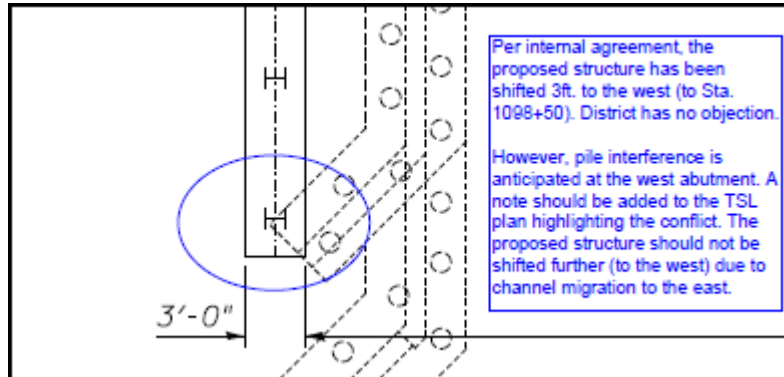


Original Report Date:	<u>6/23/21</u>	Proposed SN:	<u>096-0076</u>	Route:	<u>FAP 821</u>
Revised Date:	<u>10/1/21</u>	Existing SN:	<u>096-0005</u>	Section:	<u>(18BY)B</u>
Geotechnical Engineer:	<u>Bill Kramer</u>	County:	<u>Wayne</u>	Contract:	<u>74651</u>
Structural Engineer:	<u>Josue Ortiz-Varela</u>				

Indicate the proposed structure type, substructure types, and foundation locations (attach plan and elevation drawing): The proposed two span slab bridge structure will have integral abutments located behind the existing closed abutments to avoid pile interference with the existing footing with the exception at the south end of the west abutment shown below:



We recommend the west abutment be moved another foot or two to avoid the conflict completely.

The pier is proposed to be a solid wall encased pile bent. Steel H-piles are shown at each substructure. Recommend the words (HP10 Min.) be added after the words "Steel H-piles" at all three substructures.

Discuss the existing boring data, existing plans foundation information, new subsurface exploration and need for any additional exploration to be provided with SGR Technical Memo (attach all data and subsurface profile plot):

Existing Structure 096-0005 was built in 1920 as F.A.P. Rte. 821, Section 18B at Sta 1098+42. The single span structure was reconstructed in 1956 with a new reinforced concrete slab superstructure bridge supported on the existing closed abutments and untreated timber piles. The existing abutments were widened in-kind and a new center pier with precast piles was built as part of the reconstruction. The two-span slab bridge has an out-to-out width of 45'-4" and a back-to-back abutment length of 42'-0" with no skew. Existing structure to be removed and replaced. No existing soil borings were evaluated since the new borings are adequate.

Provide the location and maximum height of any new soil fill or magnitude of footing bearing pressure. Estimate the amount and time of the expected settlement. Indicate if further testing, analysis, and/or ground improvement/treatment is necessary: The increase in grade at this location is less than 12" and thus, we don't anticipate any settlement or downdrag. No further testing, analysis, and/or ground improvement/treatment is necessary.

Identify any new cuts or fill slope angles and heights. Estimate the factor of safety against slope failure. Indicate if further testing, analysis or ground improvement/treatment is necessary: The increase in grade at this location is less than 12" and thus, we don't anticipate any slope stability problems. No further testing, analysis, and/or ground improvement/treatment is necessary.

Indicate at each substructure, the 100-year and 200-year total scour depths in the Hydraulics report, the non-granular scour depth reduction, the proposed ground surface, and the recommended foundation design scour elevations: The theoretical 100 year and 200 year scour depths are reported to be 7.9' and 8.7' (pier + contraction) at the pier. Based on the soil type and strengths shown in the worst boring (B2), these depths can be reduced by 26.5% and 30.8% respectively and translates to what is shown in the recommended table below. In addition, rip rap is being placed complete across the opening to help defend against any scour that might develop.

Event/Limit State	Design Scour Elevations (ft.)			
	West Abut.	Pier	East Abut.	Item 113
Q100	400.5	388.1	400.6	8
Q200	400.5	387.3	400.6	
Design	400.5	388.1	400.6	
Check	400.5	387.3	400.6	

LAYER NO.	BOTTOM OF LAYER ELEV. (FT)	DEPTH BELOW SURFACE (FT)	LAYER THICK. (FT)	Qu VALUE (TSF)	ROCK TYPE (IF APPLICABLE)	SCOUR REDUCTION (%)	SCOUR RESISTANCE OF LAYER (FT)	REMAINING Q100 SCOUR BELOW LAYER (FT)	REMAINING Q200 SCOUR BELOW LAYER (FT)
1	390.8	2.5	2.5	1.00		25%	3.33	3.77	5.37
2	388.8	5.0	2.5	1.70		50%	5.00	0.00	0.37
3	385.8	7.5	2.5	1.70		50%	5.00	0.00	0.00
4	383.3	10.0	2.5	1.40		25%	3.33		
5	380.8	12.5	2.5	0.80		25%	3.33		
6	378.3	15.0	2.5	2.10		50%	5.00		

