STRUCTURE GEOTECHNICAL REPORT

I-39 and US 20 Noise Abatement Wall 20
(I-39 Reconstruction)
Proposed SN-101-N7009

FAI 39 & FAP 301
WINNEBAGO COUNTY, ILLINOIS
JOB NO. D-92-064-19
PTB 193-020
KEG NO. 19-1138.00

03/08/2024

Authored By:
Matt Masterson, P.E. &
Michael Harden, E.I.
mmasterson@kaskaskiaeng.com
(618) 233-5877

Prepared For:
Alfred Benesch & Company
35 W Wacker Drive
Chicago, IL 60601

March 8, 2024

Kaskaskia
Engineering Group, LLC

TABLE OF CONTENTS

EXHIBITS

1.0 PROJECT DESCRIPTION AND SCOPE

1.1 Introduction

The geotechnical study summarized in this report was performed by Kaskaskia Engineering Group, LLC (KEG) for proposed Noise Wall 20 adjacent to I-39. The project is located in Winnebago County, Illinois. The purpose of this report is to document subsurface geotechnical conditions, provide analyses of anticipated site conditions as they pertain to the project described herein, and to present design and construction recommendations for the proposed structure.

1.2 Project Description

The project consists of placing a noise abatement wall along west IL-20 access ramp to I-39. The general location of the proposed structure is shown on a Location Map, Exhibit A. The project is located southeast of Rockford, IL.

1.3 Proposed Structure Information

The proposed structure will consist of one noise abatement wall. The wall will be 20 ft. tall and measure 1,811 ft. 5 1/8” long from approximately Station 69+11.46 to Station 87+20.69. A General Plan and Elevation Plan (GP&E) is included in Exhibit C.

Further substructure details will be based on the findings of this SGR.

2.0 FIELD EXPLORATION

2.1 Subsurface Exploration and Testing

Nine standard penetration test (SPT) borings were drilled by the Illinois Department of Transportation (IDOT) District 2 in May of 2023. The boring locations are shown on the Boring Plan, Exhibit B. Detailed information regarding the nature and thickness of the soils encountered and the results of the field sampling and laboratory testing are shown on the Boring Logs, Exhibit D. A Soil Profile is included as Subsurface Profile, Exhibit E.

2.2 Subsurface Conditions

The profiles at the nine (9) boring locations exhibited layers of silty clay loam, clay loam, sandy loam, sandy clay loam, loam, sandy clay loam till, clay loam till, silty sand, sand, and silty loam. Bedrock was encountered in four (4) borings (B-6, B-7, B-8, and B-9) and consisted of tan weathered limestone at around El. 818 ft. Table 2.2.1 shows a summary of depth of drilling, the top of rock, and ground surface elevation (GSE) of the borings. A summary of the general condition of the subsurface is described in Table 2.2.2.

Table 2.2.1 - Boring Information Summary

Designation	Depth (ft)	Top of Rock (ft.)	GSE (ft.)
B-1	21	-	869.64
B-2	21	-	866.57
B-3	16	-	857.37
B-4	21	-	851.67
B-5	16	-	841.30
B-6	13.5	824.6	836.60
B-7	6	825.1	829.55
B-8	5	816.1	820.59
B-9	7.5	809.5	816.54

Table 2.2.2 – Subsurface Profile Summary

Soil Type	N-Values (bpf)	Q_u (tsf)	WC (%)	Boring
Silty Clay Loam	7 - 14	0.4 - 2.3	11 – 21	B-1, B-3, B-4, B-5, B-6, B-7
Clay Loam	8 - 22	1.3 – 3.1	15 – 20	B-1, B-4, B-5
Sandy Loam	8 – 62	-	7 – 19	B-1, B-4, B-5, B-6, B-8, B-9
Sandy Clay Loam	9 - 34	-	9 – 21	B-1, B-2, B-3, B-4, B-5, B-7
Loam	-	-	15	B-2
Sandy Clay Loam Till	11 – 26	-	12 – 13	B-2, B-4
Clay Loam Till	-	-	-	B-1
Silty Sand	9	-	12 – 16	B-4
Sand	11	-	17	B-5, B-6
Silty Loam	6 - 16	-	17 – 24	B-5, B-6, B-9

2.3 Groundwater

Groundwater was not encountered during drilling. It should be noted that the groundwater level is subject to seasonal and climatic variations. In addition, without extended periods of observation, measurement of true groundwater levels may not be possible.

3.0 GEOTECHNICAL EVALUATIONS

3.1 Settlement

Since no significant grading or changes to the existing grade level are expected, it is estimated that no settlement will be experienced. Therefore, no settlement calculations were performed for the proposed structure.

3.2 Seismic Considerations

The determination of Seismic Site Class was based on the method described by IDOT AGMU Memo 09.1 - Seismic Site Class Definition and the IDOT provided spreadsheet titled: '*Seismic Site Class Determination*.' Using these resources, the controlling global site class for this project is Soil Site Class C.

Additional seismic parameters were calculated for use in the design of the structure. Published information and mapping from the USGS, including software directly applicable to the AASHTO Guide Specifications for LRFD Seismic Bridge Design, was used to develop the parameters for the bridge location. The values, based on Soil Site Class C, are summarized below.

Table 3.2.1 - Summary of Seismic Parameters

Parameter	Value
Soil Site Class	C
Spectral Response Acceleration, 0.2 Sec, S_{DS}	0.102 g (Site Class C)
Spectral Response Acceleration, 1.0 Sec, S_{D1}	0.056 g (Site Class C)
Seismic Performance Zone	1

As indicated in the table above, the Seismic Performance Zone is 1, based on S_{D1} and Table 3.15.2-1 in the IDOT Bridge Manual, the Soil Site Class C, and Figure 2.3.10-4 in the IDOT Bridge Manual.

4.0 FOUNDATION EVALUATIONS AND DESIGN RECOMMENDATIONS

4.1 Foundation Recommendations

The foundations supporting the proposed walls should be sufficient to resist the dead and dynamic loads. For the zones where the bedrock was not encountered within 15 ft below the GSE, the drilled shafts' side resistance was calculated using the alpha (α) method for cohesive soils and beta (β) method for cohesionless soils. LRFD Resistance Factors of 0.55 for side resistance and 0.5 for tip resistance for cohesionless soils, and resistance factors of 0.45 for side resistance and 0.4 for tip resistance for cohesive soils are incorporated into the allowable capacities, respectively.

For the zones where the bedrock was encountered, the provided capacities are based on empirical values of weathered limestone strength properties and utilizing the IDOT Drilled Shaft Axial Capacity in Rock spreadsheet as provided by IDOT BBS Foundations and Geotechnical Unit. LRFD Resistance Factors of 0.55 for side resistance and 0.5 for tip resistance are incorporated into the allowable capacities, respectively. (See Exhibit F – Foundation Analysis)

Table 4.1.1 shows the summary of the boring selected by stationing. The estimated Drilled Shaft Axial Capacity summary of Factored Shaft Resistances available for various shaft diameters based on socket depths are shown in Tables 4.1.2 through 4.1.5 below.

Table 4.1.1 - Summary of Foundation Recommendations

Stationing	Boring	Bottom of NWA Elevation	Top of Rock
69+11.44 – 74+00.00	B-1	861.30	-
74+00.00 – 78+00.00	B-5	839.30	-
78+00.00 – 80+00.00	B-6	836.07	824.60
80+00.00 – 87+20.67	B-7	830.19	825.10

Table 4.1.2 - Estimated Drilled Shaft Axial Capacity for STA 69+11.44 – 74+00.00 (Boring B-1)

Diameter Socket (in.)	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE
30	5	63.82	25.53	0.96	0.43
	10	141.37	70.69	16.06	8.74
	15	141.37	70.69	34.47	18.86
36	5	91.90	36.76	1.15	0.52
	10	203.58	101.79	19.27	10.48
	15	203.58	101.79	41.37	22.64
42	5	125.08	50.03	1.34	0.60
	10	277.09	138.54	22.48	12.23
	15	277.09	138.54	48.26	26.41
48	5	163.37	65.35	1.53	0.69
	10	361.91	180.96	25.70	13.98
	15	361.91	180.96	55.16	30.18

Table 4.1.3 - Estimated Drilled Shaft Axial Capacity for STA 74+00.00 – 78+00.00 (Boring B-5)

Diameter Socket (in.)	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE
30	5	188.50	94.25	28.84	14.21
	10	64.80	32.40	65.83	34.56
	15	12.76	5.11	88.49	45.92
36	5	271.43	135.72	34.61	17.05
	10	93.31	46.65	78.99	41.47
	15	18.38	7.35	106.19	55.11
42	5	369.45	184.73	40.37	19.90
	10	127.00	63.50	92.16	48.38
	15	25.01	10.01	123.89	64.29
48	5	482.55	241.27	46.14	22.74
	10	165.88	82.94	105.33	55.29
	15	32.67	13.07	141.59	73.48

Table 4.1.4 - Estimated Drilled Shaft Axial Capacity for STA 78+00.00 – 80+00.00 (Boring B-6)

Diameter Socket (in.)	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE
30	3	93	46	67	37
	5	104	52	111	61
	7	114	57	156	86
36	3	134	67	80	44
	5	150	75	134	74
	7	160	82	187	103
42	3	182	91	94	82
	5	204	102	156	86
	7	223	111	219	120

Diameter Socket (in.)	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE
48	3	238	119	107	59
	5	266	133	178	98
	7	291	145	250	137

Table 4.1.5 - Estimated Drilled Shaft Axial Capacity for STA 80+00.00 – 87+20.67 (Boring B-7)

Diameter Socket (in.)	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE
30	3	118	59	67	37
	5	127	63	111	61
	7	135	67	156	86
36	3	170	85	80	44
	5	182	91	134	74
	7	194	97	187	103
42	3	232	116	94	52
	5	248	124	156	86
	7	264	132	219	120
48	3	303	151	107	59
	5	324	162	178	98
	7	344	172	250	137

4.2 Lateral Pile Response

Generally, the geotechnical engineer provides soil parameters to the structural engineer so that an L-Pile program, or other approved software, can be used for the lateral or displacement analysis of the foundations. Table 4.2.1 and Table 4.2.2 are included for the structural engineer's use in determining lateral pile response.

