



Illinois Department of Transportation

Memorandum

To: Mike Brand
From: Masood Ahmad By: Becky Marruffo
Subject: Pavement Design
Date: April 17, 2020

FAP Route 301 (US 20)
Section 29R -1
Jo Daviess County
Job No. D-92-088-92
Contract No. 64880
US 20 from Gear St. to Main St. in Galena.

Attached is the updated pavement design for the above-captioned section. This section consists of 21,546 square yards of new pavement. This is being re-submitted because the pavement design expired on October 4, 2019 and is currently scheduled for the September 17, 2021 letting.

We recommend using a rigid pavement design that consists of 9.25" jointed Portland cement concrete pavement due to a commitment made to the Illinois State Historic Preservation Officer (SHPO) of using a tinted light to medium gray concrete on the project in the Historic City of Galena. The local historic commission and the City would like to maintain the existing red concrete at the beginning of the project. Per requirement of SHPO, the multi-use path will also be concrete.

The District is requesting a waiver for alternate bidding as required per new policy if the difference between flexible and rigid pavement design is less than 10%. The flexible pavement design will not address the color of pavement as requested by local and state historic commission for approval of this reconstruction project in City of Galena.

Attached is a location map, mechanistic pavement design spread sheet, typical sections, letter from SHPO, and BDE approval letter for your use.

If you have any questions, please contact Corey Conderman at 815/284-5936.

Attachments



FAX (217) 524-7525
www.illinoishistory.gov

JoDaviess County
Galena

Roadway Widening and Resurfacing
U.S. 20/Spring St. from Gear St. to Galena River
IDOT-P-92-088-92, IDOT 2-12299A, IDOT Seq #-12299, ISAS-10074,
IHPA Log #018022213

April 23, 2014

Brad Koldehoff
Illinois Department of Transportation
Bureau of Design and Environment
2300 S. Dirksen Parkway
Springfield, IL 62764

Dear Mr. Koldehoff:

We have reviewed the additional documentation provided for the referenced project. Portions of the project area are located within the Galena Historic District, which was listed on the National Register of Historic Places on October, 18, 1969.

In our opinion the project meets the Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" and we concur in a finding of no adverse effect pursuant to 36 CFR Part 800 provided that the following conditions are met:

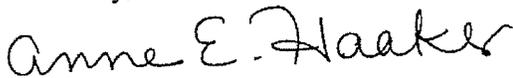
1. The following historic stone retaining walls must be carefully deconstructed, salvaged and reconstructed using stone original to each location and matching the coursing (regular or random), mortar, and other visual characteristics of all existing retaining walls including: parking lot north of Prospect Street, 344 Spring, 346 Spring, 347 Spring, 349 Spring, 400 Spring, 504-510 Spring, and 809 Spring. The reconstructed walls do not need to function as retaining walls and may be treated as veneer, as long as the true retaining wall is entirely concealed from view. To compensate for any stone lost during deconstruction or for increased wall height due to added setback, stone salvaged from other locations maybe used. If matching stone cannot be obtained, nonmatching stone must be used for the bottom courses with the top courses reconstructed using original stone.
2. Historic stone in the open ditches along 411-413 Spring, 507 Spring and 624 Spring, must be salvaged and should serve as a source for matching stone in reconstruction of the retaining walls. Any unused stone must be returned to the City of Galena for future restoration projects.

3. Historic cast iron hitching posts, such as at 411 Spring and 507 Spring, must be retained and reused in proximity to their original locations.
4. Concrete used on the road and west sidewalk cannot be standard white PCC and must be tinted light to medium gray. Sample must be submitted to our office for review.
5. Concrete used for the multiuse path must be tinted to match the yellow/tan color of the historic stone found in the open ditch along 411-413 Spring. Sample must be submitted to our office for review.
6. All plans and specifications shall be reviewed and approved by our office in writing prior to bidding the project.
7. No parkway shall be constructed at 407 Spring Street and 347 Spring Street. Utilities to be adjusted to avoid this.

Notifying our office of agreement with these conditions and their subsequent implementation constitutes compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any questions, please contact me at 217/785-5027.

Sincerely,



Anne E. Haaker

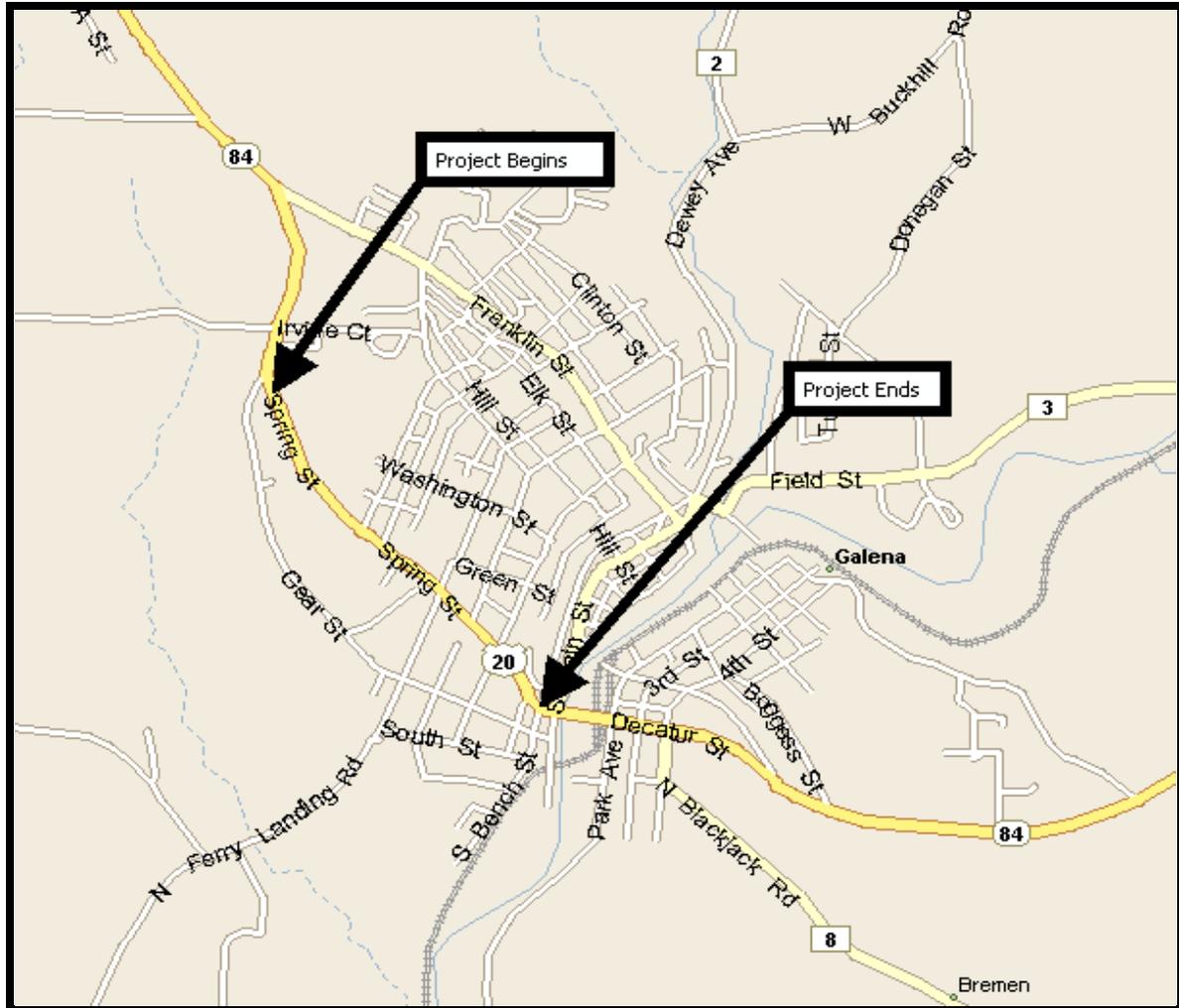
Deputy State Historic
Preservation Officer