LAYER NO.	BOTTOM OF LAYER ELEV. (FT)	DEPTH BELOW SURFACE (FT)	LAYER THICK. (FT)	Qu VALUE (TSF)	ROCK TYPE (IF APPLICABLE)	SCOUR REDUCTION (%)	SCOUR RESISTANCE OF LAYER (FT)	REMAINING Q100 SCOUR BELOW LAYER (FT)	REMAINING Q200 SCOUR BELOW LAYER (FT)
15	390.8	2.5	2.5	0.50		25%	3.33	3.77	5.37
16	388.3	5.0	2.5	1.20		25%	3.33	0.43	2.03
17	388.3	5.0	2.5	1.20		25%	3.33	0.43	2.03
18	385.8	7.5	2.5	1.50		50%	5.00	0.00	0.00
19	383.3	10.0	2.5	0.90		25%	3.33		
20	380.8	12.5	2.5	0.30		0%	2.50		
21	378.3	15.0	2.5	0.40		0%	2.50		
22	375.8	17.5	2.5	2.00		50%	5.00		

STRENGTH LIMIT STATE ADJUSTED SCOUR (ADJ. Q100)		UNADJUSTED Q100 SCOUR DEPTH		LAYER IN WHICH ADJUSTED Q100 SCOUR STOPS		DEPTH INTO LAYER 2 AT WHICH SCOUR STOPS		DEPTH BELOW GROUND SURFACE TO ADJUSTED Q100 SCO		TOTAL % ADJUSTMENT OF Q100 SCOUR = [(4.38/7.11)*100		Q100 SCOUR ELEVATION	
386.2	FT	390.8	FT	ADJ. Q100	LAYER 2: Qu = 1.7	1.9	FT	385.8	FT	38.3%	388.3	FT	383.3
388.3	FT	388.3	FT	ADJ. Q100	LAYER 3: Qu = 1.7	4.4	FT	385.8	FT	38.3%	388.3	FT	383.3
388.3	FT	383.3	FT	HR GENP	LAYER 4: Qu = 1.4						388.1	FT	383.3
388.3	FT	383.3	FT	HR GENP	LAYER 5: Qu = 0.8						388.1	FT	383.3

EXTREME EVENT II ADJUSTED SCOUR (ADJ. Q200)		UNADJUSTED Q200 SCOUR DEPTH		LAYER IN WHICH ADJUSTED Q200 SCOUR STOPS		DEPTH INTO LAYER 3 AT WHICH SCOUR STOPS		DEPTH BELOW GROUND SURFACE OF ADJUSTED Q200 SCO		TOTAL % ADJUSTMENT OF Q200 SCOUR = [(5.18/8.71)*100		Q200 SCOUR ELEVATION	
384.6	FT	380.8	FT		LAYER 6: Qu = 2.1	0.2	FT	378.3	FT	40.4%	388.1	FT	387.3
384.6	FT	380.8	FT		LAYER 6: Qu = 2.1	5.2	FT	378.3	FT	40.4%	388.1	FT	387.3
384.6	FT	380.8	FT		LAYER 6: Qu = 2.1	5.2	FT	378.3	FT	40.4%	388.1	FT	387.3
384.6	FT	380.8	FT		LAYER 6: Qu = 2.1	5.2	FT	378.3	FT	40.4%	388.1	FT	387.3

Determining the seismic soil site class, the seismic performance zone, the 0.2 and 1.0 second design spectral accelerations and indicate if that the soils are liquefiable: Liquefaction is not an issue at this location due to the consistent cohesive soils which are non-liquefiable and we are in zone 1. The seismic data required for the TSL plan is provided below:

Seismic Performance Zone (SPZ) = 1
 Design Spectral Acceleration at 1.0 sec. (SD1) = 0.288
 Design Spectral Acceleration at 0.2 sec. (SDS) = 0.690
 Soil Site Class = D

Input Data and Parameter Calculations

Select Geographic Region

Continous 48 States

Guidelines Edition

2007 AASHTO Bridge Design Guidelines

Specify Site Location by Latitude-Longitude or Zip Code

Latitude-Longitude : Recommended Zip Code

38.37191 -88.5495

Latitude (50.0 to 24.6) Longitude (-125.0 to -65.0)

Calculate Basic Design Parameters

Probability of Exceedance 7% PE in 75 years

Calculate Calculate

PGA, Ss, and S1 As, SDs, and SD1

Output Calculations and Ground Motion Maps

2007 AASHTO Bridge Design Guidelines
 AASHTO Spectrum for 7% PE in 75 years
 Latitude = 38.371910
 Longitude = -88.549500
 Site Class B
 Data are based on a 0.05 deg grid spacing.

