Structural Geotechnical Report

Noise Abatement Wall #1
Station 310+50 to 326+00
I-55 at IL 59 Diverging Diamond Interchange
IDOT PTB 189-011
Will County, Illinois
Prepared for

Illinois Department of Transportation
Contract Number: D-91-368-18

Project Design Engineer Team
Alfred Benesch & Company

Geotechnical Consultant:
GSG Consultants, Inc.

February 25, 2022

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February 25, 2022

Mr. Kurt Naus, P.E., S.E.
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Structural Geotechnical Report
Noise Abatement Wall #1
I-55 Sta. 310+50 to 326+00
PTB 189-011

Dear Mr. Naus:

Attached is a copy of the Structural Geotechnical Report for the above referenced project. This report provides a brief description of the site investigation, site conditions, foundation, and construction recommendations. The site investigation included advancing nine (9) soil borings to depths of 20 feet.

Should you have any questions or require additional information, please call us at 630-994-2600.

Sincerely,

Suhaib Ibrahim
Project Engineer

Ala E Sassila, Ph.D., P.E.
Principal

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1.0 INTRODUCTION

GSG Consultants, Inc. (GSG) completed a geotechnical investigation for the Phase II design of Noise Abatement Wall #1 between Station 310+50 and 326+00, along the west side of I-55 southbound in the Village of Shorewood, Will County, Illinois. The purpose of this Phase II site investigation was to explore the subsurface conditions along the entire proposed structure location, to determine engineering properties of the subsurface soil, and to develop final design and construction recommendations for Noise Abatement Wall #1

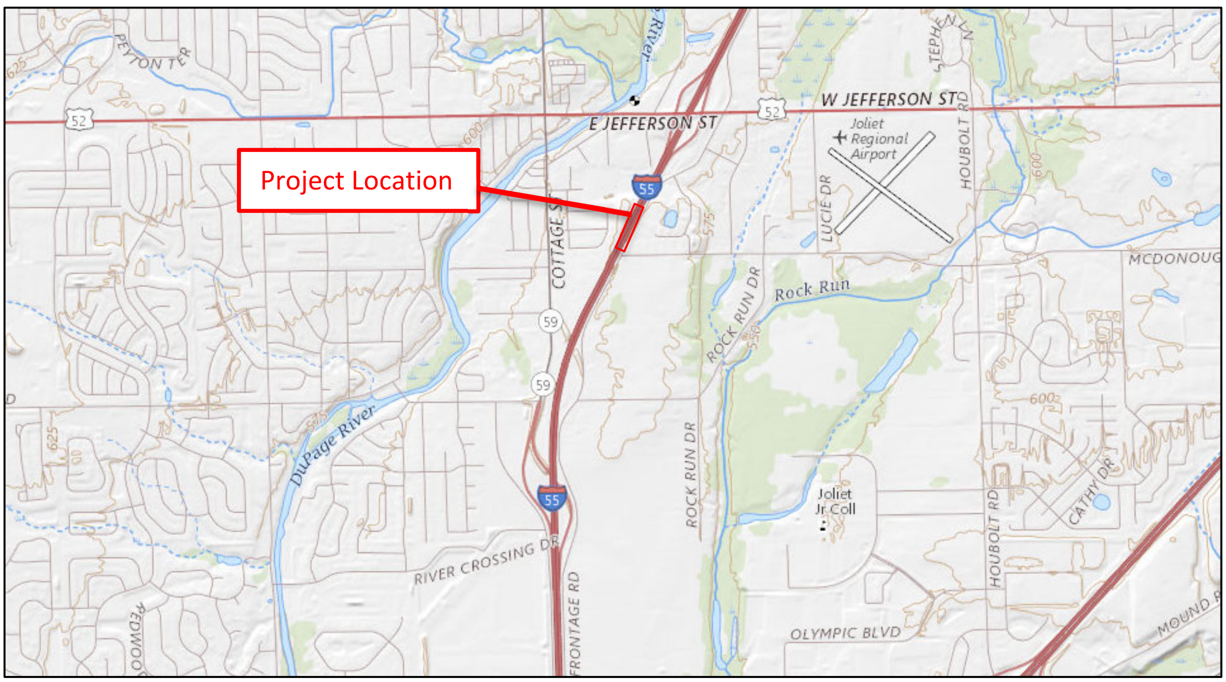


Exhibit 1 – Project Location Map
(Source: USGS Topographic Maps, usgs.gov)

The general scope of the overall project is the conversion of a partial access interchange to a full access interchange at I-55 and IL 59, including the construction of a Diverging Diamond Interchange (DDI) and associated auxiliary lanes at the intersection of I-55 and IL 59. Two new ramps are proposed to provide access and include a southbound exit and northbound entrance from/to I-55. An auxiliary lane between IL 59 and US 52 along I-55 is also proposed in each direction along the mainline. This report pertains to Noise Abatement Wall #1

1.1 Existing Site Conditions

The proposed Noise Abatement Wall #1 will be located on the west side of I-55 southbound lanes. The area of the proposed improvements is located on the existing IDOT property right-of-way (ROW) and consists of the unoccupied ditch west of I-55 southbound shoulder. **Exhibit 2** generally shows the existing conditions where the proposed noise abatement wall will be constructed.

Exhibit 2 – Existing Site Conditions at Proposed Wall Location, Looking north

1.2 Proposed Noise Wall Information

Based on the design information and drawings provided by Benesch (dated December 04, 2020, **Appendix A**), a ground mounted noise wall is proposed for this location. **Table 1** presents a summary of the proposed wall.

Table 1 –Noise Wall Summary

Wall Name	Wall Stations	Proposed Wall Type	Approximate Length (ft)	Maximum Anticipated Retained Wall Height (ft)
Noise Abatement Wall #1	Sta. 310+50 to Sta. 326+00	Ground Mounted Noise Wall	1,550	18.0

1.3 Regional Geology

GSG reviewed several published documents to determine the regional geological setting in the area. The site is located in western Will County, near Shorewood, Illinois. The surficial geologic deposits in this area are typically glacial drift deposited during the Wisconsin Glacial Age and river sediments deposited by the Des Plaines River. The subsurface profile in the area consists of deposits of silty clay, sand, silt, and gravel extending to depths of approximately 20 to 60 feet below ground surface, at which point bedrock is generally encountered, which is consistent with borings.

Deposits in the area are primarily from the Yorkville Member of the Lemont Formation of the Wedron Group deposited during the Wisconsin Period. The Lemont Formation typically consists of calcareous, gray, fine to coarse textured diamiction units (silty clay to sandy loam) that contain lenses of gravel, sand, silt, and clay. Underlying the surficial deposits, the bedrock consists of the Silurian System, Niagaran Series, which consist of dolomite that varies from extremely argillaceous, silty, and cherty to exceptionally pure.

2.0 SITE SUBSURFACE EXPLORATION PROGRAM

This section describes the subsurface exploration program and laboratory testing program completed as part of this project. The proposed locations and depths of the soil borings were selected in accordance with IDOT requirements and review with Benesch for available design information at the time of the field activities. The borings were completed in the field based on field conditions and accessibility.

2.1 Subsurface Exploration Program

Soil borings were completed on November 9 and 10, 2020. The exploration program included advancing nine (9) standard penetration test (SPT) borings at locations along the length of the proposed wall. The as-drilled locations of the soil borings are shown on the Soil Boring Location Plan and Subsurface Profile (**Appendix B**). **Table 2** presents a list of the borings used for the proposed noise wall analysis.

Table 2 – Summary of Subsurface Exploration Borings

Boring ID	Station *	Offset (ft)/ Direction	Surface Elevation (ft)	Drill Rig Used
NAW1-001	310+50	130 LT	597.80	Diedrich D-50 ATV
NAW1-002	312+50	130 LT	600.26	Diedrich D-50 ATV
NAW1-003	314+50	130 LT	601.34	Diedrich D-50 ATV
NAW1-004	316+50	130 LT	601.20	Diedrich D-50 ATV
NAW1-005	318+50	130 LT	605.20	Diedrich D-50 ATV
NAW1-006	320+50	130 LT	601.57	CME–75
NAW1-007	322+50	130 LT	599.94	CME–75
NAW1-008	324+50	130 LT	595.40	CME–75
NAW1-009	326+50	118 LT	590.81	CME–75

* Based on existing I-55 Stationing

The soil borings were drilled using an ATV Diedrich D-50 and CME-75 drill rigs using 3¼-inch I.D. hollow stem augers and an automatic hammer. Soil sampling was performed according to AASHTO T 206, "Penetration Test and Split Barrel Sampling of Soils." Soil samples were obtained at 2.5-foot intervals to the planned termination depth. Water level measurements were made in each boring when evidence of free groundwater was detected on the drill rods or in the samples.

The boreholes were also checked for free water immediately after auger removal, and before filling the open boreholes with soil cuttings.

GSG's field representative inspected, visually classified, and logged the soil samples during the subsurface exploration activities and performed unconfined compressive strength tests on cohesive soil samples using a calibrated Rimac compression tester and a calibrated hand penetrometer in accordance with IDOT procedures and requirements. Representative soil samples collected from each sample interval were placed in jars and were returned to the laboratory for further testing and evaluation.

2.2 Laboratory Testing Program

All samples were inspected in the laboratory to verify the field classifications. A laboratory testing program was undertaken to characterize and determine engineering properties of the subsurface soils encountered in the area of the proposed wall. Moisture content ASTM D2216 / AASHTO T-265 was performed on all soil samples.