- **Historic cast-iron hitching posts, such as at 411 and 507 Spring St., must be retained and reused in proximity to their original locations.**
- **Concrete used on the road and west sidewalk cannot be standard white PCC and must be tinted light to medium gray. A sample must be submitted to the SHPO for review.**
- **Concrete used for the multi-use path must be tinted to match the yellow/tan color of the historic stone found in the open ditch along 411-413 Spring St. A sample must be submitted to the SHPO for review.**
- **No parkway/raceway shall be constructed at 407 and 347 Spring St. Utilities need to adjusted to avoid these areas.**
- **SHPO must review and approve the plans and specifications in writing prior to bidding the project.**

Please forward the agreement to these conditions, as well as the updated plans and specifications, to IDOT's Cultural Resources Unit when they become available.

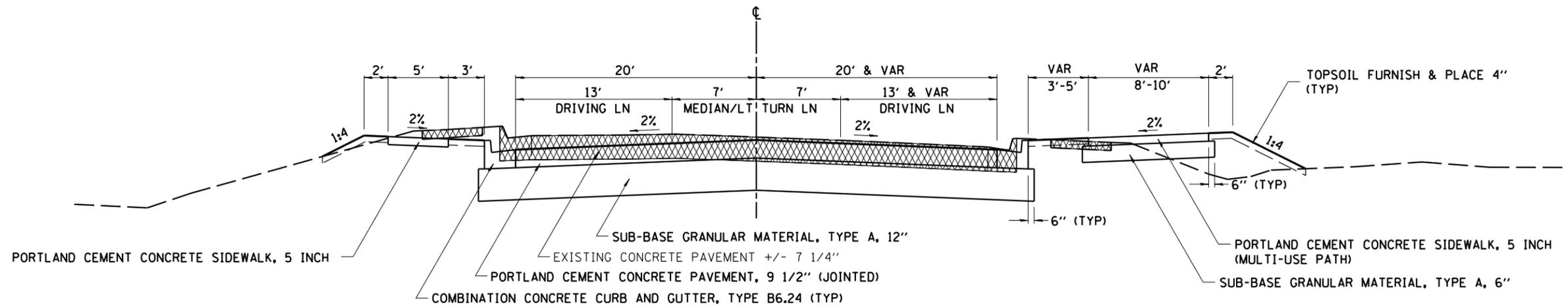
Brad H. Koldehoff, RPA
Cultural Resources Unit
Bureau of Design and Environment

BK:ee



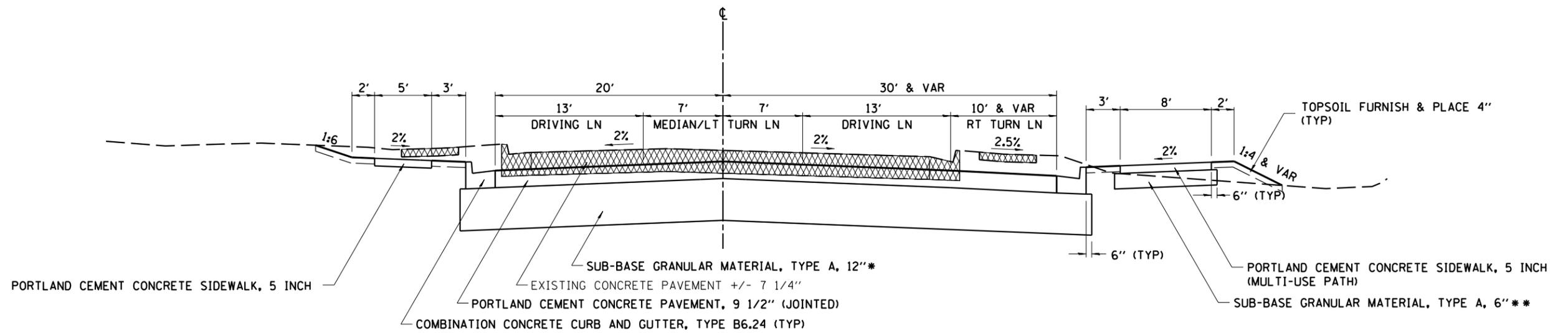
LOCATION MAP
for
FAP ROUTE 301 (US 20)
SECTION 29R-1
JODAVIESS COUNTY
JOB NO. P-92-088-92
CONTRACT NO. 64880
RECONSTRUCTION OF US 20 FROM GEAR ST.
TO MAIN ST. IN GALENA

STA 1196+39 TO STA 1198+61



REMOVAL

STA 1198+61 TO STA 1200+34.53



STRUCTURAL DESIGN INFORMATION

DESIGN PERIOD = 20 YEARS
 STRUCTURAL DESIGN TRAFFIC: YEAR 2024
 PV = 12,190
 SU = 650
 M = 860
 CLASSIFICATION: CLASS II
 PERCENT OF STRUCTURAL TRAFFIC IN DESIGN LANE:
 P=50 S=50 M=50
 TRAFFIC FACTOR: = TF 5.78
 MINIMUM SOIL SUPPORT = POOR
 IBR = 3