Period (sec)	Sa (g)	PGA - Site Class B
0.0	0.255	PGA - Site Class B
0.2	0.489	Ss - Site Class B
1.0	0.125	S1 - Site Class B

Continous 48 States
 2007 AASHTO Bridge Design Guidelines
 Spectral Response Accelerations SDs and SD1
 Latitude = 38.371910
 Longitude = -88.549500
 As = FpgaPGA, SDs = FaSs, and SD1 = FvS1
 Site Class D - Fpga = 1.29, Fa = 1.41, Fv = 2.30
 Data are based on a 0.05 deg grid spacing.

Period (sec)	Sa (g)	As - Site Class D	SDs - Site Class D	SD1 - Site Class D
0.0	0.359	As - Site Class D		
0.2	0.690		SDs - Site Class D	
1.0	0.288			SD1 - Site Class D

Confirm feasibility of the proposed foundation or wall type and provide design parameters. Provide factored bearing resistance and unit sliding resistance at various elevations and confirm no ground improvement/treatment is necessary where spread footings are proposed. Estimated top of rock elevations as well as preliminary factored unit side and tip resistance values shall be indicated when drilled shafts are proposed: End bearing H-Piles are recommended at this location due to the high seismic loads, scour concern and relatively consistent top of rock elevation across the site. They should be driven to their maximum nominal bearing values shown in bridge manual. Since the borings are particularly close to the new substructures and show rock at the same elevation, we recommend no test piles be used. Pile shoes will not be required due to the soft nature of the shale/sandstone bedrock. We recommend using HP10's or larger due to the pile length being close to 50' to avoid pile drift per the bridge manual. We estimate the pile length refusal tip elevation at all locations to be 345.0' which, using a cutoff elevation of 402.6', is an estimated length of 58 feet. The Factored Resistance Available will need to be reduced by 15 kips for the strength limit state and 25 kips for the extreme event II case due to scour.

Calculate the estimated water surface elevation and determine the need for Cofferdams (Type 1 or 2), and seal coat: The estimated water surface elevation (EWSE) was calculated below to be is 396.95 feet The soils are cohesive, so no seal coat is required. Since the bottom of the concrete encasement for the pier is at elevation 390.8', we have 6.15 feet of water which, according to policy, would require a type 2 cofferdam. However, being only 1.8 inches above the depth that would allow a type 1 cofferdam to be used, we recommend using a Type 1 cofferdam to save money.

Hampton, Lenzini and Renwick, Inc.
 CIVIL AND STRUCTURAL ENGINEERS
 3085 STEVENSON DR., SUITE 201
 SPRINGFIELD, IL 72703
 217-546-3400
 217-546-8116 fax

JOB Wayne Co FAP-821 (IL-15) Section (18BY)B
 SHEET NO 1 OF 1
 CALCULATED BY SAA DATE 10/29/2019
 CHECKED BY JWF DATE 11/11/2019

Estimated Water Surface Elevation Calculation

JOV 03/24/2021
 JTB 05/03/2021

Step 1: Survey Data
 Existing water surface elev = 394.70 ft
 Top of bank elevation = 402.00 ft
 Streambed elevation = 393.60 ft
 Date of Survey 11/29/2016


Step 2: Adjust existing water surface elevation to an assumed April value (see table below)
 $394.7 + 2.25' = 396.95$

Step 3: Check maximum water elevation
 Assumed September elevation = $396.95 - 3.75 = 393.20$
 One foot above streambed elevation = $393.6 + 1.0 = 394.60$
 Use maximum of above two elevations as September elevation = 394.60

75% of difference between September elevation and top of bank elevation =
 $0.75 (402 - 394.6) + 394.6 = 400.15$

Step 4: Select Preliminary EWSE
 Use the lower of the April high water elevation or 75% of the top of bank height
Use EWSE = 396.95

Assess the need for sheeting or soil retention or temporary construction slope and provide recommendation for other construction concerns: The structure will need to be staged constructed and based on the lowest strength boring (B2), we recommend showing temporary sheeting at the abutments. Our calculations show that an embedment of 15 ft. (tip elevation of 375.8') and a section modulus of 19 in³/ft. will be required.