The laboratory tests were performed in accordance with test procedures outlined in the IDOT Geotechnical Manual (2020), and per ASTM and AASHTO requirements. Based on the laboratory test results, the soils encountered were classified according to the AASHTO and the Illinois Division of Highways (IDH) classification systems. The results of the laboratory testing program are shown along with the field test results in **Appendix C Soil Boring Logs**.

2.3 Subsurface Soil Conditions

This section provides a brief description of the soils encountered in the borings performed in the vicinity of the proposed noise wall. Variations in the general subsurface soil profile were noted during the drilling activities. Detailed descriptions of the subsurface soils are provided in the Soil Boring Logs (**Appendix C**). The soil boring logs provide specific conditions encountered at each boring location, including soil descriptions, stratifications, penetration resistance, elevations, location of the samples, water levels (when encountered), and laboratory test data. Variations in the general subsurface soil profile were noted during the drilling activities. The stratifications shown on the boring logs represent the conditions only at the actual boring locations and represent the approximate boundary between subsurface materials; however, the actual transition may be gradual.

STA 310+50 to 319+75 (NAW1-001 to NAW1-005)

The surface elevations of these borings ranged between 597.8 and 605.2 feet. The borings noted 4 to 5 inches of topsoil, followed by medium dense to very dense silty loam to depths between 4.0 and 8.5 feet, with SPT blow counts 'N' values of the silt ranged between 19 and 54 blows per foot (bpf). Below the silty loam, very stiff to hard silty clay loam was encountered to the boring termination depths, with unconfined compressive strength values between 2.5 and 7.0 tsf, and most values between 2.5 and 5.5 tsf. The soil color changed from brown and gray to gray at depths between 10.0 and 15.0 feet (El. 589.2 to 581.8 feet).

STA 319+75 to 326+00 (NAW1-006 to NAW1-009)

The surface elevations of these borings ranged between 590.8 and 601.6 feet. The borings noted silty clay fill to depths between 6.0 and 9.5 feet. Below the fill materials, borings NAW1-006 through 008 encountered very stiff to hard silty clay loam to depths of 13.5 to 20.0 feet, with unconfined compressive strength vales between 2.5 and 5.5 tsf. Borings NAW1-007 and 008 noted a layer of medium dense to dense silty loam at depths between 15.0 and 20.0 feet, with SPT blow counts 'N' values of the silt ranging between 13 and 48 bpf. Borings NAW1-009 noted medium loose to medium dense silty loam between depths of 8.5 and 17.5 feet, with SPT blow counts 'N' values of the silt ranging between 6 and 27 bpf, followed by a layer of stiff silty clay loam at depths between 17.5 and 20.0 feet, with an unconfined compressive strength value of 1.7 tsf. The soil color changed from brown and gray to gray at depths between 12.5 and 16.0 feet (El. 588.0 to 570.8 feet).

2.4 Groundwater Conditions

Water levels were checked in each boring to determine the general groundwater conditions present at the site and were measured while drilling and after each boring was completed. Groundwater was not encountered during drilling in any of the borings. No groundwater was observed after drilling at this location or within the remaining borings at these times. No delayed groundwater readings were obtained as the borings were backfilled immediately upon completion.

Based on the color change from brown and gray to gray, it is anticipated that the long-term groundwater level could range between elevations 573.8 to 589.2 feet. Water level readings were made in the boreholes at times and under conditions shown on the boring logs and stated in the text of this report. However, it should be noted that fluctuations in groundwater level may occur due to variations in rainfall, other climatic conditions, or other factors not evident at the time measurements were made and reported herein.

3.0 GEOTECHNICAL ANALYSES

This section provides GSG's geotechnical analysis and recommendations for the design of the proposed noise wall based on the results of the field exploration, laboratory testing, and geotechnical analysis. Subsurface conditions between borings may vary from those encountered at the boring locations. If structure locations, loadings, or elevations are changed, we request that GSG be contacted so that we may re-evaluate our recommendations.

3.1 Derivation of Soil Parameters for Design

GSG determined the geotechnical parameters to be used for the project design based on the results of field and laboratory test data on individual boring logs as well as our experience. Unit weights, friction angles and shear strength parameters were estimated using corrected standard penetration test (SPT) using published correlations for N values results for the fill and cohesionless soils and in-situ and laboratory test results for cohesive soils. The SPT N values were corrected for hammer efficiency. The hammer efficiency correction factor considers the use of a safety hammer/rope/cat-head system, generally estimated to be 60% efficient. Thus, correlations should be based upon what is currently termed as N_{60} data. The efficiencies of the automatic hammers used for this exploration were estimated to be approximately 95% for the Diedrich D-50 ATV, and 91% fir CME-75 and based on previous efficiency testing of the drill rigs. The correction for hammer efficiency is a direct ratio of relative efficiencies as follows:

$$N_{60} = N_{Field} * (95/60)\text{: Diedrich D-50 ATV}$$

$$N_{60} = N_{Field} * (91/60)\text{: CME-75}$$

* Where the N_{Field} value is the blow counts recorded during the subsurface investigation.

Based on the field investigation data collected, generalized soil parameters for the soils in the project area for use in design are presented in **Tables 3a** and **3b**.

Table 3a - STA 310+50 to 319+75 (NAW1-001 to NAW1-005)

Elevation Range (feet)	Soil Description	In situ Unit Weight γ (pcf)	Undrained		Drained	
			Cohesion c (psf)	Friction Angle ϕ (°)	Cohesion c (psf)	Friction Angle ϕ (°)
	New Engineered Clay Fill	120	1,000	0	100	25
	New Engineered Granular Fill	125	0	30	0	30
601-594	Br and Gr Medium Dense to Very Dense Silty Loam	131	0	42	0	42
594-588-	Br and Gr Very Stiff to Hard Silty Clay Loam	138	3,500	0	350	28
588-581	Gr Very Stiff to Hard Silty Clay Loam	138	3,000	0	300	28

Table 3b - STA 319+75 to 326+00 (NAW1-006 to NAW1-009)

Elevation Range (feet)	Soil Description	In situ Unit Weight γ (pcf)	Undrained		Drained	
			Cohesion c (psf)	Friction Angle ϕ (°)	Cohesion c (psf)	Friction Angle ϕ (°)
	New Engineered Clay Fill	120	1,000	0	100	25
	New Engineered Granular Fill	125	0	30	0	30
600-594	Br and Gr Silty Clay Fill	138	3,000	0	300	25
594-580	Br and Gr Very Stiff to Hard Silty Clay Loam	138	3,500	0	350	28
582-580 NAW1-008 & 009	Br and Gr Medium Dense to Dense Silty Loam	126	0	37	0	37
580-574 NAW1-007, 008 & 009	Gr Medium Dense to Dense Silty Loam	126	0	38	0	38
574-570 NAW-009	Gr Stiff Silty Clay Loam	134	1,500	28	150	28

3.2 Seismic Parameters

The seismic hazard for the site was analyzed per the IDOT Geotechnical Manual, IDOT Bridge Design Manual, and AASHTO LRFD Bridge Design Specifications.

The Seismic Soil Site Class was determined per the requirements of "All Geotechnical Manual Users" (AGMU) Memo 9.1, Design Guide for Seismic Site Class Determination, and the "Seismic Site Class Determination" Excel spreadsheet provided by IDOT. A global Site Class Definition was determined for this project, and was found to be Soil Site Class D. The Seismic Performance Zone (SPZ) was determined using Figure 2.3.10-3 in the IDOT Bridge Manual and was found to be Seismic Performance Zone 1.

The AASHTO Seismic Design Parameters program was used to determine the peak ground acceleration coefficient (PGA), and the short (S_{DS}) and long (S_{D1}) period design spectral acceleration coefficients for each of the proposed structures. For this section of the project, the S_{DS} and the S_{D1} were determined using 2017 AASHTO Guide Specifications as shown in **Table 4**. Given the site location and materials encountered, the potential for liquefaction is minimal.

Table 4 – Seismic Parameters

Building Code Reference	PGA	S_{DS}	S_{D1}
2017 AASHTO Guide for LRFD Seismic Bridge Design	0.049g	0.169g	0.096g

4.0 GEOTECHNICAL RECOMMENDATIONS

This section provides GSG's geotechnical recommendations for the design of the proposed noise wall based on the results of the field exploration, laboratory testing, and geotechnical analyses, and information provided by the designer. If there are any significant changes to the project characteristics or if significantly different subsurface conditions are encountered during construction, GSG should be consulted so that the recommendations of this report can be reviewed. The foundation design recommendations were completed for the AASHTO LRFD Bridge Design Specifications, 9th Edition (2020).

4.1 Noise Wall Type Recommendations

There are several types of noise walls that could be utilized, including precast concrete, concrete masonry, brick masonry, composite plastic, or wood. The final wall type should be selected based on IDOT requirements, site conditions, and construction cost.

4.2 Noise Wall Design Recommendations

The engineering analyses performed for evaluation of the wall options followed the current AASHTO Load and Resistance Factor Design (LRFD) Methodology. LRFD methodology incorporates the use of load factors and resistance factors to account for uncertainty in applied loads and load resistance of structure elements separately. The AASHTO LRFD Bridge Design Specifications outline load factors and combinations for various strength, extreme event, service, and fatigue limit states. Section 15 of the AASHTO Specifications outlines geotechnical criteria for sound barrier wall evaluations. In general, the wall should be investigated for vertical and lateral displacement and for overall stability at the service I limit state and should be investigated at the strength limit states for bearing resistance failure, overall stability, and structural failure. The noise wall foundations shall be also evaluated at the extreme event limit states using applicable load combinations and loaf factors specified in AASHTO Table 3.4.1-1.