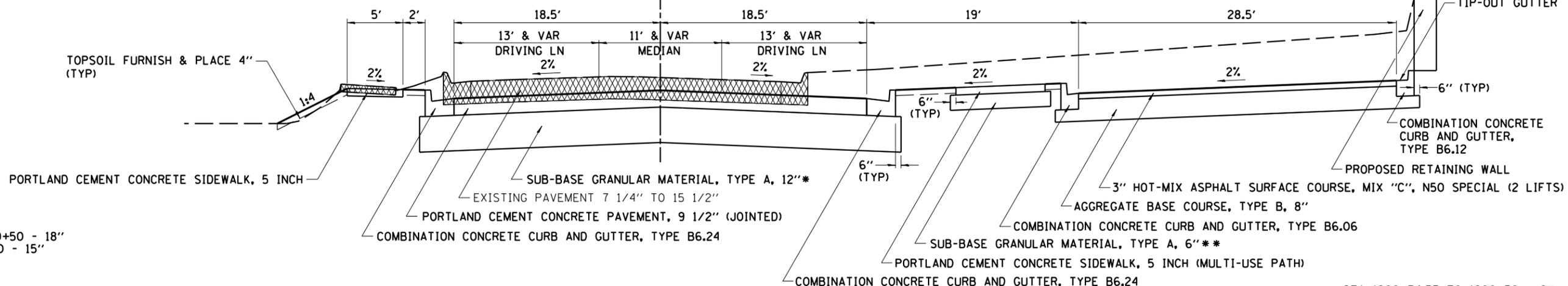
* STA 1199+00 TO 1200+34.53 - 18"

** STA 1199+00 TO 1200+34.53 - 9"

NOTE:
 SEE SCHEDULE OF QUANTITIES FOR
 LOCATIONS OF PIPE UNDERDRAINS

FILE NAME = S:\PROJECTS\2010\1095010.IDOT. PTB155\item29_Galena_US_20\DESIGN\TRANS\TYPICAL SECTIONS.dgn	USER NAME = *USER*	DESIGNED - _____	REVISED - _____	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	IL RTE 84US 20 TYPICAL SECTIONS		F.A.P. RTE. 301	SECTION 29R-1	COUNTY JODAVIESS	TOTAL SHEETS _____	SHEET NO. _____
	PLOT SCALE = *SCALE*	CHECKED - _____	REVISED - _____		SCALE: _____	SHEET NO. 1 OF 6 SHEETS	STA. 1196+39 TO STA. 1200+34.4	CONTRACT NO. 64880		ILLINOIS FED. AID PROJECT	
PLOT DATE = *DATE*	DATE - _____	REVISED - _____	REVISED - _____								

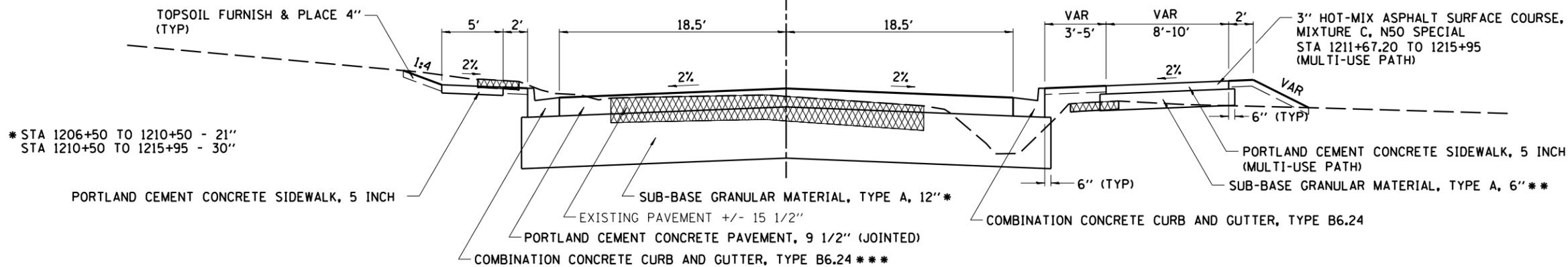
STA 1200+34.53 TO STA 1202+31.40



* STA 1200+34.53 TO 1200+50 - 18"
 STA 1200+50 TO 1201+50 - 15"

** STA 1200+34.53 TO 1200+50 - 9"
 STA 1200+50 TO 1201+50 - 8"

STA 1202+31.40 TO STA 1215+95



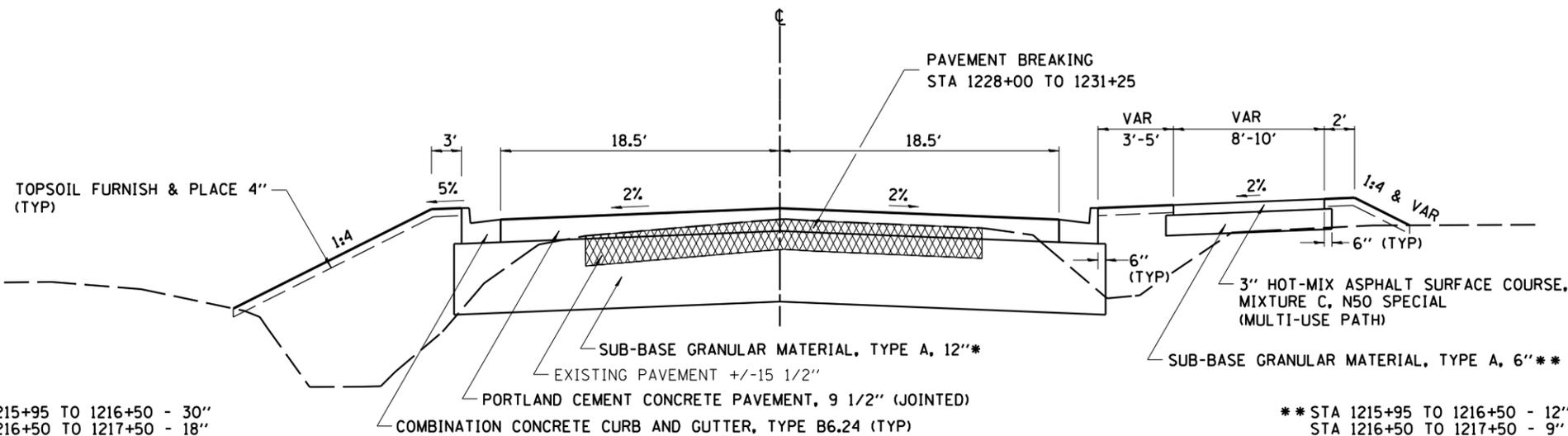
* STA 1206+50 TO 1210+50 - 21"
 STA 1210+50 TO 1215+95 - 30"