Table 4.2.1 - Soil Parameters for Lateral Pile Load Analysis

Boring	Soil Description	Depth at Bot. of Layer (Ft.)	γ (pcf)	Short Term		Long Term		N Value (Ave.)	Assumed% Fines < #200	K (pci)	ε50
				c (psf)	Φ (deg.)	c (psf)	Φ (deg.)				
B-1	Silty Clay Loam	861.14	120	1525	28	100	28	9	65	500	0.007
	Sandy Loam	853.64	120	-	33	-	33	18	35	90	-
	Clay Loam	851.14	120	2300	0	100	26	17	65	1000	0.005
B-2	Loam	864.57	120	-	32	-	32	20	25	90	-
	Gravel	859.57	125	-	31	-	38	16	3	-	-
	Sandy clay loam	845.57	120	-	33	-	33	19	45	90	-
B-3	Silty Clay Loam	855.37	120	1100	28	100	28	17	65	500	0.007
	Gravel	847.87	125	-	31	-	38	13	3	-	-
	Sandy clay loam	841.37	120	-	32	-	32	17	45	90	-
B-4	Silty Clay Loam	849.67	120	1500	28	100	28	18	65	500	0.007
	Gravel	844.67	125	-	32	-	38	21	3	-	-
	Sandy clay loam	840.67	120	-	33	-	33	20	45	90	-
	Clay Loam	838.17	120	-	0	150	26	22	65	2000	0.004
	Sandy Loam	835.67	120	-	34	-	34	23	35	90	-
	Silty Sand	833.17	115	-	30	-	30	9	25	25	-
	Silty Clay Loam	830.67	120	2100	28	100	28	14	65	1000	0.005
B-5	Silty Clay Loam	837.30	120	2100	28	100	28	17	65	1000	0.005
	Sandy clay loam	832.80	120	-	33	-	33	24	45	90	-
	Fine Sand	830.30	115	-	30	-	30	11	5	90	-
	Sandy Loam	827.80	120	-	29	-	29	8	35	25	-
	Silty Clay Loam	825.30	120	400	28	100	28	7	65	30	0.02
B-6	Silty Clay Loam	834.60	120	800	28	100	28	11	65	100	0.01
	Fine Sand	833.10	115	-	30	-	30	11	5	90	-
	Silty Loam	828.10	120	-	30	-	30	11	65	90	-
	Sandy Loam	824.60	120	-	30	-	30	12	35	90	-
B-7	Silty Clay Loam	827.55	120	800	28	100	28	9	65	100	0.01
	Sandy clay loam	826.05	120	-	29	-	29	9	45	25	-
B-8	Sandy Loam	816.09	120	-	39	-	39	51	35	225	-
B-9	Silty Loam	814.54	120	-	29	-	29	8	65	25	-
	Sandy Loam	810.54	120	-	36	-	36	35	35	225	-

Table 4.2.2 - Rock Parameters for Lateral Pile Load Analysis

Rock Type	y (psf)	Qu (tsf)	Φ (deg.)
Limestone	145	25	45

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Construction Activities

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.

Should any design considerations assumed by KEG change, KEG should be contacted to determine if the recommendations stated in this report still apply.

5.2 Temporary Sheeting and Soil Retention

Temporary shoring is not anticipated as the wall will be constructed on ground level.

5.3 Site and Soil Conditions

Provisions of the Standard Specifications should adequately address site and soil conditions.

6.0 COMPUTATIONS

Computations and analyses for specific circumstances, if any, are included as exhibits. Please refer to each section of the report for reference to the exhibit containing any such calculations or analysis used.

7.0 GEOTECHNICAL DATA

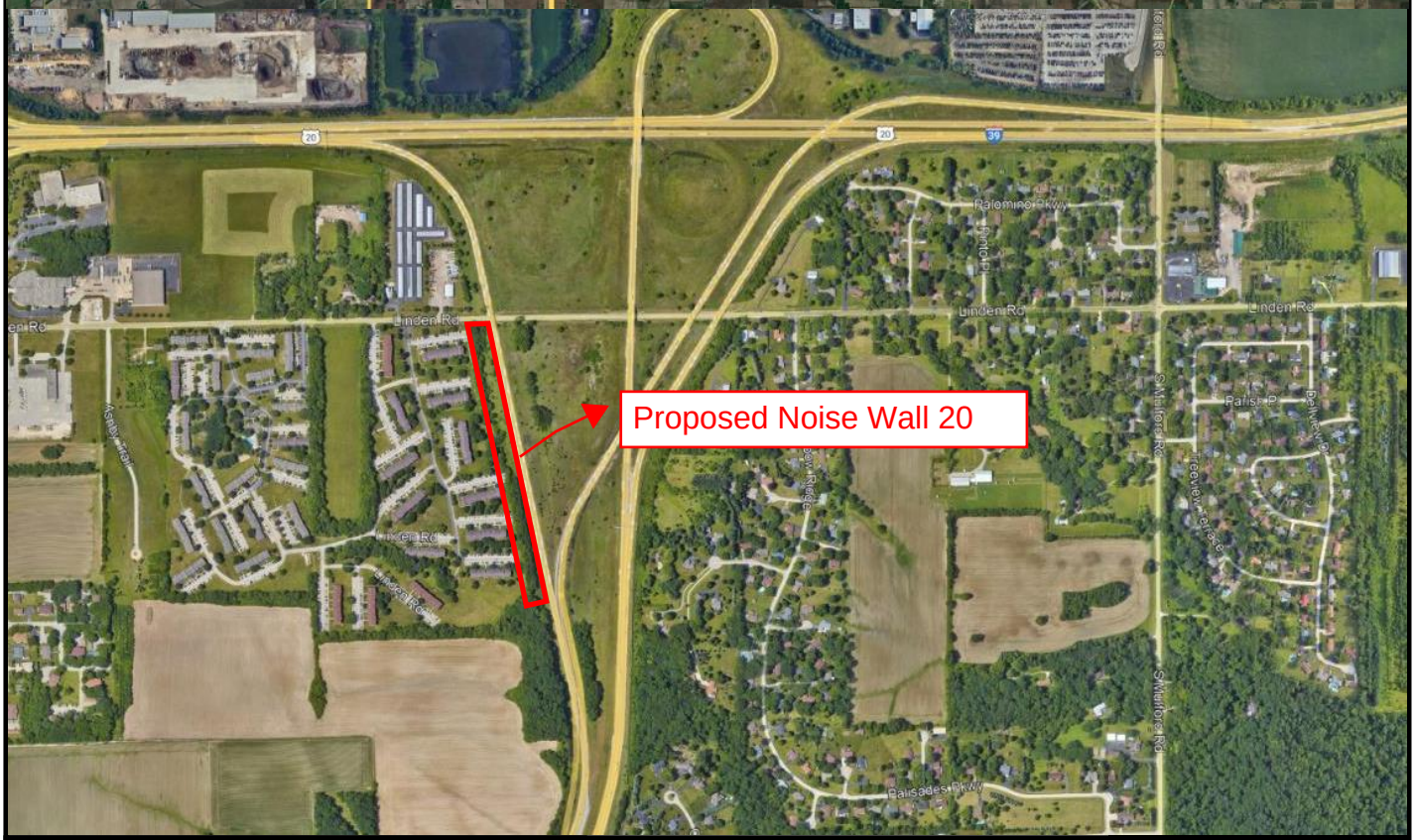
Soil boring logs and subsurface profiles can be found in Exhibit D and Exhibit E. Foundation Design Tables can be found in Exhibit F.

8.0 LIMITATIONS

The recommendations provided herein are for the exclusive use of Alfred Benesch & Company and the Illinois Department of Transportation (IDOT) District 2. They are specific only to the project described. They are based on the subsurface information obtained by IDOT at nine boring locations within the structure area, KEG's understanding of the project as described herein, and geotechnical engineering practice consistent with the standard of care. No other warranty is expressed or implied. KEG should be contacted if conditions encountered during construction are not consistent with those described.

EXHIBIT A

LOCATION MAP



Kaskaskia Engineering Group, LLC

LOCATION MAP

I-39 Noise
Abatement Wall 20
Winnebago County,
Illinois

Exhibit No.

A

KEG JOB #19-1138.00

EXHIBIT B

BORING PLAN

Kaskaskia Engineering Group, LLC

BORING LOCATION MAP

I-39 Noise
Abatement Wall 20
Winnebago County,
Illinois

Exhibit No.