Illinois Department of Transportation

TEMPORARY SHEET PILE DESIGN CHARTS

RETAINED HEIGHT (FT)	SOIL PROPERTIES BELOW EXCAVATION LINE		
	LAYER THICKNESS (FT)	SPT N-VALUE (BPF)	UNCONFINED COMPR. STRENGTH Qu (TSF)
14.71 <small>(ROUND TO NEAREST 0.25)</small>	2.5		1.2
	2.5		1.5
	2.5		0.9
	2.5		0.3
	2.5		0.4
	2.5		1.75
	2.5		2
	5		2
	2.5		4.5
	2.5		4.5

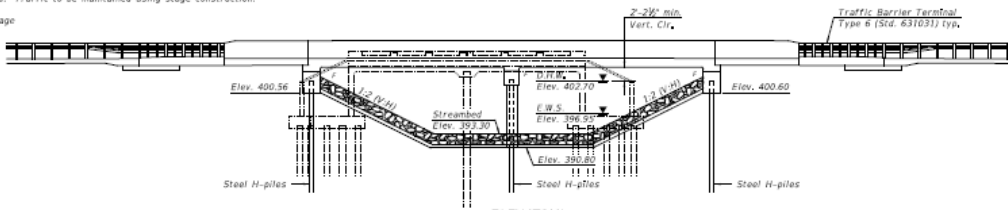
STRUCTURE ===== 096-0076
 SUBSTRUCTURE & REFERENCE BORING ===== B2

COHESIVE CHARTS CONTROL USING AN EMBEDMENT DEPTH OF: 15.10 FT
 AND REQUIRES A SECTION MODULUS OF: 18.96 IN.³/FT

Bench Mark, Chiseled "□" on northwest corner of existing structure 096-0005; 23' L. Sta. 1098+20; Elev. 405.883

Existing Structure - S.N. 096-0005 built in 1920 as F.A.P. Rte. 821, Section 188 at Sta 1098+42. The single span structure was reconstructed in 1956 with a new reinforced concrete slab superstructure bridge supported on the existing closed abutments and untreated timber piles. The existing abutments were widened in-kind and a new center pier with precast piles was built as part of the reconstruction. The two-span slab bridge has an out-to-out width of 43'-4" and a back-to-back abutment length of 42'-0" with no skew. Existing structure to be removed and replaced. Traffic to be maintained using stage construction.

No salvage



DESIGN STRESSES

FIELD UNITS
 $f_c = 3,500 \text{ psi}$
 $f_t = 4,800 \text{ psi}$ (Superstructure)
 $f_y = 60,000 \text{ psi}$ (Reinforcement)

LOADING HL-93

Allow 500#/sq.ft. for Future Wearing Surface.

DESIGN SPECIFICATIONS

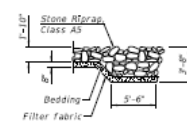
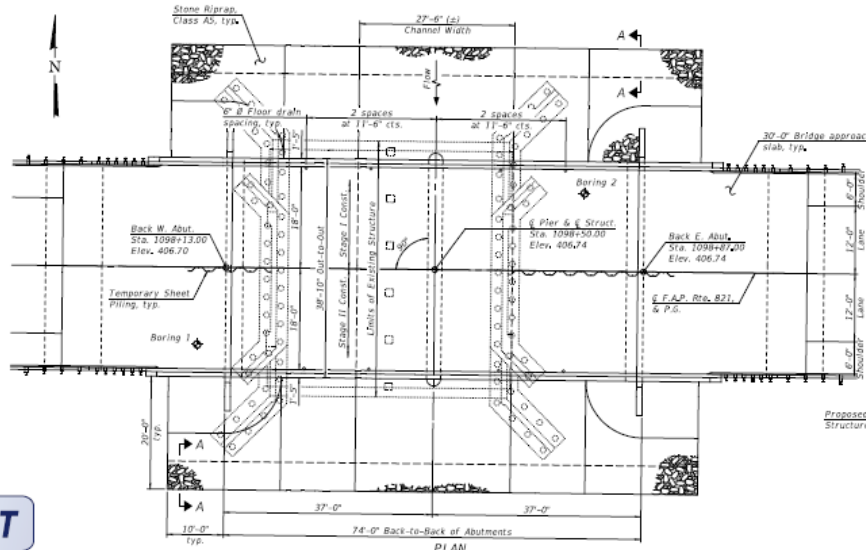
2020 AASHTO LRFD Bridge Design Specifications, 9th Edition

HIGHWAY CLASSIFICATION

F.A.P. Rte. 821 - IL Rte. 15
 Functional Class: Other Principal Arterial
 ADT: 3200 (2023); 3700 (2043)
 ADTT: 275 (2023); 317 (2043)
 DMV: 339 (2043)
 Design Speed: 40 m.p.h.
 Posted Speed: 55 m.p.h.
 Two-Way Traffic
 Directional Distribution: 50:50

SEISMIC DATA

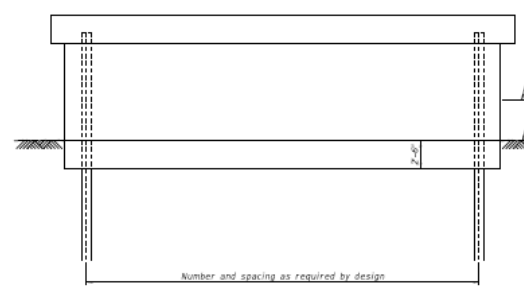
Seismic Performance Zone (SPZ) = \times
 Design Spectral Acceleration at 1.0 sec. = \times
 Design Spectral Acceleration at 0.2 sec. = \times
 Soil Site Class = \times



