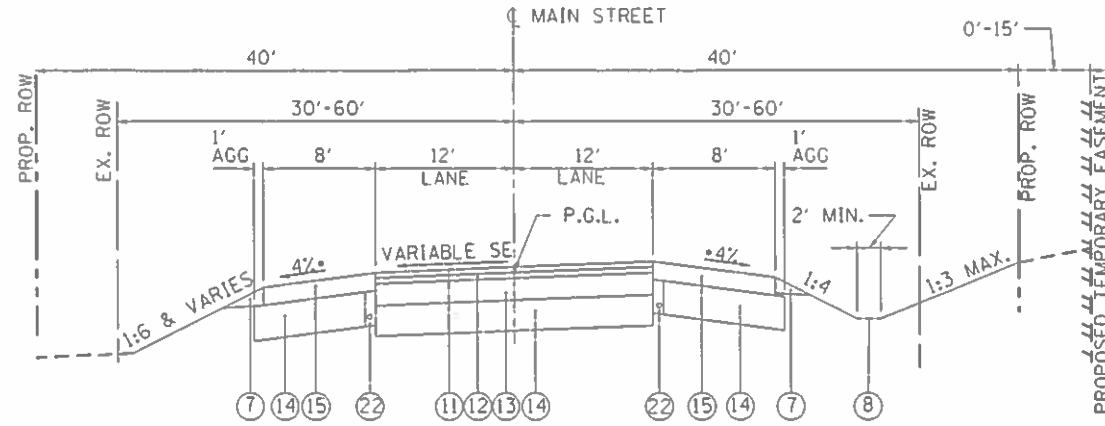
DATE	
BY	
REVISIONS	
PROFIT	
ALTIMETER CHECKED	
NOTE BOOK	
NO.	

FILE NAME: P:\2015\0556 1001 Dist I. Route 47 at Main S of Elmhurst\1777878787\1777878787\1777878787\1777878787.dwg

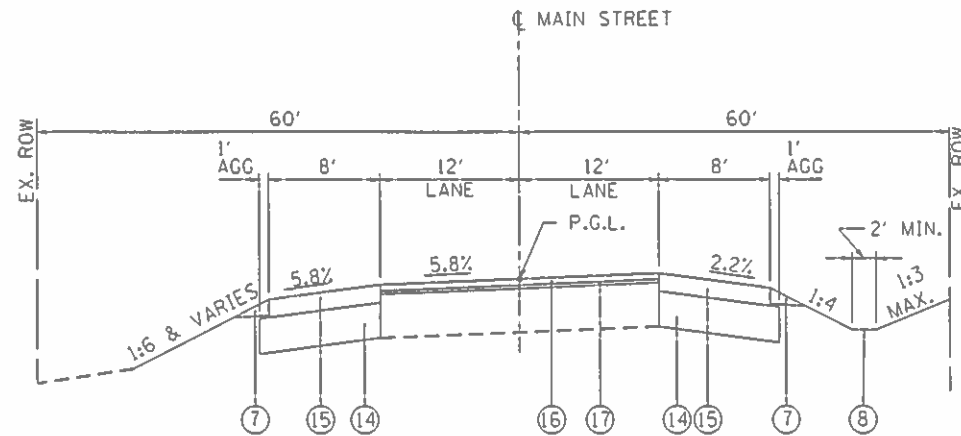
**LEGEND**

- ① EXISTING HOT-MIX ASPHALT CONCRETE SURFACE & BINDER COURSE
- ② EXISTING HOT-MIX ASPHALT CONCRETE BASE COURSE
- ③ EXISTING PCC PAVEMENT
- ④ EXISTING GRANULAR SUBBASE
- ⑤ EXISTING HMA SHOULDER
- ⑥ EXISTING AGGREGATE SHOULDER
- ⑦ PROPOSED AGGREGATE SHOULDER, TYPE B
- ⑧ PROPOSED SWALE / DITCH
- ⑨ PROPOSED B6.12 CURB & GUTTER
- ⑩ PROPOSED M6.24 CURB & GUTTER
- ⑪ PROPOSED POLYMERIZED HMA SURFACE COURSE, SMA, 9.5, N80, 2"
- ⑫ PROPOSED POLYMERIZED HMA BINDER COURSE, IL-19.0, N90, 2 1/4"
- ⑬ PROPOSED HMA BASE COURSE, IL-19.0, N90, 7"
- ⑭ PROPOSED AGGREGATE SUBGRADE IMPROVEMENT 12"
- ⑮ PROPOSED HMA SHOULDERS 8"
- ⑯ PROPOSED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70, 1 1/2"
- ⑰ PROPOSED LEVELING BINDER (MACHINE METHOD), N70, 3/4"
- ⑱ NOT USED
- ⑲ PROPOSED MOMENT SLAB
- ⑳ PROPOSED RETAINING WALL
- ㉑ PROPOSED STEEL RAILING, SM
- ㉒ PROPOSED PIPE UNDERDRAINS TYPE 2, 4"

