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650 Pierce Boulevard
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618-624-6969
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ABBREVIATED STRUCTURE GEOTECHNICAL REPORT RAMP RECONSTRUCTION AT KAMPSVILLE FERRY

IL 108 KAMPSVILLE FERRY
SECTION 101RS-LOT-1
CALHOUN AND GREENE COUNTY, ILLINOIS
PTB 183 ITEM 15 - IL ROUTE 108

CONTRACT NO. 76L96
JOB NO.: P-98-040-16 / D-90-040-16
STRUCTURE NO. TBD

Thomas J. Casey, P.E.
(618) 206-3045
TCasey@sciengineering.com

August 2020
Revised September 2020

Prepared for:
SHEILA KIMLINGER
THOUVENOT, WADE & MOERCHEN INC
4940 OLD COLLINSVILLE ROAD
SWANSEA, ILLINOIS 62226
(618) 624-4488

DocuSigned by:
Thomas Casey
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SCI No. 2017-3097.12

LICENSED PROFESSIONAL ENGINEER
THOMAS JOSEPH CASEY
062-061853
STATE OF ILLINOIS
EXP: 11/30/2021
9/24/2020

SCI ENGINEERING, INC.
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CONSTRUCTION SERVICES

September 24, 2020

Ms. Sheila Kimlinger
Thouvenot, Wade & Moerchen, Inc.
4940 Old Collinsville Road
Swansea, Illinois 62226

RE: Abbreviated Structure Geotechnical Report
Ramp Reconstruction at Kampsville Ferry
Greene / Calhoun County, Illinois
PTB 183 Item 15 – IL ROUTE 108
Contract no. 76L96
Job no.: **P-98-040-16 / D-90-040-16**
Section: 101RS-LOT-1
Structure No. TBD
SCI No.: 2017-3097.12

Dear Ms. Kimlinger:

Enclosed is our *Abbreviated Structure Geotechnical Report (ASGR)* dated August2020, revised September 2020. This report should be read in its entirety, and our recommendations considered in the design and construction of the proposed roadway ramp reconstruction at the Kampsville Ferry facility in Kampsville, Illinois. Please call if you have any questions.

Respectfully,

SCI ENGINEERING, INC.

Prakash Paudel, E.I.
Staff Engineer

Thomas J. Casey, P.E.
Chief Geotechnical Engineer

PP/TJC/tlw

Enclosure

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ABBREVIATED STRUCTURE GEOTECHNICAL REPORT
RAMP RECONSTRUCTION AT KAMPSVILLE FERRY

IL 108 KAMPSVILLE FERRY
SECTION 101RS-LOT-1
CALHOUN AND GREEN COUNTY, ILLINOIS
PTB 183 ITEM 15
CONTRACT NO. 76L96
JOB NO.: P-98-040-16 / D-90-040-16
STRUCTURE NO. TBD

1.0 PROJECT DESCRIPTION

The geotechnical study summarized in this report was performed for the planned improvements at the existing Kampsville Ferry facility in Kampsville, Illinois. The facility is situated on the east and west side of the Illinois River. The improvement includes rebuilding the two existing roadway ramps in the facility. The location of the site is shown on the *Vicinity and Topographic Map*, Figure 1.

The rebuilding of the ramps will include replacing the existing bituminous pavements with new fully reinforced concrete pavements that will feature a 32-foot width. Steel sheet piles will be installed to act as cofferdams that will allow the ramp footprint to be dewatered. Additionally, the sheet piles will be used as forms for the concrete pours. After curing, the sheet piles will be cutoff below the pavement elevation. More specific information concerning the layout and dimensions of the proposed improvements are presented on the Proposed Typical Sections presented in Appendix B.

2.0 FIELD EXPLORATION AND SUBSURFACE CONDITIONS

2.1 Area Geology

The project is located adjacent to the Illinois River and in the floodplain known locally as the Illinois River Bottomlands. The soils in the immediate area were formed in an alluvial sediment environment deposited by the Illinois River. The bedrock which underlies the site was formed in the Silurian Period, and generally consists of Moccasin Springs Limestone underlain by St. Clair and Sexton Creek Limestones (*Bedrock Geology of Illinois,* Illinois State Geological Survey, 1967).

2.2 Exploration Procedures

The field exploration was performed by others under contract to IDOT and the subsurface information was provided to SCI in the form of boring logs. It is observed from the logs that the geotechnical drill rig equipped with hollow-stem augers and mud rotary techniques were used to advance the borings. The field exploration appears to have been performed in general accordance with procedures outlined in the 2015 *IDOT Geotechnical Manual*.

Four deep soil test borings, designated as B-1 through B-4, were drilled at the proposed sheet pile wall approximately 16 feet from the centerline of the ramp. The boring locations are shown on the *Aerial Photograph*, Figure 2. SPTs were performed with a split-spoon sampler at 2½-foot intervals to the termination depths of the borings. The unconfined compressive strength of the cohesive soils was determined with a Rimac test apparatus. The deep borings were drilled to depths ranging from approximately 32 feet to 60 feet below the existing ground surface. A summary of this information is presented in Table 2.1, below.

Table 2.1 - Summary of Borings

Boring	Location	Surface Elevation (ft)	Termination Elevation (ft)	Termination Depth (ft)
B-1	Calhoun Side	423.0	391.5	31.5
B-2	Calhoun Side	423.0	384.0	39
B-3	Greene Side	421.0	361.0	60
B-4	Greene Side	421.0	361.0	60

2.3 Subsurface Conditions and Lab Testing

Detailed information regarding the nature and thickness of the soils encountered is shown on the Boring Logs in Appendix A. Figures 3E and W, *Site Plans*, indicate the boring locations with respect to the proposed improvements. From the figures, the ramp borings B-1 and B-2 are located on the west shore in Calhoun county while B-3 and B-4 are located on the east shore in Greene county.

2.3.1 Ramp Improvements (West Shore)

The fluvial deposits on the west shore (Calhoun County) predominantly consisted of sandy to silty clay to the nominal depth of 16 feet followed by a sand layer with various percentages of silt, loam and gravel all the way down to the auger refusal depth. The augers were refused at depths of approximately 31.5 feet in B-1 and 39 feet in B-2.

The N-values ranged between 2 blows per foot (bpf) and 7 bpf with an average of 4 bpf within the clay layer and 5 to 51 bpf with an average of 17 bpf in sand layer. From the laboratory testing, the moisture contents were obtained in the range of 15 percent to 32 percent with an average of 26 percent for the cohesive soils.

Table 2.2 – Summary of Bedrock Elevations

Boring	Depth to Rock (ft)	Approximate Rock Elevation (ft)
B-1	31.5	391.5
B-2	39.0	384.0

2.3.2 Ramp Improvements (East Shore)

On the east shore of the Illinois river (Greene County), the fluvial deposits consisted of surficial crust of coarse-grained sand and gravel (likely fill) to the nominal depth of 8.5 feet. Beneath the surficial sands are interbedded layers of sands with varying amounts of silt and clay and clays to the termination of both borings at a depth of 60 feet. Augers refusal was not encountered within either of these two borings.

The N-values ranged between 0 bpf (weight of hammer) and 6 bpf with an average of 1.5 bpf within the clay layers and 1 to 14 bpf with an average of 9 bpf in the sandy soils. From the laboratory testing, the moisture contents were obtained in the range of 28 percent to 78 percent with an average of 40 percent for the clay layers.

2.4 Groundwater Conditions

Groundwater levels observed at the time of drilling are summarized in Table 2.3 below. It should be noted that mud rotary techniques do not allow for accurate detection of groundwater during drilling. Additionally, it should be noted that the groundwater level is subject to seasonal and climatic variations, the water level in the Illinois River, and may be present at different depths in the future. In addition, without extended periods of observation, measurement of the true groundwater levels may not be possible.