** STA 1206+50 TO 1215+95 - 12"

NOTE:
 SEE SCHEDULE OF QUANTITIES FOR
 LOCATIONS OF PIPE UNDERDRAINS

*** COMBINATION CONCRETE CURB AND GUTTER, TYPE M6.24
 LT STA 1209+85 TO 1210+38
 STONE HOUSE POTTERY

STA 1215+95 TO STA 1231+25



* STA 1215+95 TO 1216+50 - 30"
 STA 1216+50 TO 1217+50 - 18"
 STA 1219+50 TO 1220+50 - 18"

** STA 1215+95 TO 1216+50 - 12"
 STA 1216+50 TO 1217+50 - 9"
 STA 1219+50 TO 1220+50 - 9"

STRUCTURAL DESIGN INFORMATION

DESIGN PERIOD = 20 YEARS
 STRUCTURAL DESIGN TRAFFIC: YEAR 2024
 PV = 12,190
 SU = 650
 M = 860
 CLASSIFICATION: CLASS II
 PERCENT OF STRUCTURAL TRAFFIC IN DESIGN LANE:
 P=50 S=50 M=50
 TRAFFIC FACTOR: = TF 5.78
 MINIMUM SOIL SUPPORT = POOR
 IBR = 3

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 CHECKED - _____
 DATE - _____

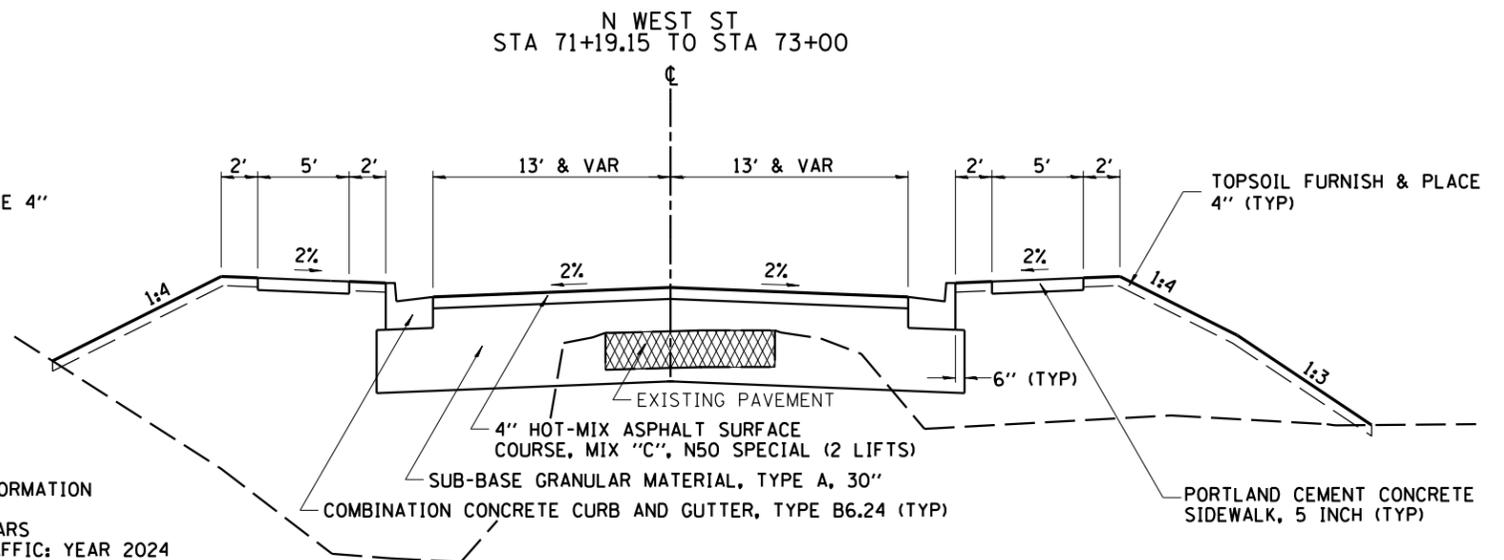
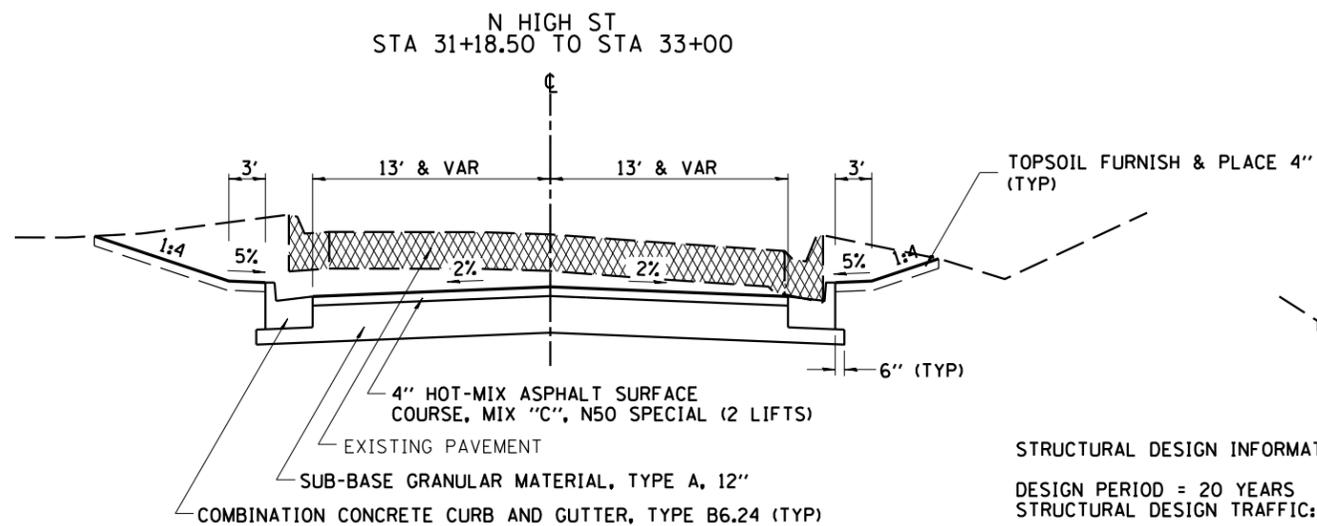
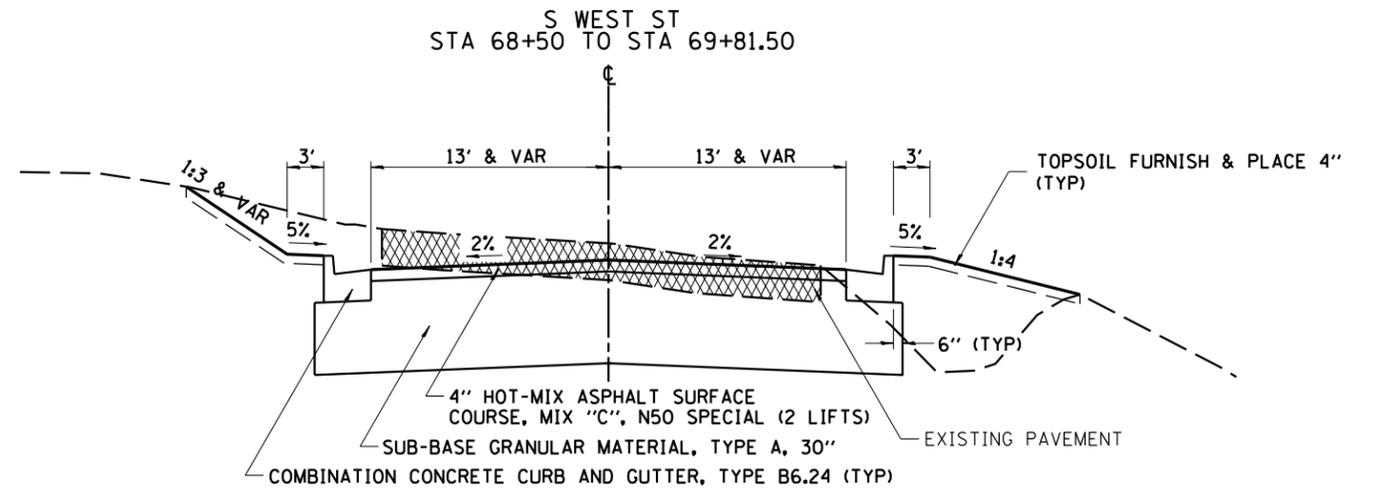
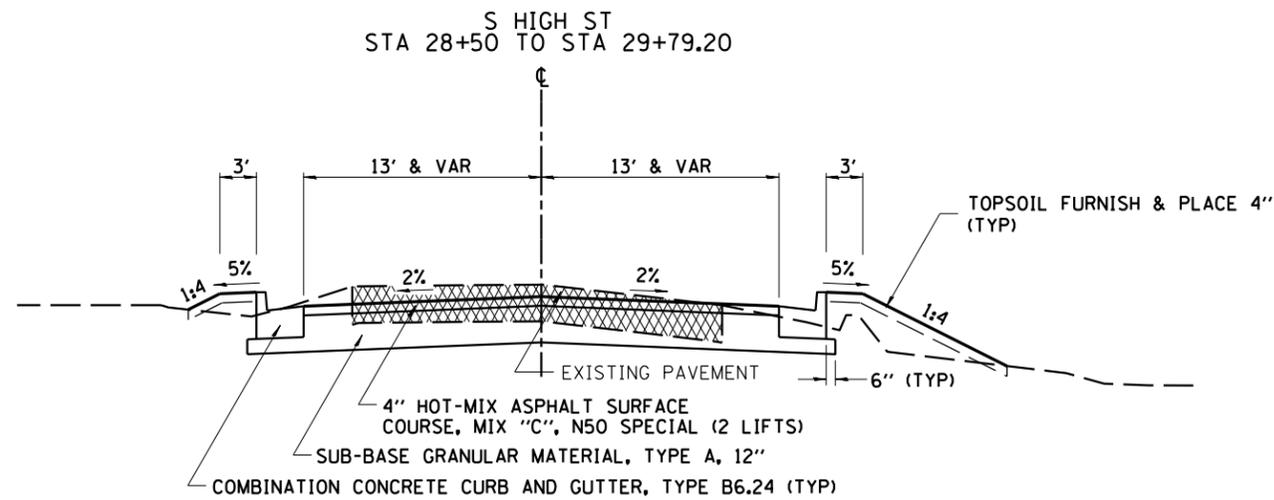
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STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