4.2.1 Shallow Foundations

The proposed wall may be supported on a conventional shallow continuous footing foundation system, bearing on suitable existing clay fill or the medium dense to very dense silty loam. Foundations should bear a minimum depth of 4.0 feet below the final exterior grade to alleviate the effects of frost. Continuous footings should have a minimum width of 2 feet and should be at least 12 inches thick. The actual footing thickness and reinforcement should be determined by a structural analysis of the individual footings with chosen plan dimensions. Shallow foundations for the noise wall should be designed using the maximum factored bearing resistance and service limit pressure shown in **Table 5**. The Service I Limit State is based on 1-inch maximum settlement.

Table 5 – Recommended Shallow Foundation Bearing Resistance

Station	Anticipated Bearing Elevation* (feet)	Nominal Resistance (ksf)	Factored Bearing Resistance (ksf)	Bearing Resistance for 1-inch Service Limit (ksf)	Anticipated Bearing Soil
Sta. 310+50 to Sta. 319+75	595-605	10.7	5.3	5.3	Silty Loam
Sta. 319+75 to 326+00	590-605	10.6	5.3	5.3	Suitable Existing Fill

*Elevations estimated from design cross section drawings dated 12/04/2020

The subgrade soils encountered at the bearing elevations should be cleared of any unsuitable material. Based on the results of the subsurface exploration, we anticipate the wall would be supported upon the soil types noted in **Table 5**. Although undercuts are not anticipated for this wall, soils should be field verified during construction of the wall, and any cohesive materials exhibiting unconfined compressive strengths less than 1.5 tsf should be removed and replaced with structural fill.

Resistance to sliding can be provided by a combination of friction at the foundation base and by passive resistance acting against the vertical faces of foundation elements. The factored resistance against sliding should be calculated using equation 10.6.3.4-1 in the AASHTO LRFD manual. Per table 10.5.5.2.2-1, a resistance factor of 0.85 may be applied for cast-in-place (CIP) or precast footings bearing on silty loam and silty clay soils. A resistance factor of 0.90 for CIP or 0.80 for precast footings may be used when bearing on a minimum of 6 inches of granular replacement material.

A resistance factor of 0.50 may be used for the wall passive resistance if passive resistance is used in the sliding evaluation. The passive lateral earth pressure coefficient (K_p) from the upper 4 feet of level backfill at the toe of the wall should be neglected, unless the soil is confined or protected by a concrete slab or well drained pavement. Similarly, the passive lateral earth pressure coefficient from the upper 4 feet of soil for a descending slope at the wall toe should also be neglected, regardless of any surface protection.

4.2.2 Wall and Embankment Settlement

Settlement of the noise wall depends on the foundation size and bearing pressure, as well as the strength and compressibility characteristics of the underlying bearing soil. Assuming the foundation subgrade has been prepared as recommended above and the service bearing resistances as noted in **Table 5** are used, settlement of the noise wall will be on the order of 1 inch. The differential settlement between two points of 100 feet apart along the length of the wall will be ½ inch or less.

4.2.3 Deep Foundations

As an alternative, the noise wall may be supported on shallow drilled shafts. Based on the nature of the subsurface soils, a resistance factor of 0.50 was used for the tip resistance and 0.55 for side shaft resistance in granular material, a resistance factor of 0.40 was used for the tip resistance, and 0.45 was used for the side shaft resistance in cohesive soils. Drilled piers extending to these depths can be designed using the nominal bearing resistance and side resistances shown in **Table 6**.

Table 6 – Drilled Shaft Design Parameters

Stations	Bearing Elevation (feet)	End Bearing		Side Friction		Anticipated Soil Type
		Nominal Tip Resistance (ksf)	Factored Tip Resistance (ksf)	Nominal Side Friction (ksf)	Factored Side Resistance (ksf)	
310+50 to 319+75	601-594	n/a	n/a	0.5	0.2	
	594-588	31.5	12.6	1.6	0.7	Very Stiff to Hard Silty Clay Loam
	588-581	27.0	10.8	1.9	0.8	Very Stiff to Hard Silty Clay Loam
319+75 to 326+00	600-594	n/a	n/a	1.6	0.7	
	594-580	21.0	8.4	4.6	2.1	Very Stiff to Hard Silty Clay Loam
	580-574	29.4	14.7	2.5	1.4	Medium Dense to Dense Silty Loam

Note: assumed shaft diameter = 2.5 feet

The top 4 feet of the shaft length should not be included in the calculated shaft resistance due to frost action. The length to diameter (L/D) ratio of drilled shafts should be in the following range: 3≤(L/D)≤30.

Given the anticipated groundwater depth, the anticipated depth of drilled shafts and potential for granular soils within the soil profile of the shaft, wet construction method will likely be required, and the contractor should be prepared to utilize these methods during construction of the shafts. Drilled shaft construction should be performed as described in **Section 5.5 Drilled Shaft Construction** in this report.

4.2.4 Lateral Earth Pressures and Loading

Drilled shafts for the proposed noise wall are normally loaded laterally by wind forces. The ability of the shaft to resist the wind loads is dependent on the passive pressures that develop in the soils along the shaft and the shaft diameter. Lateral loads on the drilled shafts should be analyzed for the maximum moments and lateral deflections. Software such as L-Pile are normally used to determine the required shaft depth to resist the lateral loads, the actual maximum moment, and the anticipated shaft deflection. If the shaft deflection is excessive or if the embedment is inadequate to provide "fixity", the shaft embedment could be increased to help address these issues. The shaft diameter should be increased if the deflection or the maximum moment is higher than the shaft designed resistance. **Tables 7a-7b** present recommended soil parameters for use in the drilled shafts lateral load analysis.

Table 7a – Lateral Soil Parameters - STA 310+50 to 319+75 (NAW1-001 to NAW1-005)

Elevation Range (feet)	Soil Description	Long-term/Drained			Soil Parameters used in L-Pile		
		Active Earth Pressure Coefficient (K_a)	Passive Earth Pressure Coefficient (K_p)	At-Rest Earth Pressure Coefficient (K_o)	Coefficient of Lateral Modulus of Subgrade Reaction (k_{py}, pci)	Soil Strain (ε_{50})	Soil Type
	New Engineered Clay Fill	0.41	2.46	0.58	500	0.01	Stiff Clay w/o free water (Reese)
	New Engineered Granular Fill	0.33	3.00	0.50	90	N/A	Sand (Reese)
601-594	Br and Gr Medium Dense to Very Dense Silty Loam	0.20	5.04	0.33	90	N/A	Sand (Reese)
594-588-	Br and Gr Very Stiff to Hard Silty Clay Loam	0.36	2.77	0.53	1,000	0.005	Stiff Clay w/o free water (Reese)
588-581	Gr Very Stiff to Hard Silty Clay	0.36	2.77	0.53	1,000	0.005	Stiff Clay w/o free water (Reese)

*The initial p-y modulus, E_{py} , varies linearly with depth. To obtain E_{py} use the equation $E_{py} = k_{py} * z$, where k_{py} is the coefficient of lateral modulus of subgrade reaction given in the table and z is the distance from the surface to the center point of the layer in inches.

Table 7b – Lateral Soil Parameters – STA 319+75 to 326+00 (NAW1-006 to NAW1-009)

Elevation Range (feet)	Soil Description	Long-term/Drained			Soil Parameters used in L-Pile		
		Active Earth Pressure Coefficient (K_a)	Passive Earth Pressure Coefficient (K_p)	At-Rest Earth Pressure Coefficient (K_o)	Coefficient of Lateral Modulus of Subgrade Reaction (k_{py}, pci)	Soil Strain (ε_{50})	Soil Type
	New Engineered Clay Fill	0.41	2.46	0.58	500	0.01	Stiff Clay w/o free water (Reese)
	New Engineered Granular Fill	0.33	3.00	0.50	90	N/A	Sand (Reese)
600-594	Br and Gr Silty Clay Fill	0.41	2.46	0.58	1000	0.005	Stiff Clay w/o free water (Reese)
594-580	Br and Gr Very Stiff to Hard Silty Clay	0.36	2.77	0.53	1000	0.005	Stiff Clay w/o free water (Reese)
582-580 NAW1-008 & 009	Br and Gr Medium Dense to Dense Silty Loam	0.25	4.02	0.40	90	N/A	Sand (Reese)
580-574 NAW1-007, 008 & 009	Gr Medium Dense to Dense Silty Loam	0.24	4.20	0.38	90	N/A	Sand (Reese)
574-570 NAW-009	Gr Stiff Silty Clay Loam	0.36	2.77	0.53	500	0.07	Stiff Clay w/o free water (Reese)

*The initial p-y modulus, E_{py} , varies linearly with depth. To obtain E_{py} use the equation $E_{py} = k_{py} * z$, where k_{py} is the coefficient of lateral modulus of subgrade reaction given in the table and z is the distance from the surface to the center point of the layer in inches.

5.0 CONSTRUCTION CONSIDERATIONS

All work performed for the proposed project should conform to the requirements in the IDOT Standard Specifications for Road and Bridge Construction (2016). Any deviation from the requirements in the manuals above should be approved by the design engineer.