Table 2.3 – Summary of Approximate Groundwater Levels

Boring No.	Depth to Groundwater During Drilling (ft)	Groundwater Elevation During Drilling (ft)
B-1	17.0	406.0
B-2	16.0	407.0
B-3	6.0	415.0
B-4	4.0	417.0

2.5 Climate Conditions

The borings were advanced between December 10 and 12, 2019. Monthly precipitation data was obtained from the website WeatherUnderground.com for the weather station at Lambert Airport in St. Louis, Missouri. Monthly precipitation during the time of the site investigation and during the three months prior to the soil survey are shown in Table 2.4. The comparison of normal precipitation data is provided by historic weather records established by the U.S. Climate data based on observations at Lambert Airport in St. Louis, Missouri.

Table 2.4 – Precipitation Prior to Soil Testing

Month	Actual Precipitation (in)*	Normal Precipitation (in)**	Difference (in)
September 2019	1.70	4.16	2.46
October 2019	3.83	3.09	0.74
November 2019	3.00	2.48	0.52
December 2019	2.42	2.05	0.37

* Observed as documented on Weatherunderground.com
**Normal established by U.S. Climate Data

3.0 GEOTECHNICAL EVALUATIONS

In order to provide design recommendations for founding the structures, SCI performed the following evaluations based on all available data collected and reviewed at the time of this report. This information includes subsurface explorations performed by TSi, and provided by IDOT, and communications with Thouvenot, Wade & Moerchen, Inc. (TWM) personnel familiar with the project.

3.1 Seismic Considerations

Based on the temporary use and the below grade nature of the sheet pile wall, it was assumed that seismic concerns would not be considered in the design. If seismic loading will need to be considered, please contact SCI to provide additional seismic data.

3.2 Ramp Improvements Shoring Wall

At the ramp improvements, there are several retaining wall type options available that may be technically feasible. L-Type and T-type walls both require a large excavation footprint as well as construction of a temporary coffer dam and would not be feasible. Feasible walls include drilled or driven Soldier Pile, Secant Pile, and Sheet Pile walls. Soldier Pile walls would also likely require the construction of a temporary coffer dam. Secant Pile walls would require temporary fill placement within the construction boundaries and a specialized contractor to construct. The requirement for temporary cofferdams and expensive construction eliminated most of these wall types. Since the existing ramps are constructed using sheet piling and the proposed construction requires installation within the river, sheet piling was considered the most desirable method. If these other options become necessary, SCI should be contacted to provide additional recommendations.

Sheet piling will be driven to construct a coffer dam around the planned ramp improvements. The area inside the sheeting will then be dewatered. The sheet piling will retain the river and some undetermined depth of soil. SCI understands that final grades will be similar to existing grades (+/-1 foot). SCI estimates that settlements will be negligible based on the minimal amount of planned fill. Lateral earth pressures and other design considerations for the sheet pile walls included in Section 3.3.

3.3 Sheet Pile Walls

The sheet piles should be designed to withstand the lateral loads of the retained soil. Based on the project, submerged values should be considered when computing the lateral earth pressures. For the sheet piles, we understand that tiebacks or other bracing will not be required and that the sheet piles will behave in the free head condition. For this condition, the active earth pressure coefficients (k_a) presented in Table 3.1 should be used. If the design changes and anchors or bracing are used, the piles would behave in a fixed head condition. For this condition, the at-rest earth pressure coefficients (k_o) presented in Table 3.1 should be used. The earth pressure values provided consider long term, drained strength parameters only and are recommended for the long-term stability analysis. Utilizing the reduced undrained shear strengths (S_u) provided below, in conjunction with the long-term values, should only be used to evaluate the construction phase stability.

In addition to lateral earth pressures from the soil, the sheet pile walls should be designed to resist any surcharge loads. If the sheet pile wall will be required to provide support at the completion of the ramps, traffic loading on the completed ramp should be included as a 250 psf surface load in the traffic lanes. This load may be modeled as uniform lateral loads, equivalent to one-half of the surface load, acting at the halfway point on the wall. For any soil surcharge loads, we recommend using a unit weight of 120 pcf in this calculation.

Table 3.1 – Drained Soil Parameters

Soil Type	Earth Pressure Coefficient	Earth Pressure Value	Earth Pressure Diagram	Load Application Point
Clay (A-6/A-7) γ_M=120 pcf ϕ'=8° Su = 50 psf N≤4	k_a	0.756	Triangular	.33 H up from base of wall
	k_p	1.323	Triangular	.33 H up from base of wall
	k_o	0.861	Triangular	.33 H up from base of wall
Clay (A-6/A-7) γ_M=120 pcf ϕ'=12° Su = 400 psf N>4	k_a	0.656	Triangular	.33 H up from base of wall
	k_p	1.525	Triangular	.33 H up from base of wall
	k_o	0.792	Triangular	.33 H up from base of wall
Sand (A-2) γ_M=120 pcf ϕ'=30°	k_a	0.333	Triangular	.33 H up from base of wall
	k_p	3.000	Triangular	.33 H up from base of wall
	k_o	0.500	Triangular	.33 H up from base of wall
Stone dumped RR5 rip rap (A-1) γ_{dry}=120 pcf ϕ'=42°	k_a	0.198	Triangular	.33 H up from base of wall
	k_p	5.045	Triangular	.33 H up from base of wall
	k_o	0.331	Triangular	.33 H up from base of wall

Note 1. Density acting over 1-foot wide vertical strip

3.4 Corrosion

Due to the temporary nature of the planned sheet piling and that the long-term design does not rely on the sheet piling, a consideration for the lifespan of the steel may not be required. However, a discussion of the effects of corrosion may be warranted if the sheet piles are required to provide support long term.

Based on information provided in the FHWA Bridge Inspection Reference Manual and IDOT ABD memo 11.4, losses to corrosion may adversely affect the performance of these components during the lifespan of the project. However, even with proper corrosion protection, these elements may require periodic inspection and maintenance. Typically, piles placed in fresh water have minor corrosion losses. Certain factors, such as the presence of sewage, electrolysis and impacts can accelerate the loss of steel section over time. A specific corrosion analysis of the soils encountered, or the Illinois River water was not included in the current scope. According to the 2016 *Design and Construction of Driven Pile Foundations (Publication No. FHWA-NHI-16-009)*, corrosion rates of 0.002 inches per year for steel piles immersed in fresh water, except at the waterline in canals where the rate was as high as 0.013 inches per year. The high rate of corrosion at the water line was attributed to debris abrasion and/or cell action between other parts of the structure. Additional design guidance is provided in the ABD 11.4 memorandum.