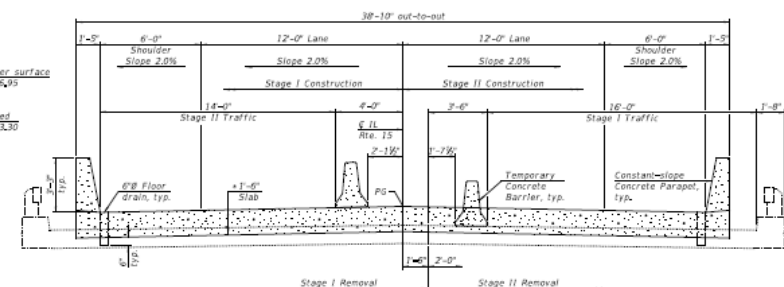
SECTION A-A

GENERAL PLAN AND ELEVATION
 ILLINOIS ROUTE 15 OVER
 MILLER CREEK
 F.A.P. RTE. 821 - SEC. (188Y)B
 WAYNE COUNTY
 STATION 1098+50.00
 STRUCTURE NO. 096-0076

DRAFT

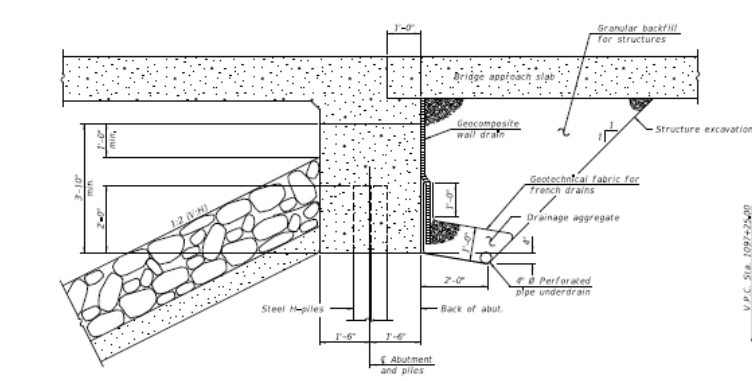


PIER SKETCH

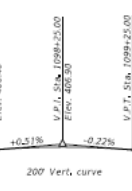


CROSS SECTION (Looking East)

* Subject to refinement during design.



SECTION THRU ABUTMENT



PROFILE GRADE (along E. of IL Rte. 15)

WATERWAY INFORMATION

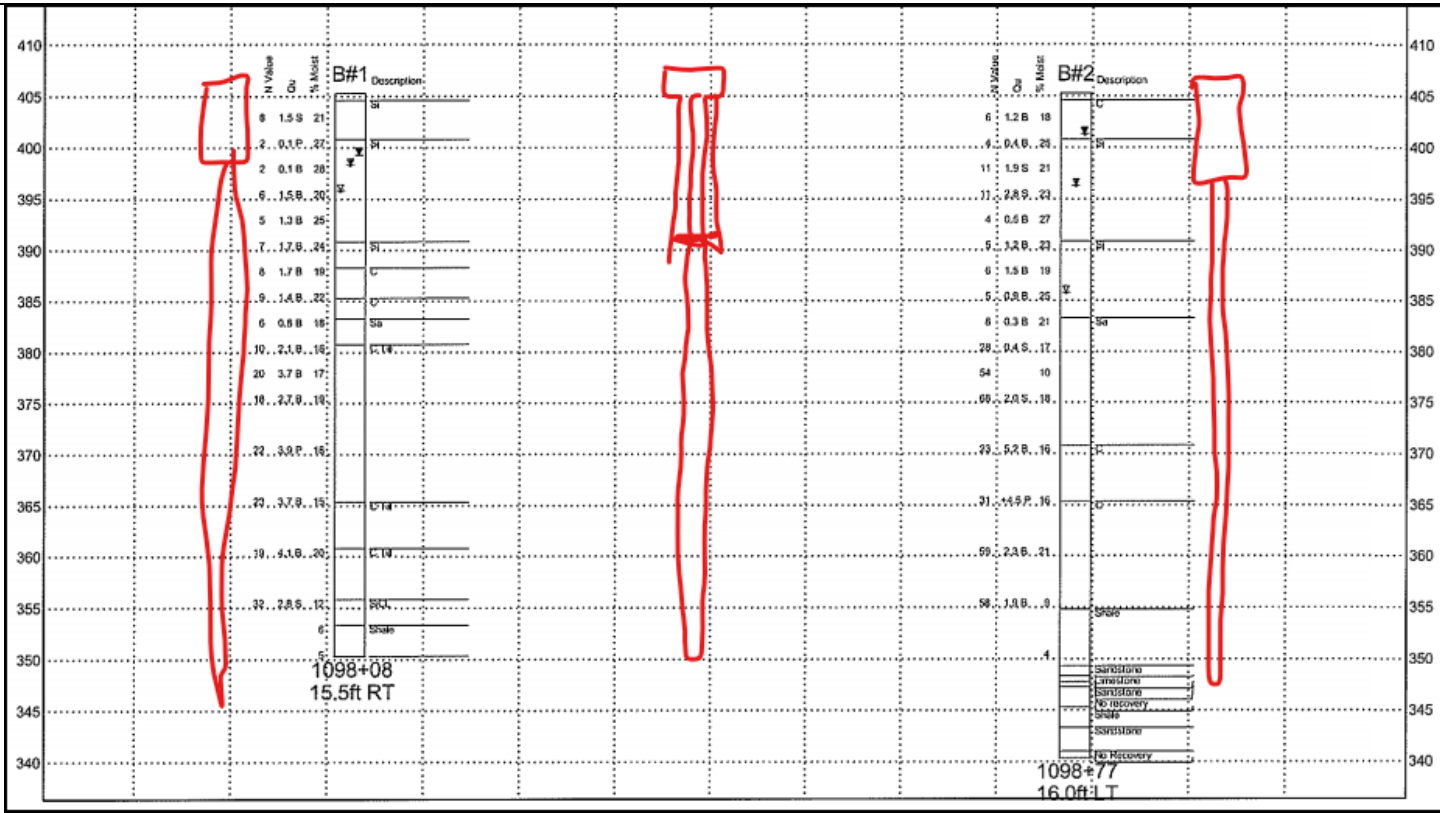
Flood	Freq. (yr.)	C.F.S.	Spanning Sq. Ft.		W. Abut. (ft)	E. Abut. (ft)	Road - Ft.	Headwater Ft.	
			Exist.	Prop.					Head - Ft.
10	1700	290	340	452.1	0.5	1.0	402.6	402.6	
Design	50	1800	310	380	402.7	1.2	0.9	403.9	403.6
Base	100	2100	320	390	402.9	1.9	1.1	404.8	404.0
Scour Check	200	2400	330	400	403.1	2.0	1.3	405.1	404.4
Max. Calc.	500	2880	340	420	403.4	2.2	1.7	405.6	405.1