5.1 Site Preparation

All trees, vegetation, landscaping, and surface topsoil should be cleared and removed from the vicinity of the proposed foundations. Any unsuitable materials observed during the evaluation should be undercut and replaced with compacted structural fill and/or stabilized in-place. The possible need for, and extent of, undercutting and/or in-place stabilization required can best be determined by the geotechnical engineer at the time of construction. Once the site has been properly prepared, at grade construction may proceed.

Foundation aggregate fill should not be placed upon wet or frozen subgrade soils. If the subgrade or structural fill becomes frozen, desiccated, wet, disturbed, softened, or loose, the affected materials should be scarified, dried and moisture conditioned, and compacted to the full depth of the affected area, or the soils should be removed. Rainfall and runoff can soften soils and affect the load bearing capacity of the soils. All water entering foundation excavation should be removed prior to placement backfill materials above the footings.

5.2 Existing Utilities

Based on the existing site conditions, significant utilities may exist along the project corridor that may interfere with construction of the proposed widening of the roadway and the noise wall construction.

Before proceeding with construction, any existing utility lines that are to be abandoned and will interfere with construction should be completely relocated from beneath the proposed construction areas. Where possible, existing utility lines that are to be abandoned in place should be removed and/or plugged with a minimum of 2 feet of cement grout. All excavations resulting from underground utility removal activities should be cleaned of loose and disturbed materials, including all previously placed backfill, and backfilled with suitable fill materials in accordance with the requirements of this section. During the clearing and stripping operations, positive surface drainage should be maintained to prevent the accumulation of water.

5.3 Site Excavation

Site excavations are expected to encounter various types of soils as described in the Subsurface Exploration section of this report. The contractor will be responsible to provide a safe excavation during the construction activities of the project. All excavations should be conducted in accordance with applicable federal, state, and local safety regulations, including, but not limited to the Occupational Safety and Health Administration (OSHA) excavation safety standards. Excavation stability and soil pressures on temporary shoring are dependent on soil conditions, depth of excavations, installation procedures, and the magnitude of any surcharge loads on the ground surface adjacent to the excavation. Excavation near existing structures and underground utilities should be performed with extreme care to avoid undermining existing structures. Excavations should not extend below the level of adjacent existing foundations or utilities unless underpinning or other support is installed. It is the responsibility of the contractor for field determinations of applicable conditions and providing adequate shoring (if needed) for all excavation activities.

5.4 Borrow Material and Compaction Requirements

If borrow material is to be used for onsite construction, it should conform to Section 204 "Borrow and Furnish Excavations" of the IDOT Construction Manual (2021). Earth-moving operations should be avoided during excessively cold or wet weather to avoid freezing of softening subgrade soils. Suitable structural fill materials shall be of a nature that will compact and develop stability satisfactory to the geotechnical engineer. Structural fill shall consist of crushed limestone or recycled concrete consistent with IDOT CA-6 gradation or medium plasticity silty clays in accordance with IDOT standards specifications.

Structural fill should be placed in lifts not to exceed 8 inches in loose thickness and compacted to a minimum of 95% of the material's standard proctor maximum dry density obtained according to the ASTM D698/AASHTO T 99 method.

Materials unsatisfactory for use as structural fill include soils classified as silt or organic silt (ML, MH, PT, OL, and OH) in the Unified Soil Classification System (ASTM D2487). Soils with these classifications may be used for general purpose landscaping and in areas where uncontrolled settlement is acceptable.

Should fill be placed during cool, wet seasons, the use of granular fill may be necessary since weather conditions will make compaction of cohesive soils more difficult. If water seepage while excavating and backfilling procedures, or where wet conditions are encountered such that the water cannot be removed with conventional sump and pump procedures, GSG recommends placing open grade stone similar to IDOT CA-7 to stabilize the bottom of the excavation. The CA-7 stone should be placed to 12 inches above the water level, in 12-inch lifts, and should be compacted with the use of a heavy smooth drum roller or heavy vibratory plate compactor until stable. The remaining portion of the excavation should be backfilled using approved engineered fill.

GSG recommends that foundation excavations, subgrade preparation, and structural fill placement and compaction be inspected by a GSG geotechnical engineer to verify the type and strength of soil materials present at the site and their conformance with the geotechnical recommendations in this report.

5.5 Groundwater Management

It is anticipated that the long-term water table is between elevations 573.8 to 589.2 feet. GSG does not anticipate groundwater-related issues during construction activity based on the predominantly cohesive nature of the site and proposed design; however, water may become perched in the fill material encountered near the surface. If rainwater run-off or perched water is accumulated at the base of excavation, the contractor should remove accumulated water using conventional sump pit and pump procedures and maintain a dry and stable excavation. The location of the sump should be determined by the contractor based on field conditions. During earthmoving activities at the site, grading should be performed to ensure that drainage is maintained throughout the construction period. Water should not be allowed to accumulate in the foundation area either during or after construction. Undercut and excavated areas should be sloped toward one corner to facilitate the removal of any collected rainwater or surface run-off. Grades should be sloped away from the excavations to minimize runoff from entering.

If water seepage occurs during excavations or where wet conditions are encountered such that the water cannot be removed with conventional sumping, we recommend placing open grade stone similar to IDOT CA-7 to stabilize the bottom of the excavation below the water table. The CA-7 stone should be placed to 12 inches above the water table, in 12-inch lifts, and should be compacted with the use of a heavy smooth drum roller or heavy vibratory plate compactor until stable.

5.6 Drilled Shaft Construction

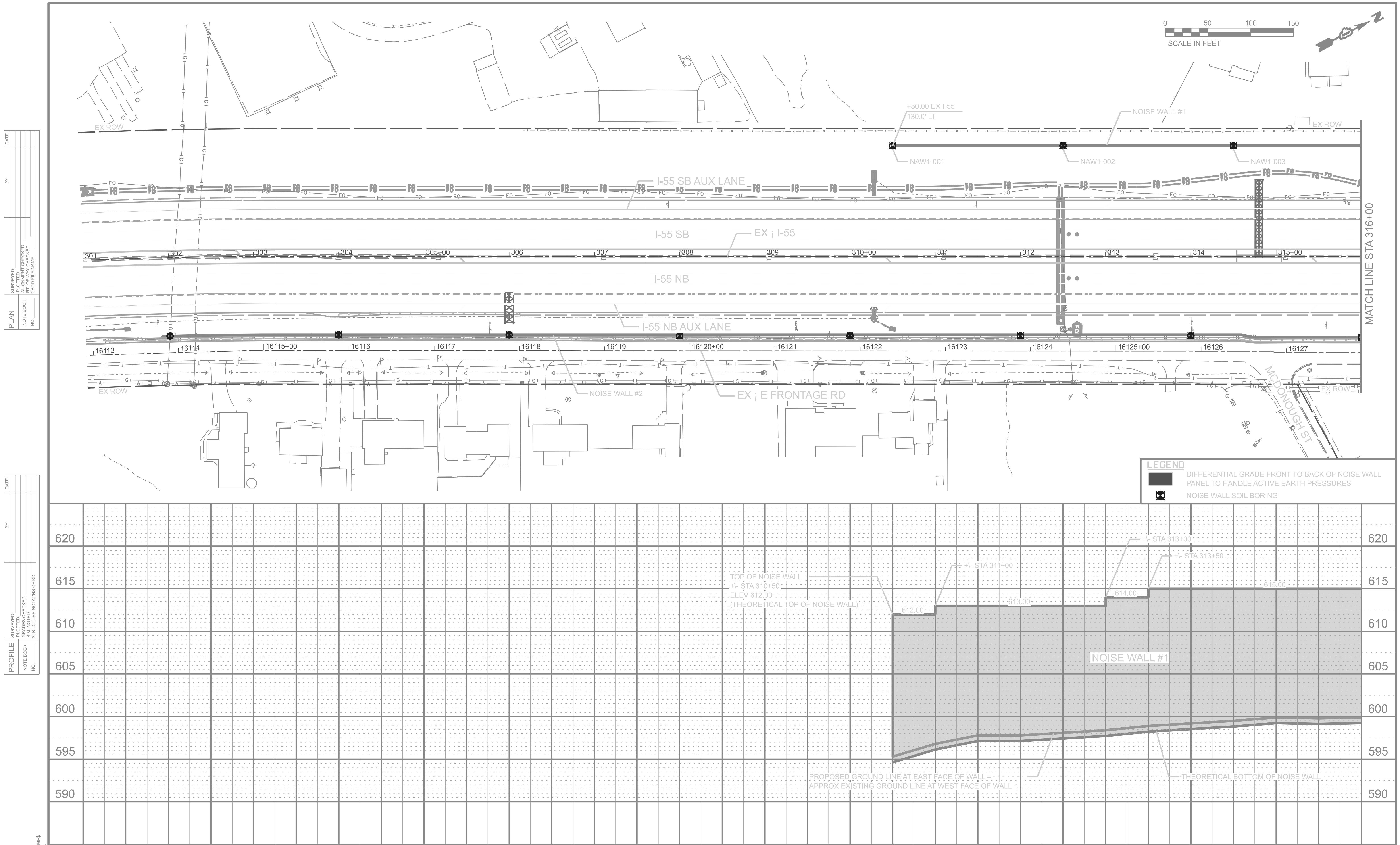
Drilled shaft construction should be completed in accordance according to Section 516, Drilled Shafts, in the IDOT Standard Specification for Road and Bridge Construction. Temporary casing will likely be required due to the granular layers encountered in the soil borings. During dry construction of a drilled shaft, water should be removed from the base of the drilled shaft prior to placing any concrete. The placement method of concrete for the drilled shaft foundation should be based on the amount of water present at the base of the shaft just prior to placing the concrete. Concrete may be placed using the free fall method, provided less than 2 inches of water is present at the base of the shaft at the time the concrete is being placed. If more than 2 inches of water is present, a tremie should be used in an effort to displace the water to the surface for removal. GSG recommends that the caisson concrete be ready on site as drilled shaft excavation is completed so that the concrete can be placed immediately after completing the drilled shaft excavation. This will reduce the potential of water accumulation in the bottom of the shaft. The bottom cleanliness of the drilled shaft excavation should be observed from the ground surface with the use of floodlight or down-hole camera. Workers should not enter the shaft to manually clean the base of the shaft due to safety reasons.