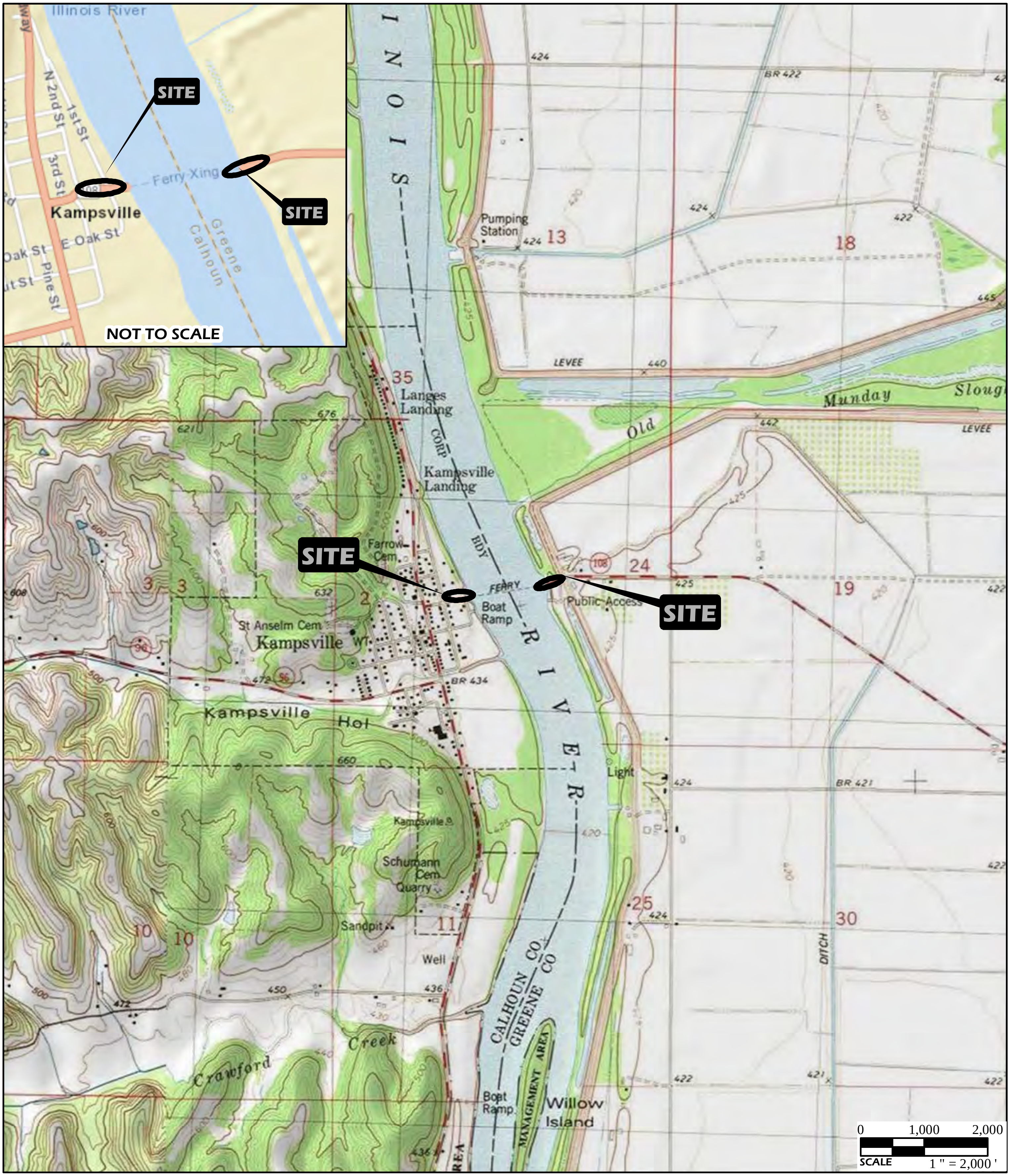
4.0 CONSTRUCTION CONSIDERATIONS

The construction activities should be performed in accordance with the current *IDOT Standard Specifications for Road and Bridge Construction* and any pertinent Special Provisions or policies.

While not anticipated, based on the previous site improvements, obstructions such as old foundations, utilities and debris are possible. Generally, these obstructions should be removed from within the planned construction area. Care should also be taken for the design and layout of the sheets to be installed into the river, and consider the velocity of the river current to select suitable installation methods.

5.0 LIMITATIONS

The recommendations provided herein are for the exclusive use of Thouvenot, Wade & Moerchen, Inc., and IDOT. They are specific only to the project described and are based on subsurface information obtained at four boring locations within the areas to receive sheet piling, our understanding of the project as described herein, the proposed undated Plan and Profile sent by TWM in July 2020, and geotechnical engineering practice consistent with the standard of care. No other warranty is expressed or implied. SCI should be contacted if conditions encountered during construction are not consistent with those described.



PROJECT NAME

IL 108 KAMPSVILLE FERRY
CALHOUN AND GREENE COUNTY, ILLINOIS

VICINITY AND TOPOGRAPHIC MAP

DRAWN BY	RCV	**DATE**	**JOB NUMBER**
CHECKED BY	TJC	09/2020	2017-3097.12

GENERAL NOTES/LEGEND

USGS TOPOGRAPHIC MAP
KAMPSVILLE, ILLINOIS QUADRANGLE
DATED 1980
10' CONTOURS

STREET MAP
HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_STREET_MAP

N
W
E
S

FIGURE
1

PROJECT NAME

IL 108 KAMPSVILLE FERRY
CALHOUN AND GREENE COUNTY, ILLINOIS

AERIAL PHOTOGRAPH

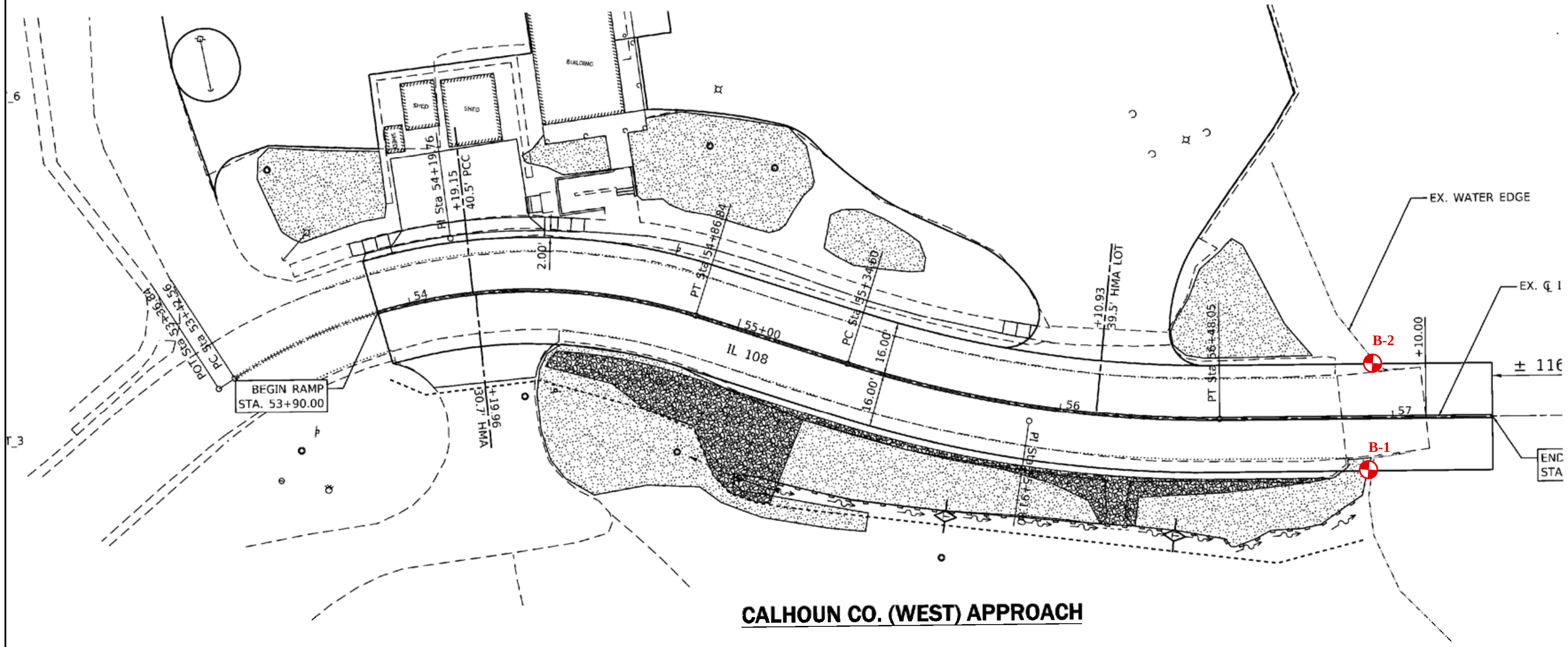
DRAWN BY	RCV	DATE	JOB NUMBER
CHECKED BY	TJC	09/2020	2017-3097.12

GENERAL NOTES/LEGEND

● INDICATES APPROXIMATE SOIL BORING LOCATIONS.

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH.

FIGURE
2



CALHOUN CO. (WEST) APPROACH

0 20 40
SCALE 1 " = 40 '

GENERAL NOTES/LEGEND

⊕ INDICATES APPROXIMATE SOIL BORING LOCATION.

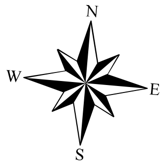
PLAN DATED 5/27/2020 BY TWM, INC.