\*\* M6.24 CURB & GUTTER EXTENDS UP TO STA. 208+40 ON RIGHT SIDE.  
 \*\*\* P.G.L. SHIFTS AT LEFT TURN LANE



**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
 STA. 207+36.50 TO STA. 209+00.00



**MAIN STREET**  
**PROPOSED TYPICAL SECTION**  
 STA. 209+00.00 TO STA. 210+00.00

HOT-MIX ASPHALT MIXTURE REQUIREMENTS			
MIXTURE TYPE	"AIR VOIDS @ Ndes"	OMP	NOTES
<b>PAVEMENT RESURFACING (IL 47 &amp; MAIN ST)</b>			
HMA SURFACE COURSE, MIX "D", N70 (IL 9.5 mm), 1 1/2"	4% @ 70 GYR.	OC/OA	1, 2, 8
LEVELING BINDER (MACHINE METHOD), N70 (IL 9.5 mm), 3/4"	4% @ 70 GYR.	OC/OA	1, 2, 8
<b>HMA FULL PAVEMENT (FULL DEPTH), 12 1/4" - IL 47</b>			
POLYMERIZED HMA SURFACE COURSE, SMA, 9.5, N80, 2"	3.5% @ 80 GYR.	OCP	1, 2, 3, 4, 5
POLYMERIZED HMA BINDER COURSE, IL-19.0, N90, 2 1/4"	4% @ 90 GYR.	OCP	1, 2, 3, 4, 5
HMA BASE COURSE, IL-19.0, N90, 8"	4% @ 90 GYR.	OCP	1, 2, 3, 5
<b>HMA FULL PAVEMENT (FULL DEPTH), 11 1/4" - MAIN ST</b>			
POLYMERIZED HMA SURFACE COURSE, SMA, 9.5, N80, 2"	3.5% @ 80 GYR.	OCP	1, 2, 3, 4, 5
POLYMERIZED HMA BINDER COURSE, IL-19.0, N90, 2 1/4"	4% @ 90 GYR.	OCP	1, 2, 3, 4, 5
HMA BASE COURSE, IL-19.0, N90, 7"	4% @ 90 GYR.	OCP	1, 2, 4, 5
<b>HMA SHOULDERS (HMA SURFACE MIX "D", N70 (IL 9.5mm), 2"</b>			
HMA SHOULDERS (HMA SURFACE MIX "D", N70 (IL 9.5mm), 2"	4% @ 50 GYR.	OC/OA	1, 2, 6
HMA SHOULDERS (HMA BINDER IL-19 mm), N70, 6"	4% @ 50 GYR.	OCP	1, 2, 6
<b>TEMPORARY PAVEMENT</b>			
HMA SURFACE COURSE, MIX "D", N50 (IL 9.5 mm), 2"	4% @ 50 GYR.	OC/OA	1, 2, 7, 9
HMA BINDER COURSE, IL-19.0, N50	4% @ 50 GYR.	OC/OA	1, 2, 7, 9
<b>DRIVEWAYS</b>			
HMA SURFACE COURSE, MIX "D", N50 (IL 9.5 mm), 2"	4% @ 50 GYR.	OC/OA	1, 2, 8
HMA BASE COURSE (HMA BINDER IL-19 mm); PE-6" & CE-8"	4% @ 50 GYR.	OC/OA	1, 2, 8
HMA STABILIZATION 6" AT STEEL PLATE BEAM GUARD RAIL (HMA SURFACE MIX "D", N70 (IL 9.5mm), 6"	4% @ 70 GYR.	OC/OA	1, 2, 10

OMP DESIGNATION: QUALITY CONTROL FOR PERFORMANCE (OCP); QUALITY CONTROL/QUALITY ASSURANCE (OC/OA)