10 Year Velocity through Existing Bridge = 3.9 fps
 10 Year Velocity through Proposed Bridge = 3.3 fps

DESIGN SCOUR ELEVATION TABLE

Event / Limit State	Design Scour Elevations (ft.)		
W. Abut.	Pier	E. Abut.	Item #13
0100	400.56	---	400.60
0200	400.56	---	400.60
Design	400.56	---	400.60
Check	400.56	---	400.60

DETAILS
 ILLINOIS ROUTE 15 OVER
 MILLER CREEK
 F.A.P. RTE. 821 - SEC. (188Y)B
 WAYNE COUNTY
 STATION 1098+50.00
 STRUCTURE NO. 096-0076



Illinois Department of Transportation

Memorandum

To: Mark Daugherty Attn: David Macklin
 From: Terry Stephenson By: Scott A. Kassel
 Subject: Foundation Borings
 Date: June 17, 2020

Route: FAP 821 (IL 15)
 Section: (18BY)B
 Structure No.: 096-0005 (Existing), 096-0076 (Proposed)
 County: Wayne
 Contract: 74651
 Job No.: D-97-010-14
 Location: 1 mile West of Sims Road

Attached is one (1) copy of the foundation boring logs, and fence diagram, for the above captioned section.

If you have any questions, or require any additional information, please contact Scott A. Kassel, P.E., District Geotechnical Engineer, at (217) 342-8233.

SAK



SOIL BORING LOG

ROUTE FAP 821 DESCRIPTION Miller Creek - 1 mile West of Sims LOGGED BY Sandschafer

SECTION (18BY)B LOCATION NW 1/4, SEC. 9, TWP. 2S, RNG. 6E, 3rd PM,

Latitude N 38.371902, Longitude W 88.549599

COUNTY Wayne DRILLING METHOD Hollow stem auger & split spoon HAMMER TYPE Auto 140#

STRUCT. NO. 096-0005 (Existing)
Station 1098+42 (E) 1098+53 (P)

BORING NO. B1 West Abutment
Station 1098+08
Offset 15.5 ft RT
Ground Surface Elev. 405.32 ft

DEPTH	W	Qu	T	Surface Water Elev.	Stream Bed Elev.	GROUNDWATER ELEV.	DEPTH	W	Qu	T
(ft)	(/6")	(tsf)	(%)	ft	ft	ft	(ft)	(/6")	(tsf)	(%)
				<u>394.75</u>	<u>392.77</u>					
						<u>395.8</u>				
						<u>398.3</u>				
						<u>399.3</u>				