DIMENSIONS AND LOCATIONS ARE APPROXIMATE; ACTUAL MAY VARY. DRAWING SHALL NOT BE USED OUTSIDE THE CONTEXT OF THE REPORT FOR WHICH IT WAS GENERATED.

PROJECT NAME

IL 108 KAMPSVILLE FERRY
CALHOUN AND GREENE COUNTY, ILLINOIS

SITE PLAN



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DATE 09/2020

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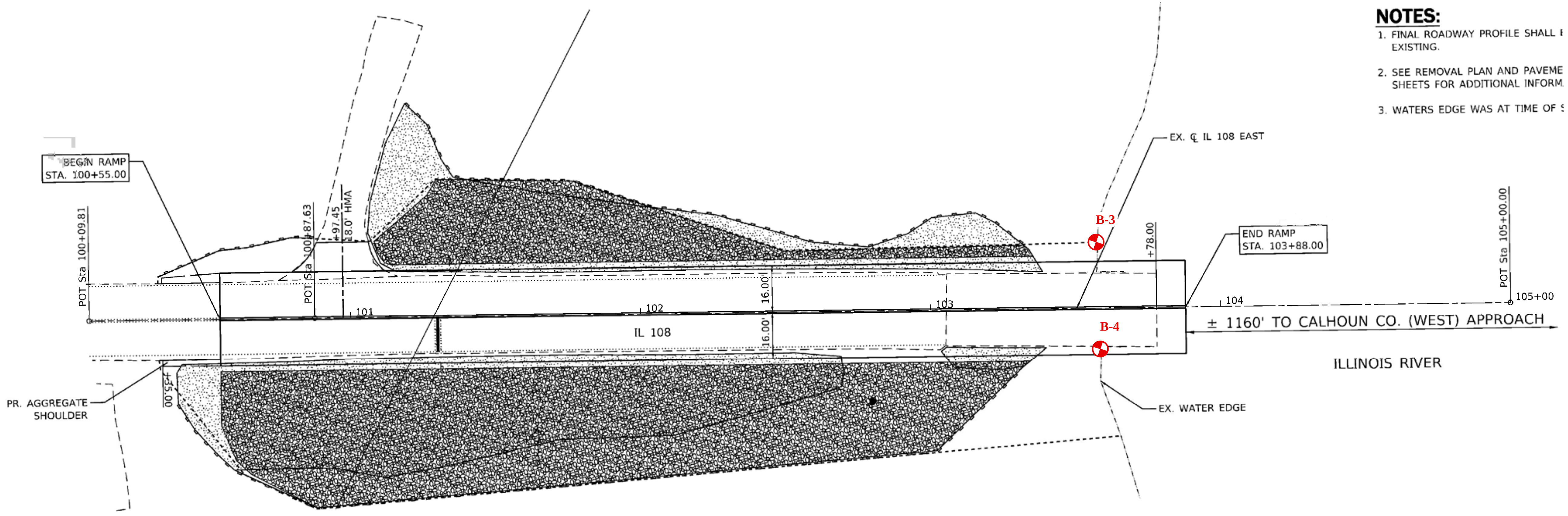
CHECKED BY TJC

FIGURE 3W



NOTES:

1. FINAL ROADWAY PROFILE SHALL
EXISTING.
2. SEE REMOVAL PLAN AND PAVEME
SHEETS FOR ADDITIONAL INFORM
3. WATERS EDGE WAS AT TIME OF

0 20 40
SCALE 1 " = 40 '

GENERAL NOTES/LEGEND

⊕ INDICATES APPROXIMATE SOIL BORING LOCATION.

PLAN DATED 5/27/2020 BY TWM, INC.

DIMENSIONS AND LOCATIONS ARE APPROXIMATE; ACTUAL MAY VARY. DRAWING SHALL NOT BE USED OUTSIDE THE CONTEXT OF THE REPORT FOR WHICH IT WAS GENERATED.

PROJECT NAME

IL 108 KAMPSVILLE FERRY
CALHOUN AND GREENE COUNTY, ILLINOIS

SITE PLAN

JOB NUMBER	2017-3097.12
DATE	09/2020
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FIGURE	3E

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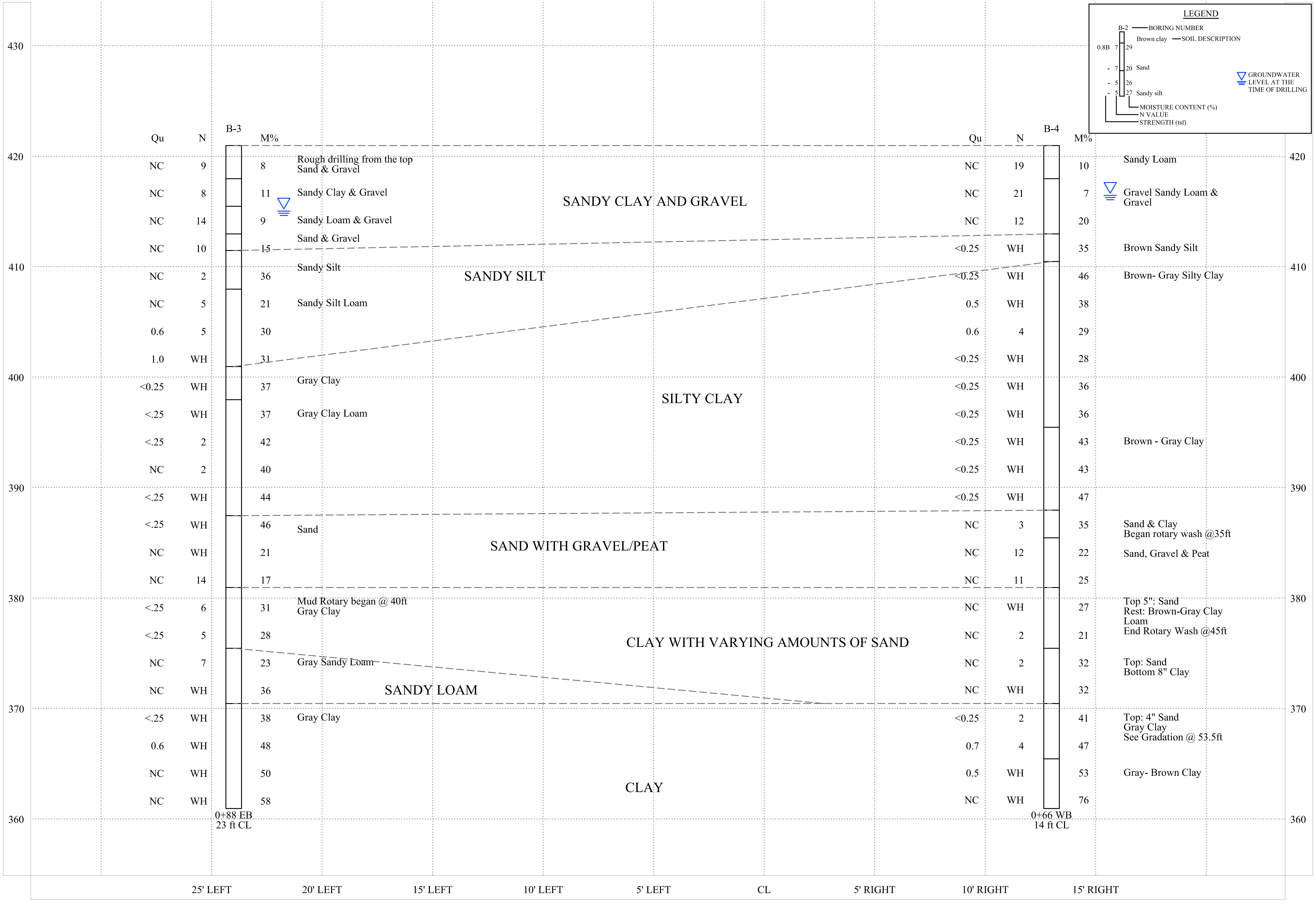