IL RTE 84US 20
 TYPICAL SECTIONS

SCALE: SHEET NO. 2 OF 6 SHEETS STA. 1200+34.4 TO STA. 1231+25

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	29R-1	JODAVIESS		
CONTRACT NO. 64880				
ILLINOIS FED. AID PROJECT				



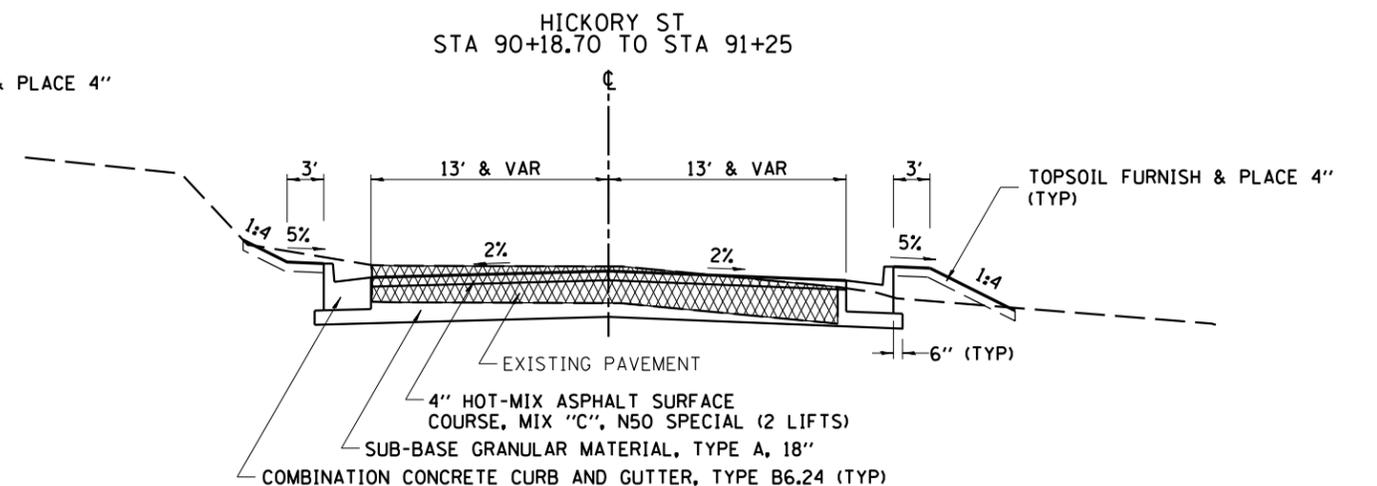
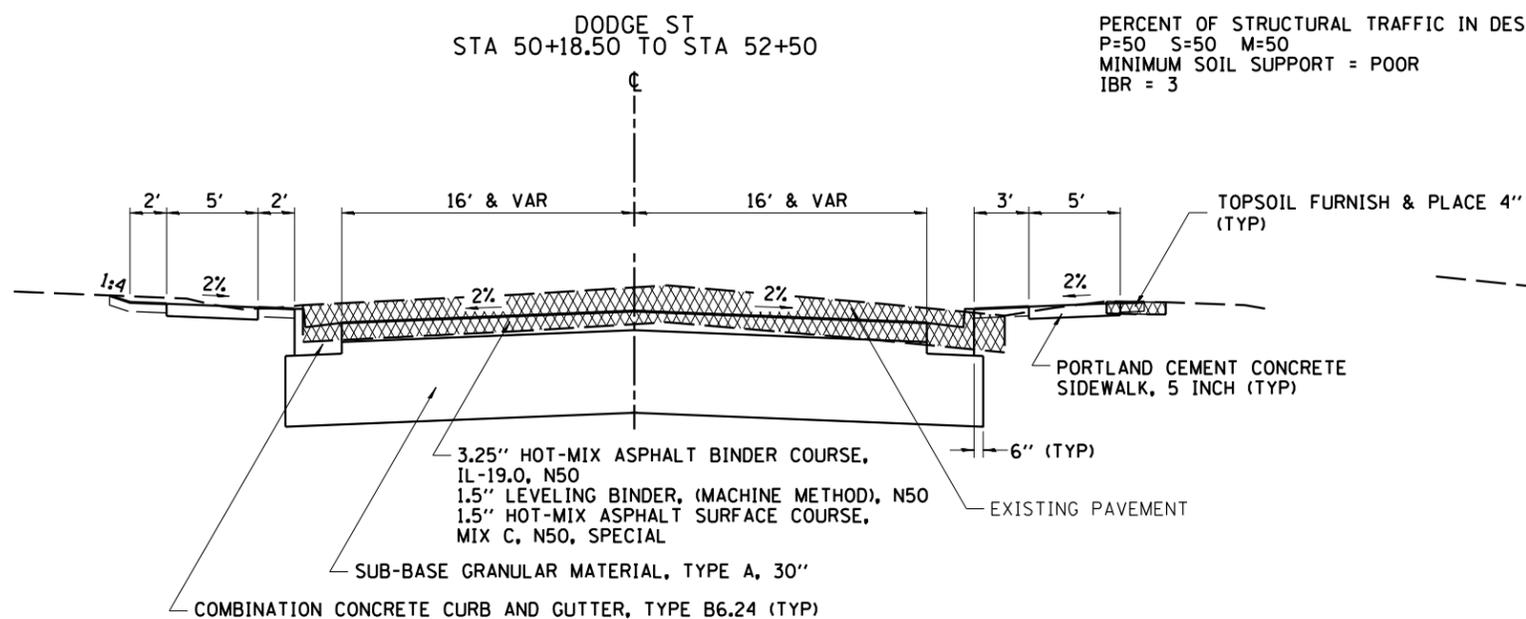
STRUCTURAL DESIGN INFORMATION
DESIGN PERIOD = 20 YEARS
STRUCTURAL DESIGN TRAFFIC: YEAR 2024

CLASSIFICATION:
CLASS II (DODGE & PROSPECT)
CLASS III (SUMMIT & WEST)
CLASS IV (HICKORY & HIGH)