6.0 LIMITATIONS

This report has been prepared for the exclusive use of the Illinois Department of Transportation (IDOT) and its Design Section Engineer consultant. The recommendations provided in the report are specific to the project described herein and are based on the information obtained at the soil boring locations within the proposed noise wall area. The analyses have been performed, and the recommendations provided in this report, are based on subsurface conditions determined at the location of the borings. This report may not reflect all variations that may occur between boring locations or at some other time, the nature and extent of which may not become evident until during the time of construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and review the recommendations presented herein.

APPENDIX A

GENERAL PLAN AND ELEVATION



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	PLOT DATE = $DATE$	DATE - 12/04/2020	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NOISE WALL #1 PLAN AND PROFILE

SCALE: 1" = 50' | SHEET OF SHEETS | STA. Sta | TO STA. ToSTa

F.A.I/P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
*	2018-075-R	WILL	1349	$R29
		CONTRACT NO. 62H15		

* FAI 55, FAP 338 | ILLINOIS | FED. AID PROJECT

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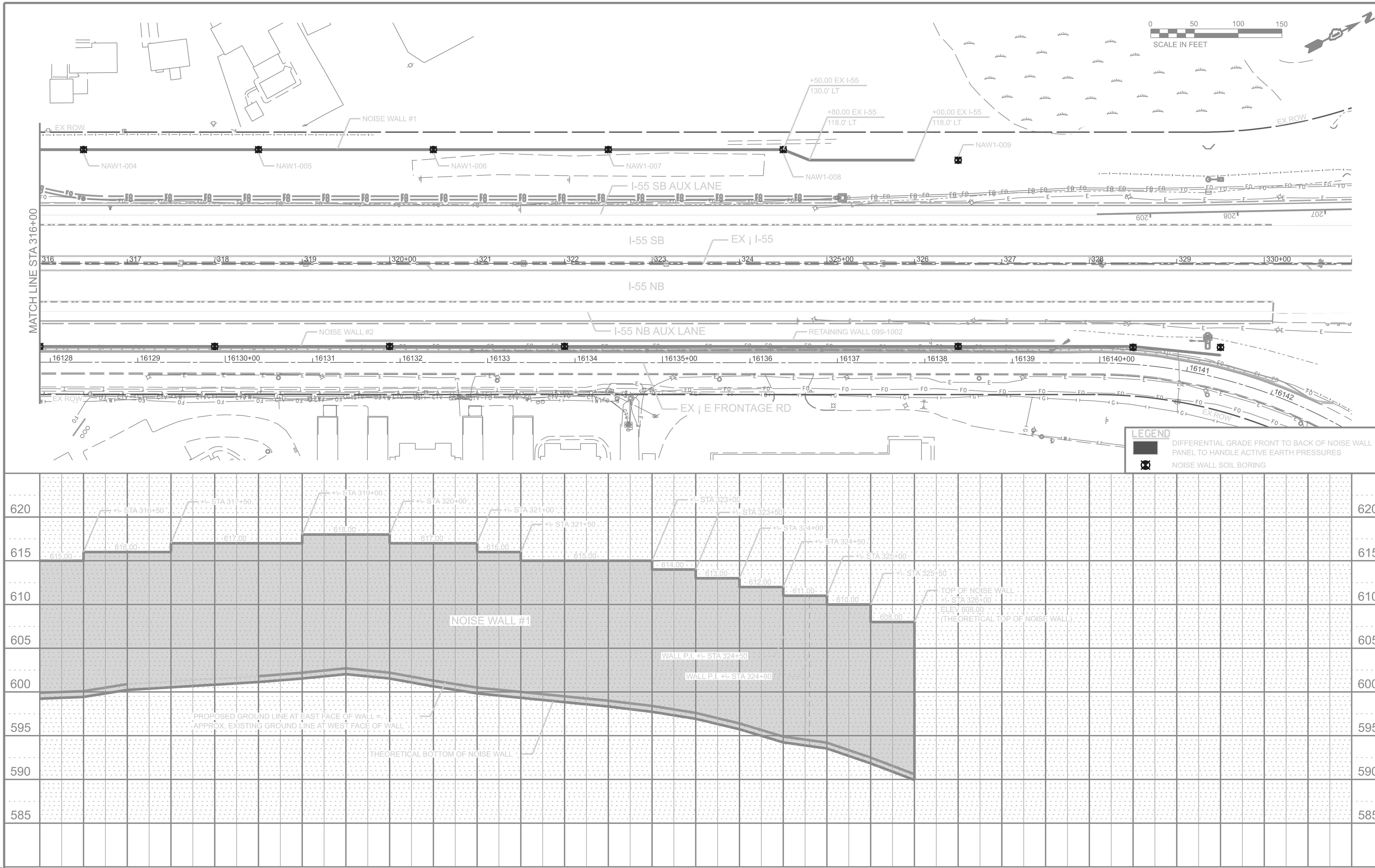
2012/11/30



benesch

Alfred Benesch & Company
35 W Wacker Drive, Suite 3300
Chicago, Illinois 60601

USER NAME = $USER$	DESIGNED - NREYNOLDS	REVISED -	
	DRAWN - JWORTHINGTON	REVISED -	
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PLOT DATE = $DATE$	DATE - 12/04/2020	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

NOISE WALL #1 PLAN AND PROFILE

SCALE: 1" = 50' | SHEET OF SHEETS | STA. Sta TO STA. ToSTa

F.A.I/P RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
*	2018-075-R	WILL	1349	SR30
		CONTRACT NO. 62H15		

* FAI 55, FAP 338 | ILLINOIS | FED. AID PROJECT

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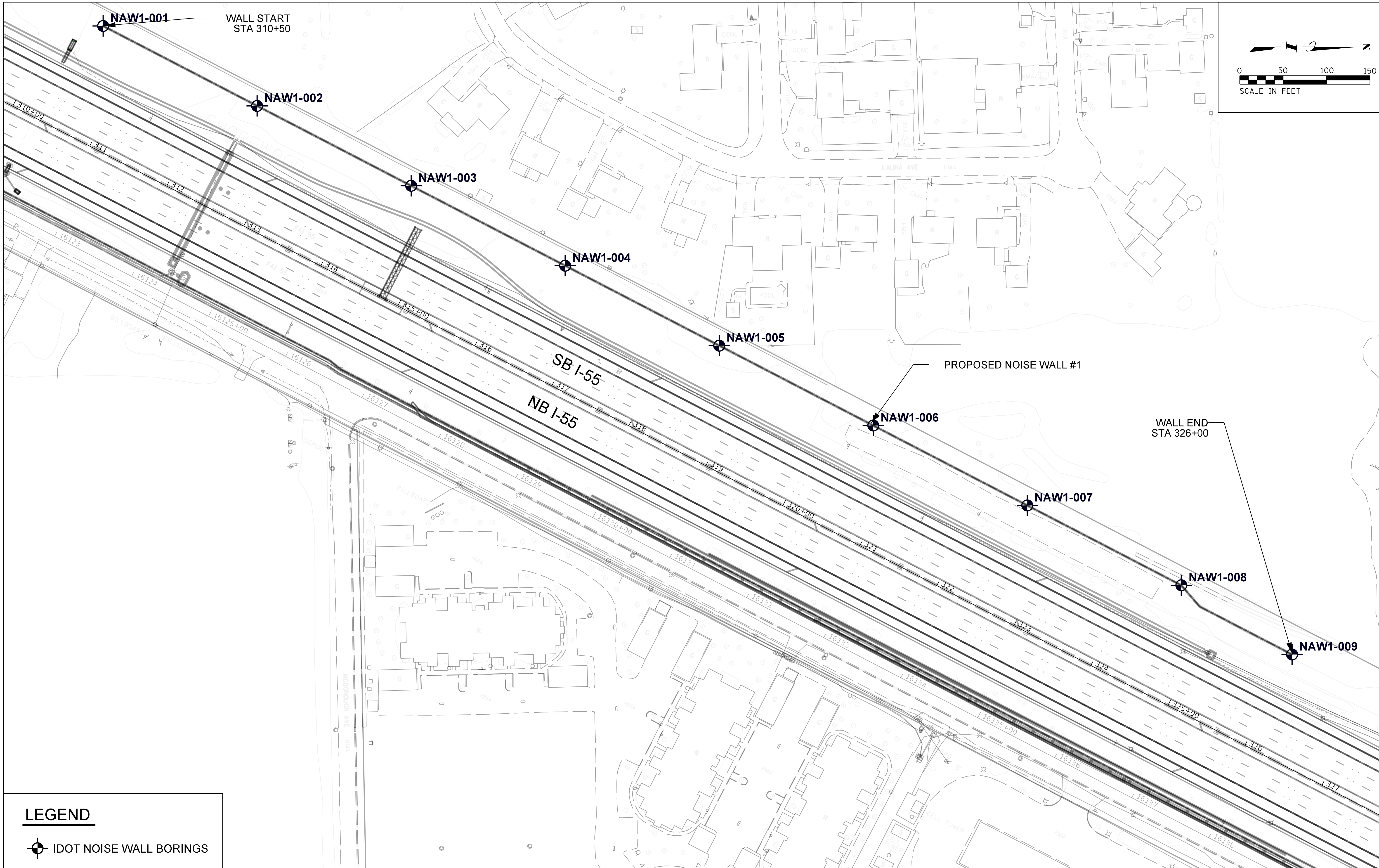
APPENDIX B