B-3

Qu	N	M%	
NC	9	8	Rough drilling from the top Sand & Gravel
NC	8	11	Sandy Clay & Gravel
NC	14	9	Sandy Loam & Gravel
NC	10	15	Sand & Gravel
NC	2	36	Sandy Silt
NC	5	21	Sandy Silt Loam
0.6	5	30	
1.0	WH	31	
<0.25	WH	37	Gray Clay
<.25	WH	37	Gray Clay Loam
<.25	2	42	
NC	2	40	
<.25	WH	44	
<.25	WH	46	Sand
NC	WH	21	
NC	14	17	
<.25	6	31	Mud Rotary began @ 40ft Gray Clay
<.25	5	28	
NC	7	23	Gray Sandy Loam
NC	WH	36	
<.25	WH	38	Gray Clay
0.6	WH	48	
NC	WH	50	
NC	WH	58	

0+88 EB
23 ft CL

B-4

Qu	N	M%	
NC	19	10	Sandy Loam
NC	21	7	Gravel Sandy Loam & Gravel
NC	12	20	
<0.25	WH	35	Brown Sandy Silt
<0.25	WH	46	Brown- Gray Silty Clay
0.5	WH	38	
0.6	4	29	
<0.25	WH	28	
<0.25	WH	36	
<0.25	WH	36	
<0.25	WH	43	Brown - Gray Clay
<0.25	WH	43	
<0.25	WH	47	
NC	3	35	Sand & Clay Began rotary wash @35ft
NC	12	22	Sand, Gravel & Peat
NC	11	25	
NC	WH	27	Top 5": Sand Rest: Brown-Gray Clay Loam End Rotary Wash @45ft
NC	2	21	
NC	2	32	Top: Sand Bottom 8" Clay
NC	WH	32	
<0.25	2	41	Top: 4" Sand Gray Clay See Gradation @ 53.5ft
0.7	4	47	
0.5	WH	53	Gray- Brown Clay
NC	WH	76	

0+66 WB
14 ft CL

General Notes/Legend

VARIATIONS IN SUBSURFACE CONDITIONS MAY AND LIKELY EXIST BETWEEN BORINGS. DASHED HORIZONS ARE INTERPRETED AND ARE SHOWN FOR ILLUSTRATION ONLY.

PROJECT NAME

IL 108 KAMPSVILLE FERRY
CALHOUN AND GREENE COUNTY, ILLINOIS

SUBSURFACE PROFILE (EAST)

SCALE 1" = 8' V
1" = 4' H
JOB NUMBER 2017-3097.12
DATE 09/2020
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FIGURE 4E

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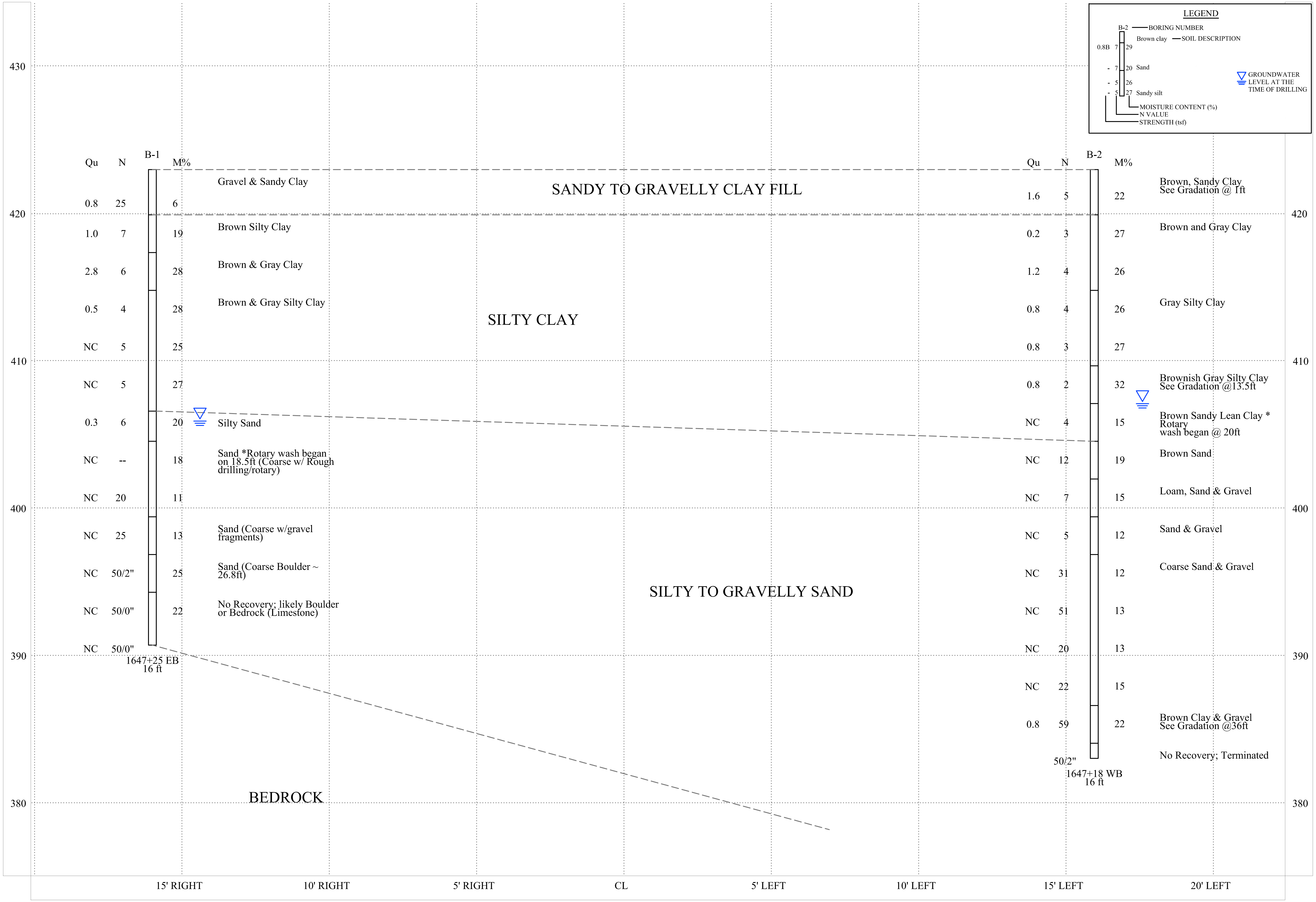

B-1

Qu	N	M%	
			Gravel & Sandy Clay
0.8	25	6	
1.0	7	19	Brown Silty Clay
2.8	6	28	Brown & Gray Clay
0.5	4	28	Brown & Gray Silty Clay
NC	5	25	
NC	5	27	
0.3	6	20	Silty Sand
NC	--	18	Sand *Rotary wash began on 18.5ft (Coarse w/ Rough drilling/rotary)
NC	20	11	
NC	25	13	Sand (Coarse w/gravel fragments)
NC	50/2"	25	Sand (Coarse Boulder ~ 26.8ft)
NC	50/0"	22	No Recovery; likely Boulder or Bedrock (Limestone)
NC	50/0"		

1647+25 EB
16 ft

B-2

Qu	N	M%	
1.6	5	22	Brown, Sandy Clay See Gradation @ 1ft
0.2	3	27	Brown and Gray Clay
1.2	4	26	
0.8	4	26	Gray Silty Clay
0.8	3	27	
0.8	2	32	Brownish Gray Silty Clay See Gradation @13.5ft
NC	4	15	Brown Sandy Lean Clay * Rotary wash began @ 20ft
NC	12	19	Brown Sand
NC	7	15	Loam, Sand & Gravel
NC	5	12	Sand & Gravel
NC	31	12	Coarse Sand & Gravel
NC	51	13	
NC	20	13	
NC	22	15	
0.8	59	22	Brown Clay & Gravel See Gradation @36ft
	50/2"		No Recovery; Terminated

1647+18 WB
16 ft

General Notes/Legend

VARIATIONS IN SUBSURFACE CONDITIONS MAY AND LIKELY EXIST BETWEEN BORINGS. DASHED HORIZONS ARE INTERPRETED AND ARE SHOWN FOR ILLUSTRATION ONLY.