PERCENT OF STRUCTURAL TRAFFIC IN DESIGN LANE:
P=50 S=50 M=50
MINIMUM SOIL SUPPORT = POOR
IBR = 3

REMOVAL

HMA RATE OF APPLICATION: 112LB/SY/IN



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DATE - _____

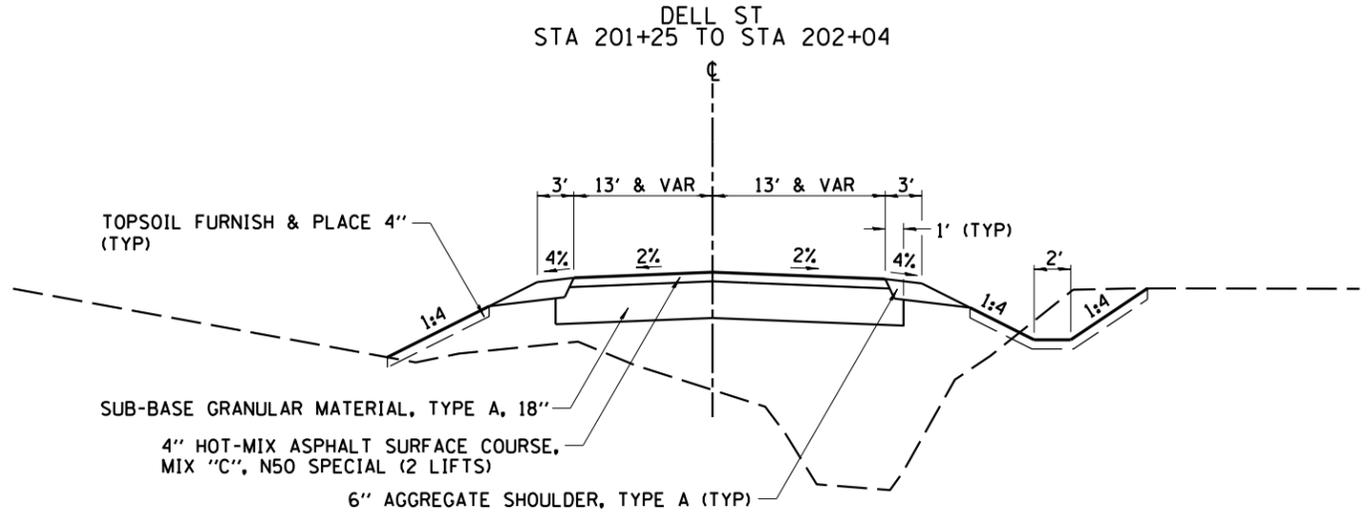