B

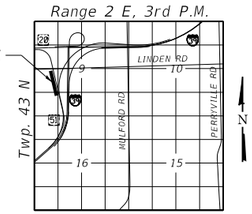
KEG JOB #19-1138.00

EXHIBIT C

GENERAL PLAN AND ELEVATION PLAN (GP&E)

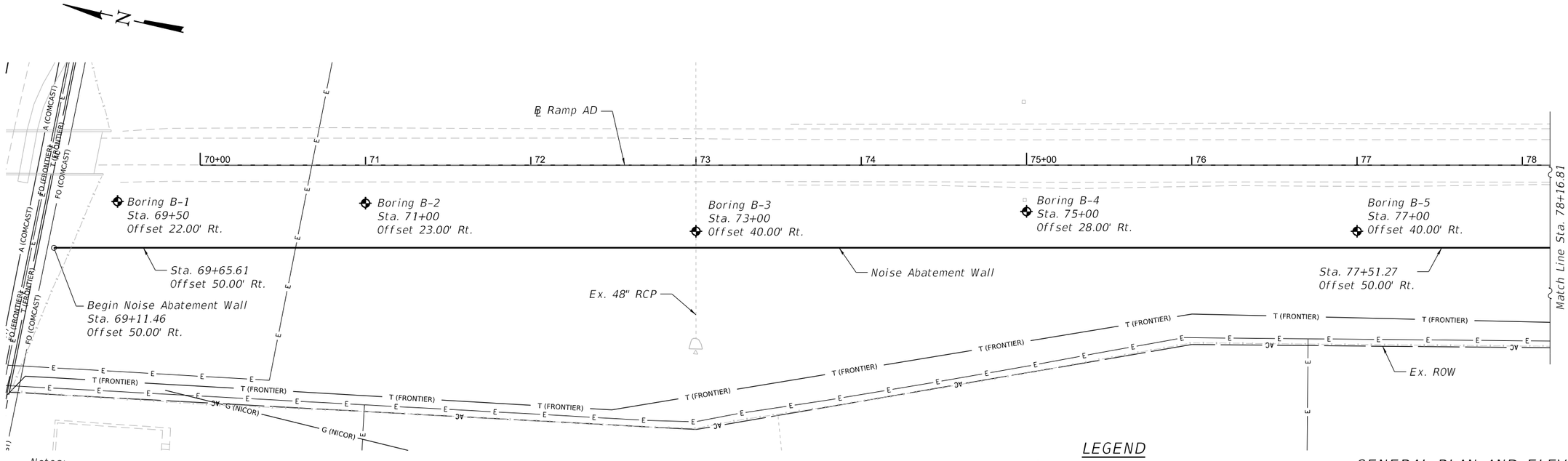
Benchmark: BM#454 – Cut "□" on westerly sign base of 30 mph ramp sign located 0.1 mile north of the centerline of Linden Road along the west side of I-39. Elev. 850.53, 42°13'06.4" N. 89°00'40.8" W.

INDEX OF SHEETS



LOCATION SKETCH

ELEVATION



PLAN

Notes:

Offsets are measured from ℄ Ramp AD to ℄ Noise Abatement Wall or Boring location.

See Data Table on sheet 3 of 9 for Offsets and Theoretical Elevations along the ℄ of Noise Abatement Wall.

Theoretical Top of NAW Elev., Theoretical Bottom of NAW Elev., Existing Grade Elev. at ℄ of NAW, and Finished Grade Elev. at ℄ of NAW shall be taken as straight lines in the segments between each pair of stations shown in the Data Table on sheet 3 of 9.

Access doors are to be spaced at 300' maximum intervals.

LEGEND

- Noise Abatement Wall Soil Boring
- Existing Fence
- AC — Access Control
- FO (COMCAST) — Comcast Fiber Optic
- FO (FRONTIER) — Frontier Fiber Optic
- T (FRONTIER) — Frontier Underground Telephone
- E — Underground Electric
- G (NICOR) — Nicor Gas Line
- A (COMCAST) — Comcast Aerial Line

GENERAL PLAN AND ELEVATION
NOISE ABATEMENT WALL
F.A.I ROUTE 39 SEC. (201-3)R & (4-1,5)R
WINNEBAGO COUNTY
STA. 69+11.46 TO STA. 87+20.69
STRUCTURE NO. 101-N7009

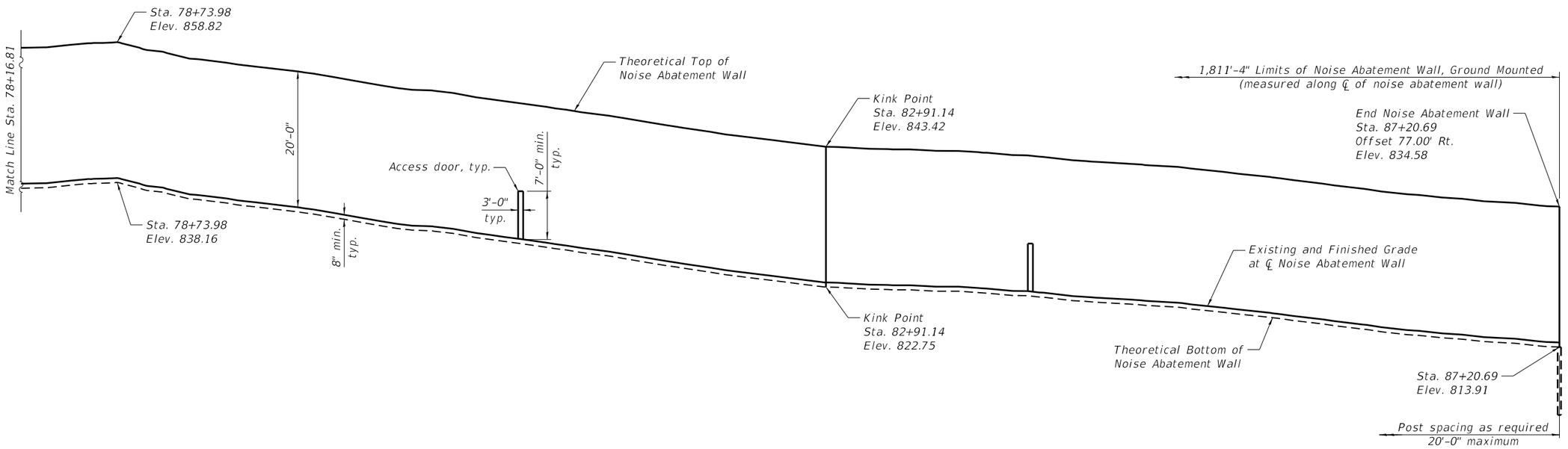
QUIGG ENGINEERING INC	USER NAME = zdavidson	DESIGNED - ZLD	REVISED -	
	101W7009-64C24-001-GPE1.dgn	CHECKED - KWB	REVISED -	
	PLOT SCALE =	DRAWN - ZLD	REVISED -	
	PLOT DATE = 05/09/2024	CHECKED - MDC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

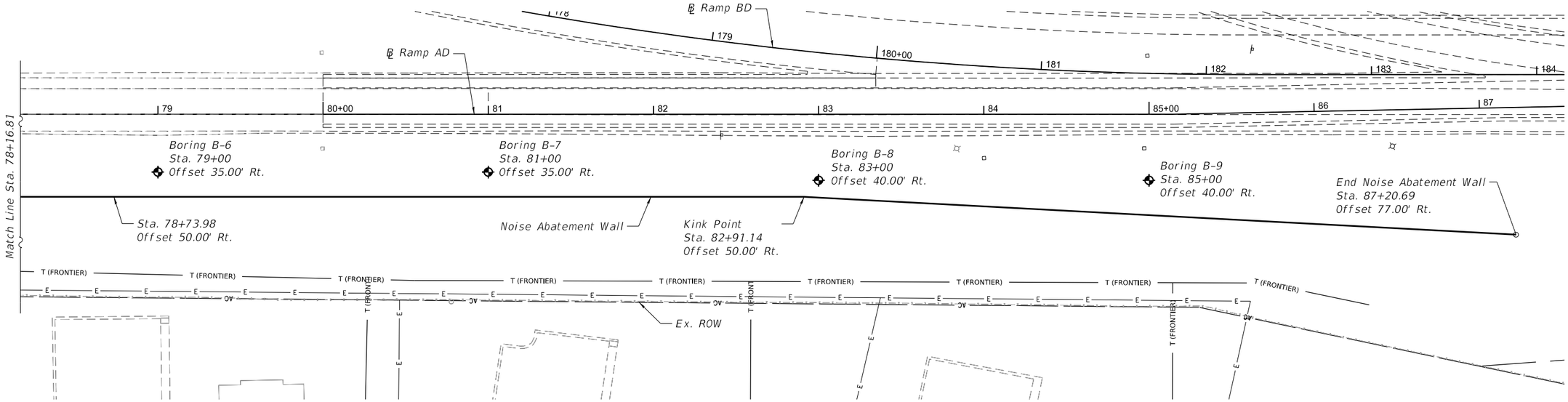
NOISE ABATEMENT WALL GENERAL PLAN AND ELEVATION I
STRUCTURE NO. 101-N7009
SHEET 1 OF 9 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
39	(201-3)R & (4-1,5)R	WINNEBAGO	1552	787
		CONTRACT NO. 64C24		
		ILLINOIS	FED. AID PROJECT	

MODEL: Default
FILE NAME: pw:\\benesch-pw.bentley.com:benesch-pw-01\Documents\108009s\108000.00\Eng_Docs\CAD_Sheets\do you mean\101W7009-64C24-001-GPE1.dgn
5/9/2024 3:36:47 PM



ELEVATION



PLAN

Notes:

Offsets are measured from ℄ Ramp AD to ℄ Noise Abatement Wall or Boring location.

See Data Table on sheet 3 of 9 for Offsets and Theoretical Elevations along the ℄ of Noise Abatement Wall.

Theoretical Top of NAW Elev., Theoretical Bottom of NAW Elev., Existing Grade Elev. at ℄ of NAW, and Finished Grade Elev. at ℄ of NAW shall be taken as straight lines in the segments between each pair of stations shown in the Data Table on sheet 3 of 9.