PROJECT NAME

IL 108 KAMPSVILLE FERRY
CALHOUN AND GREENE COUNTY, ILLINOIS

SUBSURFACE PROFILE (WEST)

SCALE 1" = 10' V
1" = 3' H

JOB NUMBER 2017-3097.12

DATE 09/2020

DRAWN BY RCV

CHECKED BY TJC

FIGURE 4W

APPENDIX A

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Page 1 **of** 1

Date 12/12/19

ROUTE FAP 761 (IL 108) **DESCRIPTION** IL 108 Kampsville Ferry **LOGGED BY** S. Yeager

SECTION 101I-6 **LOCATION** North of IL 108, **SEC.** 2, **TWP.** 9S, **RNG.** 2W, 4th **PM**, **Latitude** , **Longitude**

COUNTY Calhoun **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Automatic

STRUCT. NO.
Station

BORING NO. B-1
Station 1647+25 EB
Offset 16.0 ft
Ground Surface Elev. 425.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 408.0 ft▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gravel & Sandy Clay		14		
		17	0.8	6
		8	P	
422.00				
Brown Silty Clay		6		
		4	1.0	19
	-5	3	P	
419.50				
Brown & Gray Clay		2		
		3	2.8	28
		3	P	
417.00				
Brown & Gray Silty Clay		3		
		2	0.5	28
	-10	2	B	
		2		
		3	NC	25
		2	P	
		3		
		2	NC	27
	-15	3		
409.00				
		1		
Silty Sand ▼		3	0.3	20
		3	P	
407.00				
Sand *Rotary wash began on 18.5ft (Coarse w/ Rough drilling/ rotary)		1		
		5	NC	18
	-20	-		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Sand *Rotary wash began on 18.5ft (Coarse w/ Rough drilling/ rotary) *(continued)*		7		
		10	NC	11
		10		
402.00				
Sand (Coarse w/gravel fragments)		14		
		12	NC	13
	-25	13		
399.50				
Sand(Coarse Boulder ~ 26.8ft)		8		
		50/2"	NC	25
397.00				
No Recovery; likely Boulder or Bedrock (Limestone)		50/0		
			NC	22
	-30			
393.50		50/0"		
End of Boring			NC	
End of Boring				
	-35			
	-40			

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

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Page 1 **of** 1

Date 12/12/19

ROUTE FAP 761 (IL 108) **DESCRIPTION** IL 108 Kampsville Ferry **LOGGED BY** S. Yeager

SECTION 101I-6 **LOCATION** North of IL 108, **SEC.** 2, **TWP.** 9S, **RNG.** 2W, 4th **PM**, **Latitude** , **Longitude**

COUNTY Calhoun **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Automatic

STRUCT. NO.
Station

BORING NO. B-2
Station 1647+18 WB
Offset 16.0 ft
Ground Surface Elev. 425.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 409.0 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown, Sandy Clay				
See Gradation @ 1ft		4		
		3	1.6	22
		2	B	
422.00				
Brown & Gray Clay		1		
		1	0.2	27
	-5	2	B	
		2		
		2	1.2	26
		2	B	
417.00				
Gray Silty Clay		2		
		1	0.8	26
	-10	3	B	
		1		
		1	0.8	27
		2	B	
412.00				
Brownish Gray Silty Clay		WH		
See Gradation @13.5ft		1	0.8	32
	-15	1	B	
409.50				
▼				
Brown Sandy Lean Clay * Rotary		WH		
wash began @ 20ft		2	NC	15
		2		
407.00				
Brown Sand		2		
		6	NC	19
	-20	6		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
404.50				
Loam, Sand & Gravel		2		
		4	NC	15
		3		
402.00				
Sand & Gravel		3		
		2	NC	12
	-25	3		
399.50				
Coarse Sand & Gravel		2		
		10	NC	12
		21		
		3		
		8	NC	13
	-30	43		
		8		
		10	NC	13
		10		
		7		
		10	NC	15
	-35	12		
389.50				
Brown Clay & Gravel		3		
See Gradation @36ft		9	0.8	22
		50	B	
387.00				
No Recovery; Terminated 386.00		50/2"		
End of Boring				
End of Boring	-40			

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

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Page 1 **of** 2

Date 12/10/19

ROUTE FAP 761 (IL 108) **DESCRIPTION** Near Kampville Ferry **LOGGED BY** S. Yeager

SECTION 101I-6 **LOCATION** South of Ferry, **SEC.** 24, **TWP.** 10N, **RNG.** 14W, 3rd **PM,**
Latitude , **Longitude**

COUNTY Greene **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Automatic

STRUCT. NO.
Station

BORING NO. B-3
Station 0+88 EB
Offset 23.0 ft CL
Ground Surface Elev. 425.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 419.0 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Rough drilling from the top Sand & Gravel		13 5 4	NC	8
422.00				
Sandy Clay & Gravel	-5	4 4 4	NC	11
419.50 ▼				
Sandy Loam & Gravel		9 8 6	NC	9
417.00				
Sand& Gravel 415.50	-10	7 5 5	NC	15
Sandy Silt		3 1 1	NC	36
412.00				
Sandy Silt Loam	-15	WH 3 2	NC	21
		WH 2 3	0.6 B	30
405.00	-20	WH WH 2	1.0 B	31

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Clay		WH WH WH	<.25 P	37
402.00				
Gray Clay Loam	-25	WH WH 1	<.25 P	37
		WH 1 1	<.25 P	42
	-30	1 1 1	NC	40
		WH WH WH	<.25 P	44
	-35	WH WH WH	<.25 P	46
389.50				
Sand		WH WH 1	NC	21
385.00	-40	5 7 7	NC	17

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

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Page 2 **of** 2

Date 12/10/19

ROUTE FAP 761 (IL 108) **DESCRIPTION** Near Kampville Ferry **LOGGED BY** S. Yeager

SECTION 101I-6 **LOCATION** South of Ferry, **SEC.** 24, **TWP.** 10N, **RNG.** 14W, 3rd **PM**, **Latitude** , **Longitude**

COUNTY Greene **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Automatic

STRUCT. NO.
Station

BORING NO. B-3
Station 0+88 EB
Offset 23.0 ft CL
Ground Surface Elev. 425.00 **ft**

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 419.0 ft ▼
Upon Completion ft
After ___ **Hrs.** ft

	DEPTH (ft)	**BLOWS (/6")**	**UCS Qu (tsf)**	**MOIST (%)**
Mud Rotary began @40 ft Gray Clay		2 3 3	<.25 P	31
	-45	WH 2 3	<.25 P	28
379.50				
Gray Sandy Loam		3 3 4	NC	23
	-50	WH WH WH	NC	36
374.50				
Gray Clay		WH WH 1	<.25 P	38
	-55	WH WH 2	0.6 B	48
		WH WH 1	NC	50
365.00	-60	WH WH 2	NC	58

	DEPTH (ft)	**BLOWS (/6")**	**UCS Qu (tsf)**	**MOIST (%)**
Boring Terminated @60 ft End of Boring End of Boring				
	-65			
	-70			
	-75			
	-80			

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

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Page 1 **of** 2

Date 12/11/19

ROUTE FAP 761 (IL 108) **DESCRIPTION** Near Kampville Ferry **LOGGED BY** S. Yeager

SECTION 101I-6 **LOCATION** South of Ferry, **SEC.** 24, **TWP.** 10N, **RNG.** 14W, 3rd **PM,**
Latitude , **Longitude**

COUNTY Greene **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Automatic

STRUCT. NO.
Station

BORING NO. B-4
Station 0+66 WB
Offset 14.0 ft CL
Ground Surface Elev. 425.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 421.0 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Sandy Loam		9 8 11	NC	10
422.00				
Gravel Sandy Loam & Gravel ▼	-5	15 10 11	NC	7
		1 5 7	NC	20
417.00				
Brown Sandy Silt	-10	WH WH WH	<.25 P	35
414.50				
Brown- Gray Silty Clay		WH WH WH	<.25 P	46
	-15	WH WH WH	0.5 B	38
		2 2 2	0.6 B	29
	-20	WH WH WH	<.25 P	28