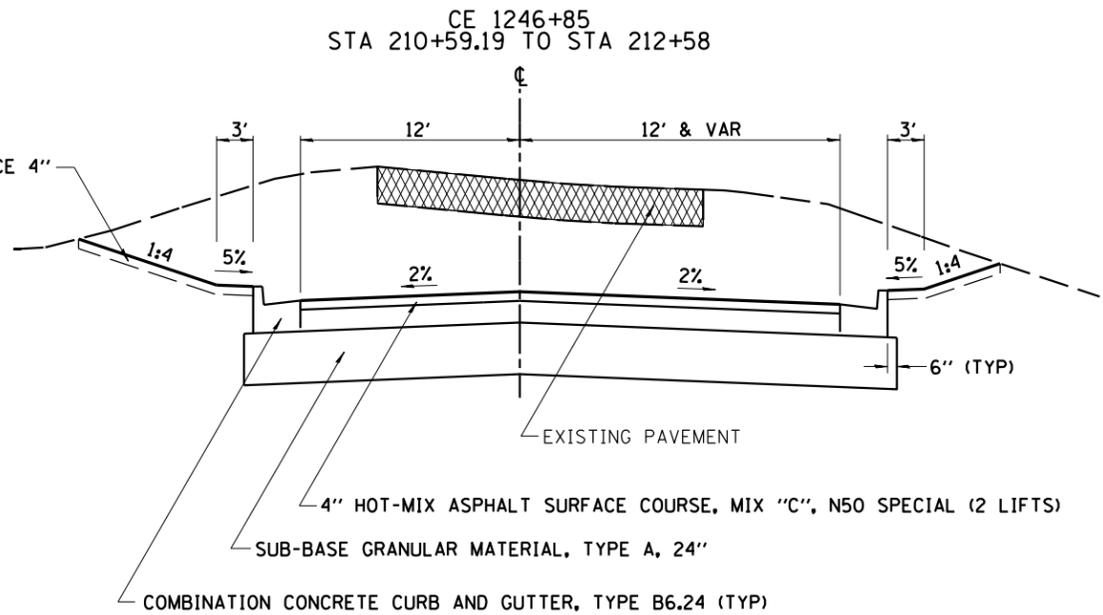
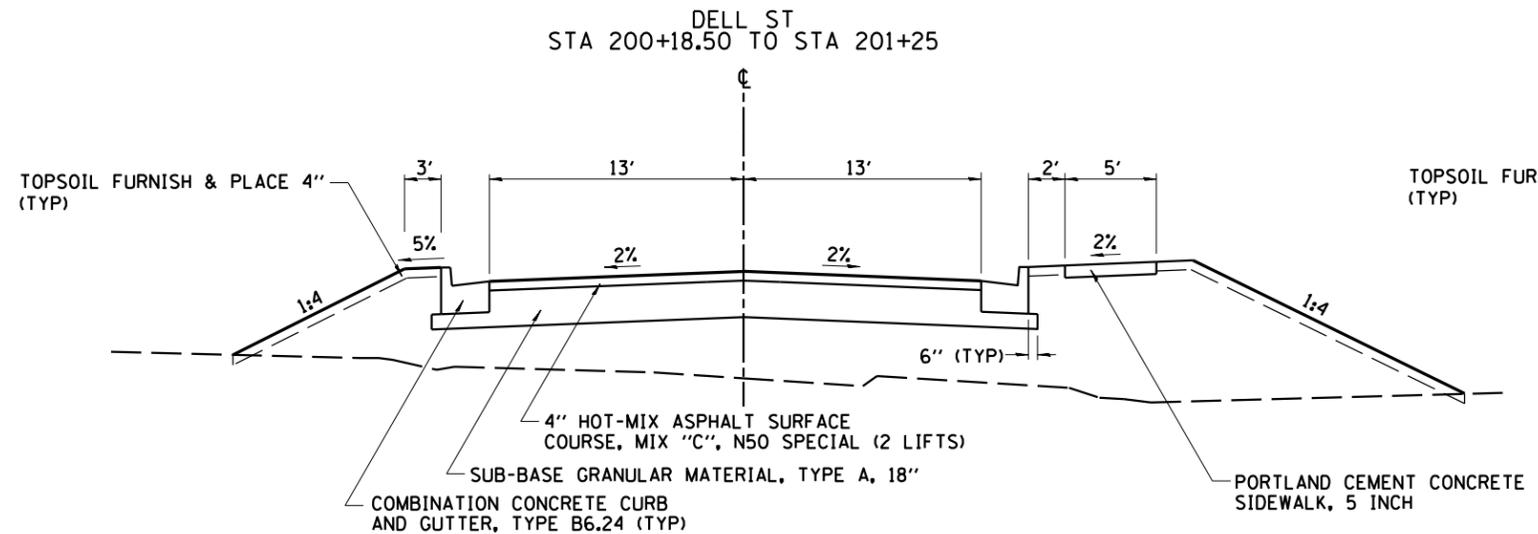
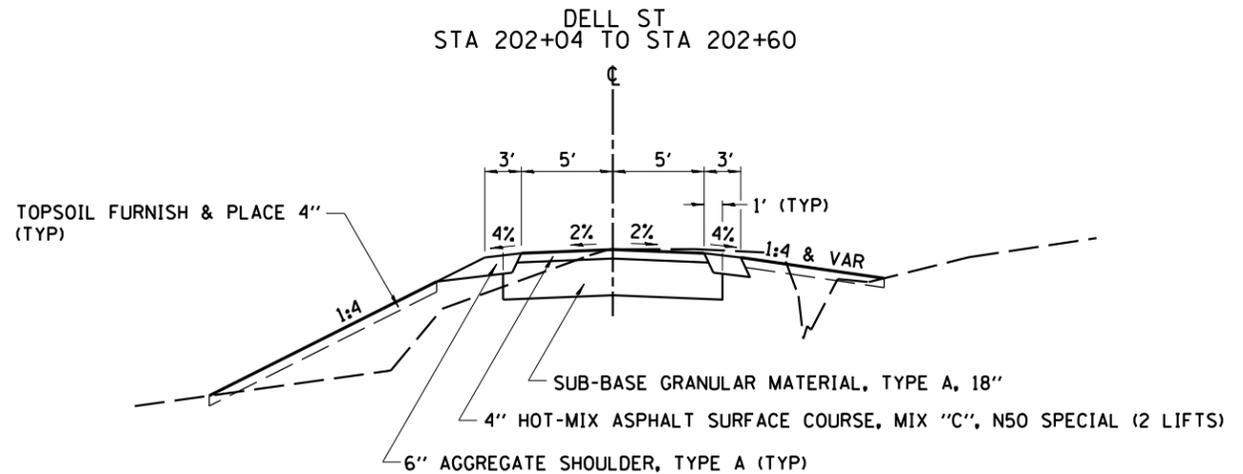
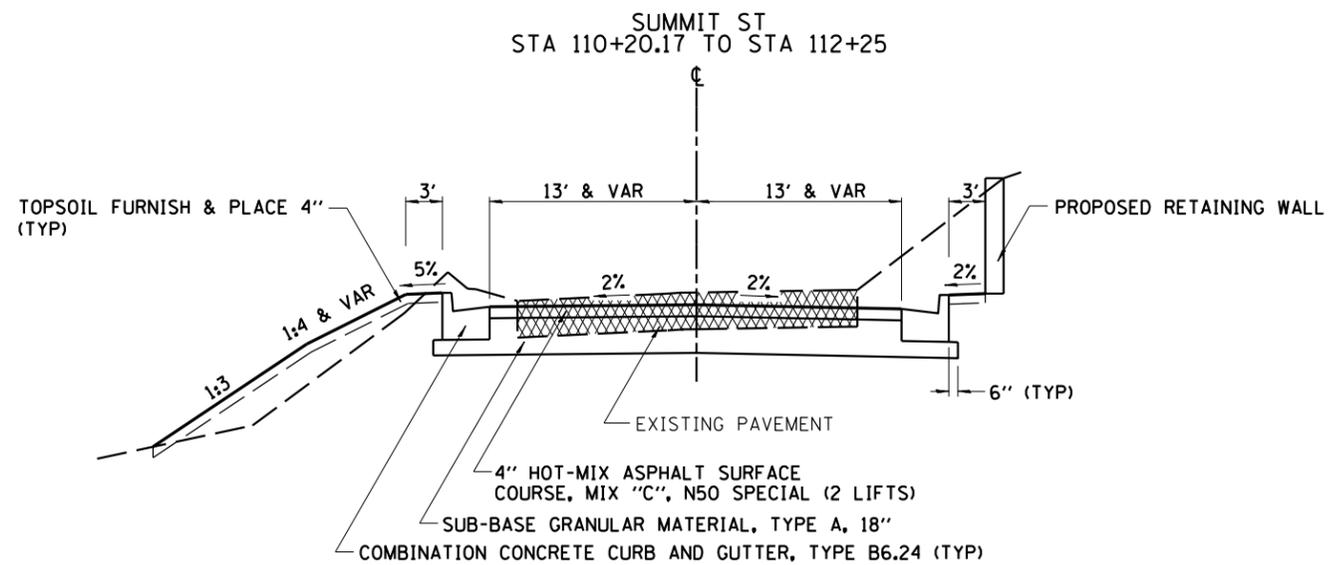
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SCALE: _____
SHEET NO. 5 OF 6 SHEETS