Access doors are to be spaced at 300' maximum intervals.

LEGEND

- Noise Abatement Wall Soil Boring
- Existing Fence
- AC — Access Control
- T (FRONTIER) — Frontier Underground Telephone
- E — E — Underground Electric

QUIGG ENGINEERING INC

USER NAME = zdavidson	DESIGNED - ZLD	REVISED -			
101W7009-64C24-002-GPE2.dgn	CHECKED - KWB	REVISED -			
PLOT SCALE =	DRAWN - ZLD	REVISED -			
PLOT DATE = 05/09/2024	CHECKED - MDC	REVISED -			

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NOISE ABATEMENT WALL GENERAL PLAN AND ELEVATION II
STRUCTURE NO. 101-N7009
SHEET 2 OF 9 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
39	(201-3)R & (4-1.5)R	WINNEBAGO	1552	788
		CONTRACT NO. 64C24		
	ILLINOIS	FED. AID PROJECT		

MODEL: Default
FILE NAME: pw:\\benesch-pw.bentley.com:benesch-pw-01\Documents\10800s\10800.001Eng_Docs\CAD_Sheets\do you mean\101W7009-64C24-002-GPE2.dgn
5/9/2024 3:36:58 PM

GENERAL NOTES

1. All excavation and grading below the finished grade elevation required for installation of the Noise Abatement Wall elements shall be included in the cost of Noise Abatement Wall, Ground Mounted.

2. Contractor shall follow requirements of Guide Bridge Special Provision "Noise Abatement Wall, Ground Mounted" for material, design, fabrication, construction and erection requirements of the proposed Noise Abatement Wall.

3. The Contractor shall field verify location of the existing utilities prior to construction. The Contractor shall take precautions not to damage existing utilities. Any such damage shall be repaired by the Contractor at no additional cost. All adjacent utilities shall be shown on the shop drawings.

4. Noise Abatement Wall drilled shaft foundation diameter, depth and spacing to be determined by the Contractor.

5. Precast panels for the Ground Mounted Noise Abatement Walls shall be cast using form liners with a simlulated limestone surface. Form liners shall be used on both faces of the panels. The form liner shall match the exact size of each panel such that there are no joints crossing the stone modules. The relief shall be an average of 1½" deep and no greater than 2½" deep at any point. The desired appearance is as follows:

6. Form liners shall be made from high-strength elastomeric urethane and be removable without causing concrete surface damage or weakness in the substrate. Form release agents shall be non-staining, non-residual, non-reactive, and shall not contribute to the degradation of the form liner material.

7. The following form liner manufacturers have been pre-approved to provide the listed pattern for the simulated limestone surface:

   a. Custom Rock International, St. Paul, MN (Jim Rogers; 800-637-2447)
      #1104-R2 14¾" Random Cut Stone or #11016 16" Random Cut Stone
   b. Milestones Incorporated, Hudson, WI (Paul Nasvik; 715-381-9660)
      #MS-1018 16" Weathered Limestone
   c. Architectural Polymers, New Ringgold, PA (Rick Fasching; 610-824-3322)
      #893 14" Quarry Stone or #894 16" Quarry Stone

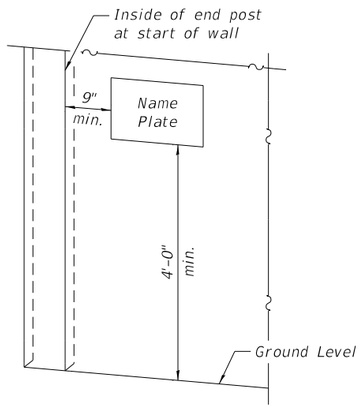
   Other products will be considered, provided sufficient information is submitted 30-days prior to use to allow the Engineer to determine that products proposed are equivalent to those named.

8. Form liners shall be used in accordance with the manufacturer's recommendations, including, but not limited to, installation and removal methods, form release agents, cleaning procedures, inspection procedures, repair procedures, curing methods, concrete slump requirements, and consolidation methods to achieve the highest quality concrete appearance possible. Manufacturer recommendations shall not supplant requirements listed elsewhere in the Contract Documents without prior approval from the Engineer.

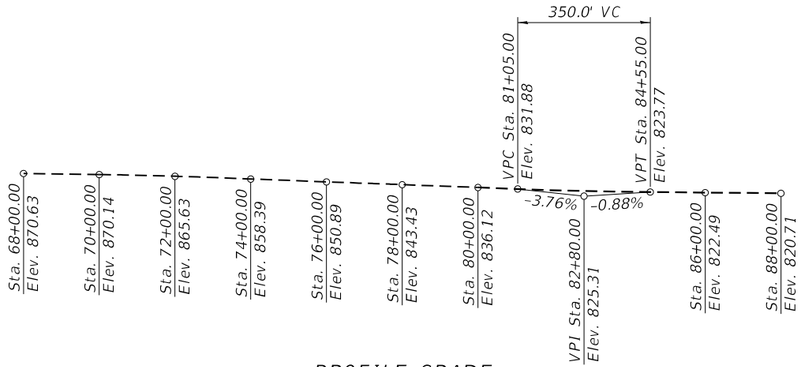
9. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks after removing the form liners. Grinding and chipping of finished formed surfaces shall be avoided.

10. The Contractor shall provide a full-size precast panel mockup containing the form liner surface. Upon receipt of comments from inspection of the mockup, adjustments or corrections shall be made where imperfections are found. If required, additional mockups shall be prepared when the initial mockup is found to be unsatisfactory.

11. All work and materials associated with form liners and mockups, including adjustments or corrections needed to address mockup comments and additional mockups, if required, will not be paid for separately but shall be included in the cost of Noise Abatement Wall, Ground Mounted.



NAME PLATE LOCATION



PROFILE GRADE

(Along ℄ Ramp AD)

DATA TABLE

Station	Offset to ℄ Wall (ft.)	Theor. Top of NAW Elev.	Exist./Finished Grade Elev. at ℄ of NAW	Theor. Bottom of NAW Elev.
69+11.46	50.00	876.31	856.31	855.64
69+50.00	50.00	882.09	862.09	861.43
69+65.61	50.00	882.91	862.91	862.24
70+00.00	50.00	882.18	862.18	861.51
70+50.00	50.00	881.26	861.26	860.60
71+00.00	50.00	880.33	860.33	859.67
71+50.00	50.00	879.12	859.12	858.46
72+00.00	50.00	877.76	857.76	857.09
72+50.00	50.00	876.31	856.31	855.65
73+00.00	50.00	874.42	854.42	853.75
73+50.00	50.00	872.38	852.38	851.72
74+00.00	50.00	870.18	850.18	849.51
74+50.00	50.00	868.05	848.05	847.38
75+00.00	50.00	865.88	845.88	845.22
75+50.00	50.00	863.77	843.77	843.11
76+00.00	50.00	861.74	841.74	841.08
76+50.00	50.00	860.53	840.53	839.86
77+00.00	50.00	859.02	839.02	838.36
77+50.00	50.00	857.74	837.74	837.07
77+51.27	50.00	857.69	837.69	837.03
78+00.00	50.00	857.75	837.75	837.08
78+50.00	50.00	858.50	838.50	837.83
78+73.98	50.00	858.82	838.82	838.16
79+00.00	50.00	857.43	837.43	836.76
79+50.00	50.00	855.37	835.37	834.70
80+00.00	50.00	853.73	833.73	833.06
80+50.00	50.00	851.78	831.78	831.11
81+00.00	50.00	850.20	830.20	829.53
81+50.00	50.00	848.41	828.41	827.75
82+00.00	50.00	846.48	826.48	825.81
82+50.00	50.00	844.68	824.68	824.02
82+91.14	50.00	843.42	823.42	822.75
83+00.00	50.47	843.35	823.35	822.69
83+50.00	53.12	842.88	822.88	822.22
84+00.00	55.78	842.20	822.20	821.53
84+50.00	58.43	841.19	821.19	820.52
85+00.00	61.09	840.39	820.39	819.72
85+50.00	64.52	838.97	818.97	818.31
86+00.00	68.17	837.38	817.38	816.72
86+50.00	71.83	835.98	815.98	815.32
87+00.00	75.48	834.99	814.99	814.32
87+20.69	77.00	834.58	814.58	813.91

DESIGN STRESSES

FIELD UNITS

f'c = 4,000 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (Struct. Steel, M270 Grade 50, posts)
fy = 36,000 psi (Struct. Steel, M270 Grade 36, all other structural steel)

PRECAST UNITS

f'c = 4,500 psi
fy = 60,000 psi (Reinforcement)
fy = 65,000 psi (Welded Wire Reinforcement)

DESIGN SPECIFICATIONS

2020 AASHTO LRFD Bridge Design Specifications, 9th Edition

DESIGN LOADS

Strength III or V Wind: 35 psf
Service I Wind: 15 psf

NOISE ABATEMENT WALL
BUILT 202_ BY
STATE OF ILLINOIS
F.A.I. RT. 39
SEC. (201-3)R & (4-1,5)R
FROM STA. 69+11.46 TO STA. 87+20.69
STR. NO. 101-N7009