DEPTH	W	Qu	T	Soil Description	DEPTH	W	Qu	T
(ft)	(/6")	(tsf)	(%)		(ft)	(/6")	(tsf)	(%)
404.62				Aggregate/Asphalt Millings				
				Brown, SILTY CLAY				
	4				383.32			
	4	1.5	21	Stiff, moist				
	4	S						
400.82				Very soft, moist, brown, SILTY LOAM				
	-5	2			380.82			
	1	0.1	27	Very stiff, moist, grey, CLAY LOAM Till				
	1	P						
	1			Grey				
	1	0.1	28					
	1	B		Brown				
	1							
	-10	1		Stiff, with organics				
	3	1.5	20					
	3	B		Brown and grey marbled				
	3							
	1			Mottled brown				
	2	1.3	25					
	3	B						
390.82				Stiff, moist, brown and grey marbled, SILTY CLAY				
	-15	1						
	3	1.7	24	Grey				
	4	B						
388.32				Stiff, moist, brown and grey marbled, CLAY				
	2							
	3	1.7	19					
	5	B						
385.32	-20	2			385.32	-40	4	

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer, E-Estimated)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

SOIL BORING 998-0005(E), -0076(P) SOIL ROCK 2020.GPJ IL_DOT.GBT 6/17/20



SOIL BORING LOG

ROUTE FAP 821 DESCRIPTION Miller Creek - 1 mile West of Sims LOGGED BY Sandschafer

SECTION (18BY)B LOCATION NW 1/4, SEC. 9, TWP. 2S, RNG. 8E, 3rd PM

Latitude N 38.371902, Longitude W 88.549599

COUNTY Wayne DRILLING METHOD Hollow stem auger & split spoon HAMMER TYPE Auto 140#

STRUCT. NO. 096-0005 (Existing)
095-0076 (Proposed)
Station 1098+42 (E) 1098+53 (P)

BORING NO. B1 West Abutment
Station 1098+08
Offset 15.5 ft RT
Ground Surface Elev. 405.32 ft

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/ft)	(tsf)	(%)
8	3.7	15	
15	B		
45	5	8	20
8	4.1	11	B
50	4	9	12
23	2.8	23	S
50		50	
15/16"		50	
50		50	
3/8"		50	
50		50	
4-1/2"		50	5
50		50	
1-1/4"		50	
50		50	
1/2"		50	

Surface Water Elev. 394.75 ft
Stream Bed Elev. 392.77 ft
Groundwater Elev.:
First Encounter 395.8 ft ∇
Upon Completion 398.3 ft ∇
After 24 Hrs. 399.3 ft ∇

Very stiff, moist, grey, CLAY LOAM Till
380.82

Hard, moist, grey, CLAY Till
355.82

Very stiff, moist, brown, SILTY CLAY LOAM
353.32

Very dense, moist, grey, SANDY CLAY SHALE
350.32

Benchmark: BM 462 - Cut square in Northwest corner of culvert on Northside of IL. 15, Sta. 1098+20, 23' LT, Elevation = 405.883 feet. End of Boring

26-0005EL-0076P1 SOIL ROCK 2020.GPJ IL DOT.DDT 8/17/20



SOIL BORING LOG

ROUTE FAP 821 DESCRIPTION Miller Creek - 1 mile West of Sims LOGGED BY: Sandschafer

SECTION (18BY)B LOCATION NW 1/4, SEC. 9, TWP. 2S, RNG. 6E, 3rd PM,
Latitude N 38.371969, Longitude W 88.549339

COUNTY Wayne DRILLING METHOD Hollow stem auger & split spoon HAMMER TYPE Auto 140#

STRUCT. NO. 096-0005 (Existing)
096-0076 (Proposed)
Station 1098+42 (E) 1098+53 (P)

BORING NO. B2 East Abutment
Station 1098+77
Offset 16.0 ft LT
Ground Surface Elev. 405.31 ft

DEPTH TH S	B L O W S	U C S Qu	M O S T	Surface Water Elev.		D E P T H	B L O W S	U C S Qu	M O S T
				ft	ft				
				394.75	392.77				
				385.8	396.3				
				401.3					
							2	0.9	25
							3	B	
				383.31					
				3			1		
				3	1.2	18	3	0.3	21
				3	B		5	B	
				400.81					
				-5	1		-25	2	
				2	0.4	25	11	0.4	17
				2	B		17	S	
				2			4		
				5	1.9	21	24		10
				6	S		30		
				-10	3		-30	5	
				5	2.8	23	30	2.0	18
				6	S		38	S	
				1					
				2	0.5	27			
				2	B				
				390.81			370.81		
				-15	1		-35	3	
				2	1.2	23	8	5.2	16
				3	B		15	B	
				1					
				2	1.5	19			
				4	B				
				-20	1		365.31	-40	10

SOIL BORING 096-0005(E), 4075(R) SOIL ROCK 2020.GPJ IL DOT.GDT 6/17/20



SOIL BORING LOG

ROUTE FAP 821 DESCRIPTION Miller Creek - 1 mile West of Sims LOGGED BYE Sandschafer