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown- Gray Silty Clay *(continued)*		WH WH WH	<.25 P	36
	-25	WH WH WH	<.25 P	36
399.50				
Brown- Gray Clay		WH WH WH	<.25 P	43
	-30	WH WH WH	<.25 P	43
		WH WH WH	<.25 P	47
392.00				
Sand & Clay Began rotary wash @35 ft	-35	WH 1 2	NC	35
389.50				
Sand, Gravel & Peat		5 7 5	NC	22
385.00	-40	4 6 5	NC	25

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

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Page 2 **of** 2

Date 12/11/19

ROUTE FAP 761 (IL 108) **DESCRIPTION** Near Kampville Ferry **LOGGED BY** S. Yeager

SECTION 101I-6 **LOCATION** South of Ferry, **SEC.** 24, **TWP.** 10N, **RNG.** 14W, 3rd **PM**, **Latitude** , **Longitude**

COUNTY Greene **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Automatic

STRUCT. NO.
Station

BORING NO. B-4
Station 0+66 WB
Offset 14.0 ft CL
Ground Surface Elev. 425.00 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 421.0 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Top 5": Sand Rest: Brown-Gray Clay Loam End rotary wash @45 ft		WH WH 3	NC	27
	-45	1 1 1	NC	21
379.50				
Top: Sand, Bottom 8" Clay		WH 1 1	NC	32
	-50	WH WH 2	NC	32
374.50				
Top: 4" Sand Gray Clay See Gradation @53.5 ft		1 1 1	<.25 P	41
	-55	1 2 2	0.7 B	47
369.50				
Gray- Brown Clay		WH WH WH	0.5 P	53
365.00	-60	WH WH 2	NC	76

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Boring Terminated @60 ft End of Boring End of Boring				
	-65			
	-70			
	-75			
	-80			

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

BBS, form 137 (Rev. 8-99)

APPENDIX B

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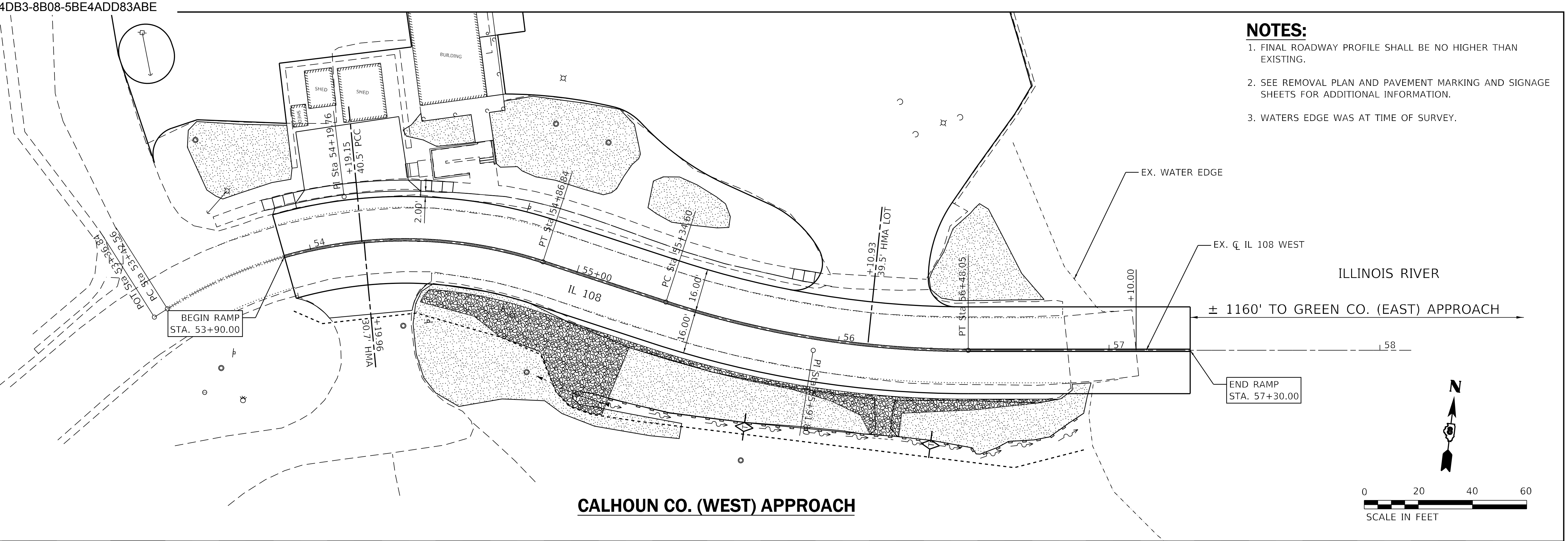
EXIST. CURVE IL108WEST_6
PI STA. = 55+91.80
Δ = 18° 06' 59" (LT)
D = 15° 58' 05"
R = 358.81'
T = 57.20'
L = 113.45'
E = 4.53'
e = ____
T.R. = ____
S.E. RUN = ____
P.C. STA. = 55+34.60
P.T. STA. = 56+48.05

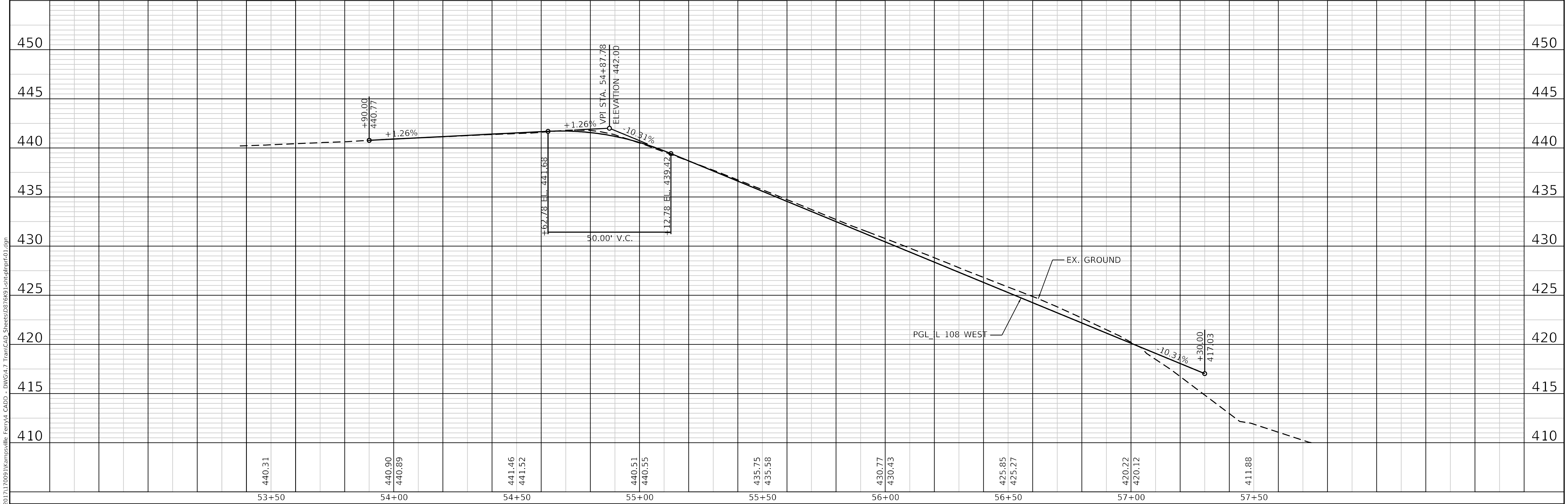
EXIST. CURVE IL108WEST_3
PI STA. = 54+19.76
Δ = 50° 29' 26" (RT)
D = 34° 59' 40"
R = 163.73'
T = 77.20'
L = 144.28'
E = 17.29'
e = ____
T.R. = ____
S.E. RUN = ____
P.C. STA. = 53+42.56
P.T. STA. = 54+86.84

NOTES:

1. FINAL ROADWAY PROFILE SHALL BE NO HIGHER THAN EXISTING.
2. SEE REMOVAL PLAN AND PAVEMENT MARKING AND SIGNAGE SHEETS FOR ADDITIONAL INFORMATION.
3. WATERS EDGE WAS AT TIME OF SURVEY.