NAME PLATE

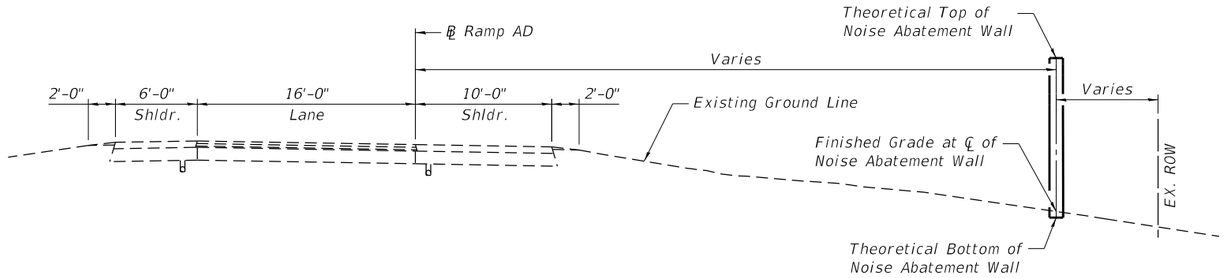
See Std. 515001

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
Name Plates	Each	1
Noise Abatement Wall, Ground Mounted	Sq. Ft.	37,435

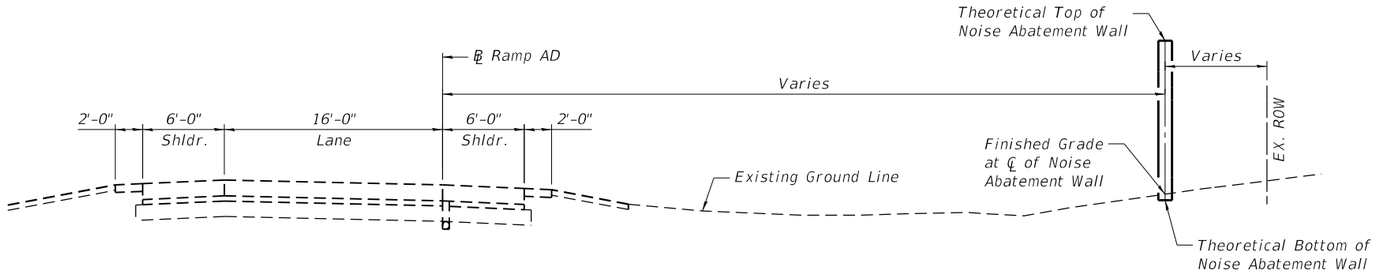
NOISE REDUCTION DATA TABLE

Noise Wall Structure Number	Face	From Sta.	To Sta.	Noise Reduction Coefficient	Comments
101-N7009	Ramp AD Face	69+11.46	87+20.69	Reflective	-
	Residential Face	69+11.46	87+20.69	Reflective	-



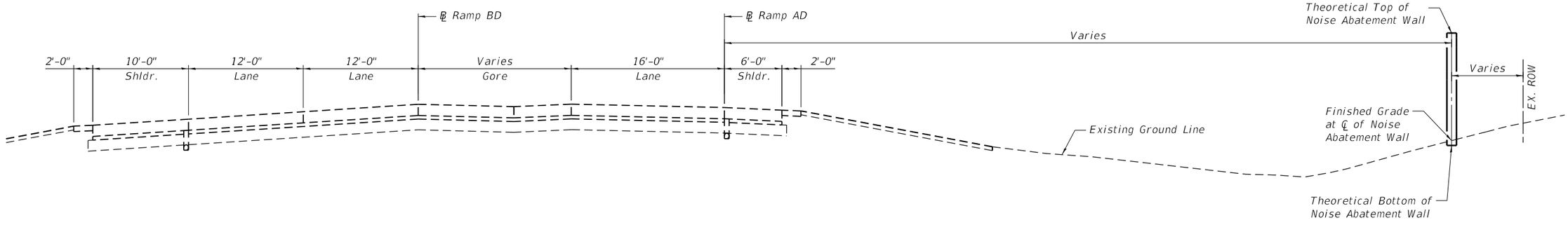
TYPICAL SECTION THRU WALL

(Sta. 69+11.46 to Sta. 80+00.00)
(Wall stations are measured along ℄ Ramp AD)



TYPICAL SECTION THRU WALL

(Sta. 80+00.00 to Sta. 83+34.57)
(Wall stations are measured along ℄ Ramp AD)



TYPICAL SECTION THRU WALL

(Sta. 83+34.57 to Sta. 87+20.69)
(Wall stations are measured along ℄ Ramp AD)

MODEL: Default
FILE NAME: pw:\\benesch-pw.bentley.com:benesch-pw-01\Documents\108009s\10800.00\Eng_Docs\CAD_Sheets\do you mean\101W7009-64C24-004-Typical Sections.dgn

QUIGG ENGINEERING INC

USER NAME = zdavidson	DESIGNED - ZLD	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTIONS STRUCTURE NO. 101-N7009
101W7009-64C24-004-Typical Sections.dgn	CHECKED - KWB	REVISED -		
PLOT SCALE =	DRAWN - ZLD	REVISED -		
PLOT DATE = 05/09/2024	CHECKED - MDC	REVISED -		SHEET 4 OF 9 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
39	(201-3)R & (4-1.5)R	WINNEBAGO	1552	790
		CONTRACT NO. 64C24		
	ILLINOIS	FED. AID PROJECT		

5/9/2024 3:37:10 PM

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/22/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-1
Station 69+50
Offset 22.0 ft RT
Ground Surface Elev. 869.64 ft

Surface Water Elev. ft
Stream Bed Elev. ft

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.8 P	18
	867.6	2		
VERY STFF light brown SITLY CLAY LOAM		3 7	2.3 B	15
	865.1			
STIFF light brown CLAY LOAM	-5	3 3 5	1.3 P	16
	862.6			
STIFF light brown CLAY LOAM with SAND		2 5 6	1.7 B	19
	860.1			
STIFF light brown SANDY LOAM with GRAVEL	-10	2 10 9	1.7 B	16
	857.6			
STIFF light brown SANDY LOAM		3 10 12	1.4 B	16
	855.1			
STIFF light brown SANDY CLAY LOAM with DRY SANDY GRAVEL LENS	-15	4 8 7	1.2 B	16
	852.6			
VERY STIFF gray CLAY LOAM		3 6 10	2.7 B	18
	850.1			
	-20	4		
STIFF light brown CLAY LOAM TILL *(continued)*	848.6	7 11	1.9 B	18
End of Boring				
	-25			
	-30			
	-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)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/22/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-2
Station 71+00
Offset 23.0 ft RT
Ground Surface Elev. 866.57 ft

Surface Water Elev. ft
Stream Bed Elev. ft

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown LOAM			0.8 P	15
	864.6			
MEDIUM tan WEATHERED LIMESTONE		15 11 9		
	862.1			
MEDIUM tan WEATHERED LIMESTONE FILL	-5	6 7		6
	859.6			
STIFF light brown SANDY CLAY LOAM TILL		6 5 6	1.3 B	12
	857.1			
VERY STIFF light brown SANDY CLAY LOAM	-10	6 9 14	2.7 B	15
	854.6			
VERY STIFF light brown SANDY CLAY LOAM		5 7 10	3.9 B	13
	852.1			
VERY STIFF light brown SANDY CLAY LOAM	-15	5 8 13	2.9 B	14
	849.6			
STIFF brown SANDY CLAY LOAM		5 7 10	1.2 B	17
	847.1			
	-20	5		
VERY STIFF gray SANDY CLAY LOAM with FINE SAND LENS *(continued)*	845.6	10 16	2.3 S	11
End of Boring				
	-25			
	-30			
	-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)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/23/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-3
Station 73+00
Offset 40.0 ft RT
Ground Surface Elev. 857.37 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter None ft
Upon Completion Dry ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.1 P	
	855.4			
MEDIUM tan DRY WEATHERED LIMESTONE FILL		6		
		5 12		16
	852.9			
MEDIUM tan DRY WEATHERED LIMESTONE FILL	-5	5		
		3 9		
hard drilling				
	850.4			
LOOSE tan WEATHERED LIMESTONE FILL		6		
		6 4		
	847.9			
VERY STIFF brown SANDY CLAY LOAM	-10	2		
		3 7	3.5 B	14
	845.4			
VERY STIFF brown SANDY CLAY LOAM		6		
		11 11	2.7 B	9
	842.9			
VERY STIFF gray/tan SANDY CLAY LOAM	-15	5		
		8 11	3.7 B	13
	841.4			
End of Boring				
	-20			

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

SOIL BORING LOG

Date 5/23/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-4
Station 75+00
Offset 28.0 ft RT
Ground Surface Elev. 851.67 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.5 P	11
	849.7			
MEDIUM tan DRY WEATHERED LIMESTONE FILL		13		
		11 7		
	847.2			
MEDIUM tan DRY WEATHERED LIMESTONE FILL	-5	3		
		12 13		
Hard drilling				
	844.7			
VERY STIFF brown SANDY CLAY LOAM		2		
		5 9	2.9 S	14
	842.2			
STIFF brown SANDY CLAY LOAM TILL	-10	5		
		7 19	1.3 B	13
	839.7			
VERY STIFF light brown CLAY LOAM		9		
		10 12	2.9 B	20
	837.2			
MEDIUM brown SANDY LOAM with FINE SAND LENS	-15	9		
		12 11	1.0 S	10
	834.7			
STIFF tan SILTY SAND with FINE SAND LENS		4		
		3 6	1.1 S	16
	832.2			
	-20	3		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY STIFF dark gray SILT CLAY LOAM *(continued)*	830.7	5 9	2.1 B	21
End of Boring				
	-25			
	-30			
	-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)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/24/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-5
Station 77+00
Offset 40.0 ft RT
Ground Surface Elev. 841.30 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM			1.1 P	13
	839.3	3		
VERY STIFF brown CLAY LOAM		7 10	3.1 B	15
	836.8 -5	6		
VERY STIFF gray SANDY CLAY LOAM		15 19	2.9 B	17
	834.3	3		
STIFF brown SANDY LOAM with SAND LENS		7 7	1.1 B	15
	831.8 -10	4		
MEDIUM brown FINE SAND		5 6		12
	829.3	2		
LOOSE light brown MOIST SANDY LOAM		4 4		19
	826.8 -15	2		
SOFT light gray SILTY CLAY LOAM		3 4	0.4 B	19
	825.3			
End of Boring				
	-20			