**NOTES:**

1. THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURE QUANTITIES IS 112 LB/50 YD/IN
2. THE "AC TYPE" FOR POLYMERIZED MIXTURES SHALL BE "SBS/SBR PG 76-22"; AND FOR NON-POLYMERIZED HMA THE "AC TYPE" SHALL BE "PG 64-22" UNLESS MODIFIED BY DISTRICT ONE SPECIAL PROVISIONS. FOR USE OF RECYCLED MATERIALS SEE DISTRICT ONE SPECIAL PROVISIONS.
3. USE PAY ITEM 40701926, HOT-MIX ASPHALT PAVEMENT (FULL DEPTH) 12 1/4", PAID IN SQUARE YARDS, FOR IL 47
4. USE PAY ITEM 40701906, HOT-MIX ASPHALT PAVEMENT (FULL DEPTH) 11 1/4", PAID IN SQUARE YARDS, FOR MAIN STREET
5. USE PAY ITEM 31300112, AGGREGATE SUBGRADE IMPROVEMENT, 12", PAID IN SQUARE YARDS
6. USE PAY ITEM 48203029, HOT-MIX ASPHALT SHOULDERS, 8", PAID IN SQUARE YARDS
7. USE PAY ITEM 20062456, TEMPORARY PAVEMENT, PAID IN SQUARE YARDS
8. USE PAY ITEM FOR MIX LISTED
9. CONCRETE MAY NOT BE USED FOR TEMPORARY PAVEMENT
10. USE 20005216 FOR HMA STABILIZATION AT STEEL PLATE BEAM GUARDRAIL



USER NAME	MS.USER
FILE NAME	
PLOT SCALE	#SCALE#
PLOT DATE	1/8/2019

DESIGNED	LAB
DRAWN	YWA
CHECKED	EJL
DATE	1/18/19

REVISED	-
REVISED	-
REVISED	-
REVISED	-

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

SCALE: N.T.S.		SHEET NO. 8 OF 8 SHEETS		STA. TO STA.	
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MAIN ST.  
 TYPICAL SECTIONS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326	107N-4	KANE	249	29
CONTRACT NO. 60T21				
ILLINOIS FED. AID PROJECT				

**PROJECT AND TRAFFIC INPUTS**

(Enter Data in Gray Shaded Cells)

Route: <b>IL 47</b>	Comments: <b>IL 47 @ Main Street</b>		
Section: <b>107N-4</b>	Design Date: <b>11/30/2018</b>	<b>ONP</b>	<-- BY
County: <b>Kane</b>	Modify Date:		<-- BY
Location: <b>at Main Street</b>			ADT
			Year
			Current: <b>9,400</b>
			Future: <b>15,000</b>
			2040
Facility Type: <b>Other Marked State Route</b>	# of Lanes = <b>2 or 3</b>		
	Part of future 4 lanes or more? <b>No</b>		
	One Way Street? <b>No</b>		
	Road Class: <b>II</b>		
	Subgrade Support Rating (SSR): <b>Poor</b>		
	Construction Year: <b>2019</b>		
	Design Period (DP) = <b>20</b> years		
		<b>Structural Design Traffic</b>	
		Minimum ADT	Actual ADT
		Actual % of Total ADT	% of ADT in Design Lane
		PV = <b>0</b>	8,724 70.8% P = <b>50%</b>
		SU = <b>250</b>	1,935 <b>15.7%</b> S = <b>50%</b>
		MU = <b>750</b>	1,663 <b>13.5%</b> M = <b>50%</b>
		Struct. Design ADT = <b>12,322</b>	(2029)

**TRAFFIC FACTOR CALCULATION**

**FLEXIBLE PAVEMENT**

Cpv = 0.15  
 Csu = **112.06**  
 Cmu = **385.44**  
 TF flexible (Actual) = 8.59 (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) = 12.07 (Actual ADT)  
 TF rigid (Min) = 4.59 (Min ADT Fig. 54-2.C)

**NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS**

Full-Depth HMA Pavement		JPC Pavement	
Use TF flexible = 8.59	PG Grade Lower Binder Lifts = <b>PG 64-22</b> (Fig. 53-4.R)	Use TF rigid = 12.07	Edge Support = <b>Tied</b> Shoulder or C.&G.
<a href="#">Goto Map</a>	HMA Mixture Temp. = <b>76.5</b> deg. F (Fig. 54-5.C)	<b>Rigid Pavt Thick. = 10.25 in. (Fig. 54-4.E)</b>	
	Design HMA Mixture Modulus (E <sub>HMA</sub> ) = 650 ksi (Fig. 54-5.D)		
	Design HMA Strain (ε <sub>HMA</sub> ) = 65 (Fig. 54-5.E)	<b>CRCP Pavement</b>	
<a href="#">Goto Map</a>	Full Depth HMA Design Thickness = 12.25 in. (Fig. 54-5.F)	Use TF rigid = 12.07	
	Limiting Strain Criterion Thickness = <b>14.75</b> in. (Fig. 54-5.I)	IBR value = <b>3</b>	
<b>Use Full-Depth HMA Thickness = 12.25 inches</b>		<b>CRCP Thickness = 9.00 in. (Fig. 54-4.N)</b>	