SIDEROAD
TYPICAL SECTIONS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	29R-1	JODAVIESS		
CONTRACT NO. 64880				
ILLINOIS FED. AID PROJECT				



REMOVAL

HMA RATE OF APPLICATION: 112LB/SY/IN

STRUCTURAL DESIGN INFORMATION

DESIGN PERIOD = 20 YEARS
STRUCTURAL DESIGN TRAFFIC: YEAR 2024

CLASSIFICATION:
CLASS II (DODGE & PROSPECT)
CLASS III (SUMMIT & WEST)
CLASS IV (HICKORY & HIGH)

PERCENT OF STRUCTURAL TRAFFIC IN DESIGN LANE:
P=50 S=50 M=50
MINIMUM SOIL SUPPORT = POOR
IBR = 3

FILE NAME = S:\PROJECTS\2010\1095010.IDOT.PTBI55item29.Galena_US_20\DESIGN\TRANS\TYPICAL SECTIONS.dgn

USER NAME = *USER*
PLOT SCALE = *SCALE*
PLOT DATE = *DATE*

DESIGNED - _____
DRAWN - _____
CHECKED - _____
DATE - _____

REVISED - _____
REVISED - _____
REVISED - _____
REVISED - _____

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SIDEROAD
TYPICAL SECTIONS
SCALE: SHEET NO. 6 OF 6 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	29R-1	JODAVIESS		
CONTRACT NO. 64880				
ILLINOIS FED. AID PROJECT				

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: **FAP 301 (US 20)**
 Section: **29R-1**
 County: **Jo Daviess**
 Location: **Main St. to Gear St. in Galena**

Comments:
 Design Date: **03/06/2020**
 Modify Date:

<-- BY	ADT	Year
Current:	11,300	2021
Future:	13,800	2041

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: **2022**
 Design Period (DP) = **20** years

	Structural Design Traffic			% of ADT in Design Lane
	Minimum ADT	Actual ADT	Actual % of Total ADT	
PV =	0	11,154	88.0%	P = 50%
SU =	250	634	5.0%	S = 50%
MU =	750	887	7.0%	M = 50%
Struct. Design ADT =	12,675 (2032)			

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT		RIGID PAVEMENT	
Cpv =	0.15	Cpv =	0.15
Csu =	112.06	Csu =	135.78
Cmu =	385.44	Cmu =	567.21
TF flexible (Actual) =	4.15 (Actual ADT)	TF rigid (Actual) =	5.91 (Actual ADT)
TF flexible (Min) =	3.17 (Min ADT Fig. 54-2.C)	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 =	4.15	Use TF rigid =	5.91
PG Grade Lower Binder Lifts =	PG 64-22 (Fig. 53-4.O)	Edge Support =	Tied Shoulder or C&G
HMA Mixture Temp. =	73.0 deg. F (Fig. 54-5.C)	Rigid Pavt Thick. =	9.25 in. (Fig. 54-4.E)
Design HMA Mixture Modulus (E _{HMA}) =	760 ksi (Fig. 54-5.D)		
Design HMA Strain (ε _{HMA}) =	80 (Fig. 54-5.E)	CRC Pavement	
Full Depth HMA Design Thickness =	10.00 in. (Fig. 54-5.F)	Use TF rigid =	5.91
Limiting Strain Criterion Thickness =	14.25 in. (Fig. 54-5.I)	IBR value =	3
Use Full-Depth HMA Thickness =	10.00 inches	CRCP Thickness =	8.00 in. (Fig. 54-4.N)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Pavement Over Rubblized PCC		Unbonded Concrete Overlay	
Use TF flexible =	4.15	Review 54-4.03 for limitations and special considerations.	
HMA Overlay Design Thickness =	7.50 in. (Fig. 54-5.U)	JPCP Thickness =	NA inches
Limiting Strain Criterion Thickness =	in. (Fig. 54-5.V)		
Use HMA Overlay Thickness =	999.00 inches		

CONTACT RESEARCH 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 Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

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	IV
750 - 2000	III
>2000	II

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%