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

SOIL BORING LOG

Date 5/25/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-6
Station 79+00
Offset 35.0 ft RT
Ground Surface Elev. 836.60 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.8 P	11
	834.6	3		
MEDIUM brown MOIST FINE SAND		5 6		17
	832.1 -5	2		
SOFT tan SILTY LOAM		3 3	0.3 P	24
	829.6	5		
VERY SOFT light brown SILTY LOAM with SAND LENS		8 8	0.2 P	19
	827.1 -10	4		
MEDIUM tan SANDY LOAM		5 7	0.6 P	17
	824.6	28		
VERY DENSE tan WEATHERED LIMESTONE		100/3"		
	822.1			
End of Boring				
	-20			

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)

MODEL: Default
FILE NAME: pw:\benesch-pw.bentley.com:benesch-pw-01\Documents\10800s\10800.001Eng_Docs\CAD_Sheets\do you mean\101W7009-64C24-007-Boring Logs.dgn

QUIGG ENGINEERING INC	USER NAME = zdavidson	DESIGNED - ZLD	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	BORING LOGS STRUCTURE NO. 101-N7009
	101W7009-64C24-007-Boring Logs.dgn	CHECKED - KWB	REVISED -		
	PLOT SCALE =	DRAWN - ZLD	REVISED -		
	PLOT DATE = 05/09/2024	CHECKED - MDC	REVISED -		SHEET 7 OF 9 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
39	(201-3)R & (4-1.5)R	WINNEBAGO	1552	793
		CONTRACT NO. 64C24		
	ILLINOIS	FED. AID PROJECT		

5/9/2024 3:38:07 PM

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/30/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-7
Station 81+00
Offset 35.0 ft RT
Ground Surface Elev. 829.55 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.8 P	20
	827.6			
STIFF tan SANDY CLAY LOAM		3		
Hard drilling		4 5	1.1 P	21
	825.1			
VERY DENSE tan WEATHERED LIMESTONE	-5	10 31 68		
	823.6			
End of Boring				

-10
-15
-20

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

SOIL BORING LOG

Date 5/30/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-8
Station 83+00
Offset 40.0 ft RT
Ground Surface Elev. 820.59 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM tan SANDY LOAM			0.5 P	10
	818.6			
VERY DENSE tan WELL CEMENTED SANDY LOAM		13 26 25		7
	816.1			
VERY DENSE tan WEATHERED LIMESTONE	815.6 -5	100/2"		
End of Boring				

-10
-15
-20

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)

MODEL: Default
FILE NAME: pw:\benesch-pw.bentley.com:benesch-pw-01\Documents\10800s\10800.00\Eng_Docs\CAD_Sheets\do you mean\101W7009-64C24-008-Boring Logs.dgn
5/9/2024 3:38:34 PM

QUIGG ENGINEERING INC

USER NAME = zdavidson	DESIGNED - ZLD	REVISED -	
101W7009-64C24-008-Boring Logs.dgn	CHECKED - KWB	REVISED -	
PLOT SCALE =	DRAWN - ZLD	REVISED -	
PLOT DATE = 05/09/2024	CHECKED - MDC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BORING LOGS
STRUCTURE NO. 101-N7009
SHEET 8 OF 9 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
39	(201-3)R & (4-1.5)R	WINNEBAGO	1552	794
		CONTRACT NO. 64C24		
	ILLINOIS FED. AID PROJECT			

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/30/23

ROUTE FAI 39 DESCRIPTION P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. LOGGED BY W. Garza

SECTION (201-3)K LOCATION Cherry Valley, NE 1/4 9

COUNTY Winnabago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-45 Automatic

STRUCT. NO.
Station

BORING NO. B-9
Station 85+00
Offset 40.0 ft RT
Ground Surface Elev. 816.54 ft

Surface Water Elev. ft
Stream Bed Elev. ft
Groundwater Elev.:
First Encounter ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF light brown SILTY LOAM			1.8 P	17
	814.5	2		
SOFT tan SANDY LOAM		3 5	0.3 P	11
	812.0			
HARD tan SANDY LOAM with MEDIUM GRAVEL	-5			
Hard drilling		13 26	4.5 P	7
	809.5	36		
VERY DENSE tan WEATHERED LIMESTONE	809.0	20 100/5"		
End of Boring	-10			
	-15			
	-20			

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)

EXHIBIT D

BORING LOGS

Illinois Department of Transportation
Division of Highways

SOIL BORING LOG

Date 5/22/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-1
Station 69+50
Offset 22.0 ft RT
Ground Surface Elev. 869.64 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM					
				0.8 P	18
	867.6				
VERY STFF light brown SITLY CLAY LOAM			2		
			3 7	2.3 B	15
	865.1				
STIFF light brown CLAY LOAM		-5	3		
			3 5	1.3 P	16
	862.6				
STIFF light brown CLAY LOAM with SAND			2		
			5 6	1.7 B	19
	860.1				
STIFF light brown SANDY LOAM with GRAVEL		-10	2		
			10 9	1.7 B	16
	857.6				
STIFF light brown SANDY LOAM			3		
			10 12	1.4 B	16
	855.1				
STIFF light brown SANDY CLAY LOAM with DRY SANDY GRAVEL LENS		-15	4		
			8 7	1.2 B	16
	852.6				
VERY STIFF gray CLAY LOAM			3		
			6 10	2.7 B	18
	850.1				
		-20	4		
STIFF light brown CLAY LOAM TILL *(continued)*	848.6		7 11	1.9 B	18
End of Boring		-25			
		-30			
		-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

SOIL BORING LOG

Date 5/22/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-2
Station 71+00
Offset 23.0 ft RT
Ground Surface Elev. 866.57 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown LOAM				
			0.8 P	15
864.6				
MEDIUM tan WEATHERED LIMESTONE		15 11 9		
862.1	-5			
MEDIUM tan WEATHERED LIMESTONE FILL		6 7		6
859.6				
STIFF light brown SANDY CLAY LOAM TILL		6 5 6	1.3 B	12
857.1	-10			
VERY STIFF light brown SANDY CLAY LOAM		6 9 14	2.7 B	15
854.6				
VERY STIFF light brown SANDY CLAY LOAM		5 7 10	3.9 B	13
852.1	-15			
VERY STIFF light brown SANDY CLAY LOAM		5 8 13	2.9 B	14
849.6				
STIFF brown SANDY CLAY LOAM		5 7 10	1.2 B	17
847.1	-20			
		5		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY STIFF gray SANDY CLAY LOAM with FINE SAND LENS *(continued)*		10 16	2.3 S	11
845.6				
End of Boring				
	-25			
	-30			
	-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

SOIL BORING LOG

Date 5/23/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-3
Station 73+00
Offset 40.0 ft RT
Ground Surface Elev. 857.37 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter None ft
Upon Completion Dry ft
After _____ **Hrs.** _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM				
			1.1 P	
855.4				
MEDIUM tan DRY WEATHERED LIMESTONE FILL		6		
		5 12		16
852.9				
MEDIUM tan DRY WEATHERED LIMESTONE FILL	-5	5		
		3 9		
hard drilling				
850.4				
LOOSE tan WEATHERED LIMESTONE FILL		6		
		6 4		
847.9				
VERY STIFF brown SANDY CLAY LOAM	-10	2		
		3 7	3.5 B	14
845.4				
VERY STIFF brown SANDY CLAY LOAM		6		
		11 11	2.7 B	9
842.9				
VERY STIFF gray/tan SANDY CLAY LOAM	-15	5		
		8 11	3.7 B	13
841.4				
End of Boring				
	-20			

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

SOIL BORING LOG

Date 5/23/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-4
Station 75+00
Offset 28.0 ft RT
Ground Surface Elev. 851.67 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM				
			1.5 P	11
849.7				
MEDIUM tan DRY WEATHERED LIMESTONE FILL		13		
		11		
		7		
847.2				
MEDIUM tan DRY WEATHERED LIMESTONE FILL	-5	3		
		12		
Hard drilling		13		
844.7				
VERY STIFF brown SANDY CLAY LOAM		2		
		5	2.9 S	14
		9		
842.2				
STIFF brown SANDY CLAY LOAM TILL	-10	5		
		7	1.3 B	13
		19		
839.7				
VERY STIFF light brown CLAY LOAM		9		
		10	2.9 B	20
		12		
837.2				
MEDIUM brown SANDY LOAM with FINE SAND LENS	-15	9		
		12	1.0 S	10
		11		
834.7				
STIFF tan SILTY SAND with FINE SAND LENS		4		
		3	1.1 S	16
		6		
832.2				
	-20	3		

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
VERY STIFF dark gray SILT CLAY LOAM *(continued)* 830.7		5	2.1	21
		9	B	
End of Boring				
	-25			
	-30			
	-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

SOIL BORING LOG

Date 5/24/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-5
Station 77+00
Offset 40.0 ft RT
Ground Surface Elev. 841.30 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF brown SILTY CLAY LOAM					
				1.1 P	13
	839.3				
VERY STIFF brown CLAY LOAM			3		
			7 10	3.1 B	15
	836.8	-5			
VERY STIFF gray SANDY CLAY LOAM			6		
			15 19	2.9 B	17
	834.3				
STIFF brown SANDY LOAM with SAND LENS			3		
			7 7	1.1 B	15
	831.8	-10			
MEDIUM brown FINE SAND			4		
			5 6		12
	829.3				
LOOSE light brown MOIST SANDY LOAM			2		
			4 4		19
	826.8	-15			
SOFT light gray SILTY CLAY LOAM			2		
			3 4	0.4 B	19
	825.3				
End of Boring		-20			