CALHOUN CO. (WEST) APPROACH



PLAN: SURVEYED, PLOTTED, ALIGNMENT CHECKED, R/T. OF WAY CHECKED, CADD FILE NAME, NOTE BOOK NO. ____ BY DATE

PROFILE: SURVEYED, PLOTTED, GRADES CHECKED, B.M. NOTED, STRUCTURE NOTATIONS CHECKED, NOTE BOOK NO. ____ BY DATE

MODEL: Default
FILE NAME: P:\2017\170091\Kampsville Ferry\4 CADD - DWG\4.7 Tran\CAD_Sheets\D876K91-sht-plnprf-01.dgn

TWM, INC.
WWW.TWM-INC.COM
IL DESIGN FIRM LICENSE NO: 184-001220
ENGINEERING & GEOSPATIAL SERVICES

USER NAME = efisher	DESIGNED -	REVISED -	
	DRAWN -	REVISED -	
PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -	
PLOT DATE = 5/27/2020	DATE -	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE
IL 108 WEST

SCALE: 1" = 20' | SHEET OF SHEETS | STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
108	101I-6	*		

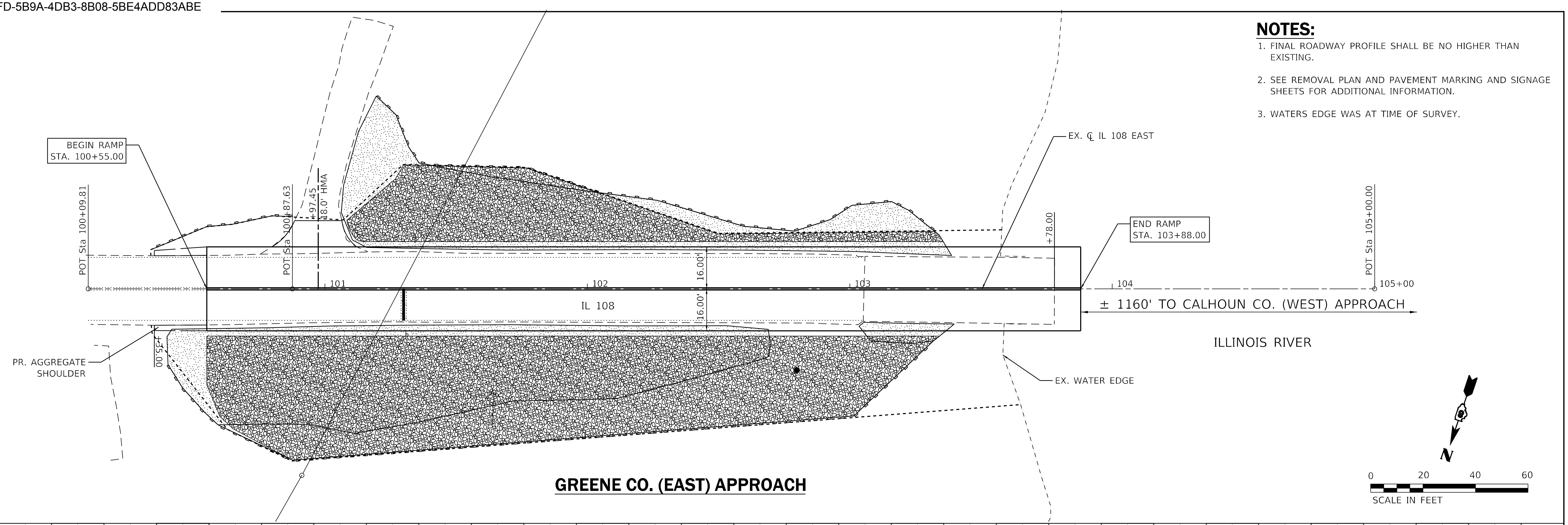
CONTRACT NO. 76K91
ILLINOIS | FED. AID PROJECT

* CALHOUN & GREENE

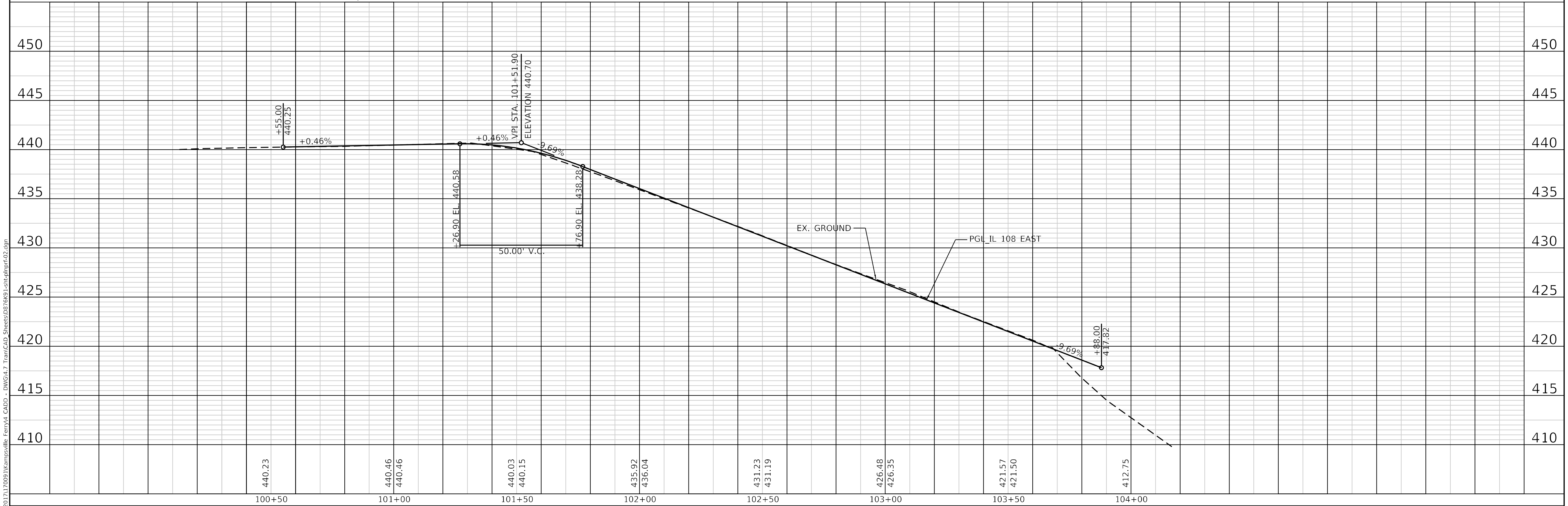
DocuSign Envelope ID: A6F0B8FD-5B9A-4DB3-8B08-5BE4ADD83ABE

NOTES:

1. FINAL ROADWAY PROFILE SHALL BE NO HIGHER THAN EXISTING.
2. SEE REMOVAL PLAN AND PAVEMENT MARKING AND SIGNAGE SHEETS FOR ADDITIONAL INFORMATION.
3. WATERS EDGE WAS AT TIME OF SURVEY.



GREENE CO. (EAST) APPROACH



PLAN: DATE / BY / SURVEYED / PLOTTED / ALIGNMENT CHECKED / R.O. WAY CHECKED / CADD FILE NAME / NOTE BOOK NO.

PROFILE: DATE / BY / SURVEYED / PLOTTED / GRADES CHECKED / B.M. NOTED / STRUCTURE NOTAT'NS CHK'D / NOTE BOOK NO.

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USER NAME = efisher	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 5/27/2020	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE
IL 108 EAST

SCALE: 1" = 20' | SHEET OF SHEETS | STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
108	101I-6	*		

CONTRACT NO. 76K91

ILLINOIS | FED. AID PROJECT

* CALHOUN & GREENE

Important Information about Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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