SOIL BORING LOCATION MAP

AND SUBSURFACE PROFILE



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PLOT SCALE = 1200.0000 ' / ft.
USER NAME = anieves

GSG CONSULTANTS, INC.
735 E. REMINGTON RD, SCHAUMBURG, IL 60173
TEL: +1630.994.2600 | WWW.GSG-CONSULTANTS.COM

USER NAME	= anieves	DESIGNED	- SI
SHEET SIZE	= 1.41667x0.916667 (ft.)	DRAWN	- NN
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PLOT DATE	= 2/21/2022	DATE	- 01/21/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011

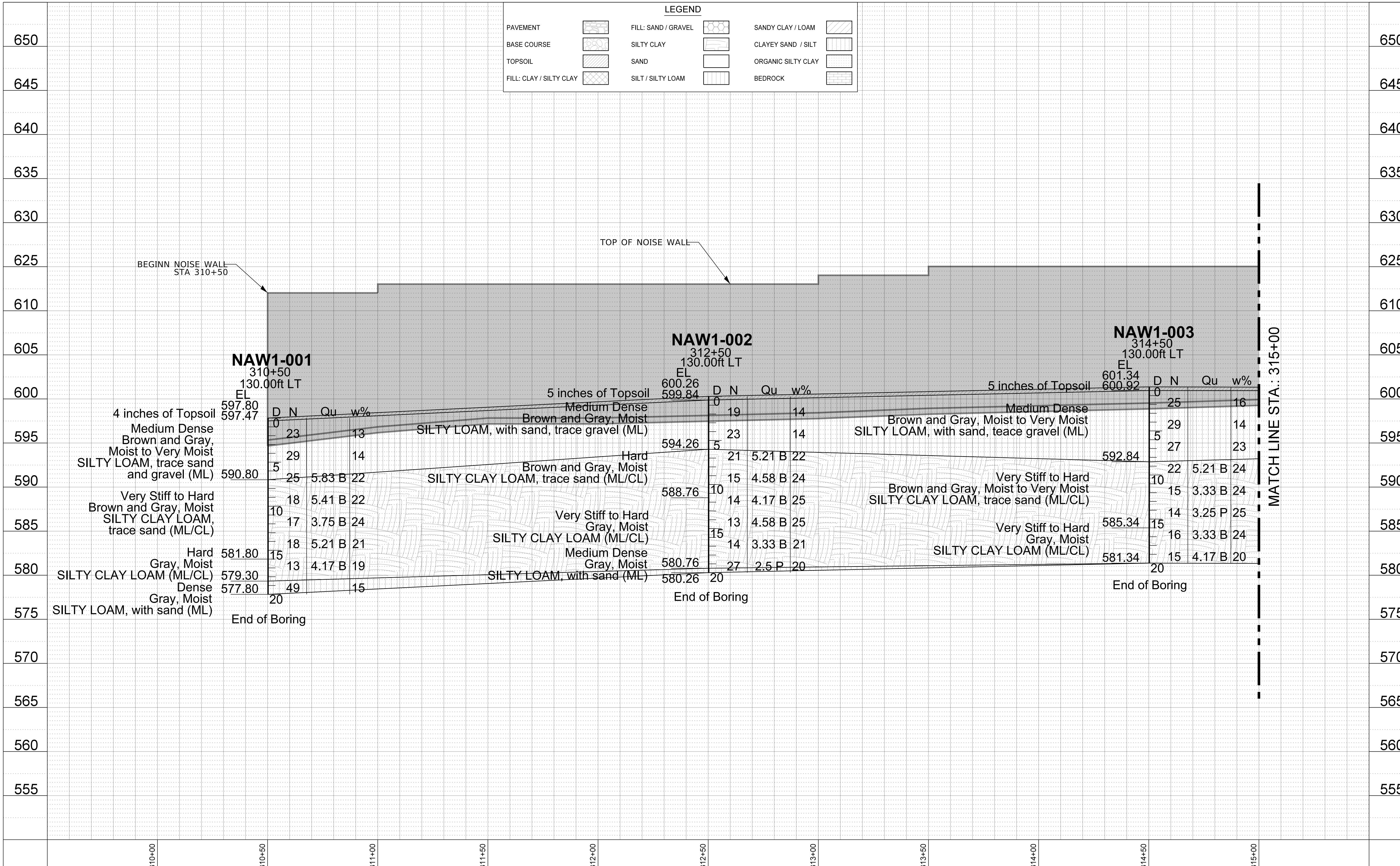
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 1 BORING LOCATION PLAN

SCALE: AS NOTED | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	5	1

CONTRACT NO. 189-011

ILLINOIS | FED. AID PROJECT



GSG CONSULTANTS, INC.
Engineers, Scientists & Construction Managers
623 Cooper Court Schaumburg, IL 60173
Tel: 630.994.2600
"Integrity| Quality| Reliability"

USER NAME	= $USER$	DESIGNED	-	SI
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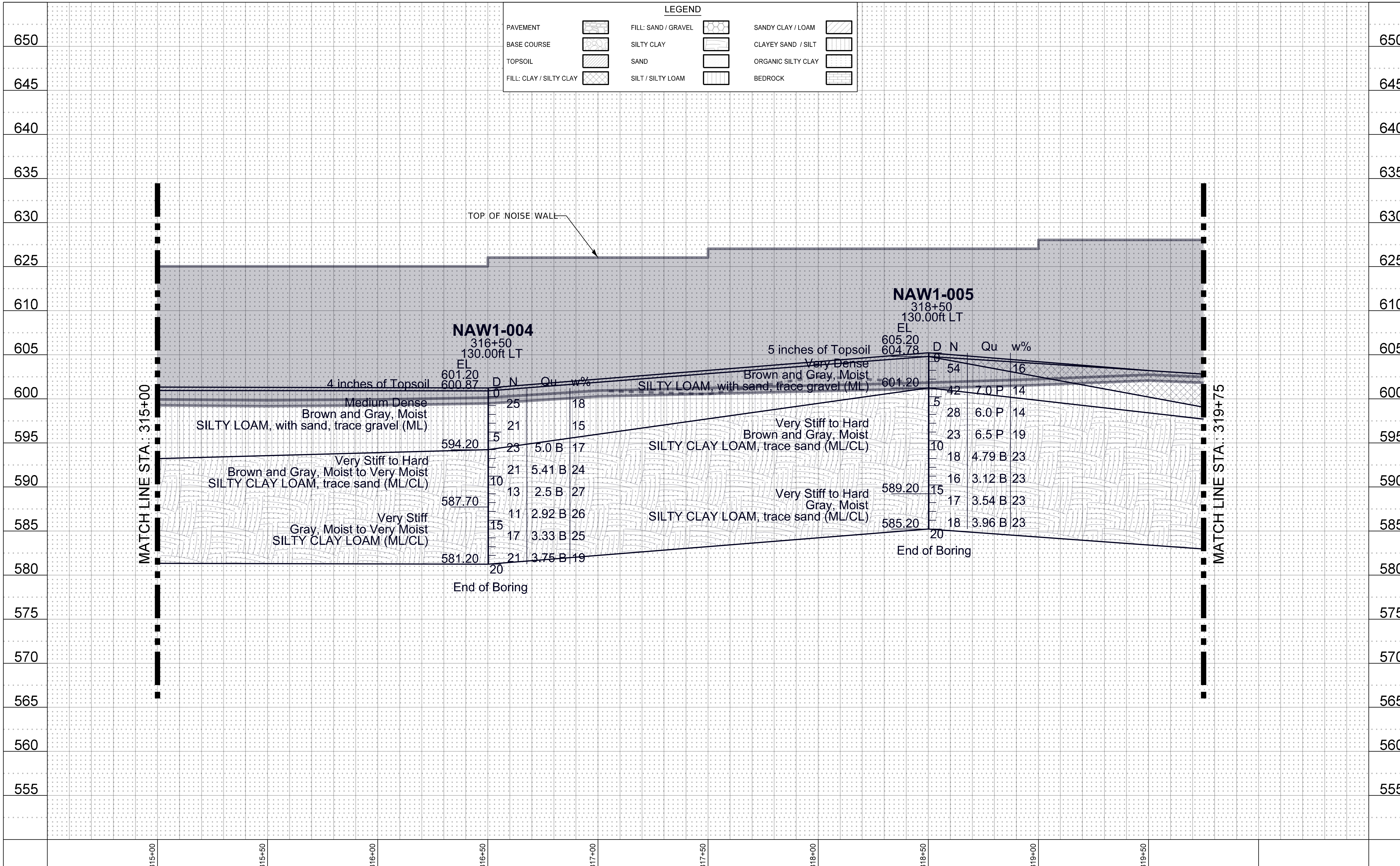
PLOT SCALE	= 120.0000 ' / ft.	CHECKED	-	DE
PLOT DATE	= 1/21/2021	DATE	-	01/21/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 1 BORING LOCATION PLAN/PROFILE

SCALE: AS NOTED | SHEET 1 OF 4 SHEETS | STA. 310+00 TO STA. 315+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	5	2
		CONTRACT NO.	2189-011	
		ILLINOIS	FED. AID PROJECT	



GSG CONSULTANTS, INC.