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

SOIL BORING LOG

Date 5/25/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-6
Station 79+00
Offset 35.0 ft RT
Ground Surface Elev. 836.60 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM					
				0.8 P	11
	834.6				
MEDIUM brown MOIST FINE SAND			3		
			5 6		17
	832.1				
SOFT tan SILTY LOAM		-5	2		
			3 3	0.3 P	24
	829.6				
VERY SOFT light brown SILTY LOAM with SAND LENS			5		
			8 8	0.2 P	19
	827.1				
MEDIUM tan SANDY LOAM		-10	4		
			5 7	0.6 P	17
	824.6				
VERY DENSE tan WEATHERED LIMESTONE			28		
			100/3"		
	822.1				
End of Boring		-15			
		-20			

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

SOIL BORING LOG

Date 5/30/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-7
Station 81+00
Offset 35.0 ft RT
Ground Surface Elev. 829.55 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM brown SILTY CLAY LOAM			0.8 P	20
827.6		3		
STIFF tan SANDY CLAY LOAM		4 5	1.1 P	21
Hard drilling				
825.1				
VERY DENSE tan WEATHERED LIMESTONE	-5	10 31		
823.6		68		
End of Boring	-10			
	-15			
	-20			

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

SOIL BORING LOG

Date 5/30/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-8
Station 83+00
Offset 40.0 ft RT
Ground Surface Elev. 820.59 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM tan SANDY LOAM					
				0.5 P	10
	818.6				
VERY DENSE tan WELL CEMENTED SANDY LOAM			13		
			26		7
			25		
	816.1				
VERY DENSE tan WEATHERED LIMESTONE	815.6	-5	100/2"		
End of Boring					
		-10			
		-15			
		-20			

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

SOIL BORING LOG

Date 5/30/23

ROUTE FAI 39 **DESCRIPTION** P92-111-06 - Noise Wall from Linden Road S, 0.35 mi. **LOGGED BY** W. Garza

SECTION (201-3)K **LOCATION** Cherry Valley, NE 1/4 9

COUNTY Winnabago **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME-45 Automatic

STRUCT. NO. _____
Station _____

BORING NO. B-9
Station 85+00
Offset 40.0 ft RT
Ground Surface Elev. 816.54 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

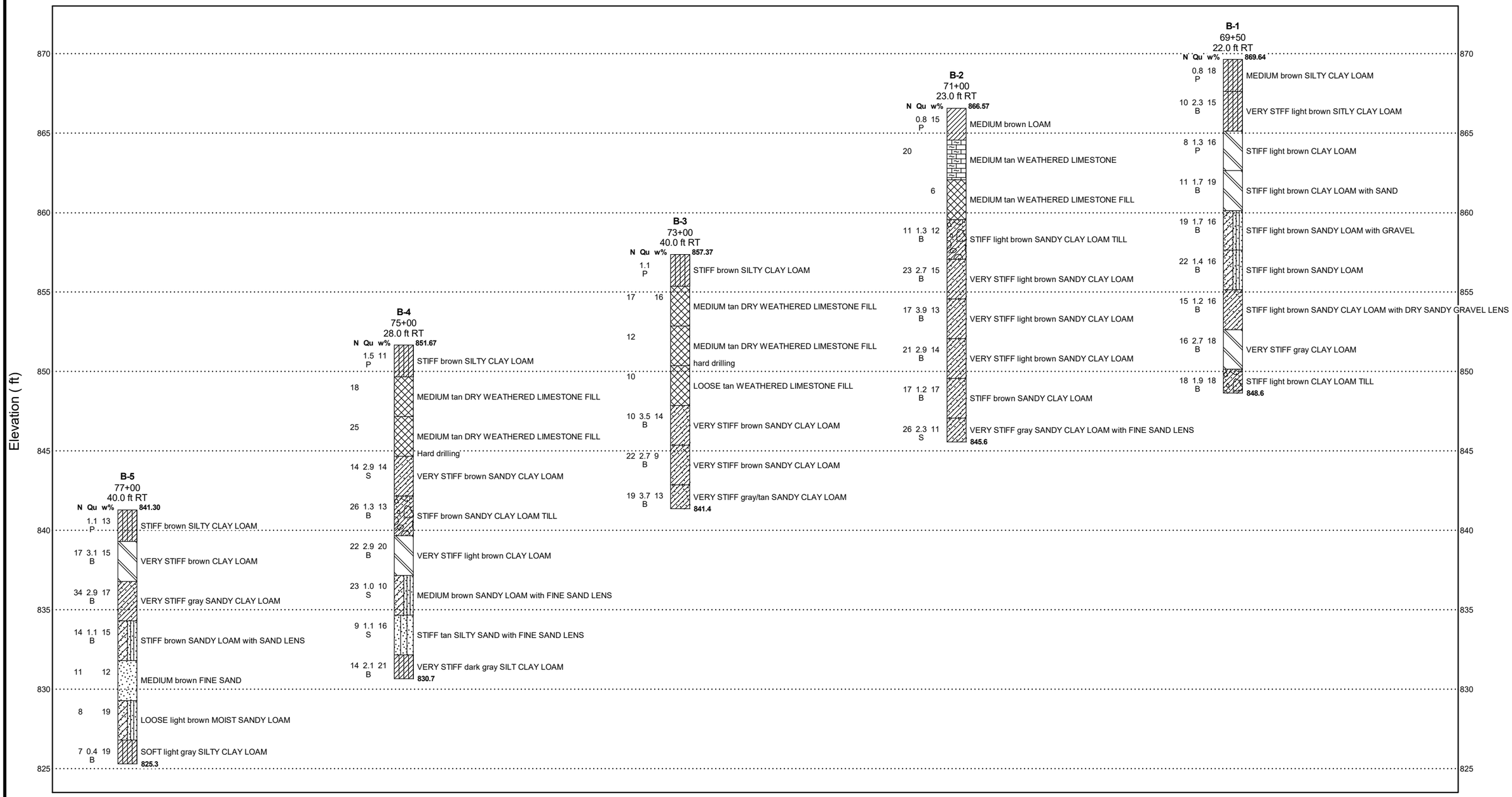
Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
STIFF light brown SILTY LOAM					
				1.8 P	17
	814.5				
SOFT tan SANDY LOAM			2		
			3 5	0.3 P	11
	812.0				
HARD tan SANDY LOAM with MEDIUM GRAVEL		-5			
Hard drilling			13		
	809.5		26 36	4.5 P	7
VERY DENSE tan WEATHERED LIMESTONE	809.0		20 100/5"		
End of Boring					
		-10			
		-15			
		-20			

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)

EXHIBIT E

SUBSURFACE PROFILE



PRINTERMOD2 11X17 19-1138.00 NOISE WALL 20.GPJ IL_DOT.GDT 3/8/24

Illinois Department of Transportation
Division of Highways

NOT TO HORIZONTAL SCALE

SUBSURFACE PROFILE

Route: FAI 39
Section: (201-3)K
County: Winnabago

Elevation (ft)

835
830
825
820
815
810

B-6
79+00
35.0 ft RT
836.60

N	Qu	w%	
	0.8	11	MEDIUM brown SILTY CLAY LOAM
	P		
11		17	MEDIUM brown MOIST FINE SAND
6	0.3	24	SOFT tan SILTY LOAM
	P		
16	0.2	19	VERY SOFT light brown SILTY LOAM with SAND LENS
	P		
12	0.6	17	MEDIUM tan SANDY LOAM
	P		
			VERY DENSE tan WEATHERED LIMESTONE
			823.1

B-7
81+00
35.0 ft RT
829.55

N	Qu	w%	
	0.8	20	MEDIUM brown SILTY CLAY LOAM
	P		
9	1.1	21	STIFF tan SANDY CLAY LOAM
	P		
			Hard drilling
99			VERY DENSE tan WEATHERED LIMESTONE
			823.6

B-8
83+00
40.0 ft RT
820.59

N	Qu	w%	
	0.5	10	MEDIUM tan SANDY LOAM
	P		
51		7	VERY DENSE tan WELL CEMENTED SANDY LOAM
			VERY DENSE tan WEATHERED LIMESTONE
			815.6

B-9
85+00
40.0 ft RT
816.54

N	Qu	w%	
	1.8	17	STIFF light brown SILTY LOAM
	P		
8	0.3	11	SOFT tan SANDY LOAM
	P		
62	4.5	7	HARD tan SANDY LOAM with MEDIUM GRAVEL
	P		
			Hard drilling
			809.0 VERY DENSE tan WEATHERED LIMESTONE

Illinois Department of Transportation
Division of Highways

NOT TO HORIZONTAL SCALE

SUBSURFACE PROFILE

Route: FAI 39
Section: (201-3)K
County: Winnabago

PRINTERMOD2 11X17 19-1138.00 NOISE WALL 20.GPJ IL_DOT.GDT 3/8/24

EXHIBIT F

FOUNDATION ANALYSIS

Drilled Shafts Side and Toe Resistance **Kaskaskia Engineering Group, LLC**

Project: NAW-20 (N7009)
Project Number: 19-1138.00

Substructure: Noise Wall
Boring Number: B-1

GWT: -
elev. Top of Drilled Shaft (ft): 861.3
Diameter(in) 48.00
At(ft²) **12.57**