**TF MUST BE > 60 FOR CRCP**

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

HMA Overlay of Rubblized PCC		Unbonded Concrete Overlay	
Use TF flexible = 8.59	HMA Overlay Design Thickness = 9.50 in. (Fig. 54-5.U)	Review 54-4.03 for limitations and special considerations.	
<a href="#">Goto Map</a>	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%

**PROJECT AND TRAFFIC INPUTS**

(Enter Data in Gray Shaded Cells)

Route: <b>Main Street</b>	Comments: <b>IL 47 @ Main Street</b>		
Section: <b>107N-4</b>	Design Date: <b>10/30/2018</b>	<b>ONP</b>	<-- BY
County: <b>Kane</b>	Modify Date:		<-- BY
Location: <b>at IL 47</b>			ADT      Year
			Current: <b>3,100</b> <b>2018</b>
			Future: <b>7,000</b> <b>2040</b>
Facility Type: <b>Unmarked State Route</b>	# of Lanes = <b>2 or 3</b>		
	Part of future 4 lanes or more ? <b>No</b>		
	One Way Street ? <b>No</b>		
	Road Class: <b>II</b>		
	Subgrade Support Rating (SSR): <b>Poor</b>		
	Construction Year: <b>2019</b>		
	Design Period (DP) = <b>20</b> years		
		<b>Structural Design Traffic</b>	
		Minimum ADT	Actual ADT
			Actual %of Total ADT
			% of ADT in Design Lane
		PV = <b>No Min</b>	3,298      65.3%
		SU = <b>No Min</b>	611 <b>12.1%</b>
		MU = <b>No Min</b>	1,141 <b>22.6%</b>
		Struct. Design ADT = <b>5,050</b>	(2029)
			P = <b>50%</b>
			S = <b>50%</b>
			M = <b>50%</b>

**TRAFFIC FACTOR CALCULATION**

**FLEXIBLE PAVEMENT**

Cpv = 0.15  
 Csu = **112.06**  
 Cmu = **385.44**  
 TF flexible (Actual) = 5.09 (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) = 7.31 (Actual ADT)  
 TF rigid (Min) = No Min (Min ADT Fig. 54-2.C)

**NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS**

Full-Depth HMA Pavement	JPC Pavement
Use TF flexible = 5.09	Use TF rigid = 7.31
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>76.5</b> deg. F (Fig. 54-5.C)	<b>Rigid Pavt Thick. = #NAME? in. (Fig. 54-4.E)</b>
Design HMA Mixture Modulus (E <sub>HMA</sub> ) = 650 ksi (Fig. 54-5.D)	
Design HMA Strain (ε <sub>HMA</sub> ) = 76 (Fig. 54-5.E)	
Full Depth HMA Design Thickness = #NAME? in. (Fig. 54-5.F)	CRCP Pavement
Limiting Strain Criterion Thickness = #NAME? in. (Fig. 54-5.I)	Use TF rigid = 7.31
<b>Use Full-Depth HMA Thickness = #NAME? inches</b>	IBR value = <b>3</b>
	<b>CRCP Thickness = #NAME? in. (Fig. 54-4.N)</b>

**TF MUST BE > 60 FOR CRCP**

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

HMA Overlay of Rubblized PCC	Unbonded Concrete Overlay
Use TF flexible = 5.09	Review 54-4.03 for limitations and special considerations.
HMA Overlay Design Thickness = #NAME? in. (Fig. 54-5.U)	
Limiting Strain Criterion Thickness = #NAME? 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	2 lanes with ADT > 2000	2 Lanes	2 Lanes
Part of a future 4 lanes or more	One way Street with ADT <= 3500	(ADT 750 -2000)	(ADT < 750)
One-way Streets with ADT > 3500			

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

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 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	<b>IV</b>
750 - 2000	<b>III</b>
>2000	<b>II</b>

Number of Lanes	Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
	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%