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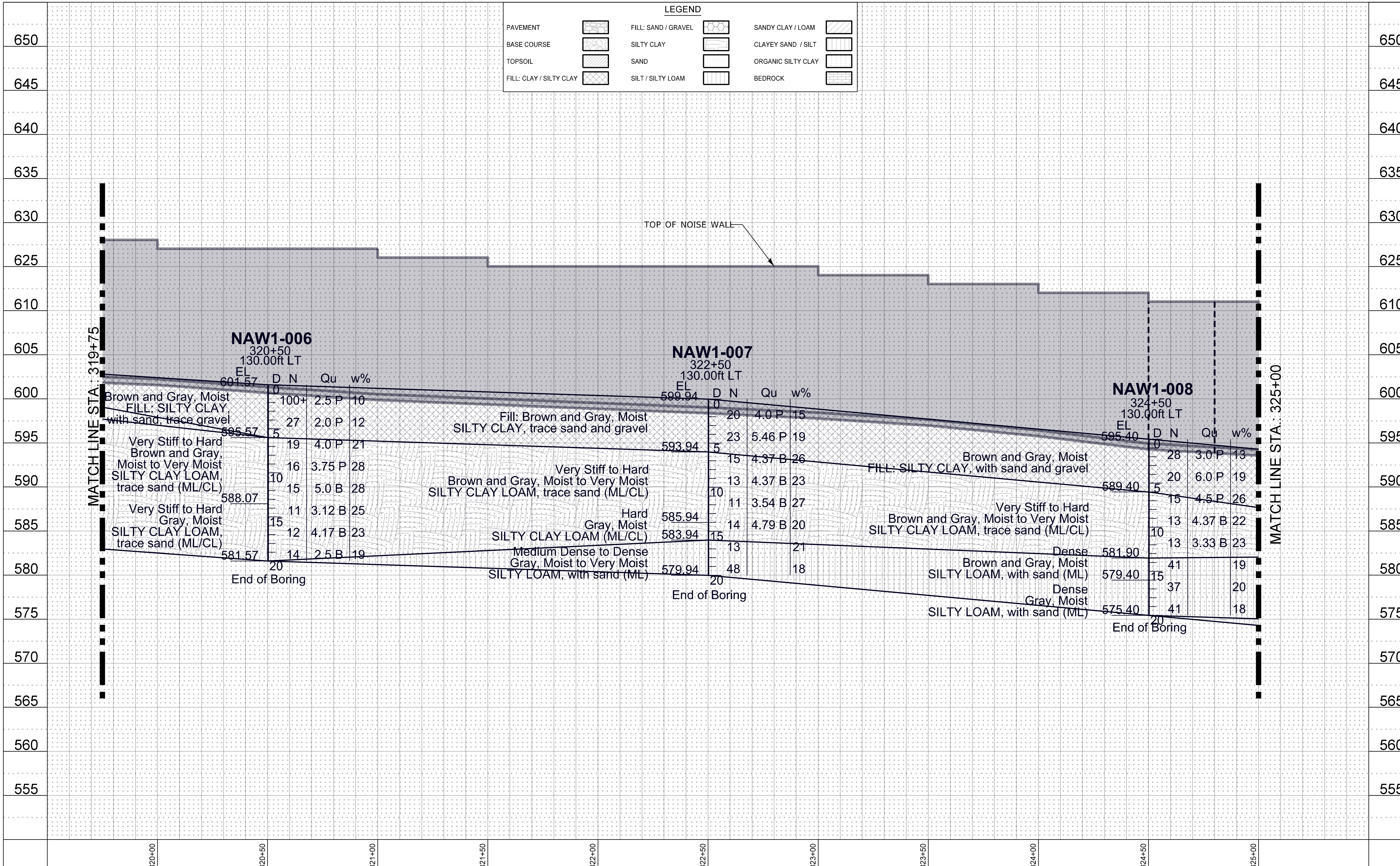
PLOT SCALE	= 120.0000 ' / ft.	CHECKED	- DE
PLOT DATE	= 2/21/2022	DATE	- 01/21/2021

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 1 BORING LOCATION PLAN/PROFILE
SCALE: ____AS NOTED | SHEET 2 OF 4 SHEETS | STA. 315+00 TO STA. 319+75

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	5	3
		CONTRACT NO. 2189-011		
	ILLINOIS	FED. AID PROJECT		



GSG CONSULTANTS, INC.

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PLOT SCALE	= 120.0000 ' / ft.	CHECKED	- DE
PLOT DATE	= 2/21/2022	DATE	- 01/21/2021

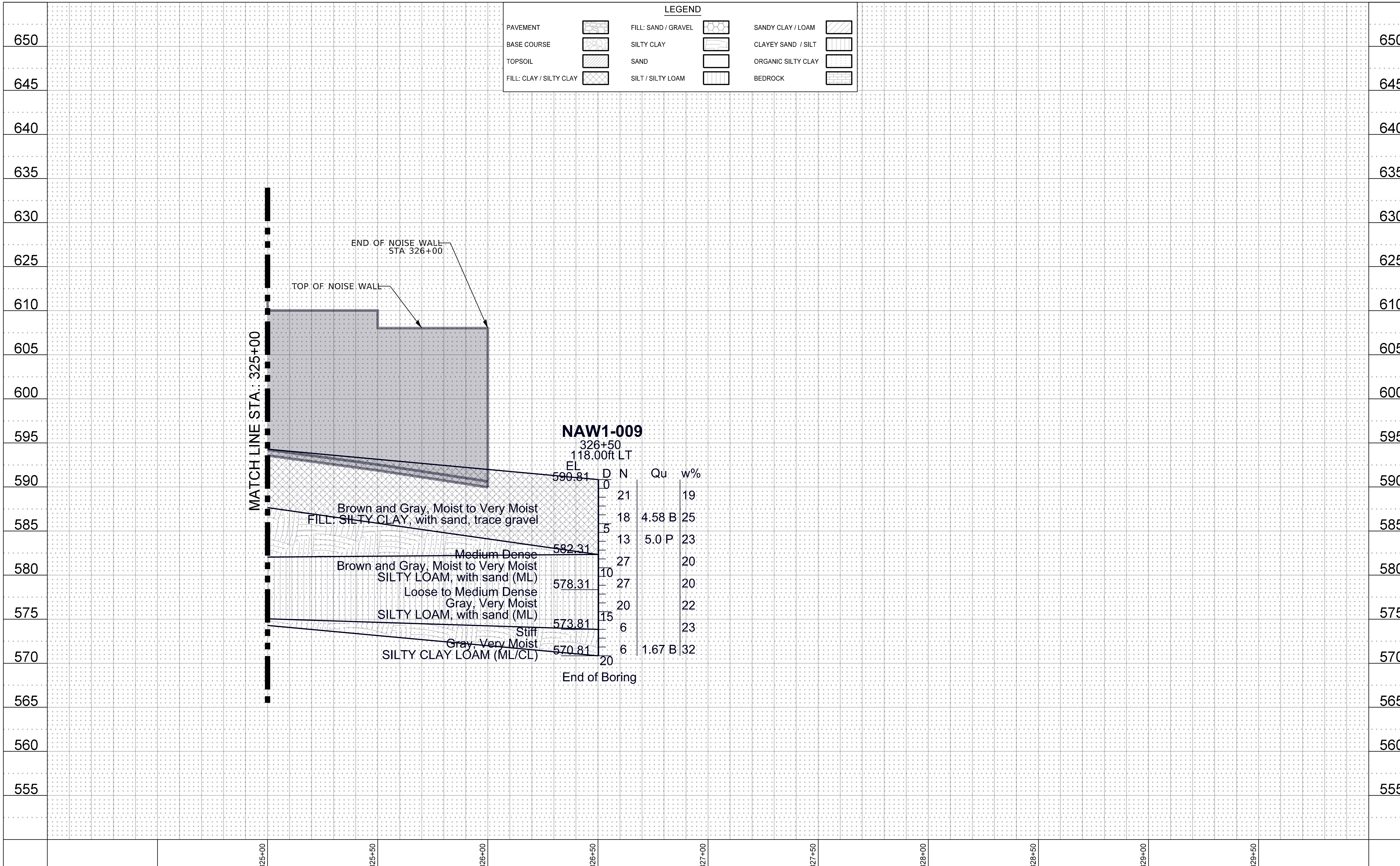
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 1 BORING LOCATION PLAN/PROFILE

SCALE: AS NOTED | SHEET 3 OF 4 SHEETS | STA. 319+75 TO STA. 325+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	5	3
		CONTRACT NO.	2189-011	

ILLINOIS | FED. AID PROJECT



GSG CONSULTANTS, INC.