SECTION (18BY)B LOCATION NW 1/4, SEC. 9, TWP. 2S, RNG. 6E, 3rd PM,

Latitude N 38.371969, Longitude W 88.549339

COUNTY Wayne DRILLING METHOD Hollow stem auger & split spoon HAMMER TYPE Auto 140#

STRUCT. NO. 096-0005 (Existing)
096-0076 (Proposed)
Station 1098+42 (E) 1098+53 (P)

BORING NO. B2 East Abutment
Station 1098+77
Offset 16.0 ft LT
Ground Surface Elev. 405.31 ft

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(ft)
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Surface Water Elev. 394.75 ft
Stream Bed Elev. 392.77 ft
Groundwater Elev.:
First Encounter 385.8 ft▼
Upon Completion 396.3 ft▼
After 24 Hrs. 401.3 ft▼

Hard, moist, brown, CLAY LOAM Till	13	4.5	16
	18	P	
Very stiff	22		
	23	2.3	21
	36	B	
Stiff, moist, grey, SANDY CLAY SHALE	23		
	36	1.9	9
Hard, sample broken Borehole continued with rock coring.	50		
	50	4-5/16"	4
	50	7/8"	
	50	3/4"	

SOIL BORING 096-0005(E), -0076(P) SOIL ROCK 2020.GPJ IL DOT.GDT 8/17/20



ROCK CORE LOG

ROUTE FAP 821 DESCRIPTION Miller Creek - 1 mile West of Sims LOGGED BY Sandschafer

SECTION (18BY)B LOCATION NW 1/4, SEC. 9, TWP. 2S, RNG. 6E, 3rd PM
Latitude N 38.371969, Longitude W 88.549338

COUNTY Wayne CORING METHOD Rotary, surf set diamond bit

STRUCT. NO. 096-0005 (Existing) CORING BARREL TYPE & SIZE NW, conv dbl bbl, split inner
Station 1098+42 (E) 1098+53 (P)

BORING NO. B2 East Abutment Core Diameter 2.1 in
Station 1098+77 Top of Rock Elev. 350.31 ft
Offset 16.0 ft LT Begin Core Elev. 349.31 ft
Ground Surface Elev. 405.31 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R - Q - D (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Grey SANDSTONE Depth: 55.5', Moisture Content: 1.26%, Dry Density: 156.8 pcf	349.31 348.31	1	60	48	1.4	696.9
Grey LIMESTONE	347.81					
Grey SANDSTONE	347.31					
No Recovery						
	345.31	-80				
Grey SHALE		2	87	25	1.89	165.1
	343.31					
Grey SANDSTONE Depth: 62.3', Moisture Content: 4.27%, Dry Density: 149.8 pcf						
	340.96					
No Recovery	340.31	-85				
Benchmark: BM 462 - Cut square in Northwest corner of culvert on Northside of IL 15, Sta. 1098+20, 23' LT, Elevation = 405.883 feet. End of Boring						
	-70					
	-75					

ROCK CORE 096-0005(EI)_037(EPI) SOL ROCK 2020.GPJ IL DDT.GDT 01/12/20

Color pictures of the cores Available on request
Cores will be stored for examination until 5/12/2025
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

Input Data and Parameter Calculations

Select Geographic Region

Conterminous 48 States

Guidelines Edition

2007 AASHTO Bridge Design Guidelines

Specify Site Location by Latitude-Longitude or Zip Code

Latitude-Longitude : Recommended Zip Code

38.04053459

-89.9157660

Latitude (50.0 to 24.6)

Longitude (-125.0 to -65.0)

Calculate Basic Design Parameters

Probability of Exceedance

7% PE in 75 years

Calculate
PGA, Ss, and S1

Calculate
As, SDs, and SD1

Output Calculations and Ground Motion Maps

2007 AASHTO Bridge Design Guidelines

AASHTO Spectrum for 7% PE in 75 years

Latitude = 38.040535

Longitude = -089.915766

Site Class B

Data are based on a 0.05 deg grid spacing.

Period (sec)	Sa (g)	
0.0	0.243	PGA - Site Class B
0.2	0.483	Ss - Site Class B
1.0	0.128	S1 - Site Class B

Conterminous 48 States

2007 AASHTO Bridge Design Guidelines

Spectral Response Accelerations SDs and SD1

Latitude = 38.040535

Longitude = -089.915766

As = FpgaPGA, SDs = FaSs, and SD1 = FvS1

Site Class D - Fpga = 1.31, Fa = 1.41, Fv = 2.29

Data are based on a 0.05 deg grid spacing.

Period (sec)	Sa (g)	
0.0	0.343	As - Site Class D
0.2	0.681	SDs - Site Class D
1.0	0.293	SD1 - Site Class D