Soil Parameters								Side Friction					Tip Resistance		Qt (kips)	Factored Qt (kips)	Cumulative Qs (kips)	Factored Qs (kips)	Cumulative Factored Qs (kips)
Layer	Description	Thickness (ft)	z(ft)	γ(pcf)	Su (psf)	N	N60	σ'(psf)	α	β	As(ft²)	fs (ksf)	Nc*	q't (ksf))					
1	Silty Clay Loam	0.16	0.16	120.00	1525.0			10	0.50		2.01	0.76	8.525	13.00063	163.37	65.35	1.53	0.69	0.69
2	Sandy Loam	4.84	5.00	120.00		18.0	24	310		1.28	60.82	0.40		28.8	361.91	180.96	25.70	13.29	13.98
3	Sandy Loam	2.66	7.66	120.00		18.0	24	760		1.16	33.43	0.88		28.8	361.91	180.96	55.16	16.20	30.18
4	Clay Loam	2.34	10.00	120.00	2300.0			1060	0.50		29.41	1.15	9	20.7	260.12	104.05	88.97	15.22	45.40
5	Clay Loam	5.00	15.00	120.00	2300.0			1500	0.50		62.83	1.15	9	20.7	260.12	104.05	161.23	32.52	77.92
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			

Drilled Shafts Side and Toe Resistance

Kaskaskia Engineering Group, LLC

Project: NAW-20 (N7009)
Project Number: 19-1138.00

Substructure: Noise Wall
Boring Number: B-5

GWT -
elev. Top of Drilled Shaft (ft): 839.3
Diameter(in) 30.00
At(ft²) **4.91**

Soil Parameters								Side Friction					Tip Resistance		Qt (kips)	Factored Qt (kips)	Cumulative Qs (kips)	Cumulative Factored Qs (kips)
Layer	Description	Thickness (ft)	z(ft)	γ(pcf)	Su (psf)	N	N60	σ'(psf)	α	β	As(ft²)	fs (ksf)	Nc*	q't (ksf))				
1	Silty Clay Loam	2.00	2.00	120.00	2100.0			120	0.50		15.71	1.05	9	18.9	92.78	37.11	16.49	7.42
2	Sandy Clay Loam	3.00	5.00	120.00		24.0	32	420		1.25	23.56	0.52		38.4	188.50	94.25	28.84	14.21
3	Sandy Clay Loam	1.50	6.50	120.00		24.0	32	690		1.18	11.78	0.81		38.4	188.50	94.25	38.40	19.47
4	Fine Sand	2.50	9.00	115.00		11.0	15	924		1.12	19.63	1.04		18	88.36	44.18	58.79	30.69
5	Sandy loam	1.00	10.00	120.00		8.0	11	1128		0.79	7.85	0.90		13.2	64.80	32.40	65.83	34.56
6	sandy loam	1.50	11.50	120.00		8.0	11	1278		0.78	11.78	0.99		13.2	64.80	32.40	77.50	40.97
7	silty clay loam	3.50	15.00	120.00	400.0			1578	1.00		27.49	0.40	6.5	2.6	12.76	5.11	88.49	45.92
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

Illinois Department of Transportation

DRILLED SHAFT AXIAL CAPACITY IN ROCK - DOLOMITE, LIMESTONE, SANDSTONE, AND HARD SHALE

STRUCTURE ========== NW 20
SUBSTRUCTURE & REFERENCE BORING ======= B-6
GROUND SURFACE ELEVATION ========== 836.60 FT
GROUND WATER ELEVATION ========== FT
ESTIMATED TOP OF ROCK ELEVATION ========= 824.60 FT
DRILLED SHAFT DIAMETER IN ROCK ========== 48 IN.
FACTORED AXIAL LOAD ========== KIPS
DRILLED SHAFT CONCRETE STRENGTH, f'c ====== 4.0 KSI

FOUNDATION REDUNDANCY ==== REDUNDANT

Drilled Shaft Dia.'s for Design Table

30	IN.
36	IN,
42	IN.
48	IN.
	IN.
	IN.

SOCKET DEPTH (FT)	TIP ELEV. (FT)	LAYER THICK. (FT)	UNCONFINED COMPRESSIVE STRENGTH (q_u) (KSF)	ROCK TYPE	GSI	ROCK CONDITION	RQD (%)	JOINT TYPE	ROCK INTACT OR TIGHTLY JOINTED?	SIDE RESISTANCE: NOM. RESIST. (KIPS)	SIDE RESISTANCE: Σ NOM. RESIST. (KIPS)	SIDE RESISTANCE: Σ FACT. RESIST. (KIPS)	SIDE RESISTANCE: SETTLEMENT Q_{C1} (KIPS)	SIDE RESISTANCE: SETTLEMENT w_{C1} (IN.)	SIDE RESISTANCE: SETTLEMENT w_{Rn} (IN.)	AVG. q_u W/IN 2 - SHAFT DIA. (KSF)	TIP RESISTANCE: NOM. RESIST. (KIPS)	TIP RESISTANCE: FACT. RESIST. (KIPS)	TIP RESISTANCE: SETTL. w_{Rn} (IN.)	COMBINED SIDE & TIP RESISTANCE: R_P/R_n	COMBINED SIDE & TIP RESISTANCE: NOM. RESIST. (KIPS)	COMBINED SIDE & TIP RESISTANCE: FACT. RESIST. (KIPS)	COMBINED SIDE & TIP RESISTANCE: SETTLEMENT Q_{C1} (KIPS)	COMBINED SIDE & TIP RESISTANCE: SETTLEMENT w_{C1} (IN.)	COMBINED SIDE & TIP RESISTANCE: SETTLEMENT w_{Rn} (IN.)
3.00	821.60	3.00	25.0	Limestone	40	Fractured	50	Closed	No	107	107	59	41	0.006	0.758	25.0	303	151	0.093	0.86	352	178	65	0.006	0.071
5.00	819.60	2.00	25.0	Limestone	40	Fractured	50	Closed	No	71	178	98	69	0.008	0.764	25.0	324	162	0.065	0.79	408	208	103	0.008	0.078
7.00	817.60	2.00	25.0	Limestone	40	Fractured	50	Closed	No	71	250	137	97	0.010	0.767	25.0	344	172	0.071	0.74	466	239	138	0.010	0.085
17.00	807.60	10.00	25.0	Limestone	40	Fractured	50	Closed	No	357	607	334	237	0.016	0.776										

Illinois Department of Transportation

DRILLED SHAFT AXIAL CAPACITY IN ROCK - DOLOMITE, LIMESTONE, SANDSTONE, AND HARD SHALE

STRUCTURE ========== NW 20
SUBSTRUCTURE & REFERENCE BORING ======= B-7
GROUND SURFACE ELEVATION ========== 829.55 FT
GROUND WATER ELEVATION ========== FT
ESTIMATED TOP OF ROCK ELEVATION ========= 825.10 FT
DRILLED SHAFT DIAMETER IN ROCK ========== 30 IN.
FACTORED AXIAL LOAD ========== KIPS
DRILLED SHAFT CONCRETE STRENGTH, f'c ====== 4.0 KSI

FOUNDATION REDUNDANCY ==== REDUNDANT

Drilled Shaft Dia.'s for Design Table

30	IN.
36	IN,
42	IN.
48	IN.
	IN.
	IN.

SOCKET DEPTH (FT)	TIP ELEV. (FT)	LAYER THICK. (FT)	UNCONFINED COMPRESSIVE STRENGTH (q_u) (KSF)	ROCK TYPE	GSI	ROCK CONDITION	RQD (%)	JOINT TYPE	ROCK INTACT OR TIGHTLY JOINTED?	SIDE RESISTANCE: NOM. RESIST. (KIPS)	SIDE RESISTANCE: Σ NOM. RESIST. (KIPS)	SIDE RESISTANCE: Σ FACT. RESIST. (KIPS)	SIDE RESISTANCE: SETTLEMENT Q_{C1} (KIPS)	SIDE RESISTANCE: SETTLEMENT w_{C1} (IN.)	SIDE RESISTANCE: SETTLEMENT w_{Rn} (IN.)	AVG. q_u W/IN 2 - SHAFT DIA. (KSF)	TIP RESISTANCE: NOM. RESIST. (KIPS)	TIP RESISTANCE: FACT. RESIST. (KIPS)	TIP RESISTANCE: SETTL. w_{Rn} (IN.)	COMBINED SIDE & TIP RESISTANCE: R_P/R_n	COMBINED SIDE & TIP RESISTANCE: NOM. RESIST. (KIPS)	COMBINED SIDE & TIP RESISTANCE: FACT. RESIST. (KIPS)	COMBINED SIDE & TIP RESISTANCE: SETTLEMENT Q_{C1} (KIPS)	COMBINED SIDE & TIP RESISTANCE: SETTLEMENT w_{C1} (IN.)	COMBINED SIDE & TIP RESISTANCE: SETTLEMENT w_{Rn} (IN.)
3.00	822.10	3.00	25.0	Limestone	40	Fractured	50	Closed	No	67	67	37	26	0.005	0.477	25.0	93	46	0.035	0.75	124	64	39	0.005	0.036
5.00	820.10	2.00	25.0	Limestone	40	Fractured	50	Closed	No	45	111	61	43	0.007	0.480	25.0	104	52	0.033	0.65	160	83	60	0.007	0.043
7.00	818.10	2.00	25.0	Limestone	40	Fractured	50	Closed	No	45	156	86	61	0.008	0.482	25.0	114	57	0.045	0.57	198	103	80	0.008	0.051
17.00	808.10	10.00	25.0	Limestone	40	Fractured	50	Closed	No	223	379	208	149	0.014	0.490										