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 189-011
I-55/ROUTE 59 WILL COUNTY
NOISE ABATEMENT WALL 1 BORING LOCATION PLAN/PROFILE

SCALE: AS NOTED | SHEET 4 OF 4 SHEETS | STA. 325+00 TO STA. 329+50

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-55		WILL	5	4
		CONTRACT NO. 2189-011		
		ILLINOIS FED. AID PROJECT		

APPENDIX C

SOIL BORING LOGS

Illinois Department of Transportation
Division of Highways
GSG

SOIL BORING LOG

Date 11/10/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG Diedrich D-50 ATC
HAMMER TYPE AUTO
HAMMER EFF (%) 95

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-001
Station 310+50
Offset 130.00ft LT
Ground Surface Elev. 597.80 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
4 inches of Topsoil	597.47				
Medium Dense Brown and Gray, Moist to Very Moist SILTY LOAM, trace sand and gravel (ML)			8		
			10		13
			13		
			9		
			14		14
		-5	15		
			8		
	590.80		11	5.8	22
Very Stiff to Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)			14	B	
			6		
			8	5.4	22
		-10	10	B	
			5		
			7	3.8	24
			10	B	
			4		
			8	5.2	21
		-15	10	B	
	581.80				
Hard Gray, Moist SILTY CLAY LOAM (ML/CL)			4		
			5	4.2	19
			8	B	
	579.30				
Dense Gray, Moist SILTY LOAM, with sand (ML)			6		
			19		15
	577.80	-20	30		

End of Boring

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
GSG

SOIL BORING LOG

Date 11/10/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG Diedrich D-50 ATC
HAMMER TYPE AUTO
HAMMER EFF (%) 95

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-002
Station 312+50
Offset 130.00ft LT
Ground Surface Elev. 600.26 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
5 inches of Topsoil	599.84				
Medium Dense Brown and Gray, Moist SILTY LOAM, with sand, trace gravel (ML)			7 / 9 / 10		14
			8 / 10 / 13		14
		-5			
	594.26				
Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)			6 / 9 / 12	5.2 B	22
			5 / 6 / 9	4.6 B	24
		-10			
	588.76				
Very Stiff to Hard Gray, Moist SILTY CLAY LOAM (ML/CL)			4 / 6 / 8	4.2 B	25
			3 / 5 / 8	4.6 B	25
		-15			
			4 / 6 / 8	3.3 B	21
	580.76		4 / 5 / 22	2.5 P	20
Medium Dense	580.26	-20			

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray, Moist SILTY LOAM, with sand (ML)					
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
GSG

SOIL BORING LOG

Date 11/10/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG Diedrich D-50 ATC
HAMMER TYPE AUTO
HAMMER EFF (%) 95

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-003
Station 314+50
Offset 130.00ft LT
Ground Surface Elev. 601.34 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
5 inches of Topsoil	600.92				
Medium Dense Brown and Gray, Moist to Very Moist SILTY LOAM, with sand, teace gravel (ML)			7 10 15		16
Rock Fragments at 4.0 feet		-5	8 14 15		14
			9 13 14		23
	592.84				
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)		-10	8 9 13	5.2 B	24
			6 7 8	3.3 B	24
		-15	3 6 8	3.3 P	25
	585.34				
Very Stiff to Hard Gray, Moist SILTY CLAY LOAM (ML/CL)			4 7 9	3.3 B	24
	581.34	-20	4 7 8	4.2 B	20

End of Boring

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
GSG

SOIL BORING LOG

Date 11/10/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG Diedrich D-50 ATC
HAMMER TYPE AUTO
HAMMER EFF (%) 95

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-004
Station 316+50
Offset 130.00ft LT
Ground Surface Elev. 601.20 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
4 inches of Topsoil	600.87				
Medium Dense Brown and Gray, Moist SILTY LOAM, with sand, trace gravel (ML)			7 11 14		18
			8 10 11		15
		-5			
	594.20		8 10 13	5.0 B	17
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)			5 8 13	5.4 B	24
		-10			
			4 5 8	2.5 B	27
	587.70				
Very Stiff Gray, Moist to Very Moist SILTY CLAY LOAM (ML/CL)			3 4 7	2.9 B	26
		-15			
			4 7 10	3.3 B	25
			4 7 14	3.8 B	19
	581.20	-20			

End of Boring
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
GSG

SOIL BORING LOG

Date 11/10/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG Diedrich D-50 ATC
HAMMER TYPE AUTO
HAMMER EFF (%) 95

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-005
Station 318+50
Offset 130.00ft LT
Ground Surface Elev. 605.20 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
5 inches of Topsoil	604.78				
Very Dense Brown and Gray, Moist SILTY LOAM, with sand, trace gravel (ML) Rock Fragments at 2.0 feet			13 17 37		16
	601.20		12		
Very Stiff to Hard Brown and Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)		-5	19 23	7.0 P	14
			13 13 15	6.0 P	14
		-10	8 10 13	6.5 P	19
			6 9 9	4.8 B	23
		-15	4 7 9	3.1 B	23
	589.20				
Very Stiff to Hard Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)			5 7 10	3.5 B	23
	585.20	-20	4 7 11	4.0 B	23

End of Boring

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
GSG

SOIL BORING LOG

Date 11/9/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG CME-75
HAMMER TYPE AUTO
HAMMER EFF (%) 91

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-006
Station 320+50
Offset 130.00ft LT
Ground Surface Elev. 601.57 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and Gray, Moist FILL: SILTY CLAY, with sand, trace gravel			8 50/4"	2.5 P	10
			19		
Rock Fragments at 4.0 feet		-5	13 14	2.0 P	12
	595.57				
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)			8 9 10	4.0 P	21
		-10	6 6 10	3.8 P	28
			6 6 9	5.0 B	28
	588.07				
Very Stiff to Hard Gray, Moist SILTY CLAY LOAM, trace sand (ML/CL)		-15	4 5 6	3.1 B	25
			4 5 7	4.2 B	23
	581.57	-20	5 6 8	2.5 B	19

End of Boring

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
GSG

SOIL BORING LOG

Page 1 of 1

Date 11/9/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA

DRILLING RIG CME-75
HAMMER TYPE AUTO
HAMMER EFF (%) 91

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-007
Station 322+50
Offset 130.00ft LT
Ground Surface Elev. 599.94 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and Gray, Moist FILL: SILTY CLAY, trace sand and gravel			5 8 12	4.0 P	15
		-5	7 11 12	5.5 P	19
	593.94				
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)			6 6 9	4.4 B	26
		-10	5 6 7	4.4 B	23
			4 4 7	3.5 B	27
	585.94				
Hard Gray, Moist SILTY CLAY LOAM (ML/CL)		-15	4 5 9	4.8 B	20
	583.94				
Medium Dense to Dense Gray, Moist to Very Moist SILTY LOAM, with sand (ML)			4 5 8		21
	579.94	-20	14 21 27		18

End of Boring

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
GSG

SOIL BORING LOG

Date 11/9/20

ROUTE I-55 and IL 59 DESCRIPTION Noise Abatement Wall #1 LOGGED BY MH

SECTION 2018-075-R LOCATION N of I-55

COUNTY WILL DRILLING METHOD HSA

DRILLING RIG CME-75
HAMMER TYPE AUTO
HAMMER EFF (%) 91

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-008
Station 324+50
Offset 130.00ft LT
Ground Surface Elev. 595.40 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A Hrs. N/A ft

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and Gray, Moist FILL: SILTY CLAY, with sand and gravel			7 18 10	3.0 P	13
		-5	6 8 12	6.0 P	19
	589.40				
Very Stiff to Hard Brown and Gray, Moist to Very Moist SILTY CLAY LOAM, trace sand (ML/CL)			5 7 8	4.5 P	26
		-10	4 5 8	4.4 B	22
			4 6 7	3.3 B	23
	581.90				
Dense Brown and Gray, Moist SILTY LOAM, with sand (ML)		-15	3 19 22		19
	579.40				
Dense Gray, Moist SILTY LOAM, with sand (ML)			11 18 19		20
	575.40	-20	14 24 17		18

End of Boring

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
GSG

SOIL BORING LOG

Date 11/9/20

ROUTE I-55 and IL 59 **DESCRIPTION** Noise Abatement Wall #1 **LOGGED BY** MH

SECTION 2018-075-R **LOCATION** N of I-55

COUNTY WILL **DRILLING METHOD** HSA **DRILLING RIG** CME-75 **HAMMER TYPE** AUTO **HAMMER EFF (%)** 91

STRUCT. NO. NAW#1
Station

BORING NO. NAW1-009
Station 326+50
Offset 118.00ft LT
Ground Surface Elev. 590.81 ft

Surface Water Elev. N/A ft
Stream Bed Elev. N/A ft

Groundwater Elev.:
First Encounter None ft
Upon Completion N/A ft
After N/A **Hrs.** N/A ft

Description	Elev.	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and Gray, Moist to Very Moist FILL: SILTY CLAY, with sand, trace gravel			7 10 11		19
		-5	7 8 10	4.6 B	25
	582.31		6 7 6	5.0 P	23
Medium Dense Brown and Gray, Moist to Very Moist SILTY LOAM, with sand (ML)		-10	7 12 15		20
	578.31		11 18 9		20
Loose to Medium Dense Gray, Very Moist SILTY LOAM, with sand (ML)		-15	9 10 10		22
	573.81		8 2 4		23
Stiff Gray, Very Moist SILTY CLAY LOAM (ML/CL)	570.81	-20	2 3 3	1.7 B	32

End of Boring

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)